

MaineDOT Machias Middle River Bridge Open House

September 14, 2021



MaineDOT, in cooperation with the Town of Machias, is hosting an open house for the study to identify the preferred alternative for the rehabilitation or the replacement of the existing bridge over the Middle River on Route 1 in Machias. The Town of Machias and others are also using this open house for input on locally sponsored studies. MaineDOT has not made any decision regarding which alternative will move forward into design and construction. The purpose of the open house is as follows:

- Solicit Feedback:
 - ✓ Current and potential future uses of the bridge and causeway
 - ✓ Comments, concerns or questions about the alternatives under consideration
 - ✓ Additional considerations
- Educate and Discuss Options:
 - ✓ Recent project history and status
 - ✓ Alternatives under consideration
 - ✓ Regulatory and decision-making processes

How to Submit Your Comments to MaineDOT on Machias Middle River Bridge Study

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| <ul style="list-style-type: none">• Submit Comments in online form or card provided at Open House• E-mail Comments to martin.rooney@maine.gov• Phone – Martin Rooney 207-624-3317 | <ul style="list-style-type: none">• Written comments:
Martin Rooney, Project Manager
MaineDOT, Bureau of Planning
24 Child Street, 16 State House Station
Augusta, Maine 04333-0016 |
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Recent Project History

2018: • MaineDOT identifies in-kind replacement as preferred alternative 2020: • National Marine Fisheries Service stated substantial concerns • New legal guidance: MaineDOT/FHWA could compensate landowners impacted by flooding from the project; and • Town of Machias Flood Project could directly impact the culverts/bridge and Route 1 and needs consideration in the design 2021: • Existing structure continues to deteriorate • March 2021 Virtual Public Meeting • Coordination with the Town of Machias on the Machias Flood Protection Project • Reduced number of alternatives on the matrix by grouping by structure type. To eliminate duplication from previous studies and allows for clearer comparison of potential impacts. • Evaluation of alternatives shifted to box culvert alternatives or bridge alternatives; less preference for in-kind due to potential impacts to Atlantic salmon and its critical habitat. • MaineDOT is committed to understanding current uses of the causeway and investigating culvert/bridge alternatives that maintain or enhance these uses	2021 cont'd • Data collection on wells, hazardous materials and waste sites, and tidal exchange continues to refine flooding/property impacts of the boxculvert and bridge alternatives. • Hydraulic modeling refined to characterize fish passage improvements with box culvert and bridge alternatives. • Coordination and technical assistance from NOAA underway to identify potential effects to Atlantic Salmon critical habitat (safe, timely, and efficient fish passage). • Expanded survey of National Register-eligible properties to include areas potentially affected by a bridge alternative and any potential improvements at Stride Bridge. Coordination with Maine Historic Preservation continues, as well as with FHWA Historical and Cultural experts. • Considering feasibility of Sea Level Rise accommodation for bridge and culvert options. • Legal Research underway to understand railroad requirements and design implications for alternatives. • Legal research underway on options for compensation of property owners related to flooding. • Characterize existing uses of the causeway and community needs • Tracking other efforts in the area (Downeast Salmon Federation Schoppee Marsh)
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Alternatives Under Consideration Summary

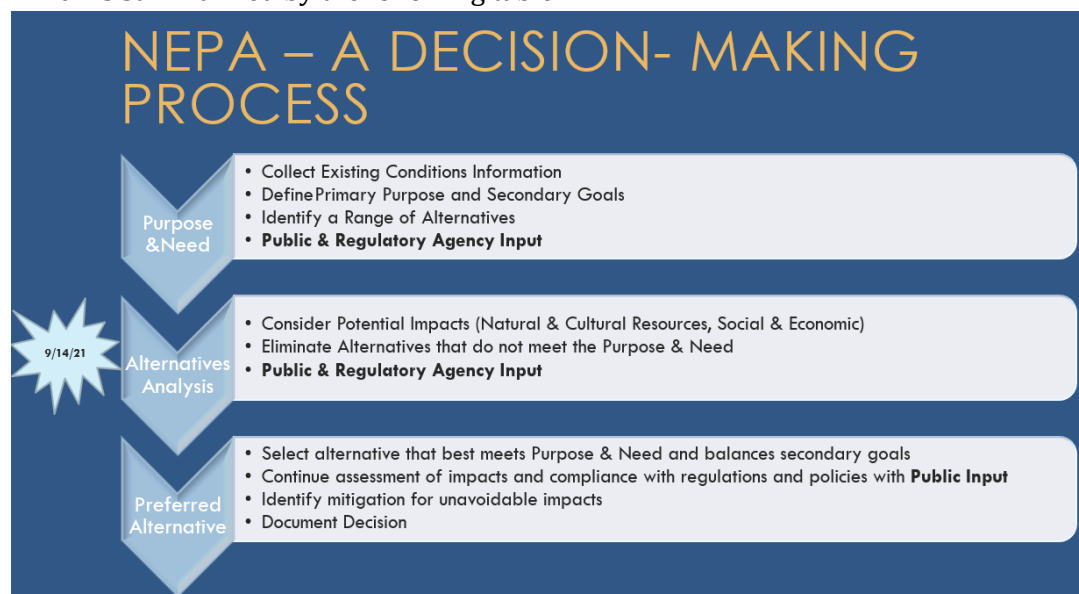
The attached matrix summarizes several alternatives depicted for further study involving both bridges and culverts. Culverts generally provide better control over landward water levels, support a phased approach to Sea Level Rise and are easier to accommodate railroad corridor grade constraints. Bridges better accommodate fish passage and tidal restoration, but have challenges associated with maximum Sea Level Rise accommodation and Route 1 connectivity. While any alternative that moves forward into design will be coordinated with Machias' Flood Protection Project, the ability to adjust the height of Route 1 over time with culverts could make coordination easier.

Regulatory and Decision-Making Process Summary

MaineDOT is continuing to study the alternatives in the above matrix and gather information which will be used in the environmental review process for decision making. MaineDOT anticipates using federal resources to rehabilitate or replace the Machias Middle River Bridge and must follow all applicable state and federal regulatory processes. In particular, the National Environmental Policy Act (NEPA), Endangered Species Act and Section 106 of the Historic Preservation Act will influence how a preferred alternative is selected. The environmental review process is not limited to the natural environment but also includes cultural, social and economic resources as well.

<i>Natural</i>	<i>Cultural</i>	<i>Social and Economic</i>
✓ Fisheries ✓ Wildlife ✓ Coastal Wetland ✓ Tidal Exchange ✓ Climate Change ✓ Sea Level Rise	✓ Historic resources (racetrack, railroad depot) ✓ Archaeology ✓ Recreational facilities (trails, boat launch)	✓ Community ✓ Property ✓ Business ✓ Traffic ✓ Utilities ✓ Cost

NEPA does not require MaineDOT to select an alternative with the least amount of environmental impact and/or any alternative with the lowest cost. NEPA guides the decision-making process which is summarized by the following table:



MaineDOT Project Need Statement (Part of Federal Process Evaluation)

✓ Primary ○ To achieve an overall structure rating of Good (7/9) or better; and ○ To preserve the Calais Branch Rail Corridor in the area in accordance with the State Railroad Preservation Act.	✓ Secondary ○ Maintain existing uses ○ Municipal coordination including local planning efforts underway ○ Minimize flooding and impacts ○ Restore fish passage ○ Account for Sea Level Rise ○
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Environmental Definitions

Fish Passage

Improved passage landward of the causeway

Advection

Landward fish passage with the incoming flood tide, not against it

Volitional

Fish may swim landward against flows, similar to natural conditions

Tidal Improvement

- Improved landward tidal flow
- Increased landward normal tidal range

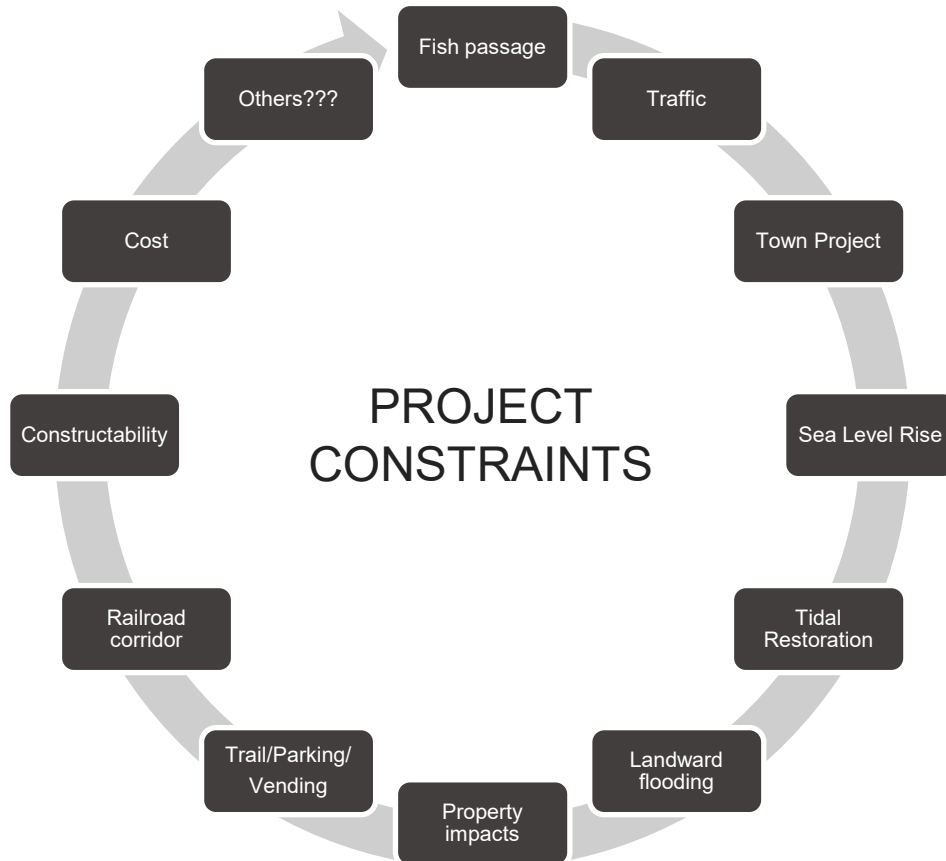
Tidal Restoration

- Full landward tidal flow
- Substantial removal of the tidal restriction



Alternatives Matrix

Summarizes current alternatives under consideration



- In general, as the alternative number increases, the proposed structure is getting larger (more open to tidal flows).
 - + Offers more opportunity for fish passage and tidal restoration.
 - Daily landward water levels get higher and cost increases.
- The water levels presented do not account for flood tides, peak river flows, storm surge, or sea level rise (SLR).
- Several SLR scenarios are being considered that are consistent with the Town flood protection planning and Maine Climate Council guidance.

Alternatives Matrix

CULVERTS: Alternative Numbers: 1, 2, 3, 4, 4m, 8, 9

REHABILITATION: Alternative Numbers 5, 6, 7

BRIDGES: Alternative Numbers 8, 10, 11, 12

CURRENT TRENDS

CULVERTS

- Better control landward water levels
- Generally make a phased SLR approach & coordination with Town Project easier
- Easier to accommodate railroad corridor grade constraints

BRIDGES

- Easier to accommodate fish passage and tidal restoration
- Cannot achieve max SLR requirements due to needed bridge clearances and excessive property impacts in approaches

CURRENT LEADING ALTERNATIVES

CULVERT: Alternative 4m: (3) - 10 ft span x 5 ft rise box culverts

- Balances improved fish passage (advection) and tidal flows with landward impacts

BRIDGE: Alternative 10: Single 120'-0" span

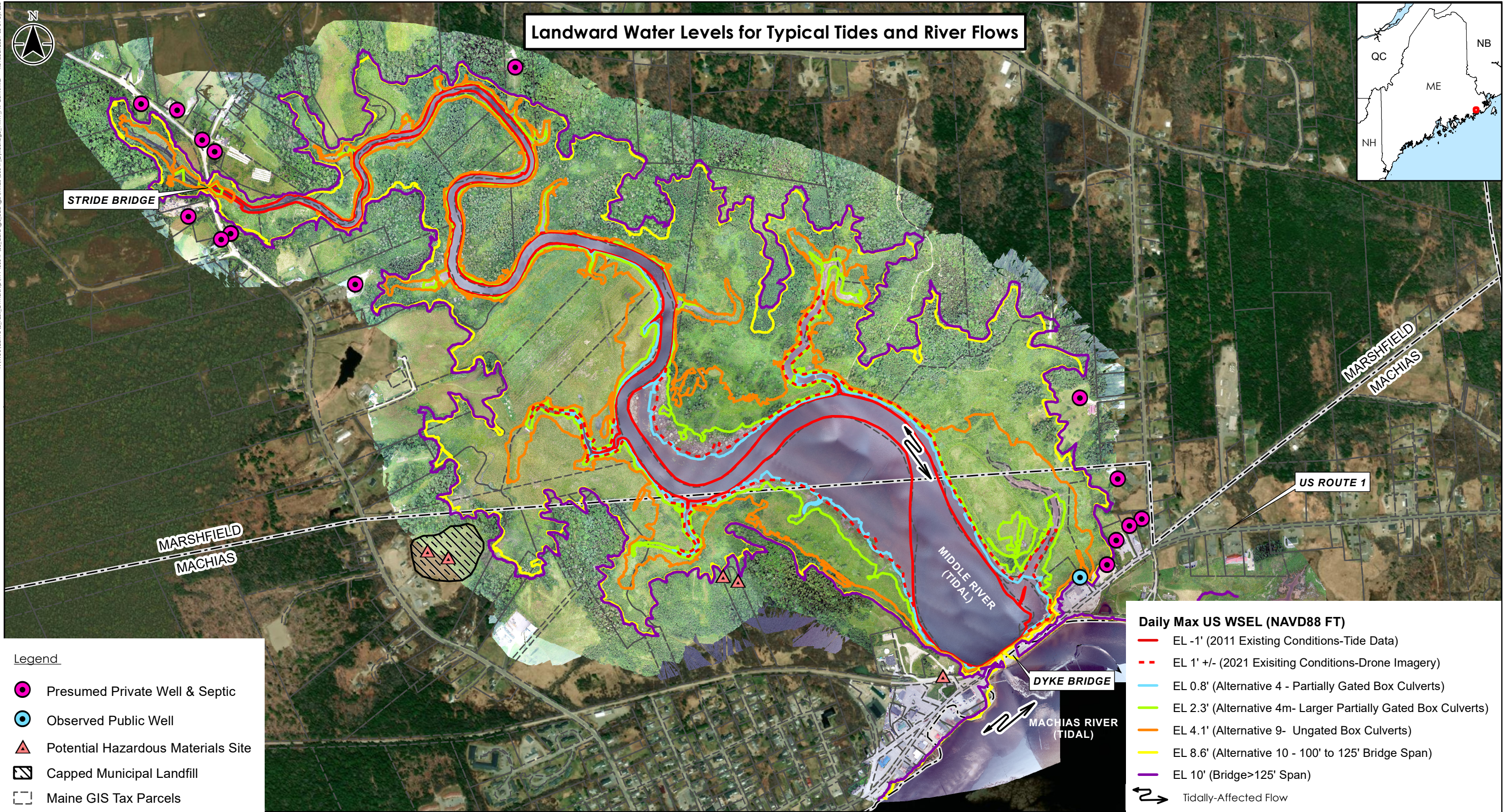
- Shortest span that allows for full fish passage (volitional) and tidal restoration

NEXT STEP – Phase II Hydraulic Analysis

Refined analysis for the leading alternatives to include:

- Riverine Floods and Flood Tides
- Sea Level Rise
- Landward Impacts
- Fish passage and Tidal Restoration

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Legend

- Presumed Private Well & Septic
- Observed Public Well
- Potential Hazardous Materials Site
- Capped Municipal Landfill
- Maine GIS Tax Parcels

Daily Max US WSEL (NAVD88 FT)

- EL -1' (2011 Existing Conditions-Tide Data)
- EL 1' +/- (2021 Existing Conditions-Drone Imagery)
- EL 0.8' (Alternative 4 - Partially Gated Box Culverts)
- EL 2.3' (Alternative 4m- Larger Partially Gated Box Culverts)
- EL 4.1' (Alternative 9- Ungated Box Culverts)
- EL 8.6' (Alternative 10 - 100' to 125' Bridge Span)
- EL 10' (Bridge > 125' Span)
- Tidally-Affected Flow

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Notes

- Existing conditions are based on 2011 tidal stage data and 2021 drone imagery collected by MaineDOT. **Collection of 2021 tidal stage data is pending and will affect existing condition mapping.**
- Approximate water surface elevations (WSEL) for proposed alternatives are based on the 2021 Phase 1 hydraulics analysis using tidal stage data collected by MaineDOT in 2011.
- Coordinate System: NAD 1983 UTM Zone 19N FT
- Vertical Datum: NAVD88
- Aerial imagery in the project area was obtained by unmanned aircraft vehicle (UAV) by MaineDOT on July 20, 2021.
- Aerial imagery surrounding the project area is provided by ArcGIS Online World Imagery Mapping Service (http://server.arcgisonline.com/arcgis/services/World_Imagery/MapServer).
- TIN Surface information is based on survey data provided by the Maine Department of Transportation.



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Prepared by EPL on 2021-08-09
Reviewed by MRC on 2021-08-09

50347_DykeBridge_11x17_Alt-Cont.mxd

0 800 Feet
1 inch = 833 feet (At page size of 11"x17")

Client/Project
Maine DOT
Dyke Bridge
Machias, Maine

Figure No.
B-1

Title Landward Water Levels for
Typical Tides and River Flows

8/31/2021

DRAFT

179450347

2020-2021 Planning Study Alternatives

ALTERNATIVE	DESCRIPTION	Fish passage	Restoration of tidal flow	Other	Landward Water Surface Elevation (WSEL) (NAVD88)	Increased Acreage Impact	Number of Properties	Hazardous Waste Sites	Wells/Septic (hand-dug)
NOTE: Impacts noted are from differences in normal water levels for normal tides and normal riverine flow (impacts do <u>NOT</u> include riverine floods, spring tides, storm surges or SLR)									
Number*	Culvert or Bridge, Span and Size	Improved landward fish passage	Ranges from no change to full restoration (i.e. no tidal restriction)	Causeway Parking/Vending; Multi-Use Trail; Stride Bridge	MHW Water Surface Elevation LOW (<2') MEDIUM (2' to 4') HIGH (>4')	Additional acreage impacts due to change in WSEL	Parcels impacted by change in WSEL	Number of potential hazmat sites impacted by change in WSEL	Number of parcels with water supply wells & septic impacted by change in WSEL
1	Replacement in-kind	No	None	Maintains parking and trail on causeway	LOW (EL. -2.5' Change = -3.7' to -1.7')	N/A	N/A	N/A	N/A
4	5 culverts, 4 gated, 1 open, all at EL-6.05	Yes (advection)	Improvement	Maintains parking and trail on causeway	LOW (EL. 0.8' Change = -0.5' to +1.5')	0 to 40	6 to 10	0	0
4 modified	3 larger culverts, 2 gated @ -4.05, 1 open @ -6.05	Yes (advection)	Improvement	Maintains parking and trail on causeway	MEDIUM (EL. 2.3' Change = +1.0' to +3.0')	47 to 92	28 to 30	0	0
9	4 open box culverts	Yes (advection)	Improvement	• Maintains full parking • Requires changes at Stride Bridge	MEDIUM/HIGH (EL. 4.1' Change = +2.8' to +4.8')	123 to 168	38	0	1
10	120 ft bridge, no parking on bridge	Yes (volitional)	Restoration	• May not maintain full parking • Requires increasing hydraulic opening at the Stride Bridge	HIGH (EL. 8.6' Change = +7.4' to +9.3')	370 to 415	54	5	15
10A	120 ft bridge, with parking on bridge	Yes (volitional)	Restoration	• Maintains parking on causeway • Requires increasing hydraulic opening at the Stride Bridge	HIGH (EL. 8.6' Change = +7.3' to +9.3')	370 to 415	54	5	15

*Not all alternatives considered in the current study are shown here. The shown alternatives were selected for detailed study as being representative of a wider range of alternatives.