GRANT APPLICATION: AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009
NOAA COASTAL AND MARINE HABITAT RESTORATION PROJECT GRANTS
FFO# NOAA- MNFS-HCOPT-2009-2001709

# Rainbow Fish Passage Complex, File 1 of 4

## PROJECT SUMMARY

**Applicant Organization:** State of Connecticut, Department of Environmental Protection
**Project Title:** Rainbow Fish Passage Complex
**Site Location:** Farmington River, Windsor, CT; 41°55' latitude N, 72°41' longitude W.
**Land Owner:** Farmington River Power Company c/o The Stanley Works, 600 Myrtle Street, New Britain, CT 06053
**On-the-ground Implementation Start Date:** July 1, 2010
**Number and types of jobs created or maintained, labor hours and anticipated duration for each:**
*Near-term:* Estimated to create or maintain 51.4 construction, engineering, landscaping, and supporting services jobs using a standard estimate of $100,000 per full time annual equivalent.
*Long-term:* Expansion of recreational fisheries in the upper and lower Farmington River, and Connecticut River in the Hartford-Windsor area with all of the indirect benefits that such tourist activities brings, e.g. restaurant, gasoline, lodging, equipment sales, etc. Additionally, with more American shad entering the Connecticut River bound for the Farmington River, the existing commercial fishery for shad in the Connecticut River (Old Saybrook to Glastonbury) will be enhanced.
**Coastal and Marine habitats to benefit from the projects:** Riverine Migratory Corridors; diadromous fish habitat. The Farmington River, with a watershed of 603 square miles, joins the Connecticut River 58 miles upstream from Long Island Sound (Figures 1 and 2) . In turn, the Connecticut River basin is the largest watershed with the greatest amount of historical diadromous fish freshwater habitat in southern New England. Construction of an effective fish passage complex over the Rainbow Dam, an instream barrier to diadromous fish passage on the Farmington River, will restore access to approximately 52 miles of essential habitat for spawning, and juvenile rearing and growth of Atlantic salmon, American shad, river herring (alewife, blueback herring), and sea lamprey, and enhance returns of American eel, six species of regional and national significance. In addition, there is a population of the federally listed endangered dwarf wedgemussel two miles upstream of the project and the restoration of anadromous fish runs to the area should enhance and spread this population of mussels upstream into the watershed.
**Project Scope:** The construction of the Rainbow Fish Passage Complex (fishlift and eel pass) represents a mid-scale project that will yield significant and sustainable ecological and economic benefits. Feasibility studies and selection of a preferred alternative are complete, and final design is underway. Design plans will be bid to contractors, a preferred contractor chosen and hired, and the contractor will use standard construction practices to build the complex. Post-construction activities will include quantifying the

number of adult Atlantic salmon, American shad, river herring, searun brown trout, sea lamprey, and American eel that ascend the complex, and descend through the existing downstream fish passage structure at the site, continuing on-going electrofishing surveys of population demographics, and extending on-going creel survey data collection as a measure of socioeconomic benefits.

**Project Outputs/Outcome:** Restoring effective fish passage at the Rainbow Dam will restore access to 52 miles of historic spawning and juvenile rearing and growth habitats for the existing diadromous fish runs below the dam. An additional 17.3 miles will be added in the future when two upstream dams are provided with fishways through an anticipated FERC licensing process. By making the habitat available to the fish populations, run sizes can be expected to increase dramatically, including an annual projected increase of 250 Atlantic salmon, 20,000 American shad, 300,000 blueback herring, 117,000 alewives, and 10,000 sea lamprey. This increase in run size will generate an array of ecological benefits including restored biodiversity, energy flow, mussel transport. There will also be socioeconomic benefits such as the establishment of new, high-quality recreational fisheries in a scenic portion of Connecticut. The existing commercial fishery in downstream portions of the Connecticut River will also benefit from a net increase in the number of American shad entering the river and passing through the area where the fishery is conducted.

**Project Timeline:**

*May – December:* administrative preparations- receive grant and set up appropriate accounts, develop lists of contractors, prepare bid documents, apply for dam safety permit, etc. while the designs are completed (process currently underway).

*January – March, 2010:* Issue construction bid request

*April, 2010:* award bid, sign contract; receive approved permit.

*May - June, 2010:* mobilize equipment, begin construction not involving existing fishway.

*July, 2010:* begin all aspects of construction

**Permits and Approvals:** The project will require a Dam Safety Permit issued by the CTDEP/Inland Water Resources Division[1]. Due to the small footprint and no in-water construction, no US Army Corps of Engineer permits are anticipated.

**Federal Funds Requested & Non-Federal Match Anticipated:** $5,139,000 of federal funds requested; no non-federal match (cash) anticipated.

**Overall Project Cost:** $5,139,000.

[1] A preliminary review by the DEP Inland Water Resources Division, the US Army Corps of Engineers, or the Town of Windsor Locks for regulatory jurisdiction has not been performed.

## PROJECT NARRATIVE

The Rainbow Dam is the first dam on the Farmington River, the largest tributary of the Connecticut River. The owner of the dam is the Farmington River Power Company (FRPC), which operates a hydroelectric project (FERC non-jurisdictional) at the site. The applicant, the State of Connecticut, Department of Environmental Protection (CTDEP), proposes to build a fish passage complex (fishlift and eel pass) that would connect the hydroelectric project's tailrace with its headpond, passing around the north end of the powerhouse. The objective is to pass targeted diadromous and resident fishes. The CTDEP has set a goal of restoring diadromous fish species from the mouth of the river upstream into most areas of the watershed within Connecticut.

### Location

The Rainbow Dam is located on the Farmington River in the Poquonock section of Windsor, CT approximately eight miles upstream from the confluence of the Farmington River with the Connecticut River (Figure 1, Supplemental Information, File 4). There are no downstream dams or barriers to diadromous fishes. The dam was built in 1925 specifically for hydroelectric generation. The dam is 59-feet high and consists of a long earthen dike along the left bank and a right bank concrete spillway with wooden flashboards (Figure 2, Supplement Information, File 4). The powerhouse is situated in between the dike and spillway. The existing fishway is a 750-foot long vertical slot fishway that extends from the tailrace to the headpond, circumventing the spillway, powerhouse, and electrical yard to the north. Water spills over the spillway infrequently, as flow is commonly diverted through the powerhouse to turn the two turbines before being released into the tailrace. The tailrace rejoins the historic river channel 0.25 miles downstream.

### History

The historical record clearly establishes that Atlantic salmon ascended to the very headwaters of the Farmington River north of Otis, MA and that American shad at least occasionally ascended as far as Otis, MA. The run of shad (and river herring) routinely extended to the falls at Collinsville (upper dam), where there was a significant Native American fishery. Site names, including Salmon Brook, further attest to the presence of these fish. The historical presence of runs has been documented by the Connecticut River Atlantic Salmon Commission, Farmington River Watershed Association, and other entities. Photographs of the reach immediately upstream of the dam taken before dam construction clearly show the river was passable (lack of waterfalls) to anadromous fish. Construction of the dam and curtailment of access to historic spawning and juvenile rearing and growth habitats led to the extirpation of Atlantic salmon, and declines in American shad, alewife, blueback herring, sea lamprey, American eel, striped bass and white perch populations. Today, remnant populations are constrained to the impaired habitats downstream of the Rainbow Dam and in the Connecticut River, and are joined by expanding runs of sea-run brown trout and gizzard shad. Atlantic salmon that were stocked as part of the restoration program have returned to the site annually since 1978.

There have been reports of shortnose sturgeon, a federally listed endangered species, in the lower Farmington River but these have not been verified. Sturgeon will use fishlifts and a new fishlift may eventual confirm the presence of this federally-listed species in the river.

Fish passage was undertaken at Rainbow as part of the larger Connecticut River Atlantic Salmon Program, which also targeted American shad and other diadromous species. The U.S. Fish & Wildlife Service designed a fishway based on designs successfully used to pass shad on the West Coast. The fishway was built by the CTDEP in 1976 and has been operated annually ever since. Data show that the fishway has been effective at passing Atlantic salmon, trout, sea lamprey, and various other species but has been ineffective at passing American shad and river herring. In fact, the fishway is one of the few in which shad actually die while in the fishway. The narrow slots (10") and the highly turbulent pools result in extreme fatigue and a high incidence of injury. Data show that the size of the American shad run in the river has declined since the operation of the fishway commenced (Figure 3, Supplemental Information, File 4). It is speculated that the fishway attracts most of the American shad in the river into the fishway and subjects them to so much stress and injury that few survive to spawn either upstream or downstream of the dam, effectively diminishing reproductive effort relative to what would have occurred without the fishway. In effect, the existing fish ladder fails to achieve the primary objective of providing effective upstream fish passage for alosids.

The CTDEP began to consider modifications over 20 years ago, but most were impractical or ineffective. The need for action accelerated in the 1990s when the physical condition of the fishway began to deteriorate. In considering remedial actions, the CTDEP pursued a comprehensive alternatives analysis to identify the most practical solution.

In 2002, the CTDEP hired Macchi Engineering to perform an alternatives analysis for providing effective upstream fish passage at the site. Alternatives that were considered were: (1) no action, (2) remove all interior partitions (vertical slots) in the existing fishway structure and build a 4-foot Denil fishway inside, (3) build a fishlift, and (4) build a fish monorail system. The consensus opinion drawn from the results of the analysis was to build a fishlift to provide passage for the full array of targeted anadromous species, and the CTDEP accepted that recommendation. The entire Alternatives Analysis is available upon request. In short, the conclusions for each option were: (1) no action would result in no fish passage for the top priority stream in Connecticut; (2) the risk of failure in achieving the primary objective – upstream passage of alosids – is high (alosids have not been reported effectively passing a Denil fishway at dams higher than 25 feet); (3) a fishlift has been proven to successfully pass alosids at Holyoke, Greeneville, Lawrence, and Cataract; (4) the monorail concept is too experimental and it is unclear whether or not it could move quickly enough without life support systems to keep the fish alive prior to delivering them to the headpond. The Conceptual Design for the fishlift is attached as Appendix A. A graphic depiction of where the fishlift would be located relative to the existing infrastructure is shown in Figure 4 (Supplemental Information, File 4). In 2008, the CTDEP, working with the

Connecticut Department of Public Works (DPW), initiated a process to select a firm to develop a full design for the fishlift option. That process is ongoing. The design will be suitable for establishing necessary construction and O&M easements, bidding, permitting, and construction.

Ecological Benefit of the Project

The stated restoration target for the Farmington River is:

a. *establish an annual run of 250 adult Atlantic salmon,*
b. *establish an annual run of 20,000 adult American shad,*
c. *establish an annual run of 300,000 adult blueback herring,*
d. *establish an annual run of 117,000 adult alewives, and*
e. *establish an annual run of 10,000 adult sea lampreys.*

By providing effective fish passage at Rainbow Dam, 31 miles of habitat in the mainstem Farmington River and 21 miles of habitat in the tributaries (notably the Salmon Brook, Pequabuck River, and Burlington Brook drainages) will be accessible to diadromous fishes—a total of 52 miles. This is a unique opportunity in Connecticut, which has a high density of dams. This accessible habitat is the portion of the river downstream from the lower Collinsville Dam in Avon. Both the Upper and Lower Colllinsville dams are currently the subject of a preliminary FERC permit issued to the Town of Canton to develop a licensed hydroelectric project. All parties accept the fact that upstream and downstream fish passage will be required as part of this license, and those facilities will open up an additional 17.3 miles of habitat on the Farmington and West Branch Farmington rivers. No effort has been made to quantify the number of miles of habitat in the tributaries above the Collinsville dams would be re-connected, but it would be substantial. Tributaries include Cherry and Morgan brooks, the Still River, and Sandy Brook, which has no dams, and would open access all the way into Massachusetts. Furthermore, the Bristol Brass Dam, which is the first barrier on the Pequabuck River, is the subject of a grant application to the CTDEP for removal. If this dam is removed, it increases the potential benefit to fish passing the future Rainbow Fish Passage Complex. So, the fish passage complex project will immediately restore 52 miles and set the stage for an additional 20+ miles in the future. These areas of habitat within the watershed are summarized in Figure 5 and Table 1 (Supplemental Information, File 4).

Diadromous fish species are NOAA trust species and run sizes are linked to the amount of available habitat. As the amount of habitat increases, so does the production of juvenile fish and, ultimately, the number of adult fish that return to the river (in the case of the anadromous species). The re-establishment of these populations will have many indirect ecological benefits as predators follow the increased forage base up the watershed and increase their populations. These include osprey, bald eagle, striped bass, bluefish, seals, porpoises, colonial nesting birds, otter, and mink. Futhermore, many freshwater mussels rely on diadromous fish to distribute them to upper portions of watersheds. Since the construction of dams, many species of mussels have disappeared

from upper watersheds and the construction of the Rainbow Fish Passage Complex will reverse this trend.

1. Importance and Applicability-

*a. Potential to Maximize Employment:*

Objectives:

1) Short term
    a. Create 51.4 construction related jobs (Full Time Equivalents)
2) Long term
    a. Increase recreational angler creel of American shad,
    b. Increase commercial harvest of American shad and river herring
    c. Increase economic benefit as a product of ecological restoration.

We estimate that 51.4 jobs (full time equivalents, calculated using the standard relative multiplier of 1 job per $100,000 spent) in construction, engineering, and related trades will be created or retained[2]. It is expected that most workers would be in the NAICS category 237990, including excavation contractors, de-watering contractors, tower construction contractors, concrete contractors, steel workers, welders, electrical contractors, and riggers. Once bids are open, CTDEP will provide specific details on the number of jobs created or maintained, as required under the ARRA for a NOAA award agreement.

Construction of the fish passage complex will result in a tangible and quantifiable result. All contractors to the State are required to abide by Connecticut's Affirmative Action and Equal Opportunity employment policies and must "implement, monitor and enforce this [Connecticut's] affirmative action policy statement and program in conjunction with all applicable Federal and state laws, regulations and executive orders." Further, CTDEP will condition any and all grant agreements in accordance with ARRA requirements to use American steel. Both CTDEP and a management consultant selected to oversee the construction contractor(s)' activities will maintain oversight and day-to-day approval of activities to ensure compliance with the contract conditions and requirements, that performance measures, including schedules, are met and that major targets for construction and performance standards are incorporated in quality management plans and met. Performance bonds are required as a standard contractual requirement in Connecticut.

Long-term benefits to the region will include an expansion of recreational fisheries in the Farmington River, and in the Connecticut River in the Hartford-Windsor area, with all of the indirect benefits that such tourist activities brings, e.g. restaurant, gasoline, lodging, equipment sales, etc. The region is a well-known destination for highly productive sport fisheries and an angling-tourism infrastructure in place to incorporate the influx of

[2] It should be clear that these are not all on-site jobs, but approximate the employment effects of the goods and services provided through the entire project cost.

anglers economic activities into the local economy. Increasing fish population sizes will enhance this system and expand the local economy. Anglers travel from all over the Northeast to visit the area to fish in the river's famed Trout Management Areas. The influx of highly desirable anadromous fishes such as Atlantic salmon, sea-run trout, and American shad will diversify the fishery both in the length of the season and the offering to the creel. Non-game species such as river herring and sea lamprey are known to make important ecological contributions that increase the carrying capacity for game species like trout. The lower Farmington River and the area immediately surrounding its mouth in the Connecticut River, is a famous area for fishing for American shad, striped bass, and sea-run trout. By increasing the number of shad returning to the Farmington River, these fisheries and traditions will be strengthened, and the local economy expanded. The increase in numbers of returning river herring is also very important to this formula since striped bass follow the river herring up the river to feed. More river herring means more, larger, and healthier striped bass, thus expanding that fishery and making commensurate expansions to the local economy. Additionally, with more American shad entering the Connecticut River bound for the Farmington River, the existing commercial fishery for shad in the Connecticut River (Old Saybrook to Glastonbury) will be enhanced.

Research into the long term economic benefits of restoring diadromous fish passage has revealed a direct link between ecological restoration and economic benefits in the form of increases in property values (E. Schultz, pers. comm.). Such increases are expected to reverse recent trends in these economically distressed communities.

*b. Potential to restore Coastal Habitats (riverine migratory corridors)*:

Objectives:

1) Short term
    a. Restore access to 52 miles of historical diadromous fish habitat for spawning, juvenile rearing and growth, and adult and juvenile passage.
2) Long term
    a. Establish an annual return of 250 adult Atlantic salmon,
    b. Increase adult American shad annual returns by 20,000,
    c. Increase adult blueback herring annual returns by 300,000,
    d. Increase adult alewife annual returns by 117,000, and
    e. Increase adult sea lamprey returns by 10,000.

Providing fish passage over the Rainbow Dam, an in-stream barrier to diadromous fish passage on the Farmington River, will restore access to 52 miles of essential habitats for Atlantic salmon, American shad, blueback herring, alewife, sea lamprey, and American eel, six NOAA trust species of regional and national significance. The Farmington River joins the Connecticut River fifty-eight miles upstream from Long Island Sound (Figure 1) and twelve miles upstream of the head of tide. The Farmington River watershed is 601 square miles, and represents approximately thirty-seven percent of the Connecticut River watershed in the state. In turn, the Connecticut River basin is the largest watershed with

the greatest amount of historical diadromous fish freshwater habitat in the southern New England.

"Riverine migratory corridor(s)" is a class of essential habitat for diadromous fishes; those that move between marine and fresh waters for purposes of reproduction. This class of habitat supports adult spawning, juvenile growth, and adult and juvenile migratory pathways. The proposed project will re-connect the existing fish runs to these historically available habitats.

The Farmington River watershed supported significant native diadromous fish runs that included Atlantic salmon, American shad, alewife, blueback herring, striped bass, white perch, rainbow smelt, sea lamprey, and American eel. Although rainbow smelt, striped bass and shortnose sturgeon were restricted to the lower 11 miles of the river, American shad, blueback herring and alewife regularly inhabited much of the habitat proposed for restoration under this project. The historic range of Atlantic salmon, sea lamprey, and American eel extended further still, in many cases to the headwaters throughout the watershed. The construction of the Rainbow Dam in 1925, and the Spoonville Dam three miles upstream in (circa) 1900 (subsequently breached in the flood of 1955, and no longer a barrier to fish passage), and aggravated by declining water quality during the industrialization of the watershed, led to the extirpation of diadromous fish runs from the upper basin. However, remnant runs of targeted diadromous fishes that continued to exist in the lower eight miles of the Farmington River, downstream of Rainbow Dam, and in the lower Connecticut River watershed, provided a restoration opportunity for the upper Farmington River basin.

Over the past 40 years, the CTDEP has been engaged in a concerted and coordinated effort to restore the water and habitat quality of the Farmington River. Water quality efforts focused on advanced wastewater treatment requirements to meet pollutant wasteload allocations (WLA) and biological toxicity requirements on the river. As a result of the substantial strides made in restoring water and habitat quality, coldwater fisheries and water contact recreational opportunities (e.g., whitewater boating, tubing, swimming) have expanded in the watershed. Reflecting the heightened public interest in the river, the 103rd Congress of the United States designated a portion of the Farmington River as a component of the National Wild and Scenic Rivers System. In addition, another portion of the Farmington River, including the 31 miles of mainstem diadromous fish habitat to be restored under this proposal, is currently under consideration for inclusion in the National Wild and Scenic Rivers System.

The 1970s CTDEP Inland Fisheries Division, in cooperation with the members of the Connecticut River Atlantic Salmon Commission, established a goal of restoring diadromous fishes, including Atlantic salmon, to the Farmington River. The most significant step in achieving that goal was establishing fish passage at the Rainbow Dam. To that end, the CTDEP Inland Fisheries Division, the US Fish and Wildlife Service and the Farmington River Power Company, collaborated on the construction of the Rainbow Fish Ladder.

The collaborators were faced with an array of challenges in designing a fish passage structure at the Rainbow Dam. At that time, no fish passage structure had been constructed on the eastern seaboard for passing alosids (American shad, blueback herring or alewife). Furthermore, little research into the behavioral response of alosids to various hydraulic parameters affecting fish passage had been conducted. In the absence of clear design guidance, engineers drew from fish passage design parameter developed and applied on the western seaboard on much larger river systems. This led to the design and construction of a vertical slot fishway, reduced in scale commensurate with the size of the Farmington River, that ultimately has proven to be ineffective.

The principal failure of the vertical slot fishway in passing alosids is directly related to three phenomena: the overall height of the dam, flow hydraulics (quantity of flow and resulting vertical slot opening size), and alosid behavioral response. In effect, alosids will not pass a vertical slot fishway scaled to a river the size of the Farmington River, and a dam 59 feet high. However, even though the fishway proved to be a failure, there were aspects of the fishway that proved to be effective.

The location, orientation and hydraulics of entrance and exit structures are critical to fish passage effectiveness. Observations recorded over the 30-year operating history of the existing fishway indicate that the entrance and exit structures are ideally sited, as the full array of targeted species enter and exit the structures unhindered. As a consequence, any new structure to overcome the design limitations of the vertical slot fish ladder may incorporate these elements to ensure effective movement of fish into and out of the passage structure.

The potential to restore riverine migratory corridors—reconnecting riverine habitat for diadromous fish—is extremely high in light of the demonstrated effectiveness of fishlifts and eel pass. Fishlifts have a track record for success in passing a wide array of anadromous fishes, including alosids, over tall barrier dams, and eel passes have been successfully deployed at a wide array of sites on the eastern seaboard. There is a very low injury rate associated with fishlifts and eel passes, and fish exiting the fish passage complex will be in good position to continue their upstream migration and access the many miles of upstream habitat which is in excellent condition, and therefore the potential for success is extremely high.

*c. Potential for sustainable and lasting benefits of Regional Significance*:

There are existing runs of diadromous fishes below the dam that have persisted over the past 300 years. Their ability to survive and adapt has been proven in other watersheds in which upstream fish passage has been restored, and the potential for large increases in run sizes in the Farmington River is high. This increase in run size increases the likelihood for long-term sustainability with lasting benefits, including enhanced biodiversity, ecosystem function, angling opportunities and passive enjoyment.

The Farmington River watershed is a regional resource, draining a large portion of northcentral Connecticut and occupying at least 13 towns. Additionally, the public has a

keen interest in Atlantic salmon, American shad and river herring, and have demonstrated its willingness to drive long distances to gain access to some aspect of these resources. This river is one of three in Connecticut, and the closest river to New York City and points farther south, where sea-run Atlantic salmon can be found—and seen. The river is one of a dozen streams in Connecticut where American shad can be found.

2. Technical/Scientific Merit-

*a. Implementation Plan*:

There are five factors to support timely implementation of this project:

1) Strong public and landowner support,
2) Absence of adverse ecological impacts,
3) The narrow range of regulatory issues to be addressed,
4) Feasibility and alternatives analyses have been completed, and
5) Standardized construction sequencing and principals are to be employed.

Support for the construction of a new and effective fish passage complex at the Rainbow Dam is broad and uniform. Both state and federal agencies participating in the Connecticut River Atlantic Salmon Commission, the Farmington River Power Company (owner of the dam and involved lands), and numerous non-governmental conservation organizations (e.g., Trout Unlimited and its subunits, the Farmington River Anglers Association, the Farmington River Watershed Association, the Connecticut River Salmon Association, the Connecticut River Watershed Council, and others) enthusiastically support the project. Similarly important, no group has indicated opposition.

Because the design of the fishlift will incorporate the existing entrance and exit flumes of the failed vertical slot fish ladder, no construction will occur in the river. As a consequence, no adverse environmental impacts from construction activities are anticipated. By extension, regulatory review will be limited to dam construction activities associated with connections between the fishlift and conveyance flume to the existing entrance and exit structures. By avoiding any actions that will affect the integrity of the dam, an expedited review and issuance of the requisite Dam Construction Permit is anticipated.

The preferred alternative fish passage design was defined during a preliminary feasibility assessment and alternatives analysis. The assessment and analysis involved a review of quantitative objectives (adult passage criteria for targeted species; Atlantic salmon, American shad, blueback herring, alewife, sea lamprey and American eel) and the compilation of data on fish passage structure design, objectives and performance from comparable rivers along the eastern seaboard. The results and recommendations put forward in the final report were analyzed by biologists specializing in fish passage behavior and fish passage design engineers with cooperating state and federal resource agencies. That analysis produced a consensus opinion that the preferred alternative was a dual complex that included a fishlift and an eel pass.

Such designs have been implemented at several sites, including two others in Connecticut. The construction techniques have been employed widely on rivers along the eastern seaboard and the CTDEP Inland Fisheries Division has extensive experience in the operation of such facilities.

*b. Socio-economic Feasibility*:

The forecasted job creation target is based on a standard approach. All contractors to the State are required to abide by Connecticut's Affirmative Action and Equal Opportunity employment policies and must "implement, monitor and enforce this [Connecticut's] affirmative action policy statement and program in conjunction with all applicable Federal and state laws, regulations and executive orders." Short term performance parameters will involve monitoring the number of hours by NAICS job code, with the total compared to projected job creation/retention targets. In addition, CTDEP will condition any and all grant agreements in accordance with ARRA requirements to use American steel.

*c. Technical Feasibility*:

Great strides have been made during the past 30 years toward understanding the behavioral response of diadromous fish species to various passage design parameters at hydroelectric dams.

In the 1970s, when the collaborators embarked on establishing fish passage at Rainbow Dam, they were faced with an array of challenges in designing a fish passage structure at the Rainbow Dam. At that time, no fish passage structure had been constructed on the eastern seaboard for passing alosids (American shad, blueback herring or alewife). Furthermore, little research into the behavioral response of alosids to various hydraulic parameters affecting fish passage had been conducted. In the absence of clear design guidance, engineers drew from fish passage design parameter developed and applied on the western seaboard on much larger river systems. This led to the design and construction of a vertical slot fishway, reduced in scale commensurate with the size of the Farmington River that ultimately has proven to be ineffective.

The principal failure of the vertical slot fishway in passing alosids is directly related to three phenomena: the overall height of the dam, flow hydraulics (quantity of flow and resulting vertical slot opening size), and alosid behavioral response. In effect, alosids will not pass a vertical slot fishway scaled to a river the size of the Farmington River, on a dam 59 feet high. However, even though the fishway proved to be a failure, there were aspects of the fishway that proved to be effective.

The location, orientation and hydraulics of entrance and exit structures are critical to fish passage effectiveness. Observations recorded over the 30-year operating history of the existing fishway indicate that the entrance and exit structures are ideally sited, as the full array of targeted species enter and exit and the structures unhindered. As a consequence, any new structure to overcome the design limitations of the vertical slot fish ladder may

incorporate these elements to ensure effective movement of fish into and out of the passage structure.

The potential to restore riverine migratory corridors—reconnecting riverine habitat for diadromous fish—is extremely high in light of the demonstrated effectiveness of fishlifts and eel pass. Fishlifts have a track record for success in passing a wide array of anadromous fishes, including alosids, over tall barrier dams, and eel passes have been successfully deployed at a wide array of sites on the eastern seaboard. There is a very low injury rate associated with fishlifts and eel passes, and fish exiting the fish passage complex will be in good position to continue their upstream migration and access the many miles of upstream habitat, which is in excellent condition, and therefore the potential for success is extremely high.

Fishlift and eel pass construction access and staging is unencumbered at the site. Most of the construction will be done on dry land without the need to control water. The existing exit and headgate will be re-used and therefore the pond will not have to be drawn down to de-water the construction of a headgate/exit. The existing entrance will be reused, minimizing the need to control water in the tailrace. It appears unlikely that a cofferdam will be needed in the tailrace. Without the need for a cofferdam or pond drawdown, the construction of the lift will not significantly affect the operation of the hydroelectric project.

Evaluation of the effectiveness of the fish passage complex will be based on two primary factors: the success of individual fish passing upstream (degree of success indicating effectiveness of the design to achieve objective), and changes in the size of the adult populations of the targeted species. In each case, evaluations cannot occur until the construction of the bypass channel is complete and restored runs of the targeted species seek out upstream habitats. The first anticipated fish run that would be able to utilize the completed fishway would be the spring 2011 run, which will occur outside of the award period. Once runs are established, performance monitoring will commence. Short term performance parameters involving the success passing fish upstream of the dam will involve visual observation and enumeration of fish passing through the fishlift and captured in the eel pass. Long term performance parameters to evaluate changes in juvenile production and population size of targeted species will involve counts of adults of all species passing upstream through the fishlift, juvenile eels collected in the eel pass, and juveniles passing downstream through the existing downstream bypass, and by electrofishing surveys. If future funds are secured, consideration will be given to tracking fish using radio and PIT tags. However, all of this would be beyond the award period of the proposed grant and therefore beyond the scope of this application.

3. Qualification of the Applicants-

*a. Capacity/knowledge of project personnel to conduct the work*:

The staff of the CTDEP has considerable experience with fish passage projects and has a network of experts to rely upon. The DPW is anticipated to administer the project including securing construction service bids, supervising construction activities and

monitoring construction performance measures, per state policy for projects of this size. The lead for the CTDEP for technical matters will be the Inland Fisheries Division (IFD). The primary IFD staff will be Steve Gephard, the supervisor of IFD's Diadromous Fish Program (*Curriculum Vitae* attached in Supplemental Information, File 4). Steve has 30 years of experience and has been involved in over 40 fish passage projects in Connecticut and has experience with some projects in other states. He has worked at Rainbow Fishway his entire career and has extensive understanding of the operational needs at the site. Curt Orvis, Hydraulic Engineer with USFWS, is an advisor for the Connecticut River Atlantic Salmon Commission and provides expert consultation with CRASC members, such as the CTDEP, on fish passage projects within the Connecticut River watershed. Curt will be brought in throughout the project to advise and recommend, as appropriate. Eric Ott, P.E., Assistant Director of the CTDEP's Agency Support Services Division, will be the lead engineer for the Department for contract and construction management (*Curriculum Vitae* attached in Supplemental Information, File 4).

*b. Facilities and Administrative Resources to conduct the work:*

The CTDEP is a professional State government agency with the administrative, fiscal management, legal, technical, engineering, and other support staff and to manage both a NOAA grant and the construction project to build the fishway. Involved staff work in various Divisions, in offices located in Hartford, Portland, and Old Lyme.

4. Project Costs- Implementation of the project is expected to cost up to $5,139,000, with generalized description provided below, and greater detail provided, including descriptions of cost-effectiveness, breakdown by category, and matching funds is found in a separate document entitled Budget Justification (File 3)

| Cost Estimates - Rainbow Fish Passage Complex | | |
|---|---|---|
| Category | Cost | Cumulative |
| General Requirements | $ 434,000 | $ 434,000 |
| Attraction System | $ 110,000 | $ 544,000 |
| Demolition | $ 56,000 | $ 600,000 |
| Water Control | $ 56,000 | $ 656,000 |
| Repair Work | $ 259,000 | $ 915,000 |
| Concrete Patch | $ 122,000 | $ 1,037,000 |
| Miscellaneous | $ 370,000 | $ 1,407,000 |
| Earthwork | $ 140,000 | $ 1,547,000 |
| Concrete | $ 1,320,000 | $ 2,867,000 |
| Fishway Lift and Exit Flume | $ 905,000 | $ 3,772,000 |
| Profit (15%) | | $ 566,000 |
| Contingency (15%) | | $ 651,000 |
| DPW Admin Fee (3%) | | $ 150,000 |
| TOTAL | | $ 5,139,000 |

5. Outreach and Education-

Information about the project will be distributed in various forms: broadcast via public presentations (e.g., the Connecticut Conference on Natural Resources), press releases, the CTDEP Webpage, the Connecticut Wildlife magazine, CT newletters (e.g., Sound Outlook), and on-site tours. In addition, the fish passage complex will include a public viewing gallery, accessible from an adjacent public parking lot. The gallery will be the first public viewing gallery of any fishway in Connecticut. It is proposed that surveillance cameras will monitor the fishlift and hopper, a biologist station periodically available for public tours, and public viewing gallery. The gallery will have information posted on the fish passage complex, the project to build it including funding, the restoration program, and the latest data on the year's returns.

**GRANT APPLICATION: AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009**
**NOAA COASTAL AND MARINE HABITAT RESTORATION PROJECT GRANTS**
**FFO# NOAA- MNFS-HCOPT-2009-2001709**

# Rainbow Fish Passage Complex, File 2 of 4

## BUDGET JUSTIFICATION

*a. Cost-effective and realistic budget*: The projected construction cost, as prepared by Macchi Engineering (Macchi Engineering, Alternatives Analysis for the Rainbow Fishway, November 2006), adjusted in accordance with the Construction Cost Index (11.41%, Engineering News- Record, 2009) and including CT DPW Administrative Fees is $5.139 million. Macchi Engineering, and its subcontractor Aldan Laboratories has extensive experience in civil engineering firm, fish passage design, and construction cost estimation.

Cost-effectiveness is a measure of both cost and effectiveness and the CTDEP and its cooperators have concluded that the fishlift is the most practical and cost-effective alternative to ensure upstream passage of the targeted species. In addition, incorporating the entrance and exit structures of the existing fishway into the new fishlift facility will increase likelihood of achieving the fish passage objectives, reduce construction related environmental impacts, expedite environmental permitting, reduce construction costs, and accelerate construction timeframes. Curt Orvis of the USFWS has stated that he feels that in light of the cost of other recently constructed fishlifts, this estimate reflects a cost-effective approach for passing fish at Rainbow Dam.

*b. Budget details:* All costs will be contractual

| Detailed Costs - Rainbow Fish Passage Complex | | | | | |
|---|---|---|---|---|---|
| Item | Unit | Quantity | Unit Price | Amount | Cumulative |
| GENERAL CONDITIONS | | | | | |
| Mobilization | L.S. | 1 | $ 17,000 | $ 17,000 | $ 17,000 |
| General Conditions | L.S. | 1 | $ 400,000 | $ 400,000 | $ 417,000 |
| Demobilization | L.S. | 1 | $ 17,000 | $ 17,000 | $ 434,000 |
| ATTRACTION SYSTEM | | | | | |
| Piping | L.S. | 1 | $ 110,000 | $ 110,000 | $ 544,000 |
| DEMOLITION SELECTIVE | L.S. | 1 | $ 56,000 | $ 56,000 | $ 600,000 |
| WATER CONTROL | L.S. | 1 | $ 56,000 | $ 56,000 | $ 656,000 |
| REPAIR WORK | | | | | |
| Expansion Joint | S.F. | 5200 | $ 33 | $ 170,000 | $ 826,000 |
| Cracks | L.F. | 1000 | $ 55 | $ 55,000 | $ 881,000 |
| Stainless Steel Plates | E.A. | 12 | $ 2,800 | $ 34,000 | $ 915,000 |
| CONCRETE PATCH | | | | | |
| Walls | C.Y. | 25 | $ 1,100 | $ 28,000 | $ 943,000 |
| Floors | C.Y. | 75 | $ 1,100 | $ 83,000 | $ 1,026,000 |
| Footings | C.Y. | 10 | $ 1,100 | $ 11,000 | $ 1,037,000 |
| MISCELLANEOUS | | | | | |
| Electrical Improvements | L.S. | 1 | $ 56,000 | $ 56,000 | $ 1,093,000 |
| Gates, Weir Boards, Valves | L.S. | 1 | $ 220,000 | $ 220,000 | $ 1,313,000 |
| Existing Operator's Areas Roof | L.S. | 1 | $ 11,000 | $ 11,000 | $ 1,324,000 |
| New Chainlink Fence | L.F. | 1500 | $ 55 | $ 83,000 | $ 1,407,000 |
| EARTHWORK | | | | | |
| Grading | L.S. | 1 | $ 56,000 | $ 56,000 | $ 1,463,000 |
| Rock Excavation | C.Y. | 100 | $ 560 | $ 56,000 | $ 1,519,000 |
| Backfill | L.S. | 1 | $ 28,000 | $ 28,000 | $ 1,547,000 |
| CONCRETE | | | | | |
| Precast & Columns | C.Y. | 400 | $ 2,800 | $ 1,100,000 | $ 2,647,000 |
| New Foundation | C.Y. | 200 | $ 560 | $ 110,000 | $ 2,757,000 |
| Collection Chamber Walls | C.Y. | 100 | $ 1,100 | $ 110,000 | $ 2,867,000 |
| FISHLIFT AND EXIT FLUME | | | | | |
| 10 ton Hoist | E.A. | 1 | $ 56,000 | $ 56,000 | $ 2,923,000 |
| Catwalk Platform | S.F. | 1000 | $ 55 | $ 55,000 | $ 2,978,000 |
| Catwals Platform Guardrail | L.F. | 210 | $ 220 | $ 46,000 | $ 3,024,000 |
| Controls | L.S. | 1 | $ 84,000 | $ 84,000 | $ 3,108,000 |
| Crowder | E.A. | 1 | $ 56,000 | $ 56,000 | $ 3,164,000 |
| Bucket and Tanks | E.A. | 1 | $ 170,000 | $ 170,000 | $ 3,334,000 |
| Operator's Platform | S.F. | 500 | $ 560 | $ 280,000 | $ 3,614,000 |
| Operator's Platform Guardrail | L.F. | 120 | $ 220 | $ 26,000 | $ 3,640,000 |
| Viewing Area | S.F. | 200 | $ 560 | $ 110,000 | $ 3,750,000 |
| Viewing Area Guardrails | L.F. | 100 | $ 220 | $ 22,000 | $ 3,772,000 |
| Profit (15%) | | | | | $ 566,000 |
| Contingency (15%) | | | | | $ 651,000 |
| DPW Admin Fee (3%) | | | | | $ 150,000 |
| TOTAL | | | | | $ 5,139,000 |

*c. Object Class Category Breakdown:* These categories are taken from form SF-424A:

**Personnel**- No funds to be expended in this category.
**Fringe Benefits**- No funds to be expended in this category.
**Travel**- No funds to be expended in this category.
**Equipment**- No funds to be expended in this category.
**Supplies**- No funds to be expended in this category.
**Contractual**- All grant funds received would be expected to fall into this category. $5,139,000.
**Other**- none anticipated at this time.
**Total Direct Charges**- $5,139,000.
**Indirect Charges**- none anticipated at this time.
**Total**- $5,139,000 (all requested federal funds)

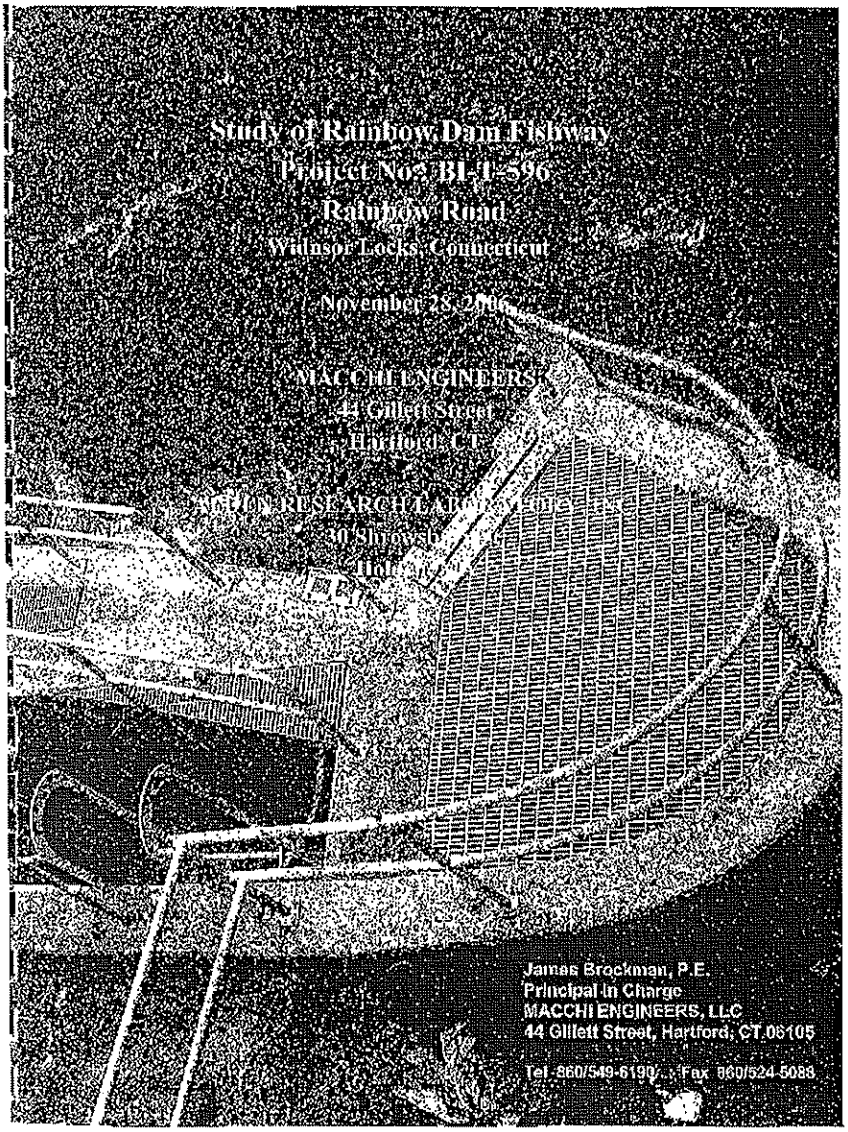
*d. Matching contributions and partnerships:* There are many parties that support this project but it would not be accurate to term them as partners with the project. Most will not provide any financial matches or contributions. The U.S. Fish & Wildlife Service will provide technical advice during the project but we are unable to place a cash value on that service. The Farmington River Power Company will act as a true partner but will not be providing any cash contributions. However, its in-kind contributions will be significant, yet difficult to calculate. The hydroelectric project generates millions of dollars profit in a typical year but it is likely that during some of the construction project, the efficiency of the project will not be as great as it adapts its operation to the needs of the construction project. FRPC staff will invariably be asked to sit in on construction meeting and have to deal with the myriad of issues that arise when contractors and subcontractors come and go onto property that is typically closed to the public and has heighten safety concerns due to high voltage.

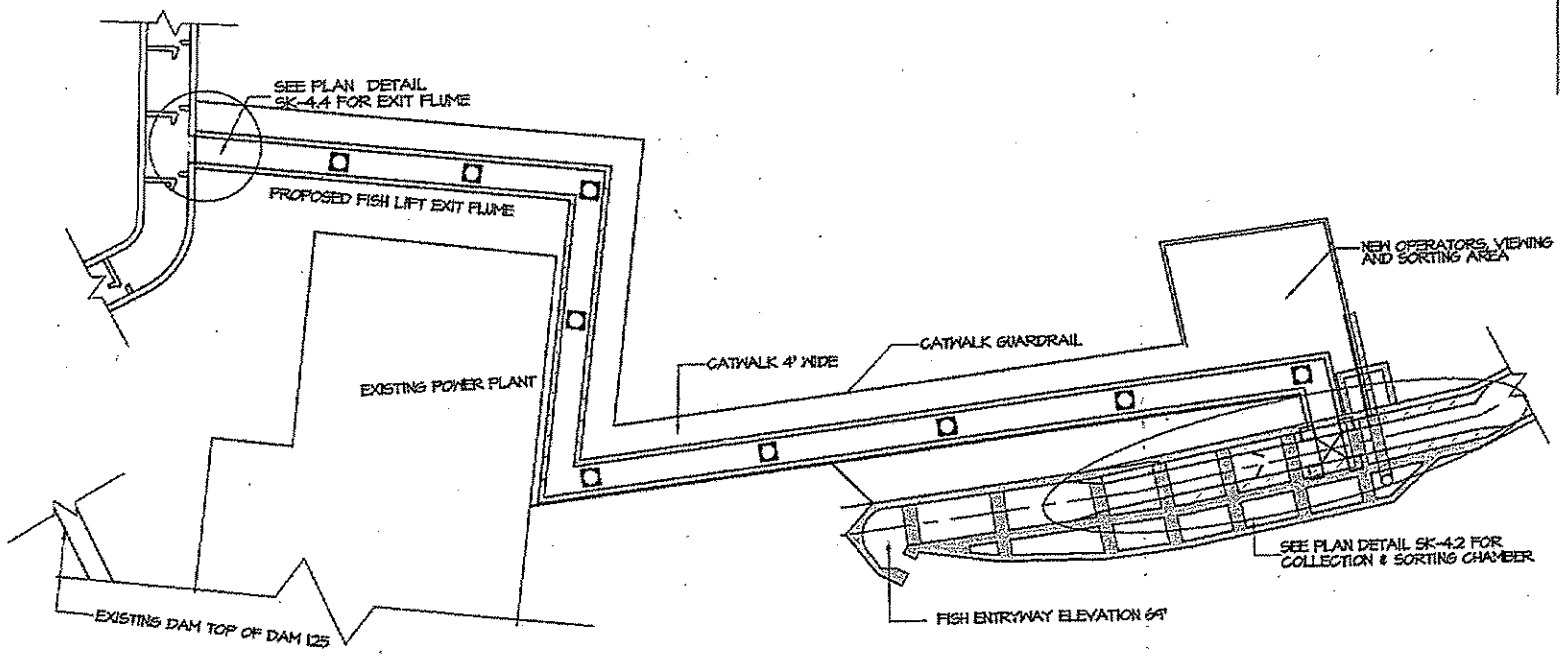
**GRANT APPLICATION: AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009**
**NOAA COASTAL AND MARINE HABITAT RESTORATION PROJECT GRANTS**
**FFO# NOAA- MNFS-HCOPT-2009-2001709**

# Rainbow Fish Passage Complex, File 3 of 4

## DESIGN PLANS

The process to design a fishlift and eel pass at the Rainbow Dam is ongoing and there are no final design plans to provide. The following pages are sketches developed by Macchi Engineering to depict the concept of the proposed fishlift at Rainbow Dam. It shows where the facility would be located relate to the existing fishway and the powerhouse, showing how it would fit and avoid negative impacts to the powerhouse and hydroelectric operation. The final designs will be based upon these conceptual plans.


Study of Rainbow Dam Fishway
Project No. BI-I-596
Rainbow Road
Windsor Locks, Connecticut
November 28, 2006
MACCHI ENGINEERS
44 Gillett Street
Hartford, CT
Jamas Brockman, P.E.
Principal in Charge
MACCHI ENGINEERS, LLC
44 Gillett Street, Hartford, CT 06105
Tel 860/549-6190 Fax 860/524-5088




**FISH LIFT w/ ELEVATED EXIT FLUME**
SCALE: 1/16"= 1'-0"

N

Macchi Engineers, LLC

Drawing Title: PROPOSED LAYOUT PLAN

REVISIONS

| Mark | Date | Description |
|---|---|---|
| | | |

CAD No.

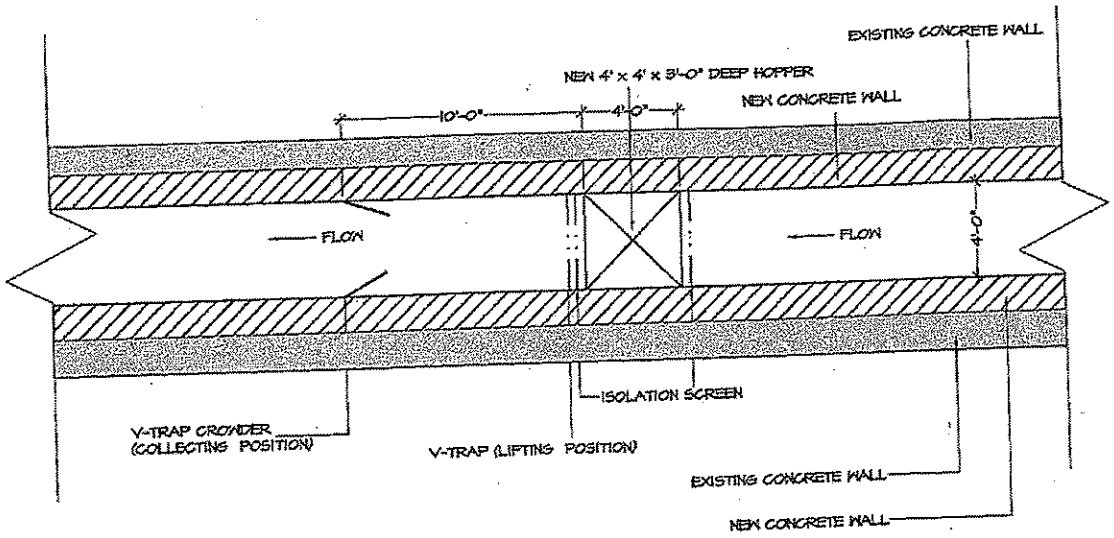
STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC WORKS

Drawing Prepared By: MACCHI ENGINEERS, LLC
44 GILLETT STREET, HARTFORD, CONNECTICUT 06105

Project: IMPROVEMENTS TO THE RAINBOW DAM FISHWAY
FARMINGTON RIVER
WINDSOR LOCKS CT

Project No. 82-T-598

Date: 11-22-06
Scale: 1"=1'
Drawn By: JSE
Approved By: JJS
Drawing No.: SK-4.1




**DETAIL OF COLLECTION/SORTING CHAMBER**
SCALE: 1/4"= 1'-0"

Macchi Engineers, LLC

Drawing Title: COLLECTION CHAMBER DETAIL

REVISIONS

| Mark | Date | Description |
|---|---|---|
| | | |

Job No.

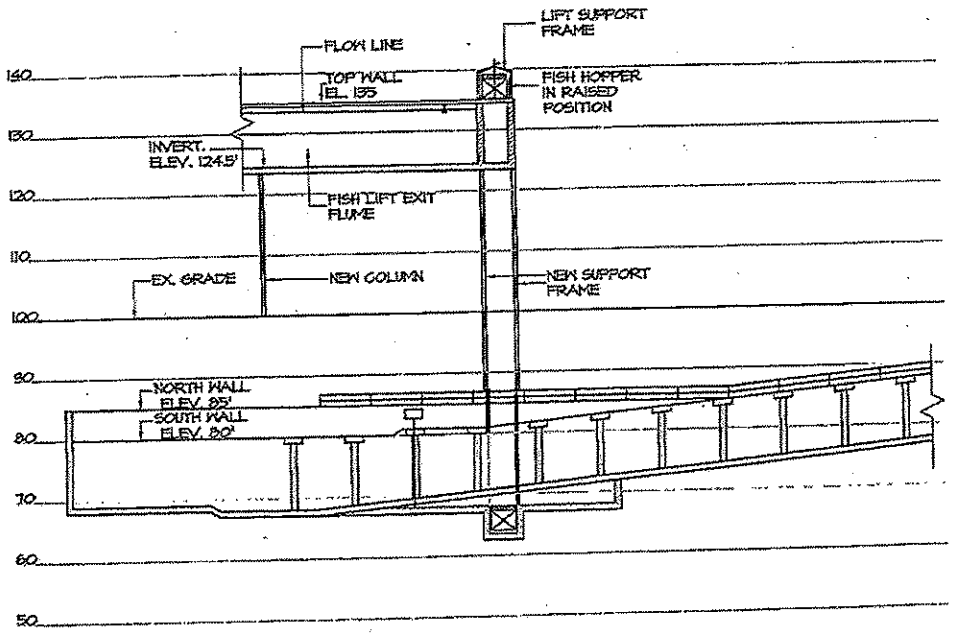
STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC WORKS

Drawing Prepared By: MACCHI ENGINEERS, LLC
41 TALCOTT STREET, HARTFORD, CONNECTICUT 06105

Project: IMPROVEMENTS TO THE RAINBOW DAM FISHWAY FARMINGTON RIVER WINDSOR LOCKS CT

Project No. 96-T-596

Date: 11-22-03
Scale: 1/4"=1'
Drawn By: J.R.
Approved By: J.R.
Drawing No. SK-4.2

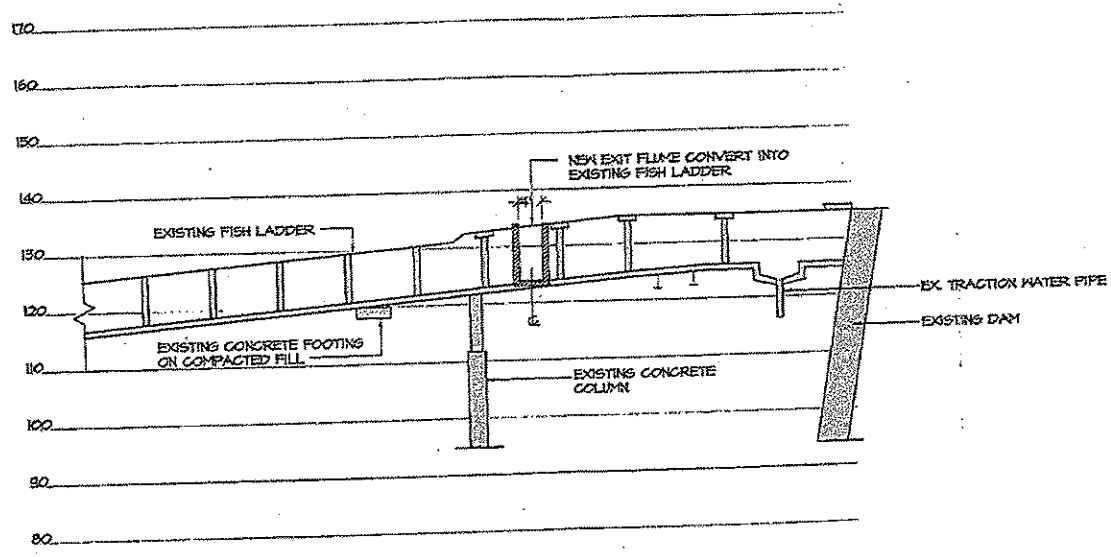



**SECTION AT COLLECTION/SORTING CHAMBER**

SCALE: 1/16" = 1'-0"

Macchi Engineers, LLC

| | |
|---|---|
| Drawing Title: LIFT & EXIT FLUME SECTION | STATE OF CONNECTICUT, DEPARTMENT OF PUBLIC WORKS |
| REVISIONS: Mark / Date / Description | Drawing Prepared By: MACCHI ENGINEERS, LLC, 44 GILLOTT STREET, NEW BRITAIN, CONNECTICUT 06105 — Date: 11-12-06 — Scale: 1/16"=1' |
| | Project: IMPROVEMENTS TO THE RAINBOW DAM FISHWAY, FARMINGTON RIVER, WINDSOR LOCKS CT — Drawn By: JJC — Approved By: JJC |
| CAD No. | Project No. 81-T-596 — Drawing No. SK-4.3 |




**SECTION AT EXIT FLUME**
SCALE: 1/16" = 1'-0"

Macchi Engineers, LLC

Drawing Title: EXIT FLUME OUTLET SECTION

REVISIONS

| Mark | Date | Description |
|---|---|---|
| | | |

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC WORKS

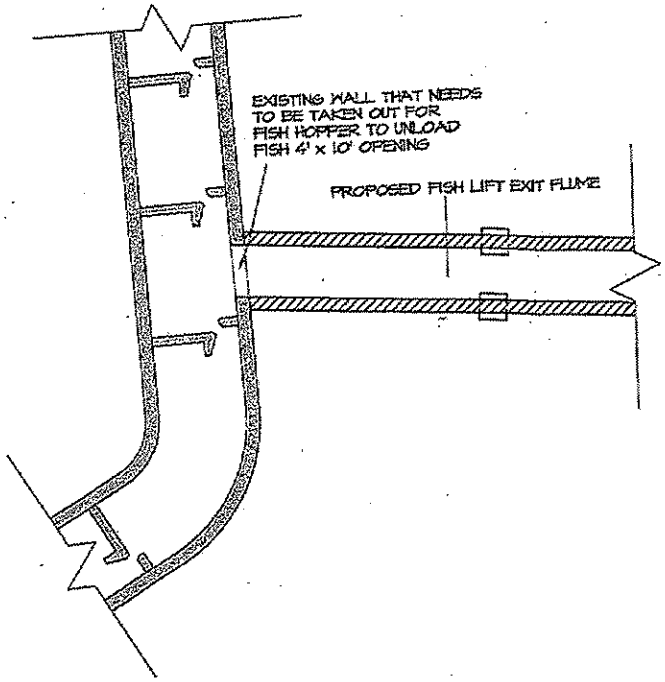
Drawing Prepared By: MACCHI ENGINEERS, LLC
44 GILLOT STREET, HARTFORD, CONNECTICUT 06106

Date: 11-22-05
Scale: 1"=1'-0"
Drawn By: JW
Approved By: LB
Drawing No.: SK-4.5

Project: IMPROVEMENTS TO THE RADEKIN DAM FISHWAY FARMINGTON RIVER WINDSOR LOCKS CT

Project No.: 81-1-515

DOT No.:




**PLAN DETAIL OF EXIT FLUME**
SCALE: 1/8"= 1'-0"

Macchi Engineers, LLC

Drawing Title: EXIT FLUME OUTLET DETAIL

REVISIONS

| Mark | Date | Description |
|---|---|---|
| | | |

CO No.

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC WORKS

Drawing Prepared By: MACCHI ENGINEERS, LLC
44 GEORGE STREET, HARTFORD, CONNECTICUT 06105

Project: IMPROVEMENTS TO THE
RAINBOW DAM FISHWAY
FARMINGTON RIVER
WINDSOR LOCKS CT

Project No. 81-T-595

Date: 11-22-06
Scale: 1/8"=1'
Drawn By: JJL
Approved By: JJL
Drawing No.: SK-4.4

GRANTS.GOV™

# Grant Application Package

| | |
|---|---|
| **Opportunity Title:** | Coastal and Marine Habitat Restoration Project Grants - |
| **Offering Agency:** | National Oceanic and Atmospheric Administration |
| **CFDA Number:** | 11.463 |
| **CFDA Description:** | Habitat Conservation |
| **Opportunity Number:** | NOAA-NMFS-HCPO-2009-2001709 |
| **Competition ID:** | 2141924 |
| **Opportunity Open Date:** | 03/06/2009 |
| **Opportunity Close Date:** | 04/06/2009 |
| **Agency Contact:** | Craig Woolcott or Melanie Gange at (301) 713-0174, or by e-mail at Craig.Woolcott@noaa.gov or Melanie.Gange@noaa.gov. Prospective applicants are invited to contact NOAA staff before submitting an application to discuss |

This electronic grants application is intended to be used to apply for the specific Federal funding opportunity referenced here.

If the Federal funding opportunity listed is not the opportunity for which you want to apply, close this application package by clicking on the "Cancel" button at the top of this screen. You will then need to locate the correct Federal funding opportunity, download its application and then apply.

**This opportunity is only open to organizations, applicants who are submitting grant applications on behalf of a company, state, local or tribal government, academia, or other type of organization.**

*** Application Filing Name:** Recovery Act - Rainbow Fish Passage

**Mandatory Documents**

| Move Form to Complete | Mandatory Documents for Submission |
|---|---|
| | Application for Federal Assistance (SF-424) |
| | Project Narrative Attachment Form |
| | Budget Narrative Attachment Form |
| Move Form to Delete | CD511 Form |
| | Assurances for Non-Construction Programs (SF-42 |
| | Budget Information for Non-Construction Program |

**Optional Documents**

| Move Form to Submission List | Optional Documents for Submission |
|---|---|
| Disclosure of Lobbying Activities (SF-LLL) | Other Attachments Form |
| Move Form to Delete | |

## Instructions

**1** **Enter a name for the application in the Application Filing Name field.**

- This application can be completed in its entirety offline; however, you will need to login to the Grants.gov website during the submission process.
- You can save your application at any time by clicking the "Save" button at the top of your screen.
- The "Save & Submit" button will not be functional until all required data fields in the application are completed and you clicked on the "Check Package for Errors" button and confirmed all data required data fields are completed.

**2** **Open and complete all of the documents listed in the "Mandatory Documents" box. Complete the SF-424 form first.**

- It is recommended that the SF-424 form be the first form completed for the application package. Data entered on the SF-424 will populate data fields in other mandatory and optional forms and the user cannot enter data in these fields.

- The forms listed in the "Mandatory Documents" box and "Optional Documents" may be predefined forms, such as SF-424, forms where a document needs to be attached, such as the Project Narrative or a combination of both. "Mandatory Documents" are required for this application. "Optional Documents" can be used to provide additional support for this application or may be required for specific types of grant activity. Reference the application package instructions for more information regarding "Optional Documents".

- To open and complete a form, simply click on the form's name to select the item and then click on the => button. This will move the document to the appropriate "Documents for Submission" box and the form will be automatically added to your application package. To view the form, scroll down the screen or select the form name and click on the "Open Form" button to begin completing the required data fields. To remove a form/document from the "Documents for Submission" box, click the document name to select it, and then click the <= button. This will return the form/document to the "Mandatory Documents" or "Optional Documents" box.

- All documents listed in the "Mandatory Documents" box must be moved to the "Mandatory Documents for Submission" box. When you open a required form, the fields which must be completed are highlighted in yellow with a red border. Optional fields and completed fields are displayed in white. If you enter invalid or incomplete information in a field, you will receive an error message.

**3** **Click the "Save & Submit" button to submit your application to Grants.gov.**

- Once you have properly completed all required documents and attached any required or optional documentation, save the completed application by clicking on the "Save" button.
- Click on the "Check Package for Errors" button to ensure that you have completed all required data fields. Correct any errors or if none are found, save the application package.
- The "Save & Submit" button will become active; click on the "Save & Submit" button to begin the application submission process.
- You will be taken to the applicant login page to enter your Grants.gov username and password. Follow all onscreen instructions for submission.

OMB Number: 4040-0004
Expiration Date: 01/31/2009

## Application for Federal Assistance SF-424

Version 02

* 1. Type of Submission:
- [X] Preapplication
- [ ] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [X] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify)

* 3. Date Received: Completed by Grants.gov upon submission.

4. Applicant Identifier:

5a. Federal Entity Identifier:

* 5b. Federal Award Identifier:

**State Use Only:**

6. Date Received by State:

7. State Application Identifier:

**8. APPLICANT INFORMATION:**

* a. Legal Name: State of Connecticut

* b. Employer/Taxpayer Identification Number (EIN/TIN): 86-1154163

* c. Organizational DUNS: 108352811

**d. Address:**

* Street1: 79 Elm St.

Street2:

* City: Hartford

County:

* State: CT: Connecticut

Province:

* Country: USA: UNITED STATES

* Zip / Postal Code: 06106

**e. Organizational Unit:**

Department Name: Environmental Protection

Division Name: Fisheries

**f. Name and contact information of person to be contacted on matters involving this application:**

Prefix: Mr.

* First Name: Rick

Middle Name:

* Last Name: Jacobson

Suffix:

Title: Assistant Director

Organizational Affiliation:

* Telephone Number: 860-424-3482

Fax Number:

* Email: rick.jacobson@ct.gov

OMB Number: 4040-0004
Expiration Date: 01/31/2009

## Application for Federal Assistance SF-424

Version 02

**9. Type of Applicant 1: Select Applicant Type:**

A: State Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

National Oceanic and Atmospheric Administration

**11. Catalog of Federal Domestic Assistance Number:**

11.463

CFDA Title:

Habitat Conservation

*** 12. Funding Opportunity Number:**

NOAA-NMFS-HCPO-2009-2001709

* Title:

Coastal and Marine Habitat Restoration Project Grants - Recovery Act

**13. Competition Identification Number:**

2141924

Title:

**14. Areas Affected by Project (Cities, Counties, States, etc.):**

*** 15. Descriptive Title of Applicant's Project:**

Recovery Act - Rainbow Fish Passage Complex

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

OMB Number: 4040-0004
Expiration Date: 01/31/2009

## Application for Federal Assistance SF-424

Version 02

**16. Congressional Districts Of:**

* a. Applicant: CT 1-5

* b. Program/Project: 1-5

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

**17. Proposed Project:**

* a. Start Date: 07/01/2010

* b. End Date: 12/31/2011

**18. Estimated Funding ($):**

| | |
|---|---|
| * a. Federal | 5,139,000.00 |
| * b. Applicant | 0.00 |
| * c. State | 0.00 |
| * d. Local | 0.00 |
| * e. Other | 0.00 |
| * f. Program Income | 0.00 |
| * g. TOTAL | 5,139,000.00 |

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☒ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☐ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes", provide explanation.)**

☐ Yes ☒ No Explanation

**21. *By signing this application, I certify (1) to the statements contained in the list of certifications** and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

**Authorized Representative:**

Prefix: Ms. * First Name: Susan

Middle Name:

* Last Name: Frechette

Suffix:

* Title: Deputy Commissioner

* Telephone Number: 860-421-3005 Fax Number:

* Email: susan.frechette@ct.gov

* Signature of Authorized Representative: Completed by Grants.gov upon submission. * Date Signed: Completed by Grants.gov upon submission.

OMB Number: 4040-0004
Expiration Date: 01/31/2009

## Application for Federal Assistance SF-424

Version 02

*** Applicant Federal Debt Delinquency Explanation**

The following field should contain an explanation if the Applicant organization is delinquent on any Federal Debt. Maximum number of characters that can be entered is 4,000. Try and avoid extra spaces and carriage returns to maximize the availability of space.

## Project Narrative File(s)

*** Mandatory Project Narrative File Filename:** 2 NOAA ARRA APPLICATION- Rainbow Summary FILE 1 (draft

Add Mandatory Project Narrative File | Delete Mandatory Project Narrative File | View Mandatory Project Narrative File

To add more Project Narrative File attachments, please use the attachment buttons below.

Add Optional Project Narrative File | Delete Optional Project Narrative File | View Optional Project Narrative File

## Budget Narrative File(s)

*** Mandatory Budget Narrative Filename:** 3 NOAA ARRA APPLICATION- Rainbow Budget FILE 2 (dr

Add Mandatory Budget Narrative | Delete Mandatory Budget Narrative | View Mandatory Budget Narrative

To add more Budget Narrative attachments, please use the attachment buttons below.

Add Optional Budget Narrative | Delete Optional Budget Narrative | View Optional Budget Narrative

FORM **CD-511**
(REV 1-05)

U.S. DEPARTMENT OF COMMERCE

CERTIFICATION REGARDING LOBBYING

Applicants should also review the instructions for certification included in the regulations before completing this form. Signature on this form provides for compliance with certification requirements under 15 CFR Part 28, 'New Restrictions on Lobbying.' The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of Commerce determines to award the covered transaction, grant, or cooperative agreement.

**LOBBYING**

As required by Section 1352, Title 31 of the U.S. Code, and implemented at 15 CFR Part 28, for persons entering into a grant, cooperative agreement or contract over $100,000 or a loan or loan guarantee over $150,000 as defined at 15 CFR Part 28, Sections 28.105 and 28.110, the applicant certifies that to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, 'Disclosure Form to Report Lobbying.' in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure occurring on or before October 23, 1996, and of not less than $11,000 and not more than $110,000 for each such failure occurring after October 23, 1996.

**Statement for Loan Guarantees and Loan Insurance**

The undersigned states, to the best of his or her knowledge and belief, that:

In any funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this commitment providing for the United States to insure or guarantee a loan, the undersigned shall complete and submit Standard Form-LLL, 'Disclosure Form to Report Lobbying,' in accordance with its instructions.

Submission of this statement is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required statement shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure occurring on or before October 23, 1996, and of not less than $11,000 and not more than $110,000 for each such failure occurring after October 23, 1996.

**As the duly authorized representative of the applicant, I hereby certify that the applicant will comply with the above applicable certification.**

* NAME OF APPLICANT
State of Connecticut

* AWARD NUMBER

* PROJECT NAME
Recovery Act - Rainbow Fish Passage Complex

Prefix: Ms.
* First Name: Susan
Middle Name:
* Last Name: Frechette
Suffix:
* Title: Deputy Commissioner

* SIGNATURE:
Completed by Grants.gov upon submission.

* DATE:
Completed by Grants.gov upon submission.

OMB Approval No.: 4040-0007
Expiration Date: 07/30/2010

## ASSURANCES - NON-CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

**NOTE:** Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.

2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C.§§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U. S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee- 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.

10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).

14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.

15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.

16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

| * SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL | * TITLE |
|---|---|
| Completed on submission to Grants.gov | Deputy Commissioner |
| * APPLICANT ORGANIZATION | * DATE SUBMITTED |
| State of Connecticut | Completed on submission to Grants.gov |

OMB Approval No. 4040-0006
Expiration Date 07/30/2010

# BUDGET INFORMATION - Non-Construction Programs

## SECTION A - BUDGET SUMMARY

| Grant Program Function or Activity (a) | Catalog of Federal Domestic Assistance Number (b) | Estimated Unobligated Funds | | New or Revised Budget | | |
|---|---|---|---|---|---|---|
| | | Federal (c) | Non-Federal (d) | Federal (e) | Non-Federal (f) | Total (g) |
| 1. Habitat Conservation | 11.463 | $ | $ | $ 5,139,000.00 | $ 0.00 | $ 5,139,000.00 |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. Totals | | $ | $ | $ 5,139,000.00 | $ | $ 5,139,000.00 |

## SECTION B - BUDGET CATEGORIES

| 6. Object Class Categories | GRANT PROGRAM, FUNCTION OR ACTIVITY (1) | (2) | (3) | (4) | Total (5) |
|---|---|---|---|---|---|
| | Habitat Conservation | | | | |
| a. Personnel | $ | $ | $ | $ | $ |
| b. Fringe Benefits | | | | | |
| c. Travel | | | | | |
| d. Equipment | | | | | |
| e. Supplies | | | | | |
| f. Contractual | 5,139,000.00 | | | | 5,139,000.00 |
| g. Construction | | | | | |
| h. Other | | | | | |
| i. Total Direct Charges (sum of 6a-6h) | 5,139,000.00 | | | | $ 5,139,000.00 |
| j. Indirect Charges | | | | | $ |
| k. TOTALS (sum of 6i and 6j) | $ 5,139,000.00 | $ | $ | $ | $ 5,139,000.00 |
| | | | | | |
| 7. Program Income | $ | $ | $ | $ | $ |

## SECTION C - NON-FEDERAL RESOURCES

| (a) Grant Program | (b) Applicant | (c) State | (d) Other Sources | (e)TOTALS |
|---|---|---|---|---|
| 8. Habitat Conservation | $ | $ | $ | $ |
| 9. | | | | |
| 10. | | | | |
| 11. | | | | |
| 12. TOTAL (sum of lines 8-11) | $ | $ | $ | $ |

## SECTION D - FORECASTED CASH NEEDS

| | Total for 1st Year | 1st Quarter | 2nd Quarter | 3rd Quarter | 4th Quarter |
|---|---|---|---|---|---|
| 13. Federal | $ 5,139,000.00 | $ 1,284,750.00 | $ 1,284,750.00 | $ 1,284,750.00 | $ 1,284,750.00 |
| 14. Non-Federal | $ | | | | |
| 15. TOTAL (sum of lines 13 and 14) | $ 5,139,000.00 | $ 1,284,750.00 | $ 1,284,750.00 | $ 1,284,750.00 | $ 1,284,750.00 |

## SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

| (a) Grant Program | FUTURE FUNDING PERIODS (YEARS) (b)First | (c) Second | (d) Third | (e) Fourth |
|---|---|---|---|---|
| 16. Habitat Conservation | $ | $ | $ | $ |
| 17. | | | | |
| 18. | | | | |
| 19. | | | | |
| 20. TOTAL (sum of lines 16 - 19) | $ | $ | $ | $ |

## SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges:

22. Indirect Charges:

23. Remarks:

## Other Attachment File(s)

*** Mandatory Other Attachment Filename:** 4 NOAA ARRA APPLICATION- Rainbow Design Plans FILE

Add Mandatory Other Attachment | Delete Mandatory Other Attachment | View Mandatory Other Attachment

To add more "Other Attachment" attachments, please use the attachment buttons below.

Add Optional Other Attachment | Delete Optional Other Attachment | View Optional Other Attachment