UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930

June 14, 2024

Todd Jorgensen, Administrator
Federal Highways Administration, Maine Division
Edmund S. Muskie Federal Building
40 Western Avenue, Room 614
Augusta, ME 04330

Re: Essential Fish Habitat Consultation for the Machias Dike Bridge Replacement

Dear Mr. Jorgensen:

We have reviewed the Essential Fish Habitat (EFH) assessment provided by the Federal Highway Administration (FHWA) on March 19, 2024, for the Machias Dike Bridge project (proposed project) located on the Machias and Middle rivers in Machias, Maine. According to the EFH assessment, prepared by the Maine Department of Transportation (ME DOT) on behalf of the FHWA, the proposed project would replace the existing dike bridge with a series of box culverts with flap gates (identified as Alternative 1 in the EFH assessment). Although the EFH assessment indicates it is likely that the arrangement will include three, 10-foot-wide by 5-foot-tall box culverts, the final design and the construction methods used for the bridge, box culverts, and tide gates will be determined during later engineering reviews and are subject to change after the completion of the EFH consultation. Based on the current design the construction of the proposed replacement structure will result in approximately 32,400 square feet (sf) of permanent and 45,000 sf of temporary impacts to EFH, and will take approximately 3-4 years to complete. The operational impacts were not fully assessed, although the submitted EFH assessment indicates the proposed project would permanently eliminate all tidal exchange to the Middle River for the life of the proposed project (80-100 years, according to the EFH assessment). The Machias River and the Middle River has been designated as EFH for a number of federally-managed species, and supports numerous other NOAA trust resources, including diadromous fish. Based on the information presented in the EFH assessment, it is our determination that the proposed project would result in significant adverse impacts to managed species, their designated EFH, as well as a number of NOAA trust resources that fall under our consultation responsibilities of the Fish and Wildlife Coordination Act (FWCA) which are important for the productivity of the Machias and Middle rivers ecosystem. In particular, the proposed project would result in adverse impacts to EFH of all stages of winter flounder, including sensitive life stages of spawning adult, egg, and larvae habitat, and Atlantic salmon spawning migratory habitat. The Machias River is also one of eleven rivers in Maine designated as a Habitat Area of Particular Concern (HAPC) for Atlantic salmon because it supports one of the only remaining U.S. populations of naturally spawning Atlantic salmon that have historic river-specific characteristics.

We offer the following recommendations under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the FWCA for the proposed project. In addition, we are providing comments to you in the appendix of this letter regarding substantial deficiencies we have identified in the EFH assessment for this proposed project. These comments provide the basis and rationale for our recommendations.

Consultation Responsibilities

In the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Congress recognized that one of the greatest long-term threats to the viability of commercial and recreational fisheries is the continuing loss of marine, estuarine, and other aquatic habitats. Congress also determined that habitat considerations should receive increased attention for the conservation and management of fishery resources of the United States. As a result, one of the purposes of the MSA is to promote the conservation of EFH in the review of projects conducted under federal permits, licenses, or other authorities that affect or have the potential to affect such habitat. The MSA requires federal agencies to consult with the Secretary of Commerce, through NOAA Fisheries, with respect to "any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act," 16 U.S.C. § 1855(b)(2).

The FWCA provides authority for our involvement in evaluating impacts to fish and wildlife from proposed federal actions that may affect waters of the United States. The FWCA requires that wildlife conservation be given equal consideration to other features of water resource development programs through planning, development, maintenance and coordination of wildlife conservation and rehabilitation. The FWCA does this by requiring federal action agencies to consult with us "with a view to the conservation of wildlife resources by preventing loss of and damage to such resources as well as providing for the development and improvement thereof in connection with such water-resource development" (16 USC 662). One of the reasons that Congress amended and strengthened the FWCA in 1958 was that it recognized that "[c]ommercial fish are of major importance to our nation[,]" and that federal permitting agencies needed general authority to require "in project construction and operation plans the needed measures for fish and wildlife conservation" (S.Rep. 85-1981 1958). As a result, our FWCA recommendations must be given full consideration by federal action agencies.

The comments and recommendations provided for this project through our statutory obligations under the MSA and FWCA will assist the FHWA in supporting the Administration's goals to combat the climate crisis in a manner that "conserves our lands, waters, and biodiversity" (E.O. 14008). The ME DOT and FHWA should give full consideration of these recommendations so that the project may contribute to the Administration's efforts to help mitigate the effects of climate change in an environmentally responsible manner.

EFH Conservation Recommendations

In order to avoid, minimize, and offset significant impacts to EFH result of the proposed project, pursuant to Section 305(b)(4)(A) of the MSA, we recommend that you adopt the following EFH conservation recommendations (CRs). As noted above, these EFH CRs are based upon the best available science and represent a risk-averse approach in response to the deficiencies in the EFH assessment, the lack of specificity in the description of the proposed action, and the potential

short and long-term synergistic, cumulative, and interactive climate change effects with this project. We recommend, pursuant to Section 305(b)(a)(A) of the MSA, that you adopt the following EFH conservation recommendations:

1. Bridge Alternative 10 (full-span, pile-supported bridge) should be selected as the preferred project alternative.

2. A plan should be developed to assess contaminated sediments and other materials that may exist in the existing dike structure and, if found at levels that exposure can cause adverse effects to aquatic organisms and/or humans, should be removed in a manner consistent with contaminated and hazardous material removal and remediation. The remediation plan should include implementing measures to prevent the release of contaminated sediments in adjacent areas of the Machias and Middle River.

3. A wetland delineation survey should be conducted to determine the type (i.e., salt marsh, brackish marsh, tidal fresh marsh, and unvegetated tidal habitats) and amount of tidally-influenced habitats in the Middle River. A wetland delineation report should be provided to NOAA Fisheries for our use in calculating the appropriate compensatory mitigation for the proposed project.

4. If Alternative 1 (in-kind replacement) is chosen as the preferred project alternative, a compensatory mitigation plan should be developed that offsets the losses of tidally-influenced wetlands and unvegetated habitats in the Middle River due to the exclusion of tidal waters from the installation of new tide gates in the structure. The amount of compensatory mitigation should be based on the results of a wetland delineation survey, as described above. At a minimum, a 3:1 ratio of compensatory mitigation to impact area should be used for calculations for the losses of tidal habitats in the Middle River.

   In addition, impacts to intertidal and subtidal habitat impacts in the Machias River and Middle River as a result of temporary (45,000 sf) and permanent (32,400 sf) of impacts from the construction of the replacement dike should be offset through implementation of a compensatory mitigation plan. To account for both permanent and temporal habitat losses over the 3-4 years of construction, at a minimum, the amount of compensatory mitigation should be based on a total area of 77,400 sf of existing intertidal and subtidal habitats. Using a 3:1 ratio of compensatory mitigation to impact area, a total of 232,200 sf of compensatory mitigation should be provided for the construction-related impacts.

Please note that Section 305(b)(4)(B) of the MSA requires you to provide us with a detailed written response to these EFH CRs, including a description of measures you have adopted that avoid, mitigate, or offset the impact of the project on EFH. In the case of a response that is inconsistent with our recommendations, Section 305(b)(4)(B) of the MSA also indicates that you must explain your reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with us over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects pursuant to 50 CFR 600.920(k).

Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920(1) if new information becomes available or the project is revised in such a manner that affects the basis for the above EFH conservation recommendations.

Fish and Wildlife Coordination Act Recommendations
The FWCA provides authority for our involvement in evaluating impacts to fish and wildlife from proposed federal actions that may affect waters of the United States. The FWCA requires that wildlife conservation be given equal consideration to other features of water resource development programs through planning, development, maintenance and coordination of wildlife conservation and rehabilitation. Our FWCA recommendations must be given full consideration and are as follows:

1. In order to improve fish passage of diadromous species, the bridge Alternative 10 (full-span, pile-supported bridge) should be selected as the preferred project alternative.

Conclusion
We appreciate the opportunity to provide these EFH conservation recommendations. The conservation recommendations we provide in this letter are based on the information provided in the revised EFH assessment and will ensure that the adverse effects to EFH, federally-managed species, and other NOAA trust resources from this project are minimized and compensated. If you have any questions regarding our conservation recommendations or information in this letter, please contact Michael Johnson at 978-281-9130 or at mike.r.johnson@noaa.gov.

Sincerely,

Louis A Chiarella
Assistant Regional Administrator
for Habitat and Ecosystem Services

cc:
Protected Resources (Anderson, Crocker, Bean)
NOAA Restoration Center (Catena, Bernier)
Office of Habitat Conservation (Robinson)
Maine Department of Transportation (Van Note, Chamberlain)
Maine Department of Marine Resources (Keliher)
U.S. Army Corps of Engineers (Turley, MacNeil, Breen)

Appendix
EFH Assessment Comments and Rationale for EFH Conservation Recommendations

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History of Coordination

Planning for the Machias Dike Bridge replacement project has been ongoing for over a decade and the approaches to replacement have varied through the years. We have been involved in a number of meetings and have provided technical assistance to ME DOT and FHWA regarding the impacts of various alternatives to NOAA trust resources. More recently, we have provided technical assistance letters to you in September 30, 2020 and November 22, 2021, in which we expressed our concerns about the climate vulnerability of an in-kind replacement of the structure and the substantial benefits of a bridge alternative that would provide full tidal transparency (i.e., pile-supported bridge spanning the entire mouth of the Middle River). Because of the substantial benefits it would provide in restoring diadromous fish and federally-managed fish access, restoring over 400 acres of salt marsh in the Middle River, and providing climate resiliency benefits to the project area, we have expressed our strong support for a pile-supported bridge alternative.

We were initially notified by FHWA of a target EFH consultation initiation date of December 16, 2022, which was subsequently modified on May 23, 2023 with a revised consultation initiation date of August 15, 2023. A draft EFH assessment was provided by FHWA on October 28, 2023. However, due to substantial deficiencies in the EFH assessment, we notified FHWA in a technical assistance letter, dated November 28, 2023, that we were unable to initiate the EFH consultation until additional information was provided in a revision of the EFH assessment. A revised EFH assessment was provided by FHWA on March 19, 2024, and we initiated the EFH consultation on May 1, 2024.

General EFH Determination Comments

Based on the information presented in the EFH assessment, it is our determination that the proposed project would result in significant adverse impacts to managed species, their designated EFH, as well as a number of NOAA trust resources that fall under our consultation responsibilities of the FWCA, which are important for the productivity of the Machias and Middle rivers ecosystem. In particular, the proposed project would result in adverse impacts to EFH of all stages of winter flounder, including sensitive life stages of spawning adult, egg, and larvae habitat, and Atlantic salmon spawning migratory habitat. The Machias River is also one of eleven rivers in Maine designated as a Habitat Area of Particular Concern (HAPC) for Atlantic salmon because it supports one of the only remaining U.S. populations of naturally spawning Atlantic salmon that have historic river-specific characteristics.

The existing dike bridge is currently restricting the ability of NOAA trust resources to access historic EFH and preventing the restoration of over 400 acres of tidal habitats in the Middle River. In addition, the proposed project would effectively eternalize and eliminate any opportunity for restoration of tidal habitats and access by species to the Middle River. According to the revised EFH assessment, tidal habitat restoration potential for the Middle River includes approximately 17 acres of high marsh, 208 acres of low marsh, and 191 acres of unvegetated habitats (e.g., intertidal mud flats and tidal riverbed). Furthermore, the proposed project would continue to have both short and long-term impacts to habitats important for diadromous fish, including alewife, blueback herring, rainbow smelt, American shad, and American eel. Project impacts include the immediate elimination of tidal flow to a combined area of at least 33 acres of salt marsh, brackish marsh, and tidal fresh marsh habitats that exist in the Middle River, resulting

in the permanent loss of these habitats and their conversion to freshwater habitats. Tidal freshwater marshes are considered a valuable and rare wildlife habitat, which has received considerable conservation attention by the Maine Department of Agriculture, Conservation & Forestry. Because the proposed project would eliminate all diurnal tidal exchange to the Middle River, tidal freshwater marshes in the Middle River will be permanently lost in this system for the life of the proposed project. Despite our multiple requests, a wetland delineation survey and quantification of the habitats in the Middle River has not been provided by ME DOT. Information regarding proposed compensatory mitigation for the adverse effect to EFH and other NOAA trust resources was not included in the EFH assessment.

Although we agreed to initiate the EFH consultation on May 1, 2024, based on the available information, the revised EFH assessment does not accurately describe EFH in the project area or fully evaluate the direct, indirect, individual, cumulative, and synergistic adverse impacts to EFH and other NOAA trust resources due to the construction, operation, and maintenance of the proposed project.

Further complicating matters, the design height of the preferred alternative stated in the revised EFH assessment is not consistent with information provided to our Protected Resources Division in the Biological Assessment (BA) for the Endangered Species Act consultation. Specifically, the revised EFH assessment indicates the maximum height of Route 1 is expected to target 18.16 feet (ft.) NAVD88, while the BA indicates a maximum height of 13.1 ft. NAVD88. This inconsistency in proposed project design complicates the ability of NOAA Fisheries to fully assess the effects of the action on NOAA trust resources, and hinders our ability to assess adverse effects to EFH and provide effective EFH conservation recommendations. This also raises substantial questions regarding the scope of the proposed action that ME DOT and FHWA is pursuing for this project.

Our evaluation of impacts to EFH was also complicated by the lack of detail on project alternatives that may reduce the short and long-term impacts of the proposed project. The EFH assessment notes two other project alternatives were considered that would provide tidal exchange to the Middle River. However, a comparison of the short and long-term effects of the preferred alternative and other project alternatives, including an assessment of the climate effects, were not provided. The level of detail necessary to compare the proposed project and the other alternatives is not sufficient to evaluate distinct differences in the adverse effects to EFH and federally-managed species, and allow for the identification of measures to avoid and minimize adverse effects. We have determined the proposed structure represents long-term climate vulnerabilities to NOAA trust resources, as well as to the built environment in the project area.

Specific EFH Assessment Concerns

As noted above, we have previously requested information from ME DOT and FHWA that we deemed necessary to evaluate the full effects of the proposed project on EFH and other NOAA trust resources, most recently in a technical assistance letter to you on November 28, 2023. Unfortunately, information provided in the revised EFH assessment was insufficient to fully assess the effects of the project. A summary of the deficiencies in the EFH assessment are provided below.

Project Design Information
In our November 28, 2023 technical assistance letter, we requested design and engineering details for the proposed dike structure, and the size, number, and design of culverts and tide gates, including plan view and cross-sectional drawings. In response, the revised EFH assessment indicated that the "final design" of the proposed project will be completed only after the National Environmental Policy Act (NEPA) process is complete, and included citations from FHWA guidance and directives. The cited references described the "final design activities, property acquisition, purchase of construction materials or rolling stock, or project construction" that should only occur after issuance of a Finding of No Significant Impact or a combined final Environmental Impact Statement/Record of Decision. However, our requests for design and engineering information were not necessary to meet the "final design activities" stage, but rather information necessary to evaluate the full effects of the construction, operation, and maintenance of the proposed project on EFH and other NOAA trust resources. NEPA requires federal action agencies to evaluate the environmental impacts of a proposed action and reasonable alternatives to the proposed action and the significance of those impacts. The comparison of a proposed action and reasonable alternatives shall be based on the discussion of the impacts (§1502.16 Environmental Consequences).

Furthermore, Section §600.920(e)(3) of the EFH Final Rule requires that an EFH assessment include an analysis of the potential adverse effects of the action on EFH and the managed species. Section §600.920(e)(4) of the Final Rule describes additional information that, if appropriate, should be included in an EFH assessment, such as the results of an on-site inspection to evaluate the habitat and the site specific effects of the project and an analysis of alternatives to the action. Such analysis should include alternatives that could avoid or minimize adverse effects on EFH. The FHWA's guidance pertaining to final design requirements should not prohibit the ME DOT and FHWA from providing appropriate information, including project drawings necessary for NOAA Fisheries to assess the extent of the direct and indirect impacts to EFH from construction and the long-term impacts from the operation of the tide gates. Furthermore, the revised EFH assessment provides limited information regarding project alternatives that were considered, and insufficient information regarding comparative environmental impacts between the alternatives.

Construction-related Impacts
Section 2.0 of the revised EFH assessment indicates a preliminary plan view and construction limits was provided in Appendix B; however, that plan only depicts a temporary bypass bridge and cofferdams, and does not include details of the proposed dike structure, culverts, and tide gates necessary to evaluate the adverse effects to EFH. Although the plan view drawing shows a path for the concrete box culverts through the new dike, it does not depict tide gates. The EFH assessment also does not include cross-sectioning drawings with elevation data for the proposed dike structure, culvert, and tide gates. Furthermore, the plan view drawing does not depict the mean high water (MHW) or mean low water (MLW) lines, which we requested and indicated is necessary to evaluate the effects of the proposed project on EFH and federally-managed species.

The revised assessment states "Activities that could result in an adverse effect (pile driving with an impact hammer) will be completed outside of the water or within the December 1- March 31

window." This is an inaccurate statement because, as noted in Table 3 of the revised EFH assessment, much of the construction activities that will result in adverse effects to EFH will occur during all months of the year (i.e., placement of fill for the temporary access road, excavation/dredging and removal of portions of the existing dike structure, and sheet pile installation for cofferdams). The only time-of-year restriction (TOY) proposed is for noise producing activities from pile driving for the temporary bridge. Furthermore, the proposed work window for the temporary bypass bridge installation is from December 1 to March 31, which will not protect sensitive life stages of a number of federally-managed species and other NMFS trust resources. For example, adult winter flounder spawning, and egg and larvae development occur in the Machias River between March 15 and June 30; Atlantic salmon spawning migrations can occur from April to December; and downstream juvenile migration can occur in the project area from April to June; other diadromous fish present in the Machias River (e.g., alewife, blueback herring, and American shad) undergo spawning migrations in April through June. We have determined that sensitive life stages of these species will be impacted by the proposed project construction, and the revised EFH assessment does not describe these adverse effects or indicate any avoidance and minimization efforts will be employed.

Cofferdam and Access Fill Impacts

Our technical assistance letter requested the location and extent of the cofferdams proposed for the project in relation to the dike structure with MHW and MLW lines depicted. As noted above, Appendix B contains a plan view drawing for the temporary bypass bridge, access fill, and cofferdams, although it does not include MHW or MLW lines which inhibits our ability to assess the impacts to EFH and NOAA trust resources. The revised assessment indicates that proposed cofferdams will impact approximately 24,000 sf of habitat, although the amount and type of each habitat and EFH present in the project area that would be impacted was not provided. The project overview section states that "the MLW line is approximately 30 feet away from the existing dike footprint and the temporary work is likely to extend further than that into the Machias River". This suggests a majority, if not all, of the existing intertidal habitats adjacent to the project will be impacted and made inaccessible to federally-managed species during the 3-4 year construction duration. Furthermore, the revised assessment indicates that the TOY restriction proposed is limited to pile driving for the temporary bypass bridge. TOY restrictions are not proposed for the sheet pile installation of cofferdams, placement of access fill, and dredging/excavation of the existing dike. As a consequence, we have determined that sensitive NOAA trust resources in the project area, including demersal and sessile winter flounder eggs and larvae, will likely be injured or killed during construction.

Temporary Bridge and Approach Fill Impacts

The revised EFH assessment states that the temporary bypass bridge and approach fill will impact 21,000 sf, but does not provide information about the type of habitats that will be impacted, or how much of the impact will occur in intertidal and subtidal habitats. The revised EFH assessment indicates the proposed temporary bridge would include the installation of 35, 30"-diameter piles, suggesting an impact of approximately 1,000 sf. We therefore assume the remaining 20,000 sf of impacts are the result of fill for an approach road for the temporary bridge. However, the revised assessment provides no explanation of why the approach fill is needed, or a description of the material proposed for the fill. There is no information regarding how turbidity and sedimentation from the fill will be controlled and minimized to adjacent

habitats, such as winter flounder spawning and egg development habitat and migration pathways for diadromous fish, or how impacts may be minimized with TOY restrictions. There is no information regarding the restoration of intertidal and subtidal habitats upon removal of the approach fill material and temporary bridge. Furthermore, the revised EFH assessment indicates the proposed temporary bridge will be located in the Machias River, but does not provide an explanation for why a temporary bridge could not be located in the Middle River. The existing dike and tide gates block federally-managed species and other NOAA trust resources from accessing the Middle River, and locating the temporary bridge there would minimize impacts to these species present in the Machias River, including Atlantic salmon and winter flounder.

Our November 28, 2023 technical assistance letter requested descriptions of proposed methods for controlling turbidity and sedimentation in wastewater and material excavated from the cofferdams, and how it will be prevented from impacting species and habitats in the Machias River and Middle River during the construction of the replacement dike structure and the demolition of the existing structure. Our letter also requested descriptions of proposed measures that will be implemented to monitor excessive turbidity and sedimentation, including contingencies in the event turbidity and sediment exceeds allowable levels (e.g., "stop-work" or revised work protocols). The revised EFH assessment does not assuage our concerns. For example, the revised assessment states "The configuration of the existing box culverts within the bridge structure will create challenges for installing temporary water control structures. It is likely there will be water leaks through the cribwork. Sandbags or other barrier methods placed on a surface are not likely to stop water flowing through the dike. Further, it is not possible to drive a traditional sheet pile through the cribwork structure." The revised assessment also states that portions of the existing dike will have to be excavated prior to installing sheet pile walls of the cofferdams, which suggests excessively turbid water will enter adjacent areas in the Machias and Middle River and will result in adverse effects to EFH and other trust resources. The information in the revised EFH assessment suggests controlling turbidity and sedimentation impacts on adjacent habitats during construction will be very difficult, if not impossible, yet the revised assessment does not include any plans to control or monitor turbidity and sedimentation, nor any contingency plans that would reduce impacts to adjacent habitats should turbidity and sedimentation impacts be identified.

The lack of any proposed plan to monitor and control high turbidity and sedimentation from impacting adjacent habitats is troubling. This is particularly concerning because the Machias River supports sensitive life stages of federally-managed species, including winter flounder spawning, and egg and larval development habitat. High turbidity levels and sedimentation in the Machias River can also impact EFH for adult and juvenile Atlantic salmon and their movement to and from spawning and rearing habitats, including the Atlantic salmon HAPC for the Machias River. The EFH assessment fails to include any evaluations or assessments of effects to EFH from turbidity and sedimentation, and does not propose any TOY restrictions for excavation and fill placement, or sheet pile installation for cofferdams.

Deficiencies Assessing Potential Contaminated Sediments

Our November 28, 2023 technical assistance letter requested information related to testing for contaminated sediments and other materials used for construction of the existing dike structure, particularly for potentially hazardous materials (e.g., polycyclic aromatic hydrocarbons) and

heavy metals. We indicated that a description of methods used to contain materials and sediments removed from the old dike, and prevent the release of contaminated sediments into the Machias and Middle River should be included in the assessment. The revised EFH assessment indicated that an initial site assessment was conducted to identify the presence of hazardous materials associated with the dike. However, details regarding the types of hazardous materials that were tested, how or where testing of hazardous material in the dike bridge was conducted was not discussed. The existing dike structure was constructed around 1870, during a time when industries, including shipyards, an iron foundry and machine shop, canned-food factories, printing establishments, and a silver mining company operated in Machias, Maine. There is a possibility that fill material used in the construction of the dike may contain hazardous materials, making it prudent to evaluate this prior to construction. The revised assessment states that ME DOT will ensure any unanticipated contamination or deleterious materials encountered during construction will be managed in accordance with applicable environmental regulations, but it is unclear what measures would be taken to identify and determine the presence of contaminated materials during construction. Testing for contaminated sediments during bridge construction and excavation is not a standard requirement for contractors, as it typically involves specific training and testing equipment onsite during project construction. We continue to be concerned that the release of contaminated sediments in the surrounding water column and benthic habitats poses a threat to EFH and other NOAA trust resources.

Operational-related Impacts

The revised EFH assessment does not provide a meaningful evaluation of the expected operational impacts to EFH for the preferred alternative or any comparative analyses for the project alternatives. Section 5.0 includes a subsection titled "Effects from new functioning tide gates" that describes a loss of tidal habitats in the Middle River. The revised assessment mentions the presence of salt marsh and several species of salt tolerant vegetation, and several tidal species observed on intertidal mudflats in the Middle River. The revised assessment only states that "The project will result in a reduction of the tidal freshwater portions of the 32.7 acres as well as the unknown amount of that area that may contain some salt tolerant vegetation. Any areas containing salt tolerant vegetation will undergo a conversion back to freshwater vegetation."

The revised EFH assessment does not describe the methods used to estimate the amount of tidal freshwater habitats in the Middle River. Without such information, we have concerns with the accuracy of the quantification of existing habitats and the area of EFH that will be permanently impacted over the life of the proposed project. In our November 28, 2023 technical assistance letter, we requested that ME DOT conduct a wetland delineation survey in the Middle River to quantify the existing salt marsh and other tidally-influenced habitats, and assess the extent of losses due to the proposed project. This was not provided in the revised assessment and, despite our continued request to ME DOT and FHWA following the receipt of the March 19, 2024 revised EFH assessment, this information has still not been provided. In the absence of an in-situ wetlands assessment, it is unclear how the area of impact was determined. Indirect methods to quantify the type of salt tolerant wetlands in the Middle River, such as using hydrological modeling, are not an accepted form of wetland delineation used by wetland scientists, and natural resource and regulatory agencies. We continue to request ME DOT conduct a wetland

delineation survey for the tidally-influenced habitats in the Middle River, and use the results to determine the effects of the proposed project.

Deficiencies Describing EFH in the Project Area

Our November 28, 2023 technical assistance letter requested a description of all EFH designated in the Middle River and Machias River, and this information should be used to describe adverse effects to EFH in Section 5.0 (Analysis of Potential Impacts on EFH) of the EFH assessment. Although Table 6 in Section 3.0 (Essential Fish Habitat Designations) of the revised assessment lists federally-managed species for which EFH is mapped in the Machias River, the information in the table is limited to depth and salinity preferences for each species relevant to the project area. The table does not describe the EFH for life stages of federally-managed species occurring in the project area, nor is a description of EFH provided in other sections of the EFH assessment. As one example, all life stages of winter flounder are designated in the project area. The EFH Omnibus Amendment identifies EFH for juvenile and adult winter flounder as mud, sand, rocky substrates with attached macroalgae, and tidal wetlands to the MHW line, all of which occur in the project area. Furthermore, the EFH Omnibus Amendment describes benthic habitats used by winter flounder eggs, including mud, muddy sand, sand, gravel, and macroalgae, can be unsuitable for eggs and reduce hatching success if exposed to excessive sedimentation (NEFMC 2017). Construction activities proposed for this project will result in turbidity and sedimentation on habitats used by spawning winter flounder adults and eggs within and outside of cofferdams during periods when these life stages are present in the action area. The revised EFH assessment fails to describe the EFH for winter flounder, or characterize the adverse effects of the proposed project.

The HAPC for Atlantic salmon is located in the Machias River approximately 800 ft. upstream of the project area. As such, migratory passage of Atlantic salmon may be adversely affected by the proposed project. The impacts to Atlantic salmon EFH include the restriction of the Machias River from the proposed temporary bridge and access road, cofferdams, noise from pile driving and other activities, and elevated turbidity in the river during construction. According to the revised EFH assessment, a large proportion of the intertidal habitat on the north side of the Machias River adjacent to the Machias Dike will be inaccessible to migrating salmon during project construction from cofferdams, the temporary bridge, and the temporary access road fill. Upon completion of the proposed project, approximately 16,200 sf of intertidal and subtidal habitats in the Machias River will be permanently filled by the new dike bridge structure. The revised EFH assessment fails to describe the potential adverse effects of the proposed project to Atlantic salmon EFH, specifically access to upstream spawning habitat and HAPC.

The deficiencies of the revised EFH assessment is particularly troubling because the descriptions of EFH designations in Section 3.0 (Essential Fish Habitat Designations) in the project area excludes the Middle River. The descriptions of habitats in the Middle River are included in a separate section (4.1 Aquatic Habitat). Furthermore, Section 3.0 states “The mapper appears to map the estuary of the Machias River as EFH and has a buffer from that area that extends upstream of the Dike into the Middle River.” Other sections of the revised assessment suggests ME DOT believes the Middle River is not designated as EFH, such as Section 2.1 (Proposed Scope), which states “16,200 square feet of impact would be to functioning EFH downstream of the Dike, and 16,200 square feet of impact would be to the areas in the Middle River.” For

clarification, the EFH Mapper tool does not describe the Middle River as a "buffer" for EFH, and in fact clearly indicates the Middle River is designated as EFH for federally-managed species. This point was made very clear on pages 10 and 11 of our November 28, 2023 technical assistance letter to the FHWA and ME DOT. Specifically, we noted the Middle River is designated EFH for 20 federally managed species. The definition of EFH in the Final Rule is not dependent upon the ability of federally-managed species to currently access part or all of a project area. As noted in the EFH Consultation Requirements of the EFH Final Rule (§600.10), EFH "may include aquatic areas historically used by fish where appropriate". There is ample evidence the Middle River was formerly a tidally-influenced river used by fish and invertebrate species similar to the Machias River today. Both the Middle River and Machias River are designated as EFH, and the assessment for this proposed project should have appropriately described the adverse effects on all EFH in the project area.

Deficiencies in Adverse Effects Analysis on EFH

In our November 28, 2023 technical assistance letter we requested a description of all expected adverse effects to the EFH for life stages of federally-managed species designated in the project area, including from the construction of the proposed dike structure and the demolition of the existing dike structure. The second paragraph of Section 5.0 (Analysis of Potential Impacts on EFH) of the revised assessment indicates habitat alteration is listed as one of the primary causes of adverse effects to EFH in both construction and demolition activities. However, the project effects discussed in Section 5.0 is almost exclusively restricted to impacts to species, rather than habitats (EFH) used by federally-managed species. Section 5.0 discusses "false attraction" and "hydroacoustic effects" and describes the effects of the project to fish species. The EFH Final Rule at §600.810 defines an adverse effect to EFH as any impact that reduces the quality and/or quantity of EFH. Our November 28, 2023 technical assistance letter to you provided guidance on appropriate considerations and analysis in an EFH assessment. The exclusive focus on the effects to species, rather than the effects on EFH, is an inappropriate method of analyzing the effects of the action on EFH.

Section 5.0 of the revised assessment fails to provide sufficient information regarding the adverse effects on EFH from the proposed project. There is a lack of discussion in the assessment about adverse effects to EFH from the 45,000 sf of temporary and 32,400 sf of permanent impacts due to increasing the height of the dike bridge. As described in the revised EFH assessment, the preliminary estimate for the maximum dike bridge elevation could be as high as 18.16 ft. NAVD88 (final elevation for the new dike bridge has not been determined, but the assessment states this is the presumed height for assessing adverse effects to EFH). The existing maximum height of the dike bridge is about 11 ft. NAVD88, suggesting an approximate +7-foot elevation change at the high point of the dike. An assumed 3:1 side slope was used to calculate the new toe of slope, which will be 21 ft. from the center and 15 ft. near the ends of the dike. Should the height or other dimensions of the dike increase in the final design phase, the area of impact will need to be reevaluated. Furthermore, increases in the height or other dimensions of the proposed dike will also increase the extent of temporary impacts from access fill and cofferdams in the Machias and Middle River. Should the final design height or other dimensions of the bridge increase, we anticipate a need for FHWA to reinitiate the EFH consultation for the proposed project.

The discussions in the revised EFH assessment about habitat impacts refers to a loss of 640 sf of salt marsh in the Machias River, although the assessment does not describe the activities that would cause the impact or the effects to designated EFH in the project area. The only other reference to habitat impacts is in a subsection titled "Effects from new functioning tide gates", which describes the loss of tidal habitats in the Middle River. However, it does not fully describe the extent of tidal habitat losses, simply referring to a reduction of the tidal freshwater portions of the river by about 33 acres, as well as an "unknown amount of that area that may contain some salt tolerant vegetation." In our November 28 technical assistance letter, we requested that ME DOT conduct a survey of the area of existing salt and brackish marshes in the Middle River, quantify the existing habitats, and assess the extent of losses due to the proposed project. This information was not provided in the revised assessment. Furthermore, the revised assessment states "Any areas containing salt tolerant vegetation will undergo a conversion back to freshwater vegetation." This is an inaccurate characterization of the loss of tidal wetlands in the Middle River from the installation of new tide gates. The proposed project would continue the long-term impact to a historically tidal river with salt-tolerant habitats, and result in a permanent conversion to a freshwater system. Furthermore, the proposed project would effectively eliminate any potential future restoration of historic salt marsh, brackish marsh, tidal freshwater wetlands, and other intertidal and subtidal habitats in the Middle River.

Tidal freshwater marshes are mixed herbaceous marshes that receive daily tidal water level fluctuations, but minimal actual saltwater input, that occur in the freshwater reaches of coastal rivers. Tidal freshwater marshes are considered valuable wildlife habitat and have received considerable conservation attention by the Maine Department of Agriculture, Conservation & Forestry, which has designated this habitat type as "S1, Imperiled in Maine – At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors." (https://www.maine.gov/dacf/mnap/features/communities/freshwatertidalmarsh.htm). The proposed project would eliminate all diurnal tidal exchange in the Middle River, resulting in the permanent elimination of this rare aquatic habitat type. The high diversity of fish and wildlife species associated with tidal fresh habitats in the Middle River will be permanently lost to this system for the life of the proposed project.

Climate Change Concerns

Our concerns regarding the climate implications for the proposed project have been expressed in our technical assistance letters to ME DOT and FHWA on September 30, 2020 and November 22, 2021. More recently, our technical assistance letter on November 28, 2023, requested you conduct a climate assessment to evaluate the synergistic, additive, and cumulative effects of the proposed project from sea level rise (SLR), storm surge, increased extreme rainfall and inland flooding, and warmer water temperatures on EFH and other NOAA trust resources. Furthermore, we requested the climate assessment evaluate the other bridge design alternatives that were considered, including an open culvert configuration (Alternative 4m) and a pile-supported bridge design (Alternative 10). According to the revised EFH assessment, the expected life span of the proposed dike bridge, culverts, and tide gates is 80-100 years. Therefore, the proposed structure will be subjected to numerous changes that will have substantial implications in the operation and the functional use of the structure.

We believe the design of a bridge structure should be informed by and be consistent with Maine Climate Council's recommendations for SLR, as well as the Maine Climate Action Plan's recommended use of natural climate solutions to increase carbon sequestration, and investing in climate-ready infrastructure (Maine Climate Council 2020). We do not believe the proposed project is consistent with guidance from the Maine Climate Council, and an appropriate evaluation of the short and long-term effects of climate change has not been conducted for the proposed project.

We have conducted a climate assessment that we believe accurately describes the implications of climate change and numerous vulnerabilities this project would represent for EFH. Our assessment indicates that the proposed structure would result in both short and long-term climate vulnerabilities to EFH and other NOAA trust resources, as well as to the built environment in the project area. The EFH Final Rule defines an adverse effect as any impact that "reduces the quality and/or quantity of EFH, and may include direct or indirect physical, chemical, or biological alterations of the waters or substrate." An adverse effect may include the loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Furthermore, the adverse effects to EFH may "result from actions occurring within EFH or outside of EFH and may include site specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions" (50 CFR 600.810). The "individual, cumulative and synergistic consequences of an action" should be considered in the context of other known effects in the project vicinity, which may include climate change if the assessment is based on the best available information and can reasonably project the directionality of climate change and overall extent of effects to the species and/or the habitats. The EFH regulations stipulate that federal agencies and NOAA Fisheries must use the best scientific information available regarding the effects of an action on EFH, and measures that can be taken to avoid, minimize, or offset such effects (50 CFR 600.920(d)). We have determined the proposed project would increase the climate vulnerability of EFH and other NOAA trust resources in the Machias and Middle River and would have synergistic, additive, and cumulative adverse effects on EFH.

Section 5.2.5 (Effects of preferred alternative combined with climate change) of the revised EFH assessment states that the proposed design accounts for "higher water in the coastal environment as well as increased precipitation and freshwater storms." We believe this is an inaccurate statement for several reasons. The revised assessment cites a November 2021 memo from Stantec that described water elevations for a Q1.1 flow during a 100-year storm surge with a SLR scenario of 3.9 ft. could be as high as 14.6 ft. NAVD88. The Stantec memo evaluated changes in water levels due to SLR and storm surge, but it does not appear to include inland flooding and extreme precipitation events caused by climate change. As noted in our November 28, 2023 letter, more frequent and intense extreme precipitation events and river flows will impact the proposed dike bridge structure, as well as the operation of tide gates and flow between the Middle River and Machias River. New England is experiencing more extreme precipitation events and this trend is projected to increase in the 21st century with corresponding higher air temperature (Easterling et al. 2017; Jong et al. 2023), which will result in higher maximum peak river flows in Maine (Hodgkins and Dudley 2013). Climate studies incorporating hydrological models have projected increased variability in streamflow, with greater frequencies

of both high-flow and low-flow events predicted for much of the Northeast region (Demaria et al. 2016; Hayhoe et al. 2007).

The 3.9 ft. projection referenced in the Stantec memo refers to the Maine Climate Council's "commit to manage" SLR scenario for the year 2100. However, we believe the projected 14.6 ft. NAVD88 SLR and storm surge scenario for the project area described in the Stantec memo is extremely conservative and not representative of likely conditions over the life span of the project. Furthermore, the Stantec memo is not consistent with the results of a study commissioned by ME DOT for the Machias Dike Bridge, published in 2013 by the ME DOT Transportation Research Division (Maine DOT 2013 Technical Report 14-05; Douglas and Kirshen 2013). This study was conducted in response to recommendations in state legislation LD460, Resolve to Evaluate Climate Change Adaptation Options for the State, passed during the First Regular Session of the 124th Maine State Legislature in April 23, 2009 (http://www.mainelegislature.org/legis/bills/bills_124th/billtexts/SP016301.asp). This study should have been included in the revised EFH assessment, as the technical report evaluated the effects of inland river flooding, storm surge and SLR on the Machias Dike Bridge. Two bridge alternatives were evaluated in the study: an in-kind replacement with box culverts and a span bridge. The ME DOT technical report simulated the combined effects of inland river flooding and storm surge on flood elevations at the Machias Dike Bridge using a HEC-RAS, a river model developed by the Army Corps of Engineers. The analysis used the 100-year peak discharge for the Middle River under existing conditions and a 10% higher discharge for future conditions. It is important to note that the existing bridge conditions were simulated assuming that the tide gates were always open, as tide gates are not a bridge option in the HEC-RAS model. Consequently, the study's evaluation of inland flooding in the Middle River was very conservative because the tide gates of the proposed project will be closed when the water elevation in the Middle River is lower than the Machias River. The only discharge through the dike bridge structure will be when the tide gates are in an open position, which occurs approximately 12 hours per day on normal diurnal tide cycles. However, during heavy rainfall and inland flooding coinciding with coastal storm surge events, which is common in New England, abnormally high tidal elevations in the Machias River can limit the time the tide gates are open and discharge water from the Middle River. Consequently, inland flooding in the Middle River above the dike will likely be greater than the estimates obtained from the 2013 ME DOT technical report. Inland flooding in the Middle River due to the presence of the dike bridge will increase the adverse effects on EFH in both the Middle River and the Machias River from scour and erosion of river banks and wetland habitats, and impact water quality from higher water temperatures, lower dissolved oxygen, and greater inundation of vegetated wetlands and freshwater releases in the tidally-influenced Machias River.

The ME DOT technical report projected flooding and SLR to the year 2050, using a high SLR scenario of 1.7 ft. However, the proposed dike bridge is expected to have a lifespan of 80-100 years, which requires a longer time horizon to assess the effects of climate change on the project. At a minimum, SLR projections used in a climate change assessment for the proposed project should be consistent with the Maine Climate Council's "Commit to Manage" SLR recommendation of 3.9 ft. for the year 2100. The climate assessment should also include the Maine Climate Council's "Prepare to Manage" recommended SLR scenario of 8.8 ft. for the year

2100 (Maine Climate Council 2020). These scenarios were incorporated into state regulations as official SLR projections in 2022.

The revised EFH assessment indicated the proposed dike bridge maximum roadway height could be as high as 18.16 ft. NAVD88. The ME DOT technical report estimated a 100-year and 5-year storm surge height of 7.04 ft. and 5.95 ft., respectively, and a wave height of 1.0 ft. We have calculated the combined effect of SLR, inland river flooding, and 50-year and 100- year storm surge events on the proposed dike bridge using a 18.16 ft. NAVD88 elevation, as shown in the table below.

Storm surge return period (yrs.)	**Surge height (ft.)**	**Existing MHHW (ft. NAVD88)**	**Wave height (ft.)**	**"Commit to Manage" SLR elevation (ft. NAVD88)**	**"Commit to Manage" water level exceedance (ft.)**	**"Prepare to Manage" SLR elevation (ft. NAVD88)**	**"Prepare to Manage" water level exceedance (ft.)**
50	5.95	7.44	1.0	18.29	+0.13	23.19	+5.03
100	7.04	7.44	1.0	19.38	+1.22	24.28	+6.12

Table 1. Year 2100 storm surge, SLR projections, and water level exceedances for the proposed 18.16 ft. NAVD88 elevation for Machias Dike Bridge (adapted from 2013 ME DOT Technical Report 14-05).

As shown in Table 1, using the Maine Climate Council's 2100 SLR ``Commit to Manage" and "Prepare to Manage" scenarios, the Machias Dike Bridge constructed with a roadway surface elevation of 18.16 NAVD88 would be inundated under both 50-year and 100-year storm surge events over the expected life of the project. Furthermore, using the shorter-term, 2050 SLR projections evaluated in the ME DOT technical report, the dike would be within less than a foot of inundation in a 100-year storm surge event (Table 2).

Storm surge return period (yrs.)	**Surge height (ft.)**	**Existing MHHW (ft. NAVD)**	**Wave height (ft.)**	**High (+1.7 ft.) SLR elevation (ft. NAVD88)**	**High (+1.7 ft.) SLR water level exceedance (ft. NAVD88)**
100	7.04	7.44	1.0	17.18	-0.98

Table 2. Year 2050 storm surge, SLR projections, and water level exceedances for the proposed 18.16 ft. NAVD88 elevation for Machias Dike Bridge (adapted from 2013 ME DOT Technical Report 14-05).

It is important to point out that the existing dike bridge is inundated by extreme high tides and storm surge multiple times per year (most recently in January 2024). Future climate change will worsen this condition. As noted in the Scientific Assessment of Climate Change and Its Effects in Maine report by the Scientific and Technical Subcommittee of the Maine Climate Council (MCC STS 2020), "a 1-foot increase in sea level, which could occur by 2050, would cause a "100-year storm" flood level to have a probability of occurring once in every 10 years. Not accounting for changes in storm intensity or frequency, this would result in a 10-fold increase in coastal flooding in Maine in the next 30 years." It is likely that the proposed dike, if built at an elevation 18.16 ft. NAVD88, has the probability of being inundated seven or more times over the lifespan of the dike, and possibly twice by 2050. This would represent a considerable climate vulnerability for the project, and would likely result in considerable cost to repair and maintain the structure. Inundation of the proposed dike bridge would increase erosion and scour impacts to vegetated and unvegetated habitats in the Middle and Machias Rivers. Future repairs,

improvements, and maintenance of the dike bridge due to damage from flood events and storm surge will result in increased adverse effects to EFH and other NOAA trust resources.

Furthermore, as discussed above, because the HEC-RAS used in the 2013 ME DOT technical report does not provide the ability to analyze tide gates in the model, the hydraulic simulations assumed that the tide gates were always open. However, this is not how flap tide gates will operate on the Machias Dike Bridge, which will remain closed for approximately 50% of the time in a 24-hour period. As future sea levels increase the tidal elevations, the tide gates will close for longer periods during an average tide cycle which can reduce the time water in the Middle River can exit through the tide gates. So while the HEC-RAS modeling provides useful information regarding flood water elevations at the dike under combined SLR and storm surge conditions, it should be interpreted as very conservative estimates of inland freshwater flooding potential for the proposed dike.

Our November 28, 2024 technical assistance letter requested information about how extreme precipitation, SLR, and flooding will affect the operation of the dike structure and tide gates, and how these changes will impact EFH, federally-managed species, and other NOAA trust resources in the project area. Section 5.2.5 (Effects of preferred alternative combined with climate change) of the revised assessment discussed "a chance of storms that could overtop a new structure" and "there could be erosion of shorelines and areas adjacent to the rip rap along the edge of the dike", but concluded "this is a potentially (sic) future effect, but do not believe the future effects can be quantified." While quantifying precise impacts to EFH from future changes in climate can be challenging, inland flooding, SLR projections and storm surge calculations for the project location are available. In fact, these calculations have already been completed for the proposed project in the ME DOT technical report (Maine DOT 2013 Technical Report 14-05; Douglas and Kirshen 2013). As noted above, based on the ME DOT technical report, inundation of the dike under climate scenarios are not simply theoretical, but highly probable. Some estimates of effects to EFH and other NOAA trust resources due to the proposed structure can be made, including the effects of higher sea level on vegetated intertidal wetlands, scour and erosion adjacent to the structure due to higher sea level and water velocity through the tide gates, and scour and erosion of habitats due to inundation of the dike structure. However, the revised EFH assessment failed to accurately quantify existing aquatic habitats in the Middle River, including intertidal vegetated and non-vegetated habitats, and subtidal habitat, nor does it provide any evaluation of the synergistic and cumulative impacts of the project with climate change.

Furthermore, the revised assessment does not assess the effects of increased water temperatures in the Middle River or how this may affect EFH and other trust resources. The revised assessment states "As water warms, water that is impounded by the Dike will also warm. Maintaining the impoundment will continue to have the effect of warming water. No monitoring of temperatures has been completed to understand the current effect of the Dike on water temperatures. Changing climate conditions are likely to warm the water in the impoundment to higher temperatures and continue the current effects that are occurring." The existing dike is likely causing elevated temperatures in the Middle River today due to restrictions in flow and from higher air temperatures from climate change. Temperatures of northern New England streams and rivers are projected to increase disproportionately higher than the national average over the 21st century (Letcher et al. 2016), which would have implications to habitats in the

Middle River. New England riverine habitats have been historically altered by a host of non-climate perturbations, including dams and tidal restrictions (Daley et al. 2009; Hall et al. 2012; US EPA 2016; Mattocks et al. 2017), which can exacerbate climate-related changes in temperature and streamflow. More extreme precipitation, extremes in river flows, higher water temperatures, and higher sea levels and storm surges will impact habitats, as well as the operation of tide gates and flow rates between the Machias River and Middle River. However, because ME DOT has not conducted any temperature monitoring to assess the conditions, the assessment does not provide any meaningful information from current or future water temperature impacts to habitats in the Middle River.

Our technical assistance letter on November 28, 2023 requested information regarding permanent impacts to EFH and other NOAA trust resources from any future plans to raise the elevation of the roadway and the dike structure to account for climate change. In response, the ME DOT noted in the revised EFH assessment that the height of the dike may be raised to adapt to future SLR. Section 2.1 (Proposed Scope) stated, "An adaptive approach to the height of the causeway is likely needed as the community continues to discuss its options. Accommodations completed today can also be completed in a way to account for future accommodations (i.e. height of the new causeway)". The calculated area of impacts to EFH for the proposed project was based on an increase in the elevation of the dike approximately 7 ft. higher than the existing maximum height of 11 ft. NAVD88. As discussed above, our climate assessment raises concerns that there is a very high likelihood that the bridge will be subjected to inland flooding, storm surge, and SLR elevations near 19 ft. NAVD88 by 2050 and 24.3 ft. NAVD88 by 2100. Assuming the Machias Dike is constructed at a height of 18.16 ft. NAVD88, the dike may require additional vertical elevation increases of 12 ft. or more by 2100 in order to prevent inundation (assuming a minimum of approximately 5 ft. of freeboard at mean high tide for the low chord of the bridge is necessary to allow for 100-year storm surge events). This additional 12 ft. of increased bridge height, using the same 3:1 side slope assumption would, at a minimum, result in an additional 65,000 square ft. of impacts to EFH over the life of the project. Furthermore, increased expansion of the dike into the Machias and Middle Rivers will result in additional temporary impacts from cofferdams and access fill and adverse effects to EFH and other NOAA trust resources. These adverse effects should be assessed during the current EFH consultation. Any future changes in the height or other dimensions of the bridge that results in increased adverse effect to EFH would likely require reinitiation of the EFH consultation.

As noted above, the comments and recommendations provided for this project through our statutory obligations under the MSA and FWCA are intended to assist the FHWA in supporting the Administration's goals to combat the climate crisis in a manner that "conserves our lands, waters, and biodiversity" (E.O. 14008). ME DOT and FHWA should give full consideration of these recommendations in a manner such that the project may contribute to the Administration's efforts to help mitigate climate change in an environmentally responsible manner.

Compensatory Mitigation

The revised EFH assessment indicates the construction of the proposed replacement structure will result in approximately 32,400 sf of permanent and 45,000 sf of temporary impacts to EFH. As discussed above, this area of impact is based on a maximum roadway elevation of 18.16 ft. NAVD88. Should the design height or other dimensions of the dike increase, the area of impact

will correspondingly increase. Furthermore, the area of impact may increase if construction methods change, including cofferdams, the temporary bridge, and approach road fill. The habitat impacts in the Middle River due to the operation of new tide gates will permanently impact tidal fresh, brackish, and salt marshes, as well as other intertidal and subtidal habitats for the life of the proposed project. Our request for a wetland delineation survey, necessary to quantify existing habitats in the Middle River and determine project-related impacts, was not provided. Although ME DOT has estimated the existing tidally-influenced habitats in the Middle River to be approximately 33 acres, the methods used to estimate the habitat and the impacts related to tide gate operations are unknown. We assume ME DOT will be required to seek appropriate permit authorizations from the U.S. Army Corps of Engineers (USACE), pursuant to section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act. We have concerns that the calculations used to determine wetland jurisdiction and compensatory mitigation through the USACE permitting processes will not be based on standard wetland delineations. We continue to request a wetland delineation survey be conducted to determine the amount of tidally-influenced habitats in the Middle River for calculating appropriate compensatory mitigation for the proposed project.

The impacts from the construction of the in-kind replacement of the Machias Dike Bridge was estimated by ME DOT to be approximately 32,400 sf of permanent and 45,000 sf of temporary impacts to EFH. Furthermore, the revised EFH assessment indicates the project construction is estimated to take approximately 3-4 years to complete. This is a considerably long period of time that exceeds the general assumptions of what is considered to be temporary impacts. EFH will be partially or fully inaccessible by federally-managed species and other NOAA trust resources during the 3-4 years of project construction, and the approximately 45,000 sf habitat area could require a year or more time to recover from the prolonged impact. Therefore, compensatory mitigation should be provided for the permanent, as well as what is characterized as "temporary" impacts for this proposed project. Providing compensatory mitigation for long-duration construction projects greater than one year is not unprecedented. In fact, FHWA agreed to provide compensatory mitigation for approximately 40,000 sf of impacts from the placement of riprap to construct a construction equipment access road on the intertidal mudflats during the 3-year construction period for the Sarah Mildred Long Bridge in Portsmouth, New Hampshire in 2014. We believe the long duration of the proposed project will result in substantial temporal impacts to EFH that will require a period for recovery that exceeds what is typically considered "temporary" effects.

Deficiencies in Alternative Analyses

40 CFR 1502.14 of the NEPA regulations require action agencies to "a) evaluate reasonable alternatives to the proposed action, and, for alternatives that the agency eliminated from detailed study, briefly discuss the reasons for their elimination" and "(b) discuss each alternative considered in detail, including the proposed action, so that reviewers may evaluate their comparative merits." Furthermore, Section §600.920(e)(4) of the EFH Final Rule describes additional information that, if appropriate, should be included in an EFH assessment, including the results of an on-site inspection to evaluate the habitat and the site specific effects of the project and an analysis of alternatives to the action. The Final Rule indicates that the assessment should include alternatives that could avoid or minimize adverse effects on EFH.

As we noted in our technical assistance letter in November 2023, we advised you that an analysis of alternatives that identifies options to avoid and minimize adverse effects on EFH should be included in the EFH assessment. Furthermore, we requested ME DOT and FHWA include in the revised EFH assessment discussions why the preferred alternative (Alternative 1) was chosen over the pile-supported bridge (Alternative 10) and open culvert design (Alternative 4m), including an analysis of direct construction-related impacts, operational impacts, and long-term climate effects. These analyses should have included climate resilience costs and benefits, carbon sequestration potential, resilience for flooding upstream and downstream of the proposed dike structure, and for higher water temperatures in the project area. The revised EFH assessment does not include any rationale for why Alternative 1 was chosen over the other alternatives in terms of avoiding adverse effects to EFH, climate resiliency, carbon sequestration, flooding mitigation, or ecosystem services. The only reference in the revised assessment regarding a rationale for choosing Alternative 1 was in Section 2.0 (Project Description), which states "a fully gated culvert alternative will best meet the project's purpose and need", and will "improve the structure's condition, maintain the Sunrise Trail, provide for future rail use, and avoid flooding of hundreds of acres of land." Although Alternatives 4m and 10 would result in inundation of some land in the Middle River, the revised assessment does not describe the other alternative's comparative degree of flooding of structures on the Middle River, potential negative effects on property values, or the impacts to continuing uses of the land. Furthermore, the revised assessment does not describe why other alternatives would not meet the other stated project purpose and need. For example, a new pile-supported bridge design would presumably be constructed to meet the required safety and functional use criteria of a roadway, and would result in an improvement of the structure's condition.

Regarding the use of the Sunrise Trail and the potential future construction of a railway, the revised assessment did not provide any discussion on how the Sunrise Trail would be designed to accommodate the proposed in-kind dike replacement. We assume the existing Sunrise Trail elevations at the east and west approaches of the dike are less than 11 ft. NAVD88. According to the revised assessment, the maximum elevation of the in-kind dike replacement will be 18.16 ft. NAVD88, suggesting that the east and west bridge approaches for the Sunrise Trail would require an increase in elevation of approximately 7 feet and substantial fill placement to raise the elevation to match that of the proposed dike bridge elevation. However, the revised assessment does not include any information regarding construction modifications necessary to modify the Sunrise Trail elevations, including potential wetland impacts. Furthermore, the stated project purpose and need included providing potential future rail use on the Sunrise Trail corridor over the proposed dike bridge replacement. However, the revised EFH assessment does not address the feasibility of accommodating changes in surface elevation of a future rail line to 18.16 ft. NAVD88 over the Machias Dike Bridge. These changes may also result in substantial wetland impacts in areas adjacent to the existing structure.

The project design of the replacement bridge is presumably heavily dependent upon meeting the project's purpose and need, which consequently affects the project's size and adverse effects to EFH. We are troubled by the lack of detail and clarity in the EFH assessment, as well as an assessment of potential adverse effects, regarding the stated project purposes. The lack of information related to the design of the dike, including components of the project that ME DOT states are necessary for meeting the project's purpose and need, continues to challenge our

ability to assess the adverse effects of the proposed project on EFH. An alternatives analysis should be conducted to evaluate the effects of meeting the project purpose and need for the preferred alternative, as well as the two project alternatives.

In our November 28, 2023 technical assistance letter to you we requested you evaluate the adverse effects to EFH and other NOAA trust resources from the preferred alternative in the Machias River and the Middle River relative to the other alternatives that have been analyzed for this project, including the span bridge (Alternative 10) and dike structure configured with open culverts (Alternative 4m). The full effects of alternatives for this project were not evaluated in the revised EFH assessment. We have included Table 3 from the revised assessment below, entitled "EFH impacts from three analyzed alternatives".

Alternative	Potential upstream areas subject to tides/ flooded normal tides	High marsh	Low marsh	Unvegetated	Fish passage conditions available
1	0	0	0	0	0
4m	127	~13 acres	~ 60 acres	54 acres	52 %
10	403	~17 acres	~ 208	~191 acres	Full range of tides naturally available

Table 3. EFH impacts from three analyzed alternatives (from the revised EFH assessment, dated March 19, 2024.

Despite the title, Table 3 does not describe impacts to EFH. While all federally-managed species in the project area use tidal waters, and several species use marsh habitat for one or more life stages, an EFH assessment should describe the effects of a proposed action on EFH designated in the project area. There is no information in the table, or in subsequent sections of the revised EFH assessment, describing the adverse effects of the alternatives on EFH or the approximately 20 species of federally-managed species that EFH designated in the Middle River. Furthermore, the revised assessment does not consider the long-term effects to EFH from climate change, including extreme precipitation and inland flooding, SLR, and storm surge, for the three alternatives.

Although the information regarding alternatives analysis in the revised EFH assessment was insufficient, it is clear based on the limited information provided that the preferred alternative would result in substantially greater impacts to habitats in the project area. For example, Alternative 4m, would include one open culvert to allow tidal flow during all ebb and flood tides. As noted in the table, this alternative would restore approximately 127 acres of former tidal habitats, including habitats that are currently designated as EFH for federally-managed species, with diurnal flows, and would restore approximately 13 acres of high marsh, 60 acres of low marsh, and 54 acres of unvegetated, intertidal and subtidal habitats. This alternative has the potential to restore access to diadromous fish spawning habitat, including Atlantic salmon, in the Middle River.

Alternative 10 is a single span, pile-supported bridge between 120 and 150 ft. long, and would provide full tidal transparency with no flow restrictions. This alternative would restore approximately 403 acres of former tidal habitats, including habitats that are currently designated as EFH for federally-managed species, with diurnal flows, and would restore approximately 17 acres of high marsh, 208 acres of low marsh, and 191 acres of unvegetated, intertidal and

subtidal habitats, according to ME DOT. This alternative would also restore unimpeded access to spawning habitats in the Middle River for diadromous fish, including Atlantic salmon, during all tides.

In comparison to Alternative 4m and 10, Alternative 1 would permanently eliminate all tidal flow to the Middle River, would permanently eliminate the potential for restoring historic and existing tidal habitats with diurnal flows, including areas designated EFH for federally-managed species for the 80-100-year life of the proposed project. This alternative would permanently eliminate access to spawning habitats in the Middle River for diadromous fish, including Atlantic salmon, alewife, blueback herring, rainbow smelt, American shad, and American eel. Furthermore, because the existing dike structure is porous to some degree and tidal waters leak through the existing dike, culverts, and tide gates during flood tides, an unquantified amount of salt marsh, brackish marsh, and other salt tolerant habitats occur in the Middle River would be permanently lost for the life of the proposed project. The entire Middle River system would be converted to an entirely freshwater system.

In addition to the operational impacts to EFH and other NOAA trust resources, Alternative 1 will result in, at a minimum, 32,400 sf of permanent impacts and 45,000 sf of temporary impacts to EFH in the Middle River and Machias River during construction. The EFH assessment does not include estimates of impacts to EFH for the other two bridge alternatives, 4m and 10, but we assume the removal of the existing dike and the construction of a pile-supported, single span bridge would result in the restoration of river bottom and intertidal habitats at the mouth of the Middle River and banks of the Machias River. Therefore, Alternative 10 would restore a substantial amount of subtidal and intertidal habitats that are currently impacted by the dike structure fill.

In addition to the relative differences between the alternatives in restoration potential for tidal wetlands and EFH for federally-managed species and other NOAA trust resources, the revised EFH assessment did not include information regarding the comparative adverse effects of the alternatives from the permanent conversion of existing and historic salt and brackish marsh habitats to freshwater wetlands. Specifically, salt marsh wetlands are known to provide climate resiliency to communities by adapting to SLR by migrating inland, reducing wave heights and attenuate storm surge, and reducing damage to landward property (Chmura et al. 2003; Duarte et al. 2013; Gedan et al. 2011; Temmerman et al. 2013). In addition, salt marshes have relatively high rates of sediment carbon burial compared to freshwater wetlands. For example, Mcleod et al. (2011) reported the long-term carbon burial rate of salt marsh wetlands ranges from 18 to 1,713 grams of carbon per meter per year (gC/m/yr), compared to an average sequestration rate of 8 to 149 gC m/yr for freshwater riverine marshes (Bernal and Mitsch 2012; Fennessy et al. 2018). Furthermore, freshwater wetlands can be significant sources of methane production relative to tidal wetlands, because high sulfate levels in tidal wetlands keep methane production low. Methane is a strong greenhouse gas, with an estimated global warming potential 25 times greater than CO_2 over 100 years (Boucher et al. 2009). Poffenbargar et al. (2011) reported polyhaline tidal marshes (salinity >18 ppt) had significantly lower methane emissions, and can be expected to decrease radiative forcing when created or restored, compared to fresh and brackish marshes.

As discussed in this letter, we have determined the preferred alternative will result in substantial negative climate implications to EFH and NOAA trust resources from higher water temperatures, sea level rise, storm surge, and more extreme precipitation patterns and flooding. Furthermore, the other design alternatives for this project would provide opportunities to reduce the vulnerability of climate change to natural ecosystems and the human-built environment. Given the considerable climate vulnerability the proposed structure would represent, the climate resiliency benefits of restoring coastal marsh habitat in the Middle River should be reconsidered for the project. As discussed above, the span bridge alternative would provide the best approach to restoring the habitat and stream function of the Middle River, as well as increasing the capacity for carbon sequestration by tidal marsh vegetation. This alternative is consistent with two of the primary strategies in the Maine Climate Action Plan: protecting and promoting natural climate solutions that increase carbon sequestration and investing in climate-ready infrastructure (Maine Climate Council 2020). In contrast, the proposed in-kind replacement of the dike bridge would be inconsistent with the two strategies recommended by the Maine Climate Action Plan.

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