

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



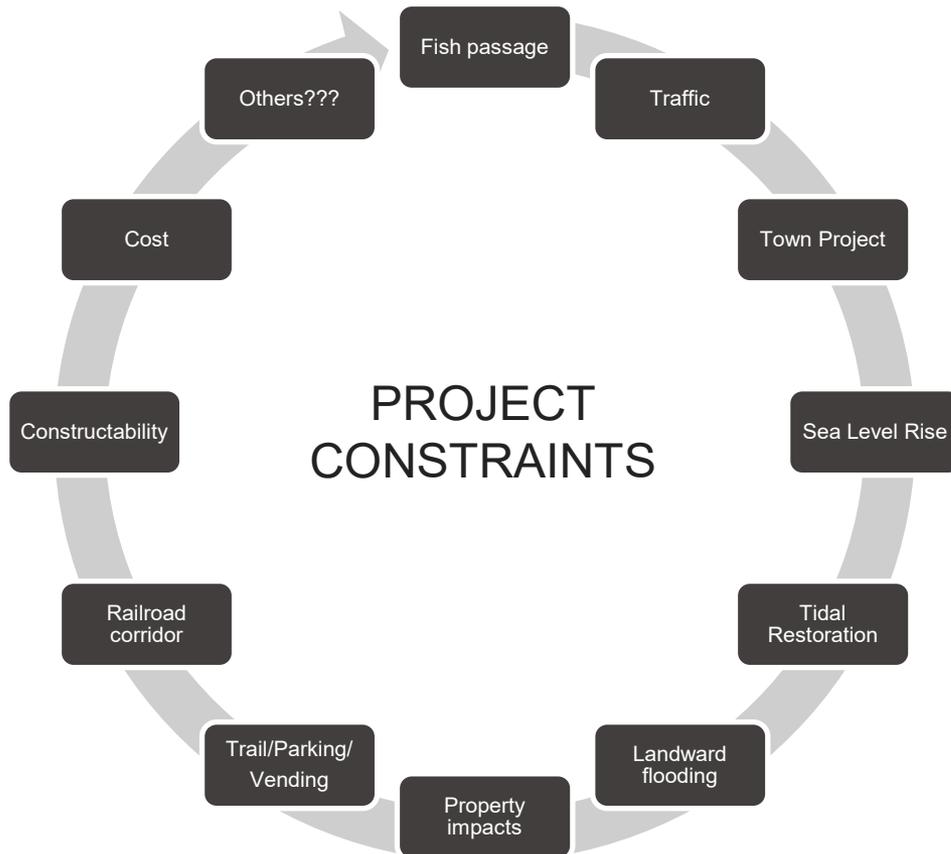
Landward



Seaward

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

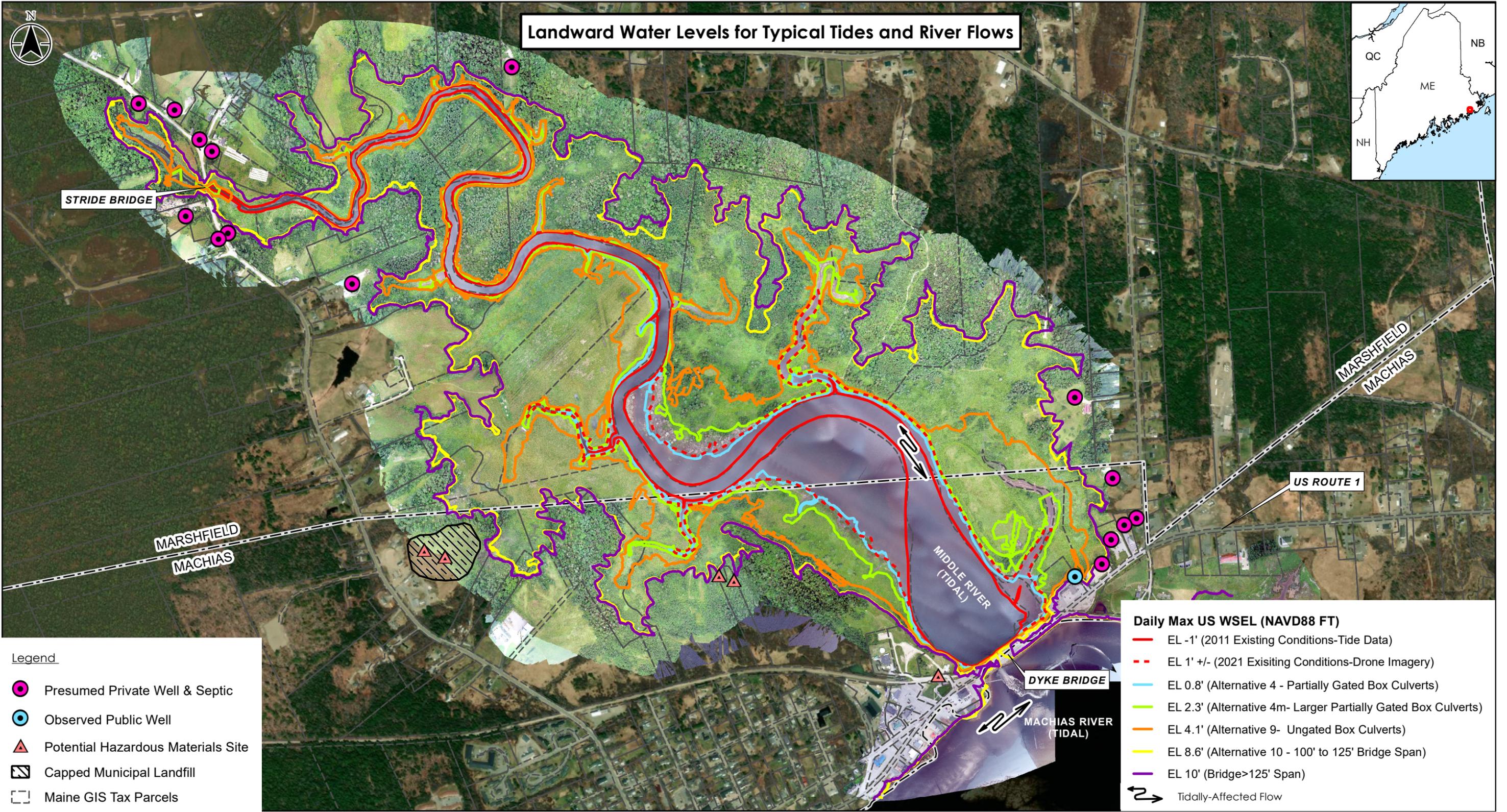
- Shortest span that allows for full fish passage (volitional) and tidal restoration

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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30 Park Drive
 Topsham, ME USA 04086
 Phone (207) 729-1199

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

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Notes

1. 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.**
2. 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.
3. Coordinate System: NAD 1983 UTM Zone 19N FT
4. Vertical Datum: NAVD88
5. Aerial imagery in the project area was obtained by unmanned aircraft vehicle (UAV) by MaineDOT on July 20, 2021.
6. Aerial imagery surrounding the project area is provided by ArcGIS Online World Imagery Mapping Service (http://server.arcgisonline.com/arcgis/services/World_Imagery/MapServer).
7. TIN Surface information is based on survey data provided by the Maine Department of Transportation.



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

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