



FISHERIES HABITAT GRANT PROGRAM FULL PROPOSAL APPLICATION

Instructions:

1. Complete the form below.
2. Please refer to the 2019 Fisheries Habitat Grant Program (FHGP) Handbook for guidance on overall program goals, priorities, and eligibility.
3. Questions on the application process should be directed to:
Joe Nohner: 517-284-6236 or by email at nohnerj@michigan.gov; or Chip Kosloski: 517-284-5965 or by email at kosloskic3@michigan.gov.
4. Full application packets must be mailed per the instructions below no later than November 22, 2019. A list of required contents for all full application packets is included in the 2019 FHGP Handbook.

Provide **one (1)** hard copy version and **one (1)** electronic version of each grant application packet to the DNR Grants Management Section. Electronic version must be in the form of a USB drive. Applications must be postmarked no later than November 22, 2019. Late applications will not be considered for funding.

Mail to:

Fisheries Habitat Grant Program
Grants Management Section
Michigan Department of Natural Resources
PO Box 30425
Lansing, MI 48909-7925

Please note: Information in this application may be used in DNR communications regarding the grant; the DNR will credit photography to its source if a citation is provided.

Project Details:

1. Themes. To what themes are you applying? Check all that apply. The maximum grant amount is the sum of available funding in the themes for which a project is eligible.
 - Aquatic habitat conservation (\$1,250,000 available for 2019): Funding to improve fish and other aquatic organism populations by protecting intact aquatic habitat and rehabilitating degraded aquatic habitat
 - Dam management (\$350,000 available for 2019): Funding and technical assistance to manage dam removal and repair projects that will enhance aquatic resources and fishing opportunities along with reducing infrastructure costs and improving public safety.
 - Aquatic habitat and recreation in the Au Sable, Manistee, and Muskegon watersheds (\$225,000 expected available for 2019): Funding to support fisheries habitat rehabilitation or enhancement, preparation of comprehensive river management plans, aquatic studies, and fisheries recreation with surface water connections to the aforementioned rivers.
2. Public Access. Public waters are those that have public access or are permanently connected to a water body with public access. Direct public access means that the site can be readily accessed from public access points, including boat launches that require a fee.
 - Project is on a public water with direct public access.
 - Project is on a public water without direct public access.
 - Project is on a water that is not permanently connected to other waters but has been stocked with fish from DNR (or its predecessors) hatcheries.
 - Projects is on a water body without public access and that has never been stocked with fish from DNR (or its predecessors) hatcheries. STOP NOW; this project is ineligible.

3. Consultation.

- Applicants have consulted with the DNR Fisheries Biologist responsible for managing this water body. (Please provide documentations such as an email, phone conversation summary, or letter of support).

Fisheries Biologist Name: Sara Thomas

4. Mussels.

- No mussel surveys are required for permitting.
 Mussel surveys are required for permitting, but not yet complete.
 Required mussel surveys have been completed. Please attach relocation plan if necessary.

5. Invasive Species Plan (Required for projects with a construction phase).

- This project has a plan for minimizing the spread of invasive species during construction. Please attach plan.
 Not applicable; this project does not include a construction phase.

6. Project Design Status.

- No design completed.
 Conceptual design (e.g. 30%) completed. Please attach designs to your application.
 Preliminary engineering design (e.g. 60%) completed. Please attach designs to your application.
 Full engineering design (e.g. 90% final) completed. Please attach designs to your application.

7. For projects applying to the “Aquatic habitat and recreation in the Au Sable, Manistee, and Muskegon watersheds” theme, in which watershed(s) is this project located?

- Au Sable
 Manistee (does not include the Little Manistee)
 Muskegon

8. Conditional Commitment. For a limited number of very high-quality projects that do not currently have match funding or other requirements in hand, we may offer conditional funding commitments. Please see the handbook for details. Are you requesting a conditional commitment of future project funding?

- No, we request funding from this grant cycle.
 Yes, the project would be expected to start on October 1 of _____ (insert year), after the applicant secures the necessary (check all that apply):
 Permission
 Funding
 Other: _____

9. Has this project previously been proposed to the DNR? (If yes, what modifications to the project design/plan have been made?).

No

Narrative Questions:

1. **Project synopsis**-75 words. Briefly describe what problem the project will solve, potential strategies employed, and the benefits to be created for the targeted water body.

This project will advance the removal process of Peninsular Paper Dam (Pen Dam) on the Huron River in Ypsilanti. Project partners will oversee progress on an engineering design study, manage an advisory committee, and facilitate restoration planning for the current impoundment.

Removing the dam will benefit aquatic species by restoring a relatively high-gradient, free-flowing stretch of river connected to Ford Lake, which has the only self-sustaining inland walleye population in southeast Michigan.

2. **Project description**-600 words. Explain the goals of the project, the direct deliverables, and how those actions address the problem. How did this project become a conservation priority? Do the proposed strategies address the underlying cause(s) of the impairment or directly treat a condition/result of the impairment(s)? How does this project address habitat limiting factors, reestablish ecosystem function, and/or address public safety?

The goal of this project is to advance the removal process of Peninsular Paper Dam (Pen Dam) on the Huron River in Ypsilanti. Project partners will oversee progress on deliverables that include an engineering design study, a restoration plan for the currently impounded area that includes an invasive species management plan, and other supplemental resources to support future dam removal projects. Project partners will lead an advisory committee and manage contracts with engineering design consultants.

The Huron River Watershed Council (HRWC) previously evaluated which impoundment areas along the Huron River would most benefit from dam removal and identified the Pen Dam impoundment as a priority restoration area. Following a completed dam removal feasibility study in 2018, the Ypsilanti City Council voted to remove Pen Dam and committed \$500,000 to removal activities. DNR Fisheries Division has also identified increased connectivity and fish passage in the Huron River as a top priority and supports removal of Pen Dam.

This stretch is fundamentally impaired by the presence of the dam. Advancing the removal process of the dam addresses the underlying cause of impairment. Pen Dam is a major habitat-limiting factor along the Huron River. It is the first dam above Ford Lake and segments a river that would otherwise provide rare and important fish habitat. Game fish species, such as smallmouth bass, walleye, and white bass would benefit greatly from the increased access to prime spawning habitat, nursery areas and likely cooler water temperatures that would result from removal of the dam.

Removal of the dam would reestablish natural ecosystem functions, and reconnect 1.25 miles of free-flowing, relatively high-gradient river to Ford Lake through Ypsilanti. In the 1.25 miles from the dam upstream to end of the impoundment, the slope of the natural river bottom averages 10 feet/mile. This is much higher than the average gradient of the mainstem (2.95 feet/mile). Based on the results of the feasibility study, the impoundment area will most likely regenerate into a meandering floodplain meadow.

This section of the Huron River is a group 3 mussel stream (both state and federally listed mussels may be present). The stretch immediately above and below the Pen Dam impoundment has recent records of Elktoe, Purple Wartback and Wavy-rayed Lampmussel, which have state special concern or threatened status. Dam construction is a primary cause of mussel habitat loss. Dam removal could improve the recovery potential of mussel species by restoring habitat for these species and their host species.

Pen Dam is rated as a "high hazard" dam in fair condition by the Army Corps of Engineers National Inventory of Dams due to the probable loss of life and severe damage to property if the dam were to fail. Removal relieves the City of Ypsilanti and its residents of the risk of failure, eliminates maintenance costs over time, and removes public safety hazards inherent to dams like drowning. Removal also reduces flood vulnerabilities and ecological stresses associated with climate change.

The impoundment is part of the Huron River Water Trail. Pen Dam is a challenging barrier that discourages paddlers from using this stretch of the river. Removing the dam would eliminate a difficult portage and create a 7.5-mile long unobstructed paddling experience through Ypsilanti.

3. **Project location and scale**-100 words. What is the scale and extent of the benefit directly provided by this project? Please include a map.

Pen Dam is located on the Huron River in Ypsilanti (42.256126, - 83.624146). The 177-acre impoundment area extends 6,575 feet (1.25 miles) upstream of the dam and occupies sections of Ypsilanti, Ypsilanti Township, and Superior Township. Peninsular Park (Pen Park), owned by the City of Ypsilanti, occupies the parcel adjacent to the north end of the dam. (See included maps.) This project would directly benefit the impoundment area, Pen Park, and areas adjacent to the current shoreline. Numerous high-density residential complexes within walking distance (0.5 miles) would benefit from the increased park area and river access following dam removal.

4. **Benefits**-500 words. How will fish, wildlife, habitat, ecosystem function, and/or public safety benefit from this project? What will the habitat project provide to the target species or ecosystems? Describe what is unique about the benefits that will be derived. What, if any, benefits will be derived by the human communities that use this waterbody?

Removing Pen Dam will benefit nearby ecosystems by improving the connectivity and quality of fish habitat. Approximately 1.25 miles of impoundment that is currently covering one of the highest gradient stretches on the mainstem will be restored, leading to more than 3 miles of continuous river above Ford Lake. The high gradient habitat is rare in the watershed and valuable to many fish and macroinvertebrate species. Ford Lake has the only self-sustaining inland walleye population in southeast Michigan because they can spawn in the specific conditions just below Pen Dam. The extended natural river area would provide additional suitable spawning and nursery area for game fish species including smallmouth bass and walleye. Previous EGLE and DNR surveys indicate fish and macroinvertebrate communities are in excellent health below the dam, suggesting these organisms would benefit from an extended stretch of open river.

Removal would provide many recreational benefits. Ford Lake and the Huron River are popular fishing destinations with high catch rates and the Huron River has recently become a popular destination for fly fishing. Dam removal would increase habitat diversity and the length of river available for spawning, which would enhance aquatic invertebrate populations and reproductive success of several fish species, benefitting area anglers.

The Huron River is a national and state-designated water trail that draws considerable use from across the Midwest. It's a significant economic driver for the region that creates \$53.5 million in annual economic value (Economic Impact of the Huron River, Grand Valley State University, 2016). Approximately 125,000 individuals from diverse socioeconomic backgrounds use the river corridor every year. The dam is a notorious obstacle that dissuades anglers and paddlers from fully utilizing and enjoying Ypsilanti's section. Dam removal would open more river for recreation in a location close to major population centers and diverse user groups.

The position of the dam within Pen Park limits recreational access to the river. The feasibility study indicated that removal would increase the exposed land area of the park by approximately 1/3 and give the City of Ypsilanti options for improving access for fishing, swimming, and paddlesports. Much of the recovered land area could be made into accessible waterfront including safe, small boat access.

Dam removal will immediately improve public safety. Drowning hazards due to the dam's presence and the risks of catastrophic dam failure will be eliminated. Removal will also avoid greater future risk of failure or damage. Southeast Michigan has experienced significant increases in the severity and frequency of extreme precipitation events since the middle of the 20th century. Those events are stressing dam infrastructure and operations along the river through highly variable, less predictable flows. Removal will allow the river channel to naturally attenuate surges and reduce the city's vulnerability to natural disasters.

Removal will relieve city residents of the financial liability for repairing and maintaining the dam over time. City staff found it difficult and prohibitively expensive to insure the dam at a rate that fully covers potential damages in the event of failure.

5. **Methods**-500 words. Are the proposed methods the most effective at accomplishing the project goals based on support in peer-reviewed literature, examples implemented in Michigan, or recent developments in conservation science? Describe alternatives that have been (or will be) analyzed and why the proposed option is preferred. Please provide concept or design plans if they are available.

We will follow the recommendations of the feasibility study (enclosed with submitted materials), a review of successful practices during similar dam removal projects, and consultations with state officials and experts. HRWC will consult with organizations, communities, engineering firms, and state agencies to advance best management practices. HRWC has consulted several engineering design firms with experience in dam removals since submitting our pre-proposal. All have indicated the activities proposed here follow logical next steps and established best practices.

We will refer to successful dam removals led by Huron Pines, American Rivers, and other organizations across the country and we will follow practices from dam removal projects in Michigan, such as the Mill Pond Dam in Dexter, the Boardman Dams near Traverse City, and the Ceresco Dam on the Kalamazoo River.

Following the completion of the feasibility study, HRWC responded to inquiries regarding alternatives for removal, including restoring hydroelectric generation, partial removal, repair, and transition of ownership to private entities. No alternative was feasible. Pen Dam does not have the physical capacity to generate electricity at a rate to cover its own maintenance costs, and the estimated initial costs of restoring hydropower were prohibitive (ranging from \$4.4 to 9.7 million). The estimated cost to repair the dam exceeded \$800,000, and no guarantee could be given to the city that the repairs would last longer than 5 years. Rising costs and the increasing difficulty of acquiring insurance to cover the risk of dam failure were major financial factors. Over a presumed lifetime of commitment to repair, removal was significantly less costly while providing the significant ecological and recreational benefits that no alternative provides.

This project will complete the following tasks:

- Regularly convene an advisory committee that expands on the model used during the feasibility study.
- Identify and contract a qualified firm that will make progress on an engineering design plan that will include hydraulic (HEC-RAS) modeling to support a sediment management plan and measures to avoid potential impacts to the sensitive infrastructure identified in the feasibility study.
- Conduct additional sediment characterization and analysis with guidance and review from state officials. This will include bulk toxicity sampling and/or incremental sampling to reduce data
- Facilitate restoration planning by creating a technical planning committee of scientific experts, waterfront owners, and relevant municipal representatives so restoration efforts in the impoundment can begin immediately following removal. Previous dam removal and wetland restoration projects have demonstrated that revegetation rates can be high. Prompt action will be needed to manage invasive species. The restoration planning process will include a mussel relocation plan and invasive species management plan.
- Identify and pursue any required easements from property owners bordering the current impoundment.
- Identify and pursue permits and approvals that will be needed for construction in consultation with relevant state agencies.
- variability and biases in estimates of mean contaminant concentrations in a sampled area.
- The City of Ypsilanti will gather information and communicate project updates to affected residents and stakeholders following their engagement plan (included in submitted materials).

6. **Relevance**-450 words. How does the proposed project align with the goals of the Fisheries Habitat Grant and the theme(s) by which it would be funded? Describe how this project fits into larger conservation planning for the target waterbody (this may include the Wildlife Action Plan, DNR River Assessments, watershed management plans, species specific recovery plans, DEGLE priorities, etc.). Preference will be given to projects that successfully address Fisheries Division priorities listed in the Priority Habitat Conservation Projects list.

This project addresses a Fisheries Division priority of the Lake Erie Management Unit (Project ID LE-S-D.) due to its potential to restore connectivity and fish passage in the Huron River watershed and its restoration of an impoundment area. It is directly aligned with two themes of the Grant Program. First, the project matches the State Dam Grant funding goals of helping dam owners deal with aging dam infrastructure in a way that incentivizes improving health of aquatic resources. Second, the project aligns with the Aquatic Habitat Grant goal of using angler license revenue to address root causes of aquatic resource impairment while improving recreational fishing opportunities. The Huron River through Ypsilanti is a premier fishing location near major population centers that draws many licensed anglers every year. This project will lead to a highly visible return on investment to these anglers who helped provide the funding source of the program.

The DNR's Fisheries Division Special Report: Huron River Assessment (Hay-Chimielewski 1995) identified dams as a major root cause of impairment within the watershed. Following that report and in consultation with the DNR, HRWC evaluated dams and impoundments along the Huron River in 1998 and identified areas that would see the greatest ecological benefits from dam removal. The assessment identified the impoundments above Pen Dam in Ypsilanti, Argo Dam in Ann Arbor, and the Mill Pond Dam on Mill Creek in Dexter as priority restoration areas. Dam removal and impoundment restoration has since been a priority within our Middle Huron Watershed Management Plan (HRWC 2008). The proposed action at Pen Dam and other dams in the Huron River watershed will further inform pending updates to HRWC's watershed management plan.

Freshwater mussels are imperiled throughout North America and 38 mussels are listed as species of greatest conservation need in Michigan's Wildlife Action Plan. Much of the Huron mainstem is classified as a group 3 mussel stream (state and federally listed species) and the stretch immediately above and below Pen Dam impoundment has recent records of Elktoe, Purple Wartyback and Wavy-rayed Lampmussel, which have state special concern or threatened status. One of the primary causes of decline to mussel populations is habitat loss from dam construction. Dam removal could help improve recovery potential of these species by restoring riverine habitat and increasing water quality and suitable riffle habitat available for these mussel species as well as their host species, which are present in this stretch (such as channel catfish for Purple Wartyback and Wavy-rayed Lampmussel).

Climate change resilience is a primary lens for Ypsilanti's Master Plan and Sustainability Plan. Dam removal will contribute to the city's goals of sustainable infrastructure, improved water quality and habitat of the Huron River, and safety and well-being of Ypsilanti residents.

7. **Connection to ongoing activities**-300 words. Explain how this project builds upon or furthers the work of other habitat/watershed projects in the region. Explain how the benefits are unique to the project and waterbody and cannot be derived from other efforts if they currently exist.

The Huron River watershed is highly fragmented by dams which fundamentally impair its ecology. HRWC maintains an inventory of dams and has assessed the potential ecological value of removing several major dams. We've pursued removal when it's been feasible for Argo Dam in Ann Arbor, Mill Pond Dam in Dexter, and we have worked with Ypsilanti since they first began considering options for Pen Dam. HRWC is also submitting a proposal to the FHGP to conduct a feasibility study for removal of the Flat Rock Dam.

The removal of Pen Dam presents unique opportunities to advance HRWC's goal of improving aquatic habitat. No other stretch of the main stem has a comparatively high gradient and the potential to increase habitat for natural walleye reproduction in southeast Michigan. Removing the dam will benefit mussel populations by extending excellent habitat where the needed host fish species are present.

HRWC also monitors macroinvertebrate population health, and this project will increase the habitat available to them, potentially benefiting ecosystem conditions for forage and game fish species.

HRWC coordinates the Huron River Water Trail, a designated state and national water trail. We focus on improving the safety of the river corridor for paddlers and anglers while improving its recreational access. Removing Pen Dam would eliminate a major obstruction with no ideal alternative for improving safety.

HRWC conducts ongoing chemistry and flow monitoring programs, macroinvertebrate collection to assess water quality, and stream restoration. Each of these projects lends expertise from HRWC staff that will enhance the removal of Pen Dam and guide the restoration of the impoundment. HRWC's programs will expand to include the restored section of the river.

8. **Monitoring and evaluation**-250 words. How will you evaluate if the project goals and objectives have been achieved? Describe any potential obstacles that limit project success. How will strategies of navigating those obstacles be documented to guide future projects of a similar nature?

To avoid obstacles with surrounding landowners, project partners will engage affected stakeholders until project goals are reached. A successful engineering design study will incorporate the best available information, address any questions from EGLE, DHHS, and DNR, include new information gained during engineering design investigation, and incorporate perspectives from stakeholders in Ypsilanti, Ypsilanti Township, and Superior Township. A successful restoration plan will include an invasive species management plan and collaborative practices that the DNR Fisheries Division finds thorough and adequate preparation for action immediately following dam removal.

HRWC staff will be engaged with partners and experts during and after the proposal period to determine how to best objectively monitor the restoration process and conduct peer-reviewed research that will benefit similar dam removal projects in the future. Future scientific monitoring will expand on HRWC's existing water quality and flow monitoring efforts and expand on HRWC's macroinvertebrate surveys to assess ecological health.

Removal of the dam would initiate new research, management, and environmental monitoring programs that would not otherwise be possible. We would pursue the rare opportunity to study an active dam removal and restoration site of substantial size in an impaired stretch of river with significant ecological potential. Several area university faculty have expressed interest in research partnerships to evaluate the impacts on fish, macroinvertebrates, salamanders, and amphibians. Other research groups are interested in observing the social effects of restoration, or want to help HRWC improve impoundment restoration practices by using Pen Dam as a featured case study.

9. **Sustainability of project benefits**-250 words. How quickly will the benefits of the project be realized, how long are they expected to last, and how will those benefits be sustained over time?

Ultimately, the removal of Pen Dam will not be possible without engineering design and restoration plans. The engineering design study and restoration plans developed during this project will directly and immediately inform the removal of Pen Dam. It will identify unforeseen issues and address the core challenges highlighted in the feasibility study, namely infrastructure impacts and appropriate management of sediment above the dam.

As with previous dam removals, case studies regarding the physical, social, and political obstacles of dam removal will benefit others working in this field, and the project partners intend to share lessons learned from both our challenges and successes.

Results from other dam removals across the country, Michigan, and within the Huron River watershed suggest that following the removal of Pen Dam, numerous ecological benefits will be apparent within months of physical removal of the dam. Substantial revegetation of the impoundment area is likely within two growing seasons (based on the rate of regeneration in other restored impoundments in

similar climates). Fish species often begin utilizing restored river channels in the first season following completed removal. The ecological benefits of removal and restoration for the current impoundment area will be transformational and effectively permanent with appropriate, ongoing stewardship. HRWC and the City of Ypsilanti are committed to helping provide that stewardship and care.

10. **Budget narrative and work plan**-500 words. Explain the expected timeline of major project tasks. Outline and describe the likely costs of each project component and any opportunities for cost savings.

This project includes 4 major project tasks: 1) management of an engineering design study, 2) advisory committee coordination, 3) restoration planning, and 4) community engagement.

1 – HRWC and Ypsilanti will co-lead the development of an RFP to make progress on an engineering design study for the removal of Pen Dam. Proposals will be solicited from engineering firms with expertise in dam removals. The RFP and initial engagements with the selected engineering firm will incorporate community feedback and information gathered from other project tasks. The contract with the firm will be finalized as soon as possible after receipt of funds and design study will be advanced until the funds are exhausted. Based on guidance from DNR and EGLE staff, consultation with engineering firms, and review of previous dam removal projects, engineering design costs generally fall within 10-15% of the total estimated construction cost of removal. In this case, conceptual designs were provided by the feasibility study, but we expect additional sediment analysis will be required. In our original proposal, we estimated engineering design costs at \$397,500, or just under 15% of the estimated removal cost. With the available funds awarded, we will be able to make significant progress, but will be unable to complete the full scope of engineering design.

The contracted components of the comprehensive engineering design and sediment analysis will include:

1-1) Project administration and addressing safety needs.

1-2) Document review, site research, correspondence and coordination. Initial site reconnaissance and document review will be conducted. A kickoff meeting with state officials will be held to solicit their feedback on critical issues, especially sediment sampling and hydraulic modelling. Consultants and project partners will follow-up with correspondence. Consultants will assist HRWC and City of Ypsilanti staff with outreach to railroad, downstream dam owner, and other stakeholders.

1-3) Sediment sample collection and analysis. Consultants recommend varying degrees of analysis. The most thorough recommendation called for approximately 11 transects through the impoundment with 3 collection points per transect. Testing would include metals, PAHs, BOD, #200 sieve, phosphorus, and dioxin/furans (downstream only) as appropriate based on guidance from experts and state officials. It is probable that additional sediment sampling will be required at a later phase when the impoundment is partially dewatered to refine sediment management and disposition methods. Consultants and project partners will work with state officials throughout the project to plan and adjust the method and scope of sediment collection and analysis. They will also work with relevant state officials to address any sediment management concerns that arise.

1-4) Survey. A bathymetric survey of impoundment (6,500 feet upstream from dam) is recommended, including pickup of shoreline, inlets and bridges. A bathymetric survey of approximately 1,000 feet downstream of dam is also recommended, as is identifying the river profile with additional cross-sections from Superior Dam to 1 mile downstream of Peninsular Dam.

1-5) Hydraulic modeling. As-built information on bridges will be reviewed. MiSAIL data will be used on overbank area and newly collected bathymetric data to construct an intermediate hydraulic model from Superior Dam to approximately LeForge Rd. The model will use EGLE flow data. At this phase, model cases will be limited to estimating the relative change in scour potential at the 2 upstream bridges and suggesting armoring. Geotechnical conditions near the bridges will be estimated using best available information. Almost certainly, a complete geotechnical investigation at the bridges will be required in a

later phase along with a geotechnical investigation along the railroad tracks running close to the southwest side of the impoundment.

1-6) Deliverables. A preliminary design basis report will be produced, which will include results of the sediment analysis, bathymetry and hydraulic analysis. The information will be used to suggest next steps and inform the geotechnical analysis.

Project partners will work with relevant state officials and experts to refine and adjust the above components of the comprehensive engineering design as needed as the project progresses.

2—HRWC staff will coordinate an advisory committee with representatives from affected communities and stakeholders. We anticipate an initial plenary meeting and regular meetings held in Ypsilanti. Costs include staff time to organize, prepare, and summarize meetings, as well as some limited materials and logistics costs.

3—HRWC staff will coordinate a technical restoration planning committee comprised of experts and affected stakeholders. We anticipate an initial plenary meeting and regular meetings held in Ypsilanti. Costs include staff time to organize, prepare, and summarize meetings, as well as some limited materials and logistics costs.

4—Ypsilanti city staff will lead community engagement associated with this project. HRWC staff will provide support as needed. Much of the time and costs related to this task will take place before the grant period and will be absorbed by the city's match. Ongoing communication, outreach, and efforts to document the removal design process will continue through the project period.

Amended costs for supplies, materials, and equipment are estimated at \$1700. This includes printing costs for communication materials and social media promotion of community outreach events.

Amended contractual costs total \$240,600, which includes \$230,000 for the engineering design, bathymetry, hydraulic modelling, and additional sediment, collection, characterization and analysis. Other contractual costs include HRWC's contracted construction manager and a facilitator for public meetings.

Amended travel costs are \$200, for meals, mileage, and lodging.

Indirect costs are 10% of the amended project subtotal.

The amended amount requested matches the awarded funds (to the nearest \$100 not exceeding the awarded amount) of \$327,877. The matched amount from HRWC and Ypsilanti is \$73,100 (18.2%). The amended total project cost is \$400,900.

11. **Cost effectiveness**-300 words. Why is this project a good investment of limited conservation dollars? How do the benefits outweigh the costs?

Removing Pen Dam matches two goals of the Fisheries Habitat Grant program. First, it perfectly matches the goal of the State Dam Grant funding, to help dam owners address aging dam infrastructure in a way that improves aquatic resources. Second, it matches the goals of the Aquatic Habitat Grant, to address root causes of aquatic resource impairment and improve fishing options for anglers who provide the funding. For both goals, the clear benefits of removing Pen Dam far exceed the initial investment.

The potential benefits to southeast Michigan fisheries are unique in the region. There are few other locations, if any, where improving such riverine fishery conditions on the main stem of a large river is possible. This project will restore habitat that has a high likelihood of increasing abundance of aquatic invertebrates, forage fish and game fish species such as channel catfish, smallmouth bass and walleye. Return of an impoundment to riverine habitat in an area adjacent to previous detections of state special concerned and threatened mussels species increases potential to support these mussel species given

that their preferred habitat and host fish species will be present. The long-term benefits to the overall ecological health of the river through restoration to natural riverine conditions in this rare higher gradient stretch of river in southeast Michigan outweigh the short-term cost of dam removal.

Pen Dam is located near major, diverse population centers. Ypsilanti's stretch of river and Ford Lake is exceptionally popular with licensed anglers from across the state. This project will not only benefit the Huron River, but will also be a highly visible example for other communities considering ambitious restoration projects. It will provide a prominent, welcome return on investment to anglers that use the river, and will reinforce the need for future investments to these funding sources.

12. **Project team**-250 words. Demonstrate the applicant's ability to implement a project of this nature. Outline how typical project roles such as manager, engineer, partners, and public involvement will be selected or handled during this project. Include any recent examples the project team may have with this type of project.

HRWC has decades of experience managing many complicated projects that span multiple jurisdictions. Our staff includes watershed planners, ecologists, and construction managers with experience in project management, community engagement, vulnerability assessment, stream restoration, ecological assessment, and construction design. We recently restored habitat on the main stem of the Huron River through Ypsilanti, and we are actively restoring Norton Creek in Wixom. Our natural areas assessments, macroinvertebrate collection programs, and chemistry and flow monitoring efforts are ongoing and will inform several dimensions of this project.

HRWC staff supported restoration planning for the Mill Pond dam removal in Dexter and the Argo Dam and cascades in Ann Arbor. Our construction manager provided technical support to the Boardman Dam removals in Grand Traverse County and led the restoration design and permitting process for the creation of Mill Creek Park in Dexter. HRWC has been working with Ypsilanti since the city began investigating options for the future of Pen Dam. Together, we guided the decision-making process and feasibility study to its current status.

HRWC and the city will lead an advisory committee to incorporate a broad range of perspectives. The advisory committee will expand on the model established during the feasibility study. The advisory committee will include representatives from the city, HRWC, Ypsilanti and Superior Townships, bridge owners, relevant scientific experts, area environmental conservation organizations, affected residents, and waterfront owners. We will engage DNR, EGLE, and DHHS staff throughout the project, and state officials will be welcome to participate at any time.

With guidance from the advisory committee, HRWC and Ypsilanti will contract an engineering firm to make progress on an engineering design study, and, as appropriate, facilitate community engagement events.

HRWC will be the administrative lead for the grant. The City of Ypsilanti will lead community engagement efforts.

13. **Necessary authorizations**-250 words. Does this project have any special considerations and how will you address them? This may include mussels, threatened and endangered species, contaminated sediment, sea lamprey management, State Designated Natural River permitting, and/or other regulatory considerations.

The feasibility study indicated the railroad and Superior Road bridges may be affected by dam removal. HRWC has communicated with representatives from both bridge owners. Neither has a formal review process, but Ryan Hoensheid, P.E. with the Office of Rail at MDOT, and Nate Murphy, P.E. with Washtenaw County Road Commission, agreed to serve on the advisory committee to make sure any issues are identified throughout the design process and stakeholders are informed prior to permit public comment periods.

Prior conversations with EGLE and DNR indicated additional sediment analysis is required to understand the exceedances in the feasibility study and determine sediment management strategies. This will include bulk toxicity sampling and/or incremental sampling to reduce data variability and biases in estimates of mean contaminant concentrations in a sampled area. We will continue consulting with EGLE, DHHS, and DNR staff throughout the proposed design phase to comply with all applicable criteria. Protecting the valuable habitat that currently exists below Pen Dam to Ford Lake will be the top ecological priority throughout the removal process.

Our DNR Fisheries Division supervisor indicated freshwater mussels are a primary species of concern regarding sediment release during dam removal. The river from Pen Dam to Ford Lake is a Group 3 mussel stream; both state and federally listed mussels may be present. Throughout the removal and restoration design process, we will consult with DNR and USFWS experts to conduct a mussel survey and potentially develop a safe relocation plan of mussels away from the dam.