

**NOAA Great Lakes Habitat Restoration Program Project Grant Application under the GLRI  
Funding Opportunity Number: NOAA-NMFS-HCPO-2011-2002872**

**Project Summary:**

**Applicant Organization:** Macomb County Public Works Office, Michigan

**Project Title:** Clinton River Spillway Habitat Restoration Planning & Design

**Site Location:** Clinton River spillway from the confluence at the main Clinton River downstream to Lake St. Clair (approx. two miles) in Clinton & Harrison Township, Macomb County, Michigan, T2N, R14E

**Land Owner:** Clinton River Spillway Intercounty Drain Drainage Board, Contact: Commissioner of Public Works – Anthony V. Marrocco, Macomb County Office of Public Works, 21777 Dunham Road, Clinton Township, Michigan, 48036, Phone: 586-469-5325

**On-the-Ground Implementation Start Date:** November, 2012

**Project Time Line:** October 1, 2011 to June 30, 2013 (for Engineering and Design)

**Coastal habitats to benefit from the project:** The habitat restoration is proposed to include the Lake St. Clair estuary, nearbank areas, riverbanks, riparian areas, floodplain, and in-stream and off-channel habitats which will provide diverse fish spawning, rearing, and refuge habitats. Although many of the native fishes have been eliminated (because of overfishing, habitat destruction, invasive species effects, etc.), Lake St. Clair probably contains the most diverse fish community of any of the Great Lakes with 45 different species. The three (3) most common species are the mimic shiner, rainbow smelt, and yellow perch. Populations of sturgeon and mooneye are also relatively healthy. Historically, Lake St. Clair and its tributaries have been home to large diverse populations of freshwater mussels (with over 30 species documented). Studies in the Clinton River Spillway however, indicate benthic organism population ratings of ‘poor’ and abundant low-quality algae species, compared to ‘good’ benthic organism ratings/scores further south along the Lake St. Clair shoreline.

Restoring the Clinton River Spillway will ultimately improve benthic organism and fish populations, due to in-stream substrate enhancements and habitat restoration. Establishing native vegetation and eliminating terrestrial invasive species will enhance self-sustaining biodiversity in this developing region.

**Project Scope:**

- Macomb County will hold meetings to collaborate with federal and state agencies, Macomb County, local jurisdictions, Lake St. Clair Direct Drainage Subwatershed Advisory Group members, and local stakeholder groups to further refine a project vision and goals.
- Compile information on existing conditions of the spillway, ecological potential, and references.
- Goals and objectives will be developed to allow the concepts of regenerative ecological processes to guide the restoration design.
- A climate change vulnerability assessment (by others) will evaluate climate-smart management options.
- An Engineering Feasibility Study will evaluate existing conditions and provide a basis of design.
- The project will result in Final Plans and Specifications and a permit pre-application meeting.

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- A Restoration Monitoring Plan will be developed that will quantify the habitat benefits of the project and document the project's significant contributions to the removal of several BUIs.

**Project Outputs/Outcomes:**

The restoration of the Clinton River Spillway is one of 25 proposed habitat restoration projects listed in the Public Advisory Committee's (PAC's) 2011 strategy for removing the Loss of Fish and Wildlife Habitat Beneficial Use Impairment (BUI) in the Clinton River Area of Concern (AOC) Remedial Action Plan. The Clinton River AOC PAC selected this project as their highest priority for restoration design in the 2011 NOAA funding cycle. The restoration design will address three BUIs: the Loss of Fish and Wildlife Habitat, Degraded Fish and Wildlife Populations and Degradation of Benthos BUIs. The consulting team, in collaboration with NOAA restoration experts, will develop ecological performance metrics and measures that are appropriate to the project scope and scale.

The restoration plan will balance angling and passive recreational uses with ecological restoration goals to provide substantial community benefits and significantly improve the economy of area businesses. The proposed ecological/engineering design project will lead directly to on-the-ground construction of 2 miles of channel restoration that is directly connected to Lake St. Clair. In addition, the types of measureable outcomes to be quantified include:

- Miles of fish passage restored to diadromous fish
- Increase in local property values
- Area of enhanced estuary habitat at Lake St. Clair
- Length of riverbank stabilization
- Acres of terrestrial invasive species removal and acres of native riparian vegetation restoration
- Volume or area of sediment removal and/or gravel augmentation
- Miles of ATV trail abandonment
- Amount of increased public parking, bicycle racks, and stable access
- Support of removal of beneficial use impairments in the Clinton AOC (degradation of benthos; fish and wildlife populations; and loss of fish and wildlife habitats)
- Number of individuals responding to public education

**Permits and Approvals:** None required for design. For construction, the permits required include:

- State/Federal: MDEQ/USACE Joint Permit Application: Michigan Department of Environmental Quality – Part 31 Floodplains, Part 301 Inland Lakes and Streams, Part 325 Great Lakes Submerged Lands and U.S. Army Corps of Engineers (USACE) - Sec. 404 CWA, Sec. 10 Rivers and Harbors Act. A pre-application meeting for permitting will be conducted with MDEQ & USACE in the winter of 2012. A Michigan Natural Features Inventory (MNFI) search for state listed species has been requested. A SHPO request will be made for possible areas of historical or cultural significance.
- Macomb County: Soil Erosion and Sedimentation Control (SESC) Permit – The Macomb County Public Works Office is an Authorized Public Agency (APA).

**Federal Funds Requested:** \$339,500

**Non-Federal Match Anticipated:** \$100,000 - Clinton River Spillway Intercounty Drain Drainage Board

**Overall Study/Engineering Design Project Cost:** \$439,500

**Project Narrative:**

**Importance and Applicability**

In 1949, the United States Army Corps of Engineers (USACE) constructed the Clinton River Spillway to alleviate flooding in several communities in the Clinton River Watershed. In 1995, the Clinton River Area of Concern (AOC) was expanded to include the entire Clinton River Watershed and the coastal and near shore areas of Lake St. Clair impacted by the Clinton River and Clinton River Spillway (Clinton River Remedial Action Plan Progress Report - 2007).

The Spillway became symbolic of what was wrong in the AOC. Although it was effective at flood control, the spillway presented environmental problems such as fish passage, stream connectivity, sedimentation, invasives and lack of habitat. The changes in hydrology, due to the installation of the weir, led to sediment deposition in the natural channel and down-cutting and erosion in the spillway.

The restoration of the Clinton River Spillway is one of 25 proposed habitat restoration projects listed in the Public Advisory Committee's 2011 strategy for removing the Loss of Fish and Wildlife Habitat Beneficial Use Impairment (BUI) in the Clinton River Remedial Action Plan. Therefore, this project represents 4% of the total number projects needed to restore habitat in the 760 square mile watershed. The Clinton River AOC Public Advisory Council (PAC) selected this project as their highest priority for restoration design in the 2011 GLRI funding cycle. The restoration design will also address the Degraded Fish and Wildlife Populations and Degradation of Benthos BUIs.

The Clinton River Spillway corridor consists of 192 acres (130 upland acres). The Clinton River and Lake St. Clair are tremendous assets to the region, specifically Clinton Township and Harrison Township and an investment in ecological restoration will provide long-term benefits to the local economies. Recent MDNR fish survey data indicates that 19 fish species were found in the channel (26% more than the main river) which indicates the Spillway's restoration potential. The project will be sustainable because the wide channel corridor is publicly-owned and managed.

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The consulting team, in collaboration with NOAA restoration experts, will develop ecological performance metrics and measures that are appropriate to the project scope and scale. The Restoration Monitoring Plan will outline specific performance measures that will be quantified before and after construction. Compiling information on length of river restored and other results will be simplified by the linear nature of the site and the fact that it is public property. The Plan will also set goals for ecological metrics such as improved rating scores using standardized monitoring procedures.

Habitat restoration efforts along the Clinton River Spillway will contribute significantly to the overall restoration of aquatic habitats in the Clinton River AOC and nearshore area of Lake St. Clair. The proposed project will promote the connection between riverbank stabilization, urban river corridor management, the health of the Clinton River fishery, and economic stimulation. It will take advantage of the Macomb County Public Works Commissioner's leadership to remove impairments of the St. Clair River AOC and efforts to promote the river's recreation use for economic stimulus. In addition, the project has been identified in, and/or addresses priorities from numerous local and regional plans and studies:

- *Strategy for Delisting Michigan's Great Lakes Areas of Concern* (2010)  
[http://www.michigan.gov/documents/deq/wb-AOC-delisting-strategy\\_306163\\_7.pdf](http://www.michigan.gov/documents/deq/wb-AOC-delisting-strategy_306163_7.pdf)
- *Macomb County Trailways Master Plan* (2005)  
<http://www.macombcountymi.gov/MCPED/Documents/Planning/Macomb%20County%20Trailways%20Master%20Plan.pdf>
- *Macomb County Natural Features Inventory Report* (2004)  
<http://www.macombcountymi.gov/MCPED/Documents/GIS/Macomb%20County%20MFI%20Report%20March%202004.pdf>
- *Great Lakes Restoration Initiative Action Plan* (2010)  
[http://greatlakesrestoration.us/action/wp-content/uploads/glri\\_actionplan.pdf](http://greatlakesrestoration.us/action/wp-content/uploads/glri_actionplan.pdf)

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Goal 1: Areas of Concern are cleaned up, restoring the areas and removing the beneficial use impairments.

Goal 2: Integrated pest management for invasive species is developed and implemented, including program functions of containment, eradication, control and mitigation.

Goal 3: High priority actions identified in strategic plans are implemented, lead to the achievement of plan goals, and reduce the loss of fish and wildlife and their habitats.

Goal 4: Development activities are planned and implemented in ways that are sensitive to environmental considerations and compatible with fish and wildlife and their habitats.

Goal 5: A cooperative monitoring and observing system provides a comprehensive assessment of the Great Lakes ecosystem.

- *St. Clair River and Lake St. Clair Comprehensive Management Plan* (2004)

<http://www.glc.org/stclair/index.html>

Goal 1: Identify all sources and quantify all loads of point source and nonpoint source contamination.

Goal 2: Locate, inventory, and map imperiled species.

- *Clinton River Remedial Action Plan Progress Report* (1998, 2007)

<http://www.epa.gov/glnpo/aoc/clinriv.html>

Goal 1: Restore and maintain healthy, diverse and self-sustaining native wildlife communities and habitats.

Goal 2: Restore and maintain natural hydrology, as feasible.

Goal 3: Delisting of the Clinton River as an area of concern, with suitable long-term monitoring and prevention mechanisms in place to ensure the continued integrity of the Clinton River watershed ecosystem.

- *Lake St. Clair Direct Drainage Watershed Management Plan* (2006)

<http://www.crowc.org/watershed/subwatersheds/lakestclair.html>

Goal 1: Protect water quality and reduce pollution

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Goal 2: Provide and promote public education

Goal 3: Protect and enhance sustainable recreation opportunities

Goal 4: Restore and enhance wildlife and associated habitat

- *Clinton River East Watershed Management Plan (2006)*

<http://www.crowc.org/watershed/subwatersheds/clintoneast.html>

Goal 1: Protect, restore, and enhance water quality of the subwatershed

Goal 2: Promote and enhance recreation opportunities in the subwatershed

Goal 3: Appropriately manage suitable habitat for aquatic life, wildlife, and fisheries in the subwatershed

Goal 4: Promote opportunities to preserve, protect, restore, and enhance natural features.

## **Technical/Scientific Merit**

### *Project Location*

The Clinton River Spillway extends two (2) miles, from the Clinton River confluence to the mouth of Lake St. Clair in Harrison Township in Macomb County (see the attached map).

### *Historic Conditions*

The Clinton River Spillway was constructed by the U.S. Army Corps of Engineers (USACE) in 1949-1952 to relieve chronic flooding conditions in the City of Mount Clemens and downstream areas in Clinton and Harrison Townships. It was modified in the 1990s to address sedimentation and low flow conditions in the lower Clinton River. Following construction, ownership of the facility was turned over to the Inter-County Drainage Board for the Clinton River Spillway. The USACE retains responsibility over the Spillway. The Spillway, also known as the Clinton River Cutoff Canal, extends two miles downstream to Lake St. Clair. A 216-foot wide fixed crest concrete weir was constructed at the upper end of the Spillway as part of the original project. The drainage district for the Spillway is 760 square miles.

Today, the condition of the Spillway is degrading. Terrestrial invasive species dominate the landscape and severe erosion and sedimentation is occurring throughout the reach, causing a

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deprivation in fish and wildlife populations. Upland areas are deteriorating due to recreational misuse (ATVs, lack of clear access points, etc.) and lack of biodiversity.

*Project Scope*

The habitat restoration is proposed to include the Lake St. Clair estuary, riverbanks, nearbank areas, riparian corridor, floodplain, and off-channel habitats which will provide diverse fish spawning, rearing, and refuge habitats for northern pike (*Esox lucius*) and a variety of warm and coolwater species. Although many of the native fishes have been eliminated (due to overfishing, habitat destruction, invasive species effects, etc.), Lake St. Clair contains one of the most diverse fish communities in the Great Lakes with 45 different species. The three (3) most common species are the mimic shiner, rainbow smelt, and yellow perch. Populations of sturgeon and mooneye are also relatively healthy. The project will identify other target species.

Historically, Lake St. Clair and its tributaries have been home to large diverse populations of freshwater mussels (with over 30 species documented). Studies performed by the Michigan Department of Natural Resources (MDNR) and Clinton River Watershed Council (CRWC) in the Clinton River Spillway however, indicate benthic organism population ratings of 'poor' and abundant low-quality algae species, compared to 'good' benthic organism ratings/scores further south along the Lake St. Clair shoreline.

Restoring the Clinton River Spillway will ultimately improve benthic organisms as well as native fish and wildlife populations by implementing in-stream, riparian, and upland habitat restoration. Establishing native vegetation and eliminating terrestrial invasive species will enhance self-sustaining biodiversity in this developing region. The scope of the project will include:

- The habitat restoration design will be a collaborative effort with federal and state agencies, Macomb County, the Intercounty Drainage Board, local jurisdictions, and local stakeholder groups. A series of meetings will further refine a project vision, goals, and specific restoration actions for the project site.
- Existing information will be compiled on the condition and function of the spillway, geographic information systems (GIS) data, soils, historic photos and aerials, angler creel

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surveys, flyways, state searches for threatened and endangered, as well as, historic and cultural areas, master plans, press articles, and other relevant studies and plans. Primary references include the Great Lakes Restoration Initiative Action Plan, *Clinton River Remedial Action Plan Progress Report*, USACE's St. Clair River and Lake St. Clair Comprehensive Management Plan, USACE technical reports, the Clinton River East Subwatershed Management Plan, State of the Lakes Ecosystem Conference (SOLEC) proceedings, and Michigan Department of Environmental Quality (MDEQ) biological and ecological datasets. Additional information will be provided to NOAA as necessary to assist in their National Environmental Policy Act (NEPA) analysis.

- The consulting scientists will conduct a site reconnaissance to assess ecological and physical conditions on the project site. This includes photo documentation, soil sampling, vegetation classification, channel condition classification, invasive species inventories, and reference ecosystem identification. The field assessment efforts will be used to verify and inform existing datasets, as well as to determine initial opportunities and constraints for ecological restoration within the project site.
- Goals and objectives will be developed to allow the concepts of regenerative ecological processes to guide the restoration design.
- Prior to project design, additional background data will need to be collected such as: a comprehensive evaluation of hydrodynamics and sediment transport in the vicinity of the Spillway weir, evaluating whether the weir is a barrier to fish passage to the Clinton River, an above and below water survey of the weir structure, identify outfalls to the river and their condition, geotechnical issues with riverbank erosion, waste characterization of sediments (if dredging is proposed), soil borings, a topographic survey of the Spillway and bathymetry of the Spillway channel, and inventory of physical and biological conditions in the Spillway. Each structure will be inspected for damage and a photographic log will be maintained. This information will be compiled into an **Engineering Feasibility Study** with a **Safety Plan**. It will also include a **climate change vulnerability assessment** that will evaluate climate-smart management options. The restoration design will consider self-sustaining ecological processes so that the project will be resilient to future climate change impacts.
- The project will result in Plans and Specifications that reflect the guiding principles of the goals/objectives. A pre-application meeting will also be held with the State and Corps to

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determine any additional permit application information necessary so that the restoration is “shovel-ready”. Final revisions based on NOAA, state, and other agency input will be incorporated into the final bid documents under the construction engineering contract.

- A **Restoration Monitoring Plan** will be developed that will establish baseline conditions, quantify the habitat benefits of the project, and document the project’s significant contributions to removing several BUIs. A Before-and-After Intervention (BACI) monitoring plan will be developed with the input of NOAA restoration experts. The parameters will be based on the goals and objectives and the target species identified during the study phase. Project goals and objectives will be used to guide the development of a Restoration Monitoring Plan. The selection of appropriate reference sites, collecting baseline data, and the establishment of testable hypotheses will be considered during the monitoring plan development. Evaluations of nonpoint source pollutants, Lake St. Clair water levels, water temperature, identifying ecologically invasive species, and channel morphology may also be considered. Historical models, spillway weir inspections, and site data will be used, when available. Field sampling and surveys will be used to address gaps in knowledge. The design project will include collecting pre-construction, baseline ecological data. The future construction phase will include post-construction monitoring and possible additional baseline data collection to monitor seasonal variability.

*Deliverables:*

- Draft and Final Reports to be submitted include: 1) Engineering Feasibility Study with a Safety Plan and climate change vulnerability assessment, and 2) Restoration Monitoring Plan
- Conceptual Restoration Plans
- 50% Design Plans
- 90% Plans and Specifications
- Final Design Plans, Specifications, and Cost Estimate
- Permit Pre-Application Meeting with MDEQ and USACE

*Project Time Line:*

Inter-Agency Agreement – September, 2011

Project Initiation Meeting – September, 2011

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Topographical Survey – November, 2011

Develop Draft Reports – September, 2011 to September, 2012

Conceptual Design Plans – July, 2012

50% Design Plans – September, 2012

90% Plans and Specifications – November, 2012

NEPA Analysis – November, 2012

Final Design Plans and Specifications – December, 2012

Project Final Reports – December, 2012

MDEQ and USACE Permit Pre-Application Meeting – December, 2012

*Quality Control*

It is important that the consultants are capable of optimizing habitat in a self-sustaining way. The design team will balance the ecological aspects of the project with riverbank stability, evaluating the impacts of the spillway weir, enhancing site aesthetics, and allowing for passive recreation. An inter-disciplinary ecological and engineering design team will be formed to insure project completion within the designated timelines.

*Project Sustainability*

Engineering Feasibility Study, Safety, and Restoration Monitoring Plans will be developed as part of the construction engineering contract which will identify immediate and long term maintenance procedures for invasive species removal, riparian plantings, habitat restoration, wetland creation, and other natural features that are created on site.

The project lies within a County drain easement and oversight is retained by the USACE, so the long-term management of the project is insured.

**Overall Qualifications of Applicants**

The Macomb County Public Works Office (MCPWO) has successfully completed many federally funded grant projects and agreements. The MCPWO personnel involved in these projects have over 70 years of combined experience and knowledge in grant management and administration, environmental engineering, civil engineering, GIS mapping, inspection, land use

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planning, environmental planning and watershed planning. Their varied educational backgrounds and advanced degrees allow them to pull resources from many disciplines. Their collective skills and talent support Macomb County's ability to successfully manage grants through to completion.

Typically for each grant, a scope of work and a work plan was developed along with tasks outlining the responsibilities for each item within the scope of work. When appropriate, a timeline was developed along with target dates for each task so that the project moves forward in an efficient manner. All due dates for quarterly, bi-monthly or annual grant reports were designated in the work plan and all reports were submitted by the due date.

Personnel assigned to previous grants have had clearly defined responsibilities; their time was tracked through their weekly time sheets. The grant administrator tracked all of the personnel's time and included that information in the appropriate report that is submitted back to the Grantor. Refer to the attached supplemental information for more details on applicant qualifications.

### **Public Outreach and Education**

The project will investigate opportunities to increase and improve public access to allow for additional recreational opportunities, in hopes of attracting more visitors to the area. Ongoing project updates will be provided for the public through a dedicated webpage for the project.

#### *Project Collaboration*

Macomb County will partner with the consultant team, Intercounty Drainage Board, and NOAA Restoration Center experts. The County will also form a stakeholder group to improve collaboration with several local, state, and federal entities. The stakeholder group will solicit input, inform local businesses, and disseminate project goals, partners, and results. The County will insure that the public outreach program communicates the sources of funding and NOAA's mission to protect the Nation's water resources. Additional opportunities for collaboration include:

- The County will hold quarterly stakeholder meetings.

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- Updates will be provided to the local Clinton River East (CREW) Subwatershed Advisory Group.
- Updates will be provided to the Clinton River Area of Concern (AOC) Public Advisory Council (PAC).
- Consultants will work with the MDEQ Lake St. Clair Fisheries Research Station to further research and address the limiting factors involved in the various life stages of the Lake St. Clair's diverse fish populations as part of the final design.