

FWS Region 3 - FY 19 Fish Passage Program- Guidance

Full Project Proposal

Applicants should be aware that the United States Fish and Wildlife Service (Service) began using Treasury's Automated Standard Application for Payments (ASAP) system for grant and cooperative agreement payments to domestic recipients in December 2011. State and local governments, non-profits, and universities are required to register in ASAP. Individuals or sole proprietors/limited liability corporations already enrolled in ASAP with another bureau within the Department must also register in ASAP. Your current registration status in the ASAP with the Service system must be included on page one of the project proposal under "Project Partner(s) Receiving Funds:"

Also included here is a list of documents used to navigate the financial assistance process if the proposal is selected for funding. Please review these materials and be prepared to provide them upon request.

- SF-424 (Application), SF-424A or SF424C (Budget), SF-424B or SF-424D (Assurances);
- Negotiated Indirect Cost Rate Agreement (NICRA), OR memo from recipient organization indicating they are waiving reimbursement for indirect costs for the proposal , OR memo indicating recipient organization does not have a NICRA;
- Complete NEPA, SHPO and ESA Compliance with FWS assistance.

PROJECT NAME:

Republic Dam Modifications and Fish Bypass Channel

FIELD OFFICE:

USFWS Conservation Office, Green Bay

PROJECT COORDINATOR:

Mr. Joseph Sheahan

PROJECT PARTNER(S) RECEIVING FUNDS:

James Brennan, Chairperson, Michigamme River Basin Tax Increment Financing and Water Improvement Authority, 279 Kloman Avenue PO Box 251, Republic, MI 49879, 906-376-2009, jamesbrennan443@hotmail.com, unregistered ASAP Status,

A-133 SINGLE AUDIT STATEMENT:

Michigamme River Basin Authority Tax Increment Financing and Water Improvement Authority (MRBA) was not required to do a single audit report for FY 2017.

FONS NUMBER:

USFWS will complete this section.

OFFICE RANK:

USFWS will complete this section.

FUNDING REQUESTED:

Funds requested=\$ 129,030 Partners contribution=\$ 321,500 Total=\$ 450,530

STATEMENT OF PROBLEM:

Republic Dam has been in place for more than 100 years as a gated spillway. This dam severely interrupts aquatic connectivity, with no fish passage possible upstream

FWS Region 3 - FY 19 Fish Passage Program- Guidance

of the dam for all age classes of native warmwater fish and brown trout that exist upstream and downstream of the dam. As a bottom-draw dam structure, moderate to low effects occur on the water quality of the Republic Dam reservoir, including seasonal changes in water levels. Effects on material transport including sediment and large woody debris is low given that the gates are open in the fall, winter, and spring. This allows sediment and woody material to transport downstream of the dam unimpacted.

The existing concrete piers will catch woody debris on occasion and the latest dam safety report cites that logs and woody debris were observed in the vicinity of the gated spillway. For that reason, the natural hydrology is only impacted in summer when the gates are lowered to maintain reservoir levels near 1492.2. During the fall, winter, and spring, the gates are left open which allows for relatively uninterrupted flow from upstream to downstream of the dam. However, given the shallow water depths through each gate opening and concentration of flow, the dam still serves as a fish passage barrier during the months when the gates are fully open.

Effects on geomorphology upstream and downstream of the dam is high. The river is 850 feet wide within the Republic Dam reservoir compared to 150 feet wide downstream of the dam. This rapid 5-fold change in width has disrupted the river's ability to gradually transition through the river valley. Furthermore, the sinuosity is decreased through the reservoir and for 0.35 miles downstream. This reduction in sinuosity limits the channel's ability to adapt to changes in upstream hydrology and sediment transport.

In recent years, the dam has needed costly maintenance and repairs. In the latest Dam Safety inspection report required by Michigan's DEQ Part 315 Dam Safety Program, some of the maintenance and repair recommendations included:

1. Repair or reinforcement of the existing gates.
2. Repair of deteriorated concrete supporting the existing gates.
3. Monitor ground loss around the dam near the right concrete abutment wall.
4. Monitor undermining of concrete piers and the overflow spillway.

PROJECT OBJECTIVES:

The MRBA has worked closely with state agency personnel, local stakeholders, and GEI to develop project objectives following the recent acquisition of the dam. These project objectives include:

1. Modify the existing dam to minimize risk to public safety, accommodate hydraulic capacity, and maintain the reservoir elevation as close to 1492.2 as is practical.
2. Construct a fish bypass channel around the dam that allows upstream and downstream fish passage.
3. Reduce long-term operation and maintenance costs.
4. Restore recreational use of the Republic Dam reservoir by creating fish passage and maintaining reservoir water levels.
5. Address wetland and inland lakes and streams impacts related to fluctuating seasonal reservoir elevations.
6. Complete all project elements within a 5-year period

FWS Region 3 - FY 19 Fish Passage Program- Guidance

DESCRIPTION OF PROPOSED PROJECT:

Location

State: Michigan County: Marquette Township: Republic 46 North 29 West Section 18
USGS Quad Map: Attached Congressional District: 1 8-Digit HUC#: 04030107
Latitude: 46.389127° Longitude: -87.985552°

Note:

1) *Sea Lamprey* -

The Menominee Dam acts as a full fish passage barrier according to Fishwerks database website. The next barrier downstream of Republic Dam forms the Michigamme Reservoir. This dam is located 30 miles downstream of Republic Dam and is classified as a complete barrier to aquatic organism passage.

2) *Historic Preservation* -

The dam is not currently listed through the State Historic Preservation Office. We will work with the U.S. Fish & Wildlife service to supply all relevant information necessary to complete the State Historic Preservation Office Section 106 documents for Republic Dam.

3) *Tribal Resources* -

We are not aware of any connection to Republic Dam being located on tribal land or having tribal historic properties.

Description of On-The-Ground Work

On-the-ground work includes fish bypass channel construction and modifications to the dam's spillway. The proposed fish passage design will emulate natural rapids with slope and flow velocities targeted to allow passage by a wide variety of fish species and age classes. The bypass channel will be constructed through the right dam embankment and connect to the downstream dam tailwater. The plan form of the channel will conform to the existing edge of the emergency spillway and blend with the natural confining topography west and southwest of the dam. The natural channel design would be constructed using Dr. Dave Rosgen's natural channel design and incorporate a series of pools, steps, and boulders to create velocity profiles varying in depth and in width. Concerns for directing fish to the inlet fish passage channel will be addressed by constructing a boulder weir approximately 170 feet down stream of the dam. By constructing a barrier to fish passage at the bypass channel outlet, fish will be attracted to flowing water from the bypass channel and enter the channel to swim upstream. The applicant will continue working closely with Michigan Department of Natural Resources (MDNR) Northern Lake Michigan and Habitat Management Unit staff to discuss this design element. Consideration will be given to determine an effective way to attract fish to the bypass channel while continuing to operate the dam safely and not disrupt flow in the Michigamme River channel.

Modifications to the existing dam's spillway are also proposed. The existing dam gates will be removed, the gate openings sealed off with concrete bulkheads, and the dam itself converted to a fixed crest spillway. Construction of the fixed crest spillway reduces operation and maintenance costs associated with operating the current gate arrangement. Removal of the existing gates and modifying the dam to a fixed crest spillway aids MRBA in our goal to maintain reservoir levels and to do so in a fiscally responsible manner.

FWS Region 3 - FY 19 Fish Passage Program- Guidance

The major steps identified at this time include the following:

1. Identify project goals and objectives.
2. Build community support and partner consensus on project objectives.
3. Vet several potential project ideas through project meetings.
4. Select a project design.
5. Generate project cost estimates.
6. Submit funding applications.
7. Collect topographic survey data collected via drone and traditional survey methods.
8. Bathymetric survey data collected upstream and downstream of the project site.
9. Sediment soundings in the impoundment to determine impounded sediment volumes.
10. Ecological Surveys including wetland assessments and freshwater mussel surveys.
11. Soil borings to identify river bed material downstream of the project site.
12. Scour analysis using bathymetric survey and soil boring data.
13. Hydraulic, Sediment Transport, and Floodplain analysis using topographic, sediment sounding, and bathymetric survey data.
14. 30% conceptual plan design to present to the Michigan Department of Environmental Quality MDEQ during the project pre-application meeting.
15. Regulatory permit applications including the MDEQ Inland Lakes and Stream Joint Permit Application, State Historic Preservation Office Application, and Marquette County Soil Erosion/Sediment Control Application.
16. Stakeholder meetings involving the owner, consultant, adjacent landowner, agency personnel, and community members.
17. Permit plans to submit with regulatory permit applications.
18. Construction specifications and construction bid administration.
19. Bid advertisement on on-site pre-bid meeting.
20. Selection and awarding of construction contract.
21. Project construction oversight.
22. Construction inspection/site walkthrough/punch list.
23. Final as-built project documents.
24. Post-project monitoring.

To date, steps 1 through 5 are complete and the MRBA is currently working on step 6 to acquire project support through grant funds.

FWS Region 3 - FY 19 Fish Passage Program- Guidance

Probability of Completion

The project will be 50% complete with permit applications submitted within 1 year of receiving funding. The project will be constructed and at 100% completion of this project for fish passage and dam modifications within 2 years.

Partner Contribution and Total Project Costs

The MRBA will directly provide project match funding either through raising funds locally or completing successful grant applications. To date, no additional federal, state, or local funds have been acquired for this project. An engineer’s opinion of probable cost was developed by GEI based on recent similar projects, vender quotations, and experience. The construction project will be publicly advertised and bid in accordance with MRBA’s requirements.

MRBA has already invested approximately \$8,000 of its own funds toward designing a solution to maintain basin water levels, reduce long-term operation and maintenance costs, operate the dam in a safe manner, and provide upstream fish passage. GEI has completed a fish passage design alternatives analysis which included full removal of the dam, construction of a rock ramp, and the current design of a fish bypass channel. The fish bypass channel meets the most of MRBA's project goals and also is the most cost-effective option to construct.

Project partners not contributing cash or in-kind support include the Lake Superior Community Partnership, Republic Township, Michigan DNR Fisheries Division, and the Moose Country Snowmobile Club.

Contributing Partners	Cash or In-Kind?	Amount \$ Contributed
MRBA	Cash	\$321,500.00
Total FWS Fish Passage Contribution (include only on-the-ground costs)	Cash	\$129,030.00
Total Project Cost =		\$450,530.00

Detailed Budget Justification (Itemized List of What Service Funds Will Be Spent On)

FWS Region 3 - FY 19 Fish Passage Program- Guidance

Expense Item (per unit cost)	\$
Engineering and Planning	\$40,030.00
Program Recognition Sign	\$2,000.00
Contractual - Mobilization	\$8,000.00
Contractual - Water Management	\$25,000.00
Contractual - Fish Bypass Channel Excavation	\$20,000.00
Contractual - Fish Bypass Channel Material	\$24,000.00
Contractual - Boulder Weir Construction	\$10,000.00
Total FWS Fish Passage Contribution =	\$129,030.00

HOW DOES THIS PROJECT ADDRESS FWS PRIORITIES?:

The U.S. Fish and Wildlife Service Draft Lake Michigan plan was reviewed. This report identifies multiple tributaries upstream of Republic Dam that are the highest priority for funding opportunities with the National Fish Passage Program given their habitat suitability for brook trout. These tributaries would be opened to fishing moving from downstream of Republic Dam to upstream tributaries for the first time in over 100 years.

Species captured during surveys of Lake Michigan and also caught during the 2018 Fishing Derby include walleye, northern pike, black crappie, bass, yellow perch, rock bass, and blue gill. During the 2018 Republic fishing derby, one brown trout catch was also documented.

Traditionally, fish passage structures have been created in the context of dams using right angles, concrete, and with little regard for the natural energy dissipation characteristics of rivers and streams. Traditional fish passage structures employ the use of baffles and compartments which are often ineffective in passing fish species, especially those without leaping abilities like most warm water fish species. This has led to a lack of success on several fish passage structures and an inefficient use of funds. Recently, biologists and engineers have started working together to design fish passage channels that better emulate natural stream processes. Dr. Luther Aadland of the Minnesota DNR has used this approach on many different projects.

HOW DOES THIS PROJECT ADDRESS PARTNER PRIORITIES?:

The MRBA is requesting funding to support modification of Republic Dam (Michigan Dam No. 00579) from its existing spillway to a fixed crest spillway. This project will meet the ongoing goals of MRBA, Republic Township, and community members to maintain existing reservoir levels, reduce long-term operations and maintenance costs, preserve reservoir property values, provide sustainable recreation opportunities, and continue to grow the local tourism-based economy.

The following entities support this funding application:

- **Lake Superior Community Partnership:** The project aligns with the LSCP's mission to provide an environment able to foster economic development. Creating a more sustainable fishery through fish passage, and maintaining the impoundment benefit property values, tourism, and recreation opportunities. These values align with LSCP's overarching economic goals for the region.

FWS Region 3 - FY 19 Fish Passage Program- Guidance

- Republic Township: The livelihood of the entire town depends on maintaining the impoundment especially during peak tourism periods in the spring and summer. Not only do the property owners on the river itself depend on this for maintaining their property values that they have worked so hard for, but so do business owners who make their living from the scheduled activities that occur during this time of year, the largest of which is the Annual Fishing Derby. Creating fish passage upstream of the impoundment will aid in rejuvenating the fishery and create better fish opportunities for the derby and throughout the year.
- Michigan DNR Fisheries Division: The proposed fish bypass channel and modifications to the dam in Republic represents a critical opportunity for the local community to update infrastructure that supports outdoor recreational opportunities on the Michigamme River. Repairs are necessary to allow the safe and controlled operation of the dam during filling and drawdown of the impoundment and also to provide a safe riverine environment for their annual fishing derby. This derby is a critical economic vehicle for the community and showcases the fishing opportunities in the river to local and non-local anglers alike. The Michigamme River supports a diverse fishery and provides popular and unique economic and recreational values to the stakeholders in the Republic area.
- Moose Country Snowmobile Club: This is a very important part of this community and its surrounding residents. This reservoir is extremely important to value of the property and the landowners involved. With the addition of the new campground it can only add to the use and enjoyment to the Basin for water activities. This project would help to attract more people to the campground and Republic areas.

ANTICIPATED BENEFITS:

Watershed-Level Ecological Benefits

About 30% or less of the watershed is currently impaired. Creating fish passage upstream of Republic Dam allows access to headwater tributaries providing critical habitat for several warmwater fish species, brown trout and brook trout, and other aquatic organisms. Very few full barriers exist in the watershed upstream of Republic Dam. At one point in time, mining operations created flow depletions through major water withdrawals. However, the mine adjacent to the dam is no longer in use and has not been operated in over three decades. The other land in the watershed upstream of the dam is primarily forested and undeveloped. Approximately 30 miles downstream there is a dam creating the Michigamme Reservoir. This is the first barrier downstream of Republic Dam. Land use downstream of Republic Dam is also heavily forested with minimal development. Given the lack of development, stable hydrology, lack of major barriers upstream of Republic Dam, and lack of water quality stressors, the Michigamme River and its tributaries upstream of Republic Dam form a high-quality watershed. Creating fish passage upstream of Republic Dam will further increase the quality of this system.

The HUC12 for the Michigamme Watershed is 040301070104. Completing a GIS analysis using data downloaded from the Fishwerks webpage results in 335 total mainstream and tributary miles upstream of Republic Dam. By creating fish passage

FWS Region 3 - FY 19 Fish Passage Program- Guidance

upstream of Republic Dam, 277 mainstream and tributary miles are opened. This results in 78% (277/335) of the HUC12 Watershed reconnected upstream of Republic Dam. While there are remnants of a former dam at Lake Michigamme (10 miles upstream of Republic Dam), the Fish Community and Fishery of Lake Michigamme Special Report 59 published by the Michigan DNR in 2011 cites on page 2 that it does not restrict fish movement.

Given the lack of development, stable hydrology, lack of major barriers upstream of Republic Dam, and lack of water quality stressors, the Michigamme River and its tributaries upstream of Republic Dam form a high-quality watershed. Creating fish passage upstream of Republic Dam will further increase the quality of this system.

Primary Native Species to Benefit

The primary native species to benefit include walleye, northern pike, black crappie, bass, yellow perch, rock bass, and blue gill. Additional species to benefit through opening access to coldwater tributary streams include brook trout and brown trout.

Stream Miles or Wetland Acres Reconnected

This project will reconnect 277 miles of connectivity between the Michigamme Reservoir and Lake Michigamme. While primarily a warm water fishery, the Michigamme River also houses a population of Brown Trout. While the Michigamme Watershed upstream of Republic Dam is not known as a coldwater fishery, several of the tributaries upstream of Republic Dam that will now be open to fish passage were ranked as the highest priority brook trout streams targeted for U.S. Fish and Wildlife Service National Fish Passage Program funding.

Appendix B of the Draft Lake Michigan Strategic Plan published by the U.S. Fish & Wildlife Service lists several HUC12 tributaries as the highest priority based on the streams suitability to sustain brook trout, the current predicted occurrence of brook trout, and the probability of brook trout persistence in 2065. These tributaries include Lake Elinor on the West Branch of the Peshekee River, Craig Lake, the West Branch of the Peshekee River itself, and Baraga Lake on the Peshekee River.

Other Social Benefits

This project will benefit the community in several ways. Constructing the fish bypass channel will increase fish movement into the reservoir and this should aid in bringing more participation to the already successful fishing derby. While the option of dam removal was explored, it is not currently an economically viable option. The fish passage modifications to the existing dam will enable MRBA to continue to manage the reservoir level while meeting fish passage goals. Maintaining a reservoir with a sustainable water level is critical to the long-term success of Republic's tourism industry, preservation of property values, and continued recreational use of the reservoir. Numerous businesses in Republic rely heavily on tourism revenue.

This project allows for an improvement to the aquatic resources upstream of Republic Dam. The Republic Sportsman's Club hosts an annual Fishing Derby on the impoundment and has done so for 28 years running. Entry fees and participation in the weekend-long fishing tournament are an economic boost to the township and its local merchants. In 2018, over 400 people participated and more than \$6,000 was

FWS Region 3 - FY 19 Fish Passage Program- Guidance

paid in entrance fees. The annual event is more than a fishing tournament, it is an opportunity for people to commune in Republic for the fireworks display, contribute the local Fire Department fundraising efforts, and camp in Northern Michigan during the beautiful summertime.

Republic Township and the MDNR have been investing in Munson Park (also referred to as Northern Lights Campground) located on the impoundment as well as adjacent the Republic Mine tourist viewing platform and Iron Ore Heritage Trail. Due to the popularity of the annual fishing derby and Republic's interest in increasing their tourism industry, the campground has reinvigorated the community. In 2017, the township received a \$172,200 MDNR Trust Fund grant to open the campground. Thus far, reservations have been high, with twice as many reservations in 2018 as there were in 2017 for the campground opening. Several of the sites are already booked for the 2019 fishing derby. Preserving the impoundment elevation is important to the viability of the campground.

Possible Negative Impacts

There is a registry of waterbodies infested with aquatic invasive species (https://www.michigan.gov/documents/deq/wrd-anc-AISRegistry_ALLSpecies_509493_7.pdf). Michigamme Reservoir in Iron County is listed therein as being infested with Eurasian Watermilfoil. Michigamme Reservoir is 30 miles downstream of Republic Dam. Michigamme River flows through a series of rapids located downstream of the Republic Dam to reach the Michigamme Reservoir, so it is unlikely that this invasive species will spread upstream through natural processes. As with all lakes and rivers where boats enter and exit, there is a high potential for the spread of invasive species from individuals who do not properly clean their marine equipment.

In addition, the U.S. Forest Service recently published a map (https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5133467.pdf) identifying aquatic invasive species near the Ottawa National Forest. One data point for Keewaydin Lake also shows the presence of Eurasian Watermilfoil. Keewaydin Lake is located upstream of Republic Dam and Lake Michigamme and drains through a shallow, narrow channel to the Peshekee River.

EXISTING BIOLOGICAL AND PHYSICAL MONITORING DATA:

In speaking with the MDNR Northern Lake Michigan Management Unit, a recent MDEQ report for sampling of the Michigamme River at the M-95 Bridge (STATION 14) resulted in a habitat score of 163 (Excellent) and an invertebrate score of 3 (Acceptable). An updated report is expected to be released sometime this year. A Procedure 51 Habitat Survey was completed in 2007 on the Michigamme River Basin. Two of the test sites were located on the Peshekee River (STATION 8 and STATION 10). STATION 8 is located off Huron Bay and Peshekee Road. This site exhibited acceptable macroinvertebrate scores with 2 mayfly and 2 caddisfly larvae, both of which are species indicative of high water quality. The habitat at this station was rated as good with reductions for substrate and instream cover as well as channel morphology. STATION 10 is on a two-track off Huron Bay Grade. This station received an excellent macroinvertebrate score with 4 mayflies, 7 caddisfly, and 2 stonefly larvae identified. STATION 10 also received an excellent habitat metric score. The U.S. Fish and Wildlife

FWS Region 3 - FY 19 Fish Passage Program- Guidance

Service Draft Lake Michigan plan was reviewed. This report identifies multiple tributaries upstream of Republic Dam that are the highest priority for funding opportunities with the National Fish Passage Program given their habitat suitability for brook trout. These tributaries would be opened to fishing moving from downstream of Republic Dam to upstream tributaries for the first time in over 100 years.

A future monitoring opportunity is to review the results of the annual fishing derby before and after the fish bypass channel is constructed. Comparing the species caught and the abundance of each before and after construction of the channel will aid in educating the community on the importance of aquatic connection.

BRIEF SUMMARY OF WHY THIS PROJECT SHOULD BE FUNDED:

The MRBA, Republic Township, and community members are dedicated to maintaining existing reservoir levels, reducing long-term operations and maintenance costs, preserving reservoir property values, providing sustainable recreation opportunities, and continuing to grow the local tourism-based economy. This project creates fish passage and improves the dam spillway to benefit the long-term quality of the area in accordance with these goals.

The Michigamme River Basin Authority recently purchased the dam from the former owner with intent to preserve the impoundment. The MRBA mission is to promote and maintain the inland water resources of the district by planning and fostering responsible economic development and fiscal responsibility. Steps taken by the MRBA include working with the MDEQ Part 315 Dam Safety staff to determine the safest way to continue dam operation. In 2017, the existing spillway gates were refabricated so that the dam can continue to operate safely while a viable long-term solution for operation could be identified.

APPENDIX A- Pictures of the Project Site

APPENDIX B- Watershed Map

APPENDIX C- Map of the State, Highlighting Location of the Watershed

APPENDIX D- MRBA Funding Resolution

APPENDIX E- Michigamme River Fish Species