


**FY 2023 – 2026 National Culvert Removal, Replacement, and Restoration Grant Program  
(Culvert AOP Program)**

**ATTACHMENT 1 – Penobscot Bundle**

**I. Basic Project Information**

<b>Description</b> - Provide a narrative for the below items on basic details pertinent to the overall application and any individual projects, including the application name, description of all projects, location(s), involved parties, etc. Items in this section will be used to determine grant program eligibility as detailed in <a href="#">Section C</a> of the NOFO.		
1	Application Name	MaineDOT & DMR Culvert Aquatic Organism Passage (AOP) Program – Penobscot Bundle
<b>Eligibility Criteria</b>		
2	Project Description:  Provide a concise description of the project(s) based on the directions in provided in D.2.a.I	<p>The projects included in this Culvert AOP application will directly and significantly contribute to habitat available for endangered anadromous fish species and their prey by removing barriers to fish passage. Existing barriers represented by these crossings include both hydraulic and physical characteristics that prevent fish from accessing or traversing through culverts or existing minor spans during normal or extreme flows (Figure 1).</p>  <p>FIGURE 1: DOT ASSET NUMBER 46200, LOIDS BROOK, TRENTON, ME.</p>

		<p>Maine’s Penobscot region falls within the historic range of federally endangered, anadromous Atlantic salmon (ATS) as well as designated critical habitat. Access to migration, spawning, and rearing habitats are impeded by stream crossings that are barriers to fish passage for ATS as well as two species of river herring (alewife and blueback herring) and rainbow smelt , American shad, American eel, and sea-lamprey, which are critical facultative, cover, and prey species for ATS. These anadromous species improve habitat for ATS, serve as prey for other species preying on ATS, and/or are direct ATS prey.</p> <p>These projects in conjunction with tribal and town projects within the same watershed as the Carleton Brook location represent restoring access to a total of approximately 2,795 acres of alewife habitat and 394 ATS habitat units (31,100 square meters or 7.6 acres) by replacing four crossings that are barriers to one or more anadromous fish species native in the Penobscot River watershed. MaineDOT recognizes that ensuring sustainability of habitats, ecosystems and transportation infrastructure can occur in concert rather than in conflict. Toward that end, MaineDOT endeavors to exercise reasonable stewardship over both natural resources and transportation infrastructure through its commitment to addressing aquatic organisms, wildlife habitat and fish passage in cooperation with natural resource agencies, while weighing all aspects of a proposed project.</p> <p>A transportation system nexus was another critical component in the decision to include a project in this application. Culverts included in this request are shown in Attachment 2, while socio-economic, geographic, habitat, and cost, information are listed in Attachments 3, 4, and 8. All crossings are associated with Maine’s state transportation system in that they pass under routes operated and maintained by MaineDOT or the crossing itself will be maintained by MaineDOT in the future due to upsizing. Because historic ranges for the target species are associated with specific river systems that are in less developed areas of the state, many of the projects are associated with rural roads with lower AADT. Road surfaces in good condition due to low traffic volumes are less likely to require heavy maintenance that includes culvert upgrades and as a result, crossing structure replacement in these geographic areas can be deferred. The Culvert AOP Grant Program provides a unique and valuable opportunity to replace rural road stream crossings that are barriers to habitat access. These projects rise to</p>
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		<p>importance due to their location in a watershed and/or association with other planned AOP restoration projects undertaken by other entities focused on anadromous species.</p> <p>Maine's Department of Marine Resources (DMR) is a co-applicant for this funding application. Over the last decade, MaineDOT and DMR have collaborated with federal fisheries management agencies and non-governmental organizations to create an extensive database of road stream crossings that pose barriers to fish, aquatic organism passage, and habitat connectivity (<a href="#">MaineStreamViewer</a>), with the goal of cooperatively restoring and conserving habitats important to Maine's economy, ecology and way of life. Prioritization of passage restoration through this partnership contributed significantly to developing the list of AOP culvert replacement projects included as Attachment 3 to this application. For this funding request, MaineDOT and DMR opted to focus on the Penobscot region to maximize cumulative benefits to the target species.</p>
3	Which anadromous species does your project propose to benefit by meaningfully improving or restoring fish passage?	<p>Atlantic salmon (<i>Salmo salar</i>)  Alewife (<i>Alosa pseudoharengus</i>)  Blueback herring (<i>Alosa aestivalis</i>)  American shad (<i>Alosa sapidissima</i>)  Rainbow smelt (<i>Osmerus mordax</i>)  Sea-lamprey (<i>Petromyzon marinus</i>)</p>
4	Briefly describe how the proposed project benefits the anadromous species in item 4 above?	These projects will benefit endangered, anadromous ATS and their facultative, cover and/or prey species by restoring access to historic migration, spawning, and rearing habitat through replacement of road crossings that currently act as barriers to these stream reaches.
5	Culvert AOP Program Request amount	Exact Amount in year-of-expenditure dollars: \$11,880,000
6	Total Cost of all Proposed Projects	Estimate in year-of-expenditure dollars: \$17,820,000
7	Who is the Application Sponsor?	<input checked="" type="checkbox"/> State – Maine Department of Transportation (MaineDOT) <input type="checkbox"/> Unit of local government

		<input type="checkbox"/> Indian Tribe
8	If Application Sponsor is a State or a unit of local government, indicate the percentage, type, and source of non-Federal match	20% non-federal match from Maine State Highway Fund, unless otherwise indicated in Attachment 4.
9	Eligible Facility Type.	<input checked="" type="checkbox"/> Culvert <input type="checkbox"/> Weir
<b>Additional Project Information</b>		
10	State(s) and/or Tribal land in which the project is located	Maine
11	Identify the Lead Applicant (who will be also the applicant responsible for administration of Culvert AOP Program funds if application is selected and point of contact for the application.)	MaineDOT Contact: Andy Bickmore MaineDOT, Results & Information Office 16 State House Station Augusta, ME 04333 <a href="mailto:andrew.bickmore@maine.gov">andrew.bickmore@maine.gov</a> (207) 624-3293
12	<b>Location Information</b>	
A	Location of eligible facility and project area ( <i>Provide State and County, name of the city, town, or jurisdiction</i> )	MSHV # N/A – DOT # 2612: ME, Penobscot County, Bradley MSHV # 50272 – DOT # 46200: ME, Hancock County, Trenton MSHV # 50433 – DOT # 2131: ME, Hancock County, Blue Hill MSHV # 51035 – DOT # 47148: ME, Hancock County, Blue Hill
B	Provide name and description of the waterway and watershed. ( <i>Provide</i>	MSHV # N/A – DOT # 2612: Blackman Stream, Lower Penobscot Watershed (HUC 8) MSHV # 50272 – DOT # 46200: Loids Brook, Maine Coast Watershed (HUC 8) MSHV # 50433 – DOT # 2131: Carleton Brook, Maine Coast Watershed (HUC 8)

	<i>waterway name and description)</i>	MSHV # 51035 – DOT # 47148: Unnamed Stream, Maine Coast Watershed (HUC 8)
C	Provide geographic coordinates for the project ( <i>Provide Latitude/Latitude; bundled projects should provide the coordinates of each eligible facility in the bundle</i> )	MSHV # N/A – DOT # 2612: 44.88918, -68.647056 MSHV # 50272 – DOT # 46200: 44.46878, -68.42134 MSHV # 50433 – DOT # 2131: 44.35544, -68.58311 MSHV # 51035 – DOT # 47148: 44.3982, -68.63175
D	Is any part of the proposed project area(s) located on a federally recognized Indian Tribe land?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<i>Other Public and Private Parties</i>		
13	Please provide organizational names of sub-recipients that will receive funds and other key partners.	Maine Department of Marine Resources (DMR)

## II. Grant Funds, Sources and Uses of all Project Funding

<p>Project Costs – Provide information detailing the costs associated with the project. These costs will be used to determine eligible award amount, how the project supports financial goals of the program, and other factors. More information on this section can be found in <a href="#">Section D.2.ii</a> of the NOFO.</p>		
1	Culvert AOP Program Request Amount	Exact Amount in year-of-expenditure dollars: \$11,880,000
2	Estimated Total of Other Federal funding (excluding Culvert AOP Program Request)	<p>Estimate in year-of-expenditure dollars: \$2,970,000</p> <p>MaineDOT will be funding pre-construction activities (design, environmental reviews, right-of-way, etc.) with FHWA program funding at the typical match of 80% federal and 20% state funds.</p>
3	Estimated Other Federal funding (excluding Culvert AOP Program) further detail	<p><i>Program:</i> N/A</p> <p><i>Amount:</i></p> <p>Estimates and sources of funding are provided in Attachment 4.</p>
4	Estimated non- Federal funding	<p><i>Source:</i> Maine State Highway Fund</p> <p><i>Amount:</i> \$2,970,000</p> <p>Estimates and sources of non-Federal funding are provided in Attachment 4.</p>
5	Future Eligible Project Cost (Sum of Culvert AOP Program request, Other Federal funds, and non-Federal funds, above.)	Estimate in year-of-expenditure dollars: \$14,850,000
6	Previously incurred project costs ( <i>if applicable</i> )	<p>Estimate in year-of-expenditure dollars: Loids Brook, Asset ID#46200, \$87,200</p> <p>Any previously incurred project costs are noted in Attachment 4.</p>
7	Total Project Cost (Sum of ‘previous incurred’ and ‘future eligible’)	Estimate in year-of-expenditure dollars: \$17,907,200

8	Include a detailed statement of work or attach separately	See Attachment 7.
9	Include a detailed budget or attach separately	See Attachment 4.
10	If more than one culvert or weir, will project bundling be used to deliver the project?	<p><input checked="" type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>Where feasible, bundling projects for design, environmental review and construction will result in time (and therefore cost) savings. To minimize design effort, designs will be based on those for recent, successful projects similar in scope, when appropriate. MaineDOT and DMR will use the MAP and HCD methods as a standard to streamline reviews and maximize outcomes for the target species. The parties involved in this grant application are also applying an innovative means with respect to NEPA and permitting for this project through Programmatic Agreements to ensure timely and consistent reviews and accelerate project delivery.</p> <p>A detailed budget is provided as Attachment 4.</p>

### III. Statutorily Required Project Selection Priorities

Project Selection Priorities—Please check which of the project selection priorities listed below, and at <a href="#">Section E</a> of the NOFO, apply to the project(s) in your application.		
1	Which of the following selection priorities does your project meet?	<input checked="" type="checkbox"/> Anadromous fish listed as endangered or threatened under the Endangered Species Act.  <input checked="" type="checkbox"/> Anadromous fish identified by NMFS or USFWS that could reasonably become listed as a federally endangered species or a threatened species.  <input checked="" type="checkbox"/> Anadromous fish identified by NMFS or USFWS as prey for endangered species, threatened species, or protected species.  <input checked="" type="checkbox"/> Anadromous fish identified by NMFS or USFWS as climate resilient stock. See <a href="#">Section H</a> .  <input checked="" type="checkbox"/> Project that opens up more than 200 meters of upstream habitat for anadromous fish before the end of the natural habitat.
2	Briefly describe how your project meets the selection priorities checked above.	These projects will benefit endangered, anadromous ATS and their facultative, cover and/or prey species by restoring access to historic migration, spawning, and rearing habitat through replacement of road crossings that currently act as barriers to these stream reaches.



#### IV. Project Selection Criteria

Project Selection Criteria – Provide narrative response on how the project responds to the selection criteria in [Section E.1.a](#) of the NOFO. In responding to Project Selection Criteria, refer to statutory selection priorities included in [Section E](#) of the NOFO and address them in the appropriate Project Selection Criteria.

##### **Criterion #1: Conservation Benefits to Anadromous Fish**

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The proposed projects meet the Conservation Benefits to Anadromous Fish criterion by increasing and enhancing connectivity between ocean and freshwater habitats important to anadromous fish recovery by identifying and replacing key barriers to fish passage along Maine’s transportation corridors. Culverts, bridges, and other crossing structures within the jurisdiction of MaineDOT have been long standing barriers to anadromous fish populations. Efforts to reconnect habitats include the expansion of freshwater spawning areas to promote and increase adult spawners through the freshwater production of juveniles as well as the interconnection to estuarine habitats for increased access to rearing habitats. Maine is home to 12 diadromous fish species, all of which are directly or indirectly impacted by poor connectivity in freshwater habitats.

The waters draining to the Gulf of Maine contain the only remaining stock of federally and state endangered, wild ATS in the United States, with both the Long Island Sound and the Central New England populations having been extirpated. Populations of alewives, blueback herring, rainbow smelt, American shad, American eel, and sea-lamprey have also suffered dramatic declines due to poor or blocked connectivity to historic habitats in Maine. Many of these species have seen dramatic range contractions and could reasonably become listed as an endangered species or a threatened species in the future if proactive recovery efforts are not undertaken. These species also provide forage or buffer against predators of ESA-listed ATS, ESA-listed whale species, and other venerable populations of mammals and bird populations. As populations of some species such as ATS and rainbow smelt, a Species of Concern, have contracted, the importance of these climate resilient habitats for the preservation of these species has increased.

Fish passage barriers continue to prevent fish from reaching essential spawning and rearing habitat (<https://webapps2.cgis-solutions.com/MaineStreamViewer/>). Fish passage impacts include: 1) undersized culverts that create hydraulic barriers; 2) improperly placed culverts that create fish passage barriers through perched outlets, increased water velocities, or insufficient water flow and depth within the culvert; and 3) poorly placed or designed culverts that alter stream processes including transport of sediment. Combined these barriers impair ecological complexity and increase vulnerability of salmon, and other diadromous species, to extinction or at the very least extirpation. The removal of these barriers will promote the conservation of remaining populations and take steps towards the restoration of historic population levels of anadromous alewife, blueback herring, American shad, ATS, sea-lamprey, and rainbow smelt. All projects will also benefit the catadromous American eel.

### Atlantic Salmon

The Gulf of Maine (GOM) Distinct Population Segment (DPS) of ATS are listed as endangered under the federal Endangered Species Act. Road stream crossings are identified as a “New and Emerging Significant Threat” in the NOAA & USFWS Recovery Plan for the GOM DPS. ATS are listed as a NOAA “Species in the Spotlight” due to their imperiled state. They are also a species of greatest conservation need in the current Maine Wildlife Action Plan. Improperly placed and undersized culverts present major concerns for this species by limiting access to freshwater spawning habitats and cold water refugia. Poorly designed culverts can also decrease the suitability of spawning habitats through the buildup of fine sediment downstream of the structure that can bury gravel, the preferred substrate for salmon spawning.

### River Herring and American Shad

River herring is a collective term that includes both anadromous alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*). River herring are vitally important to the conservation and restoration success of ATS as they provide cover for adults and smolts migrating in streams that would otherwise be preyed upon by eagles, osprey, or other predators.

River herring and American shad are also commercially important resources managed under the Magnuson-Stevens Fisheries and Conservation Act. They are also designated as a species of greatest conservation need in Maine’s Wildlife Action Plan. In Maine, river herring and shad management must comply with the Atlantic States Marine Fisheries Commission fishery management plan, which highlights improving habitat accessibility and quality as a key objective. Another key goal of the plan is to introduce river herring and shad stocks into waters that historically supported spawning migrations. Many of the culverts included in this application either prevent upstream movement of blueback herring and shad in riverine habitats, or block alewives from reaching the lakes/ponds in which they spawn. Given the opportunity to reach adequate spawning grounds, river herring and shad populations can rebound rapidly as has been shown in similar barrier removal projects. In areas where ATS are present, the restoration of river herring and shad populations will simultaneously benefit salmon populations. Downstream migrating river herring provide a prey buffering effect to out-migrating salmon smolts, reducing predation on smolts by terrestrial and aquatic species. This “prey buffering” benefit is part of the designated critical habitat for ATS.

### Rainbow Smelt

Rainbow smelt (*Osmerus mordax*) are currently undergoing steep population declines, which has already led to, or if unchecked is likely to lead to, local extinction and/or range contraction. The global geographic range of Rainbow smelt is identified to be at least 90% contained within the area defined by USFWS Region 5, Canadian Maritime Provinces, and southeastern Quebec, with their status currently listed as decreasing. In 2004, NOAA listed the anadromous rainbow smelt as a federal species of concern due to dramatic declines over the previous fifteen to twenty years. Smelt are also listed as a species of greatest conservation concern in Maine’s Wildlife Action Plan. Unlike many other diadromous fish species, the majority of smelt spawning streams in the Gulf of Maine are small, undammed coastal streams. On these small streams, perched or

	<p>undersized culverts are the main culprits preventing fish passage. Being a small-bodied fish, smelt do not possess the same energetic abilities as ATS, and thus even slightly problematic culverts can severely impair smelt migrations. For example, smelt cannot pass vertical obstructions over six inches. As such, barrier removal and reducing stream habitat fragmentation are critical for increasing access to spawning habitat and eventual restoration of smelt populations throughout the Gulf of Maine. The range of rainbow smelt has contracted significantly, with most populations in the United States existing from mid-coast to Downeast Maine.</p> <p><u>Sea-Lamprey</u></p> <p>Native sea-lampreys are an important component of the riverine ecosystem in Maine that, like other sea run fish species, have been prevented from reaching much of its historic range by barriers to upstream passage. Sea-lampreys are presumed to have a similar range to ATS, which has been contracted due to poor connectivity. Lamprey spawning activities condition the habitat for other species, including ATS, by removing fines and reducing substrate embeddedness. Given the high degree of embeddedness in Maine streams due to past land use practices, the role of lamprey as “ecosystem engineers” is particularly important. Sea-lamprey provide an influx of nutrients that may help support stream food webs during a time when nutrients and energy flow might otherwise be limiting, supporting ESA listed and climate vulnerable stocks.</p>
2	<p style="text-align: center;"><b>Criterion #2: Regional and Watershed Context</b></p> <p>These projects contribute to multiple preexisting watershed strategies and regional plans developed to benefit ATS, river herring, rainbow smelt, American shad, American eel, and sea-lamprey in the Penobscot River watershed. All the species targeted in this Culvert AOP application have experienced dramatic range contractions and population declines due to blocked passage and poor connectivity to historic habitats in Maine. Restoring access to important habitats for these species will increase climate resiliency through improved access to important spawning habitat, and access to cold water habitats that provide thermal refugia for many diadromous species. In general, road stream crossings are characterized as significant threats to ATS within the entire DPS in the NOAA and USFWS recovery plan ATS. Many of these road stream crossings are located within critical habitat for ATS, and their replacement would restore fish access to approximately 394 habitat units.</p> <p>Two priority threats associated with species conservation are directly addressed under this grant application: high flows through undersized stream crossings during extreme precipitation events and impassable road crossings. These threats are included within Maine’s 2015 Wildlife Action Plan as severe with moderate actionability because high velocity flows following storm events hinder upstream swimming ability, thus reducing the ability for these species to access freshwater spawning habitats easily and consistently. The second severe but actionable item revolves around roads and railroads, because crossings within smelt habitat pose passage problems due to under sizing or hanging during the tide cycle. Replacement with properly sized and placed culverts will</p>

	<p>increase climate resiliency through improved access to important spawning habitat and access to cold water habitats that provide thermal refugia for many diadromous species as well as assist with flood flow mitigation.</p> <p>By engaging in projects that benefit multiple species, we will provide synergistic benefits to ATS. Restoring access to multiple species' spawning habitat will improve spawning success and benefit the ATS more than salmon restoration alone. Road stream crossing projects are also important for all species in Maine's Wildlife Action Plan, the Kennebec River Resource Management Plan, and the Regional Conservation Plan for Anadromous Rainbow Smelt in the Gulf of Maine. The 2015 Maine's Wildlife Action Plan lists all species affected by these projects as high or highest priority within the state of Maine. Collectively, these projects would help open 2,795 acres of alewife habitat. Although specific target streams are not mentioned in the Regional Conservation Plan for smelt, it is estimated that two thirds of smelt streams with road stream crossings present passage problems for smelt.</p> <p>The recovery strategy for the GOM DPS for ATS is outlined in the USFWS and NMFS Recovery Plan (2019) and requires specific actions within three Salmon Habitat Recovery Units (SHRU) to accomplish recovery. Recovery criteria include increasing accessible available habitat (measured in units of 100 m squared) in each SHRU to down-list and de-list the species along with the associated improvements in fish numbers expected from those improvements. Habitat connectivity is a high priority recovery action in the plan and road stream crossings are listed as a major threat to the species across the DPS. Furthermore, these projects will significantly benefit species that may become endangered or threatened, such as rainbow smelt, alewives, blueback herring, American shad, and American eel.</p> <p>The projects included in this Culvert AOP funding application continue MaineDOT's commitment to restoring and enhancing aquatic organism passage. In 2017, ten years of coordination between MaineDOT, U.S. Fish &amp; Wildlife Service (USFWS), U.S. Army Corps of Engineers, FHWA and the Maine Turnpike Authority (MTA) culminated in a programmatic agreement that created a streamlined and transparent process for ESA, Section 7, consultation for projects affecting ATS and/or their habitats. Through the Maine Atlantic salmon Programmatic agreement (MAP), projects proposed by MaineDOT or MTA that use habitat connectivity design concepts and stream crossing design monitoring to contribute to species survival and recovery can use expedited review and decision consultation processes. To date, MaineDOT has replaced or retrofitted over 50 crossing structures under the MAP, restoring access for native anadromous and freshwater species. As a direct result of establishing this ongoing program, in 2016 MaineDOT was the first DOT in the U.S. to earn a USFWS Endangered Species Recovery Champion award.</p>
	<p style="text-align: center;"><b>Criterion #3: Ecosystem Benefits</b></p>
3	<p>These projects contribute to the Ecosystem Benefits criterion by restoring historic upstream passage, enhancing water quality, managing flood flows as well as enhancing several functions and values. Mature salmon bring nutrients that help maintain high productivity levels within the rivers and streams they inhabit. Their marine nutrients</p>

	<p>help maintain natural diversification of flora and fauna along the banks and floodplains in many of the streams and rivers they inhabit. Further, aging infrastructure can not only be a barrier to many aquatic organisms but can promote the degradation of upstream and downstream habits by causing bank slumping, erosion, and scouring which severely degrades water quality and in stream habitats. Worse yet, many of these consequences of bad culvert design and failing infrastructure don't stay localized and affect habitats downstream.</p> <p>The fragmentation of stream habitats has caused a of myriad ecosystem level damages throughout Maine. Undersized or perched culverts that block fish passage have ecosystem-wide effects that reach far beyond the scope of a single river system. For example, alewife populations have been reduced by almost 99% from historic levels. This represents a major loss of ecosystem function, impacting birds, sharks, tunas, marine groundfish species in the Gulf of Maine, and charismatic marine mammals. With such wide-ranging ecosystem benefits, the replacement of culverts in this project would continue to increase ecosystem functions that were lost and would enhance overall ecosystem resilience and biodiversity.</p> <p>The removal of barriers to aquatic organism passage will also re-establish physical and biological processes that sustain river ecosystems. Restricted sediment movement is a major concern that is typically coupled with poor passage at road-stream crossings. A lack of sediment movement can fundamentally alter stream channel morphology, structure, and flow patterns, with implications for river ecology and safety as well. Furthermore, intense sedimentation at these barriers can clog gravel habitats that are important for river-spawning anadromous fish and fill up cold-water pools that provide refugia from warm temperatures. Improperly sized culverts can also block the movement of large wood in these systems, which provides river structure where fish can hide from predators. Large wood can also lower stream temperatures and create pools for fish to rest in during their journey upstream.</p> <p>The projects included in this Culvert AOP application will contribute to other ecosystem benefits, such as reducing scour and erosion by increasing the hydraulic capacity of existing undersized or perched structures. Undersized culvert crossings can result in erosive forces on the downstream end of the culvert, especially during extreme flows that are becoming increasingly common. Undersized outlets often create turbulent, high velocity downstream flows during flood and large storm events that strip soil and vegetation thus eroding stream banks. This erosion can drastically reduce high-quality gravel spawning beds as eroded upstream sediments are deposited in lower velocity reaches downstream. Restoring flow regimes to a wild state promotes the flushing of otherwise trapped sediments according to natural fluvial processes system.</p>
	<p align="center"><b>Criterion #4: Project Design, Monitoring and Evaluation</b></p>
4	<p>These projects contribute to the Project Design and Delivery Methods criterion by ensuring that project delivery meets the intent of the MAP User's Guide (<a href="https://www.maine.gov/mdot/maspc/">https://www.maine.gov/mdot/maspc/</a>). By meeting habitat objectives of the MAP, restoration of access habitat will be accomplished through streamlined ESA Section 7</p>

consultation through the Programmatic Biological Assessment, thereby delivering the projects in a timely manner.

MaineDOT has adopted general concepts from stream simulation methodology when designing culverts for aquatic habitat connectivity. Culverts will be designed and constructed for consistency with natural stream dimensions, profiles, and dynamics, in accordance with the following technical references: U.S. Forest Service guide (Forest Service Stream Simulation Working Group 2008), augmented by documents published by the states of Washington (Barnard et al 2013), Vermont (Bates and Kirn 2009), and California (Love and Bates 2009).

Depending on site conditions, emulating natural stream conditions may not always be feasible. In these cases, the references may indicate the need for a geomorphic-based roughened channel design. These following considerations shall guide the use of this approach:

- Geomorphically-based roughened channel designs shall generally be avoided and only be used when site conditions cannot be managed to allow for more preferred designs.
- Geomorphically-based roughened channel designs completed under this Programmatic Agreement shall not create barriers to aquatic organism movement.
- Geomorphically-based roughened channel designs will be submitted to USFWS for pre-approval prior to using the Programmatic Agreement.

The design delivery approach under the MAP Users' Guide will: develop design hydrology, assess structure type ("culvert" or "span"), assess structure sizing (1.2xBSF), check hydraulic capacity ( $H_w/D \leq 1$  at Q100), determine appropriate structure placement (relative to stream profile), and assess structure backfill (creation of a stable, nature-like streambed). Attachment 3 lists the fish passage barriers included in this application and their associated 1.2xBSF, which will drive the anticipated replacement structure size. Each project will be administered following the MaineDOT's project development process, utilizing a skilled engineering team to deliver safe projects for the traveling public. Upon successful completion of construction, the installed structure will follow a regular inspection schedule to ensure satisfactory condition, and future repairs and rehabilitations will be identified prior to adversely affecting the traveling public.

The proposed Culvert AOP projects will contribute to the Project Monitoring and Evaluation criterion by complying with the requirements and guidelines described in the MAP and the MAP Users' Guide (<https://www.maine.gov/mdot/maspc/>). MaineDOT staff complete monitoring of each of the culvert replacement projects that is constructed pursuant to the MAP. Approximately 10-15 stream crossings annually are monitored using a protocol agreed upon with USFWS, which evaluates the continued function for aquatic organism passage. This protocol includes observations of the geomorphic condition of the stream post construction, the stability of any of the

	<p>new streambed and its features, and fish passage efficacy. MaineDOT staff also complete post-project longitudinal profiles to ensure the new structure was set properly and any stream adjustment does not result in aquatic organism passage issues. An annual monitoring report of all of these sites is submitted to the USFWS and is reviewed at an annual meeting. The monitoring program is also important for MaineDOT to continue to improve designs and specifications for future stream crossing projects.</p>
	<p><b>Criterion #5: Climate Change, Sustainability, and Resilience</b></p>
5	<p>MaineDOT has undertaken significant steps to assess risk associated with state transportation system vulnerability to climate change, including sea level rise, storm surge and extreme precipitation events. A GIS based risk evaluation tool, Transportation Risk Assessment for Planning and Project Delivery (TRAPPD) was developed by the MaineDOT Environmental Office. TRAPPD utilizes existing data sources to evaluate multiple risks at the asset level, assigning risk scores to individual assets. Currently this tool is actively utilized in the management of bridge and large culvert assets. The matrix currently consists of 12 questions that span the range of risks including budget, process, schedule, climate-related events, and safety. Scoring is applied to the individual questions and the summation of these scores is used along with asset condition and performance to evaluate the overall priority and risk associated with the asset. These scores are calculated for every structure in the state and accessible through a mapping interface. TRAPPD scores were considered in the prioritization of potential Culvert AOP projects.</p> <p>MaineDOT's Penobscot Bundle of Culvert AOP projects meet the Climate Change, Sustainability, and Resilience criterion by benefiting anadromous fish stocks that are capable of resisting, recovering, and adapting to climate change, such as increases in stream temperature or changes in flow. The hydrologic capacity of existing undersized structures will be substantially improved, targeting increased structure widths of at least 1.2 bankfull width. Increased hydraulic capacity more sustainably accommodates higher stream flows associated with increasingly common extreme precipitation events and address scour that threatens substructures in the face of flashy, unprecedented storm flows. Projects currently vulnerable to projected sea level rise will be designed to be resilient to increased tidal flows and elevations, ensuring the safety of the traveling public while increasing access for the target anadromous species. These projects will remove fish barriers that will improve the climate resilience and reduce climate vulnerability of anadromous fish stocks targeted in this funding application and their ecosystems.</p>
	<p><b>Criterion #6: Equity and Barriers of Opportunity</b></p>
6	<p>MaineDOT's Culvert AOP projects demonstrate a commitment to improving Equity and addressing Barriers to Opportunities for numerous historically disadvantaged communities, underserved communities, and/or areas of persistent poverty. Data review in the screening tools resulted in the finding that the proposed culverts and bridges subject to this grant application are located within historically disadvantaged communities, areas of persistent poverty, opportunities zones and/or low-income areas.</p>

	<p>These projects will: (1) benefit anadromous fish species that are culturally important to the five federally recognized Native American tribes in Maine and underserved communities and (2) contribute to the physical sustenance of or economic benefits to the Maine tribes and underserved communities. The relation of each project to economically disadvantaged and low-income communities is included in Attachments 3 and 8.</p> <p>According to the U.S. Environmental Protection Agency (March 2021), ATS are economically and ecologically valuable, but are also culturally important to Native American tribes in Maine. The five federally recognized tribes have traditionally fished migrating and resident fish species, including ATS, as a key part of their diet. However, over time, these traditional practices have been negatively impacted by industrial development, which has resulted in decreasing water quality, loss of fish habitat, and obstacles to fish migration pathways. The decline, and in some cases the elimination, of these important fish populations has meant the loss of a central component of tribes' traditional diet.</p> <p>NOAA's <i>Community Social Vulnerability Indicators Toolbox</i> is currently comprised of a suite of 14 statistically robust social, economic, and climate change indicators that uniquely characterize and evaluate a fishing community's vulnerability and resilience to disturbances. According to NOAA, there are seven historic coastal fishing communities in which projects are located qualify as disadvantaged and underserved communities. These communities along the coast of Maine increasingly face acute threats from harvest fluctuations and gentrification as well as severe storms, flooding, changes in sea level and temperature.</p>
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## V. Project Readiness and Environmental Risk

Submit the requested information in [Section D.2.b.v](#). This information will be used to evaluate the application on Project Readiness as described in E.1.b. for DOT to conduct a review of the project readiness and environmental review and permitting risk criteria for the project and provide a summary. If project includes multiple culverts or weirs, indicate the information for each structure included in the application and what impact would occur on the timeframes if the project were unbundled.

Technical Feasibility		
1	Describe the technical feasibility of the project as described in Section D.2.b.v	<p>MaineDOT has the technical experience to complete the Project, which is similar to other bridge projects the Department has designed, built, and maintained statewide. MaineDOT is a very experienced, thorough, and responsible recipient of previous TIGER, FASTLANE, INFRA, CHBP, BUILD and RAISE grant funding. USDOT can rely on MaineDOT to fully fund and begin construction well prior to the obligation of funds date and complete the Project without risk. MaineDOT expends or disburses more than \$675 million per year, including federal, state, and local funds. MaineDOT will comply with all Federal regulations with regards to all aspects of the Project. This includes EEO Policy and Affirmative Action, all NEPA requirements, all Civil Rights policies, the ADA, and all other regulations.</p> <p>MaineDOT is responsible for ensuring compliance with all federal anti-discrimination, EEO/AA, and labor requirements on all federally funded projects. MaineDOT uses such hiring and workplace preferences in delivering projects by:</p> <ul style="list-style-type: none"> <li>- Seeking to create workforce diversity and long-term retention of minorities and women on MaineDOT-administered construction contracts funded by USDOT and to assure a workplace free from harassment, intimidation and discrimination on all MaineDOT-funded projects.</li> <li>- Our On-The-Job Training (OJT) Program works to provide meaningful training opportunities for Women, Minorities, &amp; Disadvantaged individuals on federal-aid highway &amp; bridge projects and to develop full journeymen.</li> <li>- MaineDOT is required by the Federal Davis Bacon Act (DBA) to ensure that prevailing wage rates are paid to all laborers and mechanics on federal construction projects. In 2009, MaineDOT implemented the payroll tracking system, Elations, to track payroll wage and EEO related information easily and accurately. All contractors and subcontractors working on</li> </ul>

		<p>federally funded construction projects are required to use Elations for certified payroll documentation, payments to and from subcontractors and EEO data for Davis-Bacon related trades.</p> <ul style="list-style-type: none"> <li>- Finally, as a recipient of federal funding, the Department must ensure that contracts let through our agency adhere to the standards prescribed by federal and state law. The MaineDOT Civil Rights Office is responsible for ensuring that federal and state EEO laws are complied with on our projects.</li> </ul>
<b>Project Schedule</b>		
2	Include a detailed project schedule, adding additional milestone rows as needed, or attach separately	Project Schedules are provided separately as Attachment 7.
3	Design Status (If applicable)	Preliminary Design of projects not included in MaineDOT's current 3-year work plan will begin upon Culvert AOP funding receipt. Projects already included in the current three-year work plan are already undergoing Preliminary Design. A schedule for anticipated pre-construction activities, including design, is provided as Attachment 7.
4	Anticipated Construction Start Date (If applicable):	A schedule for anticipated construction activities is provided as Attachment 7.
5	Anticipated Project Completion Date (If applicable):	A schedule for anticipated construction activities is provided as Attachment 7.
<b>Required Approvals</b>		
6	NEPA Status – Indicate if the determination will likely be the result of a Categorical Exclusion (CE),	The NEPA process will inform design efforts. Past practice indicates that, because the proposed culvert replacement projects will meet the conditions of the MAP, they will be classified as Categorical Exclusion(s) in accordance with 23 CFR 771.117(c)

	Environmental Assessment (EA), or Environmental Impact Statement (EIS)	<p>(26) or d(13). MaineDOT will review all projects and prepare NEPA documentation in accordance with <i>Programmatic Agreement between the Federal Highway Administration, Maine Division and the Maine Department of Transportation Regarding the Processing of Actions Classified as Categorical Exclusions for Federal-Aid Highway Projects</i>. Should any issues arise, MaineDOT will work directly with the respective agencies to quickly resolve them.</p> <p>A schedule for anticipated pre-construction activities, including NEPA, is provided as Attachment 7.</p>
7	Will all necessary environmental approvals and permits meet the project delivery timeline specified in the project schedule?	<p><input checked="" type="checkbox"/> Yes (<i>Please provide documentation</i>)</p> <p><input type="checkbox"/> No</p> <p>As stated in Section 1 for this criterion, collaborative agreements with MaineDOT, USFWS, USACE, and FHWA under the Endangered Species Act will result in a thorough environmental review process that expedites endangered species consultations and aims to meet both wildlife, program, and project goals. In addition, culvert replacements with a restoration component have historically qualified to use expedited Permit by Rule procedures (<a href="#">Chapter 305, Permit by Rule*</a>) and Maine's General Permit (<a href="#">2020-2025-MaineGeneralPermits.pdf</a>) to receive Maine Department of Environmental Protection (DEP) and U.S. Army Corps of Engineers (USACE) approval, respectively.</p>
8	Are there any prepared environmental studies or documents describing known project impacts and possible mitigation for those impacts?	<p><input type="checkbox"/> Yes (<i>Please provide documentation preferably through a Website link</i>)</p> <p><input checked="" type="checkbox"/> No</p> <p>MaineDOT evaluates potential impacts on a project-specific basis as part of its standard environmental screening process. Each potential impact will include consideration of a comprehensive mitigation strategy, if warranted; however, culvert replacements that restore anadromous fish passage are typically determined to be self-mitigating by state and federal fisheries agencies.</p>
<b>Assessment of Project Risks and Mitigation Strategies</b>		

9	Indicate potential project risks and strategies undertaken or that might be taken to mitigate those risks.	Preliminary baseline data collected to identify natural and cultural resources potentially affected by the projects will be refined during design and will be used to avoid and minimize impact while meeting the purpose and need of the projects. In-water work will be minimized; when necessary, this work will comply with time-of-year restrictions included in the MAP. Constructability reviews will be completed during design to ensure the selected alternative is buildable given the various environmental restrictions.
10	Is right-of-way acquisition necessary?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable <p>No full property acquisitions will be required to complete the projects. Current design standards may result in minor property acquisition, primarily for temporary construction access. MaineDOT follows Federal law and guidelines regarding contact, appraisal, and acquisition of land. These guidelines are found in MaineDOT's Right of Way Manual (<a href="https://www.maine.gov/mdot/rowmanual/">https://www.maine.gov/mdot/rowmanual/</a>).</p> <p>A schedule for anticipated pre-construction activities, including right of way, is provided as Attachment 7.</p>
11	Right-of-way acquisition considerations ( <i>If applicable</i> )	<p>If right-of-way must be acquired for the project:</p> <ul style="list-style-type: none"> <li>• Would right-of-way acquisition require relocation of any people or businesses?</li> </ul> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <ul style="list-style-type: none"> <li>• If Yes, are people or businesses being relocated members of traditionally underserved and underrepresented populations (underserved communities)?</li> </ul>

		<ul style="list-style-type: none"> <li>• If Yes, please describe the required relocation of any people or businesses.</li> </ul>
	<b>Lead Applicant Evaluation</b>	
12	Describe the Lead Applicant's experience with receipt and expenditure of DOT grant funds or other Federal funding sources as described in <a href="#">Section D.2.b.V.</a>	MaineDOT is a very experienced, thorough, and responsible recipient of previous TIGER, FASTLANE, INFRA, CHBP, BUILD and RAISE grant funding. USDOT can rely on MaineDOT to fully fund and begin construction well prior to the obligation of funds date and complete the Project without risk. MaineDOT expends or disburses more than \$675 million per year, including federal, state, and local funds. All funding received is allocated as per MaineDOT's three-year work plan.