



## Pipeline Megunticook Watershed Flood Resiliency and Habitat Restoration

### Part I Pre-Proposal – Project Overview

#### 1. Project Context:

*Town owned dams currently require significant time and maintenance on the part of town staff. Heavy rain and Spring melting events mean daily and sometimes hourly adjustments to the dams in order to prevent lakeshore property and downtown flooding. The dams also require Town investment in insurance, periodic assessments and other investments for repair, operation and maintenance. Meanwhile, the river has been ignored for many years following the legacy of industrial development since the founding of the Town in the late 1700s. The dams no longer serve their original intent, and have led to degraded conditions in the watershed. The lowest 3 dams function as choke points that raise the base flood elevation and limit the options for management of the dams in the upper watershed to reduce flooding of Megunticook Lake and Norton Pond. Additionally, they block passage of fish and other aquatic organisms and create a series of management and maintenance complications. With increasing precipitation and changing flooding patterns as a result of climate change, there is opportunity to enhance flood management and resilience along the Megunticook River.*

*In 2019 the Town of Camden received NCRF support for the completion of site assessments and initial designs that would lead to flood risk reduction and habitat restoration throughout the Megunticook River Watershed. In particular, the study focused on 7 dam sites, 3 of which are located in the immediate downtown area and contribute to elevated flood risk for private and public infrastructure across multiple properties. Funding is being requested to pursue design recommendations and project management associated with the recommendations outlined in the feasibility study.*

2. **Proposed Solution:** *The feasibility study outlines the recommended options for 3 privately owned and 4 town owned dams. Funding for this round would be used for community engagement and coordination with public and private property owners to complete a review of conceptual design options followed by final design and engineering for the 4 lower dams and associated structures in their impoundments as well as 50% design for fish passage options at the 2 remaining sites where dam removal was not found to be a feasible option.*

**Project Category:** Project Final Design and Permitting

#### 3. Communities to Benefit:

*The Town of Camden is well positioned to work extensively with local groups, conservation organizations, and other individuals within the community. Earlier phases of the project have included work with a broad range of local partners including the Camden-Rockport Middle School, the Watershed High School, Maine Sea Grant, Trout Unlimited, the Megunticook Watershed Association, Coastal Mountains Land Trust, Midcoast Conservancy, The Nature Conservancy in Maine, Maine DEP, Maine Department of Marine Resources, The Penobscot Nation, NOAA’s Restoration Office, Passamaquoddy elver fishermen, the Camden Public Library, and others.*

*Given that Camden is a local service center and a significant tourist destination, the highly visible project locations in the heart of downtown Camden create the opportunity for benefits to the community that extend far beyond local residents. Camden Harbor supports an active working waterfront with commercial fishing operations ranging from lobster to elver to urchin harvesting. The lobster fishermen in particular would benefit from the availability of alewives for bait. Camden is an important location for elver harvesting and improved passaged for elvers would support the long term sustainability of this important fishery, especially for Maine’s native American population.*

Town of Camden, Maine:

Population 5,232

Median Age: 51.9 years



**FOR PRE-PROPOSAL – STOP HERE**

Race: 96.4% white  
Ethnicity: 94.8% white alone  
Poverty Rates: 6.2%

Median Age: 54.8  
Race: 94.4% white  
Ethnicity: 94.4% white alone  
Poverty Rate: 7.1%

Population 1,698  
Median Age: 44.3  
Race: 93.3% white  
Ethnicity: 93.3%

Town of Lincolnville, Maine:  
Population 2,312

Town of Hope, Maine:

Poverty Rate: 7.2%

4. **Anticipated Community and Fish and Wildlife Benefits:** *The project includes multiple dam sites along the Megunticook River which drains a 30.9 square mile coastal watershed that empties to Camden Harbor and Penobscot Bay, in midcoast Maine. The river extends 3.5 miles from the head of tide to Megunticook Lake in the middle watershed, with numerous ponds, wetlands and tributaries above the lake. The six intact and one breached dam are located between the head of tide at Camden Harbor and Megunticook Lake. The watershed includes potential habitat for alewife, blueback herring, sea-run brook trout, wild native eastern brook trout, American eel, Atlantic salmon and rainbow smelt. Notably the watershed has potential to support a population of 300,000 to 500,000 alewife. The Megunticook watershed is within the Penobscot salmon habitat recovery unit (SHRU) for Atlantic salmon and the Penobscot Habitat Focus Area under NOAA's Habitat Blueprint. Restoration of the Megunticook River's historical sea-run fish support the goals of the recovery plan for endangered Atlantic salmon.*

*The project area includes a significant public access and educational component. Four of the dams are town owned and all of the impoundments include existing public parks and other publicly owned land such as the Camden Wastewater Treatment Plant and the Camden Rockport Middle School, where the extension of an existing community riverwalk is planned. Earlier phases of the project have included extensive stakeholder engagement and the next phase will expand on these efforts to bring 4 of the sites to the final design phase.*

#### **A. Methods and Activities:**

##### **Stakeholder engagement and community collaboration**

The feasibility study funded by NFWF in 2019 helped lay the foundation for a broad assessment of 7 dams within the watershed as well as their respective impoundments and adjacent properties. Four of the dams are town owned and most of their impoundments are adjacent to public property. Expanding on public engagement and finding innovative ways to incorporate public knowledge is of critical importance during the next phase of the work. The complexity of this project and the fact that all of the central sites critical for restoration are located with the Town of Camden creates both a challenge and an opportunity for public engagement and we believe that this project has the potential to serve as model for other communities facing similar challenges.

The Town of Camden is a typical New England style democracy where Select Board members are elected to oversee the Town Manager and to make recommendations on the budget and ordinances, but the final decision for most town matters lies with the electorate and is subject to a public vote. As such, any major investment in the repair or maintenance of the dams owned by the Town of Camden depends on a plan that is supported by the majority of residents in the form of a public vote. For this reason, it is of critical importance that the detailed design phase of the project focuses on ensuring broad participation that allows the public to fully understand the options and the short and long term costs of each of them. The feasibility phase of the study included significant public engagement despite the challenges presented by the pandemic. However, many residents refrained from engaging due to various pandemic related concerns or technology barriers. The project has attracted significant interest both locally and regionally and it is now safe to say that most Camden residents are aware of the proposals and ongoing evaluation of dam removal and fish passage options throughout the watershed. Although much information is available on the Town of Camden website and has been disseminated during public meetings, we have received feedback that much of it is too technical and not easily digestible by non experts and that residents and stakeholders need to be involved in developing additional visual references and options in order to feel prepared for a public vote.

We propose to contract with an outside firm with expertise and experience connecting citizens to the science-based decision making on environmental and infrastructure issues to develop a decision-making matrix to help residents understand the choices and challenges we face.

The Town of Camden Select Board is currently in the process of interviewing potential consultants to develop a scope of work for a first phase of planning, and will proceed independently of whether or not this funding request is successful. This work will be expanded if we are successful in the grant request. To date, proposals for the work have been received from Source to Sea, Biohabitats, and FB Environmental. In addition, the Town will build on existing relationships with Maine Sea Grant and the Knox-Lincoln Soil and Water Conservation District to engage citizens in decision making through a variety of methods. \$30,000 in funding for this purpose is available in the town approved budget for fiscal year 2021-22 and another \$30,000 is available pending voter approval in mid-June. Initial tasks identified by the Select Board to be completed over the summer include:

- The development of a community advisory committee that will advise the Select Board and work with the consultant to develop a list of frequently asked questions and answers as well as advise the Select Board on additional information needed to prepare citizens for a public vote.
- Development of a plan for working with private property owners on design related matters that impact private property. The consultant will be a direct point of contact for private dam owners and property owners potentially impacted by implementation of any of the design alternatives.
- Facilitate the sourcing and presentation of information, conceptual drawings, and cost estimates in a way that prepares the community to understand the options available and the short and long term costs.
- The consulting firm will help be a point of contact for the numerous partnerships and connections we have already established in the community. We have frequent requests from universities, local schools, and local citizens for opportunities to get involved and learn more. Projects completed to date include public art and educational signage on the Public Landing by students from a local high school, design recommendations from students studying climate change, and sea level rise mapping and arcgis story maps by university interns from Bowdoin College. Opportunities to expand the efforts are extensive and dovetail nicely with plans already in place for the completed and planned sections of the Megunticook Riverwalk and the Town owned Public Landing. Camden is one of the most visited towns in Maine during the summer months and the highly visible Montgomery Dam and adjacent Harbor Park sea wall offer a real time opportunity for people to witness the impact to infrastructure associated with rising seas and more frequent rain events.

The focus point of the entire project centers around the Montgomery Dam. This site, as well as the adjacent Harbor Park and the Public Landing are highly public areas of critical importance to the larger community, both aesthetically and functionally. With numerous impacted property owners and users ranging from tourists to commercial fishermen to shopkeepers, the design must be aesthetically pleasing and consistent with the Olmsted designed historic assets nearby. On a related note, the ultimate success of actions taken in other parts of the watershed depend on highly functional fish passage that maintains important aspects of the waterfall aesthetic while reducing the bottleneck effect and the need for opening and closing a gate and related maintenance.

With the Select Board structure of government, the Town is extremely well positioned and accustomed to involving citizens and private property owners through direct community engagement and have done so extensively related to the river restoration and resilience planning. The form of government and the public review required for all actions often lends itself to smaller, reactive decisions and taxpayer funding requests rather than comprehensive evaluation that requires multiyear planning and funding. This opportunity through NCRF is a critical tool for small towns seeking to plan more effectively for a changing climate. Select Board discussed and approved this grant application in a public meeting where citizens had the opportunity to make comments.

Many of the conversations are typical of any river restoration or dam removal discussion for similar communities, but unlike other similar watershed scale projects, the fact that all the dams are located within the boundaries of a single town, means that Camden residents and officials must grapple with multiple projects all at once. The level of public interest in the topic has reached a tipping point where the capacity of Town staff and elected officials to meaningfully engage with all interested parties and community members will be exceeded in the next phase of the project.

**Montgomery Dam and Harbor Park:** This site is unique in that it faces threats from both sea level rise and increased extreme rain events and impacts a diverse group of stakeholders with concerns and interest ranging from historic preservation to commercial fishing to recreation to tourism. It's highly public location serves as an opportunity to be a classroom for visitors and residents alike through the use of temporary educational signage and other activities. This phase of the project will build on existing conceptual designs and hydrogeological and bedrock surveys to create multiple design options that can be reviewed with stakeholders and community members. Due to the proximity of the dam to the Olmsted designed Harbor Park as well as the visual impact to adjacent property owners and the sensitivity surrounding the historic nature of the district, we propose to develop 3 designs to the 50% design phase with cost estimates and a summary of the pros and cons from an operational, financial, resiliency, and habitat connectivity perspective.

In order to more effectively communicate the pros and cons of various approaches with the public, we propose to work with an advisory committee or committees to develop these options and prepare questions and answers for public review. At least two of the options will maximize opportunities for nature-based approaches, reduction in base flood elevation, and natural fish passage optimization, while the third will explore and develop a design that would more closely mirror existing conditions.

- We will build on work begun in 2020 to develop a dam removal option that would restore the river's natural path over bedrock to the greatest degree possible, restoring the former intertidal estuary at its outlet and removing the fill that was imported in the 1930s to reveal the original Megunticook Falls where Camden's first dam was erected. A new sea wall will be designed that is a hybrid between soft and hard erosion control techniques and incorporates living shoreline principles to the highest degree possible.
- A second dam removal conceptual design will follow up on input from the Library Board of Trustees, which has the authority to make decisions regarding Harbor Park. The plan here will be to minimize disruptions to Harbor Park and create a fish passage channel instead by modifying bedrock adjacent to the sluiceway. We will work with the Trustees of the Library (who are appointed by the Camden Select Board) to develop multiple design options and cost estimates for various approaches to retrofitting the seawall to be more resilient to sea level rise and less reliant on grout and concrete. Costs and benefits related to intertidal habitat, fish passage, costs, historic preservation, and long term maintenance will be developed into a summary table with community input.
- In order to help people more fully understand why nature based solutions are being considered by the town and favored by funding agencies, we propose to work with stakeholders to develop a design and long and short term cost estimates for an option that retains the existing dam and the Harbor Park seawall to the greatest degree possible without attempting to incorporate nature based solutions. Public comment has indicated an interest in more fully answering questions about the viability of simply raising the sea wall in Harbor Park and bringing in more fill, enlarging and/or automating the gate on Montgomery Dam, building a fish ladder around the dam, adding fall protection, etc. We will develop cost estimates and begin permitting discussions on these grey infrastructure solutions in order to more clearly differentiate for residents the difference in costs and benefits between the current design and a more nature based approach. It is understood that this solution would be unlikely to obtain funding through this or other federal programs, but it is necessary for the public to understand the full costs of the status quo and the modifications that would need to be made to the dam to preserve it into the future. A similar exercise is needed for the existing sea wall.

Specific technical tasks will include:

- Selected supplemental field data collection - Data collection will supplement that collected during the feasibility study to support advancing the detailed design from refined 50% complete to 100% complete bid-ready design documents and project permitting. Supplemental data collection may include selected topographic and bathymetry data, and data on structures.
- Hydraulic modeling – advance the hydraulic model developed for the feasibility study for the ultimately selected project alternative to support development of detailed designs and project permitting
- Develop detailed designs – advance the detailed designs from to refined 50% complete designs and to 100% complete bid ready designs
- Detailed designs will include sediment management, supplemental structural, and landscape design.

- Integrate with Harbor Park and Seawall Improvements
- Develop project specifications and cost estimates
- Support community stakeholder outreach activities
- Project permitting, including historical structures assessment and documentation plan.
- Detailed technical scope of work available upon request

### ***Main Street-Washington Street Stormwater and Flooding Improvement***

- Coordinate with MDOT on planned repairs/replacement of bridge #2497 which has been identified on the project list for its first major upgrade since 1931. The bridge is located within the area of the Montgomery Dam impoundment and inspections and work on the bridge require drawdown of the water.
- The feasibility study identified relic structures such as weirs and a decorative water wheel that likely contribute to flood risk in this area. We will complete design, permitting, and stakeholder engagement for a restoration of the river channel, removal of barriers, and any necessary or beneficial adaptations to buildings.
- Assess the relative impact of the Town of Camden stormwater infrastructure and smaller tributaries to the flood risk. There is a stream that runs from the Camden Bog, behind Pearl Street, under free street and is buried under a parking lot. It overflows and floods the barber shop before attempting to make its way into town catch basins and under the bagel café.
- Specific technical tasks will include:
  - Selected supplemental field data collection - Data collection will supplement that collected during the feasibility study. Supplemental data collection will include selected topographic and bathymetry data, and data on existing structures.
  - Hydraulic modeling – advance the hydraulic model developed for the feasibility study for the assessment
  - Develop conceptual design for river resilience measures beneath the Brewster building
  - Develop project cost estimates
  - Support community stakeholder outreach activities
  - Project permitting review.
  - Detailed technical scope of work available upon request

### ***Knox Mill***

- Design and permitting for dam removal, stakeholder engagement, permitting, cost estimates, and pursue any additional options for giving the river some more room between the buildings?
- Evaluate impact to groundwater levels and infiltration into properties in areas directly adjacent to mill pond.
- Develop cost tables that answer questions around property value changes related to flood plain and aesthetic changes.
- Review and present at least 2 landscaping options to accompany dam removal plans. Move forward on construction ready plans and permitting discussions for the landscaping option that is most desirable to stakeholders.
- Specific technical tasks will include:
  - Selected supplemental field data collection - Data collection will supplement that collected during the feasibility study to support advancing the detailed design from 50% complete to 100% complete bid-ready design documents and project permitting. Supplemental data collection will include selected topographic and bathymetry data, and impounded sediment samples as needed to comply with Maine DEP dredging/solid waste management requirements.
  - Hydraulic modeling – advance the hydraulic model developed for the feasibility study for the dam removal alternative to support development of detailed designs and project permitting
  - Develop detailed designs – advance the detailed dam removal and restoration designs from the current 50% complete designs to 100% complete bid ready designs
  - Detailed designs will include sediment management, supplemental structural, and landscape design.
  - Integrate with river walk as appropriate
  - Develop project specifications and cost estimates

- Support community stakeholder outreach activities
- Project permitting, including historical structures assessment and documentation plan.
- Detailed technical scope of work available upon request

### ***Knowlton***

- Advance the dam removal design from 50% to 90-100% design, including integration with the riverwalk. Sediment testing, disposal options, beneficial reuse, and wetland restoration for flood storage throughout the impoundment.
- Coordinate design with the wastewater treatment plant upgrades.
- Specific technical tasks will include:
  - Selected supplemental field data collection - Data collection will supplement that collected during the feasibility study to support advancing the detailed design from 50% complete to 100% complete bid-ready design documents and project permitting. Supplemental data collection will include selected topographic and bathymetry data, and impounded sediment samples as needed to comply with Maine DEP dredging/solid waste management requirements.
- Hydraulic modeling – advance the hydraulic model developed for the feasibility study for the dam removal alternative to support development of detailed designs and project permitting
  - Develop detailed designs – advance the detailed dam removal and restoration designs from the current 50% complete designs to 100% complete bid ready designs
  - Detailed designs will include sediment management, supplemental structural, and landscape design.
  - Integrate with river walk as appropriate
  - Develop project specifications and cost estimates
  - Support community stakeholder outreach activities
  - Project permitting, including historical structures assessment and documentation plan.
  - Detailed technical scope of work available upon request

### ***Rawson Avenue Area / Tannery Property Assessments and Opportunities Analysis***

- ***Rawson Ave crossing and tributary at pump station***
  - Extend the feasibility study model throughout the catchment area of the tributary that is overtopping Rawson Ave on a regular basis and control erosion throughout the riparian area to limit sediment migration that is currently impacting the Megunticook River regularly. Identify road crossing design options that won't be subjected to regular flooding and disruption of road access.
- ***Rawson Ave Pedestrian Bridge***
  - Coordinate with the design of the new pedestrian bridge to be designed and constructed by others. Coordinate to ensure stream smart crossing design standards are met at a minimum, and facilitate design of a resilient crossing. Evaluate opportunity to restore adjacent riparian zone.
- ***Tannery Property Riparian Restoration Opportunity Analysis***
  - Evaluate opportunity to mitigate existing waste along and buried in riverbank in a comprehensive manner that also enhances river and riparian functions, and results in a more resilient stream reach along this popular Town-owned property.
  - Integrate concepts with existing riverwalk, to result in restored floodplain functionality and habitat.

### ***Powder Mill Dam***

- Advance the dam removal design from the feasibility study concept to 50%-75%-100% designs,
- Specific technical tasks will include:
  - Selected supplemental field data collection - Data collection will supplement that collected during the feasibility study to support advancing the detailed design through 50% complete to 100% complete bid-ready design documents and project permitting. Supplemental data collection will include selected topographic and bathymetry data as required.

- Hydraulic modeling – advance the hydraulic model developed for the feasibility study for the dam removal alternative to support development of detailed designs and project permitting
- Develop detailed designs – advance the detailed dam removal and restoration designs from 50% and 75% complete designs to 100% complete bid ready designs
- Detailed designs will include sediment management, and landscape design.
- Develop project specifications and cost estimates
- Support community stakeholder outreach activities with basic renderings and other support
- Project permitting, including historical structures assessment and documentation plan.
- Detailed technical scope of work available upon request

### ***Seabright Dam***

- Advance design planning at this site. Evaluate and facilitate selection of final project alternative through characterization of the two highest ranked feasibility study fish passage alternatives. Dam will be retained in place.
- Based on selected alternative, complete 50% design of selected fish passage and seek to coordinate decisions and construction timing with any other needed work to the dam and spillway. Design educational signage to accompany riverwalk and public park adjacent to coastal mountains land trust property.
- Specific technical tasks will include:
  - Selected supplemental field data collection - Data collection will supplement that collected during the feasibility study to support advancing the alternative analysis and conceptual design to 50% complete level. Supplemental data collection will include selected topographic and bathymetry data as required, structure data, and water level logger deployment in impoundment to record impoundment water level fluctuations.
  - Hydraulic modeling – advance the hydraulic model developed for the feasibility study for the alternatives analysis, conceptual design and 50% complete design
  - Development of conceptual designs for alternatives evaluated to facilitate selection of a preferred alternative by stakeholders.
  - Describe alternatives in terms of function, cost, effectiveness
  - 50% designs will include integration with recreational user access and revegetation/landscape design.
  - Support community stakeholder outreach activities with basic renderings and other support
  - Project permitting review
  - Detailed technical scope of work available upon request

### ***East and West Dam (Megunticook Lake Outlet)***

- Evaluate ability of dam to pass 100 year flood
- Advance design planning at this site. Evaluate and facilitate selection of final project alternative through characterization of the two highest ranked feasibility study fish passage alternatives. Dams will be retained in place. One alternative each for fish passage at East Dam and West Dam will be evaluated.
- Based on selected alternative, complete 50% design of selected fish passage and seek to coordinate decisions and construction timing with any other needed work to the dams and spillways.
- Specific technical tasks will include:
  - Selected supplemental field data collection - Data collection will supplement that collected during the feasibility study to support advancing the alternative analysis and conceptual design to 50% complete level. Supplemental data collection will include selected topographic and bathymetry data as required, structure data, and water level logger deployment in impoundment to record impoundment water level fluctuations.
  - Hydraulic modeling – advance the hydraulic model developed for the feasibility study for the alternatives analysis, conceptual design and 50% complete design
  - Development of conceptual designs for alternatives evaluated to facilitate selection of a preferred alternative by stakeholders.
  - Describe alternatives in terms of function, cost, effectiveness

- 50% designs will include integration with recreational user access and revegetation/landscape design.
- Support community stakeholder outreach activities with basic renderings and other support
- Project permitting review
- Detailed technical scope of work available upon request

**B. Implementation Timeline and Milestones:** Overall project activities will be scheduled and phased as appropriate in concert with stakeholder outreach activities and community-based decision-making. Please see below snapshot, which is also available via attached upload. Schedule arranged according to a two-year project timeline, stemming from June 1, 2022 to May 31, 2024. **Please see attached upload for details.**

**Monitoring Project Impact:** Use this section to expand on how stated community and wildlife benefit goals align with established resilience or other plans where applicable (provide links to plans when possible.), how metrics listed in the Metrics Section will be monitored and additional metrics that will be tracked beyond required NFWF metrics to evaluate project progress and success in achieving stated community and wildlife benefit goals.

**Project Team & Partners:**

- Town-employed Dam Control Agent, David Bolstridge – 32 years of experience in a variety of water resources, waste water, and environmental engineering and management roles
- Town-employed Planning and Development Director, Jeremy Martin – 22 years of experience in a variety of community planning and development, natural resources and environmental management
- Camden Select Board and Town Manager Audra Caler
- Inter-Fluve - environmental engineering firm that specializes in sustainable design, restoration and construction of river, lake, wetland, fish passage, dam removal, and aquatic ecosystems. Staff assigned to the effort with over 60 years of combined experience on similar projects.
- Gartley & Dorsky – Camden-based civil/structural engineering and surveying firm with extensive knowledge and experience associated with Town infrastructure.
- Community Consultant: To be determined based on Select Board review process currently underway.
- Selected Additional Technical Consultants: Additional technical disciplines will be engaged as needs arise during the course of the effort, in part depending on the outcomes from stakeholder processes and early phase advanced alternatives evaluations. Some of these may include specialized dam engineering and technical fishway design, historical resource consulting, landscape design consultation, and regulatory permitting consultation. Supplemental technical consultants will be selected from trusted Maine-based regular collaborators, but will also be selected with key input from project stakeholders.

**a. Other (Optional):**

**b. Uploads Description:**

1. *Photos:* Via the Uploads section of the proposal, please include 1-3 photos of the project location or activities. **For each uploaded photo, provide a photo credit and brief description below.** Example — *Photo 1: John Smith, NFWF. Photo of the current eroded area to be addressed by plantings.*

Photo 1: High tide flooding in Harbor Park adjacent to Montgomery Dam by Jeff Senders

Photo 2: Knox Mill Flooding during Spring Rain event in 2005 by Holly Anderson

Photo 3: High water during normal Spring rain event upstream from the Main Street Bridge







