

**Maine Infrastructure Adaptation Fund and  
Municipal Stream Crossing Application**

**Section 1: General Information**

Applicant Name(s): Island Heritage Trust (IHT)		
Contact Person: Julia Zell, Executive Director		
Mailing Address: PO Box 42		
City: Deer Isle	State: Maine	Zip: 04627
Daytime Phone No.: 207-348-2455	Email: jzell@islandheritagetrust.org	
Has this projected received FEMA or Insurance funds?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>NOTE: The following sections of this application request specific project-related information. If warranted, pictures, maps, exhibits, diagrams, survey summaries, etc., should be included with the application. Please be concise. If additional space is required, please attach supplemental sheets.</p> <p>For those applying for Municipal Stream Crossing Program, Section 2, parts A, B, and F have additional information that is required, fill out the lines that say “<b><u>Additional information needed for MSC</u></b>”. That information is not applicable for Maine Infrastructure Adaptation Fund.</p>		

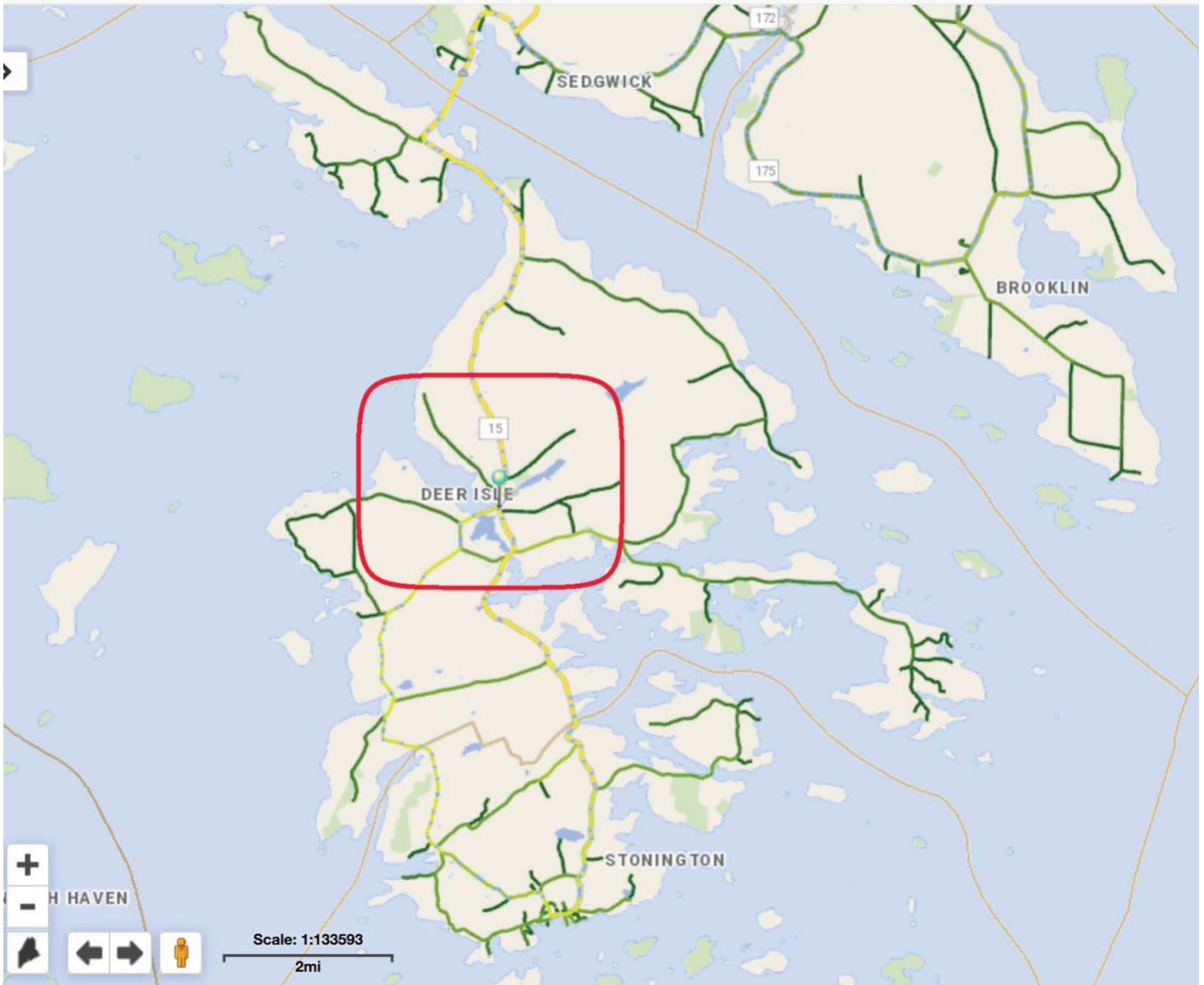
**Section 2: Project Information**

A. Project Location

Provide latitude/longitude (decimal degrees), abutting street name(s), and additional project location references. Feel free to attach designs/ diagrams, maps, etc. that will help provide a clear description of the proposed scope and location.

There are 3 interrelated project site locations, and we were advised this is one project application because they are all inextricably interdependent upon each other.

- State Highway Route 15, Church Street, Culvert at Eel Brook, Deer Isle; Coordinates: 44.2241, -68.6782; Segment ID: 33209; MaineDOT Region Number 4; Cross-Culver number: 169570; Maine Stream Habitat Viewer Crossing Site ID: 51117;
- Lily Pond Dam, Deer Isle; Eel Brook, Deer Isle; Coordinates: Site 1: 44.2273, -68.6733; Maine Stream Habitat Viewer Crossing Site ID: D1504; Hydrologic Unit Code (HUC): 010500021908;
- Proposed New Firewater Tank System, Deer Isle; Coordinates: 44.2267, -68.6759;



^ State Highway Route 15 is the primary transportation way for the largest economic fishing port in the State of Maine (Stonington). MaineDOT has already invested significantly in vulnerable assets and infrastructure along this route, such as recently at the Holt Mill Pond Bridge on the Deer Isle / Stonington Town line and evaluating solutions for the Deer Isle causeway, the Deer Isle-Sedgwick Bridge, and the bridge landing causeway.

This three-phase project includes one of the few remaining significant infrastructure vulnerabilities on this transportation route in Deer Isle, after the above-mentioned Causeways and Bridge.



**B. Project Summary**

Describe the proposed crossing replacement/ infrastructure adaptation project, including vulnerable assets, asset age and condition, as well as the natural hazards magnified by climate change, potential ri system, and proposed improvements.

1. State Highway Route 15 Culvert at a stream that has sometimes locally been known (and hereafter referred to) as Eel Brook, Deer Isle. Age unknown. Construction: dry-laid stone and concrete. The current condition is listed on the MaineDOT map viewer as “GOOD,” but it is currently undersized for

the stream width, causing pooling upstream with the possibility of overtopping the State Highway during extreme weather events. This condition is worsened by the fact that on the outlet side of the culvert, there is an impoundment created by a crumbling firewater cistern used by the Town of Deer Isle's Fire Department. This impoundment stifles adequate flows of water through the culvert during climate-change-worsened storm events and presents a complete barrier to fish passage. If this crumbling cistern were to fail or blow out during a storm event, it would leave the Town of Deer Isle without an essential emergency firewater supply in the heart of Deer Isle Village.

This phase of construction contemplates a culvert replacement on a State Highway, which is under the jurisdiction of MaineDOT. This funding request estimates budget numbers and assumes control of this phase of the project would be handled by MaineDOT. However, in speaking with MaineDOT regional engineers, the Town of Deer Isle, and the engineer who has prepared the preliminary design report for this project, all partners would be willing to apply for a Municipal Partnership Initiative (MPI) to lower costs for this construction site and expect that the municipality would handle project management in consultation and coordination with MaineDOT as required. Because we would hope to use funding from this MIAF application as a match for MPI funds, and the Town has not yet applied for an MPI, the rest of this application assumes MaineDOT costs and construction for this State Highway culvert without MPI.

2. Upstream from the State Highway Route 15 culvert and cistern is a 100+ year-old earthen dam at the outlet of the Lily Pond. The Lily Pond is the largest natural waterbody on Deer Isle and, at 35 acres, is classified as a Maine State Great Pond, with a maximum depth of 21 feet. An earthen dam extends for approximately 180 feet along the southwest end of the Pond and adds approximately 6 feet to its water depth. The Dam is classified as a "significant hazard dam" under Maine law and is in poor condition with leaks, "boils" and evidence of overtopping. The severe storms over this past winter, including several in late March, showed NEW evidence of overtopping not previously witnessed or shown evidence of (picture in next section below). Eel Brook flows from the Lily Pond through the narrow culvert at State Route 15 and the Fire Department water cistern to the Mill Pond. The Dam is on public access conservation property and provides an essential public recreation and public health asset to the Towns of Deer Isle, Stonington, and surrounding areas and visitors. The dam's "operator" is listed as the Town of Deer Isle Fire Department, despite the land being owned by Island Heritage Trust (the conservation organization). The "operator" has the ability to increase flow through the spillway when needing to refill the downstream culvert during a fire emergency. However, the current condition of the dam and spillway has removed this ability for the last several years, limiting the fire department to one cistern's worth of water supply and a slow refill, depending on the current stream flow condition.

3. After the culvert is replaced, as proposed in item 1, there will no longer be an emergency water supply for the Town of Deer Isle Fire Department in the high-density/planned-growth village area. A third construction site for the project would decouple this emergency firewater supply from both the cistern and the dam by building a pump and underground tank system from the Lily Pond at another location just North off of Route 15. This significantly mitigates a climate change-magnified risk of both the potential lack of water in the existing cistern and the possibility of an overflow blowout or eventual crumbling of the impoundment. A concept of the new system is in the next section below.

### C. Infrastructure Resiliency and Future Climate Conditions

Demonstrate climate change impacts or vulnerability to hazards and provide documentation of historic events. **(itemized with each phase below)**

Describe how the proposed project will reduce the asset's vulnerabilities. **(itemized with each phase below)**

1. Replacing the undersized culvert, currently 24-30" wide, on State Highway Route 15 that also houses an impoundment, creating a fire water cistern in failing condition with an appropriately sized box culvert, and removing the crumbling cistern would significantly reduce this public infrastructure's vulnerability to climate-change-worsened storm events by providing adequate culvert size (1.2x the bank full width) and removing the impoundment that blocks the heavy flows associated with storm events. This significantly reduces the risk of roadway washout or infrastructure failure. The impoundment removal would also allow for the reintroduction of fish passage, allowing for a more resilient landscape as habitat and species migrate in the face of a changing climate. The MaineDOT map viewer indicates the previous inspection date of the culvert was 1/22/2015, almost a decade ago, with the next inspection scheduled for 7/24/2024, which will likely be in continued current dry conditions rather than the significant storm conditions over the winter/spring, worsened by climate change. Because of this, the next inspection scheduled by MaineDOT may not be able to provide an accurate assessment of the current hazards and asset's vulnerabilities. Here are two images following a late March, 2024 above-normal storm rainfall event:



^ The upstream side of the culvert, standing on State Highway Route 15 looking East, flooded stream due to inadequate culvert size and flow.



^Downstream side of the culvert showing the crumbling fire water cistern and heavy flows impounded causing pooling, standing West of State Highway Route 15, looking East. Photos taken April 5<sup>th</sup>, following heavy rain events on March 23<sup>rd</sup> and April 4<sup>th</sup>.

2. Rehabilitate a 100+ year-old earthen dam at the Lily Pond, directly upstream of the Route 15 culvert. The Lily Pond is the largest natural waterbody on Deer Isle, with a maximum depth of 21 feet.

An earthen dam of indeterminate age (estimated to be pre-1900s) extends for approximately 180 feet along the southwest end of the Pond and adds approximately 6 feet to its water depth. The Dam is classified as a “significant hazard dam” under Maine law and is in poor condition with leaks, “boils” and evidence of overtopping. The same storms over the winter, including the one in late March, showed new evidence of overtopping not previously witnessed or shown evidence of (picture below, same date as the culvert and stream pictures).



^ Looking along the 180ft ridge of the earthen dam at Lily Pond from the spillway following the March heavy rainfall event. There had been no previous evidence of overtopping at this spot.



^ Standing below the undersized spillway of the Lily Pond Dam. Water overtopped on both sides of the spillway, causing erosion and destabilization, in addition to the previous picture of the overtopping along the ridge.

IHT maintains an Emergency Action Plan (EAP) for a dam breach scenario on file with Maine Emergency Management Agency (MEMA) supplemental maps below:



**Notes:**  
 -Datum/Proj: NAD 83/UTM Zone 19N  
 -The areas depicted in the following maps can be found Maine Atlas and Gazetteer Map(s): 15  
 -All Flood data are estimates made using a FEMA sponsored program called DSS-WISE Lite  
 -Areas inundated will depend on the actual flood/failure conditions, and the resulting inundated areas may be different than what is shown on the map

**Peak Breach Flow Estimates:**  
 (Times measured from the moment the breach begins forming)  
**-Fair Weather**  
 -Peak Flow: 137 cfs  
 -Occurs at: 34 minutes  
 -Volume Released: 28/45 acre-feet  
**-Overtopping**  
 -Peak Flow: 1,520 cfs  
 -Occurs at: 51 minutes  
 -Volume Released: 108/108 acre-feet

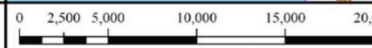
**Sources:**  
 Maine OGIS, MEMA

**Legend**

- Floodlines**
  - Observation Line
  - Fair Weather Breach
  - Overtopping Breach
- Boundaries**
  - - - Town Line
  - Map Outline
- Locations**
  - Ⓜ Nursing Home
  - Ⓝ School
  - Ⓜ Fire/EMS Station
- Infrastructure**
  - Roads**
    - Secondary
    - Local/Town
    - Private
  - Bridges**
    - MEDOT
- Other**
  - Ⓜ Campsite
  - Ⓜ Library
  - Ⓜ Cemetery
  - Ⓜ Municipal Landfill
  - Ⓜ Address Point



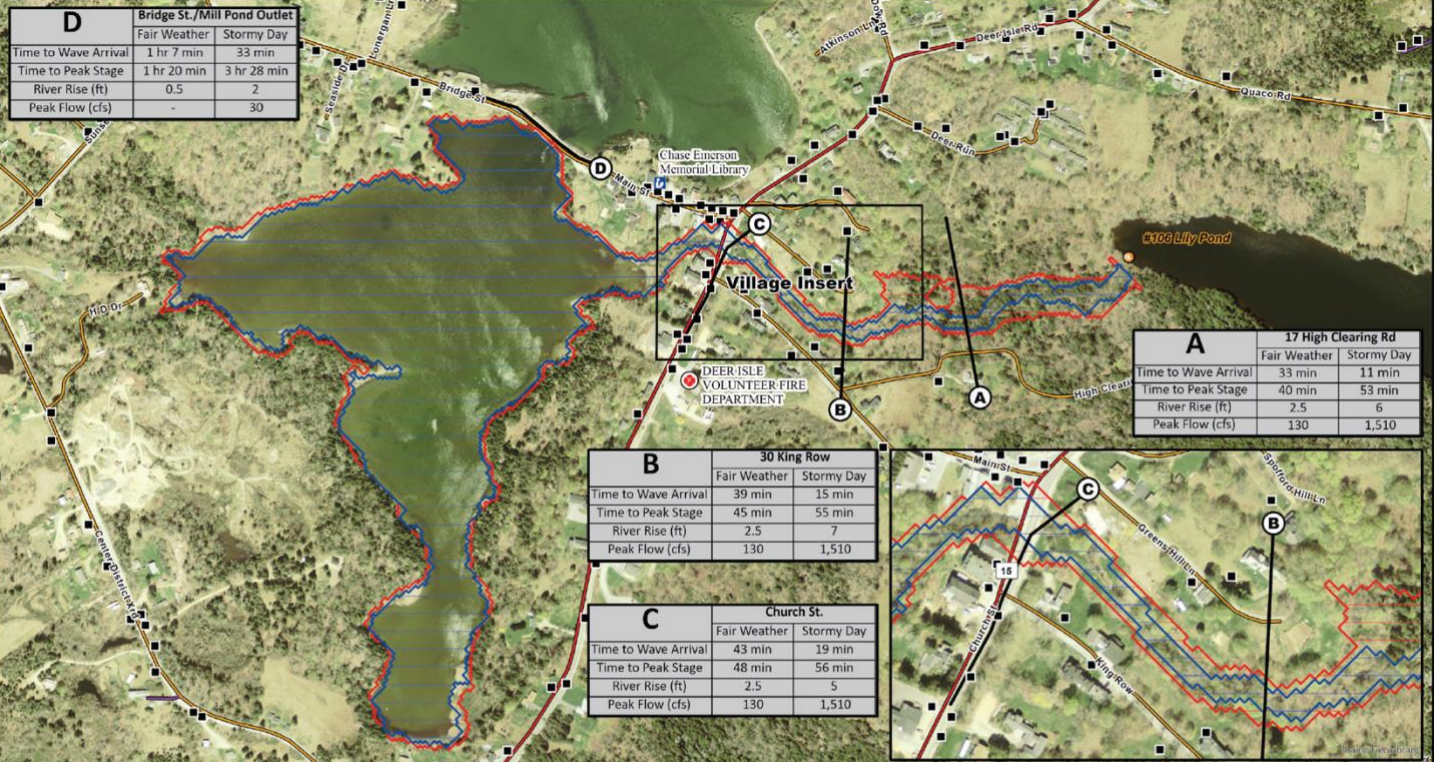
**#106 Lily Pond Dam Dam Breach Inundation Map**



Rev: 1.0	Drawn By: Andrew Marsi	Drawn On: 12/23/2019	CHK'd By: John Skelley	CHK'd On: 12/24/2019	Rev. Made: Initial Draft
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Office of Dam Safety at Maine Emergency Management Agency (207) 624-4400  
 Sheet: **1**

D	Bridge St./Mill Pond Outlet	
	Fair Weather	Stormy Day
Time to Wave Arrival	1 hr 7 min	33 min
Time to Peak Stage	1 hr 20 min	3 hr 28 min
River Rise (ft)	0.5	2
Peak Flow (cfs)	-	30

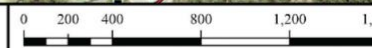


A	17 High Clearing Rd	
	Fair Weather	Stormy Day
Time to Wave Arrival	33 min	11 min
Time to Peak Stage	40 min	53 min
River Rise (ft)	2.5	6
Peak Flow (cfs)	130	1,510

B	30 King Row	
	Fair Weather	Stormy Day
Time to Wave Arrival	39 min	15 min
Time to Peak Stage	45 min	55 min
River Rise (ft)	2.5	7
Peak Flow (cfs)	130	1,510

C	Church St.	
	Fair Weather	Stormy Day
Time to Wave Arrival	43 min	19 min
Time to Peak Stage	48 min	56 min
River Rise (ft)	2.5	5
Peak Flow (cfs)	130	1,510

**#106 Lily Pond Dam Dam Breach Inundation Map**



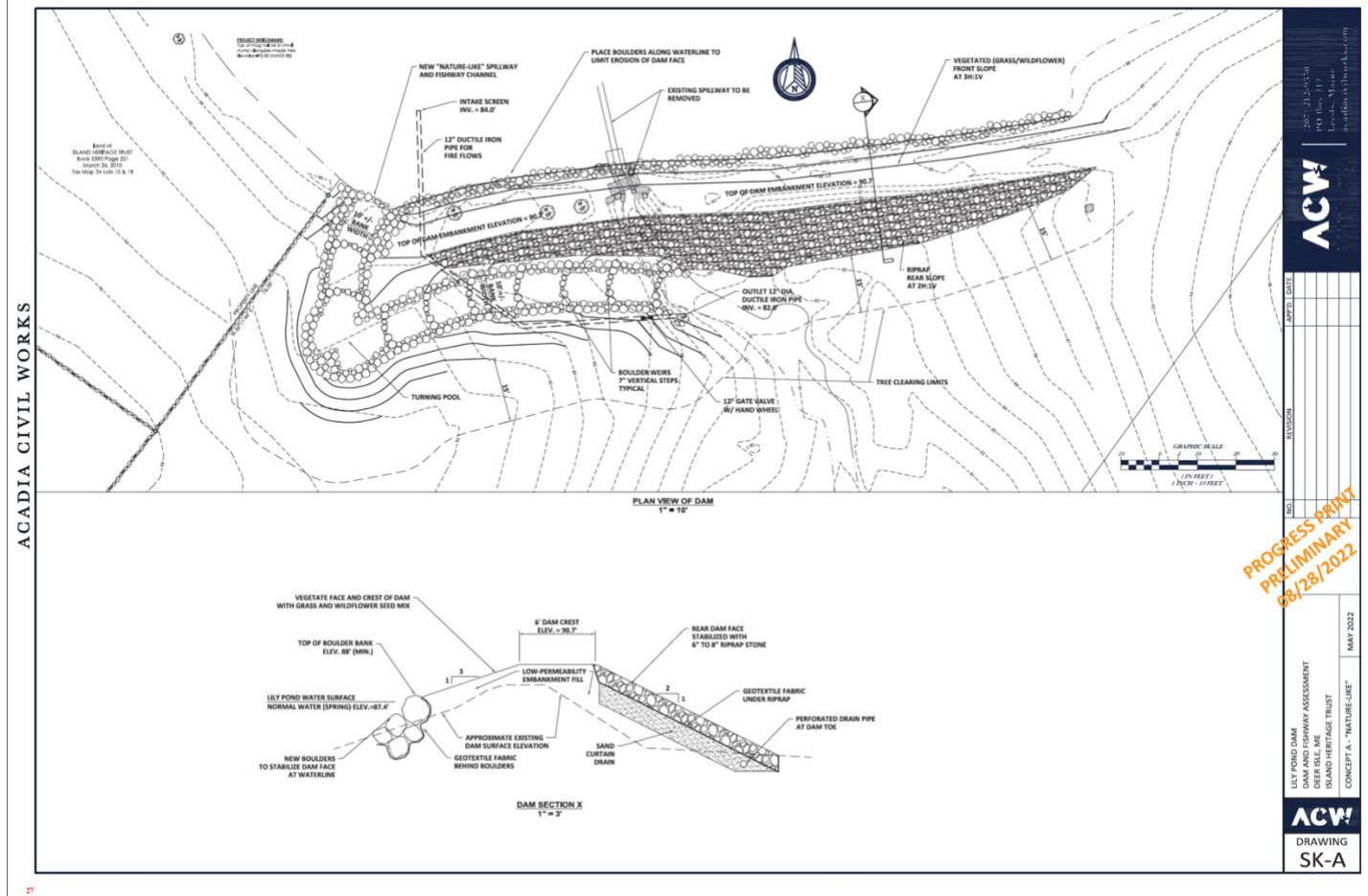
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Office of Dam Safety at Maine Emergency Management Agency (207) 624-4400  
 45 Commerce Dr. Suite #2  
 Augusta, ME 04330  
 Sheet: **2**  
 of 2

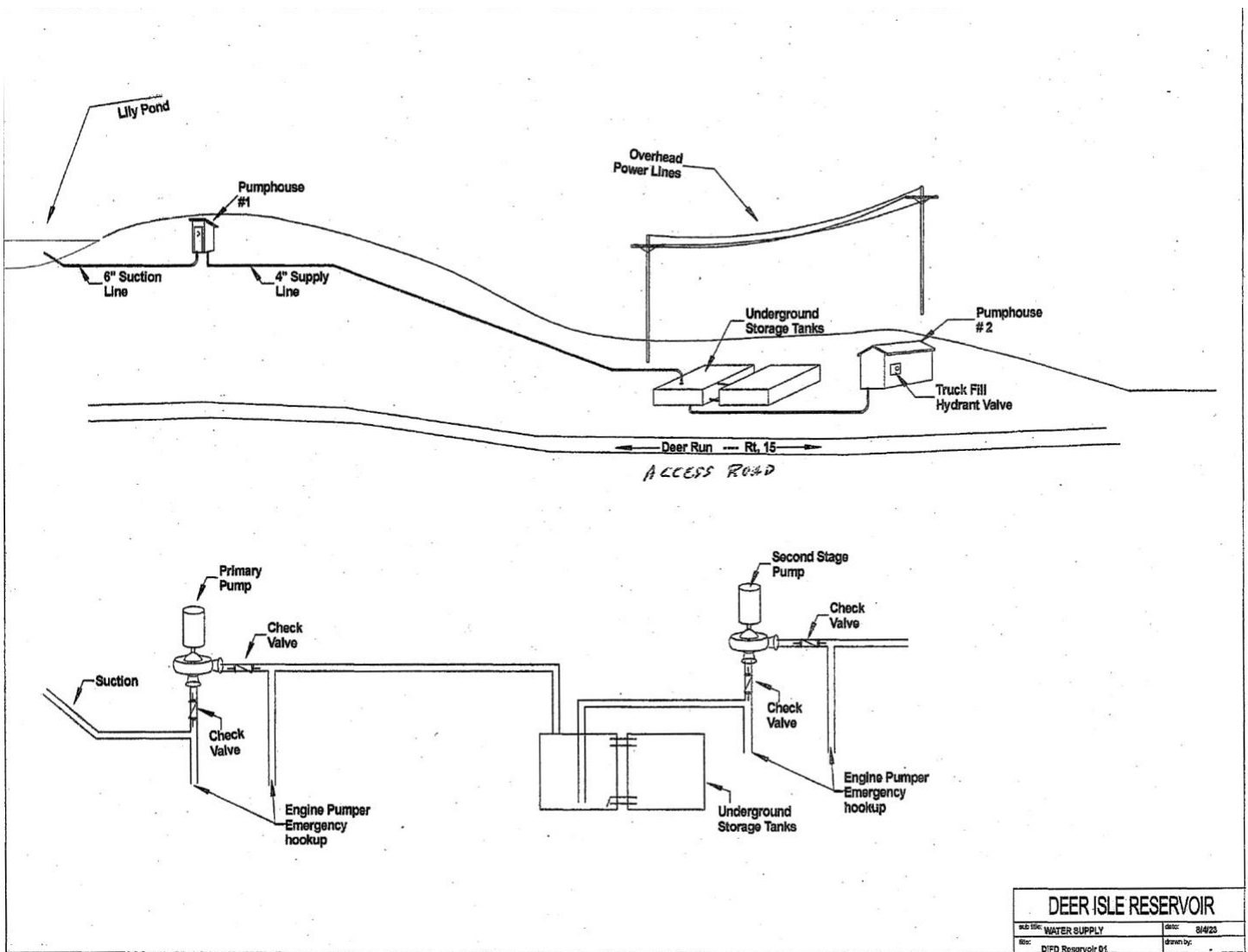
Project Location: Deer Isle, Hancock County, ME  
 Owner: Island Heritage Trust

Map Scale: 1 inch = 400 feet

Because MEMA has classified the dam as a significant hazard dam in “fair to poor condition” and it poses a significant hazard to downstream infrastructure, the dam itself must be stabilized, and the spillway size must be increased to handle climate change-worsened storms and heavier rainfall, as it is currently undersized. The new spillway will be a pool and weir nature-like fishway as conceptually designed by Acadia Civil Works, a Maine State licensed engineer. However, the increased flow capacity of a new spillway will only worsen the pooling behind the undersized culvert at State Highway Route 15 downstream. Additionally, the dam must provide fish passage if the new downstream passage is to be connected all the way to the pond. Thus, each of the components of this multi-site project are fundamentally interconnected.



3. Removing the impoundment at the State Highway Route 15 culvert as part of the culvert replacement, helping to increase adequate flows during storm events, will necessitate removing the Town of Deer Isle’s Fire Department emergency water supply cistern. This third phase of construction would decouple the firewater supply from the dam, culvert, and stream by providing a pump and underground tank system accessible from a Lily Pond Park public access point in Deer Run. This is of significant importance to the Town of Deer Isle as the Fire Department’s current water supply system at the Route 15 culvert is currently woefully inadequate for emergency response and public safety needs. See the conceptual drawing of the new tank system below:



Provide details on how climate change projections and data have or will be considered and incorporated into the project design. (i.e. How will the crossing be upsized, or facility be raised in elevation.)

A preliminary scope and assessment of all three phases of construction has already been conducted by a Maine State Licensed Engineer, Acadia Civil Works. Link to the full report here: <https://www.islandheritagetrust.org/lily-pond-dam-preliminary-design-report/> This report includes a concept drawing of the dam rehabilitation and nature-like fishway. Flow rates are designed for a minimum 100-year storm event. The freeboard of the dam will be designed to 1,000-year storm events as prescribed by USGS StreamStats webtool with the possibility of a peak discharge of 95cfs, exponentially higher than the current estimated monthly average flows of .01cfs in the dry summer month of August up to 1.1cfs monthly average of March. This is discussed in detail in Section 4 of the above-linked report.

According to the engineer's preliminary assessment report, "(t)he existing culvert crossing at Route 15 would not be able to handle the associated flow if the dam were to fail and a large volume of water was released from Lily Pond." (sec. 8-1). Climate change worsened single-storm events, in

addition to the increased prevalence of back-to-back unprecedented events are becoming the norm, increasing the likelihood of storm-related damage. The current culvert size of 24-30” is significantly undersized for the approximate stream width of 10 feet, requiring a roughly 12-foot span to meet the 1.2 times bank-full width at minimum. However, the engineer also noted that if the crossing infrastructure was increased to, say, 20 feet instead of 12 feet, it would be better able to handle the potential peak discharge from the Lily Pond in the event of a dam breach, further reducing the hazard of washout threatening the traveled way and associated highway infrastructure. This is discussed in detail in Section 8 of the above-linked report. This application contemplates an estimated \$2.25 million in construction funding for the minimum project size of a 12-foot crossing, as given to us by MaineDOT regional engineers when we inquired in September 2023 and again in June 2024. Further review of site conditions may lead the engineers to recommend a 20-foot crossing.

The third phase of the project will be the construction of a new emergency firewater supply system for the Town of Deer Isle. The existing cistern does not meet any current form of fire protection standards (NFPA), nor does it receive credit from ISO (Insurance Services Office) as a supply that reduces property insurance requirements for businesses and residents in the area. That said, it has been useful when the water supply is adequate. As noted, due to the state of the Lily Pond Dam and spillway, the spillway stoplogs have been removed in recent years to reduce hydrolic pressure on the earthen dam structure and reduce failure risk. As a result, the Fire Department’s ability to increase the flow of water to the cistern has been eliminated. The new system would decouple the supply from the dam and culvert and provide up to 2,500 gallons per minute for a minimum of two hours. Additionally, wildfire risk will continue to grow on Deer Isle as fuel loads throughout the understory of forests increase during severe weather events. An adequate emergency firewater supply is essential for the island, with many of the residential and commercial buildings being located within the wildland-urban interface (WUI) with a lack of management for defensible space. Data has shown an increased risk of drought, low relative humidity, and extreme weather events, which factor into an increase in fire risk. A new system with adequate supply would provide increased resilience for public safety and infrastructure, in addition to the resilience of the physical system components.

#### **D. Public Safety and Emergency Management**

**Describe the risk to public safety associated with vulnerable infrastructure and which groups (business, general public etc.) will benefit from the project.**

The Lily Pond Dam, the Route 15 culvert and the Fire Department cistern present substantial risks to public safety in their current condition. The Lily Pond Dam is classified as a “significant hazard dam” because of its potential for downstream damage in the event of a breach, including damage to Route 15 and the properties bordering Eel Brook. A sudden Dam failure could send a wave of water downstream, flooding over eight residential properties before reaching Route 15. At Route 15, the undersized culvert and Fire Department cistern would effectively block the flow, resulting in the overtopping and likely washing out of the roadway. Five commercial properties along Eel Brook below Route 15 could also be damaged in the aftermath. Individuals in the path of the flood waters could face injury or death; vehicles on route 15 could be washed away. Depending on the volume of water released, commercial and residential properties bordering the Mill Pond and the Bridge Street culverts leading to Northwest Harbor might also suffer injury.

In addition to direct damage to property and infrastructure, failure of Route 15 would have severe ramifications for emergency services. The Deer Isle Fire Department, Town Office and Public Works

Department and Memorial Ambulance Corps are all located beyond the Route 15 culvert. Access of those resources to emergency scenes above the culvert would be delayed, possibly substantially, in the event of a roadway failure. The Fire Department's access to an adequate supply of firefighting water would also be impaired by the destruction of its cistern, compounding the risks of structure fires and wildfires on the Island.

The primary beneficiaries of the project will be the general public. Island residents and businesses will continue to enjoy clear access to their homes and places of business, as well as to the mainland via the vital artery of Route 15. Security of the public against the risk of fire will be enhanced. The Lily Pond will continue to provide a recreational resource for all Islanders and visitors, as well as a potential future source of drinking water. Businesses in Deer Isle Village and residents along Eel Brook will also benefit from greater security of their properties against the effects of severe weather events. Residents bordering the Lily Pond will benefit from continued access to the Pond's waters.

Describe (if applicable) the safety and impact to communities including detour lengths, identifying any critical infrastructure cut-off from access if the vulnerable infrastructure were to fail, number of businesses and home cut-off, average annual daily traffic (AADT) using MaineDOT's Public Viewer.

If the Route 15 crossing at Eel Brook were to fail, there would be two alternative routes for access to points on the Island beyond the failure. First, traffic from the North could be routed through Deer Isle Village, along Bridge Street and Sunset Road, turning left on the Center District Cross Road, adding miles to a trip to points South on roads that are not designed for the traffic volumes seen on Route 15. Pedestrians in the Village would be at increased risk of being struck by vehicles. In addition, the Bridge Street culverts connecting the Mill Pond with Northwest Harbor are themselves vulnerable to the effects of sea level rise and severe weather events. The second alternative would be to divert southbound traffic to the Reach Road in North Deer Isle, thence to Fish Creek Road, the Greenlaw District Road and Sunshine Road, returning to Route 15S approximately .6 miles from the crossing. This detour would add more than 4.1 miles to a trip to Stonington, utilizes roads not designed for Route 15 traffic levels and has sections that could be flooded in severe weather events.

Although no homes or businesses would be completely cut-off by a failure of Route 15, the inconvenience and disruption would be very significant.

Route 15 is a State road classified by MaineDOT as a Priority 3 high-volume major collector road. It sees some very heavy vehicles, including trucks carrying granite blocks from the Stonington quarries and those bringing supplies for the fishing industry. According to the MaineDOT Public Viewer, Route 15 at approximately the location of the Eel Brook crossing had an average annual daily traffic level (AADT) of over 3,000. The Reach Road number was just 430, and the Center District Cross Road only 550.

The Route 15 culvert is undersized by current MaineDOT standards and would be scheduled for replacement in due course. MaineDOT has previously indicated its support for accelerating the priority of replacement and providing State funding. This project provides a unique opportunity to achieve major infrastructure improvements that will be resilient to the effects of climate change, sea level rise and extreme weather while contributing to ecosystem enhancements in the entire Lily Pond/Eel Brook/Mill Pond/Northwest Harbor system.

Describe (if applicable) how this project will benefit public health.

The replacement of the Route 15 culvert will benefit public health by, among other things, securing rapid access for Memorial Ambulance Corps to patients in the northern parts of the Island and to emergency rooms at hospitals off-Island. Residents living north of the culvert will also have secure access to the Island Medical Center in Stonington.

The reconstruction of the Lily Pond Dam will preserve the recreational resources of Lily Pond Park for the benefit of all Islanders and visitors, including health benefits resulting from access to fresh air and exercise. The Lily Pond may also contribute to public health by becoming a source for fresh and safe drinking water for the Town.

Provide documentation and description of flooding or overtopping and any associated damage.

The Lily Pond Dam is served by a narrow spillway that normally has several “stoplogs” in place to control water flow. When needed, the Deer Isle Fire Department, as the “operator” of the Dam, would remove stoplogs to increase the flow of water downstream to replenish its cistern below Route 15. Because of seepage through the base of the Dam (“boils”) and overtopping events, IHT has removed the stoplogs altogether and lowered the level of the Pond pending reconstruction of the Dam. Notwithstanding this measure, on March 23<sup>rd</sup> and April 4<sup>th</sup> 2024, back-to-back heavy rainfall events elevated water levels in the Pond so quickly that the Dam was again overtopped. The volume of water flowing downstream was also sufficient to back up against the mouth of the Route 15 culvert and inundate the banks of Eel Brook above the roadway. Unfortunately, heavy rainfall events of this nature are no longer exceptional. (See again photos in Section C following two heavy precipitation events, Spring 2024, within a week of each other.)

Describe whether a new design will eliminate or greatly reduce current maintenance costs.

The vulnerable infrastructure requires daily monitoring and maintenance by Island Heritage Trust’s paid professional staff, with help from volunteers when available. In order to keep hydraulic pressure off of the dam, the spillway must be clear of debris. The mouth of the spillway regularly requires plant matter and other debris to be cleared away. The Fire Department periodically drains and cleans the cistern. The Lily Pond Dam requires monitoring and placement of sandbags around boils to prevent erosion; beavers seeking to block the spillway must be discouraged.

A 1.2X bankwidth stream crossing would allow Eel Brook to flow more freely and limit the amount of debris that could block its passage. A new fire water pumping system directly from the Lily Pond would require periodic maintenance but would provide a greater and more reliable supply that meets National Fire Protection Association (NFPA) standards. A reconstructed Lily Pond Dam with a nature-like fishway will still require monitoring, but IHT has an enthusiastic cadre of volunteers to see to its care. IHT has also consulted with wildlife biologists from USDA with experience maintaining recent nature-like spillway designs throughout the Bagaduce River Watershed. Their guidance will help to reduce current maintenance costs.

Amount of money spent on maintenance or failures of the vulnerable infrastructure and description and documentation of maintenance history or recent damage, if applicable.

None of the vulnerable infrastructure has suffered any significant recent damage. Rather, each has witnessed a gradual deterioration over time. The Lily Pond Dam boils are probably more prominent than they were ten years ago, but IHT has sought to limit the threat of sudden damage by removing the stoplogs from the spillway and lowering the level of the Pond. The threat of overtopping the Dam is not new; the threat of exceptional rainfall events giving rise to overtopping has, however, increased. The concrete in the Fire Department cistern is deteriorating, reducing its capacity, but it has not yet failed dramatically. The culvert is still open and still undersized. Although none of this infrastructure has yet failed, it is the purpose of this application to seek to prevent failures that have the potential to be catastrophic.

Since the MEMA dam inspection in 2019, the costs of maintenance have been professional staff time over the last five years, totaling an estimated \$50,000; contractor expense for managing tree removal from the toe of the earthen dam totaling \$15,000; and minor supplies such as sandbags and new spillway bridge material totaling \$5,000; all together totaling roughly \$70,000.



^Sandbagging areas on both sides of the spillway that showed evidence of overtopping. May 2020.



^Sandbagging around a boil in the outlet stream below the spillway. July 2021.

E. Community, Economic, and Environmental Benefits

Describe how this project directly improves physical, social, and economic development within the community. (i.e. How would this project support the goals of a town's comprehensive plan or improve the overall function of the community?)



All the Project’s components—the Route 15 culvert replacement, the new fire water supply and the reconstruction of the Lily Pond Dam—will contribute to the physical, social and economic development of Deer Isle.

One of the stated objectives of Deer Isle’s 2024 Comprehensive Plan is to support IHT’s reconstruction of the Lily Pond Dam. The Plan notes the potential for the Lily Pond to serve as a future public drinking water source. The Plan also calls for the Town to upgrade its fire water supply. The Plan further identifies the Route 15 culvert as a potential fish passage barrier in poor condition. Overall, the Plan recommends the Town repair or rebuild vulnerable infrastructure such as culverts and low-lying roadways. The Plan designates the Deer Isle Village area that includes the Route 15 culvert and the Lily Pond Dam as a “growth area” for future development, as indicated by the gray circle below.



Route 15 is the lifeline for Deer Isle’s economy. Over \$100 million of Island commerce reaches the mainland over this route annually. Were the Dam to fail as a result of a severe weather event, for example, and wash out the undersized culvert and roadway, significant economic disruption could ensue. Although there are two alternative routes to the Town of Stonington and its nation-leading lobster

industry, they run through residential neighborhoods, utilize roads not designed for Route 15's traffic volumes, and are themselves subject to disruption from sea-level rise and extreme weather events. Public safety could also suffer. Rerouting fire and ambulance services based beyond the culvert crossing could cost precious minutes in an emergency.

The development of the Deer Isle Village growth area could be threatened by failure to act on the Route 15 stream crossing. The overarching threat of culvert and road failure could disincentivize investment in the Village businesses and infrastructure that may be damaged in its wake. Some proposals for Village development include sidewalks and traffic pattern changes that are not compatible with the existing Eel Brook road crossing. In contrast, a new crossing that was attractive and a revitalized Eel Brook could spur compatible development.

The Town of Deer Isle suffers from inadequate supplies of fresh water to fight fires. The Deer Isle Fire Department has been listed as the "operator" of the Lily Pond Dam because, in the past, they would remove the stoplogs from its spillway to replenish the fire water supply cistern downstream at Route 15 used to refill tank trucks. Under current circumstances, with the stoplogs removed and the Pond level lowered, the ability to control the flow of water from the Lily Pond to fill the cistern has been undermined. As a result, the Town may be at risk of having its ISO fire ratings downgraded, possibly leading to higher insurance rates for homeowners and businesses. The Deer Isle Fire Department's preferred solution for these problems is to eliminate the Route 15 cistern and replace it with a system that pumps water from the Lily Pond up to tanks located on the entrance road to the Deer Run senior housing development. IHT has committed to supporting this infrastructure being located on its Lily Pond Park property. This strategy should have the beneficial effect of improving public safety, removing the threat of ISO-driven insurance rate increases, and bolstering residential and commercial development in the Village and beyond.

The Lily Pond is a beloved local recreational resource, used for swimming, fishing, boating, hiking, and ice skating by thousands of Islanders and visitors annually. The failure or removal of the Dam would mean the loss of most of the Lily Pond and its recreational benefits for Islanders. A catastrophic failure could also wash out Route 15 at its undersized culvert, damage properties bordering Eel Brook, and have significant economic ripple effects for Deer Isle Village and the Island as a whole. Because of these risks, IHT, as the owner of the Dam, has determined to have it reconstructed as soon as feasible.

As part of its goal of restoring the Dam and the Lily Pond habitat, IHT has also determined to pursue a design that includes a nature-like fishway at the Dam. IHT believes that there is good potential for restoration of the passage of alewives and other anadromous fish to Eel Brook and the Lily Pond. A successful alewife run could improve the health of the entire ecosystem, including the Mill Pond (into which Eel Brook runs), Northwest Harbor, and East Penobscot Bay. This goal links the Dam reconstruction inextricably with the replacement of the Route 15 culvert and the removal of the fire water cistern. The culvert and cistern are effectively complete blocks to anadromous fish passage. All three must be addressed to achieve the expected ecosystem benefits. Economic benefits would also likely extend to commercial and recreational fisheries and tourism, as well as all the service businesses that support them. Restoration would also provide a public educational benefit. IHT plans public outreach and public involvement in fish monitoring and counting.

**Describe how the project will improve community resilience at, adjacent to, and beyond the project site, and how outcomes will benefit the public.**

The Route 15 culvert replacement would be an important component of the development of the Deer Isle Village growth area. Improvements in traffic patterns and pedestrian access could enable greater connectedness between the Village center and the portions of the growth area that extend along

Route 15. A more integrated Village business district should be better able to withstand general economic downturns, providing services that are needed in all economic conditions. A more secure transportation link between different parts of the Island should be resilient to the effects of extreme weather events and sea level rise. A healthier ecosystem in the Lily Pond and Eel Brook and their connected waterways could mitigate possible downturns in current coastal fisheries.

In addition to its insurance benefits, a more robust replacement firewater system would help offset the risk of climate change-driven wildfires. Much of the interior of Deer Isle presents a significant wildfire risk, with aging and dying trees contributing to the forest fuel load.

Reconstruction of the Lily Pond Dam will reduce the risk of extreme rainfall events causing a breach and damaging downstream infrastructure, including Route 15. The addition of a nature-like fishway will contribute to the health of the entire ecosystem. The new structure will become an attraction, adding to the appeal of Lily Pond Park as a public recreation space. Quality recreation facilities can help attract young families and others to remain in and relocate to the Town.

**Describe the presence of environmental resources nearby such as significant wildlife habitats, vernal pools, endangered species presence, etc.**

The Lily Pond is a 35-acre great pond with a sparsely developed shoreline and watershed. It is considered to be a well-nourished waterbody, very productive, supporting a diverse array of organisms, and, usually, with low transparency due to high algae and chlorophyll-a content. It provides habitat for beaver, muskrat, raccoon, white-tail deer, red fox, mink, and the occasional moose or black bear, among others. Fish species present include American eel, pumpkinseed, and rainbow smelt; the Pond is stocked annually by Inland Fish and Wildlife with brook and brown trout. The State's High-Value Plant & Animal Habitats maps identify the Pond as having Inland Waterfowl and Wading Bird habitat. Bald eagles and osprey soar over the Pond on the hunt for fish.

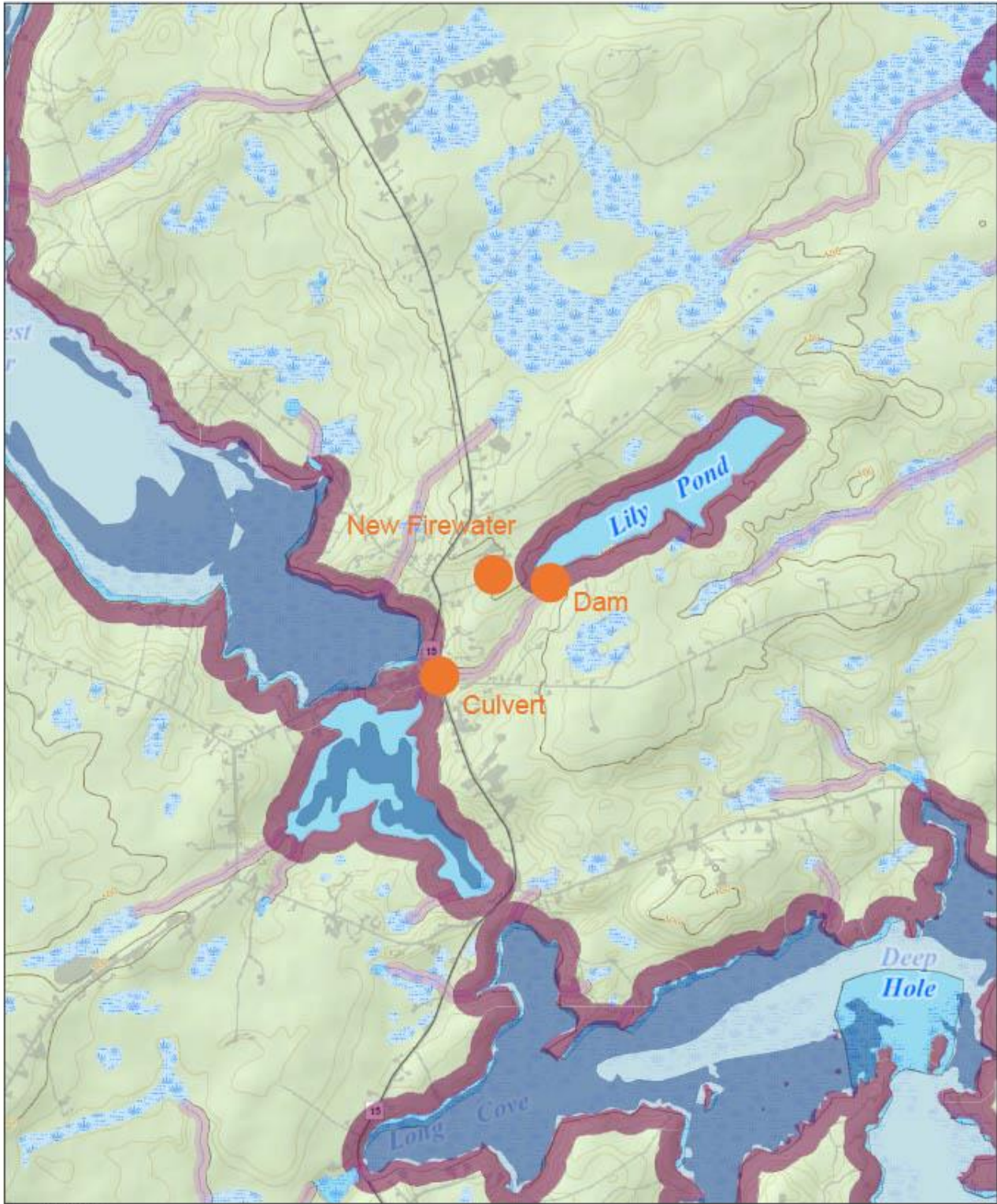
Eel Brook flows some 2000 feet from the Lily Pond Dam to the Mill Pond. American eel and other fish washed out of the Pond inhabit its waters. Because of the cistern and undersized Route 15 culvert, anadromous fish do not pass up Eel Brook to the Lily Pond.

The Beginning with Habitat maps identify the Mill Pond as Tidal Waterfowl and Wading Bird Habitat. Striped bass, menhaden (pogies), and mackerel are known to frequent its waters; tomcod are reported. Despite not being reported in these waters, Alewives and Atlantic salmon would benefit from increased ecological health of this area and may appear if anadromous fish passage is restored to the Lily Pond. Sea-run brook trout may also benefit from restoration.

The Mill Pond connects with Northwest Harbor, itself an arm of East Penobscot Bay. Northwest Harbor and adjacent waters are part of the Penobscot Bay and Islands Focus Area of Statewide Ecological Significance. It includes National Wetlands Inventory Wetlands, Tidal Waterfowl and Wading Bird Habitat, blue mussel and softshell clam beds, and habitat for the purple sandpiper Species of Special Concern.

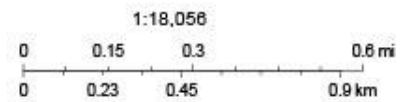
Much of the interior of Deer Isle is comprised of wetlands, including vernal pools, but the only Significant Vernal Pool identified in Beginning with Habitat is not in the Lily Pond watershed. Deer Isle has only one Endangered Species present: the peregrine falcon. It has been identified in the area of the Deer Isle Sedgwick Bridge but may include the Lily Pond/Mill Pond/Northwest Harbor/East Penobscot Bay ecosystem in its territory.

# Beginning With Habitat



June 25, 2024

- Shellfish Beds
- Stream Buffer (75 feet)
- Great Ponds, Rivers and Coastal Buffer (250 feet)
- Tidal Waterfowl / Wading Bird Habitat



F. Project Scoping and Design

Describe whether the project is scoping and design, or implementation/construction.

This project funding request is for both scoping and design as well as implementation /construction. Island Heritage Trust has already invested over \$50,000 in direct costs on engineering scope and assessment that has resulted in a preliminary report of all three phases of this project with conceptual designs for the dam and fishway construction phase, as well as professional staff time monitoring and mitigating hazard conditions at the Lily Pond Dam. The remaining engineering work for the culvert crossing and new firewater supply system phases is yet to be completed, along with the final construction engineering drawing for the dam and fishway. This project also requests the roughly estimated funding needed to complete the construction of the three phases of this project, as estimated by the Acadia Civil Works and MaineDOT.

Provide a bulleted list of proposed specific improvements organized by task, including work to be completed, methodology, deliverables, and project team members.

- Engineering scoping and design (details outlined in previous sections)
  - Lily Pond Dam engineering – final construction drawings – Acadia Civil Works
  - Firewater Supply – site scoping & final construction drawings – Acadia Civil Works
  - Route 15 Culvert – site scoping & engineering, MaineDOT or Acadia Civil Works (if MPI)
- Project bidding and oversight
  - Lily Pond Dam – Acadia Civil Works
  - Firewater supply – Acadia Civil Works
  - Route 15 Culvert – MaineDOT or Acadia Civil Works (if MPI)
- Construction
  - All three phases team members are TBD pending the bidding process
- Public engagement – ongoing – IHT, Towns of Deer Isle & Stonington, Deer Isle Fire Department

Island Heritage Trust (IHT) is a nonprofit land trust founded in 1987 to contribute to the well-being of the Deer Isle community by conserving its distinctive landscapes and natural resources, maintaining public access to valued trails, shoreline and islands, and by providing educational programming for all ages. It holds 27 conservation properties in fee on Deer Isle and its surrounding islands, as well as 38 conservation easements. It is accredited by the Land Trust Accreditation Commission, proving sound finances, ethical conduct, responsible governance, and ability to provide lasting stewardship of the lands we conserve. Island Heritage Trust has held and managed Lily Pond Park, including the Lily Pond Dam, since 2015. Island Heritage Trust staff members include:

- Julia Zell, Executive Director, has been with the Trust for over five years and has been part of its successful accreditation by the National Land Trust Accreditation Commission, increase in professional capacity, launch of the Trust's largest capital campaign, and more than doubling annual revenue and operating budget. Julia is the Project Contact with authority to act on behalf of the Applicant and manages finances and budgets.

- Alex Drenga, Stewardship Director, has been with the Trust for over three years and comes with a master's degree in Natural Resource Management and has previously worked for USFW at the Eastern Massachusetts National Wildlife Refuge Complex doing education and monitoring of ESA-listed species. He will be the key staff liaison for the implementation of this project and will direct the management and stewardship of the dam site going forward along with the proposed new position of Land Steward.

- Martha Bell, Environmental Educator and a Maine Master Naturalist, has over 30 years of environmental education experience and has been with the Trust for 10 years. She works nearly full-time in the schools as a resource to teachers and leads field trips on the Trust's preserves. We plan to utilize her expertise and experience to create long-term education and outreach at the Lily Pond Dam Fishway site, enhancing community and environmental benefit.

- Noël Ruth, Outreach Manager, has been with the Trust for over two years. She will help coordinate and advertise community programs throughout and following the completion of the project and work on the design and creation of educational signage and materials.

- Island Heritage Trust retained the services of engineering design consultant Acadia Civil Works of Leeds, ME (principal: Joseph McLean) to evaluate the condition of the Lily Pond Dam and propose engineering solutions. Mr. McLean is a civil engineer with a wealth of experience in stream crossing, fishway engineering, and other projects. Mr. McLean engaged Soil Metrics LLC and Northern Test Boring, Inc. to perform a geotechnical investigation of the Dam. Rural Fire Protection consulted on the current fire water supply system and evaluated alternatives. Mr. McLean's resume is in the linked preliminary design report. Due North LLC surveyed the site of the Dam.

Describe (if applicable) design efforts that have been completed to date on the proposed project and attach any completed design information, and proposed schedule for design or implementation completion.

- All projects must at least provide an estimated construction start and end date.
- Commitment that applicant has or will obtain necessary Army Corps of Engineers and Maine DEP Natural Resources Protection Act permits for this project.
- Photos of the project area that demonstrate facility condition. For stream crossings, photos should be provided looking at the crossing from downstream and upstream, inside of the structure, and any safety conditions.

A preliminary engineering report for all three project phases has been completed (including photos, maps, and appendixes) and is available here: <https://www.islandheritagetrust.org/lily-pond-dam-preliminary-design-report/>. This includes conceptual designs of the dam rehabilitation and nature-like fishway. A further concept for the firewater supply design has been inserted in the above section C with more details held by the Town of Deer Isle Fire Department. Costs for construction-level engineering drawings for both the dam/fishway and firewater supply system have been included in the design costs estimate of the project. Our engineer has extensive experience with projects like this one and will be handling the permitting and oversight of the construction of the dam/fishway and firewater supply system phases of the project.

IHT did obtain a quote from the same engineer for the culvert portion of the project, as we contemplated seeking an MPI with MaineDOT should we have received the NOAA grant funds. However, this application anticipates full MaineDOT design and construction management of the State Highway Route 15 phase of this project in this funding proposal.

G. Schedule:

Provide detailed timeline of project tasks with anticipated completion dates for the project, including deliverables, likelihood of project success based on support of landowners and public, funding feasibility, technical, financial, and management capacity, and regulatory hurdles.

The execution of this project entails coordination of many moving parts and partners. The timing and funding of the Route 15 culvert replacement aspects are dictated in large part by MaineDOT. This Project is anticipated to be a two-year project, with the construction to be completed within that time frame. Preliminary designs and review are largely complete.

Linked here are letters of support:

<https://www.islandheritagetrust.org/letters-of-support-for-miaf-proposal/>

2023: Gained Town of Deer Isle and public support for three-phased project and selected fishway concept design during a July 2023 public meeting and subsequent Deer Isle Select Board meeting.

2024: Final engineering and design of the Dam and fire water replacement system should be completed by late 2024 in time for evaluation, selection and contract negotiation with the winning bidder.

2025: Construction of the Dam and fire water replacement system will commence in June, 2025, with completion targeted for October, 2025.

Preliminary assessment and final construction design of the Route 15 culvert replacement will happen on MaineDOT's schedule, assuming MaineDOT agrees to take on this project. Otherwise, a MPI will be applied for by the Town of Deer Isle with plans to complete engineering of the culvert in 2025 and then complete construction in 2026.

2026: Construction of the Route 15 replacement culvert and bridge would take place within the permitted in-stream construction window of July 15 – September 30, 2026.

Fish passage monitoring and environmental education will take place ongoing into the future. IHT has a 37-year history of successful non-profit governance and fiscal responsibility, IHT's Board has unanimously supported this project and our ability to provide matching funds for this funding request, as well as our responsibilities going forward.

This project is anticipated to need the following: Municipal Shoreland Zoning Permit and flood hazard development permit with the town of Deer Isle, Maine Department of Environmental Protection (MDEO) Natural Resources Protection Act (NRPA) Permit by Rule #10 or #11 with the Maine DEP, U. S. Army Corps of Engineers (Corps) Programmatic General Permit (PGP) with the Maine Office of the Corps, Section 106 required consultation with Maine Historic Preservation Commission, USFWS consultation on endangered species. Additionally, applicant will benefit greatly from experienced guidance by its consultant engineering firm, Maine Coast Heritage Trust and from the anticipated cooperation with MaineDOT.

Provide all applicable public meeting dates including Town Council or Select Board meeting for the project, for the budgetary approvals of funding, and local match.

**12/18/2019** – MEMA Dam inspector meets with IHT representative at the Lily Pond Dam, followed by an inspection report on 12/20/2019 presenting the “fair to poor” and “significant hazard” rating.

**1/13/2021** – Engineering Kick-off meeting held on Zoom. Attendees besides IHT included:

Town of Deer Isle – Jim Fisher

DI Fire Department – Brent Morey

Town of Stonington – Kathleen Billings

Maine Center for Coastal Fisheries – Mike Thalhauser

Dept. of Marine Resources – Mike Brown

Inland Fish & Waterways – Greg Burr

Maine Coast Heritage Trust – Ciona Ulbrich

Maine Emergency Management Agency – John Skelley

Hancock County Emergency Management Agency – Andrew Sankey and Andrew Braley

Acadia Civil Works Engineering – Joseph McLean

**7/10/2023** – Public meeting held at Deer Isle Town Office for preliminary engineering report presentation and public comment on dam/fishway design.

**10/5/2023** – Presented project to Deer Isle Select Board for approval of Town support for NOAA Grant application (unsuccessful)

**10/16/2023** – NOAA Barrier Removal Grant Submitted (unsuccessful)

**6/6/2024** – Presented MIAF funding opportunity and gained Deer Isle Selectboard approval for Town support again

Provide any public engagement activities that have occurred to date.

**5/28/2021** – Landowner letters were sent to the community around Deer Isle Village to explain the status of Lily Pond Dam and potential hazard mitigation and rehabilitation strategies. Additional resources were provided to landowners of parcels around Lily Pond, downstream of the dam, and around the Mill Pond to inform them of the potential hazard in case of dam failure.

**5/13/2023** – 6<sup>th</sup> Annual Bagaduce Alewife Celebration at Pierce’s Pond – introducing local conservation groups and community members to the Lily Pond Dam project, showcasing Pierce’s Pond restoration as an example of turning a hazard into an opportunity.

**6/3/2023** – First Annual Family Fishing Day at Lily Pond Park – introducing local families to fishing at the Lily Pond and using the opportunity to discuss the current state of the dam and what impacts construction might have on recreation and the importance of the project.

**3/6/2024** – Bi-annual approval of Emergency Action Plan (EAP) for Lily Pond Dam (MEMA #106, NID# ME00585) with partnering organizations: Island Heritage Trust, Hancock County RCC, Deer Isle Fire Department, Hancock County Sheriff, Hancock County EMA, DPS Bangor RCC, & ME Department of Transportation.

**5/18/2024** – 7<sup>th</sup> Annual Bagaduce Alewife Celebration at Pierce’s Pond - introducing local conservation groups and community members to the Lily Pond Dam project, showcasing Pierce’s Pond restoration as an example of turning a hazard into an opportunity.

**6/9/2024** – Second Annual Family Fishing Day at Lily Pond Park – introducing local families to fishing at the Lily Pond and using the opportunity to discuss the current state of the dam and what impacts construction might have on recreation and the importance of the project.



H. Budget:

Provide detailed budget by completing table below.

Estimated Cost of Infrastructure Project	Preliminary or Final Design, Engineering, and Environmental Permitting	\$ 80,000
	Construction (all three phases)	\$ 3,300,000
	Construction Engineering and Oversight (CE)	\$ 35,000
	Total Value of Project (add lines 1 through 3)	\$ 3,390,000
Sources of Funds	Funds from FEMA or Insurance	\$ 0.00
	Total Cash or In-kind Contributions <sup>1</sup>	\$ 90,000
	Total funds leveraged <sup>2</sup> from other sources	\$ 80,000
	Funds Requested from MaineDOT <sup>3</sup>	\$ 3,220,000

- <sup>1</sup> Local Match Contributions:
- Local match cash is those funds that are raised and or appropriated by the town.
  - For Maine Infrastructure Application Fund projects, a minimum match of 5% of total project cost is required.
  - For Municipal Stream Crossing projects, a minimum \$5,000 match is required.
- <sup>2</sup> Ability to leverage other funds: The benefit to the community is such that other funding sources are being garnered in support of this project. Projects not covered by Federal Emergency Management Agency (FEMA) disaster funds, and that demonstrate that damage is not covered by insurance, where all emergency relief available has been exhausted, will be prioritized.
- <sup>3</sup> Funds available to be requested from DOT:
- For Maine Infrastructure Application Fund projects, applicants may request up to \$75,000 to support scoping and design, and \$4,000,000 to support match for construction or for direct construction costs.
  - For Municipal Stream Crossing projects, applicants may request up to \$200,000.

Please detail the source of local match.

Cash/in-kind is professional staff and resources provided by IHT for the duration of the project, and expect to cover the portion of engineering costs that exceeds the \$75,000 max.

Funds leveraged from other sources by IHT as a 501c3 will include private individuals and foundations already committed to supporting IHT and the Lily Pond Dam project.

**ALTERNATIVE BUDGET:**

Should MaineDOT determine this comprehensive project is not the appropriate funding opportunity for the State Highway Route 15 culvert and decide to prioritize that project on its own timeline and funding sources, then we wish to still be considered for the other two phases of this project funding request, as they represent failing critical public infrastructure that needs to be adapted in the face of a changing climate. Completing the dam rehabilitation and new emergency firewater system, even without the culvert phase included, will significantly improve community safety and adaptability of public infrastructure. This also benefits MaineDOT as these auxiliary components will not be a factor to consider once the culvert project is eventually taken on.

Estimated Cost of Infrastructure Project	Preliminary or Final Design, Engineering, and Environmental Permitting	\$ 80,000
	Construction (Dam and Firewater only)	\$ 1,050,000
	Construction Engineering and Oversight (CE)	\$ 35,000
	Total Value of Project (add lines 1 through 3)	\$ 1,165,000
Sources of Funds	Funds from FEMA or Insurance	\$ 0.00
	Total Cash or In-kind Contributions <sup>1</sup>	\$ 50,000
	Total funds leveraged <sup>2</sup> from other sources	\$ 10,000
	Funds Requested from MaineDOT <sup>3</sup>	\$ 1,105,000

Please detail the source of local match.

With a smaller project, cash/in-kind matching funds will be smaller for staff and resources provided by IHT and its partners for the duration of the project, and expect to cover the portion of engineering costs that exceeds the \$75,000 max.

Funds leveraged from other sources will be smaller because this version of the budget and project does not immediately complete the environmental benefit of opening fish passage.