TABLE OF CONTENTS

Page Number

ENVIRONMENTAL ASSESSMENT

LIST OF FIGURES

LIST OF TABLES

LIST OF PLATES

ATTACHMENTS

ENVIRONMENTAL ASSESSMENT

SECTION 1. INTRODUCTION

This Environmental Assessment (EA) is the result of a coordinated effort between the U.S. Army Corps of Engineers (USACE) and the City of Stamford, Connecticut. The Mill River is located within the Rippowam Watershed (HUC 01100006) in southwestern Fairfield County, Connecticut (Figure 1). The intention of this EA is to evaluate the existing conditions of the Mill River and the environmental effects of the proposed restoration and habitat enhancement along the project reach to fulfill project compliance with the National Environmental Policy Act of 1969. The restoration plan focuses upon the removal of the Main Street Dam and adjoining retaining walls within the Mill River Park in downtown Stamford. In-stream and floodplain restoration will be achieved through the creation of freshwater and tidal wetlands as well as through riparian enhancement. The environmental impacts of dam removal and fish passage restoration are discussed and described in terms of the value and benefit to habitat health and function. This project is being conducted under USACE Aquatic Ecosystem Restoration (Section 206) Program.

For this report, the Mill River is defined as an eight-mile section of the Rippowam River, south of the North Stamford Reservoir, in southwestern Connecticut. The Mill River is joined by Poorhouse Brook, Haviland Brook, Ayers Brook, and Toilsome Brook and runs through the City of Stamford and eventually into Long Island Sound (Figure 2). The project area encompasses a 2.5-mile reach from Cold Spring Road to Stamford Harbor, which is within the designated coastal zone pursuant to the Connecticut Coastal Zone Management Act. (A coastal zone management consistency determination is required of federal activities in tidal, coastal or navigable waters or tidal wetlands with impacts within the coastal area.) A restoration plan by the City of Stamford and the USACE seeks to enhance aquatic habitat and function in the Mill River while improving its value as a public amenity and urban green space. Several restoration strategies have been considered and evaluated in this report. Assessment criteria include biological resource enhancement, protection of priority natural areas, amelioration of urban storm water pollution and the enrichment of the social and cultural setting of the City of Stamford.

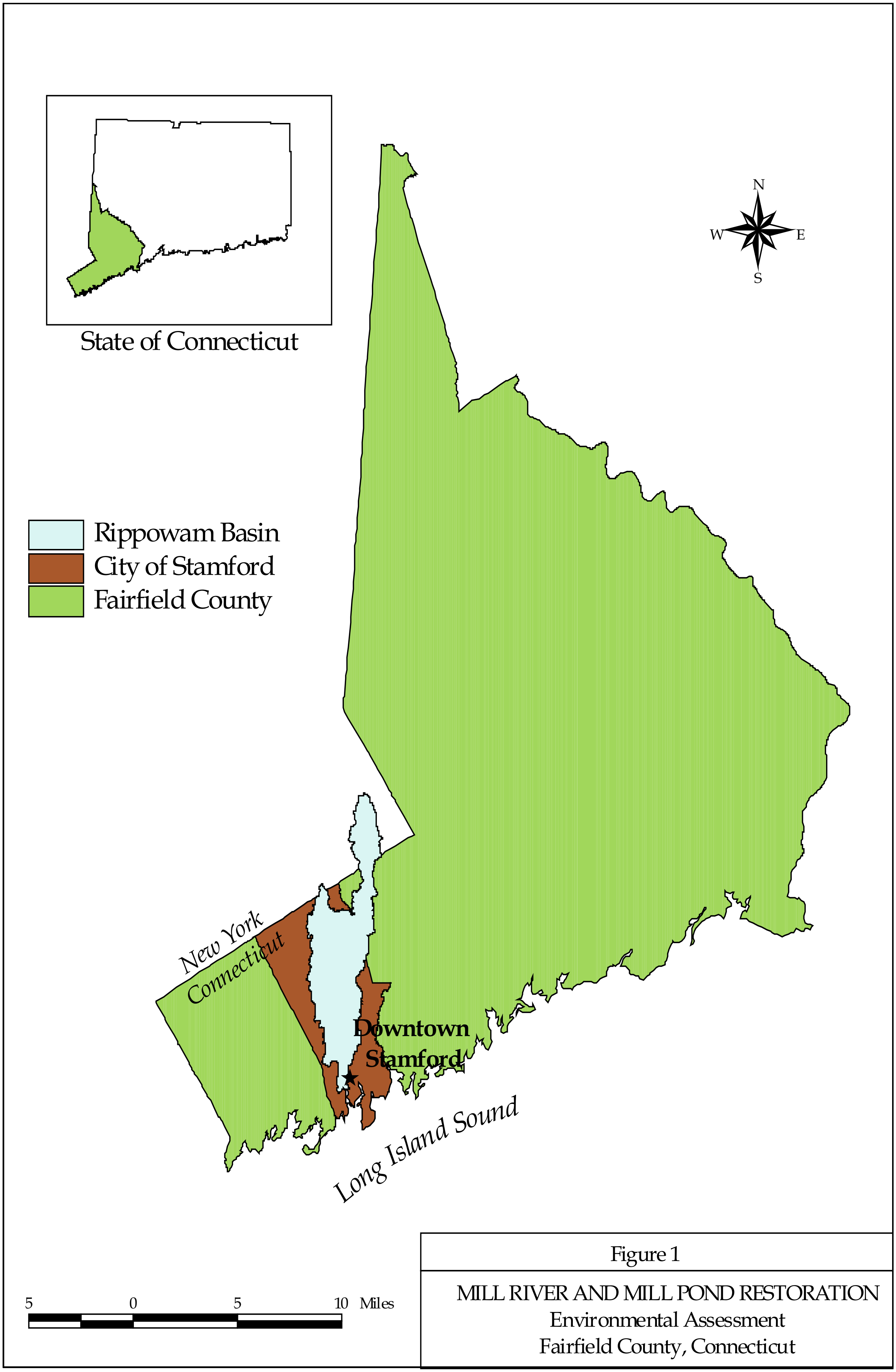


FIGURE 1: Fairfield County and the Rippowam Basin, New York and Connecticut

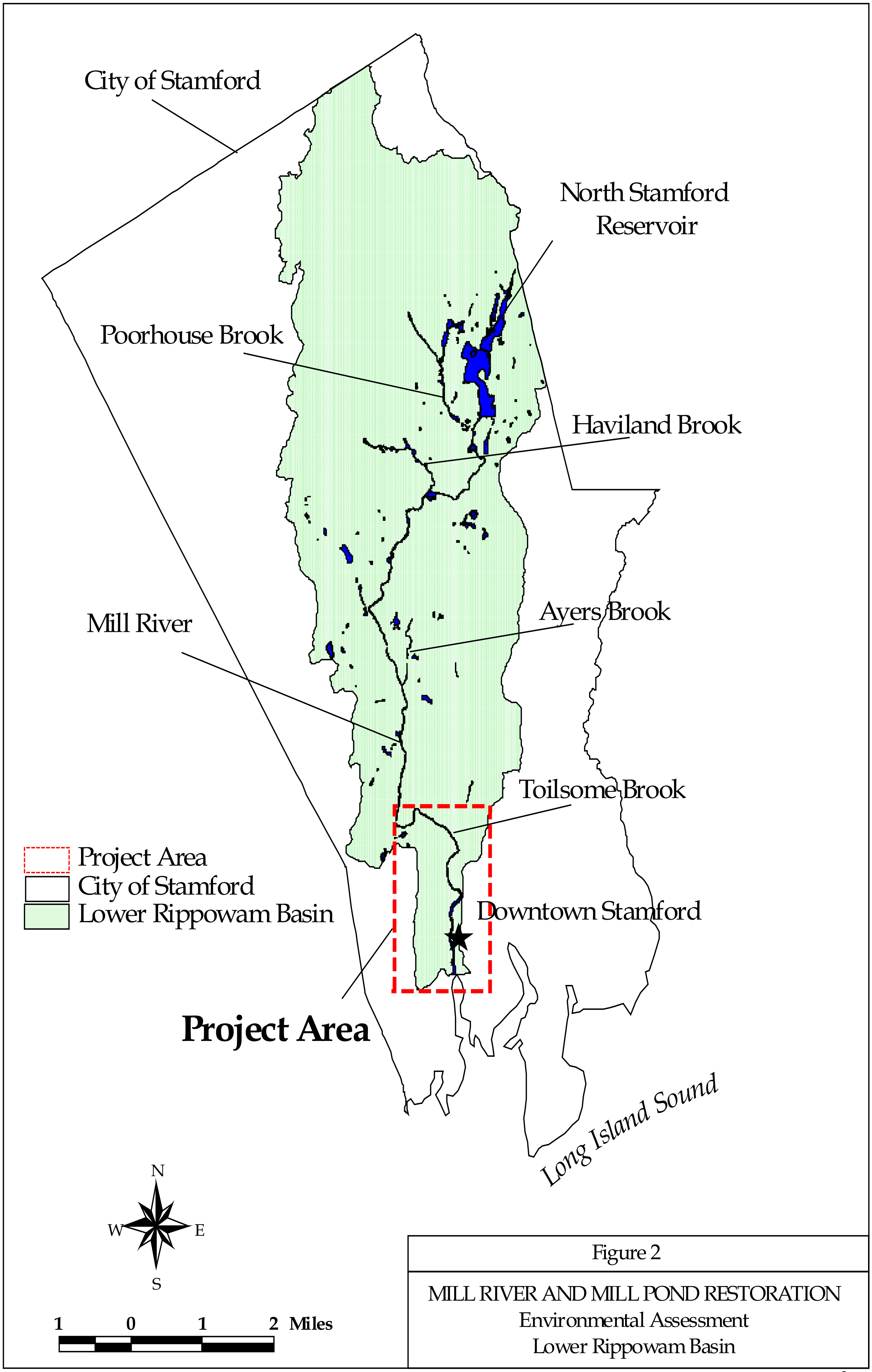


FIGURE 2: Project Area within the City of Stamford, CT

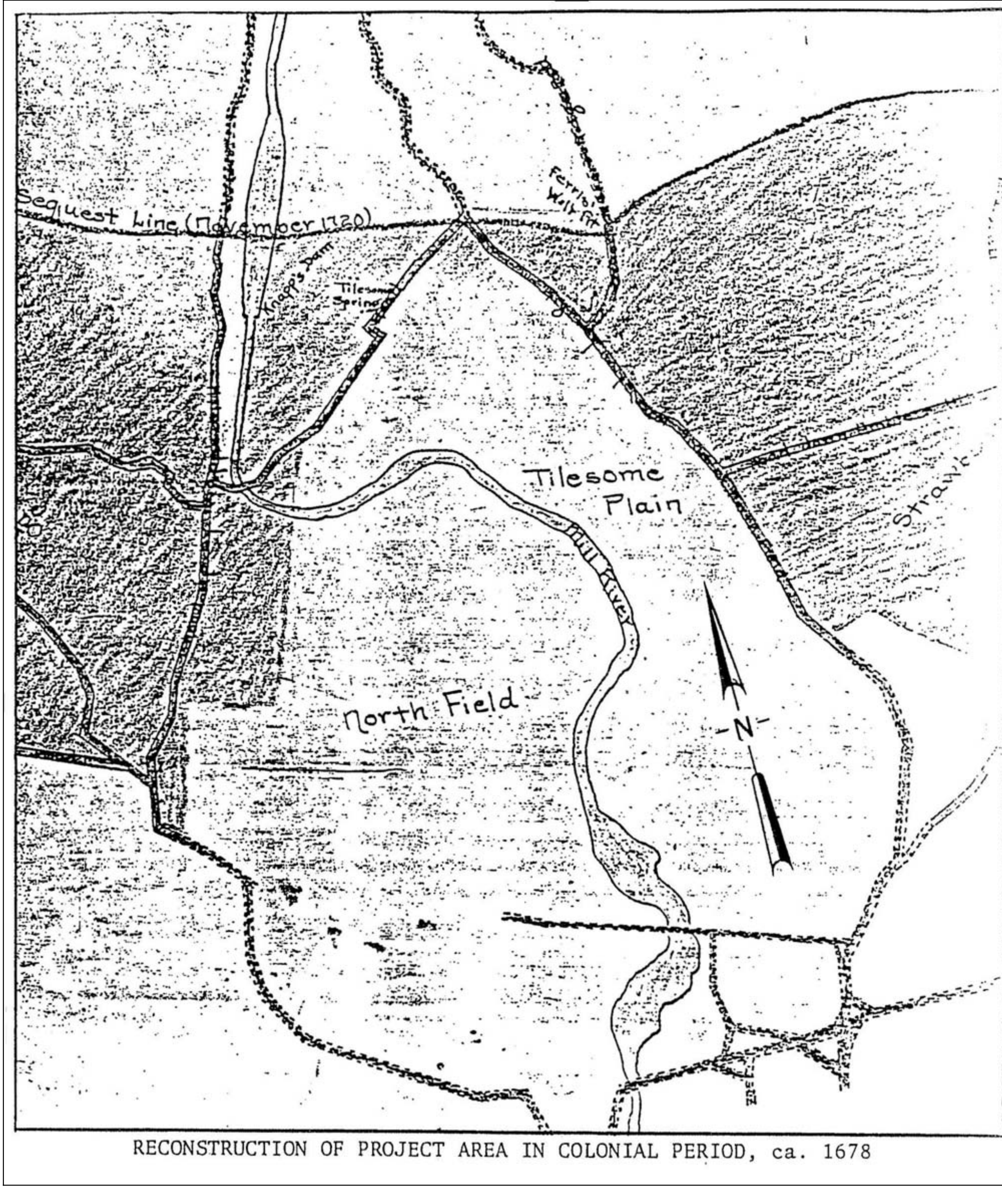
SECTION 2. PROJECT HISTORY

The Rippowam River basin was settled as an agricultural community in the mid-17th century (Figure 3). Due to its location on a natural harbor the community grew into an economically thriving commercial and manufacturing center. The Mill River, which drains most of the City of Stamford, has been modified and impacted by human use since the first settlers diverted the river's water for irrigation. Water use by industry and damming of the river for mills has affected stream flow and the path of the river and thereby altered the river's habitat. Historically there have been two primary dams in the project area, the Stillwater Dam and the Main Street Dam. A number of smaller dams were constructed farther upstream, some of which remain and are further discussed in Section 6.3, Aquatic Environment.

The Stillwater Dam, once known as Knapp's Dam, was constructed between 1678 and 1751 (Figure 3) and was utilized for a number of industrial uses. The Stillwater Manufacturing Company produced steel rods and bars until circa 1890 when operations were moved to the Stamford Harbor. At this time the Stillwater Dam was abandoned and its structure removed (USACE 1985). Today, there is no dam or fish obstruction in this location.

The first dam constructed at the Mill Pond was in 1642 for the original gristmill in Stamford (USACE 1985). The Mill Pond was larger in area than it is today and contained an island (Figure 4). In 1922, the present Main Street Dam was constructed in the same location. Vertical concrete retaining walls were built on the eastern and western shores of the pond to reduce the size of the pond and increase the extent of the adjacent park (Figure 5). The Mill Pond is currently a 3.5-acre impoundment formed by the Main Street Dam (Plate 1). The construction of the Main Street Dam has prevented the passage of anadromous fish to their spawning grounds upstream. Since 1999, Save the Sound, a local conservation non-profit organization, along with the City of Stamford, CT Department of Environmental Protection (DEP), and the National Oceanic and

Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) have been developing plans to install a fish ladder at the dam to restore anadromous fish runs to the Mill River. At this time, those plans remain in development however, there is general consensus among the environmental agencies with interest or jurisdiction in the project that dam removal and river channel restoration is preferable to achieve this goal. Any action by Save the Sound will take the federal project into consideration to prevent any duplication of effort.



RECONSTRUCTION OF PROJECT AREA IN COLONIAL PERIOD, ca. 1678

Figure 3. Historical map of Stamford Area. (1678) **Source: USACE 1985**

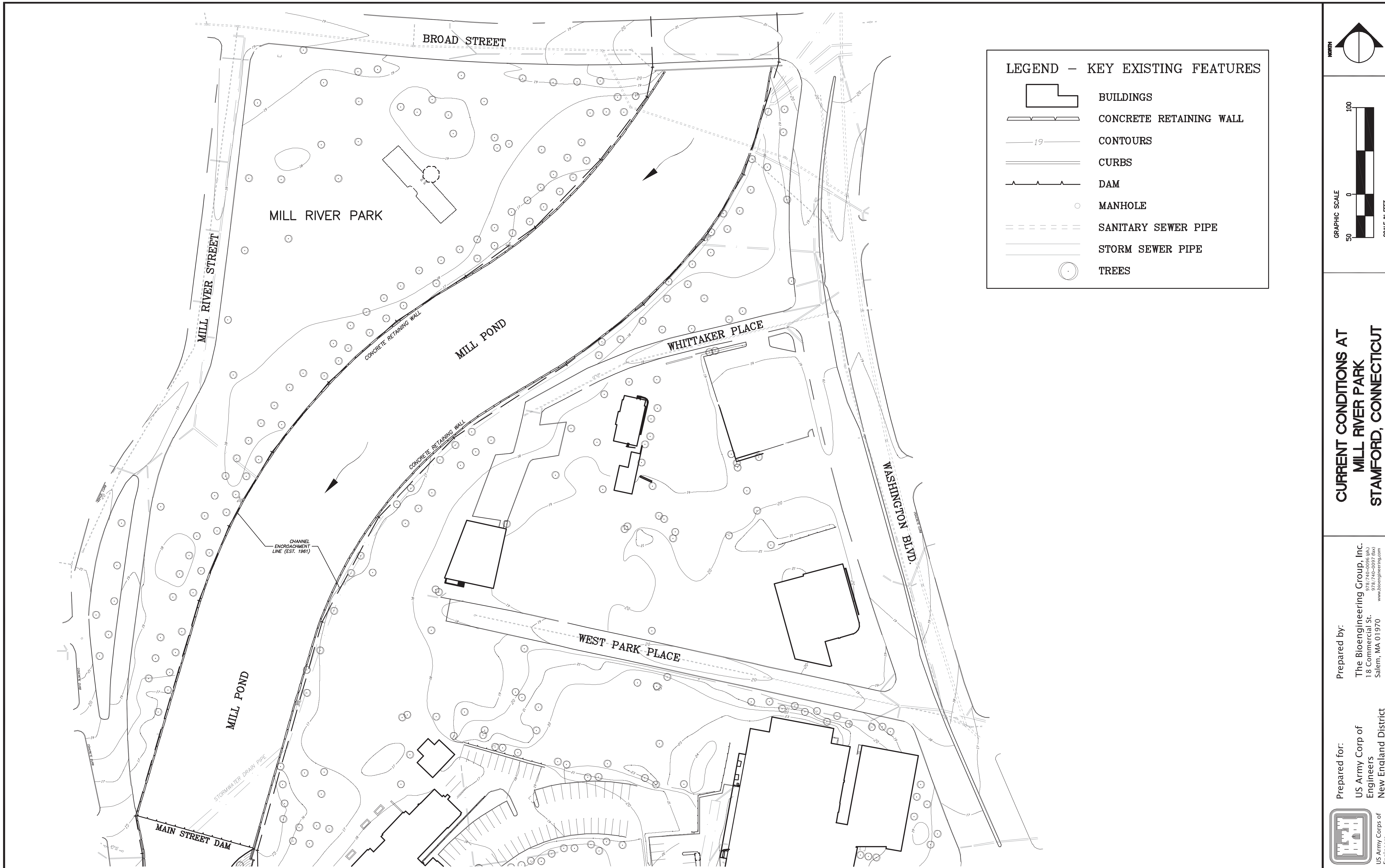


FIGURE 4 EXISTING SITE PLAN AND TOPOGRAPHIC SURVEY OF THE MILL RIVER PARK

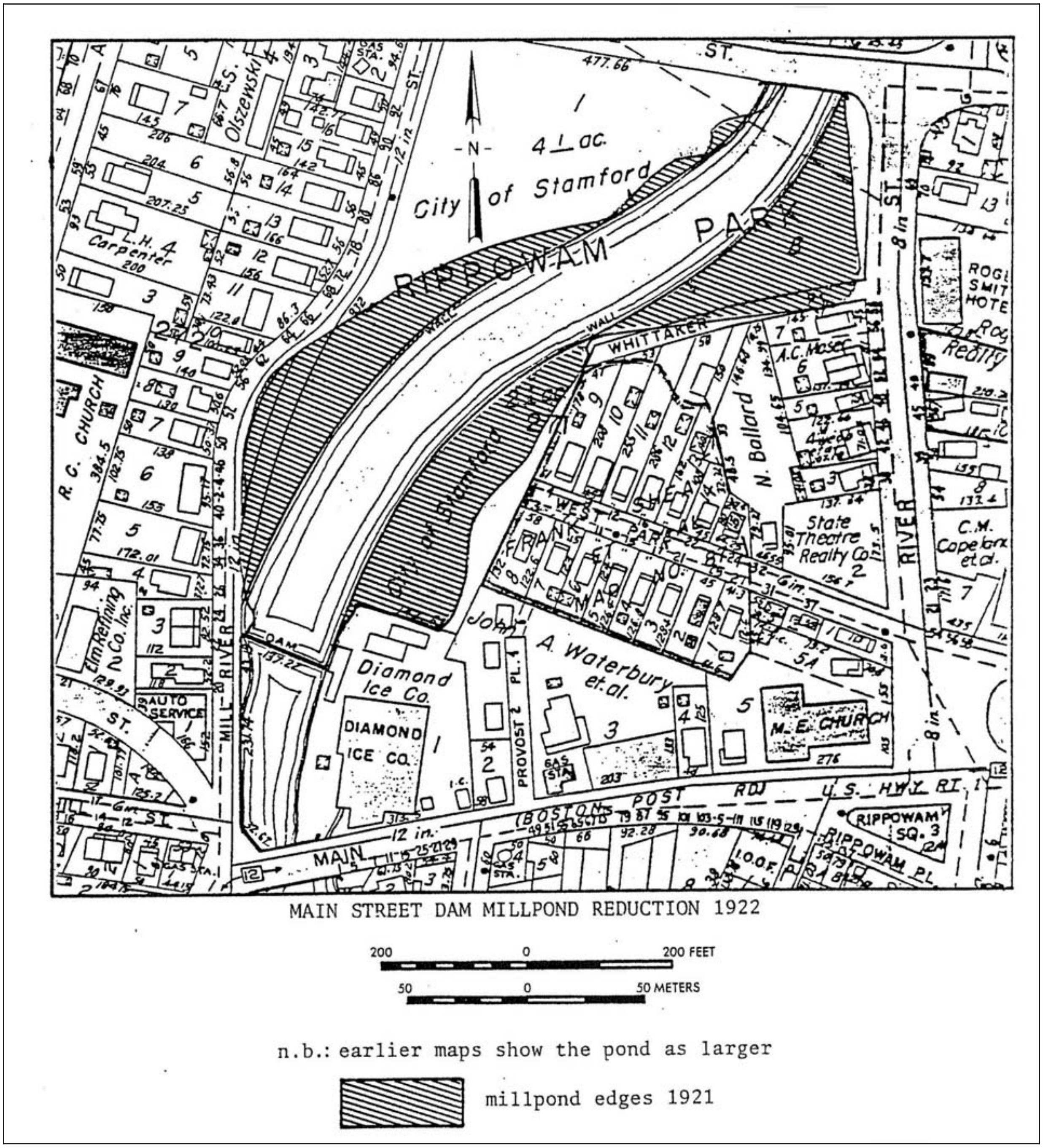


Figure 5. Historical map of downtown Stamford and Mill Pond Park (1922)

Source: USACE 1985

Plate 1. Mill Pond in downtown Stamford, CT, showing concrete retaining walls lining the pond.

The City of Stamford is dedicated to expanding and enhancing the Mill River riparian corridor to act as a wildlife passageway and urban greenspace. In 1997, the City commissioned a study by Sasaki Associates for the creation of a Mill River Corridor (Sasaki 1999). The findings of the study called for a continuous greenway along the Mill River. This greenway would create much needed open space for the residents of Stamford. The river would become the focal point of the park system from which connections to downtown Stamford and surrounding neighborhoods would be strengthened.

In 2000, the City of Stamford approached the USACE to investigate alternatives for the improvement of aquatic habitat in the lower reach of the Mill River. This investigation included the restoration of aquatic habitat in the Mill Pond behind the Main Street Dam. The study is being conducted under the authority of the USACE Aquatic Ecosystem Restoration Program, Section 206 of the Water Resources Development Act of 1996 (PL 104-303).

SECTION 3. PROJECT NEED

Dam construction and channelization of the Mill River has left its aquatic habitat in poor condition. The habitat value of the Mill Pond is now highly degraded due to vertical concrete retaining walls, elevated nutrient levels, and excessive sedimentation. Cracked and failing concrete walls provide no shading or habitat value. The lack of floodplain and the presence of a large population of resident Canada geese have contributed to the poor water quality, resulting in uncontrolled growth of algae and invasive aquatic plants. The pond has historically experienced sedimentation problems that require routine maintenance and dredging. The pond was last dredged in 1996 and has subsequently refilled. The City of Stamford is currently permitted to remove 9,000 cubic yards of sediment from within Mill Pond. All materials determined inappropriate for disposal in residential, industrial, or commercial areas will be transported to the Manchester Municipal Landfill. For more information on sediment quality, see DPR section 4.3.3.

Poor quality of habitat is compounded by a lack of fish passage at the Main Street Dam. The enhancement of the Mill Pond and restoration of fish passage through the park will once again allow river herring (the collective name for blueback herring and alewife) to utilize the pond and upstream reaches of the Mill River. The river was historically a spawning area and hatchery for the herring. Suitable habitat will support all the requirements for the life cycle of these fish. The possibility also exists to restore American shad and sea-run brown trout to these areas.

Urbanization within the floodplain has placed pressure on the Mill River and has left it in a deteriorated state. Storm water outfalls empty directly to the river, creating high-energy flows that lead to erosion and flooding during storm events. Emergent vegetation lacks diversity and is dominated by exotic and invasive species.

SECTION 4. PROJECT DESCRIPTION (PREFERRED PLAN)

The preferred project, a modified Alternative 2, includes the following measures:

- Removal of approximately 18,600 cubic yards of sediment behind the dam and regrading of 26,000 cubic yards of material (outside of the walls), removal of the Main Street Dam and retaining walls and restoration of a natural stream channel through a quarter-mile reach of Mill River, thereby opening up 4.2 miles (32 acres) of riverine habitat to anadromous fish
- Restoration of 1.53 acres of riparian corridor through planting of native woody and herbaceous vegetation and removal of exotic and invasive plant species
- Restoration of 0.8-acre tidal wetlands through re-grading banks and planting native salt marsh vegetation
- Removal of abandoned concrete blocks and a gate structure beneath the Pulaski Street Bridge
- Incorporation of a trail system to connect the greenway and parks along the river corridor in the vicinity of the restored sites

Alternative 2 was modified during the evaluation process to exclude the restoration of a one-acre freshwater wetland located at the J.M. Wright Technical School grounds. This restoration measure was eliminated from the preferred plan due to its high cost.

The Mill River and Mill Pond Restoration Project will remove the Main Street Dam and the concrete retaining walls around the Mill Pond. Removal of these structures will create an opportunity to restore the river channel and floodplain to the Mill River Park and open 5 miles of the Mill River for the passage of anadromous fish species. The Mill River Park is a 9-acre inner city park. The Mill Pond is 3.5 acres in area, extending 1,100 feet from the Broad Street Bridge to the Main Street Dam. The pond has a uniform width of 140 feet between concrete retaining walls. These walls are a total of 15 feet high with 7.5 feet of wall typically exposed above the water surface. The Main Street Dam stands 9.3 feet high with a 112-foot wide spillway. Restoration of the Mill River in the Mill River Park will create an attractive water feature of riffles and pools for park users to enjoy. The restored riverbed will represent a stable equilibrium of sediment and nutrient transport supporting aquatic, riverbank, and floodplain habitat. The restoration will include re-establishment of a riparian corridor on both sides of the river through the park.

The project area extends 3,800 feet downstream of the Main Street Dam to the mouth of Stamford Harbor and 9,650 feet upstream of the Main Street Dam to Cold Spring Road. The total reach of 2.5 miles has been evaluated for possible in-stream and floodplain habitat restoration. Restoration strategies vary according to the extent of ecological degradation and land use impacts.

Restoration of river channel, tidal wetlands, and riparian corridor will improve foraging, spawning, and sheltering habitat. Additional, wetland functions include intercepting sediment, ameliorating floods, recharging groundwater, removing nutrients, remediating pollutants, and improving water quality. In other areas the removal of invasive plants and garbage and the stabilization and replanting of riverbanks will improve riparian habitat. Habitat improvements will support local biodiversity and improve the ecosystem health of Stamford's urban river. A contiguous system of river parks, open space, protected habitat and trail systems will provide a public amenity for the residents of Stamford to enjoy. The natural resources of the Mill River would provide recreational and educational opportunities while connecting neighborhoods and providing essential ecological services to the city. The restoration of the Mill River will distinguish Stamford as a city that recognizes and protects its urban ecology.

The removal of the Main Street Dam will proceed as described in Section 7 of the DPR and during the specified season (low flow periods). Removing the dam will eliminate the barrier to upstream and downstream migration of fishes within the Mill River. Activities will restore the historic stream channel, lowering the water level within the park, and creating beneficial floodplain.

SECTION 5. ALTERNATIVES

Alternatives, including additional restoration measures, evaluated for the restoration of the Mill River and Mill Pond in Stamford, Connecticut are described below:

Alternative 1: No Action

No alterations to the Mill River or Mill Pond would be performed. The Mill Pond landscape would remain unchanged. Historic cherry trees and other vegetation would remain in their current locations. The concrete walls bordering the pond and dam would remain in place and require continued maintenance. Sediment from a variety of watershed sources (e.g., stormwater runoff) would continue to be deposited in Mill Pond, thus requiring regular dredging and maintenance by the City of Stamford. For example, the City removed 3,500 cubic yards of sediment from the pond in 1996 and has plans and permits to remove 9,000 cubic yards in the future. Water quality within Mill Pond would continue to be impaired. The Main Street Dam would continue to block the movement of anadromous and freshwater fishes as well as require immediate gate repair and continued structural reinforcement.

Alternative 2: Dam Removal and River Channel Restoration

To facilitate fish passage and allow continual flushing of sediment, the Main Street Dam would be removed. A stable river that effectively transports the imposed discharge and sediment load would be re-established through the former Mill Pond. The configuration of the natural channel design, along with the selective placement of boulders and other rock structures in the stream channel, would create an in-stream pool and riffle sequence within the park reach. The deeper pools would be self-maintained by natural flushing during high river flows. Excess contaminated sediment (approximately 18,600 cubic yards) that has collected behind the dam would be excavated. Sediment will be tested as it is removed and dewatered. All materials determined inappropriate for disposal in residential and/or industrial/commercial areas will be transported to the Manchester Municipal Landfill. The concrete walls of the Mill Pond would be removed and replaced with gently sloping banks composed of soil material stabilized by native vegetation. These vegetated banks would act as a riparian buffer providing shade. A natural floodplain would be restored to provide flood storage for large discharge events without increasing established Federal Emergency Management Agency (FEMA) flood elevations.

Dam removal would reduce the river's elevation in this reach and require bank regrading and stabilization to create floodplain that integrates with existing park elevations. Creating a floodplain and terraces may require removing some existing vegetation. Passage of anadromous and freshwater fishes would be restored to the Mill River, and habitat connectivity between the river and Long Island Sound would be re-established. Little maintenance would be required to sustain stream channel integrity and water quality. Trails and/or boardwalks would accommodate recreational access to the river. The arrangement of channel form, native plants, boulders, water conditions and healthy fish and wildlife populations would create an appealing and appropriate functional greenspace in downtown Stamford.

Additional restoration actions (Additive Measures) would occur both upstream and downstream of the Mill Pond. Restoration activities would include:

- Creating a 1.0 acre wetland and outdoor education area on the JM Wright Technical School grounds
- Enhancing 1.53 acres of the riparian corridor through removal of exotic and invasive plant species and planting of native woody and herbaceous vegetation
- Creating and restoring 0.8 acres of tidal wetlands through re-grading banks and planting native salt marsh vegetation
- Removing concrete blocks and gate structures directly beneath the Pulaski Street Bridge
- Incorporating a trail system to connect the greenway and parks along the river corridor

Alternative 3: Dam Removal and Creation of Step Pools

Dam removal would occur as described in Alternative 2. A series of pools connected by small cascades would be created within Mill Pond Park. Excess contaminated sediment that has collected behind the dam would be excavated and disposed of at a designated site before construction. The concrete walls around the Mill Pond would be removed and replaced with vegetated banks stabilized and functioning in the same manner as describe in Alternative 2. Wetland habitat may be established along the margins of the pools. Passage of a broad range of fish and other aquatic species would be enhanced in the Mill River, and habitat connectivity would be restored between the river and the ocean. Trails and/or boardwalks would accommodate recreational access to the river.

Additional restoration activities (Additive Measures) would include:

- Creating a 1.0 acre wetland and outdoor education area on the JM Wright Technical School grounds
- Enhancing 1.53 acres of the riparian corridor through the removal of exotic and invasive plants and planting of native woody and herbaceous vegetation
- Creating and restoring 0.8 acres of tidal wetlands through re-grading banks and planting native salt marsh vegetation
- Removing concrete blocks and gate structures directly beneath the Pulaski Street Bridge
- Incorporating a trail system to connect the greenway and parks along the river corridor

Alternative 4: Partial Removal of Concrete Retaining Walls

The Main Street Dam and the Mill Pond would be retained. A portion of the concrete walls around Mill Pond would be removed (10% of the walls would remain in place to support the structural integrity of the dam) and the shoreline of the pond would be reshaped and regraded. Excess contaminated sediment (approximately 18,600 cubic yards) that has collected behind the dam would be excavated and disposed at a designated site prior to construction. Main Street Dam would be repaired and structurally reinforced. The new shoreline would be regraded to create a floodplain connecting to the park area. The new pond slopes would be stabilized with native upland vegetation to develop a riparian buffer zone around the pond. Existing cherry trees may need to be removed. Installing a fish ladder at the Main Street Dam would enhance fish passage. Trails and/or boardwalks would accommodate recreational access to the pond.

Additional restoration activities would include:

- Creating a 1.0 acre wetland and outdoor education area on the JM Wright Technical School grounds
- Enhancing 1.53 acres of the riparian corridor through removal of exotic and invasive plants and planting of native woody and herbaceous vegetation
- Creating and restoring 0.8 acres of tidal wetlands through re-grading banks and planting native salt marsh vegetation
- Removing concrete blocks and gate structures directly beneath the Pulaski Street Bridge
- Incorporating a trail system to connect the greenway and parks along the river corridor

Removal of the dam without removing the walls was also formulated, but was dropped from further consideration. This measure would create a channelized reach with walls that would need additional protection at considerable expense with no restoration benefit to the currently impounded reach. Partial wall removal is considered in Alternative 4 because the dam remains in place, and complete wall removal would compromise the structural stability of the dam.

The goal of this project is to restore the aquatic and riparian resources of the Mill River to a healthy, viable, and self-maintaining river system. To measure the environmental benefits of each alternative and determine cost-effectiveness, a series of habitat criteria were identified. Values of habitat unit outputs, measured as effective acres, were assigned to the criteria for each of the various alternatives, and the total values were calculated (see Table 4 of Section 6, Comparison of Alternatives, in the Detailed Project Report for further details.) The results of this analysis determined that the predicted habitat unit outputs for each proposed alternative were considerably better than the habitat unit outputs of the no-action alternative. The improved habitat unit outputs expected after project completion were calculated by subtracting the habitat unit output of the no-action alternative from the score of the other alternatives. Habitat units ranged from 3.3 for the no-action alternative to 43.9 for Alternative 2, which had the highest level of habitat improvement. Additive measures provide additional habitat improvements in the project area of 1.8 for removal of the fish blockage, 3.1 for tidal wetland restoration, 5.1 for riparian corridor restoration and 4.8 for freshwater wetland creation. These additional measures were added to the alternatives (except for the no-action alternative) in a linear fashion to achieve a more comprehensive restoration goal.

Alternative 2 had the highest habitat unit score. The restoration proposed in this alternative is most comparable to the biological community found in a healthy watershed. A diverse array of species within a balanced community would be found on the site with the implementation of this alternative. Alternatives 3 and 4 scored lower than alternative 2. Restoration of the site following the design of Alternatives 3 or 4 would not create as much species diversity nor community diversity. The no-action alternative, Alternative 1, scored substantially lower than all the other outlined plans. With this alternative, the physical characteristics of the site would not change. More detailed information on the evaluation of alternatives and the recommended alternatives is provided in Sections 5 and 6 of the Detailed Project Report and Appendix E, Incremental Analysis.

SECTION 6. EXISTING CONDITIONS

6.1 GENERAL DESCRIPTION

The Mill River encompasses the lower section of the Rippowam River from the North Stamford Reservoir to the West Branch of the Stamford Harbor and eventually flows into the Long Island Sound. The Mill River flows eight miles through the City of Stamford, Connecticut joining with Poorhouse Brook, Haviland Brook, Ayers Brook, and Toilsome Brook (see Figure 2). Downstream of Broad Street, near Stamford's center, the Mill River is impounded behind the Main Street Dam. This area of slow flowing water is known as the Mill Pond. Downstream from the Main Street Dam, the Mill River discharges to the Long Island Sound through the West Branch of Stamford Harbor. Twenty-three bridges span the Mill River from its source at the North Stamford Reservoir to its outfall at the Sound.

For the purposes of this study, the Mill River has been divided into three reaches. The "Upstream Reach" refers to the river's course from Stillwater Pond to the Broad Street Bridge. The "Mill Pond Reach" refers to the impounded section of river from the Broad Street Bridge to the Main Street Dam. The "Downstream Reach" refers to the Mill River's course from the Main Street Dam downstream to Stamford Harbor (Figure 6).

6.1.1 The Upstream Reach

The North Stamford Reservoir is located eight miles upstream from the Stamford Harbor and serves as the headwaters for the Mill River (Plate 2). The North Stamford Dam was built in 1908, creating the reservoir primarily for city water supply. The land surrounding the reservoir is protected and is therefore undeveloped. The reservoir is currently owned by the Aquarion Water Company, and is a part of a series of reservoirs that supply drinking water for the City of Stamford. The rate of discharge into the Mill River during inter-storm periods is controlled by the reservoir. During high flow periods the water discharges over the reservoir's spillway (Plate 3).

The upstream reach of the river is primarily bordered by suburban homes and remnants of woodland. Poorhouse Brook joins the Mill River in a residential area just south of the reservoir. The Poorhouse Brook flows through Bartlett Arboretum Historic Preserve and the Stamford Museum before joining the Mill River (Plate 4). The river then passes under the Merritt Parkway, flows through a series of six small dams and under bridges at Barnes Road, Buckingham Drive, Long Ridge Road, and Cold Spring Road.

Upstream of Cold Spring Road, residential lawns and specimen trees border the river. Downstream the riverbanks are wooded. Residential homes and apartment complexes abut the river as it winds to the east for a half-mile. At the Bridge Street Bridge the river bends back to the south and passes alongside Scalzi Park. Invasive plant species dominate the banks, and there is evidence in some parts of dumping of household debris.

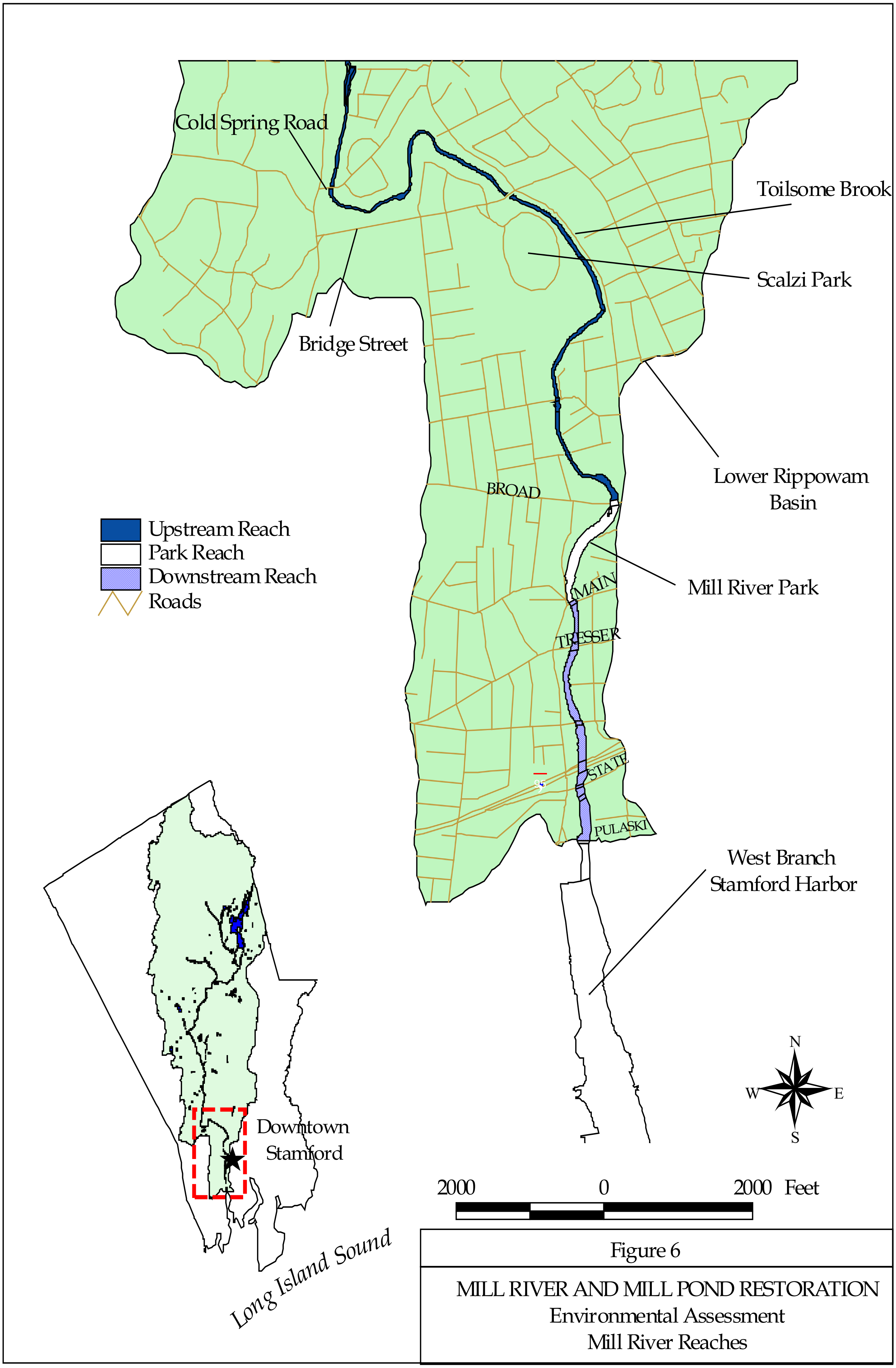


FIGURE 6. Mill River Reaches

Plate 2. The North Stamford Reservoir, headwaters of the Mill River

Plate 3. North Stamford Reservoir Spillway.

Plate 4. The confluence of the Poorhouse Brook and the Mill River

Toilsome Brook discharges into the Mill River through a large outfall near Scalzi Park (Plate 5). This culverted stream flows beneath City streets and primarily receives urban storm water runoff. The Mill River then passes along side a State owned technical high school (JM Wright Technical School), an elementary school, a middle school and residential backyards. Before reaching the Broad Street Bridge, the riverbanks are lined with parking lots whose storm water runoff empties directly into the river.

Plate 5. Toilsome Brook as it discharges to the Mill River.

6.1.2 The Mill Pond

The Mill Pond is formed by the Main Street Dam and vertical concrete walls rising on either bank. There is a great deal of organic debris and trash in the pond, particularly in the northern end where the river enters. There is a constant sheet flow over the dam at the southern end of the pond (Plate 6). The pond divides Mill River Park into eastern and western portions (Figure 7). Mill River Park is the largest park in downtown Stamford and is currently utilized for community gatherings and functions. A city-owned housing development abuts the southeastern portion of the pond and the Main Street Dam.

Plate 6. Sheet flow over the Main Street Dam.

Mill River Park supports a large population of Canadian geese (Plate 7). Geese waste contributes considerably to the poor water quality of the pond, which is choked with invasive submergent plants.

The pond is bordered by a double row of kwanzan oriental cherry trees on both eastern and western banks. These trees were a gift to the city by Junzo Nojima, a local resident, in 1957 (Plate 8). The cherry trees are considered a valuable public resource but are nearing the end of their lifespan suffering from damage and disease. For more information on the cherry trees see Appendix I.

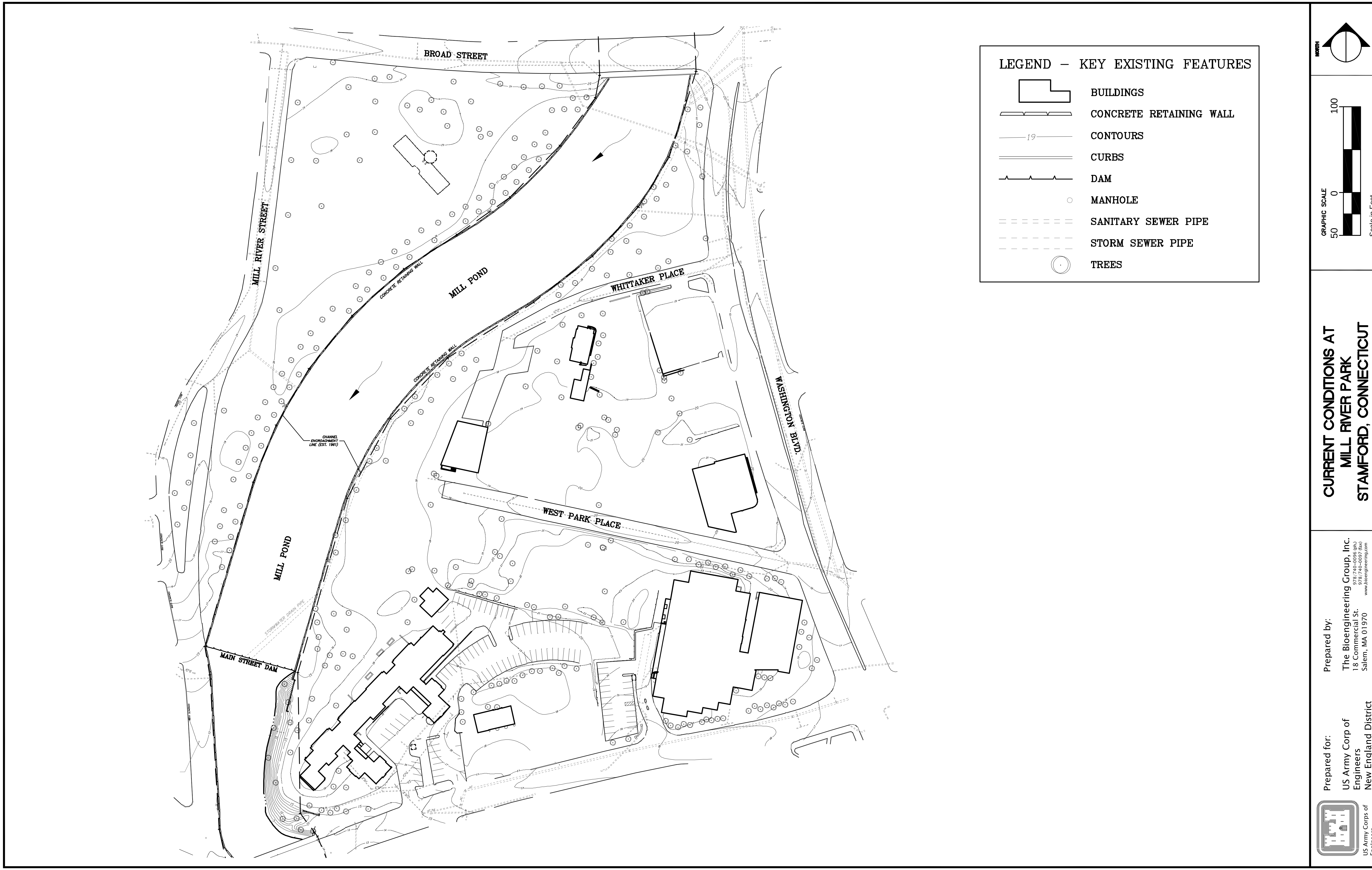


FIGURE 7 CURRENT CONDITIONS AT MILL RIVER PARK

Plate 7. Resident Canada geese of Mill River Park.

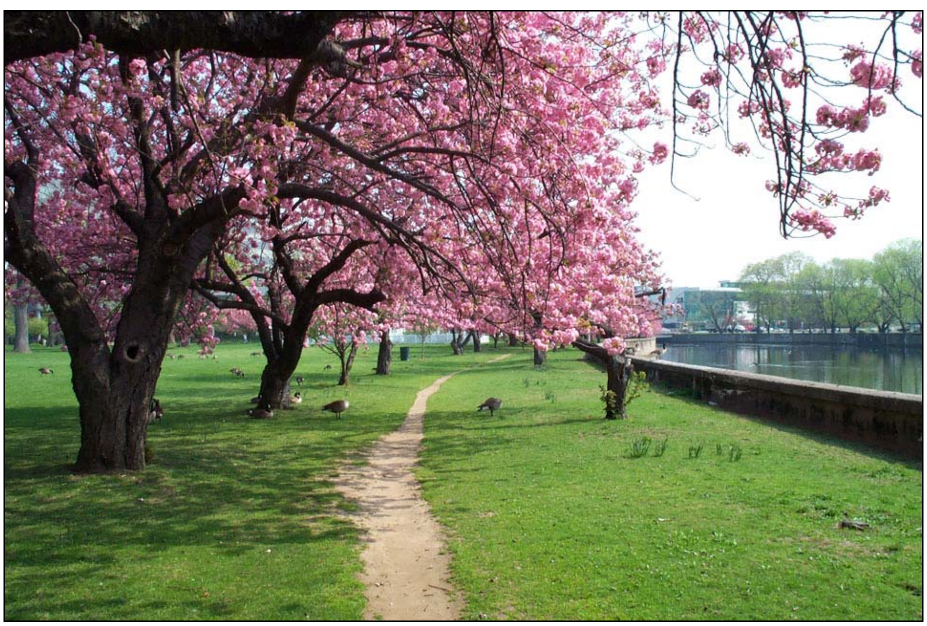


Plate 8. Cherry trees bordering the Mill Pond.

6.1.3 The Downstream Reach

South of the Main Street Dam, the river again flows in riffles and pools with scoured rock and small amounts of fine sediments. Considerable tidal influence is seen just south of the Tresser Boulevard Bridge approximately 900 feet downstream of the dam. The mean tidal range for the South Arm of the Stamford Harbor is 7.2 feet (USFWS 1997). Land use within the tidal portions of the river includes: light industry, residential and commercial development, and City owned parkland. The east bank is densely residential with some abandoned industrial buildings and a commuter rail station downstream of I-95. There is a narrow vegetated buffer along both banks and some isolated wetland areas. The vegetation affords some habitat to the river corridor but is dominated by exotics and invasive species.

There is a contiguous park system from Broad Street to I-95 on the western bank, but this system shows signs of the neglect seen in Mill River Park upstream, with invasive species and debris dumping.

The river passes under numerous bridges including Interstate I-95 and a railroad bridge before flowing into the West Branch of Stamford Harbor. Pulaski Street Bridge, the last bridge before the Harbor, restricts fish passage at low tide with large concrete blocks (Plate 9). The beginning of the Sound is characterized by marinas and industrial land uses including a large sand and gravel operation on the west bank.

Plate 9. Concrete blocks under Pulaski Street Bridge.

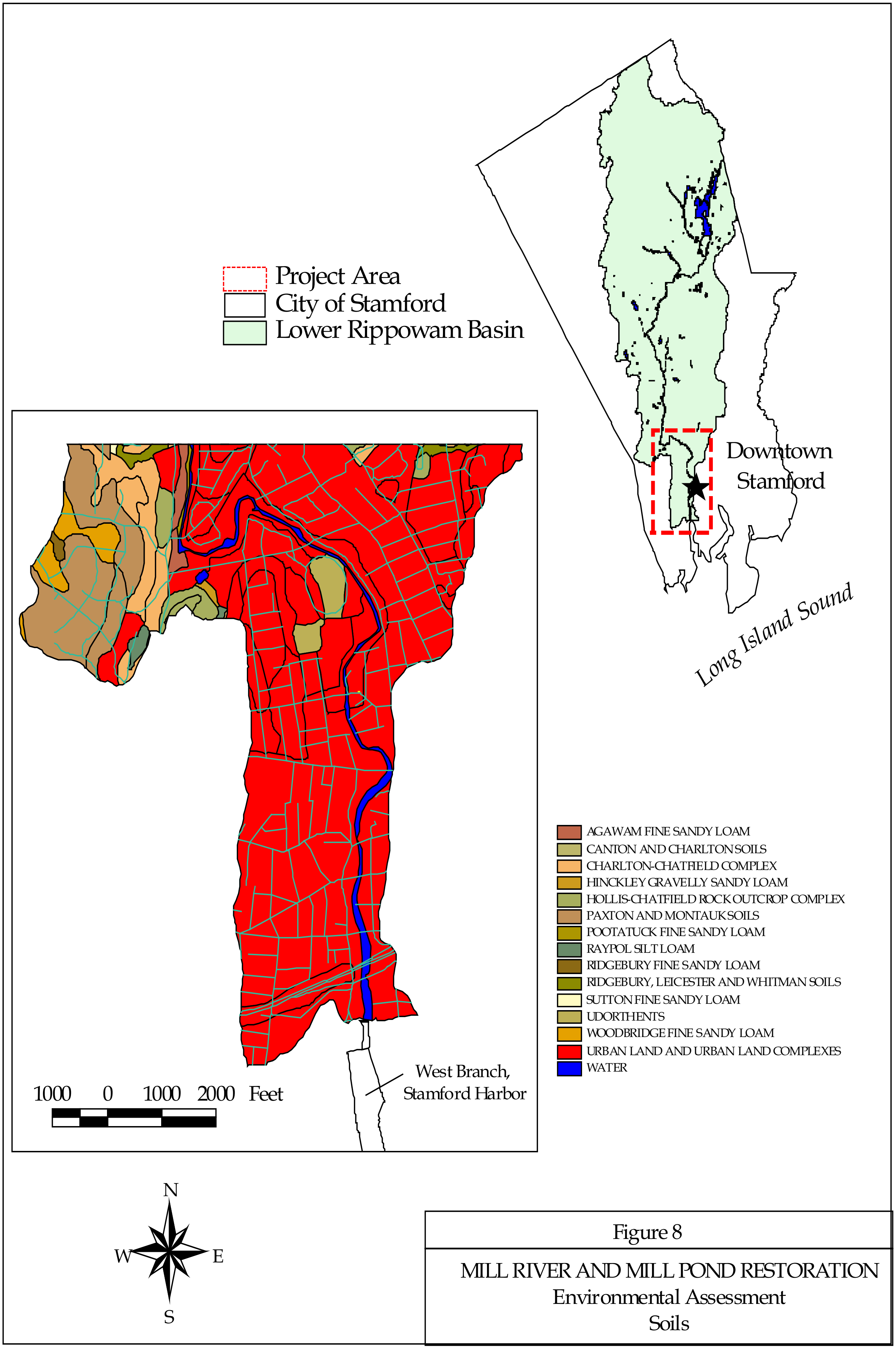
6.2. TERRESTRIAL ENVIRONMENT

6.2.1 Geology and Soils

Stamford's bedrock geology consists of Paleozoic gneiss and schist (USACE 1985). The surficial materials are mostly glacial till, unstratified deposits with particles ranging from clay-size to large boulders. The till forms a thin mantle over the bedrock, and bedrock outcrops are common. In some areas, glaciofluvial deposits of stratified sand and gravel compose the surficial sediments. A few smaller areas of swamp deposits are present, consisting of organic matter mixed with sand and silt.

A considerable proportion of the project area soils are mapped as either urban land or an urban complex (Figure 8). Soil map units classified as urban land are areas where urban structures cover more than 85% of the surface. Urban complexes are soil map units with a combination of urban land and one or more additional soil series where the land area is either too small, or the assemblage of the different soils too intricate, to map the units separately (USDA 1981). In Figure 8, urban land and urban complexes are generalized and both shown in red. Udorthents are another soil unit mapped in the project area. The soil surface has been altered in these units by either the removal of more than two feet of the upper part of the original soil, or the placement of more than two feet of fill material atop the original soil (USDA 1981).

The remainder of the project area consists of a variety of soil series and soil complexes most of which are sandy loams, soils with textures dominated by sand-sized sediments. The exception is the Raypol silt loam that is found in only two small units of the project area located on the J.M Wright Technical School grounds and adjacent Scalzi Park (Figure 8). Raypol silt loam is listed as an Additional Farmland of Statewide Importance in Fairfield County, Connecticut (NRCS, 2004). Site 19, restoration of riparian habitat along the Mill River, was the closest proposed restoration site to the Raypol soil unit. However, during the evaluation process, Site 19 was eliminated from further consideration because it was not considered to be under threat and was not critical to the overall health of the Mill River. These soil units are also contained within a urban area which is not under the jurisdiction of the Federal Farmland Protection Act of 1981. Therefore, there would be no impacts to Prime Farmland or Additional Farmland of Statewide Importance as a result of the proposed project.



Data Source: University of Connecticut Map and Geographic Information Center (MAGIC)

FIGURE 8: Project Area Soils Map

6.2.2 Vegetation

6.2.2 (a) The Upstream Reach

Floodplain species, ranging from large trees to small shrubs, dominate this stretch of the river. Bank and emergent vegetation is sparse. The river is shaded by a continuous tree canopy between Cold Spring Road and Bridge Street and between Woodside Street to Broad Street (Plate 10). This reach is predominantly residential with fragments of wooded areas. Residential areas are characterized by stretches of lawn that meet the river and large specimen trees such as Norway maple (*Acer platanoides*), silver maple (*Acer saccharinum*), black locust (*Robinia pseudoacacia*), London plane tree (*Platanus acerifolia*), and weeping willow (*Salix var*.). These trees, along with green ash (*Fraxinus pennsylvanica*) and red maple (*Acer rubrum*), have colonized the banks of the river. In the upper section of this reach, where an understory is present it consists primarily of elm (*Ulmus* sp.), grape (*Vitis* sp.), bittersweet (*Celastrus* sp.), silky dogwood (*Cornus amomum*), Japanese knotweed (*Polygonum cuspidatum)*, and multiflora rose (*Rosa multiflora*). The understory in the lower sections of this reach is dominated by poison ivy (*Toxicodendron radicans*), bittersweet, and sapling tree-of-heaven (*Ailanthus altissima*). In the herbaceous layer the dominant plants are dock (*Rumex* sp.), jewelweed *(Impatiens capensis*), and purple loosestrife (*Lythrum salicaria*), an invasive exotic.

Plate 10. Typical section of the upstream reach.

From Bridge Street to Woodside Street, alongside Scalzi Park, the river is more open with large trees, cottonwood (*Populus deltoides*) and oak (*Quercus* sp.), spaced widely along the adjacent footpath. There are fragmented patches of shrubs, mostly silky dogwood, on both banks. Just south of Scalzi Park and the Wright Technical School there is a large patch of the submerged aquatic curly pondweed (*Potemogeton crispus*). Curly pondweed is an indicator of alkaline and polluted waters (Crow and Hellquist 2000). Nevertheless, mature fish were seen seeking refuge in this plant, which was the only native submerged aquatic plant observed within the project area.

Specimen trees along this reach include a large American linden (*Tilia americana*) downstream of Cold Spring Road, cottonwoods by Scalzi Park, and a large sycamore downstream of Vernon Street. There is a very attractive stretch of river upstream of North Street with large silver maples whose boughs overhang to the water.

Table 1 lists the plant species observed in the upstream reach.

Table 1. Plant species found in the upstream riparian corridor.

Scientific name	Common name
Acer negundo	box elder
Acer palmatum	Japanese maple
*Acer platanoides**	Norway maple
Acer rubrum	red maple
Acer saccharinum	silver maple
*Ailanthus altissima**	tree-of-heaven
Berberis sp.*	barberry
Carya ovata	shagbark hickory
Catalpa speciosa	northern catalpa
*Celastrus orbiculatus**	oriental bittersweet
Celastrus scandens	American bittersweet
Chelidonium majus	celandine
Cornus amomum	silky dogwood
Euonymus alatus	burning bush
Fagus grandifolia	American beech
Fagus sylvatica	European beech
Forsythia sp.	forsythia
Fraxinus pennsylvanica	green ash

Table 1. (cont.) Plant species found in the upstream riparian corridor.

Scientific name	Common name
Hedera helix	English ivy
Hemerocallis sp.	daylily
Impatiens capensis	jewelweed
Iris sp.	iris
Juniperus communis	juniper
Lonicera sp.	honeysuckle
*Lythrum salicaria**	purple loosestrife
Morus sp.	mulberry
Onoclea sensibilis	sensitive fern
Pachysandra terminalis	pachysandra
Parthenocissus quinquefolia	Virginia creeper
Peltandra virginica	arrow arum
Phytolacca americana	pokeweed
Pinus strobus	white pine
Platanus acerifolia	London plane tree
*Polygonum cuspidatum**	Japanese knotweed
Populus deltoides	eastern cottonwood
Prunus sp.	cherry
Quercus palustris	pin oak
Quercus velutina	black oak
Quercus rubra	red oak
Robinia pseudoacacia	black locust
*Rosa multiflora**	multiflora rose
Rubus sp.	blackberry
Rumex sp.	dock
Salix babylonica	weeping willow
Salix bebbiana	Bebb willow
Sambucus canadensis	elderberry
Sassafras albidum	sassafras
Syringa sp.	lilac
Taxus spp.	yew
Tilia americana	basswood, American linden
Toxicodendron radicans	poison ivy
Ulmus sp.	elm
Viburnum dentatum	arrowwood viburnum
*Vinca minor**	periwinkle, myrtle
Viola sp.	Violet
Vitis sp.	grape

*Generally considered invasive

6.2.2 (b) The Mill Pond

Above the floodwalls of Mill River Park are rows of kwanzan oriental cherry trees (*Prunus serrulata*), planted in 1957. These trees are approaching the end of their expected life (Sasaki & Associates 1999) and show signs of decline. The northeastern quadrant of the park is planted with other tree species, primarily yellow wood (*Cladrastus kentukea*). One pin oak (*Quercus palustris*), a silver maple, a honey locust (*Gleditsia triachantos*), and two English hawthorne (*Crataegus laevigata*). At the southeastern edge of the park there are a mulberry (*Morus* sp.), a tree-of-heaven and a willow (*Salix* sp.) tree. Many of the trees are suffering from disease and neglect and require immediate attention.

A detailed survey of the trees adjacent to the floodwalls was performed, and tree species are summarized in Table 2. Of the 100 trees surveyed, several show extensive deterioration that may require their immediate removal. Growth limitations identified during field investigations include proximity to paved and concrete sidewalks, proximity to other man-made objects, and proximity to other trees. Sources of damage include: lack of maintenance, such as pruning and removal of dead branches; repeated striking of tree trunks by lawn mowers; branch removal leading to unhealed wounds; and lightning. The trees are of varying ages, with eleven trees between 60 and 100 years, 82 trees between 30 and 60 years, two trees between 10 and 30 years, and two trees less than 10 years. The complete survey results are available in Appendix I.

Table 2. Tree species surveyed at Mill River Park.

Species	Number of trees
kwanzan oriental	80
yellow wood	12
pin oak	1
silver maple	1
honey locust	1
English hawthorne	2
mulberry	1
tree-of-heaven	1
willow	1

6.2.2 (c) The Downstream Reach

This reach of the river is broad and largely unshaded (Plate 11). The canopy trees are primarily green ash and Norway maple. These trees also occur in adjacent urban parks and urban residential backyards. The understory is largely Japanese knotweed, tree-of-heaven, poison ivy, bittersweet, box elder (*Acer negundo*), and red mulberry (*Morus rubra*). Phragmites or common reed (*Phragmites australis*) dominates the west bank between the Richmond Hill Avenue Bridge and I-95 as well as the western bank south of the railroad bridge. Japanese knotweed dominates the eastern bank from I-95 to the Harbor. Table 3 lists the plant species observed in the downstream reach.

Plate 11. Tidal reach of river downstream of Tresser Boulevard Bridge (photo taken at high tide).

Table 3. Plant species found in the downstream riparian corridor.

Scientific name	Common name
Acer negundo	box elder
*Acer platanoides**	Norway maple
Acer rubrum	red maple
Acer saccharinum	silver maple
Aesculus hippocastanum	horse chestnut
*Ailanthus altissima**	tree-of-heaven
Arctium minus	common burdock
Asclepias syriaca	milkweed
Berberis sp.*	barberry
Betula nigra	river birch

Table 3. (cont.) Plant species found in the downstream riparian corridor.

Scientific name	Common name
Catalpa speciosa	northern catalpa
*Celastrus orbiculatus**	oriental bittersweet
Celastrus scandens	American bittersweet
Cirsium discolor	field thistle
Cornus amomum	silky dogwood
Daucus carota	Queen Anne's lace
Fragaria virginiana	wild strawberry
Fraxinus pennsylvanica	green ash
Impatiens capensis	jewelweed
Iris spp.	iris
Juncus tenuis	path rush
Ligustrum sp.	privet
Lonicera sp.	honeysuckle
*Lythrum salicaria**	purple loosestrife
Morus sp.	mulberry
Parthenocissus quinquefolia	Virginia creeper
Peltandra virginica	arrow arum
*Phragmites australis**	common reed
Phytolacca americana	pokeweed
Platanus x acerifolia	London plane
*Polygonum cuspidatum**	Japanese knotweed
Prunus sp.	cherry
Quercus rubra	red oak
Robinia pseudoacacia	black locust
*Rosa multiflora**	multiflora rose
Rubus spp.	blackberry
Rumex crispus	curly dock
Salix var.	weeping willow
Solanum dulcamara	woody nightshade
Solidago canadensis	common goldenrod
Syringa sp.	lilac
Tanacetum vulgare	common tansy
Toxicodendron radicans	poison ivy
Typha latifolia	common cattail
Ulmus sp.	elm
Vernonia noveboracensis	ironweed
Viola sp.	violet
Vitis sp.	wild grape

*Generally considered invasive

6.2.3 Wildlife

Wildlife on the Mill River is restricted to open space corridors along its banks. Most of the river has vegetated banks, especially in forested upstream areas. Mammalian species in the area include those adapted to suburban and urban environments, such as brown bat, beaver, cottontail rabbit, coyote, gray squirrel, muskrat, raccoon, red fox, striped skunk, white tailed deer, and woodchuck (CT DEP 1999). Table 4 lists reptiles and amphibians commonly found in Stamford.

Table 4. Reptiles and amphibians found in the greater Stamford area (Klemens 1993).

Scientific Name	Common Name
Ambystoma maculatum	spotted salamander
Bufo a. americanus	eastern American toad
Carphophis a. amoenus	eastern worm snake
Chelydra s. serpentina	common snapping turtle
Chrysemys picta	painted turtle
Clemmys guttata	spotted turtle
Clemmys insculpta	wood turtle
Desmognathus f. fuscus	northern dusky salamander
Diadophis punctatus edwarsii	northern ringneck snake
Eurycea bislineata	northern two-lined salamander
Hyla versicolor	gray tree frog
Lampropeltis t. triangulum	eastern milk snake
Notophthalmus v. viridescens	red-spotted newt
Plethodon cinerus	redback salamander
Pseudacris c. crucifer	northern spring peeper
Rana catesbeiana	Bullfrog
Rana clamitans melatona	green frog
Rana palustris	pickerel frog
Rana sylvatica	wood frog
Sternotherus odoratus	common musk turtle
Storeria d. dekayi	northern brown snake
Terrapene c. carolina	eastern box turtle

The Mill River riparian corridor will require preservation and enhancement to ensure the passage of wildlife and to provide sufficient access to shelter and forage. Urban greenways are invaluable wildlife resources and the preservation and enhancement of this wildlife corridor is an important goal of the City of Stamford. Future planning consideration should be given to connecting nearby urban green spaces such as parks, cemeteries and golf courses.

The Mill Pond is heavily used by waterfowl, such as Canada geese, mallard ducks, black ducks and mute swans. Mill River Park also supports many urban tolerant bird species, such as sparrows, starlings, mourning doves and swallows. The upstream reach is more wooded, and its extended canopy provides habitat for additional bird species. The wooded banks provide refuge from people and predators, material for nesting, and food sources. The Mill River is in the path of the North Atlantic flyway and is used by many migratory species. Table 5 lists nesting bird species commonly found in Stamford.

Table 5. Nesting birds common to Stamford, Connecticut (Bevier 1994).

Scientific Name	Common Name
Agelaius phoeniceus	red-winged blackbird
Aix sponsa	wood duck
Anas platyrhynchos	mallard
Anas rubripes	American black duck
Branta canadensis	Canada goose
Butorides virescens	green heron
Carpodacus mexicanus	house finch
Ceryle alcyon	belted kingfisher
Colaptes auratus	northern flicker
Columba livia	rock dove
Corvus brachyrhynchos	American crow
Cyanocitta cristata	blue jay
Cygnus olor	mute swan
Dendroica petechia	yellow warbler
Dumetella carolinensis	gray catbird
Hirundo rustica	barn swallow
Melanerpes carolinus	red-bellied woodpecker
Melospiza melodia	song sparrow
Mimus polyglottos	northern mockingbird
Molothrus ater	brown-headed cowbird
Nycticorax nycticorax	black-crowned night heron
Otus asio	eastern screech-owl
Passer domesticus	house sparrow
Picoides pubescens	downy woodpecker
Quiscalus quiscula	common grackle
Sayornis phoebe	eastern phoebe
Spizella passerine	chipping sparrow
Stelgidopteryx serripennis	northern rough-winged swallow
Sturnus vulgaris	European starling
Troglodytes aedon	house wren
Tyrannus tyrannus	eastern kingbird

6.3. AQUATIC ENVIRONMENT

6.3.1 River Hydrology

The Mill River watershed can be characterized as moderately urban. Much of the watershed land surface is impervious, especially within the project area near Stamford's downtown. Storm sewers from adjacent streets drain directly into the Mill River. Storm water outfalls are particularly dense in the downstream reach, which is more heavily urbanized. These outfalls increase the peak discharge to the river during storm events and increase the risk of erosion and sediment transport downstream. As a result the Mill River overflows its banks during heavy rainfall events. Rainfall from a 1955 storm was augmented by a high tide leading to a flood that caused considerable property damage (FEMA 1993).

There is a history of industrial use on the Mill River. Water utilization through damming of the river for mills has affected the stream flow and path of the river and thereby altered the river's habitat. Discharge from the North Stamford Reservoir controls the base flow of the Mill River. Six smaller dams south of the Merritt Parkway interrupt flows and partially inhibit fish passage (Figure 9). There are currently no known plans to remove any of the listed dams above the Main Street Dam. The Main Street Dam is the southernmost of the dams on the Mill River. See Appendix I for photos of the dams listed below.

Table 6. Dams along the Mill River from the North Stamford Reservoir to Stamford Harbor (FEMA 1993).

Number	Name	Fish Passage	River Mile (from mouth)
1	Main Street Dam	NO	0.72
2	General Electric, 260 Long Ridge Road	YES	4.88
3	Arden Lane 1	NO	5.22
4	Arden Lane 2	NO	5.25
5	Maltbie Avenue	YES	5.29
6	Hunting Lane	YES	5.49
7	Merritt Parkway	NO	6.05
8	North Stamford Reservoir Dam	NO	8.13

Note: Dam names are based on location and make no reference to ownership.

The North Stamford Reservoir discharges into the river following the minimum discharge requirements of the State of Connecticut. Under normal circumstances, the required discharge for the North Stamford Reservoir is about 4 cubic feet per second (cfs) (Gilmore, personal communication). During heavy storm flow events, the reservoir may discharge at higher levels. The Aquarion Water Company manages the water behind the reservoir to minimize the amount of water lost during storms. This has the effect of dampening stream flow variation in the Mill River. Despite North Stamford Reservoir's streamflow regulation, tributaries and storm water runoff below the reservoir provide additional flow and cause river levels to rise dramatically during storm events.

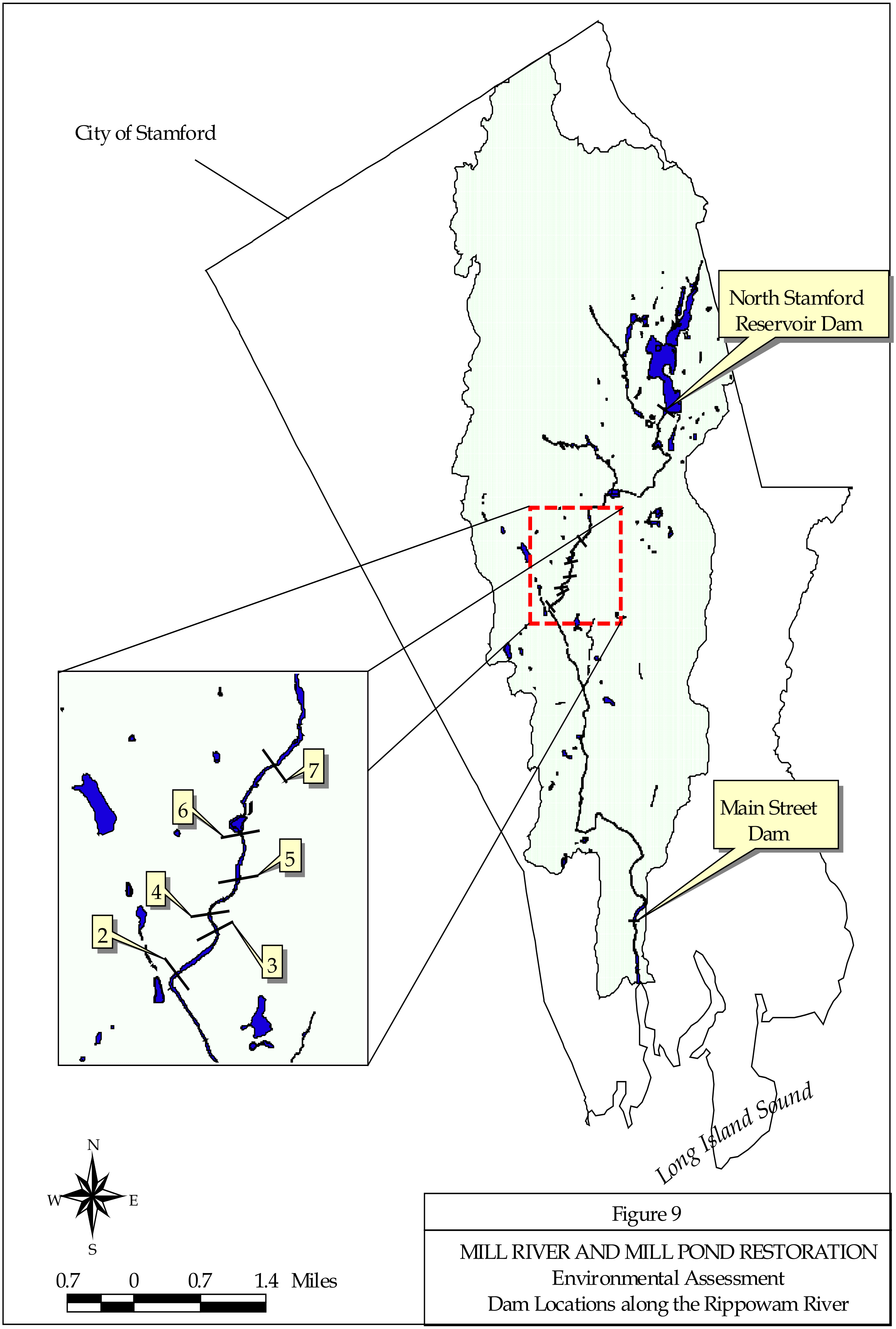


FIGURE 9: Approximate locations of dams along the Rippowam River

6.3.2 Water Quality and Aquatic Habitat

The Mill River is rated by the State of Connecticut as Class B/A from the North Stamford Reservoir to Stamford Harbor (Hust, personal communication). Class B/A waters are considered suitable for fish and wildlife habitat, recreational uses, agricultural and industrial water supply, and potentially suitable for drinking water supply. Dissolved oxygen should be not less than 5 mg/L at any time. Total fecal coliform counts are limited to a monthly mean of 100 colonies/100ml (Appendix K).

Limited water quality data exists for the Mill River, and all studies to date have been conducted upstream of Mill Pond. Past sampling activity was conducted by the U.S. Geological Service (USGS) in 1994 (USGS 2002), CT DEP in July and September 1998, and CT DEP in October 2000 (Pizzuto, personal communication). In addition, several water quality parameters have been monitored since 1994 by students at Westhill High School as part of Project SEARCH (Sullivan, personal communication), a statewide water quality monitoring and aquatic studies program for high school students. Existing water quality data are included in Appendix K. Additional testing to establish baseline conditions should be performed prior to restoration activities.

Data indicates that water quality becomes increasingly impaired downstream of the North Stamford Reservoir. Within Mill Pond the abundance of submergent plant species and algae suggests high nutrient levels and potentially high fecal coliform counts. This results from trash, leaf litter deposition upstream, and detention of organic matter growing within the pond. Ubiquitous Canada geese contribute fecal material to the pond.

The Rippowam River is officially listed as an Impaired Waterbody by the CT DEP according to the requirements of Section 303(d) of the Federal Clean Water Act (CT DEP 1998, CT DEP 2002b). The river has been listed twice, in 1998 and 2002. In 1998, the Rippowam River was classified as impaired due to inadequate fish passage. In 2002, the impairment changed to ‘inadequate life support’. The State has not yet identified the source of this impairment.

6.3.3 Sediment Chemistry

<u>Sediment Sample Collection and Analysis</u>

On March 20, 2002, a total of six (6) grab sediment samples (SB-01, SB-02, SB-03, SB-04, SB-05, and SB-06) were collected from Mill Pond between West Broad Street (to the north) and Main Street Dam (to the south). Each sample was collected approximately 120 ft to 160 ft apart, moving in a downstream direction (Figure 10). Sample SB-01 represents the furthest sample point upstream and SB-06 represents the furthest sample point downstream. CT DEP contracted Premier Laboratory of Dayville, CT to conduct a suite of analyses (Zimmerman, personal communication). The samples were analyzed on March 27, 2002 using methodologies recommended in EPA Manual SW-846. Table 7 lists the constituents that were analyzed and the methodologies that were used.

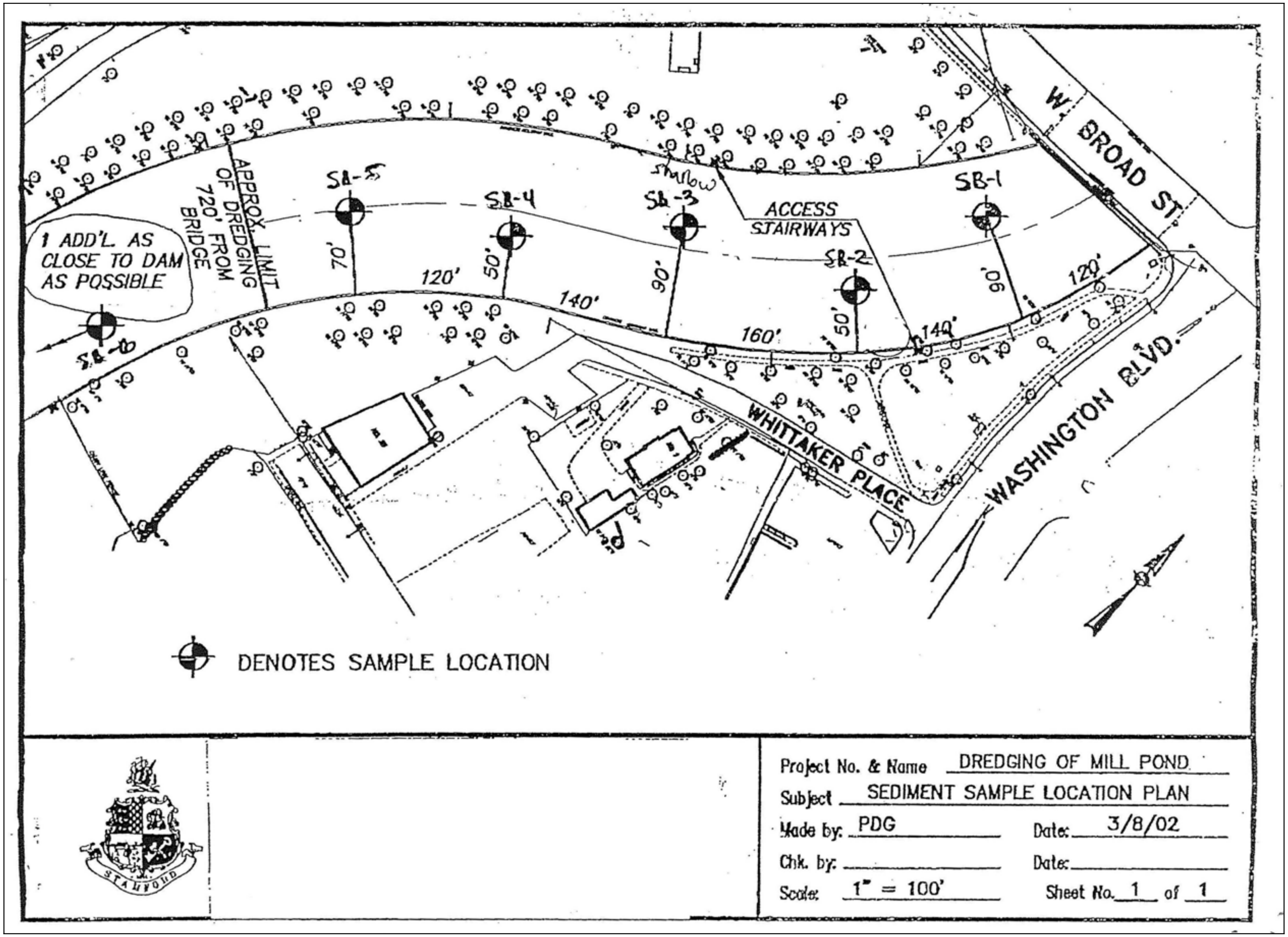


Figure 10. Sediment sample location plan.

Table 7. Methods used by Premier Laboratory to analyze Mill Pond sediment samples.

Constituent Type	Analytical Method
Sulfide	7.3.4.2, Reactive
Hexavalent Chromium	7196A
Phenolics, Total	9065
Metals	6010B TCLP
Trace Metals	6010B
Mercury	7470 TCLP
Trace Mercury	7471
Extractable Total Petroleum Hydrocarbons	CT ETPH
Semi-Volatile Organic Compounds	8270C, 8270C TCLP
Polychlorinated Biphenyls (Aroclor)	8082, 8082 TCLP
Total Organic Carbon	415
Volatile Organic Compounds	8260B, 8260B TCLP

Wet sieve analysis could not be performed due to the high organic matrix (leaves and other fibrous material) in each of the samples. Volatile organic compound (VOC) analysis (8260B) for samples SB-01, SB-03, SB-04, SB-05, and SB-06 was interrupted by matrix interference and resulted in elevated detection limits. VOC data was therefore not included in the overall data analysis.

<u>Data Results</u>

Sulfide concentrations ranged from 4.8 mg/l in sample SB-03 to 32 mg/l in sample SB-04, with no detectable sulfide concentration in sample SB-06 (Table 8). Analysis for hexavalent chromium resulted in no detectable concentrations in any of the six samples (Table 8). Total phenolics were not detectable in five samples, with sample SB-05 displaying a concentration of 20 mg/l (Table 8).

Table 8. Sulfide, chromium, and phenolics concentrations in sediment samples

	SB-01	SB-02	SB-03	SB-04	SB-05	SB-06
Sulfide (mg/l)	12	22	4.8	32	21	ND
Hexavalent Chromium (mg/l)	ND	ND	ND	ND	ND	ND
Phenolics (mg/kg)	ND	ND	ND	ND	20	ND

ND = Not detected

Using method 6010B TCLP, eleven metals were analyzed, and included: arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, selenium, silver, and zinc (Table 9). Of these 11 metals, six had detectable concentrations as shown on Table 9. Using method 7470 TCLP, there were no detectable mercury concentrations in any of the six samples (Table 9).

Table 9. Metals in sediment samples (6010B TCLP method)

	SB-01	SB-02	SB-03	SB-04	SB-05	SB-06	GA, GAA[a]	GB[b]
Arsenic (mg/l)	ND	ND	ND	ND	0.36	ND	0.05	0.5
Barium (mg/l)	0.86	0.90	1.2	1.2	1.2	1.2	1.0	10.0
Cadmium (mg/l)	ND	ND	ND	ND	ND	ND	0.005	0.05
Chromium (mg/l)	ND	ND	ND	ND	ND	ND	0.05	0.5
Copper (mg/l)	ND	ND	ND	ND	ND	0.051	1.3	13
Iron (mg/l)	1.1	0.92	15	37	46	2.3	--	--
Lead (mg/l)	ND	ND	ND	ND	ND	0.10	0.015	0.15
Manganese (mg/l)	2.9	2.4	7.4	1.9	8.0	8.0	--	--
Selenium (mg/l)	ND	ND	ND	ND	ND	ND	0.05	0.5
Silver (mg/l)	ND	ND	ND	ND	ND	ND	0.036	0.36
Zinc (mg/l)	1.0	0.95	1.6	0.62	0.57	2.6	5	50
Mercury (mg/l)	ND	ND	ND	ND	ND	ND	0.002	0.02

ND = Not detected
[a]CT DEP recommended GA, GAA Mobility Criteria By TCLP or by SPLP in mg/l (ppm)
[b]CT DEP recommended GB Mobility Criteria By TCLP or by SPLP in mg/l (ppm)

Eleven trace metals (arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, selenium, silver, and zinc) were analyzed using method 6010B. The results are presented in Table 10. Using method 7471, trace mercury was present in five of the six samples with concentrations ranging from 0.028 mg/kg in sample SB-01 to 0.076 in sample SB-05 (Table 10). Connecticut Extractable Total Petroleum Hydrocarbons (CT ETPH) was present in all six samples with concentrations ranging from 620 mg/kg in sample SB-01 to 1700 mg/kg in sample SB-02 (Table 11).Twelve semi-volatiles were present in the sediment and are listed in Table 12. The polychlorinated biphenyl (PCB), Aroclor, was present in six samples with concentrations ranging from 0.099 mg/kg in sample SB-05 to 0.57 mg/kg in samples SB-02 and SB-06 (Table 13).

Table 10. Trace metals (6010B method) and total organic carbon (TOC) concentrations in sediment samples

	SB-01	SB-02	SB-03	SB-04	SB-05	SB-06	RC[a]	I/CC[b]	ESV[c]
Arsenic (mg/kg)	ND	ND	ND	1.6	1.4	ND	10	10	7.24
Barium (mg/kg)	62	90	97	100	100	130	4700	140000	-
Cadmium (mg/kg)	0.38	0.74	0.58	0.74	0.71	0.64	34	1000	1
Chromium (mg/kg)	12	18	20	21	36	25	3900	51000	52.3
Copper (mg/kg)	27	44	44	53	49	51	2500	76000	18.7
Iron (mg/kg)	6700	9000	9000	9500	10000	12000	-	-	-
Lead (mg/kg)	33	52	59	68	70	73	500	1000	30.2
Manganese (mg/kg)	180	260	330	180	380	430	-	-	-
Selenium (mg/kg)	ND	ND	ND	ND	1.7	ND	340	10000	-
Silver (mg/kg)	ND	ND	0.40	0.64	0.64	0.50	340	10000	2
Zinc (mg/kg)	120	190	190	220	200	220	20000	610000	124
Mercury (mg/kg)	0.028	ND	0.046	0.051	0.076	0.068	20	610	0.13

[a]CT DEP recommended Residential Criteria (RC) for sediment disposal
[b]CT DEP recommended Industrial/Commercial Criteria (I/CC) for sediment disposal
[c]EPA (1996) ecological screening values (ESV) for sediments (Jones *et al.*, 1997)
ND = not detected
(-) = no available data

Table 11. Connecticut ETPH concentrations in sediment samples

	SB-01	SB-02	SB-03	SB-04	SB-05	SB-06	RC[a]	I/CC[b]
CT ETPH (mg/kg)	620	1700	830	1500	750	940	500	2500

[a]CT DEP recommended Residential Criteria (RC) for sediment disposal
[b]CT DEP recommended Industrial/Commercial (I/CC) for sediment disposal

Table 12. Semi-volatile concentrations in sediment samples.

	SB-01	SB-02	SB-03	SB-04	SB-05	SB-06	RC[a]	I/CC[b]	ESV[c]
Benzo[a]anthracene (mg/kg)	0.96	**1.6**	**1.5**	**1.6**	**2.0**	**2.7**	1.0	7.8	0.33
Benzo[a]pyrene (mg/kg)	***1.3***	***2.3***	***2.2***	***2.3***	***2.8***	***3.8***	1.0	1.0	0.33
Benzo[b]fluoranthene (mg/kg)	**1.8**	**3.6**	**2.8**	**2.8**	**3.5**	**4.6**	1.0	7.8	-
Benzo[g,h,i]perylene (mg/kg)	0.67	ND	1.0	1.8	1.4	1.8	1000	2500	-
Benzo[k]fluoranthene (mg/kg)	1.5	2.8	2.7	2.4	2.7	4.0	8.4	78.0	-
Bis(2-ethylhexyl)phthalate (mg/kg)	1.4	2.5	1.9	1.9	2.1	2.5	44	410	-
Chrysene (mg/kg)	1.7	2.9	2.7	2.8	3.3	4.5	84	780	0.33
Dibenz[a,h]anthracene (mg/kg)	ND	ND	0.46	0.66	0.61	0.82	1 #	1 #	0.33
Fluoranthene (mg/kg)	3.4	6.0	5.3	5.6	6.6	9.5	1000	2500	0.33
Indeno[1,2,3-cd]pyrene (mg/kg)	0.68	ND	**1.0**	**1.6**	**1.4**	**1.9**	1 #	7.8	-
Phenanthrene (mg/kg)	1.4	2.3	2.0	2.2	2.4	3.9	1000	2500	0.33
Pyrene (mg/kg)	2.4	4.1	3.8	4.0	4.7	6.6	1000	2500	0.33

[a]CT DEP recommended Residential Criteria (RC) for sediment disposal
[b]CT DEP recommended Industrial/Commercial (I/CC) for sediment disposal
[c]EPA (1996) ecological screening values (ESV) for sediments (Jones *et al.*, 1997)
bold = exceeds CT DEP RC
bold & italicized = exceeds CT DEP RC and I/CC
ND = not detected
(-) = no available data
= criteria based on detection limit

Table 13. PCB concentrations in sediment samples.

	SB-01	SB-02	SB-03	SB-04	SB-05	SB-06	RC[a]	I/CC[b]	ESV[c]
Aroclor 1254 (mg/kg)	0.2	0.57	0.35	0.24	0.099	0.57	-	-	-
Total PCBs (mg/kg)	-	-	-	-	-	-	1.0	10	0.033

[a]CT DEP recommended Residential Criteria (RC) for sediment disposal
[b]CT DEP recommended Industrial/Commercial (I/CC) for sediment disposal
ND = not detected
(-) = no available data

Discussion
Semi-volatiles and Aroclor concentrations were compared with CT DEP hazardous waste values to determine if the materials stored in Mill Pond meet requirements for dredging and disposal. It was determined that Mill Pond sediments are not considered to be hazardous and, therefore, dredging and disposal are not required.

Trace metal, ETPH (total petroleum hydrocarbon), and semi-volatile concentrations were compared with: 1) CT DEP residential criteria (RC) and industrial/commercial criteria (I/CC) for disposal of polluted soils in residential and industrial/commercial areas, and 2) EPA ecological screening values (ESV) for sediment (Jones *et al.*, 1997). Concluding observations are as follows:

- Trace metal concentrations do not exceed RC or I/CC.
- ETPH concentrations exceed RC but not I/CC.
- Benzo[a]anthracene concentrations exceed RC (but not I/CC) in samples SB-02, SB-03, SB-04, SB-05, and SB-06.
- Benzo[a]pyrene concentrations exceed RC and I/CC in all six samples.
- Benzo[b]fluoranthene concentrations exceed RC (but not I/CC) in all six samples.
- Indeno[1,2,3-cd]pyrene concentrations exceed RC (but not I/CC) in samples SB-03, SB-04, SB-05, SB-06.
- All detectable semi-volatiles have the highest concentrations in sample SB-06, which is located furthest downstream and closest to the Main Street Dam.

Overall, the constituents that are present within the sediment do not pose a serious problem and are considered to be typical of an urban stormwater catchment area. However, disposal of sediments laden with semi-volatile compounds that exceed RC and/or I/CC will require an appropriate selection of disposal locations. Disposal must be done in accordance with state environmental regulations. Approximately 18,600 cubic yards of sediment will be removed from within Mill Pond. All sediment determined inappropriate for disposal in residential and/or industrial/commercial areas will be transported to the Manchester Municipal Landfill.

EPA ecological screening values were established for the purpose of evaluating the potential for adverse ecological impacts (Jones *et al.*, 1997). In Mill Pond, some metals (copper, lead, and zinc) and some semi-volatile compounds have concentrations that exceed EPA ecological screening values (ESVs). It is therefore possible that certain pollutant-intolerant macroinvertebrate and fish species may not be capable of living in this waterbody with the existing sediment present. It can be concluded that removal of sediment in certain areas will improve aquatic habitat in the pond.

6.3.4 Benthic Environment

Macroinvertebrate communities occur in a range of freshwater lake and stream habitats and are sensitive to modifications in their environment such as nutrient and contaminant loading, sedimentation, and elevated water temperature regimes (Reice and Wohlenberg 1993). In response to environmental stresses and perturbations, genera and species sensitive or intolerant to the new habitat parameters often disappear from or occur in reduced numbers in macroinvertebrate communities. Therefore, the composition of macroinvertebrate assemblages can be assessed to determine the habitat quality of the water body.

The macroinvertebrate community in the Mill River upstream of the Mill River Pond was sampled between 1995 and 2000 in independent studies by the CT DEP and Westhill High School, Stamford, CT. No samples were taken within or downstream of the Mill River Pond.

CT DEP Study

The CT DEP collected samples approximately one mile upstream of the Mill River Pond in October 1997 and October 2000 (Table 14) (Beauchene 2002). The composition of species sampled in October 1997 was found to be 8% pollution intolerant, 86% moderately pollution tolerant, and 6% pollution tolerant. In October 2000, the macroinvertebrate community consisted of 2% pollution intolerant species, 96% moderately pollution tolerant species, and 2% pollution tolerant species. The CT DEP concluded that the low percentage of intolerant species indicated that riverbed habitats were degraded.

Project SEARCH Study

Students at Westhill High School collected and analyzed macroinvertebrate samples taken from the Mill River between 1995 and 1999 as part of Project SEARCH (Sullivan 2002). Samples were sorted by family; each family was assigned a pollution tolerance value between 0-10, with the most sensitive families assigned a value of 0 and increasing in value in relationship with increasing pollutant tolerance. This ranking index is commonly known as the Hilsenhoff Biotic Index (Hilsenhoff 1987). For each sample, a mean HBI was calculated from the pollution tolerance value of each family collected (Table 15). The mean HBI value of the fourteen samples was 4.91, indicating that the water quality of the Mill River within the period of study was good, with some organic pollution.

Table 14. Macroinvertebrate families sampled in the Mill River, one mile upstream of the Mill River Pond, October 1997 and October 2000 (from Beauchene 2002).

Order	Number of individuals
Trichoptera	353
Ephemeroptera	20
Diptera	14
Plecoptera	10
Monostilifera	8
Veneroida	4
Amphipoda	3
Lymnophila	3
Neuroptera	3
Tricladida	2
Coleoptera	1
Oligochaeta	1

Table 15. Macroinvertebrate data collected and analyzed by Project SEARCH at Westhill High School, Stamford Connecticut. The following is a code for the columns : EPT Index = the total # of families of Ephemeroptera, Plecoptera and Trichoptera; Scr/CF Ratio = Scrapers : Collector Filterers; EPT:Chirono Ratio = # of individual EPT: chironomids; HBI = Hisenhoff Biotic Index (from Sullivan 2000).

Date	Taxa Richness	EPT Index	Scr/CF Ratio	EPT/Chirono Ratio	HBI
10/26/95	12	4	1.90	Undefined	4.9
10/17/95	8	2	0.09	Undefined	4.2
04/24/96	10	4	1.10	0.70	4.8
05/06/96	8	4	0.25	1.10	4.70
11/07/96	8	5	15.5	Undefined	3.54
04/08/97	13	7	0.38	2.40	5.87
04/17/97	12	6	0.33	1.73	5.87
09/23/97	13	4	0.82	1.95	5.51
10/6/97	9	3	1.00	2.81	4.68
04/06/98	17	8	1.30	0.96	4.40
04/27/98	10	6	1.08	4.86	5.46
10/08/98	18	7	2.25	16	5.4
10/16/98	11	7	.667	Undefined	5.75
05/14/99	17	8	2.00	Undefined	3.75

6.3.5 Fisheries

The Main Street Dam in Stamford, CT divides the Mill River into two reaches. The reach upstream of the dam is primarily a warm-water fresh water fishery stocked with trout, while the reach downstream of the dam is primarily an estuarine fishery composed of warm-water freshwater fishes and marine fishes.

Downstream of the Main Street Dam, the Mill River supports alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) and likely supports white perch (*Morone americana*) (Gephard, personal communication). Historically, the Mill River supported American shad (*Alosa sapidissima*), but no populations have been observed in recent times (Gephard, personal communication). Both alewife and blueback herring are anadromous fishes. Anadromous fish are born in freshwater, then migrate to the ocean as juveniles, and return to freshwater as adults to spawn.

Several fish species use Stamford Harbor at the mouth of the Mill River during some point in their life cycles. These include: pollock (*Pollachius virens*), cobia (*Rachycentron canadum*), winter flounder (*Pleuronectes americanus*), windowpane flounder (*Scophthalmus aquosus*), bluefish (*Pomatomus saltatrix*), summer flounder (*Paralichthys dentatus*), black sea bass (*Centropristis striata*), king mackerel (*Scomberomorous cavalla*), and Spanish mackerel (*Scomberomorous maculates*). Removal of the Main Street Dam will allow unimpeded tidal flow in and out of the Mill River enabling access to additional forage and nursery habitat by estuarine fish species.

The Main Street Dam currently prevents alewife and blueback herring from migrating into spawning habitat found in the seven miles of the Mill River upstream of the dam. Without access to spawning habitat, the long-term viability of the river herring population is poor, leaving the population vulnerable to threats from over-fishing and predation. Observations and counts of returning alewife and blueback herring runs at rivers throughout Connecticut indicate that populations have declined as much as 98% within the past ten years (CT DEP 2002a). Two major factors have been identified as causing this decline: degradation of habitat quality (including the loss of access to spawning habitat) and increase predation by striped bass (CT DEP 2002a). As a result of the decline in population, alewife and blueback herring fisheries have been closed throughout the state of Connecticut since February 2002.

Upstream of the Main Street Dam, the Mill River is primarily a warm-water fishery (Table 16) composed mainly of shiners (*Notropis* spp.), dace (*Rhinichthys* spp.), and bass (*Micropterus* spp.), and supplemented with annual trout stockings by CT DEP. In 2000, a total of 480 brook trout, brown trout, and rainbow trout were stocked in the Mill River. Survival of stocked trout to the next season is poor in the Mill River, due to the combined effects of high harvest rates and poor habitat (Hyatt *et al.* 1999).

Table 16. Fish common to Southwestern Connecticut (Whitworth 1996).

Scientific Name	Common Name
Catostomus commersoni	white sucker
Cyprinus carpio	common carp
Erimyzon oblongus	creek chubsucker
Esox americanus	grass pickerel
Esox niger	chain pickerel
Etheostoma olmstedi	tessellated darter
Exoglossum maxillingua	cutlips minnow
Fundulus diaphanous	banded killifish
Lepomis auritus	redbreast sunfish
Luxilus cornutus	common shiner
Micropterus salmoides	largemouth bass
Notropis bifrenatus	bridle shiner
Notropis hudsonius	spottail shiner
Rhinichthys atratulus	blacknose dace
Rhinichthys cataractae	longnose dace
Salvelinus fontinalis	brook trout
Semotilus atromaculatus	creek chub
Semotilus corporalis	fallfish

6.4 WETLANDS

The locations of hydric soils for the lower portion of the Rippowam Basin are shown in Figure 11. There are no hydric soils identified by the State of Connecticut within the riparian corridor of the project area. Any wetland areas that may have occurred in downtown Stamford and adjacent to the Mill River have long been eradicated with changing land use. Wetlands within the estuarine portions of the river are limited by the absence of a flood plain and riparian buffer and those that remain are currently dominated by *Phragmites*.

The term "wetland" is defined by the USACE as those areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted to life in saturated conditions. Wetlands generally include swamps, marshes, bogs and similar areas (USACE 2002). Wetlands reduce flooding, recharge groundwater, provide habitat, and may act as sinks for nutrients and contaminants found commonly in urban storm water (Kadlec and Knight 1996). The vast majority of commercially and recreationally important fish species are dependent on wetlands for at least one portion of their life cycle (Mitsch and Gosselink 1993). Wetlands provide food and shelter to waterfowl. Wetlands also provide opportunities for recreation and education. The restoration of wetland habitat within the riparian corridor is an essential component in returning the river system to ecological health.

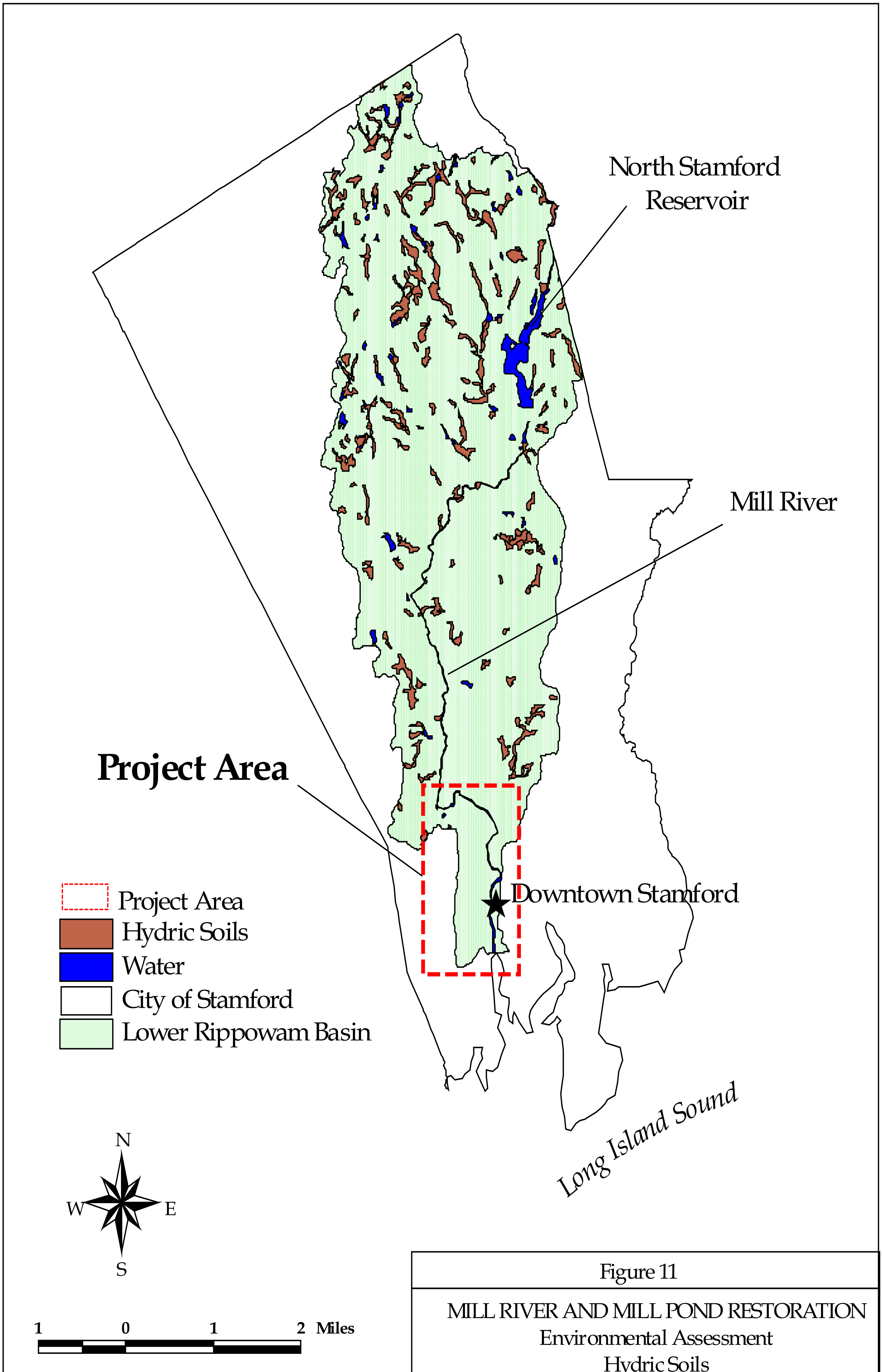


FIGURE 11: Hydric Soils of the lower Rippowam Basin

Data Source: University of Connecticut MAGIC

6.5 RARE, THREATENED, AND ENDANGERED SPECIES

There are no Federally or State listed, threatened or endangered species in the project area. Pertinent correspondence with USFWS and CT DEP are provided in Appendix D.

6.6 ESSENTIAL FISH HABITAT

The Magnuson-Stevens Fishery Conservation and Management Act of 1996 mandates the identification of “Essential Fish Habitat” for Federally managed fish species. The Act defines Essential Fish Habitat as “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity”. The New England Fisheries Management Council and the NMFS have designated Long Island Sound, including Stamford Harbor, as “Essential Fish Habitat” for several fish species (See Appendix L). There are fish species listed that use the tidal mouth and/or the freshwater reach of the Mill River at some point during their life cycles. These include: pollock (*Pollachius virens*), cobia (*Rachycentron canadum*), winter flounder (*Pleuronectes americanus*), windowpane flounder (*Scopthalmus aquosus*), bluefish (*Pomatomus saltatrix*), summer flounder (*Paralicthys dentatus*), black sea bass (*Centropristus striata*), king mackerel (*Scomberomorus cavalla*), and spanish mackerel (*Scomberomorus maculates*) (NMFS 2002). The only anadromous fish listed is the Atlantic salmon (*Salmo salar*). Atlantic salmon is historically native to southern Connecticut, but populations currently exist only in eastern Maine. Restoration efforts are underway in the Connecticut River. This includes stocking, habitat improvement, and the creation of fish passages. The NMFS determined “there may be some modest presence of species managed under the Magnuson-Stevens Fishery Conservation and Management Act or afforded consideration under the Fish and Wildlife Coordination Act in the Mill River, Stamford, Connecticut. In all cases, the restoration of the Mill River may facilitate an enhanced use of the waterway by both those estuarine and diadromous species”(NMFS letter dated 26 August 2002, contained in Appendix D).

6.7 HISTORICAL & ARCHAEOLOGICAL RESOURCES

The Main Street Dam, constructed in 1922, is an Ambursen Dam, a flat-buttressed dam designed and patented by Nils F. Ambursen in 1903. The Ambursen designed dam was very popular in the early part of the twentieth century, and by the end of the 1920s, more than 200 Ambursen Dams had been constructed throughout the United States. In addition to the Main Street Dam, there are four other Ambursen Dams in existence in the state of Connecticut: one in New London, two in Sprague, and one in Shelton.

The current location of the Main Street Dam is situated on the approximate site of a series of dams and mills that have operated in Stamford from 1641 to the early nineteenth century. The first dam at the site was constructed in 1641 for a gristmill in Stamford. This mill and dam were destroyed the following year and replaced. A second mill was constructed in the vicinity in 1727. By 1789, they were three mills near the dam at Main

Street. This location continued to be the site for mill operations for more than 150 years, with the most recent mill standing well into the nineteenth century.

The Connecticut State Historic Preservation Officer (CT SHPO), in a letter dated October 2, 2002 and addressed to Mr. Nathan Morphew of TRC Environmental Corporation, the Archaeological Consultant for The Bioengineering Group, recommended that an archaeological reconnaissance survey be completed for the project area due to its moderate to high sensitivity for prehistoric and archaeological resources (Appendix D – Pertinent Correspondence). No ground disturbance or construction-related activities are to be initiated until the SHPO has had an opportunity to review and comment upon this reconnaissance survey. Consequently, Mr. Morphew conducted the reconnaissance survey and accompanying report entitled *Phase IA Study for the Mill River Restoration Project, Stamford, Fairfield County, Connecticut* included as Appendix A. The results are briefly summarized here and in Section 7.7**.**

There are no previously recorded archaeological sites in the vicinity of the Main Street Dam and associated portions of the project area within the files of the Office of Connecticut State Archaeology in Storrs. However, there could be as yet unrecorded archaeological sites within the proposed project's area of potential effect. These sites may include areas of prehistoric and/or historic period Native American activity that typically focused upon perennial streams such as the Mill River. There also may be historic period EuroAmerican archaeological sites in the proposed impact areas, particularly sites associated with the series of mills located in this vicinity during the period from the seventeenth through the nineteenth centuries.

There are seven properties within a one-mile radius of the project area listed on the National Register of Historic Places (NRHP), including the Main Street Bridge and two historic districts—the Downtown Stamford Historic District and the Downtown Stamford Ecclesiastical Complexes (A detailed list of the NRHP properties is included as Table 1 of the archaeological reconnaissance report, Appendix A.

6.8 AESTHETICS AND RECREATION

6.8.1 General

The City of Stamford has been developing a "Mill River Corridor Plan". The aim of this plan is to develop a park system centering upon the river. The city currently has minimal open space in its downtown area. The planned greenway will provide city residents with open space for recreation and public gatherings as well as an opportunity to interact with the Mill River (Sasaki *et al.* 1998, Sasaki *et al.* 1999).

The project area consists of a 2.5-mile length of the Mill River from Cold Spring Brook downstream to the West Branch of Stamford Harbor, which is predominantly urbanized with residential areas, urban parks, commercial buildings, parking lots and some bordering woodlands.   The Mill River Park currently provides open space and some picturesque views (cherry trees in bloom); however, the pond is currently choked with invasive aquatic plants and filled with sediment. Restoration of the riparian habitat, tidal wetlands and riverine habitat in the Mill River Park is consistent with desired goals of the City of Stamford to develop greenway centered on the river.

6.8.2 Fishing

Trout are the most popular game fishes in Connecticut. Trout fishing in the Mill River upstream is sustained by stocking adult and yearling trout by CT DEP. The trout are raised by the CT DEP in the Quinebaug Valley and Burlington State Fish Hatcheries (Hyatt *et al.* 1999). The fish are stocked pre-season (March-April) and are sometimes restocked in April-May. However, only a few sections of the river between the North Stamford Reservoir and Cold Spring Road near downtown Stamford are publicly accessible to anglers.

6.8.3 Education

There are a number of schools within the project area, including Westhill High School, J.M. Wright Technical School, Cloonan Middle School, and Hart Magnet Elementary School. Students from Westhill High School and JM Wright Technical School have participated in Project SEARCH for a number of years, collecting water quality and invertebrate samples from the Mill River. Project SEARCH is a state-run program in which students learn to assess the health of local rivers and streams. Data collected by these students was used in the preparation of this report, as a supplement to official data collected by CT DEP and the USGS, and can be found in Appendix K.

SECTION 7. ENVIRONMENTAL CONSEQUENCES

7.1 GENERAL DESCRIPTION

The environmental effects of the alternatives on natural resources in the project area are discussed in detail in Appendix D in the incremental analysis. The incremental analysis measures the environmental effects (benefits and adverse impacts) of the proposed alternatives. Because the goal of this Section 206 project is to restore degraded habitat, the desired output is the restoration of the historic riparian corridor with its associated anadromous fisheries as well as improvement of the water quality of the Mill River.

This section discusses both the adverse and beneficial impacts expected from the proposed plan on the project site. This includes both direct and indirect impacts of the proposed actions. Issues of importance and of particular concern to the community are discussed at length within this section. To limit the length of the document, impacts that are expected to be negligible or minimal are only briefly addressed.

Impacts to the Mill Pond area will occur during the construction phase. These temporary impacts occur during site preparation, excavation, removal of approximately 18,600 cubic yards of sediment behind the dam, dam removal, regrading of side slopes, and planting. An estimated 26,000 cubic yards of material (outside of the walls) will be regraded to restore the new river floodplain and banks.

These temporary and localized impacts will be limited to the period of construction and include reduced water quality, disruption to resident wildlife and constraints on recreational use of the park. Best management practices and safety measure will be employed to minimize these impacts to the maximum extent practicable, as listed in Section 4.2.2 of the Detailed Project Report. Efforts will be made to minimize construction impact during river herring spawning season. In contrast to these temporary adverse impacts, direct beneficial impacts will occur from the construction phase and continue throughout the life of the project. A natural floodplain would be restored to provide flood storage and conveyance for large discharge events, which will decrease the established FEMA flood elevations (see Appendix B for more information).

By removing the Main Street Dam, the barrier to upstream and downstream migration of anadromous fisheries will be eliminated. This will open a migration corridor of approximately 5.2 miles. The river corridor will be enhanced for the migration of both fresh and saltwater species. The enhanced riparian corridor will be used as a wildlife corridor for upland species. Removal of the dam will also result in improved water quality. The removal of the Main Street Dam and the restoration of natural banks along the Mill Pond will have an overall habitat benefit.

Other restoration measures, i.e. the removal of the concrete obstruction at the Pulaski Street Bridge, 1.53 acres of riparian habitat restoration along the river corridor, and 0.8 acres of tidal marsh restoration will have beneficial environmental effects on fisheries and wildlife habitat. The removal of the obstruction at the Pulaski Street Bridge will allow anadromous fish to pass during low tides. The recreational improvements proposed, including trails and boardwalks in the effected areas will provide non-motorized recreational opportunities and will help to protect restored areas from human impacts.

7.2 TERRESTRIAL ENVIRONMENT

7.2.1 Geology and Soils

The proposed restoration project will not result in any direct or indirect beneficial or adverse impacts to the geological composition of the study area. Dredging of sediment in the Mill Pond and the removal of the Main Street Dam will allow a natural flushing of excess sediments from the Mill River. Dam removal will provide the opportunity to restore natural riffle/pool configurations within this reach. Removal of the obstruction of the channel at the Pulaski Street Bridge will restore the river channel morphology in that location. Soils and geology in the riparian areas will not be affected. Restoration of 0.8 acres of tidal wetlands will require excavating depositional sediments to attain proper elevations for the restoration of salt marsh vegetation. The impacts of soil removal, such as reduced water quality, will be limited to the construction period and are not expected to be significant.

During site construction, the proposed project will result in temporary direct, adverse impacts on the stream. Increased erosion potential and soil movement during earth moving segments of construction may negatively impact the stream. Using erosion control practices (such as coffer dams, hay bales, silt fences, etc.) during construction will minimize these short term and nominal impacts. These erosion-control measures will reduce the potential indirect impacts to aquatic resources by reducing sediment transport and deposition.

The Raypol soil unit, listed as Additional Farmland of Statewide Importance (NRCS, 2004) located on the J.M. Wright Technical School grounds and adjacent Scalzi Park will not be impacted the proposed project. Site 19, restoration of riparian habitat along the Mill River, was the closest proposed restoration site to the Raypol soil unit. However, during the evaluation process, Site 19 was eliminated from further consideration because it was not considered to be under threat and was not critical to the overall health of the Mill River. Therefore, there would be no impacts to Prime Farmland or Additional Farmland of Statewide Importance as a result of the proposed project.

7.2.2 Vegetation

The removal of the Main Street Dam will not have an appreciable impact on vegetation within the project area. Restoration of 1.53 acres of riparian corridor, restoration of 4.0 acres of riparian area in the Mill River Park, and 0.8 acres of tidal marsh creation will have a beneficial impact on the vegetation communities and habitat value along the river. The enhanced riparian corridor will provide increased shading for the river, which will improve aquatic habitat by decreasing water temperature, providing organic litter, as well as providing bank stabilization (Allan 1995).

Floodplain and riverbank restoration around the Mill Pond will affect the ornamental cherry trees currently lining the Mill Pond in the follow manner. Many of the cherry trees on the west bank of the river and some of cherry trees on the east bank may require removal prior to site excavation. Of the trees that are removed, those that are healthy and can be successfully dug without major damage may be transplanted by the city of Stamford to another location in the park or elsewhere as designated by the city. In addition, the city may choose to replace cherry trees that may be lost due to disease or age. A comprehensive tree survey was performed that identified individual tree health. For more information on the cherry trees within Mill River Park see Appendix I.

7.2.3 Wildlife

The removal of the Main Street Dam and restoration of floodplain vegetation at the Mill Pond will reconnect upstream and downstream riparian corridors, enhancing wildlife passage along the river. Establishment of native plant species will benefit local biodiversity while providing refuge and forage for wildlife habitat. The creation of a greenway and riverbank restoration along the remainder of the Mill River will further facilitate wildlife migration. The net effect of the project will be to enhance habitat. Short-term effects of construction will be limited to the Mill Pond area, and other active restoration locations. Wildlife inhabiting these areas may be temporarily displaced during construction activities. Once construction is complete, resident wildlife will reestablish in restored habitats, with one noteworthy exception. Riverine habitat may not be as attractive to the large population of Canada geese, which have contributed to nutrient loading in the pond and the degraded conditions in the park.

7.3 AQUATIC ENVIRONMENT

7.3.1 River Hydrology

The removal of the Main Street Dam and the re-creation of a river channel will return the Mill River to a more ecologically appropriate hydrology. The proposed restoration attempts to restore some of the natural hydrologic processes once found within the lower portion of the Rippowam Watershed. The restoration of 0.8 acres of tidal marsh will involve removal of sediment and lowering of the elevation in order to receive daily tidal inundation. The site currently receives infrequent tidal inundation. The restoration of a natural stream channel and tidal marsh will both directly benefit the watershed.

The volume of sediments transported under the proposed plan (dam removal) is not expected to significantly impact the estuary and the Federal channel downstream, especially considering the size of the receiving basin when compared to the size of the current impoundment. Furthermore, considering the impoundment is aggraded with sediments, it is likely that its current trapping capabilities are greatly reduced. If the dam were removed, sediment delivered to the estuary and the Federal channel downstream may not be significantly greater than under the modern regime.

During construction there may be some short-term direct impacts, including alterations in hydrology during dam removal and dredging. During the lowering of the Mill Pond there may be temporary erosion issues to manage, however construction impacts will be mitigated with appropriate erosion and sediment controls. It is anticipated that these post-construction areas will rapidly stabilize with the establishment of natural vegetation.

7.3.2 Water Quality and Aquatic Habitat

The Mill River aquatic habitat will directly benefit from the proposed restoration. Removal of the Main Street Dam and restoring riparian habitat and natural channel in the present location of the Mill Pond will directly impact the aquatic habitat, temperature, and sediment quality within the river. Removing the dam, eliminating the impoundment and restoring riparian vegetation should result in cooler water temperature and also likely higher dissolved oxygen levels which more closely represent historic water quality conditions in the river. Proposed restoration of wetland areas will provide wildlife habitat, and potentially increase the base flow of the Mill River. Native vegetation rooted in saturated soils along the shorelines can improve water quality through numerous biochemical reactions, including oil and grease breakdown, toxic metal immobilization, pesticide and herbicide degradation, nutrient reduction, and bacteria/virus elimination.

Aquatic conditions in downstream reaches of the river will also benefit indirectly from the proposed design. Species that may indirectly benefit from the Mill River restoration include numerous freshwater fish, reptile, amphibian, and mussel species.

Minor and temporary negative impacts will occur along the Mill River during the construction phase of the project. These negative impacts include temporary increase of turbidity resulting from the removal of 18,600 cubic yards of sediments from behind the dam prior to removal of the Mill Pond dam and grading activities. Historically, dredging has occurred a periodic basis by the City of Stamford as a maintenance effort. Little maintenance would be required to sustain stream channel integrity and water quality with the proposed restoration of the Mill River. Best management practices will be employed during construction to minimize turbidity impacts to the maximum extent practicable. The long-term beneficial impacts to the watershed and river ecosystem are much greater than the negative impacts caused during construction.

7.3.3 Sediment Chemistry

Sediment quality issues in Mill Pond and Mill River are primarily associated with pollutant runoff and sedimentation. Over the years, material accumulated in the Mill Pond, upriver of Main Street Dam. Dredging will remove contaminated sediments, and removal of the Main Street Dam will eliminate sedimentation within the pond. Sediment analysis has shown that the pollutants in the pond do not reach hazardous waste levels. Dredging and on-going maintenance will be required if the Main Street Dam remains in place. When the dam is removed and the stream channel reestablished, natural flushing activity would create a self-maintaining sediment transport system. No future dredging or on-going maintenance is expected, as sediments will be transported through the riverine system through natural geomorphological processes to Stamford Harbor. The restored streambed would consist of scoured rock and some fine sediment similar to upstream and downstream reaches.

7.3.4 Benthic Environment

The majority of benthic species identified in the Mill River Pond were classified as moderately pollution tolerant. Restoration of the Mill River Park will allow for the return of diverse benthic community, which may include increased representation from macroinvertebrate families classified as pollution intolerant. The effective transport of discharge and sediments will improve the streambed habitat for aquatic macroinvertebrates. Increased flow currents will elevate dissolved oxygen levels and lower nutrient loading. The restoration of riparian buffers and floodplains will lead to improvements in water quality, as areas of interface between soil, water, and vegetation is increased. This will create habitats suitable for a greater range of aquatic invertebrates more representative of a healthy ecosystem. The increase in aquatic invertebrate populations will benefit the ecosystem by providing an increase in food supply for resident fish species. Additional wetland area will also provide valuable habitat for benthic communities. There will be direct, adverse impacts on the stream bottom during site construction, however these will be temporary.

7.3.5 Fisheries

The Mill Street Dam divides the Mill River into two reaches; upstream of the dam is primarily a warm-water fresh water fishery stocked with trout, and downstream of the dam is primarily an estuarine fishery. Removal of the Main Street Dam and obstruction at the Pulaski Street Bridge will restore run-of-the-river conditions to the Mill River and enable access to the upper reaches of the river by estuarine and anadromous fishes. Four and a half miles of the Mill River upstream of the Main Street Dam would be available as potential spawning habitat for alewife, blueback herring and American shad. There will be opportunity for the warm-water fresh water fisheries to move into the newly restored riverine channel in the Mill River park area. In addition, a striped bass fishery may develop within downtown Stamford as striped bass chase baitfish and migrating alewife upstream. Run-of-the-river conditions may also provide the CT DEP with a new opportunity to restore Atlantic salmon or sea-run brown trout populations.

There have not been any quantitative studies of fish populations in the Mill River in the reaches upstream and downstream of the Main Street Dam. Without this baseline assessment of anadromous and freshwater fish assemblages, it is impossible to quantitatively predict specific biotic responses (such as future population numbers) to the removal of the Main Street Dam. However, it is reasonable to expect that anadromous fishes will migrate into the 4.5 miles of Mill River habitat upriver of the Main Street Dam that was previously unavailable to them. One result of this migration would be increased spawning opportunities, which would then lead to increased recruitment of juvenile fishes available for out-migration, which would then lead to increased numbers of adult anadromous fishes returning to spawn in the Mill River.

There will be temporary and localized impacts associated with construction activities, which have the potential to effect downstream fisheries resources in the project area (i.e. water quality, migration, etc.). Best Management Practices (BMP's) will be employed to minimize these impacts to the maximum extent practicable, as listed in Section 4.2.2 of the Detailed Project Report. Efforts will be made to minimize construction impact during river herring spawning season. In contrast to these temporary adverse impacts, direct beneficial impacts will occur to estuarine and anadromous fish resources from the construction phase and continue throughout the life of the project. Although no impacts are anticipated to upstream fisheries resources as a result of construction activities, these resources will also benefit from the restored Mill River channel and a more diverse riparian habitat corridor.

7.4 WETLANDS

Wetland restoration and enhancement is a major component of the proposed project. The removal of the dam just north of Main Street and the creation of a naturally flowing stream will allow some wetland functions to be incorporated into Mill River Park. This area will provide protective habitat to desirable bird species within the park and provide diverse plant species for seasonal interest to park users. The Park may become a stopover for migrating waterfowl while incorporating controls to limit the number of resident Canada geese.

Small pockets of tidal wet areas vegetated primarily by *Phragmites* are currently found in the downstream reach of the river. These wetland areas provide little habitat value to the Mill River under current conditions. However, proposed restoration of tidal wetland areas will have a direct beneficial impact. These wetlands will provide habitat for an array of native species from the Long Island Sound and the Mill River. The proposed creation of 0.8 acre of tidal wetlands would be planted with salt marsh vegetation, restoring habitat for marsh species.

7.5 RARE, THREATENED, AND ENDANGERED SPECIES

The USFWS, NMFS and the CT DEP have not identified any federally listed, threatened, or endangered species in the project area (See correspondence located in Appendix D). Therefore the proposed action will not have any effect on threatened or endangered species. Long-term planning of Stamford's biodiversity could establish the Mill River as a conduit for wildlife passage from inland parks to coastal environments.

7.6 ESSENTIAL FISH HABITAT

The proposed project is not expected to negatively impact Federally designated Essential Fish Habitat in the Mill River and Stamford Harbor. Currently there is no Atlantic salmon in the Mill River, and the proposed construction would have no negative effect on this species. Removal of the Main Street Dam and removal of the obstruction at the Pulaski Street Bridge would allow access to upstream spawning habitat for other anadromous fish species. Expected improvements in water quality would further enhance habitat for the possibility of re-introduction of Atlantic salmon. All fish species that utilize the river will benefit from improvements in water quality, fish passage, and estuarine habitat associated with restoration of the Mill River. For information on the life history of individual species, see Appendix L – Essential Fish Habitat. The National Marine Fisheries Service (NMFS) provided comments on Essential Fish Habitat pursuant to the 1996 amendments to the Magnunson-Stevens Fishery in a letter dated 5 August 2004. One Essential Fish Habitat Conservation Recommendation was provided in the letter and will be addressed during preparation of Plans and Specifications as follows:

> "The in-water work should be restricted to periods when water quality is not distressed and sediment migration off the site would not adversely impact the lower or tidal portions of the West Branch/Mill River system. The protective window when no work should be undertaken in the waterway to attain these objectives should extend from May 15 through September 30 of any calendar year. During this period, the West Branch of Stamford Harbor and the lower Mill River are used by species such as summer flounder, bluefish, and their forage. The redistribution of sediment and release of pollutants could degrade the EFH of these species by alternation of the seafloor, burial of prey items, and abrasion of gill tissue."

7.7. HISTORICAL & ARCHAEOLOGICAL RESOURCES

Removal of the Main Street Dam will have no adverse impact to properties listed on the National Register of Historic Places. However, because of the potential for prehistoric and historic archaeological sites (especially mill sites) in the vicinity of the project area, it is recommended that a Phase Ib archaeological survey be conducted once the precise project alternative has been determined. Any locations where ground-disturbing activities will be carried out will require systematic archaeological survey coverage. See Appendix A for more information on Historical and Archaeological Resources.

The results of the Phase Ib archaeological survey will be coordinated with the CT SHPO, the Connecticut State Archaeologist, Indian Tribes with ancestral ties to the area, and to any other interested parties identified in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implementing regulations 36 CFR 800. The extent of the coordination efforts will be determined prior to the commencement of the archaeological study.

The proposed project will not adversely impact the seven individual properties within a 1-mile radius that are listed on the National Register including the Main Street Bridge, nor are adverse impacts expected for the two nearby historic districts-the Downtown Stamford Historic District and the Downtown Stamford Ecclesiastical Complexes.

7.8 AESTHETICS AND RECREATION

7.8.1 General

Increased operation and maintenance along the river, including the removal of refuse, will directly improve the aesthetic value of the river. Removal of the walls along the Mill Pond will allow greater public access to the water. While construction will temporarily prevent access to the Mill Pond, long-term benefits far outweigh the temporary inconvenience. Localized traffic around the park may be periodically and temporarily disrupted during construction activities. A traffic plan will reduce this impact to the minimal practicable level. The restoration of 0.8 acres of tidal marsh and 1.53 acres of riparian habitat in the Mill River corridor will also enhance the greenway through the removal of non-native exotic species with more diverse native vegetative communities. Once completed, the project will reconnect the city with the more natural hydrology and diverse native plant community of its river.

The visual setting of the river corridor in the Mill River Park will change from an urban setting with a concrete lined channel and even lines of non-native ornamental species to a more natural setting using natural materials along the banks of the river and a more natural arrangement and diversity of plant species. Most of the ornamental cherry trees will be removed from the borders of the river channel, and if possible, some trees will be transplanted to other parts of the park. The city has plans to plant additional cherry trees in other parts of the park as well.

7.8.2 Fishing

Most of the trout fishing on the Mill River takes place in the upper reach. The removal of the Main Street Dam is not likely to have any effect on upstream trout habitat. Once the Mill River habitat is restored, it is possible that trout will migrate down to the restored channel. The naturalization of the banks will improve access to the river, and thus improve fishing opportunities in this part of the river. Construction activities will locally and temporarily effect access to the river, in the immediate vicinity of the project sites. Construction activities will have minimal effect on use of the river upstream of the project.

7.8.3 Education

There are many opportunities for neighborhood schools to increasingly recognize the river and its associated habitat as a valuable teaching tool. Children can learn about riparian and wetland habitats restoration ecology, while actively participating in water and habitat quality monitoring during the course of the Mill River restoration.

7.9 ENVIRONMENTAL JUSTICE

The proposed restoration sites were not selected based on the social or economic make-up of the neighboring landowners or the watershed community, but rather based on the environmental benefits and costs of site restoration. Residents, regardless of their race or income, will benefit from this project. As a result, no disproportionate impacts on environmental justice populations, in accordance with Executive Order #12989, dated February 11, 1994 (*Environmental Justice in Minority Populations),* are expected.

7.10 PROTECTION OF CHILDREN

Executive Order # 13045 requires federal agencies to examine proposed actions to determine whether they will have disproportionately high effects on the health or safety of children. During the construction phase of the proposed project, heavy construction equipment and vehicles will be in use on the site. The site will be fenced off to prevent unauthorized access to the work area, including children. There will be a temporary increase in truck traffic transporting materials to and from the site. This will be limited to public roadways, and will be of a short duration. Construction is therefore not expected to cause any disproportionate impact to the health and safety of children.

7.11 CLEAN AIR ACT CONFORMITY

Corps of Engineers guidance on air quality compliance is summarized in Appendix C of the Corps Planning Guidance Notebook (ER1105-2-100, Appendix C, Section C-7, pg. C-47). Section 176 (c) of the Clean Air Act (CAA) requires that Federal agencies assure that their activities are in conformance with Federally-approved CAA state implementation plans for geographic areas designated as non-attainment and maintenance areas under the CAA. The U.S. Environmental Protection Agency (EPA) General Conformity Rule to implement Section 176 (c) is found at 40 CFR Part 193.

Ambient air quality is protected by Federal and state regulations. The EPA has developed National Ambient Air Quality Standards (NAAQS) for certain air pollutants, with the NAAQS setting concentration limits that determine the attainment status for each criteria pollutant. The State of Connecticut is designated as attainment or non-attainment with respect to the NAAQS for six criteria air pollutants: particulate matter no greater than 10 micrometers in diameter (PM_{10}); sulfur dioxide (SO_2); ozone (O_3); nitrogen dioxide (NO_2); carbon monoxide (CO); and lead (Pb). Stamford, along with the entire state of Connecticut, is within a non-attainment zone for ozone and is part of the Northeast Ozone Transport Region, which extends northeast from Maryland and includes all six New England states. The Mill River in the City of Stamford, Fairfield County, is designated to be in a region considered "severe non-attainment" for the 1-hour ozone standard (Connecticut Department of Environmental Protection, 2004a).

Section 176c of the Clean Air Act (CAA) requires that Federal agencies assure that their activities are in conformity with state plans for non-attainment areas. The Corps must evaluate and determine if the proposed action will generate air pollution emissions that aggravate a non-attainment problem or jeopardize the maintenance status of the area for ozone.

Construction would occur over a period of about 6 to 9 months, and would require road and nonroad equipment: bulldozers, dump trucks, pick-up trucks, cranes, forklifts, front-end loaders, and other construction equipment, including small generators. The State of Connecticut does not have requirements for non-road construction vehicle emissions, but does follow the final federal rules that establish emission standards for nonroad land-based diesel engines. These are engines used mainly in construction, agricultural, industrial, and mining operations. The federal engine standards, adopted in June 2004, are applicable to new equipment effective in the 2008 model year, phasing in over a number of years (40 Code of Federal Regulations Part 9).

By requiring the road-based vehicles to comply with state emissions requirements, the Mill River Section 206 Project will conform to the requirements of the Connecticut State Implementation Plan (SIP). Therefore, the proposed Corps activity will not worsen an existing NAAQS violation, cause a new NAAQS violation, delay the SIP attainment schedule of the NAAQS, or otherwise contradict SIP requirements for the State of Connecticut. The proposed activity meets the *de minimus* requirement established by the EPA's General Conformity Rule in that total direct and indirect emissions caused by the operation of the federal action are less than *de minimus* levels established in the rule.

In addition to the criteria pollutants, various substances are classified as toxic or hazardous air pollutants (HAP). Toxic pollutants or HAP, such as benzene or chromium, present serious threats to human health and the environment. Toxic air pollution is a health concern both in the vicinity of the emitting source and beyond. Exposure to toxic pollutants may yield various short- or long-term effects in humans. Short-term effects include eye irritation, nausea, or difficulty breathing. Longer effects effects can include damage to the respiratory or nervous systems, birth defects, reproductive effects or cancer. The type and severity of the effect is determined by the toxicity of the pollutant, the quantity of the pollutant, the duration and frequency of exposure, and the general health and level of resistance or susceptibility of the person exposed. Toxic air pollutants can have indirect effects on human health through deposition onto soil or into lakes and streams, potentially affecting ecological systems and eventually human health through consumption of contaminated food (Connecticut Department of Environmental Protection, 2004a).

The Connecticut Department of Environmental Protection regulates 850 compounds under its air toxics program. The national emission standards for hazardous air pollutants (NESHAP), including the NESHAPs for source categories also known as maximum achievable control technology (MACT) standards, are implemented in Connecticut through the Title V process (Business and Legal Reports, 2004). The project will not require review under the Title V permit process.

Construction of the proposed project would cause a temporary reduction in local ambient air quality because of fugitive dust and emissions generated by construction equipment.

The extent of dust generated would depend on the level of construction activity and on soil composition and dryness. If proper dust suppression techniques were not employed, dry and windy weather conditions could create a nuisance for nearby residents. Under certain meteorological conditions, there might be high temporary concentrations of pollutants in the vicinity of construction (FERC, 1997).

The project would have no long-term impacts on air quality. During construction, equipment operating on the site would emit pollutants including nitrogen oxides that can lead to the formation of ozone. Connecticut has no permit requirements for construction projects, only on equipment. In order to minimize air quality effects during construction, construction activities would comply with applicable provisions pertaining to dust, odors, construction, noise, and motor vehicle emissions. The emissions from construction vehicles and equipment should have an insignificant effect on air quality of the immediate area or region. Therefore, this project conforms to the Federal requirements for activities under the Clean Air Act within Connecticut's State Implementation Plan.

7.12 CUMULATIVE IMPACTS

The Council on Environmental Quality (CEQ) definition of cumulative impacts as found in 40 Code of Federal Regulation (CFR) section 1508.7 is as follows: "Cumulative Impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions." The proposed project is authorized by Section 206 of the Water Resources Development Act of 1996, which provides programmatic authority for the US Army Corps of Engineers (USACE) to carry out aquatic ecosystem restoration projects that improve the quality of the environment, are in the public interest, and are cost effective. The overarching goal of the project is to restore the aquatic and riparian resources of the Mill River to a healthy, viable, and self-maintaining river system. The proposed project is beneficial to wetlands and riverine systems in the project area, in effect, reversing historical degradation and incremental impacts to natural resources. No negative cumulative impacts are anticipated.

Restoration of the Mill River is an integral part of the city's plan to create a downtown greenway. This project will also contribute cumulative benefits to the aquatic ecosystem of Mill River when combined with future actions planned by the city of Stamford to improve stormwater drainage systems in the Rippowam (Mill River) watershed. Improvements to the storm drainage system include construction of additional detention basins and sediment traps to treat storm water associated with city street runoff within the city of Stamford. These projects planned by the city would reduce sediment loads, nutrients, and contaminants into Mill River. The city also plans to further protect the riparian corridor in Scalzi Park, upstream from the proposed project locations in this assessment. These actions are planed by the city during the next three years. The proposed project described in this assessment provides a cumulative positive impact to the aquatic habitat and water quality of Mill River in combination with these other proposed projects.

In addition, the proposed project provides cumulative positive benefits to regional habitat restoration initiatives within Long Island Sound and its watershed. These initiatives are being undertaken by the Long Island Sound Habitat Restoration Initiative (LISHRI), a partnership of government agencies and other groups dedicated to improve the quality of Long Island Sound habitat, and Save the Sound, a bi-state, non-profit membership organization dedicated to the restoration, protection, and appreciation of Long Island Sound and its watershed.

SECTION 8. ACTIONS TAKEN TO MINIMIZE IMPACTS

During the construction phase of the proposed project, appropriate measures will be taken to prevent erosion of the banks of the Mill Pond and Mill River in order to minimize turbidity impacts to the aquatic environment such as hay bales and silt curtains. When appropriate, the work will be done during the low-flow period of the river, which will further minimize adverse effects to the surrounding and downstream aquatic environments. In-water work will be restricted from May 15 through September 30 of any calendar year to reduce sediment migration off the construction site for the protection of summer flounder, bluefish, and their forage. This in-water restriction is based on an Essential Fish Habitat Recommendation provided by the National Marine Fisheries Service in a letter dated 5 August 2004 (see Appendix D to view correspondence).

SECTION 9. PUBLIC INVOLVEMENT AND AGENCY COORDINATION

Meetings have been convened between vested parties including the City of Stamford, State government, the USACE, and local non-profit organizations. Discussion has centered on alternatives to restore the Mill Pond and the adjoining Mill River Park. The project's scope has been extended to include reaches upstream and downstream from the park. An initial project meeting was held on July 1, 2002. Minutes of this meeting are included in Appendix D. The following people and agencies participated:

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Coordination letters were sent to federal, state, and local agencies and interest groups as listed below. Pertinent correspondence and letters of receipt are located in Appendix D:

Federal:
U.S. Environmental Protection Agency
National Marine Fisheries Service
U.S. Fish and Wildlife Service

State:
Connecticut Department of Environmental Protection
Connecticut State Historic Preservation Officer (will coordinate during archaeological survey)
Connecticut State Archaeologist (same as above)

Local:
Save the Sound. Inc.
Aquarion Water Company
American Rivers
City of Stamford

The Project Coordination meeting was held on September 25, 2002 in Stamford CT. Agencies and organizations represented at the Coordination meeting included: City of Stamford, USACE, US EPA, CT DEP, Save the Sound, American Rivers, and TBG. Meeting minutes can be found in Appendix D. The following people and agencies participated:

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The Final Coordination Act Report (FCAR) for the Mill River and Mill Pond Habitat Restoration Project was received from the U.S. Fish and Wildlife Service (USFWS) dated 13 May 2004. In general, comments were favorable concerning the restoration of the Mill River and removal of the Main Street Dam to restore riverine habitat and anadromous fish passage. The FCAR also recommended that additional freshwater wetland restoration be included in the project. Clarification on the study was provided to the USFWS in a letter from the U. S. Army Corps of Engineers (USACE) dated 26 May 2004. As stated in the response letter, emergent wetlands are a component of the Mill River Park restoration, as described in the DPR and EA. In addition, a further clarification of the restoration rating system, which was used to determine environmentally beneficial and cost-effective sites for recommendation, was provided. Copies of the FCAR and USACE response letter are provided in Appendix D, Pertinent Correspondence. No further FCAR comments were received from USFWS.

A Public Notice was sent to agencies with jurisdiction in the project and interested parties dated May 17, 2004. During the comment period, copies of the Draft Detailed Project Report and Environmental Assessment were available for viewing at the Stamford Public Library, the Stamford City Hall, and the Army Corps of Engineers Public website. All comments received during the 30-day comment period have been addressed. A copy of the Public Notice, letters received during the 30-day comment period, and comment responses are contained in Appendix D. A public information meeting was held by the city of Stamford on June 24, 2004, with assistance from the Army Corps of Engineers. The Mayor of Stamford, other city representatives, and the Corps of Engineers Project Manager addressed all comments heard at the meeting. The meeting minutes are contained in Appendix D.

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ATTACHMENT A

COMPLIANCE WITH ENVIRONMENTAL FEDERAL STATUTES AND EXECUTIVE ORDERS

Environmental Federal Statutes And Executive Orders

Federal Statutes

1. Archaeological Resources Protection Act of 1979, as amended, 16 USC 470 et seq.

Compliance: Issuance of a permit from the Federal land manager to excavate or remove archaeological resources located on public or Indian lands signifies compliance.

2. Preservation of Historic and Archeological Data Act of 1974, as amended, 16 U.S.C. 469 et seq.

Compliance: Project has been coordinated with the State Historic Preservation officer. Impacts to archaeological resources will be mitigated.

3. American Indian Religious Freedom Act of 1978, 42 U.S.C. 1996.

Compliance: Must ensure access by Native Americans to sacred sites, possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

4. Clean Air Act, as amended, 42 U.S.C. 7401 et seq.

Compliance: Public notice of the availability of this report to the Environmental Protection Agency is required for compliance pursuant to Sections 176c and 309 of the Clean Air Act.

5. Clean Water Act of 1977 (Federal Water Pollution Control Act Amendments of 1972) 33 U.S.C. 1251 et seq.

Compliance: A Section 404(b)(1) Evaluation and Compliance Review has been incorporated into the project report. An application shall be filed for State Water Quality Certification pursuant to Section 401 of the Clean Water Act.

6. Coastal Zone Management Act of 1972, as amended, 16 U.S.C. 1451 et seq.

Compliance: A CZM consistency determination shall be provided to the State for review and concurrence that the proposed project is consistent with the approved State CZM program.

7. Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq.

Compliance: Coordination with the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) determined no formal consultation requirements pursuant to Section 7 of the Endangered Species Act because no threatened or endangered species were identified to be present in the project area..

8. Estuarine Areas Act, 16 U.S.C. 1221 et seq.

Compliance: Not applicable. Applicable only if report is being submitted to Congress.

9. Federal Water Project Recreation Act, as amended, 16 U.S.C. 4601-12 et seq.

Compliance: Public notice of availability of the project report to the National Park Service (NPS) and Office of Statewide Planning relative to the Federal and State comprehensive outdoor recreation plans signifies compliance with this Act.

10. Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661 et seq.

Compliance: Coordination with the FWS, NMFS, and State fish and wildlife agencies signifies compliance with the Fish and Wildlife Coordination Act. A Planning Aid letter was received from the USFWS dated 17 October 2002. Upon completion of the Draft DPR and Environmental Assessment, a request will be made to the USFWS for a Final Coordination Act Report.

11. Land and Water Conservation Fund Act of 1965, as amended, 16 U.S.C. 4601-4 et seq.

Compliance: Public notice of the availability of this report to the National Park Service (NPS) and the Office of Statewide Planning relative to the Federal and State comprehensive outdoor recreation plans signifies compliance with this Act.

12. Marine Protection, Research, and Sanctuaries Act of 1971, as amended, 33 U.S.C. 1401 et seq.

Compliance: Not applicable because the project does not involve the transportation or disposal of dredged material in ocean waters, pursuant to Sections 102 and 103 of the Act, respectively.

13. National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq.

Compliance: Coordination with the State Historic Preservation Office signifies compliance.

14. Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3000-3013, 18 U.S.C. 1170

Compliance: Regulations implementing NAGPRA will be followed if discovery of human remains and/or funerary items occur during implementation of this project.

15. National Environmental Policy Act of 1969, as amended, 42 U.S.C 4321 et seq.

Compliance: Preparation of an Environmental Assessment signifies partial compliance with NEPA. Full compliance shall be noted at the time the Finding of No Significant Impact is issued.

16. Rivers and Harbors Act of 1899, as amended, 33 U.S.C. 401 et seq.

Compliance: No requirements for projects or programs authorized by Congress. The proposed aquatic ecosystem restoration project is being conducted pursuant to the Congressionally-approved authority.

17. Watershed Protection and Flood Prevention Act as amended, 16 U.S.C 1001 et seq.

Compliance: Floodplain impacts were considered in project planning and the project is in compliance with the act.

18. Wild and Scenic Rivers Act, as amended, 16 U.S.C 1271 et seq.

Compliance: Not applicable; the Mill River is not a designated Wild and Scenic River.

19. Magnuson-Stevens Fisheries Conservation and Management Act, as amended, 16 U.S.C. 1801 et seq.

Compliance: Coordination with the National Marine Fisheries Service and preparation of an Essential Fish Habitat (EFH) Assessment signifies compliance with the EFH provisions of the Magnuson-Stevens Fisheries Conservation and Management Act. Upon completion of the Draft DPR and Environmental Assessment, a request will be made to the NMFS for an Essential Fish Habitat Review.

20. Federal Farmland Policy Protection Act of 1981

Compliance: The Act applies to soils of prime, unique or statewide importance, bur not to farmland already in or committed to urban development. Soil units of statewide importance in the project area will not be impacted by the proposed project. These areas are also located within an urban area.

Executive Orders

1. Executive Order 11593, Protection and Enhancement of the Cultural Environment, 13 May 1971

Compliance: Coordination with the State Historic Preservation Officer signifies compliance.

2. Executive Order 11988, Floodplain Management, 24 May 1977 amended by Executive Order 12148, 20 July 1979.

Compliance: Public notice of the availability of this report or public review fulfills the requirements of Executive Order 11988, Section 2(a) (2).

3. Executive Order 11990, Protection of Wetlands, 24 May 1977.

Compliance: Public notice of the availability of this report for public review fulfills the requirements of Executive Order 11990, Section 2 (b).

4. Executive Order 12114, Environmental Effects Abroad of Major Federal Actions, 4 January 1979.

Compliance: Not applicable to projects located within the United States.

5. Executive Order 12898, Environmental Justice, 11 February 1994.

Compliance: The project is not expected to have a disproportionate impact on minority or low income populations in the project area. The project is in compliance with this EO.
6. Executive Order 13007, Accommodation of Sacred Sites, 24 May 1996

Compliance: Not applicable because the project is not located on Federal lands. If Federal lands are involved, then agencies must accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and avoid adversely affecting the physical integrity of such sacred sites.

7. Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks.
21 April, 1997.

Compliance: In compliance because the project would not create a disproportionate environmental health or safety risk for children.

8. Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, 6 November 2000.

Compliance: Consultation with Indian Tribal Governments, where applicable, and consistent with executive memoranda, DoD Indian policy, and USACE Tribal Policy Principles signifies compliance.

Executive Memorandum

Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing NEPA, 11 August 1980.

Compliance: Not applicable because the project does not involve or impact agricultural lands.

White House Memorandum, Government-to-Government Relations with Indian Tribes, 29 April 1994.

Compliance: Consultation with Federally Recognized Indian Tribes, where appropriate, signifies compliance.

ATTACHMENT B

NEW ENGLAND DISTRICT
US ARMY CORPS OF ENGINEERS, CONCORD, MA
CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION

PROJECT: Mill River and Mill Pond Habitat Restoration Project, Stamford, Connecticut – Conducted under the US Army Corps of Engineers Authority contained in Section 206 of the 1996 Water Resources Development Act, as amended.

PROJECT MANAGER: Adam Burnett Tel: 978-318-8547

FORM COMPLETED BY: Judith Johnson Tel: 978-318- 8138

PROJECT DESCRIPTION: The selected plan consists of removal of the Main Street Dam and Mill Pond retaining walls. Additionally, slopes will be regraded adjacent to the stream channel to restore the river to its approximate pre-development configuration. Approximately 18,600 cubic yards of sediment will be excavated out of Mill Pond within the existing walls of the pond. This sediment material will be disposed of off site at an appropriate disposal site, such as the Manchester Municipal Landfill in Manchester, Connecticut. In addition, 26,000 cubic yards of material (outside of the walls) will be regraded to restore new river floodplain and banks. Other features of the proposed project include enhancing 1.53 acres of the riparian corridor through removal of exotic and invasive plant species and planting of native woody and herbaceous vegetation, creating and restoring 0.8 acres of tidal wetlands through re-grading banks and planting native salt marsh vegetation, removing concrete blocks and gate structures directly beneath the Pulaski Street Bridge and incorporating a trail system to connect the greenway and parks along the river corridor.

NEW ENGLAND DISTRICT
US ARMY CORPS OF ENGINEERS, CONCORD, MA

PROJECT: Mill River and Mill Pond Habitat Restoration Project, Stamford, Connecticut – Conducted under the US Army Corps of Engineers Authority contained in Section 206 of the 1996 Water Resources Development Act, as amended.

CLEAN WATER ACT
Evaluation of Section 404(b)(1) Guidelines

1. Review of Compliance Section 230.10a – d.

A review of the permit application indicated that:

a. The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose.

YES	NO
X	

b. The activity does not appear to:

1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the CWA;

2) jeopardize the existence of Federally listed threatened and endangered species or their habitat; and

3) violate requirements of any Federally designated marine sanctuary.

YES	NO
X	

c. The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values.

YES	NO
X	

d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.

YES	NO
X	

2. **Technical Evaluation Factors Subparts C-F.**

	N/A	Not Significant	Significant
a. Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem Subpart C.			
1 Substrate.		X	
2 Suspended particles/turbidity.		X	
3 Water column impacts.		X	
4 Current patterns and water circulation.		X	
5 Normal water fluctuations.		X	
6 Salinity gradients.		X	
b. Potential Impacts on Biological Characteristics of the Aquatic Ecosystem Subpart D.			
1 Threatened and endangered species	X		
2 Fish, crustaceans, mollusks, and other organisms in the aquatic food web.		X	
3 Other wildlife mammals, birds, reptiles and amphibians.		X	
c. Potential Impacts on Special Aquatic Sites Subpart E.			
1 Sanctuaries and refuges.	X		
2 Wetlands.			

	X	

3 Mud flats.

X		

4 Vegetated shallows.

X		

5 Coral reefs.

X		

6 Riffle and pool complexes.

	X	

d. Potential Effects on Human Use Characteristics Subpart F.

1 Municipal and private water supplies.

	X	

2 Recreational and commercial fisheries.

	X	

3 Water-related recreation.

	X	

4 Aesthetics impacts.

	X	

5) Parks, national and historic monuments, national seashores, wilderness areas, research sites and similar preserves.

	X	

3. Evaluation and Testing Subpart G.

The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. Check only those appropriate.

1) Physical characteristics...………… X

2) Hydrography in relation to known or anticipated sources of contaminants…...…X

3) Results from previous testing of the material or similar material in the vicinity of the project ....……….X

4) Known, significant sources of persistent pesticides from land runoff or percolation...………..

5) Spill records for petroleum products or designated hazardous substances Section 311 of CWA..……….

6) Public records of significant introduction of contaminants from industries,

municipalities, or other sources ....……

7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities...……

8) Other sources specify...……

See 2004 Draft Environmental Assessment for the Mill River and Mill Pond Habitat Restoration Project, Stamford, Connecticut.

a. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or that levels of contaminants are substantially similar at extraction and disposal sites and not likely to require constraints. The material meets the testing exclusion criteria.

YES	NO
X	

4. Disposal Site Delineation Section 230.11 f.

a. The following factors, as appropriate, have been considered in evaluating the disposal site.

1) Depth of water at disposal site ....…………
2) Current velocity, direction, and variability at disposal site
3) Degree of turbulence..…………
4) Water column stratification.......................................…………
5) Discharge vessel speed and direction ....…………
6) Rate of discharge...…………
7) Dredged material characteristics constituents, amount, and type of material, settling velocities ....…………X
8) Number of discharges per unit of time ....…………
9) Other factors affecting rates and patterns of mixing (specify)

b. An evaluation of the appropriate factors in 4a above indicated that our disposal sites and/or size of mixing zone are acceptable.

X
YES NO

Note: Material will be disposed at an upland location as yet to be determined. See 2004 Draft Environmental Assessment for the Mill River and Mill Pond Habitat Restoration Project, Stamford, Connecticut.

5. Actions To Minimize Adverse Effects Subpart H.

All appropriate and practicable steps have been taken, through application of recommendation of Section 230.70-230.77 to ensure minimal adverse effects of the proposed discharge.

X
YES NO

List actions taken.

See 2004 Draft Environmental Assessment for the Mill River and Mill Pond Habitat Restoration Project, Stamford, Connecticut.

6. Factual Determination (Section 230.11).

A review of appropriate information as identified in items 2 - 5 above indicates that there is minimal potential for short or long term environmental effects of the proposed discharge as related to:

a. Physical substrate (review sections 2a, 3, 4, and 5 above). _X_ YES ____ NO

b. Water circulation, fluctuation and salinity (review sections 2a, 3, 4, and 5). _X_ YES ____ NO

c. Suspended particulates/turbidity (review sections 2a, 3, 4, and 5). _X_ YES ____ NO

d. Contaminant availability (review sections 2a, 3, and 4). _X_ YES ____ NO

e. Aquatic ecosystem structure, function and organisms(review sections 2b and c, 3, and 5). _X_ YES ____ NO

f. Proposed disposal site

(review sections 2, 4, and 5).
c, 3, and 5).

_X_ YES ___ NO

g. Cumulative effects on the aquatic ecosystem.

_X_ YES ___ NO

h. Secondary effects on the aquatic ecosystem.

_X_ YES ___ NO

7. Findings of Compliance.

The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines.

31 AUG 04

Date

Thomas L. Koning
Colonel, Corps of Engineers
District Engineer