

**Fiscal Years 2023 through 2026
National Culvert Removal, Replacement, and Restoration Grant Program
Attachment 1 – Construction Phase Only Bundle**

This is the Application Template for Fiscal Years (FY) 2023 through 2026 National Culvert Removal, Replacement, and Restoration Grant Program (Culvert Aquatic Organism Passage (Culvert AOP).

Submission of this Application Template is required as part of a complete application package. The Application Template, in conjunction with the allowable attachments and standard forms, should provide all information necessary for the U.S. Department of Transportation (DOT), Federal Highway Administration to determine if the project satisfies the eligibility requirements described in NOFO [Section B](#) and to evaluate the criteria specified in NOFO [Section F](#). DOT will consider applications submitted without the completed template as incomplete and will not review the submission. DOT encourages applicants to review the NOFO in its entirety to verify their project is eligible and includes all required information is provided with their application.

I. SUMMARY

Project Name:	MaineDOT & DMR Culvert AOP Program – Construction Phase Only Bundle
Eligible Entity Applying to Receive Federal Funding:	Maine Department of Transportation (MaineDOT)
Entity Type:	☒ State ☐ Unit of local Government ☐ Indian Tribe
Project Scale:	☐ Local ☐ Regional ☒ Statewide ☐ Multi-State
Total Project Cost: (from all sources)	\$ 18,750,000
Culvert AOP Competitive Grant Program funding request:	\$ 15,000,000
State(s) in which the project is located:	Maine
Lead Applicant Point of Contact information:	MaineDOT Contact: William Gayle
Project Abstract: <i>Summarize project work to be completed under the project and succinctly describe how the Culvert AOP Competitive Grant Program funds would be used to complete the project.</i> The Maine Department of Transportation (MaineDOT) and Department of Marine Resources (DMR) Construction Phase Only Bundle proposal will use Culvert AOP program funds to remove key hydraulic and physical barriers at six road-stream crossings in Midcoast and Downeast watersheds. This will restore connectivity between ocean and freshwater habitats for endangered Atlantic salmon (ATS), river herring (alewife and blueback herring), American shad, rainbow smelt, sea-lamprey, Atlantic tomcod, sea-run brook trout, and other anadromous species. Located within the Gulf of Maine ATS Distinct Population Segment and designated critical habitat, these projects will reopen approximately 357 units (35,700 m ²) of modeled ATS spawning and rearing habitat and 1,644 acres of alewife habitat, supporting recovery of the only remaining wild ATS stock in the United States and rebuilding forage species that benefit marine mammals, groundfish, sea birds, and birds of prey. By	

replacing undersized, perched, and poorly aligned culverts using a robust design approach for habitat connectivity and fish passage, the program advances priority actions in the ATS Recovery Plan, Maine’s Wildlife Action Plan, the Maine River Herring Sustainable Fishery Management Plan, and other regional strategies, while reducing scour, sediment trapping, and habitat degradation and improving hydraulic performance and infrastructure resiliency under extreme precipitation events. These projects will generate substantial economic and cultural co-benefits by supporting commercial and recreational alewife fisheries, providing bait for Maine’s lobster industry, enhancing nature tourism, and restoring access to traditional sea-run fish resources for Wabanaki Nations and rural communities to reduce food insecurity and rebuild resilient ecosystems.

Attachments: <i>Please list any attachments to this form, including letters of support.</i>	Attachment 2 – Project Location Map Attachment 3 – Project List with Specific Criteria Attachment 4 – Project Selection Criteria Maps Attachment 5 – Project Costs Attachment 6 – Project Schedule Attachment 7 – Statement of Work Attachment 8 – Permitting Risk Assessment Attachment 9 – Match Commitment Letter Attachment 10 – Letters of Support
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II. Project Information

Expand the response blocks as necessary but limit the Project Information section of the application to a total of three pages. [*Applicants: delete instructions shown below in italic prior to submittal*]

1	Project Name:	MaineDOT & DMR Culvert AOP Program – Construction Phase Only Bundle
2	Location of facility and project area:	MSHV # 50272 – DOT #46200: Trenton, Hancock County, ME MSHV # 50195 – DOT #3230: Mariaville, Hancock County, ME MSHV # 50938 – DOT #2783: Gouldsboro, Hancock County, ME MSHV # 13156 – DOT #47121: East Machias, Washington County, ME MSHV # 51934 – DOT #47380: Cooper, Washington County, ME MSHV # 14095 – DOT #0604: Camden, Knox County, ME
3	Waterway and watershed:	MSHV # 50272 – DOT #46200: Loids Brook, Frontal Drainages of Washington and Hancock Counties (HUC 8) MSHV # 50195 – DOT #3230: Dumb Brook, Frontal Drainages of Washington and Hancock Counties (HUC 8) MSHV # 50938 – DOT #2783: Bay Stream, Frontal Drainages of Washington and Hancock Counties (HUC 8) MSHV # 13156 – DOT #47121: Unnamed Tributary East Machias River, Frontal Drainages of Washington and Hancock Counties (HUC 8) MSHV # 51934 – DOT #47380: Mill Stream, Frontal Drainages of Washington and Hancock Counties (HUC 8) MSHV # 14095 – DOT #0604: Megunticook River, Frontal Drainages of Washington and Hancock Counties (HUC 8)
4	Project Coordinates:	MSHV # 50272 – DOT #46200: 44.46878, -68.42134 MSHV # 50195 – DOT #3230: 44.72080, -68.41060 MSHV # 50938 – DOT #2783: 44.48291, -68.03639 MSHV # 13156 – DOT #47121: 44.74932, -67.39102 MSHV # 51934 – DOT #47380: 44.99839, -67.46216 MSHV # 14095 – DOT #0604: 44.2211, -69.07908

5	Tribal Consideration	Is any part of the proposed project area(s) located on federally recognized Indian Tribe lands? ☒ No ☐ Yes If yes, provide the name of the Tribal lands:
6	Public or Private Parties:	Maine Department of Marine Resources (DMR), co-applicant. DMR assisted in project selection for this application and is available to provide support during design review and construction.
7	Lead Applicant Point(s) of Contact:	William R. Gayle MaineDOT Assistant Director, Bureau of Planning 16 State House Station, Augusta, Maine 04330 (207) 624-3253 William.r.gayle@maine.gov
8	Eligible Facility Type:	☒ Culvert ☐ Weir ☐ Both
9	Anadromous Species/Stocks:	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>) Atlantic tomcod (<i>Microgadus tomcod</i>) Sea-run brook trout (<i>Salvelinus fontinalis</i>)
10	Project Background	Project scope and broad conservation context: The six culvert replacement projects included in this Culvert AOP Program application will directly and significantly contribute to habitat available for endangered and other native anadromous fish species and their prey by removing barriers to fish passage in Maine's Midcoast and Downeast regions, including some of the most rural counties in the state. 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. Maine's Midcoast and Downeast regions fall within the historic range of federally endangered, anadromous 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), rainbow smelt, Atlantic tomcod, sea-run brook trout, 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 forage for other species preying on ATS, are a listed element of ATS critical habitat, and/or are direct ATS prey. These projects will restore access to a total of approximately 357 units of modeled spawning and rearing habitat for ATS and 1,644 acres of alewife habitat by replacing six crossings that are barriers to one or more anadromous fish species native to Maine, including ATS. MaineDOT recognizes that ensuring sustainability of habitats, ecosystems and transportation infrastructure can occur in concert rather than in conflict. To 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. All crossings in this proposal are associated with Maine’s state transportation system in that they pass under routes operated and maintained by MaineDOT. Culverts included in this request are shown in Attachment 2, while geographic information, specific criteria, and costs are listed in Attachments 3, 4, and 5. 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 Annual Average Daily Traffic (AADT). Road surfaces in good condition due to low traffic volumes are less likely to require heavy maintenance; as a result, crossing structure replacement in these geographic areas is often deferred even though culvert condition may be poor. The Culvert AOP Program provides a unique and valuable opportunity to replace rural road stream crossings that are barriers to habitat access. These projects rise to importance due to their location in a watershed and/or association with other planned AOP restoration projects undertaken by other entities, such as towns or other institutions, focused on anadromous species. 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 (MaineStreamViewer), 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
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		of AOP culvert replacement projects included as Attachment 3. For this funding request, MaineDOT and DMR opted to focus on the Construction Phase Only projects to maximize cumulative benefits to the target species. Previous incurred costs for each of the six projects are listed in Attachment 5 and total \$209,468.13. The six projects in this bundle are at different stages of development. Generally, they have not completed public process or preliminary and final design.
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III. Budget and Funding

1	Program Request Amount:	Exact Culvert AOP Competitive Grant Program request amount in year-of-expenditure dollars: \$15,000,000
2	Other Federal Funding:	Other Federal programs and estimated amounts: <i>(add lines as needed)</i> Program: N/A Amount: N/A While MaineDOT is confident in the provided estimates, markets can change. If the changing markets would cause an overage, MaineDOT would utilize other federal funds to maintain prescribed federal and non-federal funding requirements.
3	Future Project Cost:	Provide the sum of Culvert AOP Competitive Grant Program request, other Federal funds, and non-Federal funds as an estimate in year-of-expenditure dollars: \$18,750,000
4	Previously incurred project costs:	Amount: \$209,468.13
5	Total Project Cost:	Estimate in year-of-expenditure dollars (sum of previously incurred project costs' and 'future project cost): \$18,959,468.13
6	Statement of Work:	See Attachment 5 – Project Costs, Attachment 6 – Project Schedule, and Attachment 7 – Statement of Work.
7	Bonus Activities [Optional: See NOFO Section B for more information.]	Will the applicant request approval of “Bonus Activities”, if there are project cost savings? ☒ Yes ☐ No If yes, describe the proposed “Bonus Activities” below: MaineDOT has identified additional investments in components of structural replacement as an opportunity for bonus investments. This includes items such as upgraded steel components to maximize the life of the replacement structure and will reduce future maintenance costs.

		MaineDOT will also investigate providing public access at the project locations.
8	Grant Funds, Sources and Uses of Project Funds (Detailed Budget):	Activity: Cost: Activity: Cost: Activity: Cost: Activity: Cost: ☒ A detailed budget is attached separately. The file is named: Attachment 5 – Project Costs
9	Project Bundling	Bundling is the practice of combining projects to accelerate delivery, reduce costs, and increase efficiency by combining multiple projects into a single contract. Will bundling be used for the project? ☐ No ☒ Yes 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 Maine Atlantic Salmon Programmatic Consultation (MAP) and Habitat Connectivity Design (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 to accelerate project delivery.

IV. Merit Criteria

In the space below, describe how the project will meet the merit criteria and the associated objectives as found in Section F of the FYs 2023 through 2026 Culvert AOP Competitive Grant Program NOFO. Where appropriate, reference attachments or other sections of the application. Expand the response blocks as needed but limit the length of the merit criteria section of the application to six total pages in length.

Criterion #1: Conservation Benefits to Anadromous Fish
The proposed projects contribute to the recovery of federally protected anadromous species and associated resource (forage) species (Criterion 1A.) by increasing and enhancing connectivity between ocean and freshwater habitats important to ATS and other anadromous fish recovery through replacing key barriers to fish passage along Maine’s transportation corridors. Maine is home to 11 anadromous fish species, all of which are directly or indirectly impacted by poor connectivity in freshwater habitats. Culverts, bridges, and other crossing structures within the jurisdiction of MaineDOT have been long standing barriers to anadromous fish populations, and the projects in this application will eliminate these barriers.

The Gulf of Maine contains the **only remaining stock of federally- and state-endangered ATS in the U.S.**, as the Long Island Sound and the Central New England populations have been extirpated. Populations of **alewives, blueback herring, rainbow smelt, American shad, Atlantic tomcod, sea-run brook trout, 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 threatened or endangered species in the future if proactive recovery efforts are not undertaken. These species also provide forage or buffer against predators of ESA-listed ATS, whale species, and other vulnerable 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 habitats for the preservation of these species has increased.

Fish passage barriers continue to prevent fish from reaching essential spawning and rearing habitat in Maine (<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 ATS 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, ATS, and rainbow smelt. All projects will also benefit the catadromous American eel.

The proposed projects conform with written recovery, management and State planning documents (Criterion 1B), including the National Oceanic and Atmospheric Administration (NOAA) and U.S. Fish and Wildlife Service (USFWS) Recovery Plan for the Gulf of Maine (GOM) Distinct Population Segment (DPS), the Maine River Herring Sustainable Fishing Plan, Atlantic States Marine Fisheries Commission Fishery Management Plans, and the Maine Wildlife Action Plan, listed in their management and species-specific contexts below:

- **Atlantic Salmon:** The GOM 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.
- **River Herring and American Shad:** River herring (a term encompassing both alewife and blueback herring) and American shad are commercially and recreationally important resources managed under the Magnuson-Stevens Fisheries and Conservation Act. River herring are a NOAA Species of Concern. Additionally, river herring and American shad 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.
- **Rainbow Smelt:** In 2004, NOAA listed the rainbow smelt as a Species of Concern due to dramatic declines. Smelt are also listed as a Priority 1 Species of Greatest Conservation Need in Maine’s Wildlife Action Plan. The majority of smelt spawning streams in the Gulf of Maine are small, undammed coastal streams. The small-bodied smelt do not possess the same energetic abilities as ATS, thus even slightly problematic culverts can severely impair smelt migrations.
- **Atlantic Tomcod:** Like rainbow smelt, Atlantic tomcod rely on coastal Maine streams for spawning. Barriers that limit access to these small spawning streams have caused population declines across the state and contributed to the closure of tomcod fisheries in the 1950s. A

recent Maine DMR citizen science project, which monitors seasonal spawning activity, has highlighted how critical small coastal streams are for tomcod populations throughout Maine.

- **Sea-Run Brook Trout:** Recognized as a Species of Greatest Conservation Need in Maine's Wildlife Action Plan, this particular brook trout, an important recreational fishery in the region, is threatened by barriers that block access to preferred upstream spawning habitats and critical thermal refugia.
- **Sea-lamprey:** Lamprey spawning activities condition the habitat for other species, including ATS, by removing fines and reducing substrate embeddedness. They provide an influx of nutrients that may support stream food webs during limited nutrients and energy flow.

These projects **improve habitat availability for the target anadromous species by increasing the extent and quality of accessible spawning, rearing, and migratory habitats (Criterion 1C)**. Culvert replacement in this application will expand ATS 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. 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. 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. 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. **Modeled ATS habitat will increase by 357 units, and modeled alewife habitat will increase by over 1,600 acres.**

Criterion #2: Regional & Watershed Benefits Supporting American Families & Economy

These six culvert replacement projects are important to the Midcoast and Downeast watersheds and support anadromous fish conservation and restoration strategies (Criterion 2A) through improved access to spawning and rearing habitat and thermal refugia. All the species targeted in this 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 fishery production and resilience through improved access to important spawning habitat, and access to cold water habitats. 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 ATS access to approximately 357 habitat units (35,700 square meters). These projects are located within ATS critical habitat areas, as well as surveyed and modeled ATS spawning and rearing habitat (see Attachment 4 – Project Selection Criteria Maps).

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 in 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 increase species production and resilience through improved access to important spawning habitat and access to cold water habitats.

These projects fit within and will advance multiple preexisting watershed strategies and regional plans developed to benefit ATS, river herring, and other anadromous species in Maine (Criterion 2B). 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 ATS more than salmon restoration alone. Road stream crossing projects are also important for all species in **Maine's Wildlife Action Plan** and **The Maine River Herring Sustainable Fishery Management Plan**. The 2015 Maine's Wildlife Action Plan lists all species affected by these projects as high or highest priority within the state of Maine. These projects are located within alewife spawning habitat areas (Attachment 4) and would collectively open 1,644 acres of alewife habitat, which could result in an eventual run of 1,323,420 alewives.

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 alewives, blueback herring, rainbow smelt, which are all NOAA Species of Concern.

The projects included in this application continue MaineDOT's commitment to restoring and enhancing aquatic organism passage. In 2017, ten years of coordination between MaineDOT, U.S. Fish & 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 Consultation (MAP)**, projects proposed by MaineDOT or MTA that use HCD 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 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.

These projects promote economic competitiveness through anadromous fish restoration, supporting commercial activities, tourism, recreational harvesting and regional economic activity tied to healthy fisheries (Criterion 2C). Restoring anadromous fish populations to these watersheds confers commercial, recreational, and cultural benefits to the region and Tribes. Alewives are important commercial resources in Maine. Alewife harvest rights have been given to 24 towns who generate revenue through leasing harvest rights to commercial fishermen, and the State continues to expand these harvest rights. Once harvested, alewives are a critical bait source to Maine's \$460 million nationally renowned lobster fishery. Maintaining this heritage industry is critical to the economic competitiveness of the coastal region and the state.

Improved fish passage also promotes economic competitiveness through nature tourism in the region. Across the Midcoast and Downeast regions, rebounding alewife runs draw tourists interested in birding,

photography, and nature and cultural amenities during the spring season when tourism, the single largest economic driver in Maine with \$16 billion generated annually, is typically slow. Festivals such as the Bagaduce River Alewife Festival and Damariscotta Alewife Festival in late spring draw an increasing tourism to the area.

In addition to alewives, all anadromous species are important recreationally or culturally to the tribes of the Wabanaki Nations, which traditionally fished for all species. The projects in this application fall within the Wabanaki Nations' traditional homeland, and replacing barriers to improve ecosystem health will benefit tribal health through cultural and economic activity. Increases in sea-run species will also indirectly support commercial and recreational fisheries for other species such as cod, pollock and striped bass, as river herring are forage for these species.

The projects expand access to traditional food sources and reduce food insecurity for rural and Tribal communities (Criterion 2D). According to the U.S. Environmental Protection Agency (March 2021), ATS are economically, ecologically, and culturally important to the Wabanaki Nations. 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, 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. The Penobscot Indian Nation is proposing complementary Culvert AOP Program projects in these watersheds.

These projects also demonstrate a commitment to expanding recreational and commercial harvest opportunities to reduce food insecurity for American families. Increasing sea-run fish species like river herring and Atlantic tomcod reduces food insecurity by providing valuable and abundant protein sources to the Tribe and American families.

Criterion #3: Ecosystem Benefits

These projects improve key physical, chemical, and biological riverine and floodplain ecosystem processes (Criterion 3A) by restoring historic upstream passage, enhancing water quality, managing flood flows, and enhancing nutrient exchange and biodiversity. Mature salmon bring nutrients that help maintain high productivity levels within the rivers and streams 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.

The removal of barriers to aquatic organism passage will also reestablish 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.

The projects included in this 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. 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.

The projects in this application benefit other native aquatic and terrestrial species (Criterion 3B), such as iconic birds of prey (bald eagles and ospreys), apex marine predators, and groundfish. For example, across their various habitats, river herring habitats are eaten by a wide range of native species: ATS, striped bass, bluefish, tuna, cod, haddock, halibut, American eel, brook trout, rainbow trout, brown trout, lake trout, smallmouth bass, largemouth bass, pickerel, pike, white and yellow perch, seabirds, bald eagle, osprey, great blue heron, gulls, terns, cormorants, seals, whales, otter, mink, fox, raccoon, skunk, weasel, fisher, and turtles.

The fragmentation of stream habitats has caused 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 seabirds and birds of prey, sharks, tunas, and marine groundfish species in the Gulf of Maine, and charismatic marine mammals such as dolphins and seals.** 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.

Criterion #4: Project Design and Performance Prioritizing Core Infrastructure

These projects support anadromous fish passage goals and sound methodologies (Criterion 4A) through MAP guidance (<https://www.maine.gov/mdot/maspc/>). By meeting habitat objectives of the MAP, restoration of access habitat will be accomplished through streamlined ESA Section 7 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: the U.S. Forest Service guide by the 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).

The design delivery approach under the MAP Users' Guide will develop design hydrology, assess structure type ("culvert" or "span"), assess structure sizing (1.2x bankfull width [BFW]), check hydraulic capacity ($Hw/D \leq 1$ at Q_{100}), 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 1.2xBFW, 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 projects will include a technically adequate monitoring and evaluation approach (Criterion 4B) by complying with the requirements and guidelines described in the MAP and the MAP User's Guide. 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 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.

The projects in this application will improve the condition, safety, and resiliency of transportation facilities (Criterion 4C) through improved hydraulic capacity and replacement of deteriorating structures. The majority of the current culvert ratings for these six projects indicate moderate to major deterioration. The hydrologic capacity of existing undersized structures will be substantially improved, targeting increased structure widths of at least 1.2 BFW. Increased hydraulic capacity more sustainably accommodates higher stream flows associated with extreme precipitation events and addresses scour that threatens substructures in storm flows.

V. Project Readiness

In the space below, describe how the project will meet the Readiness Considerations and the associated elements as found in Section F of the FYs 2023 through 2026 Culvert AOP Competitive Grant Program NOFO. Where appropriate, reference attachments or other sections of the application. Expand the response blocks as needed but limit the length of the project readiness section of the application to three total pages in length.

Readiness: Technical Assessment

MaineDOT has the resources to deliver the project (A), which is similar to other culvert and bridge projects the Department has designed, built, and maintained statewide. MaineDOT's three-year work plan contains ~\$4.5 billion in funds. This proposal will complete work using multiple funding sources, including federal, state, and local funds, and uses this financial viability to support the implementation of this Culvert AOP project.

These projects will comply with all applicable Federal requirements (B). MaineDOT is a very experienced, thorough, and responsible recipient of previous Culvert AOP, TIGER, FASTLANE, INFRA, CHBP, BUILD and RAISE grant funding. MaineDOT will comply with all Federal regulations, including NEPA requirements and all other regulations.

MaineDOT demonstrates a commitment to timely project delivery, as demonstrated by the schedule information (C) in Attachment 6. 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 demonstrates the technical feasibility of the project (D) given the agency’s regular completion of structure replacements and AOP design, including the successful implementation of prior Culvert AOP program funding. A schedule for anticipated pre-construction and construction activities is provided in Attachment 6, and the statement of work in Attachment 7. The technical approach to delivery is described in Criterion 4A. 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 following the MAP approach (detailed in Criterion 4A).

Readiness: Financial Completeness Assessment

The application includes complete funding estimates based on recent stages of design (A) in Attachment 5 – Project Costs. These costs are linked to the schedule (Attachment 6) and statement of work (Attachment 7).

The application includes a plan to address potential cost overruns (B). MaineDOT operates a three-year, ~\$4.5 billion budget that utilizes a mixture of federal and state funding, which would be reallocated as appropriate in the case of cost overruns.

The application demonstrates reasonable availability of all funding needed to complete the project with an award (C). MaineDOT has extensive experience developing appropriate funding for culvert AOP projects. Based on the Project Costs (Attachment 5), Project Schedule (Attachment 6), and Statement of Work (Attachment 7), MaineDOT is providing a Match Commitment Letter (Attachment 9) to demonstrate the commitment to all funding needs.

Future operation, maintenance, and preservation costs will be funded (D) through MaineDOT’s \$4.5 billion budget. As detailed in Criterion 4B, projects will include a technically adequate monitoring and evaluation approach (Criterion 4B) by complying with the requirements and guidelines described in the MAP and the MAP Users’ Guide, which are regularly completed using existing funding mechanisms.

Readiness: Permitting Risk Assessment

Attachment 8 – Permitting Risk Assessment, demonstrates that:

- **(A) NEPA will be complete in time to meet the project schedule;**
- **(B) All necessary permits and approvals will be obtained in time to meet the project schedule;**
- **There are no known public controversies (D),** and any that arise will be addressed or mitigated.

Public engagement will occur (C) in line with MaineDOT’s [Public Involvement Plan](#). As a culvert replacement project moves from the planning phase into the design phase, ongoing public involvement is essential to maintain support for the project and to obtain meaningful input on the design elements. This public outreach is often a public meeting or series of public meetings, but it may also include less-formal dialogues with municipal officials, interested parties, and other stakeholders. The public involvement process may differ for each effort as projects vary in size, scope, and length of time required for design and construction.

VI. Statutory and DOT Selection Priorities

In the space below, describe how the project will meet the selection priorities in Section F of the FYs 2023 through 2026 Culvert AOP Competitive Grant Program NOFO. Where appropriate, reference attachments or other sections of the application. Expand the response blocks, as needed, but limit the length of the Statutory and DOT Selection Priorities section of the application to three total pages in length.

Statutory Selection Priorities	DOT Selection Priorities
<i>Check all that apply to the project:</i> The project would improve fish passage for: ☒ Anadromous fish listed as endangered or threatened under the Endangered Species Act. ☒ Anadromous fish identified by the National Marine Fisheries Service (NMFS) or the U.S. Fish and Wildlife Service (USFWS) that could reasonably become listed as a federally endangered species or a threatened species. ☒ Anadromous fish identified by NMFS or USFWS as prey for endangered species, threatened species, or protected species, including Southern resident orcas (<i>Orcinus orcas</i>). ☒ Anadromous fish identified by NMFS or USFWS as climate resilient stock. See Section H. ☒ The project opens up more than 200 meters of upstream habitat for anadromous fish before the end of the natural habitat. ☐ None of the above apply to the project.	<i>Check all that apply to the project (DOT will utilize information in other portions of the application to determine responsiveness to the other Selection Priorities listed in the NOFO):</i> ☒ The project focuses on Reinvesting in the American Family by expanding access to traditional food sources or reducing food insecurity for rural and Tribal communities. ☒ The project promotes the productive harvest of our seafood resources. ☒ The project deploys innovative and emerging technologies that also enhance or maintain the safety of the travelling public. ☐ None of the above apply to the project.
Statutory Selection Priorities: Briefly describe below how the project meets the checked statutory priorities and also provide the estimated length of upstream habitat that would be opened to Anadromous fish from the project.	
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. These projects would open access to a total of approximately 357 units of modeled spawning and rearing habitat for ATS and 1,644 acres of alewife habitat by replacing six crossings that are barriers to one or more anadromous fish species.	
DOT Selection Priorities: Briefly describe below how the project meets the checked DOT priorities.	

These projects focus on Reinvesting in the American Family by **expanding access to the traditional food source of alewives in Midcoast and Downeast Maine**. Access through both recreational and commercial harvesting in turn reduces food insecurity for both rural and Tribal communities, including rural classified counties and Maine's five federally recognized tribes.

These projects **promote harvest of our seafood resources** by increasing the available anadromous fish stocks, specifically river herring, available for **municipal and recreational harvest**, as well as **commercial harvests** available in the Gulf of Maine. River herring are a **key bait species**, and economical bait promotes the efficient and successful harvest of **Maine's seafood economy driver, the American lobster**. Finally, increased anadromous fish stocks with forage species such as alewives **support the health of the Gulf of Maine groundfish and pelagic fisheries**, increasing access for fishermen.

These projects **deploy innovative and emerging technologies** that also enhance or maintain the safety of the travelling public. These innovations include:

- **Culvert bank designs** that allow for passage of small and large animals through the culvert, increasing traffic safety by reducing potential collisions with animals;
- MaineDOT's **predictive modeling approach to culvert selection** that determines when crossings need replacement, using inputs of prior knowledge and regular bridge inspections;
- Utilizing a **range-wide programmatic agreement** for ATS, in which the parties involved in this grant application are also applying an innovative means (MAP) with respect to NEPA and permitting through programmatic agreements to ensure timely and consistent reviews and to accelerate project delivery This allows MaineDOT to more efficiently move through related permitting processes and streamline Culvert AOP Program replacement projects, decreasing the amount of time to replacement and thus enhancing road safety.

