

Memo



To: Emily Roadhouse, Environmental Planner, Ministry of Transportation, Ontario (MTO)

From: Dylan Morse, Fisheries Assessment Specialist, Dillon Consulting Limited (Dillon)

cc: Jessica Wright, Fisheries Assessment Specialist, Dillon
Adele Mochrie, Environmental Manager, Dillon

Date: January 5, 2021

Subject: Highway 401 Improvements from 0.6 km east of Essex Road 42 to 1.5 km west of Merlin Road, Design Build Contract 2020-3011
Fish and Fish Habitat Impact Assessment Update Memo

Our File: 20-2875

Introduction

The Ministry of Transportation, Ontario (MTO) retained Coco Paving Inc. (Coco) and Dillon Consulting Limited (Dillon) to complete the Design-Build (DB) Contract for the design and construction of improvements to Highway 401 from 0.6 km east of Essex Road 42 to 1.5 km west of Merlin Road. The project lies within the Municipality of Chatham-Kent, the County of Essex and the Town of Lakeshore (Figure 1).

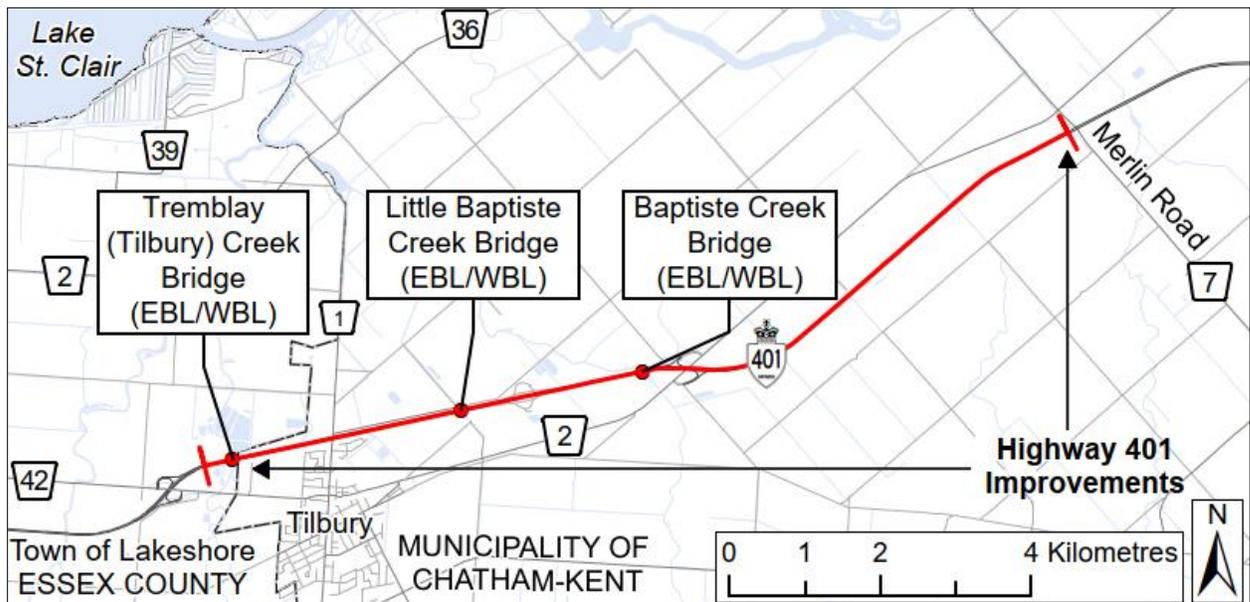


Figure 1: Key Plan

Background

Fish and fish habitat field investigations were initially completed during the Preliminary Design phase in 2008; however, as more than 10 years had lapsed, the information required updating. As such, in 2019, the aquatic existing conditions for the study area were reassessed by Parsons Corporation (Parsons) and documented in a Fish and Fish Habitat Existing Conditions Report (July 2019). As part of the initial Detail Design phase, WSP completed a Fish and Fish Habitat Impact Assessment Report (December 2019), in accordance with the requirements of the *MTO/DFO/OMNR Fisheries Protocol for Protecting Fish and Fish Habitat on Provincial Highway Undertakings – Version 3 (Pilot, 2016)* and the associated guidance provided in MTO's (2009) *Environmental Guide for Fish and Fish Habitat (Fish Guide)*, *Operational Procedure: ENV19-01* (November 2019a) and *Release Notes* (November 2019b).

As part of the current Design-Build phase of the project, Dillon has reviewed the above-noted reports to document the final anticipated aquatic impacts and mitigation measures in this Fish and Fish Habitat Impact Assessment Update Memo.

Proposed Works

The majority of proposed works and anticipated impacts documented in WSP's Fish and Fish Habitat Impact Assessment report were confirmed to remain unchanged as part of the Design-Build phase. Minor changes include the installation of TL5 barriers at each location, new approach slabs for the widening at the Tilbury Creek Bridges, and the removal of deteriorated concrete from the deck top is no longer proposed. Proposed works at the Tilbury Creek, Little Baptiste Creek and Baptiste Creek Bridges include installation of a new deck extension, abutments, and pile foundations as well as, fascia, soffit, and abutment walls, patch repairs with the form and pump method, and new asphalt and waterproofing on the deck extension. The proposed works at the Baptiste Creek bridges also include removal of the southeast and southwest median retaining walls and footings.

The bridges will be widened to the median and require work below the high water mark (HWM), including site isolation measures and dewatering to carry out work "in the dry". The proposed bridge widenings will follow the existing bridge alignments with only minor alteration of the channel banks within the median required to construct and extend the new abutments. No permanent encroachment into the normal wetted width of the channel is anticipated at the Baptiste Creek and Little Baptiste Creek Bridges, however the abutment at Tilbury Creek Bridges will result in a minor permanent encroachment into the normal wetted channel. Additional direct impacts of the bridge widenings will involve enclosure of the existing open median, resulting in the localized removal of riparian vegetation. There will be a permanent loss of vegetation growing on the embankment in the existing median reaches, within the footprint of the new bridge segments. In addition, temporary scaffolding will be installed parallel to the bridges to conduct the concrete repairs. The scaffolding will include a containment platform that will be

maintained to prevent release of deleterious substances from entering the watercourse, and will be removed once works are complete.

Temporary and localized disturbance above the HWM may result from equipment access within the riparian area, resulting in the potential for indirect impacts through the introduction of potential contaminants, deleterious substances and/or sediments and debris during the proposed works. However, these minor impacts can be mitigated through the implementation of standard construction-related mitigation measures, such that death of fish and/or Harmful Alteration, Disruption or Destruction (HADD) to fish and fish habitat can be avoided.

Fish Community

The expansion of Highway 401 from four to six lanes requires widening of six structures over three fish bearing watercourses; Tilbury Creek, Little Baptiste Creek and Baptiste Creek. All three crossings have been identified by MNRF Aylmer District Office as warmwater systems with a permissible in-water construction timing window of July 1st to March 15th. Fish community data was documented in the Fish and Fish Habitat Existing Conditions report (Parsons, 2019) and consists of a warmwater forage and baitfish community, as well as panfish and sportfish in all three watercourses.

In 2019 WSP reviewed the DFO Aquatic SAR mapping which confirmed there were no records of aquatic SAR (threatened or endangered) identified in Tilbury Creek or Little Baptiste Creek; however, potential for Mapleleaf Mussel (*Quadrula quadrula*) to be present in Baptiste Creek was identified. Mapleleaf Mussel is listed as Special Concern under both the Ontario Endangered Species Act (ESA) and the federal Species at Risk Act (SARA). Due to the suitability of the habitat present and the size of Baptiste Creek, there is a high potential for Mapleleaf Mussel to be present. As this species is not protected under the ESA or SARA, permits and/or approvals under the ESA or SARA are not required. General fisheries mitigation measures identified below will also protect these species.

ASSESSMENT OF IMPACTS

A review of the WSP Fish and Fish Habitat Impact Assessment Report (December 2019) and current Detailed Design was completed by Dillon Fisheries Assessment Specialists to identify any updates to the proposed works. **Table 1** below includes the proposed works and impacts at the three bridge crossings as identified in the WSP Report (2019). The Final Design Changes and Footprints column in the table below identifies the minor changes and additions to the previous design (as outlined in the WSP, 2019 report) including rounding of proposed dimensions, installation of TL5 barriers, final impact areas below the HWM for all three bridges and new approach slabs for the widening at the Tilbury Creek Bridges. As identified in the WSP Fish and Fish Habitat Impact Assessment Report (December 2019), the residual

effects of the proposed works are related to riparian vegetation clearing and enclosure of the medians, use of industrial equipment resulting in the disturbance of watercourse banks, placement of materials and structure in the water and aquatic vegetation management, both associated with the abutment footprints within the normal wetted channel in Tilbury Creek.

Table 1: Proposed Bridge Rehabilitation Works, Highway 401

| Watercourse Crossing (WSP, 2019) | Fish Habitat Classification (WSP, 2019) | Existing Structure (WSP, 2019) | Proposed Works (WSP, 2019) | Final Design Changes, Additions and Footprints (Dillon, 2020)* |
|---|--|---|--|---|
| Baptiste Creek Bridges | Directly supports a warmwater baitfish and sportfish community | One eastbound lane and one westbound lane bridge consisting of a single span concrete rigid frame founded on spread footings at the abutments. Each structure measures 13.1 m wide with a clear span of 17.6 m between abutments. | <ul style="list-style-type: none"> • Remove median retaining walls and footings • Remove and replace existing westbound lane approach slab • Install new deck extension, north and south abutments, and pile foundation • Each bridge will be widened into the median by 5.79 m, for a total width of 18.89 m at each structure • Install new asphalt on deck and complete slope repairs • Patch repair to deck top, fascia, soffit, and abutment walls with form and pump method. • Permanent footprint below the high water mark = 14 m² (7 m² at each abutment) located outside of the wetted channel. | <ul style="list-style-type: none"> • Remove median retaining walls and footings • Remove and replace existing westbound lane approach slab • Install new deck extension, north and south abutments, and pile foundation • Each bridge will be widened into the median by 5.8 m, for a total width of 18.9 m at each structure • Install new asphalt on deck and complete slope repairs. • Install new TL5 barriers • Patch repair to deck top, fascia, soffit, and abutment walls with form and pump method • Permanent footprint below the high water mark = 14 m² (7 m² at each abutment) located outside of the wetted channel |

| Watercourse Crossing (WSP, 2019) | Fish Habitat Classification (WSP, 2019) | Existing Structure (WSP, 2019) | Proposed Works (WSP, 2019) | Final Design Changes, Additions and Footprints (Dillon, 2020)* |
|--------------------------------------|--|---|--|---|
| Little Baptiste Creek Bridges | Directly supports a warmwater baitfish and sportfish community | One eastbound lane and one westbound lane bridge consisting of a single span concrete rigid frame founded on spread footings at the abutments. Each structure measures 13.1 m wide with a clear span of 10.7 m between abutments. | <ul style="list-style-type: none"> • Remove and replace existing westbound lane approach slab • Install new deck extension, north and south abutments, and pile foundation • Each bridge will be widened into the median by 5.74 m, for a total width of 18.84 m at each structure • Install new asphalt on deck and complete slope repairs • Patch repair to deck top, fascia, soffit, and abutment walls with form and pump method • Permanent footprint below the high water mark = 35 m² (17.3 m² at each abutment) located outside of the wetted channel. | <ul style="list-style-type: none"> • Remove and replace existing westbound lane approach slab • Install new deck extension, north and south abutments, and pile foundation • Each bridge will be widened into the median by 5.8 m, for a total width of 18.9 m at each structure • Install new asphalt on deck and complete slope repairs • Install new TL5 barriers • Patch repair to deck top, fascia, soffit, and abutment walls with form and pump method. • Permanent footprint below the high water mark = 35 m² (17.3 m² at each abutment) located outside of the wetted channel. |

| Watercourse Crossing (WSP, 2019) | Fish Habitat Classification (WSP, 2019) | Existing Structure (WSP, 2019) | Proposed Works (WSP, 2019) | Final Design Changes, Additions and Footprints (Dillon, 2020)* |
|----------------------------------|--|---|---|--|
| Tilbury Creek Bridges | Directly supports a warmwater baitfish and sportfish community | One eastbound lane and one westbound lane bridge consisting of a single span concrete rigid frame founded on spread footings at the abutments. Each structure measures 20.7 m wide with a clear span of 15.2 m between abutments. | <ul style="list-style-type: none"> • Install new deck extension, north and south abutments, and pile foundation • Each bridge will be widened into the median by 5.89 m, for a total width of 26.59 m at each structure • Install new asphalt and waterproofing system on deck • Patch repairs to deck top, fascia, soffit, and abutment walls with form and pump method • Permanent footprint below the high water mark = 65 m² (32.7 m² at each abutment) located within the wetted channel. | <ul style="list-style-type: none"> • Install new deck extension, new approach slabs for the widening, north and south abutments, and pile foundation • Each bridge will be widened into the median by 5.8 m, for a total width of 26.6 m at each structure • Install new asphalt and waterproofing system on deck • Install new TLS barriers • Patch repairs to deck top, fascia, soffit, and abutment walls with form and pump method • Permanent footprint below the high water mark = 65 m² (32.7 m² at each abutment) located within the wetted channel. |

*Bolded text indicates rounding and 2020 design changes or additions.

MITIGATION MEASURES

This section summarizes specific mitigation measures for the proposed in-stream activities. Measures to be undertaken include:

- To protect sensitive life stages/processes of resident fish, in-water work can occur between July 1 and March 14, of any given year (OPSS.PROV 182)
- Site isolation measures (e.g., cofferdams) will be used to create dry working conditions during construction, where applicable (OPSS.PROV 805)
- If applicable, a fish salvage will be performed under a Licence to Collect Fish for Scientific Purposes from the MNR during dewatering (OPSS.PROV 182, SSP101F23)
- Flow will be maintained downstream during construction around the isolated work areas
- Dewatering and use of pumps shall be conducted in accordance with OPSS.PROV 517 and the DFO end-of-pipe fish screens code of practice:
 - Pumping system shall be sized to accommodate high flows of the waterbody during the construction period. Pumps shall be monitored at all times, and back-up pumps shall be readily available on-site in the event of pump failure
 - Sediment laden dewatering discharge shall be pumped into a vegetated area, settling basin or similar measure >30 m from the watercourse and prevent sediment and other deleterious substances from entering any waterbody
 - All water intakes and outlets in the watercourse will have screens to prevent entrainment or impingement of fish
- All disturbed riparian areas will be restored to pre-construction conditions or better with a native grass seed mix and stabilized to prevent erosion (OPSS.PROV 804 and 805)
- Appropriate erosion and sediment control measures must be installed around the work areas to prevent migration of loose soils and accumulated sediment downstream or to adjacent areas (OPSS.PROV 804 and 805)
 - Effective sediment and erosion control will follow MTO's Environmental Guide for Erosion and Sediment Control During Construction of Highway Projects (MTO 2007), including keeping required clearing and grubbing to a minimum and installing silt fence along watercourse banks and around fill placement areas
- Equipment shall arrive on site in clean conditions and be maintained free of fluid leaks (OPSS.PROV 182)
- Operate machinery on land from outside the water in a manner that minimizes disturbance to the banks and/or bed of the watercourse (OPSS.PROV 182)
- Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds (OPSS.PROV 182)
- Equipment re-fueling and maintenance shall take place in a manner that prevents any sediment and other deleterious substances from entering into a waterbody (OPSS.PROV 182)

- An emergency spill kit shall be kept on site to address any fluid leaks or spills from equipment (OPSS.PROV 182)
- Handling of fuel, excess materials and debris will be properly managed on-site and removed as per the standard construction practices necessary to protect watercourses (OPSS.PROV 180, OPSS.PROV 182)
- All materials used or generated (e.g., organics, soils, woody debris, temporary stockpiles, construction debris, etc.) will be temporarily stored, handled and disposed of during site preparation, construction and clean-up in a manner that prevents entry into the watercourse (OPSS.PROV 180, OPSS.PROV 182)
- Any unused dredged material will be disposed of offsite (OPSS.PROV 180, OPSS.PROV 182)
- A debris containment platform will be used in conjunction with the falsework and will be regularly cleaned in order to prevent debris from falling into the watercourse.

ASSESSMENT OF PROJECT LIKELIHOOD OF CAUSING DEATH OF FISH OR HARMFUL ALTERATION, DISRUPTION OR DESTRUCTION OF FISH HABITAT

Dillon has completed a review of the proposed works and potential impacts identified at the Tilbury Creek, Little Baptiste Creek and Baptiste Creek Bridges. As identified in **Table 1**, there are no design changes resulting in a change of the project footprints below the HWM. The residual negative effects from the extension of the abutment in Tilbury Creek will result in the loss of 65 m² of general edge habitat including aquatic vegetation. Given Tilbury Creek is approximately 18 m wide at the crossing and the availability of abundant, non-specialized habitat for a warmwater fish community the new abutment footprint is not anticipated to directly or indirectly impair the habitat's ability capacity to support one or more life processes of fish. The residual effect from riparian vegetation clearing and enclosure of the medians will result in a permanent localized loss of riparian vegetation within the footprints of the new bridge segments. Given the small scale, localized areas of impact and riparian vegetation available beyond the bridges, the removal of riparian vegetation is not anticipated to directly or indirectly impair the habitat's ability capacity to support one or more life processes of fish. The residual effect from use of industrial equipment to complete work on the abutments and bridge decks will result in the localized, temporary disturbance to watercourse banks. Disturbance to the banks will be restored immediately following construction as per OPSS 804, temporary erosion and sediment controls will be installed as per OPSS 804 and 805 and the use of equipment in and around watercourses will be in accordance with OPSS 182 to prevent the entry of sediment and deleterious substances into the watercourse.

DFO interprets "harmful alteration, disruption or destruction" as any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes of fish (DFO, 2019). Based on the review, assessment of impacts and recommended mitigation

measures, the proposed bridge widening activities are considered to be not likely to result in death of fish and/or HADD of fish habitat. As such, a Project Notification Form will be provided for MTO review under separate cover.

Summary

The in-water works will incorporate mitigation measures as outlined above including adhering to the permissible in-water construction timing window of July 1st to March 15th and will not impede flows or constrict fish movement through the work area. The residual negative effects to fish and fish habitat include the minor increase in footprint below the high water mark, loss or reduction in riparian cover within the existing open median and disturbance to the banks from the use of industrial equipment at all three locations. It has been determined that the identified residual negative effects will not limit or diminish fish's ability to use the habitat for one of more of their life processes. Therefore, the proposed works, with implementation of mitigation measures are not likely to result in the death of fish or HADD of fish habitat. As such, a Project Notification Form will be provided for MTO review under separate cover.