

## **Full Project Proposal**

**PROJECT NAME:**

Removal of Watervliet Dam on the Paw Paw River (St. Joseph River) in Berrien County, MI

**FIELD OFFICE:**

Green Bay National Fish and Wildlife Conservation Office

**PROJECT COORDINATOR:**

Rick Westerhof, Fish Biologist

**FONS NUMBER:**

31320-2007-1019

**FUNDING REQUESTED:**

Funding requested \$75,000, Partners contribution \$149,550, Project total \$224,550

This project is estimated to cost \$264,100 to remove the Watervliet Dam (Barrier ID is 13\_204). Funding requested from the FWS is anticipated to be \$114,550 with the City of Watervliet matching this amount at a one to one ratio. Additional partners from the Michigan Department of Natural Resources (MDNR) Fisheries Division will contribute \$10,000 in In-kind services and Berrien County will contribute a minimum of \$25,000 from grants.

**STATEMENT OF PROBLEM:**

The Watervliet Dam was closed in mid-1970 because of structural degradation. Steel beams were completely rusted through and one side of the dam had no structural support. It was deemed easier to pay to decommission and remove the dam, before an imminent failure occurred. Currently, the sill and crest structure remain under degraded condition. The Watervliet Dam leaks to some degree and the water passing through could result in gradual undermining of the structure or deterioration would eventually result in collapse of the dam.

The City of Watervliet does not want to invest money to return the structure to a safe condition, rather the city believes that safety and security is a major issue. The downstream hazard of this dam is moderate because of the local proximity to the City of Watervliet, the physical deterioration of the dam, and highly erodable soils of the downstream river channel geomorphology. The dam prevents upstream migration of aquatic animals except potadromous sea lamprey and salmonids. The dam also fragments the riverine habitat for native fish, mussels, and other aquatic biota.

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### **PROJECT OBJECTIVES:**

1. Restore the physical and biological processes to reference status of the existing conditions in the watershed.
2. Remove an unsafe and deteriorating structure
3. Provide ecosystem restoration that reduces habitat fragmentation, creates fish passage, and allows for connectivity to the system that supports ecologically diverse habitats upstream and downstream of the site.

### **DESCRIPTION OF PROPOSED PROJECT:**

#### **Location**

Watervliet Dam is located in Watervliet Township, Berrien County, Michigan (T3S, R17W, Sec 23). The project is located within Michigan Congressional District 6. Watervliet Dam (N42.19413, W86.25153) is located on the Paw Paw River. It's a large tributary stream to the Saint Joseph River identified by the USGS hydrologic unit code 04050001. This dam is located within the middle valley segment of the Paw Paw River creating the only barrier along the main stem river channel. Sea lampreys currently migrate upstream beyond the dam which provides no control of access to upstream spawning habitat. A sea lamprey barrier has been proposed for a site located downstream from this dam.

#### **Description of On-The-Ground Work**

Site preparation and mobilization of equipment to the site will provide access and working preparation. Excavation of debris and sediment from behind the dam and within the Paw Paw River channel will be conducted to provide channel capacity and restore channel dimensions. Diamond bladed rope cutting will separate the remaining dam structure into blocks that the excavator can physically remove from the site. A grade control structure will be designed and installed to maintain the channel at bankfull dimensions after dam removal. Erosion control, vegetation plantings and final grading will prepare the site for public access and stable bank conditions. Permits are needed from joint applications with Michigan Department of Environmental Quality (MDEQ and United States Environmental Protection Agency (USEPA). Engineering designs have already been completed for the Watervliet Dam removal.

#### **Probability of Completion**

The project is proposed to be completed at 80% by the end of year 1 after funding and 100% completed after year 2.

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### Partner Contribution and Total Project Costs

Contributing Partners	Cash or In-Kind?	Amount \$ Contributed
MDNR Fisheries Division	In-Kind	\$10,000.00
City of Watervliet, Michigan	Both	\$114,550.00
Berrien County	Cash	\$25,000.00
Total FWS Fish Passage Contribution (include only on-the-ground costs)	Cash	\$75,000.00
Total Project Cost =		\$224,550.00

Additional partners on this project include Southwest Michigan Planning Commission, Southwest Michigan Land Conservancy, Trout Unlimited, and The Nature Conservancy

### Itemized List of What Service Funds Will Be Spent On

Expense Item	\$
Diamond rope cutting	\$65,000.00
Dump truck and hauling materials	\$10,000.00
Total FWS Fish Passage Contribution =	\$75,000.00

### HOW DOES THIS PROJECT ADDRESS FWS PRIORITIES:

A primary focus of the fish passage program is on dam removal. The proposed project would result in removal of a dam that would open access to greater than 216.8 miles of stream and provide habitat to potadromous fish from Lake Michigan as well as native species that are currently at low levels of abundance as a result of the fragmentation of habitat.

Another priority of the FWS is to conserve species of listed status or of special concern status. Lake sturgeons are a threatened species that are at current low population levels as a result of dams that have fragmented their habitat in the Saint Joseph River system. Lake sturgeon spawning has not been observed in the Paw Paw River, but their habitat has been fragmented and management objectives for rehabilitation will include increasing the amount of available habitat to provide this species with suitable conditions to complete their life history. Snuffbox and purple wartyback are two mussel species that would benefit from the interaction of native fish and the dispersion to adequate habitats upstream from the dam.

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In addition, the Paw Paw River supports a diverse ecosystem that would be enhanced by the removal of the dam because of the large scale watershed implications of this project. Watervliet Dam is also currently recognized in the Fish Passage Decision Support System as a candidate for removal.

This project addresses FWS priorities through the Fisheries Strategic Vision:

- 1) Partnerships and Accountability; Objective 1.1. Develop and improve long term partnerships with States, Tribes other Federal agencies, non-governmental organizations, and other Service programs to develop collaborative conservation strategies for aquatic resources.
- 2) Aquatic Species Conservation and Management; Objective 2.3: Maintain diverse, self-sustaining fish and other aquatic resource populations. Action 2.3.2. Work with States, Tribes and other federal agencies to identify and implement priority actions that need to be taken to reduce and monitor the biggest threats.
- 3) Aquatic Habitat Conservation and Management; Objective 6.1. Facilitate management of aquatic habitats on national and regional scales. Action 6.1.1. Identify and implement significant watershed management programs with partners to ensure that habitat conservation and restoration is an integral component of management actions.
- 4) Aquatic Habitat Conservation and Management; Objective 6.2. Expand the use of Fisheries Program expertise to avoid, minimize or mitigate impacts of habitat alteration on fish and other aquatic species. Action 6.2.2. Work with partners to identify and provide access beyond barriers to fish migration.

This project addresses the Region 3 Conservation Priorities by working with inland native lake sturgeon and walleye populations.

1. Obstacle 4 - inability to restore populations, e.g., lack of availability of genetic material, habitat fragmentation, population isolation, etc.
2. Obstacle 7 - habitat loss or degradation.

### **HOW DOES THIS PROJECT ADDRESS PARTNER PRIORITIES:**

The City of Watervliet currently has the burden of maintaining the dam and views this removal as an opportunity to revitalize the river as an economic stimulus for the community through recreation and low impact development as well.

The MDNR Fisheries Division has developed the Saint Joseph River Assessment (Wesley and Duffy 1999) that identifies the Watervliet Dam as a high priority for removal to provide fish passage and restore the, biological, morphological and hydrological functions in the Paw Paw River.

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Berrien County has developed a Hazard Mitigation Plan (January 2006) identifying the removal of the Watervliet Dam as a priority.

### **ANTICIPATED BENEFITS:**

#### **Watershed-Level Ecological Benefits**

The Paw Paw River Watershed supports a large concentration of biodiversity and is one of the most ecologically diverse areas remaining in southwest Michigan. The Watervliet Dam is centrally located along the main stem channel creating a barrier to the connectivity of this ecosystem. An emergent marsh occurs along the lower Paw Paw River that creates important habitat for spawning fish and breeding and migrating birds. The main stem river supports a large floodplain forest that is not fragmented by human development like most other watersheds in the southwest Michigan area. Removal of the dam would open access to this habitat. The headwaters and tributaries support prairie fens that are a unique post-glacial wetland feature that support a distinct array of wetland plants and animals. Removal of the dam would provide spatial habitat needed to secure existing populations of native aquatic species and maintain the critical refuges that support natural ecosystem function in this diverse watershed.

Implementation of this project will complement other restoration efforts within the watershed. Currently, the Nature Conservancy, Southwest Michigan Land Conservancy, Sarett Nature Center, and the Southwest Michigan Planning Commission (through a USEPA 319 water quality grant) have obtained land, managed habitat, and created conservation oriented plans for maintaining the natural system of the watershed. In addition, the MDNR-Fisheries Division has developed a Saint Joseph River Watershed Management Plan that lists removal of the dam as a high priority action.

Other projects proposed for fish passage funding include:

31320-2007-1025 – Replace failing culverts with new box culverts on Blue Creek (St. Joseph River) in Berrien County, MI

#### **Primary Native Species to Benefit**

The Paw Paw River is a large tributary stream that is classified as a coolwater system containing hornyhead chub, Johnny darter, burbot, walleye, lake sturgeon, smallmouth bass, northern pike and many other native centrarchid species. Biological surveys have identified 32 different fish species that would benefit from this project. Twenty three species of native mussels have been recorded along the lower and middle sections of the watershed. Michigan Natural Features Inventory lists the endangered snuffbox and purple wartyback of special concern located in this area. Thirty-two species of amphibians and reptiles that require the river or wetlands for their life history stages have been found in the watershed. Species of concern in the area include eastern box turtle, Massasauga rattlesnake, blue-spotted salamander, Blanchards Cricket Frog, and Blandings Turtle. The prothonotary warbler is a unique breeding bird that inhabits the river corridor and requires crucial floodplain forest habitat in this area.

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### **Stream Miles or Wetland Acres Reconnected**

Removal of the Watervliet Dam would restore connectivity to approximately 223.5 miles of river from the confluence of the Saint Joseph River to the first upstream barriers on tributary streams in the watershed. These important tributaries include the North Branch that originates from wetlands and groundwater near the Wolf Lake State Fish Hatchery, South Branch up to the first barrier near the city of Paw Paw, Brush Creek that is a coldwater trout stream, and additional smaller streams that flow into the Paw Paw main stem.

### **Other Social Benefits**

The City of Watervliet views this project as a revitalizing of the river to provide an economic stimulus to the community through recreational opportunity. The city also holds the burden of taxing residents to maintain the safety of this facility. There are numerous conservation organizations that have identified the watershed as a unique area for education, protection of critical habitats, and outreach opportunities to local communities. Anglers and nature viewers would benefit from the increased navigability of this stream reach.

### **Possible Negative Impacts**

Some provision for control of sea lamprey would still be necessary; however plans have been identified for control and presently sea lamprey are migrating upstream beyond the structure where chemical treatments are currently applied.

### **EXISTING BIOLOGICAL AND PHYSICAL MONITORING DATA:**

MDNR Fisheries Division conducts standardized status and trends survey protocols to fish surveys. MDEQ Water Bureau conducts procedure 51 protocols for habitat and aquatic invertebrate surveys.

### **BRIEF SUMMARY OF WHY THIS PROJECT SHOULD BE FUNDED:**

The dam is a safety hazard. Watervliet is concerned about its liability if the dam were to break, but it does not have the financial resources to remove or repair it. Because the dam is an attractive nuisance, there is always the danger of a drowning there. In spite of the city's best efforts, children are often seen playing on the dam's crest and swimming in the hydraulics below the dam. A sudden breach may cause serious erosion on either river bank and at the downstream bridge, and it will also release sediment downstream in an uncontrolled fashion. Removal would result in a large scale connection of barrier free river habitat benefiting the social, physical environmental and biological components of the Paw Paw River.

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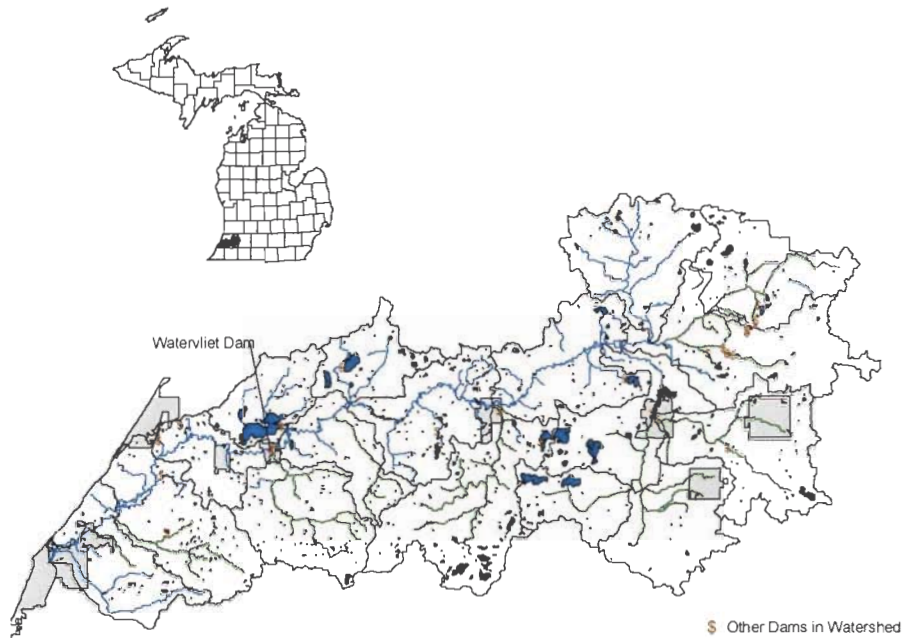
### APPENDIX A - Pictures of the Project Site



**FIGURE A.** Watervliet Dam looking West and East along structure

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### APPENDIX B - Watershed Map and APPENDIX C - Map of the State, Highlighting Location of the Watershed



**FIGURES B AND C:** State of Michigan illustrating the Paw Paw Watershed in Southwest Michigan. Watervliet Dam is located along a large floodplain forest river section highlighted in blue, designated trout streams are highlighted in green. Other dams located in the watershed are identified and usually located in tributaries.