

PURPOSE AND NEED FOR ACTION

Project Background and Need:

Dyke Bridge (Br#2246) carries Route 1 over the Middle River in the Town of Machias, Maine. The Middle River joins the tidal portion of the Machias River at/immediately downstream of the bridge. The bridge consists of four box culverts within an embankment structure (causeway). The culverts are constructed of timber and stone masonry and are approximately 130 feet long, 6 feet wide and 5 feet high. Each culvert has top-hinged flap gate installed on its seaward side. The causeway is constructed of timber cribbing with rubble and earthen fill and is over 1,000 feet long.



Photo 1. Route 1 Causeway with parking and Downeast Sunrise Trail.



Photo 2. Dyke Bridge culverts with flap gates.

The culverts and the flap gates are deteriorated. MaineDOT completed a dive inspection of the Dyke Bridge on 9/21/2016 and routine inspections on 12/27/2016 and 4/28/20. The inspections indicated large spalls, heavy scaling, wide cracks, loss of and rotten timber members, and roadway settlement. MaineDOT Bridge Maintenance has replaced broken flapper gates in 2012 and repaired pavement (Light Capital Paving) in 2017.

MaineDOT uses Federal Highway's *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridge* (NBIS). Based on these inspections the bridge has a current structure rating of four (4) on a scale of zero to nine (0-9). The structure item evaluates the alignment, settlement, joints, structural condition, scour, and other items associated with the structure. The rating code is intended to be an overall condition evaluation of the structure.

Route 1 is classified as a minor arterial, is a highway corridor Priority 2, and carries approximately 8,600 vehicles per day. Route 1 over the causeway consists of two 12-foot travel lanes, two 8-foot shoulders and a 20-foot wide public parking area that is regularly used for local markets and trade events. In addition, the causeway carries the Calais Branch Rail Corridor and a section of the 87-mile off-road Downeast Sunrise Trail¹. A municipal boat launch is located at the southeast corner of the causeway.

The Dyke Bridge does not currently allow landward flow of tides into the Middle River except by leakage through the flap gates and the causeway during flood tides. Residents have indicated anecdotally that some fish passage occurs at the bridge, however it is generally considered a barrier to fish passage. NOAA Fisheries, the Coordinator of the Downeast Salmon Habitat Recovery Unit (SHRU), and state fisheries agencies have expressed interest in fisheries habitat restoration above the Dyke Bridge.

¹ <https://www.sunrisetrail.org/about-the-downeast-sunrise-trail/>

Project Purpose:

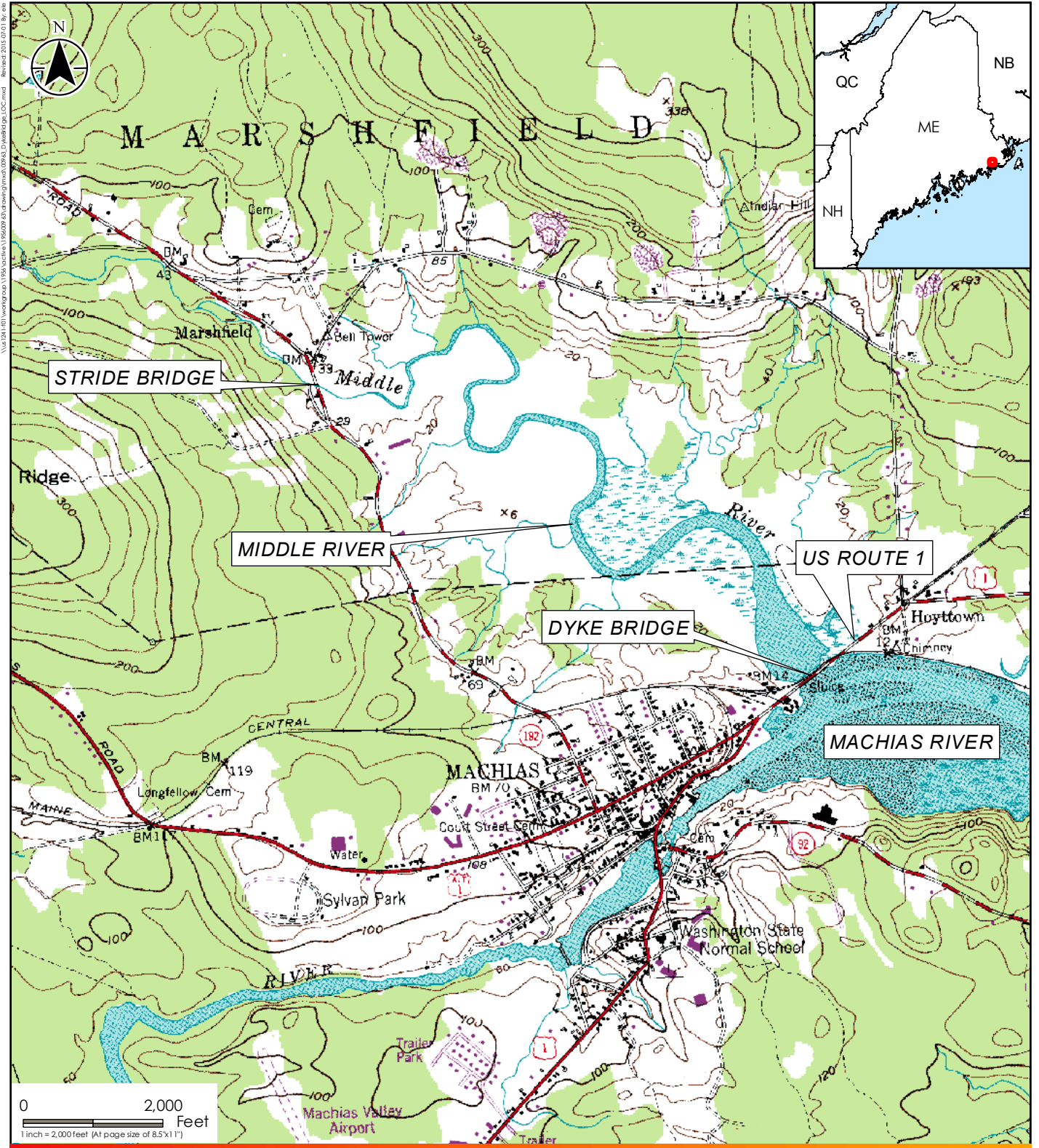
The primary purposes of the project are:

1. To achieve an overall structure rating of Good (a rating of 7 or better on a scale 0-9). The desired structure rating of at least 7 indicates there are no noticeable or noteworthy deficiencies which affect the condition of the structure. This is in accordance with Federal Highway's *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridge* (NBIS); and
2. To preserve the Calais Branch Rail Corridor in the area in accordance with the State Railroad Preservation Act.

Secondary Goals of the action and other desirable outcomes include:

- To improve fish passage through the transportation asset.
- Consistent with surrounding infrastructure, to account for Sea Level Rise (SLR) in accordance with Maine's Climate Council guidance to manage for 1.5 feet of relative sea level rise by 2050 and to assess 3.9 feet of sea level rise by the year 2100;
- Consistent with other goals, to minimize inundation of land upstream from Dyke Bridge that may result from increased tidal exchange from the Project;
- To accommodate existing transportation uses of the causeway (trail/railroad);
- To accommodate existing community uses of the causeway (parking/local markets and trade); and
- To coordinate with the ongoing Town of Machias flood protection project².

² <http://wccog.net/machias-resilience.htm>



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Prepared by ABC on 2014-00-00
 Reviewed by ABC on 2015-00-00

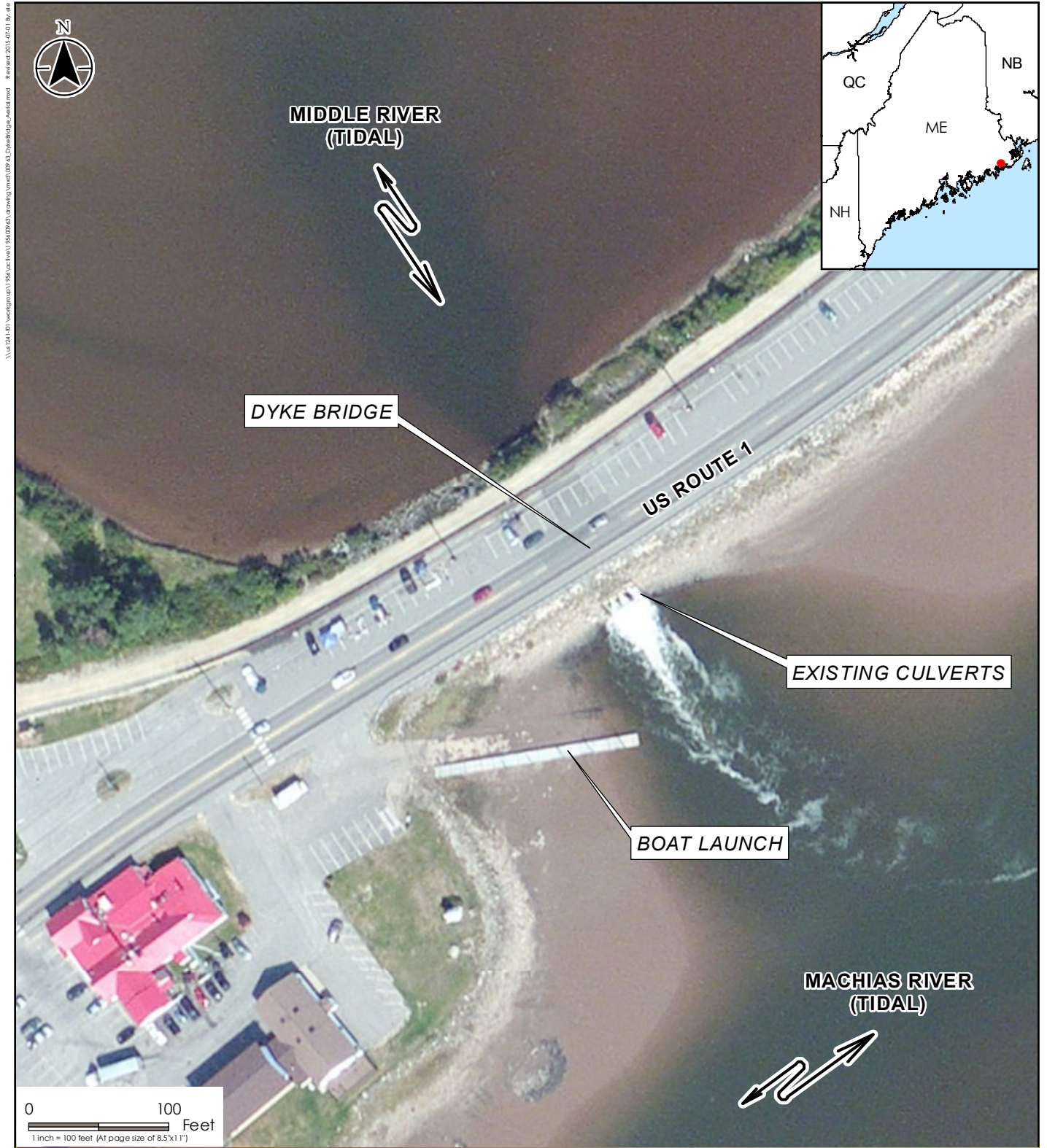
00963_DykeBridge_LOC.mxd

Notes
 1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Data Sources include: USGS Imagery/Topo provided by The National Map Mapping Service (<http://basemap.nationalmap.gov/arcgis/services/USGSImageryTopo>).

Client/Project
 Maine DOT
 Dyke Bridge
 Machias, Maine

Figure No.
 1

Title
 Project Location Map
 7/1/2015



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Prepared by EPL on 2015-02-23
Reviewed by MRC on 2015-02-23

00963_DykeBridge_Aerial.mxd

- Notes**
1. Coordinate System: NAD 1983 UTM Zone 19N
 2. Aerial imagery provided by ArcGIS Online World Imagery Mapping Service (http://server.arcgisonline.com/arcgis/services/World_Imagery/MapServer).

Legend

Dominant Upland Flow

Client/Project

Maine DOT
Dyke Bridge
Machias, Maine

Figure No.

2

Title

Dyke Bridge Aerial
7/1/2015