# SECTION 6. COMPARISON OF ALTERNATIVES

## 6.1 INTRODUCTION

The following criteria were utilized to compare various combinations of alternatives and restoration measures: (1) benefits to the aquatic ecosystem, (2) project costs, including construction costs, real estate values, and operations and maintenance costs-benefit analysis, and (3) other benefits to the public that could weigh in on importance and acceptability of the project, including flood damage reduction benefits.

## 6.2 COMPARISON OF ENVIRONMENTAL BENEFITS

To measure the benefits of each alternative, a series of habitat criteria were identified. Values were assigned to the criteria for each of the various alternatives, and the total value was calculated. (See Appendix E for further details.)

The primary goals of the project are improvement of aquatic habitat, improvement of water quality, and restoration of anadromous fisheries. Four supplemental habitat criteria were identified: riparian corridor habitat, habitat for migratory birds, habitat for wetland species, and native habitat diversity.

The first three habitat criteria (water quality, aquatic habitat, and anadromous fish habitat) were broken down into basic requisites for aquatic life. Three requisites related to water quality were identified: dissolved oxygen, temperature, and flow. Aquatic habitat was broken down into four component requisites: spawning substrate, in-stream cover, forage, and benthic invertebrates. Habitat requisites for anadromous fisheries were identified as upstream passage and spawning habitat for both alewife and blueback herring.

To determine the existing habitat conditions and the benefits of restoration activities, individual values (used as an index of habitat quality) were assigned to seven habitat criteria for each alternative and additive measure. Values ranging from 0 to 1 were assigned with a value of 0 as the poorest condition, and a value of 1 as the optimal condition. The assigned value for each habitat criterion was then multiplied by a weighting factor (acres) to determine "Habitat Units" (HU's) for each Alternative. The HU's calculated for the no-action alternative represent existing habitat conditions or the future without project conditions.

The seven habitat criteria used in this incremental analysis include: aquatic habitat, improvement of water quality, restoration of anadromous fisheries, riparian corridor habitat, habitat for migratory birds, habitat for wetland species, and native habitat diversity. The first three habitat criteria (water quality, aquatic habitat, and habitat for anadromous fisheries) were further broken down into basic requisites for aquatic life (the requisites were averaged to calculate the value for the habitat criteria). Each habitat criterion value was multiplied by the number of acres affected by the individual

alternative (Alternatives 2, 3, and 4) or additive measure (i.e. tidal wetland restoration, freshwater wetland creation, riparian corridor restoration, etc.) to determine Habitat Units (HU's). HU's for each habitat criteria were then added to determine total HU's for each alternative or additive measure.

For the no-action alternative and Alternatives 2, 3, and 4, weighted acreage represents acres specifically in the Mill River Park area for each habitat criteria (with the exception of anadromous fish habitat, which takes into account the entire restored reach of 5.2 miles). Acreage figures for additive measures represent the site-specific areas proposed for restoration (again, with the exception of anadromous fish habitat, which takes into account the entire restored reach of 5.2 miles).

HU's for the no-action alternative represent the habitat value of existing conditions in the Mill River Park area, and HU's for Alternatives 2, 3, and 4 represent the expected habitat value of the Mill River Park with implementation of each alternative. For additive measures, the habitat value of the existing condition was considered so that HU's represent the increase in habitat value should the action be undertaken. Although proposed restoration improvements have some ecological benefits outside of the proposed restoration sites (i.e. water quality, wildlife habitat, etc.), the majority of the benefit occurs site-specifically. Quantitative and qualitative habitat changes are necessary to determine cost-effective restoration measures through the incremental analysis methodology. Appendix E provides a complete discussion of these criteria, along with their values and an explanation of their ranking.

The predicted habitat units for each proposed alternative were considerably better than the habitat units of the no-action alternative. The improved habitat unit expected after project completion was calculated by subtracting the habitat unit of the no-action alternative from the score of the other alternatives. The predicted habitat units for each alternative are outlined in Table 4. In addition to the habitat units presented in Table 4, four additive measures add habitat units to each alternative in any combination in a linear fashion (see Table 4 a).

**Table 4. Comparison of Alternatives Using Anticipated Habitat Value**

| Evaluation Criteria | Alternatives | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Aquatic Habitat | 0.9 | 1.7 | 1.1 | 1.3 |
| Water Quality | 0.9 | 1.7 | 0.9 | 0.7 |
| Habitat for Anadromous Fish | 0.0 | 26.0 | 22.8 | 14.2 |
| Riparian Corridor Habitat | 0.3 | 4.0 | 3.0 | 2.9 |
| Habitat for Wetland Species | 0.0 | 0.4 | 0.4 | 0.3 |
| Native Habitat Diversity | 0.0 | 4.4 | 4.4 | 2.8 |
| Potential Habitat for Migratory Birds | 1.2 | 5.8 | 5.8 | 4.1 |
| **Total** | **3.3** | **43.9** | **38.4** | **26.2** |

**Table 4 a. Comparison of Additive Measures Using Anticipated Habitat Value (values represent increase over existing habitat)**

| Evaluation Criteria | Additive Measures | | | |
|---|---|---|---|---|
| | Removal of Fish Blockage at Pulaski St Bridge | Tidal Wetland Restoration | Riparian Corridor Restoration (Including Invasive Plant Removal) | Freshwater Wetland Creation |
| Aquatic Habitat | 0.1 | 0.5 | 0.9 | 0.8 |
| Water Quality | 0.0 | 0.2 | 0.4 | 0.8 |
| Habitat for Anadromous Fish | 1.6 | 0.0 | 0.0 | 0.0 |
| Riparian Corridor Habitat | 0.0 | 0.6 | 1.1 | 1.0 |
| Habitat for Wetland Species | 0.0 | 0.6 | 1.1 | 1.0 |
| Native Habitat Diversity | 0.1 | 0.6 | 1.1 | 0.8 |
| Potential Habitat for Migratory Birds | 0.1 | 0.6 | 1.1 | 0.8 |
| **Total** | **1.8** | **3.1** | **5.1** | **4.8** |

## 6.3 COMPARISON OF COSTS

For the purpose of comparison, various project costs are displayed below, including study and design costs, construction costs, real estate values attributable to the project costs, monitoring costs, and operations and maintenance costs. The values of the real estate needed for the project, including lands, easements, rights-of-way, relocations, and disposal sites (LERRDS), and those real estate values that are considered project costs, are explained in more detail in Appendix G.

Construction costs were estimated through the use of MCACES software program, RS Means 2003 cost guides, and verbal and written quotations from suppliers and contractors. Table 5 provides estimated construction quantities for major items for each alternative.

**Table 5. Estimated Construction Quantities for Major Items for Each Alternative**

| **Mill River Park restoration** | **Alternatives** | | | |
|---|---|---|---|---|
| | **1** | **2** | **3** | **4** |
| Total Construction Site (Acres) | 6 | 6 | 6 | 6 |
| Dam Removal (cubic yards) | 0 | 178 | 178 | 0 |
| Retaining Wall Removal (cubic yards) | 0 | 2,200 | 2,200 | 2,200 |
| Sediment Removal from Pond (cubic yards) | 0 | 18,600 | 18,600 | 18,600 |
| Earthwork – Regrading (cubic yards) | 0 | 26,200 | 26,200 | 26,200 |
| **Remove Obstruction at Pulaski Street Bridge** | | | | |
| Remnant Dam Removal (Pulaski St.) (cubic yards) | 556 | | | |
| **Freshwater Wetlands Creation** | | | | |
| Area Impacted (acres) | 1.0 | | | |
| Soil Excavation (cubic yards) | 8,100 | | | |
| Asphalt (Parking lot and Sidewalk) Demolition (cubic yards) | 585 | | | |
| **Tidal Wetlands restoration** | | | | |
| Area Impacted (acres) | 0.8 | | | |
| Soil Excavation (cubic yards) | 3,900 | | | |
| **Riparian Restoration** | | | | |
| Revegetation - Total Area (acres) | 1.53 | | | |
| Invasive plant Removal (acres) | 0.36 | | | |

Table 6 provides a summary of construction costs, operation and maintenance costs, and other project costs. An MCACES software cost analysis is displayed in Appendix F.

**Table 6. Estimated Project Costs for each of the alternatives and additional measures that could be added to the alternatives.**

| | Primary Alternatives | | | | Additional Measures | | | |
|---|---|---|---|---|---|---|---|---|
| | **No Action** | **Mill Pond Park - Channel Restoration Alt 2** | **Mill Pond Park - Step Pools Alt 3** | **Mill Pond Park - Fish Ladder Alt 4** | **Pulaski Street** | **Tidal Wetlands** | **Riparian Corridor** | **Fresh-water Wetlands** |
| Study Costs | $350,000 | $350,000 | $350,000 | $350,000 | $0 | $0 | $0 | $0 |
| Plans and Specifications | $0 | $315,000 | $315,000 | $315,000 | $20,000 | $27,000 | $18,000 | $25,000 |
| Construction (includes 15% Contingency) | $0 | $3,597,000 | $3,723,000 | $3,503,000 | $150,000 | $272,000 | $64,000 | $358,000 |
| Engineering and Design during Construction (8% of Construction Cost) | $0 | $108,000 | $116,000 | $105,000 | $4,000 | $8,000 | $2,000 | $11,000 |
| Construction Management (6% of Construction Cost) | $0 | $286,000 | $290,000 | $270,000 | $12,000 | $18,000 | $4,000 | $29,000 |
| Total Construction Costs | $0 | $3,991,000 | $4,129,000 | $3878,000 | $166,000 | $298,000 | $70,000 | $398,000 |
| Real Estate Value *[1] | $0 | $185,000 | $185,000 | $185,000 | $20,000 | $45,000 | $11,000 | $351,000 |
| Post Construction Monitoring (1% of total project cost) | $0 | $48,000 | $50,000 | $47,000 | $2,000 | $4,000 | $1,000 | $8,000 |
| Total Project Shared Costs | $0 (no project) | $4,889,000 | $5,029,000 | $4,775,000 | $208,000 | $374,000 | $100,000 | $782,000 |
| Periodic Operations and Maintenance (O&M) Costs *[2] | $1,500,000 per 10 years *[3] | $5,000 per year *[4] | $1,500,000 per 10 years; plus $5,000 per year *[5] | $1,500,000 per 10 years; plus $6,000 per year *[6] | $0 | $1,000 per year *[7] | $1,000 per year *[8] | $1,000 per year *[9] |

NOTES:

*1– Sponsor is required to provide real estate needs and can credit the real estate value toward the sponsor's cost share.

*2– Operations and maintenance costs are not cost shared and are the responsibility of the sponsor.

*3– Dam and Pond Operation and Maintenance including dredging of pond sediments every 10 years, and maintaining the structural integrity of concrete retaining walls and dam, and maintenance of the sluice gate.

*4 – Estimated operation and maintenance of restored habitats included stream banks, riparian vegetation, and channel.

*5 – Estimated operation and maintenance of restored habitats included pool banks, riparian vegetation, and freshwater wetland. Includes dredging pools at a cost of $1,500,000 every ten years.

*6 – Dam and Pond Operation and Maintenance including dredging of pond sediments every 10 years at a cost of $1,500,000 as well as the maintenance of stream banks, management of restored habitat, and fish ladder maintenance $1,000/ year over 50 years.

*7 – Estimated annual maintenance of tidal wetlands, including controlling invasive weeds.

*8 – Estimated annual maintenance of riparian corridor, including controlling invasive weeds.

*9 – Estimated annual maintenance of freshwater wetlands, including controlling invasive weeds.

Costs that are eligible for federal funding and cost-sharing under the Section 206 Authority include project study costs; plans and specifications costs; the cost or value of real estate, easements, and rights-of-way; project construction costs; and monitoring costs (up to 1% of the project cost). All operations and maintenance costs are the responsibility of the sponsor. Costs that are eligible for cost sharing between the federal government and the sponsor (the city of Stamford) are normally split 65% federal, 35% sponsor. An exception to this 65%/35% cost sharing is the construction cost of recreational components to the project that are eligible under the Section 206 Program. Recreation-related construction costs are shared 50% federal, 50% sponsor. More information on cost sharing and eligibility are found in Corps Engineer Regulations (ER 1105-2-100 and ER 1165-2-501).

Of Alternatives 2, 3, and 4, the least expensive alternative is Alternative 2, with cost-shared project costs amounting to $4,889,000. Alternative 2 has the lowest cost for construction and lowest cost in long-term operations and maintenance requirements. Alternative 4 has both the highest construction cost and O&M costs. Alternative 4 has additional expenses of a fish ladder and stabilizing the remaining portion of retaining wall. Alternative 3 has additional construction costs over Alternative 2 due to the cost of the step pool construction and series of small weirs for the pools. Alternatives 3 and 4 both have dredge maintenance costs that add significant costs to the total project costs for these alternatives.

The cost-shared project costs of the additional measures range from $100,000 for the riparian corridor restoration, to $782,000 for the freshwater wetlands restoration. The freshwater wetlands restoration has a relatively high real estate cost of $351,000.

Operations and maintenance costs, the responsibility of the sponsor, include repair and maintenance of the dam in Alternatives 1 and 4, and they also include the cost of periodic dredging of sediments behind the dam in Alternatives 1 and 4 and within the constructed pools in Alternative 3. Operations and maintenance costs also include maintenance of the restored habitats, including control of invasive weeds.

If the dam remains in place, short and long-term operations and maintenance costs would be incurred. The Main Street Dam is nearly 80 years old, and it is anticipated that it will need major repair or replacement in the near-term. It is assumed that under Alternative 4, major maintenance or a full replacement of the dam would be required.

Of all four primary alternatives, including the no-action alternative, Alternative 2 is the least-cost option for the sponsor, while Alternative 4 is the most expensive.

## 6.4 INCREMENTAL ANALYSIS

An incremental analysis is presented in Appendix E. A summary of the results is included in this section of the report. The incremental analysis measured the environmental benefits 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.

With the estimated benefits and costs developed from the concept designs, cost effectiveness and incremental analyses were performed. These two analyses are techniques used to evaluate project alternatives for ecosystem restoration studies. The purpose of these analyses is to ensure that the economically efficient, least-cost solution is identified for each possible level of environmental output. These analyses also show how the incremental cost increase changes when levels of environmental output increase.

### 6.4.1 Comparing Habitat Output

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 HU 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 or 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.

### 6.4.2 Incremental Cost Analysis

The costs of the alternative restoration plans are compared with the environmental benefits, within the framework of an incremental cost analysis, to identify the most cost-effective alternatives. An incremental cost analysis examines how the costs of additional units of environmental output increase as the level of environmental output increases. For this analysis, the environmental outputs are measured in habitat units. The analysis is in accordance with IWR Report 95-R-1, Evaluation of Environmental Investments Procedures Manual-Interim: Cost Effectiveness and Incremental Cost Analyses, May 1995; and ER 1105-2-100, Planning Guidance Notebook, Section 3-5, Ecosystem Restoration, April 2000. The computer program IWR-PLAN, developed for the Institute for Water Resources (IWR), was used to conduct the analysis.

An incremental cost curve can be identified by displaying cost-effective solutions. Cost-effective solutions are those plans that provide a level of habitat output,, or number of habitat units, for the least cost. A plan is cost effective if there are no others that cost less

and provide the same, or more, habitat units. Alternatively, for a given cost, there will be no other plans that provide more habitat units.

The primary restoration measures to improve environmental conditions in the Mill River and Mill Pond, as shown in Table 7, include 1) no action; 2) removal of the dam, sediment, and retaining walls and restoration of the river channel with riffles and pools; 3) removal of the dam, sediment, and walls, and creation of step pools; and 4) removal of sediment, partial removal of walls, and installation of a fish ladder. Additional measures that may be added to the primary measures are 5) removing fish passage blockage at Pulaski Street Bridge, 6) tidal marsh restoration, 7) riparian corridor restoration, and 8) freshwater wetland creation. These additional measures are not analyzed independently, but only in conjunction with the primary Alternatives 2, 3, or 4.

Project description, project cost, and the number of habitat units created by each plan are shown in Table 7. Costs are shown as economic costs and are discounted to the present value at an interest rate of 5 $^{5}/_{8}$%. This interest rate, as specified in the Federal Register, is to be used by Federal agencies in the formulation and evaluation of water and land resource plans for the period October 1, 2003 to September 30, 2004. The project economic life is considered to be 50 years. Project cost (economic cost) derivation is shown in detail in Appendix E.

**Table 7. Restoration Measures Cost and Output**

| No | Description | Cost*[1] | HU |
|---|---|---|---|
| | | ($000) | (acres) |
| 1 | No Action | 1,926 | 3.3 |
| 2 | Restore River Channel | 4,727 | 43.9 |
| 3 | Create Step Pools | 6,801 | 38.4 |
| 4 | Install Fish Ladder | 6,558 | 26.2 |
| 5 | Remove Fish Passage Blockage at Pulaski Bridge | 213 | 1.8 |
| 6 | Tidal Restoration | 400 | 3.1 |
| 7 | Riparian Corridor Restoration | 119 | 5.1 |
| 8 | Freshwater Wetland Creation | 818 | 4.8 |

*1 – Costs are shown as economic costs and are discounted to the present value at an interest rate of 5 $^{5}/_{8}$%.

The total economic costs and habitat unit outputs were derived for all possible combinations of alternatives and additive measures and were compared with each other. Of the 50 combinations of measures analyzed, nine combinations were cost effective and 4 were best buy. The cost-effective plans are shown in Table 8.

**Table 8. Cost-Effective Plans**

| Alternatives | HU | Cost |
|---|---|---|
| | | ($000) |
| 1 | 3.3 | 1,926 |
| 2 | 43.9 | 4,727 |
| 2+7 | 49.0 | 4,846 |
| 2+5+7 | 50.8 | 5,060 |
| 2+6+7 | 52.1 | 5,246 |
| 2+5+6+7 | 53.9 | 5,459 |
| 2+5+7+8 | 55.6 | 5,877 |
| 2+6+7+8 | 56.9 | 6,064 |
| 2+5+6+7+8 | 58.7 | 6,277 |

In Table 8, the plans are arranged by increasing output of habitat units. Alternative 3 (create step pool) and Alternative 4 (install fish ladder) are not cost effective when compared to Alternative 2 (restore river channel), because Alternative 2 provides more habitat units than these other plans at a lower cost. This cost comparison can be readily seen by reference to Table 7. As shown in Table 8, Alternative 1 is the no-action plan, and the cost shown for this plan is for long-term operations and maintenance of the existing pool. Alternative 2 is river channel restoration. The remaining alternatives add various combinations of Alternatives 5(removal of fish passage blockage), 6 (tidal restoration), 7 (riparian corridor restoration), and 8 (freshwater wetlands creation).

Best buy plans are a subset of cost-effective plans. For each best buy, plan there are no other plans that will provide at least the same level of output at a lower incremental cost. The analysis identified four best buy plans, as shown in Table 9.

**Table 9.** Incremental Cost Curve of Best Buy Plans

| Alternatives | Habitat units (HU) | Cost | Average Cost | Incremental Cost | Incremental Output | Incremental Cost Per Output |
|---|---|---|---|---|---|---|
| | | ($000) | ($000/HU) | ($000) | | ($000) |
| 2+7 | 49.0 | 4,846 | 99 | 4,846 | 49.0 | 99 |
| | | | | | | |
| 2+5+7 | 50.8 | 5,060 | 100 | 213 | 1.8 | 118 |
| | | | | | | |
| 2+5+6+7 | 53.9 | 5,459 | 101 | 400 | 3.1 | 129 |
| | | | | | | |
| 2+5+6+7+8 | 58.7 | 6,277 | 107 | 818 | 4.8 | 170 |

Also shown in Table 9 are the corresponding incremental cost, incremental output, and incremental cost per incremental output. Incremental cost is the increase in cost of each successive plan. Incremental output is the increase in output of each successive plan. Incremental cost per output is the change in cost per incremental output when proceeding to plans with higher output Usually, the no-action alternative (also known as the without-project alternative), is a best buy plan. However, for this analysis the no-action alternative results in an economic cost of $1,926,000 for operations and maintenance over the 50-year period. The high cost for little output causes the no-action alternative to have a high incremental cost and to not be a best-buy plan.

The question that is asked at each increment is whether the additional gain in environmental benefit is worth the additional cost. The first increment provides an additional 49 HU with an incremental cost of $99,000 per HU. This increment would restore the river channel and provide for riparian corridor restoration. The second increment would add the removal of the fish passage blockage at the Pulaski Bridge to the first increment. The second increment would provide an additional 1.8 HU at an incremental cost of $118,000 per HU. The third increment would add tidal wetland tidal restoration to the second increment. This increment would provide an additional 3.1 HU at an incremental cost of $129,000 per HU. The fourth, and final, increment would provide an additional 4.8 HU with an incremental cost of $170,000 per HU. The fourth increment adds freshwater wetland creation to the third increment.

### 6.4.3 National Economic Development Benefits

Though the primary goal of this project is environmental restoration, the alternatives provide additional benefits at various levels to the National economic development in the form of flood damage reduction. Alternatives 2 and 3 would reduce flooding in the reaches of the Mill River upstream of the Main Street Dam. For the 100-year event, water surface levels would be lowered by between 2.0 and 2.6 feet between the removed dam and Broad Street located approximately 1,100 feet upstream (See Appendix B). The economic benefits resulting from these reductions in flood levels were not specifically calculated for the dollar values of these benefits because this project is being conducted under the Ecosystem Restoration Program (Section 206 of Water Resources Development Act), which addresses National environmental restoration outputs, and economic development benefits are not defined as a primary goal of this project.

## 6.5 RECOMMENDATIONS

Since this project is federally funded through the Section 206 program, a plan that best meets national interests must be identified under Corps of Engineers regulations (ER 1105-2-100). This national plan, called the National Environmental Restoration (NER) Plan, reasonably maximizes environmental benefits, is cost effective, and provides aquatic habitat restoration benefits that are in the national interest. The NER plan must meet planning objectives and constraints and reasonably maximize environmental benefits while passing tests of cost effectiveness, significance of outputs, acceptability,

completeness, cost efficiency, and effectiveness. The plan must also have a reasonable cost in context with other similar projects (Corps Regulations ER 1105-2-100, Appendix E). Corps regulations allow federal funding to be contributed to support the project to the maximum allowed when the NER plan is chosen as the proposed plan. Locally preferred plans can also be funded (partially or in whole) if they are determined to be best buy plans through incremental analysis and meet other planning criteria.

Four plans are identified as best-buy plans and can all be considered for the NER recommended plan. The first three plans have relatively similar incremental costs, ranging from $99,000 to $129,000 per HU, and these costs are within the normal range of restoration projects in the North Atlantic Division. The plan that includes the restoration of the river channel at Mill Park (Alternative 2) along with riparian corridor restoration, removal of the fish blockage at Pulaski Street Bridge, and tidal wetlands restoration is selected as the NER recommended plan. The total economic cost is estimated at approximately $5.5 million with a total HU output of 58.7. This alternative, with the additive measures, is in the national interest because it provides for effective anadromous fish passage, waterfowl habitat, and tidal wetlands restoration. This plan is carried forward in this report as the recommended alternative.

The next increment, the addition of the freshwater wetlands has a large jump in incremental cost, up to $170,000 per HU. This increment, which involves restoration of one acre of wetlands for a total project cost of over $700,000, is more expensive than similar projects in North Atlantic Division. Therefore, the wetlands restoration measure is not recommended at this time, given the costs identified in this report.

Alternative 2 with the three additive measures, as noted above, appears to meet selection factors of cost efficiency and effectiveness. For this alternative to be brought forward as the recommended plan into a final report, the plan must be acceptable to the city of Stamford, as the sponsor, and state and other federal resource agencies. In 2002 and 2003, Connecticut Department of Environmental Protection and U.S. Fish and Wildlife Service provided letters of support for this alternative. In January 2004, Stamford agreed to the recommended plan for public review.

The additional incremental cost of tidal wetlands restoration is justified because wetlands along the Long Island Sound of the Atlantic Ocean are critical to the ecological function of the northeastern Atlantic coastline. Federal Agencies, including the Department of the Army, and Connecticut State agencies have signed a Resolution under the Coastal America Program to address constricted coastal embayments along the Connecticut coast. As stated in this Resolution, “Marshes along the Connecticut coast have historically been an exceptionally productive and biologically diverse ecosystem important to the economics and aesthetics of the Northeast and the Nation.” The Resolution further states that the acreage of these key habitats for fish, shellfish, birds, and wildlife has greatly declined over the last century. Therefore, restoration of wetlands along the Connecticut coast as proposed in this study, are in the National interest and are vital steps to help stop this coastal ecosystem from further degradation.

Additional benefits in the national interest include flood damage reduction. Alternative 2 would provide some level of flood damage reduction in the downtown Stamford (See Appendix B for more information). The 100-year computed water surface elevation would be reduced by at least 2 feet for approximately 1,000 feet upstream of the Main Street Dam, with smaller reductions further upstream in the current impoundment. Though this benefit is not specifically measured in the incremental analysis, it is an important additional benefit that would result from implementation of Alternative 2.