Appendix G

Terrestrial and Aquatic Existing Conditions and Impact Assessment

Note:

*The Terrestrial Ecosystem Existing Conditions Report may be found in **Appendix F** of the Terrestrial Ecosystem Impact Assessment Report.*

*The Fish and Fish Habitat Existing Conditions Report may be found in **Appendix B** of the Fish and Fish Habitat Impact Assessment Report.*

DILLON CONSULTING

MINISTRY OF TRANSPORTATION, ONTARIO

County Road 17 Bridge Replacements GWP 4023-15-00

Terrestrial Ecosystem Impact Assessment Report (Final)

March 2019 – 17-5180

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1.0 Introduction

The Ministry of Transportation, Ontario (MTO) retained Dillon Consulting Limited (Dillon) to complete a series of structural rehabilitations and replacements under Retainer in Eastern Ontario. The assignments are being completed following MTO's *Class Environmental Assessment (EA) for Provincial Transportation Facilities* (2000) and include both preliminary and detail design projects.

This project is being completed under the Retainer and includes the replacement of two structures on County Road 17 in the Town of Hawkesbury, namely, Hawkesbury Creek/CNR Overhead (Site No. 27-50) and Highway 34 Underpass at County Road 17 (Site No. 27-51) (**Figure 1 – Appendix A**) under GWP 4023-15-00.

The replacement of the two structures is being completed as a Group "B" project and a Transportation Environmental Study Report (TESR) will be prepared for public review.

This Terrestrial Ecosystem Impact Assessment Report (TEIAR) identifies existing terrestrial features and the potential environmental impacts of the improvements, following the requirements of MTO's Environmental Reference for Highway Design (ERD; MTO, 2013). This report also identifies potential mitigation measures to reduce or eliminate potential impacts. The TEIAR will be summarized in the applicable project TESR or ESD. The Study Area for this TEIAR is within the Highway Rights-of-Way (ROW) (**Figure 2 – Appendix A**).

2.0 Methodology

The Natural Environment Assessment was completed following the requirements outlined in Section 3.2, Terrestrial Ecosystems, of MTO's ERD (2013).

2.1 Background Information Review

Background information was collected from the following sources:

- Terrestrial Ecosystems Existing Conditions Report Mega 6 Bridges – Hawkesbury Creek –CNR Overhead (SN.27-50) & Highway 34 Underpass at County Road 17 (SN.27-51) (**Appendix F**)
- Ministry of Natural Resources and Forestry (MNRF), Kemptville District (June 20, 2017)
- MNRF's Species at Risk by Area Online Mapping Tool
- MNRF's Natural Heritage Information Centre (NHIC):
  - Biodiversity Explorer Database (accessed July 2016)
  - Ontario Herpetofaunal Atlas (NHIC)
  - MNRF's Land Information Ontario (LIO) Database (LIO MNRF 2016)

- Various wildlife atlases, including:
  - Ontario Breeding Bird Atlas (Square #18WR24)
  - Ontario Butterfly Atlas (Square #18WR24)
  - Ontario Herpetofaunal Atlas (Ontario Nature, 2016)
  - Ontario Odonata Atlas (NHIC, 2005)
  - Atlas of the Mammals of Ontario (NHIC).

2.2 Field Inventory Methodology

Field verification of terrestrial natural resources included the following:

- Confirmation of Ecological Land Classification (ELC) of vegetation communities, using accepted protocols in Ontario, identified in the Existing Conditions Report (**Appendix F**)
- A migratory bird nest search of the structures and vegetated areas potentially affected by the project
- Documentation of incidental wildlife and wildlife habitat encountered in the field
- A Butternut Health Assessment (BHA) for identified Butternut trees in the Existing Conditions Report (**Appendix F**)
- Documentation of sensitive/rare species, and/or Species at Risk (SAR), and/or associated habitat encountered in the field.

A Dillon terrestrial biologist completed field investigations on May 31, 2017. The weather conditions during the investigation consisted of sunny with 50% cloud cover and an average ambient temperature of 13°C. Field investigations were completed using accepted protocols in Ontario (e.g., ELC for Southern Ontario – Lee *et al*. 1998; Ontario MNRF's Wildlife Monitoring Programs and Inventory Techniques in Ontario – Konze and McLaren 1997; Butternut Assessment Guidelines – SAR Branch 2011). **Appendix B** includes a photographic record of the terrestrial ecosystem reviewed during field investigations.

2.3 Evaluation of Significance Methodology

The significance of previously evaluated natural features observed in the Study Area was determined through the examination of secondary source background information. The significance of unevaluated natural features in the Study Area was determined using provincially accepted protocols such as those adapted from the MNRF's Natural Heritage Reference Manual (NHRM; MNRF 2010), the Significant Wildlife Habitat Technical Guide (MNRF, 2000) and the relevant Significant Wildlife Habitat Ecoregion 6E Criterion Schedule (MNRF, 2015).

3.0 Background Review and Field Investigation Findings

3.1 Background Review Findings

Fourteen SAR listed as *Threatened* or *Endangered* under the Ontario *Endangered Species Act*, 2007 (ESA, 2007) have the potential to occur in the vicinity of the Study Area based on historical occurrence records (**Table 1**).

Six Species of Conservation Concern (SCC) were also identified as potentially occurring within the vicinity Study Area (**Table 2**). SCC are defined as species listed as *Special Concern*, *Threatened* or *Endangered* on the Federal SARA, 2002, but not *Threatened* or *Endangered* under ESA, 2007, and/or species that are provincially rare/tracked (i.e., have a Sub-national (provincial) Rank of S1 – Critically Imperiled, S2 – Imperiled or S3 – Vulnerable) or are designated as Special Concern under the ESA, 2007.

Other species identified by secondary source information have secure (S5) or apparently secure (S4) populations in Ontario and are not considered SAR or SCC. The list of plant and wildlife species with potential to occur in the Study Area, based on background studies, is included in **Appendix C1**.

Table 1: Species at Risk Identified Through Background Review

Scientific Name	Common Name	Provincial Conservation Rank (S Rank)	Federal Species at Risk Act Status	Ontario ESA (2007) Status	Information Source*
BIRDS					
Ixobrychus exilis	Least Bittern	THR	THR	S4B	OBBA, MNRF SAR in Area
Chaetura pelagica	Chimney Swift	THR	THR	S4B, S4N	OBBA
Ammodramus henslowii	Henslow's Sparrow	END	END	SHB	MNRF SAR in Area
Hirundo rustica	Barn Swallow	---	THR	S4B	OBBA, MNRF SAR in Area
Riparia riparia	Bank Swallow	---	THR	S4B	OBBA
Dolichonyx oryzivorus	Bobolink	---	THR	S4B	OBBA, MNRF SAR in Area
Sturnella magna	Eastern Meadowlark	---	THR	S4B	OBBA, MNRF SAR in Area

Scientific Name	Common Name	Provincial Conservation Rank (S Rank)	Federal Species at Risk Act Status	Ontario ESA (2007) Status	Information Source*
HERPTILES					
Emydoidea blandingii	Blanding's Turtle	THR	THR	S3	OHA, MNRF
Apalone spinifera	Spiny Softshell	THR	END	S3	NHIC; MNRF SAR in Area
MAMMALS					
Myotis leibii	Eastern Small-footed Myotis	S2S3	---	END	MWH
Myotis lucifugus	Little Brown Myotis	S4	END	END	MWH
Myotis septentrionalis	Northern Myotis	S3	END	END	MWH
Pipistrellus subflavus	Tri-colored Bat	S3?	END	END	MWH
PLANTS					
Juglans cinerea	Butternut	S3	END	END	MNRF

*Information sources included: MNRF = MNRF Consultation, NHIC = Natural Heritage Information Centre, OBBA = Ontario Breeding Bird Atlas, OBA = Ontario Butterfly Atlas, ON = Ontario Nature, AMO = Atlas of the Mammals of Ontario, MWH = Digital Distribution Maps of the Mammals of the Western Hemisphere, version 3.0; see **Appendix C3** for conservation status codes.

Table 2: Species of Conservation Concern Identified Through the Background Information Search

Scientific Name	Common Name	Provincial Conservation Rank (S Rank)	Federal Species at Risk Act Status	Ontario ESA (2007) Status	Information Source*
Birds					
Hylocichla mustelina	Wood Thrush	---	SC	S4B	OBBA
Contopus virens	Eastern Wood-Pewee	---	SC	S4B	OBBA
HERPTILES					
Chelydra serpentina	Snapping Turtle	SC	SC	S3	OHA, MNRF SAR in Area; MNRF
Thamnophis sauritus	Eastern Ribbonsnake (Great Lakes population)	SC	SC	S3	MNRF SAR in Area; MNRF

Scientific Name	Common Name	Provincial Conservation Rank (S Rank)	Federal Species at Risk Act Status	Ontario ESA (2007) Status	Information Source*
Graptemys geographica	Northern Map Turtle	SC	SC	S3	MNRF SAR in Area, OHA; MNRF
BUTTERFLIES AND MOTHS					
Danaus plexippus	Monarch	SC	SC	S2N,S4B	OBA, MNRF

*Information sources included: NHIC = Natural Heritage Information Centre, MNRF = MNRF Consultation, OBBA = Ontario Breeding Bird Atlas, ON= Ontario Nature, OBA = Ontario Butterfly Atlas see **Appendix C3** for conservation status codes.

3.2 Natural Heritage Features

Based on a review of background information, terrestrial natural features have been identified in the Study Area (**Figure 2 – Appendix A**). Known nature heritage features consisted of a mapped watercourse (Hawkesbury Creek), woodlands and a portion of unevaluated wetland north of the Study Area. The northern portion of the Study Area is within the Town of Hawkesbury and the southern portion of the Study Area is within the United Counties of Prescott and Russell. The Official Plans and associated Schedules for these jurisdictions are further described below.

3.2.1 Town of Hawkesbury Official Plan and Zoning By-law

As shown on the Zoning Map Section 4 of the Town of Hawkesbury Zoning By-Law (2018), lands within the northeastern portion of the Study Area are designated as Highway Commercial. As per Schedule A of the Town of Hawkesbury Official Plan (2010), the northeastern portion of the Study Area is designated as Residential Policy Area. Additionally, the northern extent of the Study Area is located within the Hawkesbury Creek floodplain and is shown on Schedule B of the Official Plan.

3.2.2 United Counties of Prescott and Russell Official Plan

The area south of County Road 17 is included in the United Counties of Prescott and Russell Official Plan (2018). As per Schedule B of the United Counties of Prescott and Russell Official Plan (2018), the southwestern portion of the Study Area is designated Rural Policy Area and the southeastern portion is designated Trade and Industry Policy Areas. There are no Natural Heritage Features (i.e., Significant Woodlands) identified within the Study Area (Schedule B).

3.3 Field Investigation

The following summarizes the terrestrial natural features inventoried in the Study Area.

3.3.1 Topography

The Study Area has no major topographical relief and is typical of level terrain generally associated with floodplain and wetlands. Gentle rolling slopes were observed within the deciduous forest on the southwestern extent of the Study Area as well as steep embankments within the ROW adjacent to Highway 17.

3.3.2 Ecological Land Classification

Ecological land classification (ELC) was completed for the Study Area based on aerial photograph interpretation and field observations from the ROW. The objective of the ELC investigation was to confirm the ELC communities identified in the Existing Conditions Report (**Appendix F**). In general, the ELC communities observed during the 2017 field investigations were consistent with the Existing Conditions Report (**Appendix F**). Slight alternations to the ELC mapping consisted of reclassifying small distinct ELC communities (< 0.05 ha) as inclusions into larger ones.

Sixteen natural communities were identified in the Study Area. The landscape in the Study Area is predominantly culturally influenced meadows and thickets with natural forests, swamps and marshes located in the floodplain adjacent to Hawkesbury Creek. The descriptions of ELC communities are outlined in **Table 3**, and these communities are shown on **Figure 3 – Appendix A**. A list of plant species observed during the field investigation is provided in **Appendix C2**. Field sheets are also provided in **Appendix D**. None of the vegetation communities documented in the Study Area are rare in Ontario.

Table 3: Descriptions of ELC Communities within Study Area

ELC Code (Existing Conditions Report: Appendix F)	Dillon ELC Code	Community	Vegetation Description	Description of Changes	Photo Reference (Appendix B)
CUM1-1	MEM	Dry to Moist Old Field Meadow Type	Found in all quadrants, this ELC type variable in composition based on location and soil moisture. Few trees and shrubs exist in this vegetation type, and sparse young Manitoba Maple and White Elm were found in these units. The dense ground layer contained abundant Tall Goldenrod (*Solidago altissima*), Canada Anemone (*Anemone canadensis*), Kentucky Bluegrass (*Poa pratensis*) and Hog Peanut (*Amphicarpaea bracteata*), with occasional Cow Vetch (Vicia cracca), Red Raspberry (*Rubus idaeaus*), White Clover (*Trifolium repens*), Rose *(Rosa sp.)*, Thicket Creeper (*Parthenocissus vitacea*), Riverbank Grape (*Vitis riparia*), Bouncing Bet (*Saponaria officinalis*), and Poison Hemlock. Other common species of cultural meadows including: Kentucky Bluegrass, Wild Parsley (*Pastinaca sativa*), Red Clover (*Trifolium pratense*), Smooth Brome (*Bromus inermis),* Burdock (*Arctium minius*), Creeping Thistle (*Cirsium arvense*), Common Milkweed (*Asclepias syriaca*), Wild Carrot (*Daucus carota*), and Field Horsetail (*Equisetum arvense*) were also present but less abundant. An inclusion of Sumac Mineral Cultural Thicket type (CUT1-1) was observed in the unit on the south edge of County Road 17, west of Hawkesbury Creek. This inclusion was dominated by a dense shrub layer of Staghorn Sumac. Other inclusions occur in the drainage ditches of the southeast and northeast quadrants of the Highway 34 Underpass at County Road 17. They are dominated Broad-leaf Cattail (*Typha latifolia*) and also contain occasional Purple Loosestrife (*Lythrum salicaria*).	Community was amended to Mixed Meadow.	1, 2, 3, 13, 19, 20

ELC Code (Existing Conditions Report: Appendix F)	Dillon ELC Code	Community	Vegetation Description	Description of Changes	Photo Reference (Appendix B)
FOD7-1	FOD7-1	Fresh-Moist White Elm Lowland Deciduous Forest Type	Located southwest of the Hawkesbury Creek bridge structure along the riverbanks. This vegetation type was dominated by a canopy dominated by White Elm (*Ulmus americana*) and Manitoba Maple (Acer negundo), with occasional Hybrid Poplar (*Populus x canadensis*) and Black Cherry (*Prunus serotina*), and sparse Trembling Aspen (*Populus tremuloides*) and Black Ash (*Fraxinus nigra*). The dense subcanopy was abundant with Common Buckthorn (*Rhamnus cathartica*) with occasional young Trembling Aspen. The moderately dense shrub layer is abundant with Black Cherry saplings, and occasional Red Raspberry, Riverbank Grape, Sugar Maple (*Acer saccharum*) saplings, Honeysuckles (*Lonicera sp*.), and Alternate-leaved Dogwood (*Cornus alternifolia*). The ground layer is moderately dense, containing occasional abundant Thicket Creeper, Avens (*Geum sp.),* and occasional Sensitive Fern (*Onoclea sensibilis*). A Butternut was found in in the east unit of this vegetation type, at the boundary of a unit of Forb Mineral Meadow Marsh Type.	No adjustments were made to the boundaries of this community.	4
FOD3-1	FOD3-1	Dry-Fresh Poplar Deciduous Forest Type	Found northwest and southwest of the Hawkesbury-CNR bridge, this vegetation type had a semi-closed canopy with abundant with Eastern Cottonwood (*Populus deltoides*) with a subcanopy of occasional White Elm (*Ulmus americana*) with sparse young Sugar Maple. The moderately dense shrub layer was abundant with Riverbank Grape and contained occasional Common Buckthorn. The dense ground layer was abundant with Kentucky Bluegrass and Riverbank Grape with occasional Tall Goldenrod, Canada Anemone and Poison Hemlock (*Conium maculatum*).	This community was kept on the south side of Highway 17; however the community north of the Highway was incorporated into FOD8-1.	6

ELC Code (Existing Conditions Report: Appendix F)	Dillon ELC Code	Community	Vegetation Description	Description of Changes	Photo Reference (Appendix B)
MAM2-10	MAM2-10	Forb Mineral Meadow Marsh Type	Found in the Hawkesbury Creek floodplain, both north and south of County Road 17, this vegetation type was variable in composition by unit. In all units trees and shrubs were sparse with only sparse White Elm, Speckled Alder, Staghorn Sumac, Virgin's Bower, and Tatarian Honeysuckle. The ground layer was dense with forbs including abundant Canada Goldenrod, Poison Hemlock, Spotted Touch-me-not and Reed Canary Grass with occasional Bouncing Bet, Sensitive Fern, Early Meadow-rue, Ostrich Fern, Red Trillium, Jack-in-the-pulpit, Avens, Bedstraw (*Galium sp.)* with sparse Stinging Nettle (*Urtica dioica),* Northern Water Horehound (*Lycopus americanus*), and Blue Flag (*Iris versicolor*).	No adjustments were made to this community.	7
SWD	SWD/THD M5	Deciduous Swamp	Small deciduous swamp units are found in low-lying areas in the floodplain to Hawkesbury Creek, south of County Road 17. The moderately dense canopy contains occasional Black Ash and Large Tooth Aspen while the dense subcanopy is abundant with Domestic Apple (*Malus pumila*) and occasional White Elm, with sparse Manitoba Maple. The dense shrub layer contains occasional Staghorn Sumac, Red Raspberry, Riverbank Grape, Virginia Creeper, Virgin's Bower, Nannyberry, young Manitoba Maple, and Common Buckthorn. The ground layer was abundant with Canada Goldenrod (*Solidago canadensis*), Sensitive Fern, Ostrich Fern, Poison Hemlock, and Canada Anemone, with occasional Tall Meadow-rue (*Thalictrum pubescens*), Red Baneberry, and Field Horsetail.	The boundary of the southern SWD community was considered an inclusion of the adjacent meadow community due to the small size. The SWD community slightly to the north was amended to a THDM5: Fresh-Moist Deciduous Thicket Ecosite community as it consisted of mostly shrubs along the river bank.	8

ELC Code (Existing Conditions Report: Appendix F)	Dillon ELC Code	Community	Vegetation Description	Description of Changes	Photo Reference (Appendix B)
FOD5-2	FOD5-2	Dry-Fresh Sugar Maple-Beech Deciduous Forest Type	Found in the southwest quadrant of the CNR overhead, this vegetation type had a dense canopy dominated by abundant Sugar Maple with occasional American Beech (*Fagus grandifolia*), Black Cherry, and White Elm. The shrub layer contained occasional Choke Cherry (*Prunus virginiana*), Honeysuckles, and Common Buckthorn. The variable ground layer contained sparse areas with occasional Red Trillium (*Trillium erectum*) and Jack-in-the-Pulpit (*Arisaema triphyllum*) and areas dense with ferns such as Ostrich Fern (*Matteuccia struthiopteris*), Sensitive Fern (*Onoclea sensibilis*), and Interrupted Fern (*Osmunda claytoniana*). Two Butternut trees were found at the edge of this unit and the Forb Mineral Meadow Marsh (MAM2-10).	No adjustments were made to the boundaries of this community.	9
FOD5	FOD5	Dry-Fresh Sugar Maple Deciduous Forest Ecosite	Found along the east banks of Hawkesbury Creek, north and south of the bridge (SN 27-51), this ecosite had a dense canopy abundant with White Elm and Sugar Maple, with occasional Basswood (*Tilia americana*), Black Cherry, Large Tooth Aspen (*Populus grandidentata*), and sparse Black Ash on the riverside slopes. A single Butternut was found in this unit, south of County Road 17, at the edge of the deciduous swamp (SWD) unit found along the riverbanks. The dense shrub layer was abundant with Nannyberry (*Viburnum lentago*), Virgin's Bower (*Clematis virginiana*) and contained occasional Staghorn Sumac *(Rhus typhina).* The dense ground layer was abundant with Field Horsetail, and occasional Coltsfoot (*Tussilago farfara*), with sparse Virginia Strawberry *(Fragaria virginiana*).	No adjustments were made to the boundaries of this community.	11

ELC Code (Existing Conditions Report: Appendix F)	Dillon ELC Code	Community	Vegetation Description	Description of Changes	Photo Reference (Appendix B)
FOD8-1	FOD8-1	Fresh-Moist Poplar Deciduous Forest Type	Found in the northwest quadrant of the CNR overhead, this vegetation type is immediately adjacent to FOD3-1, but has a moister moisture regime and ground flora. The canopy was moderately dense and abundant with Eastern Cottonwood and Trembling Aspen, with occasional Manitoba Maple and Black Ash. The shrub layer contained abundant Common Buckthorn The ground layer was abundant with Canada Anemone, Poison Hemlock, and Canada Goldenrod, with occasional Sedges (*Carex spp.),* Tall Agrimony (*Agrimonia gryposepala*), and Red Baneberry (*Actaea rubra*). There are also patches of this vegetation type in the northeast quadrant of the Highway 34 underpass. They contain a canopy of abundant Trembling Aspen and occasional Balsam Poplar (*Populus balsamifera*) and White Elm. Common Buckthorn, Tatarian Honeysuckle (*Lonicera tatarica*) and Red-osier Dogwood (*Cornus stolonifera*) occur in the understorey and Red Raspberry and Flat-top Fragrant Goldenrod (*Euthamia graminifolia*) in the ground cover. Next to the culvert adjacent to Highway 34 are patches of Coltsfoot on the bank and watercress (*Nasturtium sp.)* in the watercourse.	This community was extended west as well as included the previous identified FOD3-1. Additionally, Dillon noted that the FOD8-1 communities documented in the northeast quadrant of the Study Area were small for a forest community polygon and consisted of small patches of Trembling Aspen.	14
CUP3	---	Coniferous Plantation Ecosite	These small units of planted landscape trees were dominated by tall White Spruce trees *(Picea glauca);* the ground layer vegetation was consistent with the adjacent Old Field Meadow units (CUM1-1). The White Spruce trees in the southeast quadrant of the Highway 34 Underpass at County Road 17 are accompanied by a large patch of Staghorn Sumac.	Dillon removed this community as it consisted of eight trees around the same ages, likely planted. It is now labelled MEM.	N/A

ELC Code (Existing Conditions Report: Appendix F)	Dillon ELC Code	Community	Vegetation Description	Description of Changes	Photo Reference (Appendix B)
CUW1	WOD	Deciduous Woodland	There is no description of this ELC community within the Existing Conditions Report (**Appendix F**).	The boundaries of this community were not changed. This community was observed to contain a stand of Box Elder, Elm sp. and Poplar.	N/A
CVR_4	CVR_4	Residential-Rural Property	This ELC unit represents the residential property found northwest of the Highway 34 Underpass at County Road 17. The vegetation on this property is landscaped trees and gardens and is not inventoried as a part of the natural terrestrial ecosystem.	No changes	N/A
SWT3-1	SWT3-1	Alder Organic Thicket Swamp Type	This vegetation type was observed in the floodplain to Hawkesbury Creek north of County Road 17 and west of Highway 34. The sparse canopy contained White Elm, Manitoba Maple, and Red Ash. The dense shrub layer was dominated by Speckled Alder (*Alnus incana subsp. rugosa*) with occasional Riverbank Grape and sparse Staghorn Sumac and Nannyberry. The ground layer was abundant with Dwarf Raspberry (*Rubus pubescens*), and contained occasional Spotted Touch-me-not (*Impatiens capensis*), Canada Goldenrod, and Current (*Ribes sp.*), with sparse Thicket Creeper, Graceful Sedge (*Carex gracillima*), other Sedges (*Carex spp.),* Avens, and seedlings of Red Osier Dogwood (*Cornus stolonifera*). A soil sample taken in this location found greater than 40 cm of Organic humic soils.	No adjustments were made to this community.	17

ELC Code (Existing Conditions Report: Appendix F)	Dillon ELC Code	Community	Vegetation Description	Description of Changes	Photo Reference (Appendix B)
MAM2-2	MAM2-2	Reed-canary Grass Mineral Meadow Marsh Type	This vegetation type was observed in the western floodplain to Hawkesbury Creek, north of County Road 17. Few trees or shrubs exist in this unit, save some young White Elm and occasional Speckled Alder, Common Buckthorn, and Riverbank Grape, and sparse Tatarian. Honeysuckle (*Lonicera tatarica*), and European Highbush Cranberry (*Viburnum opulus subsp. opulus*). The ground layer was dominated by Reed Canary Grass (*Phalaris arundinacea*), with abundant Poison Hemlock, and Canada Goldenrod and occasional Bouncing Bet, Red. Baneberry, Sensitive Fern, Early Meadow Rue (*Thalictrum dioicum*), Spotted Touch-me-not, and Spotted Joe-Pye Weed (*Eupatorium maculatum*). A soil sample taken in this location found stony mineral soils underlying a 2 cm organic litter layer.	No adjustments were made to this community.	N/A
MAS3-1	MAS3-1	Cattail Organic Shallow Marsh Type	This vegetation type was found north of County Road 17, between the CNR line and Hawkesbury Creek. Sparse shrubs of Nannyberry were found in the shrub layer. The ground layer was dominated by Cattails (*Typha angustifolia and T. latifolia*) with abundant Reed Canary Grass and occasional Sensitive Fern. Standing water was observed at ground level at the time of field investigations. A soil auger taken in this unit found 50 cm of organic mesic soils over clay.	No adjustments were made to this community.	17

ELC Code (Existing Conditions Report: Appendix F)	Dillon ELC Code	Community	Vegetation Description	Description of Changes	Photo Reference (Appendix B)
MAMM2-7	MEMM4	Ostrich Fern Forb Mineral Meadow Marsh Type	This unit is found north of County Road 17 in a drainage area west of the CNR tracks. The ground layer is abundant with Ostrich Fern, Bracken Fern (*Pteridium aquilinum*), Field Horsetail, and Virgin's Bower, with occasional Interrupted Fern, and Canada Goldenrod with sparse Poison Hemlock and Reed Canary Grass. Dillon amended this community to be MEMM4: Fresh-Moist Mixed Meadow Ecosite based on moist meadow conditions with some upland species mixed in the area directly adjacent to the railroad tracks.	Dillon removed two MAM2-10 communities west of the river in the southwest quadrant as it was identified as a low spot in the forest taking drainage. This community type on the east side of the river was not adjusted.	18
CUT1	THD	Mineral Cultural Thicket Ecosite	Observed from west of the CNR tracks, this unit was found adjacent to a residential lot in complex with Old Field Meadow (CUM1-1). Although the unit could not be observed in detail, the shrub layer was abundant with Manitoba Maple and Staghorn Sumac with a ground layer consistent with the previously described flora in the Old Field Meadow units (CUM1-1).	The area of meadow was reclassified to a thicket.	18

3.3.3 Vegetation Survey

In total, 48 flora species were identified within the Study Area. Of the flora species observed, 16 (33%) are either non-native or exotic species with the remaining 32 (67%) being native to Ontario. A list of plant species encountered during the field survey, including their federal and provincial status, is provided in **Appendix C2**. None of the species observed are listed as SAR or SCC.

3.3.4 Wildlife and Wildlife Habitat

During the field investigation, any incidental wildlife observations were noted in the Study Area. A total of ten species of birds were observed during the field investigation consisting of the following species: Red-winged Blackbird (*Agelaius phoeniceus*), American Goldfinch (*Carduelis tristis*), Northern Flicker (*Colaptes auratus*), Gray Catbird (*Dumetella carolinensis*), Yellow-bellied Flycatcher (*Empidonax flaviventris*), Common Yellowthroat (*Geothlypis trichas*), Baltimore Oriole (*Icterus galbula*), Song Sparrow (*Melospiza melodia*), Eastern Phoebe (*Sayornis phoebe*), Magnolia Warbler (*Setophaga magnolia*), Yellow Warbler (*Setophaga petechia*), Chipping Sparrow (*Spizella passerina*), Warbling Vireo (*Vireo gilvus*) and Red-eyed Vireo (*Vireo olivaceus*). None of the incidental wildlife observed are considered rare in Ontario. No other incidental wildlife observations were made.

Although turtles were not observed during 2017 Dillon field investigations, attributes adjacent to Hawkesbury Creek were identified as having potential nesting habitat for turtle species such as Snapping Turtle. A Snapping Turtle was observed in the field studies completed in 2015 for the Existing Conditions Report (**Appendix F**). Candidate Turtle Nesting Habitat observed within the Study Area are shown in **Figure 4 – Appendix A**.

A shallow marsh dominated by cattails was observed on the northeastern extent of the Study Area within the floodplain of Hawkesbury Creek. Standing water was observed within this community during Dillon's 2017 field survey and may be of sufficient depth to support amphibian breeding. While no amphibians were observed during the field work in 2017, Green Frogs (*Rana clamitans*) and American Toads (*Anaxyrus americanus*) were documented in 2015 as occurring within the Study Area for the Existing Conditions Report (**Appendix F**).

3.3.5 Migratory Bird Nest Survey Results

A survey for migratory bird nests was completed at the Hawkesbury Creek and CNR Overhead, the Highway 34 Underpass and vegetated areas within the ROW by a Dillon biologist during the 2017 field investigation. No nests were observed within the ROW or on structures during the 2017 field survey. Photos of the bridge underdeck of both structures are provided in **Appendix B** (**Photos 21-24**). It was observed that the style of the bridge construction consisting of smooth concrete support beams would make these structures less suitable for species such as Barn Swallow or Cliff Swallow (*Petrochelidon pyrrhonota*). The absence of nest observations during the 2017 field investigations supports this assertion; however, it does not preclude individuals from utilizing these structures in the future. As such, should there be a lag period of greater than two years between the completion of the surveys in 2017 and the commencement of construction, re-survey of the structures is recommended to confirm they are unoccupied.

3.3.6 Ecological Corridors and Linkages

The Study Area contained a mixture of several vegetation communities mainly consisting of deciduous forests, deciduous woodlands, mixed meadows and several small wetland communities. The landscape adjacent to the Study Area is a mix of meadows, deciduous forest, residential and light commercial operations.

North-South wildlife movement between natural areas in proximity to the Study Area would be facilitated by the deciduous forest and wetland communities adjacent to Hawkesbury Creek. Hawkesbury Creek would provide an ecological corridor with wildlife movement potential under the Highway 17 as sufficient clearance was provided under the bridge for passage of large mammals such as White-tailed Deer. Hawkesbury Creek would also provide a migratory corridor for turtle and amphibian species between the wetland communities located along the creek's floodplain.

4.0 Determination of Significance

A determination of the significance of natural heritage features identified in the Study Area is provided in this section. Wherever possible, an evaluation has been undertaken for features not previously evaluated including, the determination of significance for woodlands, wetlands, wildlife habitat and the presence of actual or potential SAR habitat observed in the Study Area.

4.1 Significant Woodlands

The province delegates the responsibility of defining the evaluation criteria for significant woodlands to the local planning authority. Hawkesbury Official Plan does not identify evaluation criteria for determining significant woodlands. Additionally, the United Counties of Prescott and Russell Official Plan indicates that the Significant Woodland mapped on Schedule B was based on information from a number of sources, including the MNRF (Section 5.2).

The potential for significant woodlands was identified by the Kemptville MNRF in a response to the information request completed for the 2017 Existing Conditions Report, received August 2015. As such, the evaluation criteria utilized for the evaluation of Woodlands within the Study Area was generally based on the guidelines of the NHRM (i.e., woodland size, ecological functions, uncommon characteristics and economic and social functional values). Under the NHRM based on the size and presence of an adjacent watercourse (Hawkesbury Creek), these woodlands would be considered significant.

4.2 Significant Wetlands

Provincial Significant Wetlands (PSW) are not located within the Study Area or within 120 m of the Study Area. A known area of unevaluated wetland was located to the north of the Study Area as seen in **Figure 2 – Appendix A**. Several other unevaluated wetland units confined to the floodplain of Hawkesbury Creek were identified during field investigation.

4.3 Significant Wildlife Habitat

An assessment of SCC with the potential to occur in the Study Area is provided in **Table 4**. As noted in **Table 4**, four SCC (i.e., Eastern Wood-Pewee, Northern Map Turtle, Snapping Turtle and Eastern Ribbonsnake) have potential habitat within or adjacent to the Study Area. Using the ELC classifications described in **Section 3.2.2** and the guidelines for identifying significant wildlife habitat in the NHRM (MNRF, 2010), Significant Wildlife Habitat Technical Guide (MNRF, 2000) and the guide's addendum for EcoRegion 6E (MNRF 2015), candidate significant wildlife habitat within the Study Area were identified (**Figure 4 – Appendix A**). Field studies to evaluate the significance of candidate significant wildlife habitat have not been completed, and as such, it will be assumed that the habitats identified below are significant. An assessment of potential SCC impacts and mitigation measures is provided in **Section 6**.

Candidate Significant Wildlife within the Study Area included (**Figure 4 – Appendix A**):

- *Specialized Habitat for Wildlife*
  - *Candidate Amphibian Breeding habitat*
    The Cattail Organic Shallow Marsh has the potential to support breeding populations of amphibians
  - *Candidate Turtle Nesting Area (Snapping Turtle and Northern Map Turtle)*
    The riparian area adjacent to Hawkesbury Creek in the Study Area provides potential nesting habitat above the high water mark where vegetative cover is sparse and suitable nesting substrate was observed
- *Seasonal Concentration Areas of Animals*
  - Candidate Bat Maternity Colonies. The woodland communities have the potential to support SAR bat habitat
- *Candidate Habitat for SCC - Special Concern and Rare Wildlife Species*
  - There is potential for SCC species, including Eastern Wood-Pewee, Wood Thrush, Northern Map Turtle, Snapping Turtle and Eastern Ribbonsnake.

No suitable hibernacula sites or other potential snake Candidate Habitat for SCC – Special Concern and Rare Wildlife Species habitat features (e.g., basking/shedding sites) were observed; however, there is the potential for Eastern Ribbonsnake to forage and incidentally move within the Study Area.

4.4 Species at Risk

The correspondence from the MNRF regarding the potential SAR that could be present in the Study Area is provided in **Appendix E**. The evaluation of the Study Area for suitability as potential habitat for *Endangered* or *Threatened* SAR is discussed in **Table 4**. As noted in **Table 4**, six SAR (i.e., Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-colored Bat, Butternut and Barn Swallow) have potential habitat within or adjacent to the Study Area. However, there were no Barn Swallows nesting in the Study Area. Vegetation removal within the forest (FOD) and woodland (WOD) communities is not expected to impact individual Endangered SAR roosting bats during site preparation. The forest and woodland within the areas of impact include trees less than 20 cm diameter at breast-height (DBH), which do not provide adequate roosting habitat for SAR bats. Additionally, no snags or cavity trees were observed within or along the edge of the woodlands within the areas of impact. Overall, the availability of bat habitat is not expected to be affected given the abundance of woodland habitat in the vicinity of the Study Area.

Based on their range, known occurrences, and/or the vegetation communities observed in the Study Area, only Butternut trees have habitat within the Study Area and could be affected by the proposed project activities if mitigation measures are not implemented. During the 2017 field investigation, seven Butternut trees (see **Figure 4 – Appendix A**) and one Butternut hybrid tree were identified within the Study Area. A subsequent BHA was completed and submitted to the MNRF on September 6, 2017. This assessment was conducted in accordance with Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act, 2007*. This report concluded that the pure Butternut trees assessed were Category 1 – Non-retainable, meaning they are not legally protected under the *ESA, 2007*. Further, Butternut hybrids are also not legally protected under the *ESA, 2007*. None of the Butternut trees will be directly affected by the proposed works as they are outside of the identified construction zones; although, they could be indirectly impacted if mitigation measures are not implemented.

Mitigation measures to avoid or minimize the potential impacts on these species and their habitat are outlined in **Section 6.1** of this TEIAR.

Table 4: Species at Risk and Provincially Rare Species

Species		Status in Canada[1]	Status in Ontario[2]	S Rank[3]	Information Source[4]	Observed During Field Studies	Habitat Requirements [5,6,7]	Potential Habitat in Study Area	Rationale for Potential to Occur	Will Species and/or Habitat be Impacted by the Project (see Section 6.0 for Impacts)
Scientific Name	Common Name									
BIRDS										
Ixobrychus exilis	Least Bittern	THR	THR	S4B	OBBA, MNRF SAR in Area	No	Deep marshes, swamps, bogs; marshy borders of lakes, ponds, streams, ditches; dense emergent vegetation of cattail, bulrush, sedge; nests in cattails; intolerant of loss of habitat and human disturbance.	No	Suitable habitat was not present within the Study Area.	No. Suitable habitat is not found within the Study Area.
Chaetura pelagica	Chimney Swift	THR	THR	S4B,S4N	OBBA	No	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; fees over open water.	No	Suitable habitat was not present within the Study Area.	No. Suitable habitat is not found within the Study Area.
Ammodramus henslowii	Henslow's Sparrow	END	END	SHB	MNRF SAR in Area	No	Large, fallow, grassy area with ground mat of dead vegetation, dense herbaceous vegetation, ground litter and some song perches; neglected weedy fields; wet meadows; cultivated uplands; a moderate amount of moisture needed; requires a minimum tract of grassland of 40 ha, but usually in areas > 100 ha.	No	Large undisturbed grasslands of 40 ha or more are not found within the Study Area.	No. Suitable habitat is not found within the Study Area.
Hirundo rustica	Barn Swallow	---	THR	S4B	OBBA, MNRF SAR in Area	No	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	Yes	Current structure has the potential to provide nesting habitat. No nests were observed on the bridge underdeck in 2017 but this would not preclude usage of this site in the future.	No. If nests are found prior to construction, a Notice of Activity (NOA) registration under Section 23.5 of *Ontario Regulation 242/08* should be completed for the applicable bridge structure, and the associated mitigation measures should be implemented in accordance with the Regulation.
Riparia riparia	Bank Swallow	---	THR	S4B	OBBA	No	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence.	No	The Study Area does not have silt or sand deposits that would provide suitable nesting habitat for the species.	No. Suitable habitat is not found within the Study Area.
Dolichonyx oryzivorus	Bobolink	---	THR	S4B	OBBA, MNRF SAR in Area	No	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland > 50 ha.	No	The Study Area does not provide open county habitat > 50 ha required for this species.	No. Suitable habitat is not found within the Study Area.

Species		Status in Canada[1]	Status in Ontario[2]	S Rank[3]	Information Source[4]	Observed During Field Studies	Habitat Requirements [5,6,7]	Potential Habitat in Study Area	Rationale for Potential to Occur	Will Species and/or Habitat be Impacted by the Project (see Section 6.0 for Impacts)
Scientific Name	Common Name									
Sturnella magna	Eastern Meadowlark	---	THR	S4B	OBBA, MNRF SAR in Area	No	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas > 10 ha in size.	No	The Study Area does not provide open county habitat > 50 ha required for this species.	No. Suitable habitat is not found within the Study Area.
Hylocichla mustelina	Wood Thrush	---	SC	S4B	OBBA	No	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m.	Yes	The Study Area contains forest that would provide suitable habitat for this species.	No. Woodland removal will be limited to the forest edge and interior habitat will be unaffected by the proposed works.
Contopus virens	Eastern Wood-Pewee	---	SC	S4B	OBBA	No	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearing, edges; farm woodlots, parks.	Yes	The Study contains forest that would provide suitable habitat for this species.	Potential for impacts to the species if present in the area. Minimal potential for impacts if mitigation measures are implemented.
BUTTERFLIES AND MOTHS										
Danaus plexippus	Monarch	SC	SC	S2N,S4B	OBA, MNRF	No	Caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies prefer diverse habitats where they feed on nectar from wildflowers.	Yes	Occasional occurrence of Milkweed and low abundance of herbaceous flora were observed within the Study Area mixed meadow community, and as such, potential habitat is marginal and would not be considered candidate significant wildlife habitat.	No. The occasional occurrences of milkweed and low abundance of herbaceous flora within Study Area is marginal habitat for this species. Construction is not anticipated to impact the species or habitat Monarchs depend on to support their important life stages.
HERPTILES										
Chelydra serpentina	Snapping Turtle	SC	SC	S3	OHA, MNRF SAR in Area	Yes	Permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernate together in groups in mud under water; home range size ~28 ha.	Yes	The edge of the meadow community where it meets the creek outside of the construction zone could provide suitable habitat for turtle nesting. The depth of water and type of aquatic habitat (i.e., lack of pools) in the creek precludes turtle overwintering. The creek could also provide suitable movement and foraging habitat for this species. This species was observed during field investigation completed in 2017 for the Existing Conditions Report (**Appendix F**).	Potential for impact on the species if present in the area of construction and mitigation measures are not implemented.

Species		Status in Canada[1]	Status in Ontario[2]	S Rank[3]	Information Source[4]	Observed During Field Studies	Habitat Requirements [5,6,7]	Potential Habitat in Study Area	Rationale for Potential to Occur	Will Species and/or Habitat be Impacted by the Project (see Section 6.0 for Impacts)
Scientific Name	Common Name									
Thamnophis sauritus	Eastern Ribbonsnake (Great Lakes population)	SC	SC	S3	MNRF SAR in Area	No	Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows, grassy marshes or sphagnum bogs; borders of ponds, lakes or streams; hibernates in groups.	Yes	The shorelines and wetlands associated with Hawkesbury Creek could provide suitable movement and foraging habitat for this species. No potential snake hibernacula were observed.	Potential for impacts to the species if present in the area. Minimal potential for impacts if mitigation measures are implemented.
Emydoidea blandingii	Blanding's Turtle	THR	THR	S3	OHA, MNRF	No	Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation; basks on logs, stumps, or banks; surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats; hibernates in bogs; not readily observed.	No	No large, deep wetlands complexes, ponds or lakes were present in proximity to the Study Area.	No suitable habitat is not found within the Study Area.
Graptemys geographica	Northern Map Turtle	SC	SC	S3	MNRF SAR in Area, OHA	No	Inhabits rivers and lakeshores where it basks on emergent rocks and fallen trees throughout the spring and summer. Their habitat must contain suitable basking sites, such as rocks and deadheads, with an unobstructed view from which a turtle can drop immediately into the water if startled.	Yes	Emergent rocks and fallen trees within Hawkesbury Creek were not observed in the Study Area; however, the edge of the meadow community where it meets the creek outside of the construction zone could provide suitable habitat for turtle nesting. The depth of water and type of aquatic habitat (i.e., lack of pools) in the creek precludes turtle overwintering. The creek could also provide suitable movement and foraging habitat for this species.	Potential for impact on the species if present in the area of construction and mitigation measures are not implemented. Potential disturbance to suitable nesting habitat.
Apalone spinifera	Spiny Softshell	THR	END	S3	NHIC; MNRF SAR in Area	No	Spiny softshells are highly aquatic turtles that rarely travel far from water. They are found primarily in rivers and lakes but also in creeks and even ditches and ponds near rivers. Key habitat requirements are open sand or gravel nesting areas, shallow muddy or sandy areas to bury in, deep pools for hibernation, areas for basking, and suitable habitat for crayfish and other food species.	No	Suitable habitat (sandy bars and basking areas) was not present within the Study Area.	No suitable habitat is not found within the Study Area.

Species		Status in Canada[1]	Status in Ontario[2]	S Rank[3]	Information Source[4]	Observed During Field Studies	Habitat Requirements [5,6,7]	Potential Habitat in Study Area	Rationale for Potential to Occur	Will Species and/or Habitat be Impacted by the Project (see Section 6.0 for Impacts)
Scientific Name	Common Name									
PLANTS										
Juglans cinerea	Butternut	END	END	S3?	MNRF	Yes	Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges.	Yes	This species was observed within the deciduous forest communities present within the Study Area.	Potential for impacts to the species if present in the area. Minimal potential for impacts if mitigation measures are implemented.
MAMMALS										
Myotis leibii	Eastern Small-footed Myotis	---	END	S2S3	MWH	No	Roosts in caves, mine shafts, crevices or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings; hunts in forests.	Yes	The deciduous forest and woodland communities have the potential to support this species.	No. Bridge structures and woodland and forest communities within the area of impact did not have trees adequate for bat roosting.
Myotis lucifugus	Little Brown Myotis	END	END	S4	MWH	No	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges.	Yes	The deciduous forest and woodland communities have the potential to support this species.	No. Bridge structures and woodland and forest communities within the area of impact did not have trees adequate for bat roosting.
Myotis septentrionalis	Northern Myotis	END	END	S3	MWH	No	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, manmade structures but prefers hollow trees or under loose bark; hunts within forests, below canopy.	Yes	The deciduous forest and woodland communities have the potential to support this species.	No. Bridge structures and woodland and forest communities within the area of impact did not have trees adequate for bat roosting.
Pipistrellus subflavus	Tri-colored Bat	END	END	S3?	MWH	No	Can be found in a variety of forested habitats. They form day roosts and maternity colonies in older forest and occasionally in barns or other structures, and overwinter in caves. They forage over water and along streams in the forest.	Yes	The deciduous forest and woodland communities have the potential to support this species.	No. Bridge structures and woodland and forest communities within the area of impact did not have trees adequate for bat roosting.

5.0 Proposed Improvements

The proposed improvements shall consist of the replacement of the Hawkesbury Creek and CNR overhead (site 27-50) and the Highway 34 underpass structure (site 27-51).

The existing structure over Hawkesbury Creek is a three-span slab on variable depth reinforced concrete T beam bridge, oriented in the southeast-northwest direction, that was constructed in 1955. It supports four lanes of vehicular traffic (two in each direction) along County Road 17, with a clear roadway width of 15.35 m and two 0.48 m wide concrete barriers at the north and south for an overall bridge width of 16.31 m. The bridge spans over Hawkesbury Creek in the center span and over CNR tracks in the eastern span for an overall length equal to 56.69 m between centerline of abutment bearings (16.46 m, 23.77 m and 16.46 m). The bridge superstructure is supported by a reinforced concrete counterfort wall at the east abutment, five reinforced concrete columns at each pier and a buried reinforced concrete substructure at the west abutment. The selected configuration for the new Hawkesbury Creek & CNR Overhead is a 71.0 m long (38.0 m, 33.0 m spans) two-span slab-on-steel I-girder bridge using ASTM A1010 steel with modified semi-integral abutments supported by concrete caissons and a pier supported by a spread footing.

The existing Highway 34 underpass is a single-span cast-in-place reinforced concrete rigid frame bridge, oriented in the southeast-northwest direction that was constructed in 1955. It supports four lanes of vehicular traffic (two in each direction) along County Road 17 with a clear roadway width of 16.15 m and two 0.99 m wide curbs with parapet walls at the north and south for an overall bridge width of 18.14 m. The selected configuration for the new Highway 34 Overpass is a 36.0 m long single span slab-on-steel I-girder bridge using ASTM A1010 steel with modified semi-integral abutments supported by concrete caissons.

Two construction staging alternatives, conventional staged construction and lateral slide construction staging were proposed, with lateral slide being the recommended option. Lateral slide construction staging alternative is recommended so that the existing County Road 17 alignment is maintained. The preferred temporary staging areas to accommodate bridge replacement via the lateral slide construction staging alternative, are located on the north side and adjacent to the existing structure with the MTO ROW. Temporary supports will be installed in this area so that the new bridge superstructure can be constructed. To facilitate this, removal of existing vegetation within the project foot print will be required.

6.0 Assessment of Potential Impacts and Proposed Mitigation

6.1 Potential Impacts

This section summarizes the potential impacts to wildlife and vegetation that could result if mitigation measures are not implemented. Construction activities will be completed within the MTO ROW.

In general, the works associated with the replacement of the Hawkesbury Creek and CNR overhead and the Highway 34 underpass has the potential to:

- Increase erosion and sedimentation of lands adjacent to the construction area
- Potential indirect affects to non-retainable Butternut trees located outside of the vegetation removal area
- Removal of 0.19 ha of woodland, 0.55 ha of meadow and 0.004 ha of wetland habitat
- Increase vulnerability of areas cleared of vegetation to invasion by non-native species
- Result in a loss and/or disruption to wildlife and/or wildlife habitat. Potential examples include:
    - Temporary decrease in potential marginal migratory bird nesting habitat in areas cleared of woodland and meadow vegetation within the Study Area
    - Potential destruction of migratory bird nests, eggs or young in vegetated areas prior to and during construction (e.g., site preparation)
    - Temporary disruption to wildlife movement and wildlife avoidance of habitat areas adjacent to Hawkesbury Creek during replacement due to disturbance associated with construction activity
    - Harm or temporarily harassment of herptiles, which include SCC that could move along riparian habitat or in-water through the Study Area during construction (e.g., Snapping Turtle, Northern Map Turtle and Northern Ribbonsnake).

Potential impacts to wildlife species that incidentally occur in the Study Area can be minimized or avoided using standard erosion and sediment control measures, wildlife exclusionary fencing, and timing windows for vegetation removals to avoid sensitive wildlife periods, among others. Mitigation measures to avoid or minimize potential terrestrial natural environment features are detailed in **Table 5**. Overall, impacts to wildlife and natural features are expected to be minimal and temporary in duration if mitigation measures are implemented. As applicable, these measures are recommended for inclusion in the construction contract to mitigate potential impacts to the terrestrial ecosystem.

Table 5: Potential Impacts and Proposed Mitigation

I.D. #	Potential Impacts/Concerns	Potentially Concerned Agencies/Stakeholders	Mitigation/Protection/Monitoring

1. Natural Features and Vegetation	• Increased erosion and sedimentation of lands adjacent to the construction area
	• Removal of 0.19 ha of woodland, 0.55 ha of meadow and 0.004 ha of wetland habitat
	• Increased vulnerability of the areas cleared of vegetation to invasion by non-native species.
		MNRF, Conservation Authority, Municipality	Vegetation removal and/or trimming may be necessary to complete the two bridge replacements. No SAR or significant trees of concern will be impacted by the removals. Impacts to vegetation will be minimized by the following recommendations:
			• Minimize vegetation removal to the extent possible
			• Follow tree felling and grubbing procedures as outlined in OPSS 201, Construction Specification for Clearing, Close Cut Clearing, Grubbing
			• Areas temporarily cleared of vegetation to facilitate bridge construction should be stabilized (e.g., vegetated/seeded) prior to removal of erosion and sedimentation control measures
			  ○ Disturbed vegetated areas along Hawkesbury Creek should be re-vegetated to minimize invasion and colonization by non-native species and increase shade/cover for wildlife
			  ○ Develop and implement an erosion and sediment control (ESC) plan to mitigate impacts on riparian habitat. These measures should contain the construction area
			  ○ Minimize the disturbance of existing well-vegetated ditches and grassed slopes
			  ○ Protect undisturbed slopes and sensitive ditching with silt fence and temporary flow check dams. These measures should remain in place until exposed soils are stabilized
			  ○ Place erosion control blanket on 2:1 slopes where height warrants its use
			  ○ Place appropriately sized rip rap and geotextile at new and existing storm sewer outlets
			  ○ Erosion and sediment control measures shall be monitored regularly and/or after every 10 mm or greater rainfall event as they could require periodic cleaning, maintenance and/or re-construction. If deficiencies are found, they should be repaired and/or replaced promptly
			  ○ Grading, placement of topsoil and seeding specifications will be implemented to decrease erosion potential and promote suitable vegetation regeneration
			  ○ The site shall be stabilized prior to removal of erosion and sediment control measures
			• A dewatering plan (if applicable) should be prepared in accordance with environmental best management practices.

2. Wildlife and Wildlife Habitat	• Temporary disruption to wildlife movement and wildlife avoidance of habitat areas adjacent to the Hawkesbury Creek during replacement due to disturbance associated with construction activity • Harm or temporarily harass herptiles that could move along riparian habitat or in-water through the Study Area during construction.	MNRF, Conservation Authority, Municipality	• It is recommended that exclusion fencing be installed in select areas immediately adjacent to the work area at Hawkesbury Creek. The fencing could be combined with erosion and sediment control measures. Further details are described below (see *Species of Conservation Concern*) • If wildlife is encountered in the construction area, work should be temporarily suspended until the animal is out of harm's way • The Hawkesbury Creek and CNR overhead is in proximity to wetland units and aquatic habitat. However, there is low likelihood of occurrence of a reptile or amphibian in the construction zone given the exclusion fencing proposed. If reptiles and amphibians are persistently found in the construction zone, and allowing them to vacate in accordance with the wildlife encounter protocol described herein is found to delay construction activity, a Scientific Wildlife Collectors Permit under the *Fish and Wildlife Conservation Act*, 1997 could be sought by a qualified professional in order to complete wildlife salvages and transport these herptiles to an alternative habitat location. • If a turtle nest is encountered during construction, it is recommended that a qualified biologist extract the nest and transport the eggs to a suitable wildlife care facility such as a turtle trauma centre.
3. Migratory Nesting Birds	• Potential destruction of migratory bird nests, eggs or young in vegetated areas prior to and during construction (e.g., site preparation) • Temporary decrease in potential marginal migratory bird nesting habitat in areas cleared of woodland and meadow vegetation within the Study Area.	MNRF, Conservation Authority, Municipality	Birds are protected under the *Migratory Bird Convention Act* (MBCA). To protect birds and comply with the MBCA, the following measures shall be incorporated into the construction Contract: • Construction activities, including site preparation and vegetation removals, will be completed outside the breeding bird period (April 1 to August 31). Bird nest prevention/deterrent measures (e.g., tarping) should be installed prior to April 1 to prevent nesting and allow construction to occur during the restricted bird breeding period • Vegetation removal can occur during the restricted period if a qualified Avian Biologist conducts a nest search of the area prior to work commencing and determines that active nests are not observed in proximity to the work area. Should active nests be found, a buffer must be applied to the area around the nest until the young have left the nest. This could result in delays to the construction contract • If breeding birds and/or nests are encountered, works should not continue in the location of the nest until after August 31 or as soon as it has been determined that the young have fledged and left the nest.

I.D. #	Potential Impacts/Concerns	Potentially Concerned Agencies/Stakeholders	Mitigation/Protection/Monitoring
4. Species at Risk (Butternut)	• Potential indirect affects to non-retainable Butternut trees located outside of the vegetation removal area.	MNRF, Conservation Authority, Municipality	There is potential for one provincial SAR (i.e., Butternut) to be present within the Study Area and affected by the proposed project activities. To generally mitigate potential impacts on this species, a fact sheet and detection protocol for the species shall be provided to the contractor before project construction begins. To mitigate potential impacts on the species, the follow measures shall be implemented: • Confine work to the designated construction areas • Any SAR sightings should be reported to MNRF's NHIC • Butternut trees are to be retained in the Study Area
5. Species of Conservation Concern (Snapping Turtle, Northern Map Turtle, Eastern Wood-Pewee, Eastern Ribbonsnake)	• Harm or temporarily harass SCC herptiles that could move along riparian habitat or in-water through the Study Area during construction (e.g., Snapping Turtle, Northern Map Turtle and Northern Ribbonsnake). • Potential harm or temporary harassment of Snapping Turtle, which was observed within the Study Area. • Potential harm or temporary harassment to SCC birds (Eastern Wood-Pewee and Wood Thrush) in woodland areas in the Study Area.	MNRF, Conservation Authority, Municipality	There is potential for four SCC (i.e., Snapping Turtle, Northern Map Turtle, Eastern Wood-Pewee and Eastern Ribbonsnake) to be present within the Study Area and affected by the proposed project activities. To generally mitigate potential impacts on these species, a fact sheet and detection protocol for these species shall be provided to the contractor before project construction begins. To mitigate potential impacts on these species, the follow measures shall be implemented: • Confine work to the designated construction areas • Workers should be vigilant and check work areas and machinery for the presence of reptiles prior to each day of construction • Measures shall be put in place to prevent these species from entering construction areas. These measures shall include the installation of temporary fencing in proximity to the creek to exclude herptiles from the general construction area (**Figure 4**). The temporary fencing can be installed just prior to construction (in conjunction with installation of erosion control measures) and left in place during the turtle active season (April 15 – October 1). If construction begins after April 15, a wildlife sweep of the construction area is recommended prior to fence installation and construction to observe any herptile nests present in the area • Exclusion fences shall be included on contract drawings and specifications • It is recommended that the exclusion fencing installed for herptiles should follow guidelines set out on the MNRF's SAR Branch Best Practices Technical Note on Reptile and Amphibian Exclusion Fencing (MNRF 2013) in order to provide the most effective protective function and prevent mortality to herptiles • If these species are encountered in the construction area, work should be temporarily suspended until the animal is out of harm's way. If the species persists in the work area, a person qualified to handle herptiles should be contacted to relocate the animal • Follow mitigation measures for migratory nesting birds in #3 in this table above. Construction activities should be completed outside the breeding bird period (April 1 to August 31). Vegetation removal can occur during the restricted period if a qualified Avian Biologist conducts a nest search of the area prior to work commencing and determines that active nests are not observed in proximity to the work area. Should active nests be found, a buffer must be applied to the area around the nest until the young have left the nest. This could result in delays to the construction contract. If breeding birds and/or nests are encountered, works should not continue in the location of the nest until after August 31 or as soon as it has been determined that the young have fledged and left the nest.

7.0 Conclusion

The replacement of the Hawkesbury Creek and CNR overhead (site 27-50) and the Highway 34 underpass structure (site 27-51) have limited potential for impacts to the terrestrial natural environment. Wildlife and wildlife habitat disturbance impacts to natural features located in or near the Study Area are expected to be minimal and temporary in duration.

Based on the proposed bridge replacement designs, the construction works will require removal of meadow, wetland and woodland vegetation in the ROW; however, vegetation removals have been minimized to the extent possible and timing windows for vegetation clearing have been proposed to avoid sensitive wildlife periods. There is the potential for incidental occurrence of SCC species such as Snapping Turtle, Northern Map Turtle and Eastern Ribbonsnake during the construction period. This potential impact will be mitigated by installing terrestrial wildlife exclusion fencing in select locations to prevent turtle entry to and nesting within the construction area. Wildlife exclusion fencing will be specified on contract drawings.

There were no bird nest observations during the 2017 field investigations on the bridge structures proposed to be replaced and nesting in these areas is unlikely going forward; however, should the construction schedule be delayed until 2020 or later, re-survey of the structures is recommended to confirm they are unoccupied.

The mitigation measures proposed in this document will result in general avoidance or minimization of the potential impacts to terrestrial natural features including habitat of SAR, special concern species, migratory nesting birds, and other potential wildlife and wildlife habitat in proximity to the Study Area.

DILLON CONSULTING LIMITED
LONDON, ONTARIO

David Restivo, B.Sc. (Hons.), EP
Associate/Biologist/ISA Certified Arborist

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Appendix A

Figures

Ontario

MTO LARGE VALUE RETAINER - EAST REGION

ASSIGNEMENT No. 14 - HAWKESBURY

Project Location

FIGURE 1

- Project Location
- Railway
- Local Roads
- Arterial
- Highway
- Watercourse
- Waterbody

0 125 250 500 m

SCALE 1:15,015

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: LK/SFG
MAP CHECKED BY: DL/MB
MAP PROJECTION: NAD 1983 UTM Zone 18N

DILLON CONSULTING

PROJECT: 17-5180
STATUS: DRAFT
DATE: 5/9/2018

FILE LOCATION: G:\GIS\175180 MTO Large Value Retainer\mxd\Hawkesbury\TEAR\Figure 1 Study Area.mxd

Ontario

MTO LARGE VALUE RETAINER - EAST REGION

ASSIGNEMENT No. 5 - HAWKESBURY

Natural Heritage Features

FIGURE 2

- Railway
- Roads
- Watercourse
- Study Area
- Unevaluated Wetland
- Woodland

0 10 20 40 m

SCALE 1:1,500

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: LK
MAP CHECKED BY: JW
MAP PROJECTION: NAD 1983 UTM Zone 18N

DILLON CONSULTING

PROJECT: 17-5180

STATUS: DRAFT

DATE: 4/25/2018

FILE LOCATION: I:\GIS\175180 MTO Large Value Retainer\mxd\Hawkesbury\TEAR\Figure 2 Natural Heritage Features.mxd

Ontario

MTO LARGE VALUE RETAINER - EAST REGION

ASSIGNEMENT No. 5 - HAWKESBURY

TERRESTRIAL SITE INVESTIGATION RESULTS

FIGURE 3

- Butternut Locations
- Road
- Railway
- Watercourse
- Study Area

Ecological Land Classification

1. CVR_4: Rural Property
2. Gravel
3. FOD3-1: Dry-Fresh Poplar Deciduous Forest
4. FOD5: Dry-Fresh Sugar Maple Deciduous Forest
5. FOD5-2: Dry-Fresh Sugar Maple - Beech Deciduous Forest
6. FOD7-1: Fresh-Moist White Elm Lowland Deciduous Forest
7. FOD8-1: Fresh-Moist Poplar Deciduous Forest
8. MAM2-10: Mixed Forb Mineral Meadow Marsh
9. MAM2-2: Reed-Canary Grass Graminoid Mineral Meadow Marsh
10. MAS3-1: Cattail Organic Shallow Marsh
11. MEM: Mixed Meadow
12. MEMM4: Fresh-Moist Mixed Meadow Ecosite
13. SWD: Deciduous Swamp
14. SWT3-1: Speckled Alder Organic Deciduous Thicket Swamp
15. THD: Deciduous Thicket
16. THDM5: Fresh-Moist Deciduous Thicket
17. WOD: Deciduous Woodland
18. CVC_2: Light Industry
19. OAO: Open
20. CVC_1: Business Sector

0 10 20 40 m

SCALE 1:1,500

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: LK
MAP CHECKED BY: JW
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 17-5180
STATUS: DRAFT
DATE: 4/25/2018

FILE LOCATION: I:\GIS\175180 MTO Large Value Retainer\mxd\Hawkesbury\TEAR\Figure 3 Site Investigation Results.mxd

Ontario

MTO LARGE VALUE RETAINER - EAST REGION

ASSIGNEMENT No. 5 - HAWKESBURY

TERRESTRIAL CONSTRAINTS

FIGURE 4

- Direction of Flow
- Approximate Location of Wildlife Exclusion Fence
- Watercourse
- Candidate Turtle Nesting Habitat
- Study Area
- Construction Work Area
- Candidate Amphibian Breeding Habitat
- Road
- Railway
- Butternut Locations
- Woodlands
- Wetlands
- Open Aquatic

0 10 20 40 m

SCALE 1:1,500

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: LK/SG
MAP CHECKED BY: DL/MB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 17-5180

STATUS: DRAFT

DATE: 4/25/2018

FILE LOCATION: I:\GIS\175180 MTO Large Value Retainer\mxd\Hawkesbury\TEAR\Figure 4 Terrestrial Constraints.mxd

Appendix B

Photo Plate

Photograph 1 May 31, 2017 Mixed Meadow located in SE interchange facing NE	
Photograph 2 May 31, 2017 Mixed Meadow located in SE interchange facing SE	

Photograph 3 May 31, 2017 Mixed Meadow located south of Country Road 17	
Photograph 4 May 31, 2017 Fresh-Moist White Elm Lowland Deciduous Forest south of County Road 17	

Photograph 5 May 31, 2017 Butternut located within the Fresh-Moist White Elm Lowland Deciduous Forest south of County Road 17	
Photograph 6 May 31, 2017 Dry-Fresh Poplar Deciduous Forest south of County Road 17	

Photograph 7 May 31, 2017 Mixed Forb Mineral Meadow Marsh on SW extent of Study Area	
Photograph 8 May 31,2017 Deciduous Swamp on SW extent of Study Area	

Photograph 9 May 31, 2017 Dry-Fresh Sugar Maple - Beech Deciduous Forest located on SW extent of Study Area.	
Photograph 10 May 31, 2017 Butternut located within the Dry-Fresh Sugar Maple - Beech Deciduous Forest	

Photograph 11 May 31, 2017 Dry-Fresh Sugar Maple Deciduous Forest south of County Road 17	
Photograph 12 May 31, 2017 Fresh-Moist Deciduous Thicket south of County Road 17 with a dead Butternut in foreground	

Photograph 13 May 31, 2017 Mixed Meadow located NW of County Road 17	
Photograph 14 May 31, 2017 Fresh-Moist Poplar Deciduous Forest NW of County Road 17	

Photograph 15 May 31, 2017 Butternut located within the Fresh-Moist Poplar Deciduous Forest NW of County Road 17	
Photograph 16 May 31, 2017 Recently brushed section of Fresh-Moist Poplar Deciduous Forest NW of County Road 17 along hydro corridor	

Photograph 17 May 31, 2017 Speckled Alder Organic Deciduous Thicket Swamp and Cattail Organic Shallow Marsh on northern extent of the property.	
Photograph 18 May 31, 2017 Deciduous Thicket and Fresh-Moist Mixed Meadow adjacent to rail tracks on northern extent of the property	

Photograph 19 May 31, 2017 Mixed Meadow located north of County Road 17 within the NE interchange	
Photograph 20 May 31, 2017 Mixed Meadow located within the NE interchange	

Photograph 21 May 31, 2017 Underside of bridge deck western segment	
Photograph 22 May 31, 2017 Underside of bridge deck central segment	

Photograph 23 May 31, 2017 Underside of bridge deck eastern segment	
Photograph 24 May 31, 2017 Highway 34 underpass	

Appendix C

Species List

Table 1: Background Review Species List for Hawkesbury Bridge Replacements

Scientific Name	Common Name	Federal SARA Registry Status[1]	Ontario ESA Species at Risk List Status[2]	Provincial Conservation Rank (SRank)[3]	Information Source						
					NHIC	OBBA Square	Dobbyn et al. 1994	Ontario Herpetofaunal Atlas	Ontario Odonata Atlas	Butterfly Atlas	MNRF[4,5]
PLANTS/LICHENS											
Juglands cinerea	Butternut	END	END	S3?							•
BIRDS											
Asio flammeus	Short-eared Owl	SC	SC	S2N,S4B	•						•
Hylocichla mustelina	Wood Thrush	END	SC	S4B		•					
Contopus virens	Eastern Wood-pewee	SC	SC	S4B		•					
Ixobrychus exilis	Least Bittern	THR	THR	S4B							•
Ammodramus henslowii	Henslow's Sparrow	END	END	SHB							•
Hirundo rustica	Barn Swallow	THR	THR	S4B							•
Riparia riparia	Bank Swallow	THR	THR	S4B							•
Dolichonyx oryzivorus	Bobolink	THR	THR	S4B							•
Sturnella magna	Eastern Meadowlark	THR	THR	S4B							•
MAMMALS											
Myotis leibii	Eastern Small-footed Myotis	---	END	S2S3			•				
Myotis lucifugus	Little Brown Myotis	END	END	S4			•				

Scientific Name	Common Name	Federal SARA	Ontario ESA Species	Provincial Conservation	Information Source						
Myotis septentrionalis	Northern Myotis	END	END	S3			•				
Pipistrellus subflavus	Tri-colored Bat	END	END	S3?			•				
Canis latrans	Coyote	---	---	S5			•				
Vulpes vulpes	Red Fox	---	---	S5			•				
Castor canadensis	Beaver	---	---	S5			•				
Alces americanus	Moose	---	---	S5			•				
Odocoileus virginianus	White-tailed Deer	---	---	S5			•				
Clethrionomys gapperi	Southern Red-backed Vole	---	---	S5			•				
Microtus chrotorrhinus	Rock Vole	---	---	S4			•				
Microtus pennsylvanicus	Meadow Vole	---	---	S5			•				
Ondatra zibethicus	Muskrat	---	---	S5			•				
Peromyscus leucopus	White-footed Mouse	---	---	S5			•				
Peromyscus maniculatus	Deer Mouse	---	---	S5			•				
Napaeozapus insignis	Woodland Jumping Mouse	---	---	S5			•				
Zapus hudsonius	Meadow Jumping Mouse	---	---	S5			•				
Erethizon dorsatum	Porcupine	---	---	S5			•				
Lynx canadensis	Canada Lynx	---	---	S5			•				
Lynx rufus	Bobcat	---	---	S4			•				
Lepus americanus	Snowshoe Hare	---	---	S5			•				
Sylvilagus floridanus	Eastern Cottontail	---	---	S5			•				

Scientific Name	Common Name	Federal SARA	Ontario ESA Species	Provincial Conservation	Information Source						
Mephitis mephitis	Striped Skunk	---	---	S5			•				
Lontra canadensis	North American River Otter	---	---	S5			•				
Martes pennanti	Fisher	---	---	S5			•				
Mustela erminea	Ermine	---	---	S5			•				
Mustela frenata	Long-tailed Weasel	---	---	S4			•				
Mustela nivalis	Least Weasel	---	---	SU			•				
Mustela vison	American Mink	---	---	S4			•				
Procyon lotor	Northern Raccoon	---	---	S5			•				
Glaucomys volans	Southern Flying Squirrel	---	---	S4			•				
Marmota monax	Woodchuck	---	---	S5			•				
Sciurus carolinensis	Eastern Gray Squirrel	---	---	S5			•				
Tamias striatus	Eastern Chipmunk	---	---	S5			•				
Tamiasciurus hudsonicus	Red Squirrel	---	---	S5			•				
Blarina brevicauda	Northern Short-tailed Shrew	---	---	S5			•				
Sorex cinereus	Masked Shrew	---	---	S5			•				
Sorex fumeus	Smoky Shrew	---	---	S5			•				
Sorex hoyi	Pygmy Shrew	---	---	S4			•				
Sorex palustris	Water Shrew	---	---	S5			•				
Condylura cristata	Star-nosed Mole	---	---	S5			•				

Scientific Name	Common Name	Federal SARA	Ontario ESA Species	Provincial Conservation	Information Source						
Parascalops breweri	Hairy-tailed Mole	---	---	S4			•				
Ursus americanus	American Black Bear	---	---	S5			•				
Eptesicus fuscus	Big Brown Bat	---	---	S5			•				
Lasionycteris noctivagans	Silver-haired Bat	---	---	S4			•				
Lasiurus borealis	Eastern Red Bat	---	---	S4			•				
HERPTILES											
Chelydra serpentina	Snapping Turtle	SC	SC	S3				•			•
Thamnophis sauritus	Eastern Ribbonsnake (Great Lakes population)	SC	SC	S3				•			•
Graptemys geographica	Northern Map Turtle	SC	SC	S3				•			•
Emydoidea blandingii	Blanding's Turtle	THR	THR	S3				•			
Apalone spinifera	Spiny Softshell	THR	END	S3				•			
ODONATA											
Danaus plexippus	Monarch	SC	SC	S2N,S4B						•	•

* = identified as having Regulated Habitat within the Study Area

Table 3: Plant Species Observed within the Study Area during the 2017 Field Investigations

Scientific Name	Common Name	Federal SARA Registry Status[1]	Ontario ESA Species at Risk List Status[2]	Provincial Conservation Rank (SRank)[3]	Coefficient Conservation	Coefficient Wetness	Native
Acer negundo	Manitoba Maple	---	---	S5	0	-2	Y
Acer rubrum	Red Maple	---	---	S5	4	0	Y
Acer saccharum	Sugar Maple	---	---	S5	4	3	Y
Alnus glutinosa	European Alder	---	---	SNA	---	-2	N
Alnus incana	Speckled Alder	---	---	S5	6	-5	Y
Anemone canadensis	Canada Anemone	---	---	S5	3	-3	Y
Anthriscus sylvestris	Wild Chervil	---	---	SNA	---	5	N
Aralia nudicaulis	Wild Sarsaparilla	---	---	S5	4	3	Y
Arctium minus	Common Burdock	---	---	SNA	---	5	N
Carex intumescens	Bladder Sedge	---	---	S5	6	-4	Y
Cornus sericea ssp sericea	Red-osier Dogwood	---	---	S5	2	-3	Y
Daucus carota	Wild Carrot	---	---	SNA	---	5	N
Equisetum arvense	Field Horsetail	---	---	S5	0	0	Y
Frangula alnus	Glossy Buckthorn	---	---	SNA	---	-1	N
Fraxinus nigra	Black Ash	---	---	S4	7	-4	Y
Fraxinus pennsylvanica	Green Ash	---	---	S4	3	-3	Y
Hesperis matronalis	Dame's Rocket	---	---	SNA	---	5	N
Impatiens capensis	Spotted Jewelweed	---	---	S5	4	-3	Y
Juglans cinerea	Butternut	END	END	S3?	6	2	Y
Laportea canadensis	Wood Nettle	---	---	S5	6	-3	Y

Scientific Name	Common Name	Federal SARA Registry Status[1]	Ontario ESA Species at Risk List Status[2]	Provincial Conservation Rank (SRank)[3]	Coefficient Conservation	Coefficient Wetness	Native
Lonicera tatarica	Tartarian	---	---	SNA	---	3	N
Matteuccia struthiopteris	Ostrich Fern	---	---	S5	5	-3	Y
Onoclea sensibilis	Sensitive Fern	---	---	S5	4	-3	Y
Osmunda regalis	Royal Fern	---	---	S5	7	-5	Y
Osmundastrum	Cinnamon Fern	---	---	S5	7	-3	Y
Parthenocissus inserta	Thicket Creeper	---	---	S5	3	3	Y
Pastinaca sativa	Wild Parsnip	---	---	SNA	---	5	N
Phalaris arundinacea	Reed Canary Grass	---	---	S5	0	-4	Y
Populus nigra	Black Poplar	---	---	SNA	---	5	N
Populus tremuloides	Trembling Aspen	---	---	S5	2	0	Y
Prunus serotina	Wild Black Cherry	---	---	S5	3	3	Y
Pteridium aquilinum	Bracken Fern	---	---	S5	2	3	Y
Rhamnus cathartica	Common	---	---	SNA	---	3	N
Rhus hirta	Staghorn Sumac	---	---	S5	1	5	Y
Rubus allegheniensis	Alleghany	---	---	S5	2	2	Y
Rubus idaeus ssp. *idaeus*	Common Red	---	---	SNA	---	5	N
Rubus odoratus	Purple-flowering	---	---	S5	3	5	Y
Solanum dulcamara	Climbing	---	---	SNA	---	0	N
Solidago altissima ssp.	Eastern Late	---	---	S5	1	3	Y
Solidago flexicaulis	Zigzag Goldenrod	---	---	S5	6	3	Y
Syringa vulgaris	Common Lilac	---	---	SNA	---	5	N
Tilia americana	American	---	---	S5	4	3	Y

Scientific Name	Common Name	Federal SARA Registry Status[1]	Ontario ESA Species at Risk List Status[2]	Provincial Conservation Rank (SRank)[3]	Coefficient Conservation	Coefficient Wetness	Native
Trifolium pratense	Red Clover	---	---	SNA	---	2	N
Trifolium repens	White Clover	---	---	SNA	---	2	N
Typha angustifolia	Narrow-leaved	---	---	SNA	3	-5	N
Ulmus americana	American Elm	---	---	S5	3	-2	Y
Viburnum lentago	Nannyberry	---	---	S5	4	-1	Y
Vitis riparia	Riverbank Grape	---	---	S5	0	-2	Y

Nomenclature According to Newmaster et al (1998)[2]Species at Risk Act; [3]Endangered Species Act; [4]SRank Code – S5 = Secure Population, S4 = Apparently Secure Population, SE = Exotic/Non-native Species, SNA = species not suitable for conservation activities (vagrants, non-natives), SU = insufficient data

Overview of Codes for the Conservation Status of Species

Federal Conservation Status

Federal Status: Status assigned by the Committee on the Status of Endangered Wildlife in Canada. (COSEWIC, 2007) and listed under the *Species at Risk Act*

EXT Extinct. A wildlife species that no longer exists.
EXP Extirpated. A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
END Endangered. A wildlife species facing imminent extirpation or extinction.
THR Threatened. A wildlife species likely to become endangered if limiting factors are not reversed.
SC Special Concern. A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
DD Data Deficient - A wildlife species for which there is inadequate information to make a direct, or indirect, assessment of its risk of extinction.
NAR Not At Risk. A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

Provincial Conservation Status

Provincial Status: Status assigned by the Ontario Ministry of Natural Resources (OMNR, 2006) under the *Endangered Species Act, 2007*

EXT Extinct. A species that no longer exists anywhere.
EXP Extirpated. A species that no longer exists in the wild in Ontario but still occurs elsewhere.
END Endangered. A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's ESA.
THR Threatened. A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
SC Special Concern. A species with characteristics that make it sensitive to human activities or natural events.
DD Data Deficient. A species for which there is insufficient information for a provincial status recommendation.
NAR Not At Risk. A species that is currently not listed as risk.

Provincial (S) Rank

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (2007) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation needs can be ascertained. The NHIC

evaluates provincial ranks on a continual basis and produces updated lists at least annually.

S1 Extremely rare in Ontario; usually 5 or fewer occurrences in the province or very few remaining individuals; often especially vulnerable to extirpation.

S2 Very rare in Ontario; usually between 5 and 20 occurrences in the province or with many individuals in fewer occurrences; often susceptible to extirpation.

S3 Rare to uncommon in Ontario; usually between 20 & 100 occurrences in the province; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances. Most species with an S3 rank are assigned to the watch list, unless they have a relatively high global rank.

S4 Common and apparently secure in Ontario; usually with more than 100 occurrences in the province.

S5 Very common and demonstrably secure in Ontario.

SH Historically known from Ontario, but not verified recently (typically not recorded in the province in the last 20 years); however suitable habitat is thought to be still present in the province and there is reasonable expectation that the species may be rediscovered.

SR Reported for Ontario, but without persuasive documentation which would provide a basis for either accepting or rejecting the report.

SRF Reported falsely from Ontario.

SX Apparently extirpated from Ontario, with little likelihood of rediscovery. Typically not seen in the province for many decades, despite searches at known historic sites.

SE Exotic; not believed to be a native component of Ontario's flora.

S? Not Ranked Yet, or if following a ranking, Rank Uncertain (e.g. S3?). S? Species have not had a rank assigned.

SU Unrankable, often because of low search effort or cryptic nature of the species, there is insufficient information available to assign a more accurate rank; more data is needed.

Coefficient of Conservatism (CC) Definition (Plants)

Each native taxon was assigned a rank of 0 to 10 ("coefficient of conservatism") based on its degree of fidelity to a range of synecological parameters. Plants found in a wide variety of plant communities, including disturbed sites, were assigned ranks of 0 to 3. Taxa that typically are associated with a specific plant community, but tolerate moderate disturbance, were assigned ranks of 4 to 6. Rankings of 7 to 8 were applied to those taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance. Those plants with high degrees of fidelity to a narrow range of synecological parameters were assigned a value of 9 to 10

Wetness Index (CW) (Plants)

The wetness index gives an indication of were plant species are typically found. A wetness value (coefficient of wetness) between -5 and 5. A value of -5 was assigned to

Obligate Wetland (OBL) species and a value of 5 to Obligate Upland species (UPL), with intermediate values assigned to the remaining categories. The wetland categories and their corresponding values are as follows:

These categories are defined as follows:

OBL	-5	OBL Wetland	Obligate	Occurs almost always in wetlands under natural conditions (estimated > 99% probability).
FACW+	-4	FACW	Facultative Wetland	Usually occurs in wetlands, but occasionally found in non-wetlands (estimated 67-99% probability).
FACW	-3			
FACW-	-2			
FAC +	-1	FAC	Facultative	Equally likely to occur in wetlands or non-wetlands (estimated 34-66% probability).
FAC	0			
FAC-	1			
FACU+	2	FACU	Facultative Upland	Occasionally occurs in wetlands, but usually occurs in non-wetlands (estimated 1-33 % probability).
FACU	3			
FACU-	4			
UPL	5	UPL	Obligate Upland	Occurs almost never in wetlands under natural conditions (estimated <1 % probability).

Appendix D

Field Sheets

Hawksbury Interchange
staff Mike Wolosinecky
Date - May 31st, 2017
conditions → sunny with clouds, Temp 13°C
CC 50%, wind 1-2, percip- over night rain, -

ELC already completed just confirm

Wildlife
AMCR
SOSP
COYE
RWBB
WAVI
YEWA
YBFC
MAWA
CHSP
EAPH
GRCB
AMGO
NOFL
BAOR
REVI

Plant list
goldenrod sp, common burdock
wild parsnip, reed canary grass
wild carrot, Touch-me-not
common buckthorn, Red clover
staghorn sumac, white clover
canada anemone, tartarian honeysuckle
Riverbank grape
sensative fern, nanny berry
Red maple, Black ash
cottonwood sp., Bracken fern
purple flowering raspberry,
red raspberry, Field horsetail
Trembling aspen, Royal Fern
virginia creeper, cinnamon
wild cirvel Fern
American Elm. Bladder sedge
green ash, p False solomons seal
manitoba maple, glossy buckthorn
sugar maple, American Basswood
Ostrich Fern, wild sarsaspharilla
Black alder, zig-zag goldenrod
Dames Rocket.
~~False~~ nettle
wood
Red osier dogwood

P# 223-228 From other side.

Notes
wp 1591 p# 186-188
mixed meadow in interchange
wp 1592 p# 189-190
Edge of Roadway
p# 191-197 underside of bridge no nests apparent
wp 1593 - 198-199
forest at edge of Roadway
wp 1594 p# 200-202
~~Forest~~ area
wp 1595 - potential dead butternut 203-205
have to tell due to extensive decay
wp 1596 206-209
Forested area.
wp 1597 p# 2010-2012
Butternut tree, Dead
DBH 23.5cm
wp 1598, p# 2013-2015
Butternut, Dead
DBH 28.1cm.
p# 216-210 Area
Adjacent to Butternut trees
wp 1599, p# 220-222
Butternut, Dead DBH 17.5

Hawksbury notes
cont'd

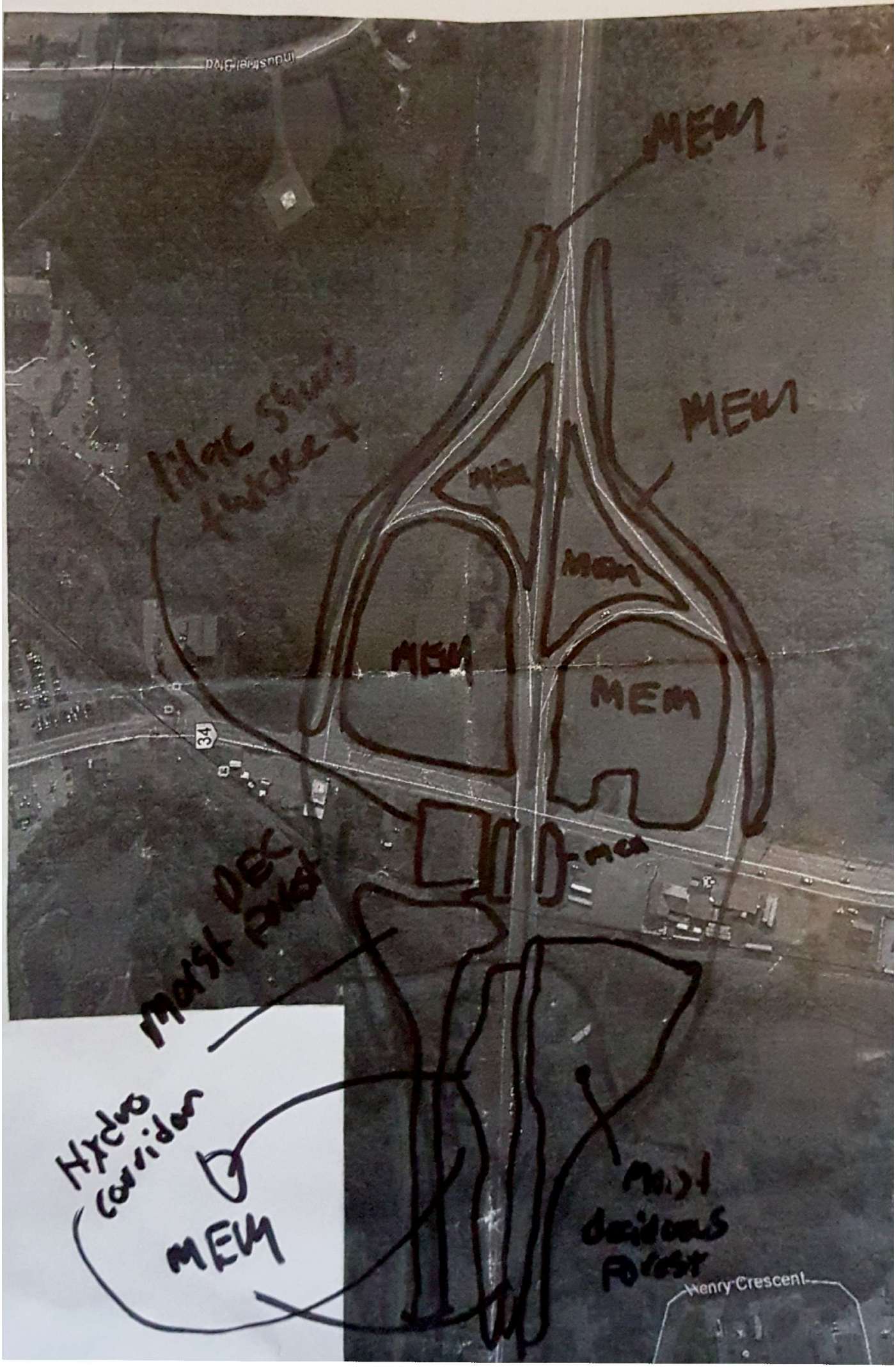
wp 1600 p# 229, 231 Butternut
Real., DBH 25.1

wp 1601, p# 232-235
4 photos From edge of Roadway
wp 1602 p# 236-238 · general site photo
wp 1603 p# 239-242 - Forest at
Edge of Hydro Corridor, popla- dominat
moist Forest
wp 1604 p# 243-246 - example of
forest between Hydro Corridor and
Rail tracks.

1605 p# 247-250, Butternut
DBH 34.5 condition - moderate
decline 25 precent loss of crown
die back of smaller branches.

wp 1606 p# 251-253, Butternut
DBH 25.3 condition moderate decline
loss of 30-40 percent of crown, die back
of smaller limbs. canker present.

wp 1607 p# 254-255 photo From bridge
wp 1608 p# 257-259 general site photo
wp 1609 p# 262-265, MEM located
within the interchange areas
wp 1610 p# 266-269, MEM located
within interchange areas.



Appendix E

MNRF Correspondence

DILLON
CONSULTING

51 Breithaupt Street
Suite 200
Kitchener, Ontario
Canada
N2H 5G5
Telephone
519.571.9833
Fax
519.571.7424

May 10, 2017

Ministry of Natural Resources and Forestry – Kemptville District
10 Campus Drive
PO Box 2002
Kemptville, Ontario
K0G 1J0

Ministry of Transportation, Ontario
Bridge and Highway Design and Construction Administration – Highway 417/CR 34 (Assignment #02, Site 31-453/C, GWP 4260-15-00); Raisin River/Finney Creek (Assignment #04, Site 31-321/1, Site 31-321/2, Site 31-260/C, GWP 4013-11-00); Hawkesbury (Assignment #05, Site 27-50, Site 27-51, GWP 4016-E-0012)

MNRF Kemptville District Office:

The Ministry of Transportation, Ontario (MTO) has retained Dillon Consulting Limited to complete two assignments:

- Assignment #02: Highway 417/CR 34 in the Township of North Glengarry;
- Assignment #04: Raisin River/Finney Creek in the Township of South Glengarry, in the County of Stormont, Dundas and Glengarry; and
- Assignment #05: Hawkesbury Creek/CNR and the Highway 34 Overpass on Highway 17, in the Township of Prescott and Russell.

The Highway 417/CR 34 assignment is for the removal and replacement of the existing rigid concrete pavement in the west bound lanes of Highway 417 from approximately 7.0 km east of Highway 34 to 5.0 km west of Highway 34, as well as Detail Design and consultation for the Highway 34 eastbound ramp terminal, drainage, and structural culvert improvements (**Attachment 1**). The Raisin River/Finney Creek assignment is for the Preliminary and Detail Design for the replacement of two Raisin River Overpass sites on Highway 401, approximately 750m west of the Highway 2/34 Underpass, and the Preliminary Design for the rehabilitation of the Finney Creek Culvert on Highway 401 (**Attachment 2**). The proposed work forms part of a larger MTO work program for Bridge and Highway Engineering Design and Construction Administration services. The Hawkesbury Creek assignment is for the replacement of two structures including the CNR and Hawkesbury Creek overhead on Country Road 17, just west of Highway 34, and also the Highway 34 underpass at Country Road 17 (**Attachment 3**).

In accordance with Step 2 of the MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Highway Undertakings (Version 3, 2016), this letter is to provide notification to the Ministry of Natural Resources and Forestry of the proposed highway and bridge projects and request that the MNRF complete the attached tables (**Attachment 4**) to provide information on the fish community, including aquatic Species at Risk (SAR) and habitat given that proposed project works may occur within 30 m of mapped waterbodies.

In addition, we request that the MNRF provides the following terrestrial information from within the assignment study areas:

- Information regarding species protected under the provincial Endangered Species Act, 2007;
- ESAs/ANSIs;
- Wetland evaluation records for wetlands in proximity to the proposed Study Area(s);
- Timing considerations/windows to consider when undertaking work in these areas;
- Regionally or locally significant/rare flora, fauna, vegetation communities; and,
- Any additional natural environment data for the area, if applicable.

We look forward to MNRF's response to our request within 30 working days, as specified in the Protocol.

Yours sincerely,

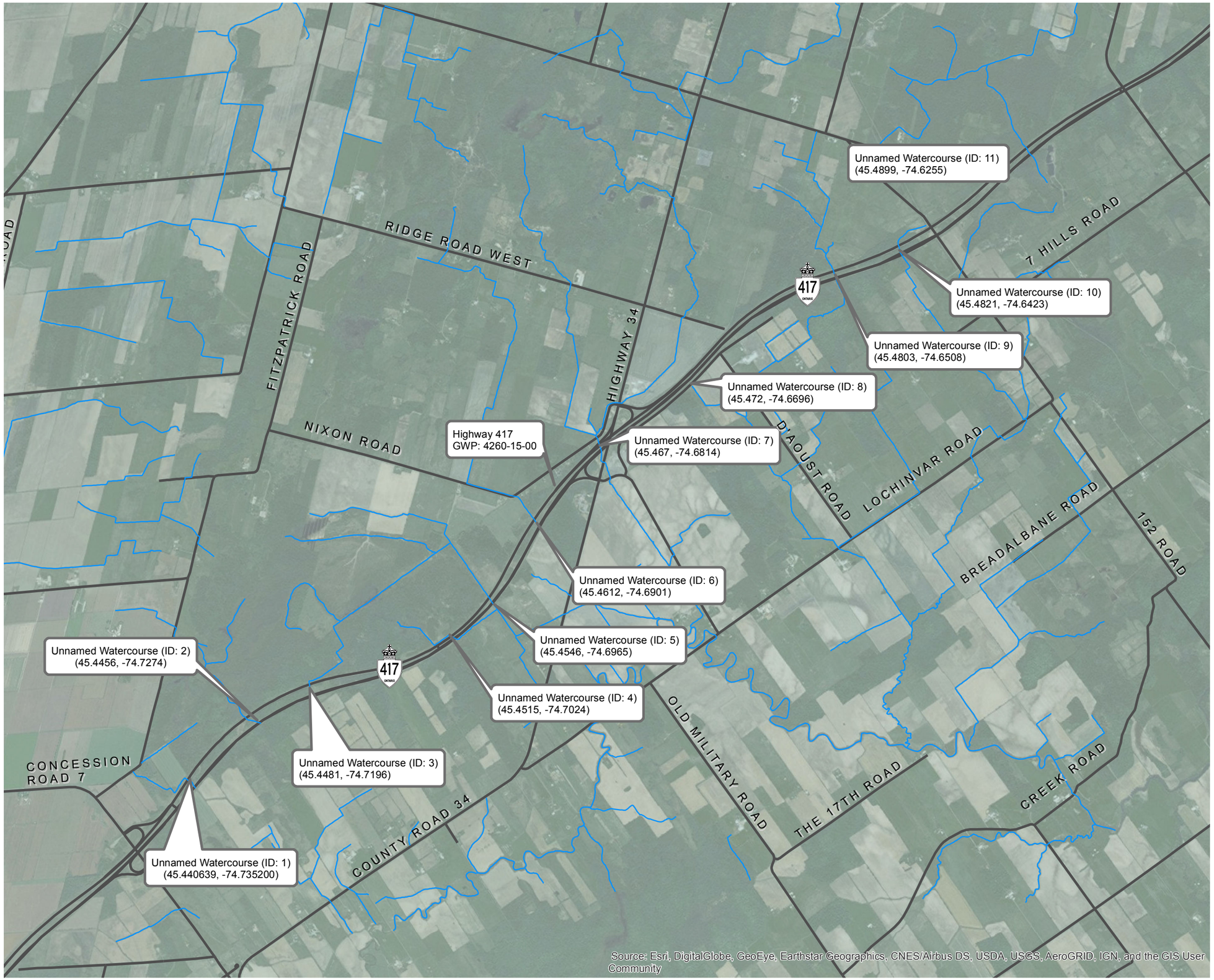
DILLON CONSULTING LIMITED

Daniel Knee, Fisheries Assessment Specialist
for John Gawley, P.Eng.
Project Manager

DK:khr
Enclosures

Our file: 17-5180

Attachment 1



Ontario

Ministry of Transportation, Ontario

Highway and Bridge Design Services on Retainer
Agreement No: 4016-E-0012/0013

Assignment 2: Highway 417
Study Area

Legend

- Watercourse
- Road

0 0.5 1 2 Kilometers

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

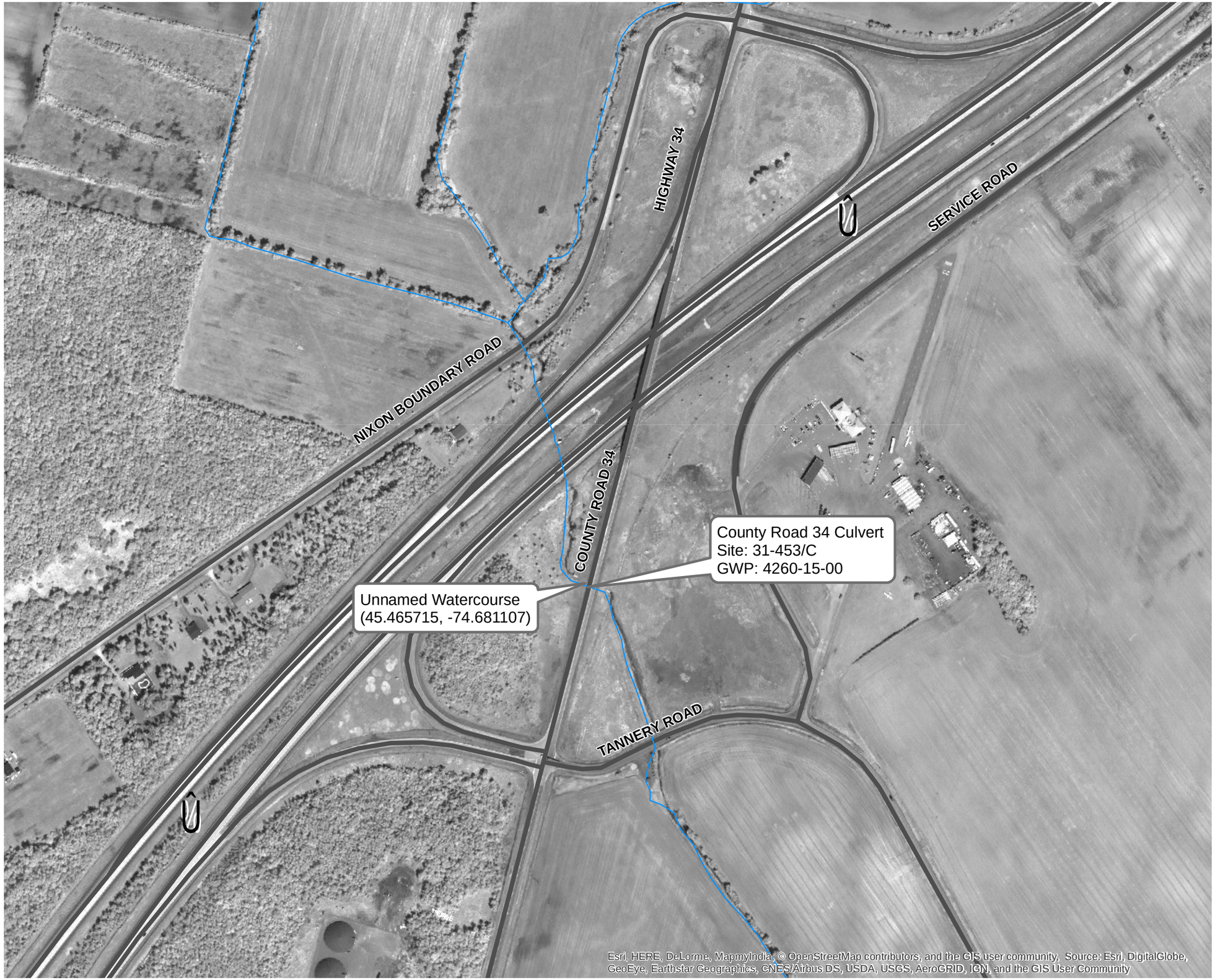
MAP CREATED BY: MMS
MAP CHECKED BY: AMB
MAP PROJECTION: NAD 1983 UTM Zone 17N

N W E S

DILLON CONSULTING

PROJECT: 17-5180

DATE: 04/28/17



Ontario

Ministry of Transportation, Ontario

Highway and Bridge Design Services on Retainer
Agreement No: 4016-E-0012/0013

Assignment 2: Highway 417 and Highway 34
Study Area

Legend

- Watercourse
- Road

0 50 100 200 Meters

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: MMS
MAP CHECKED BY: AMB
MAP PROJECTION: NAD 1983 UTM Zone 17N

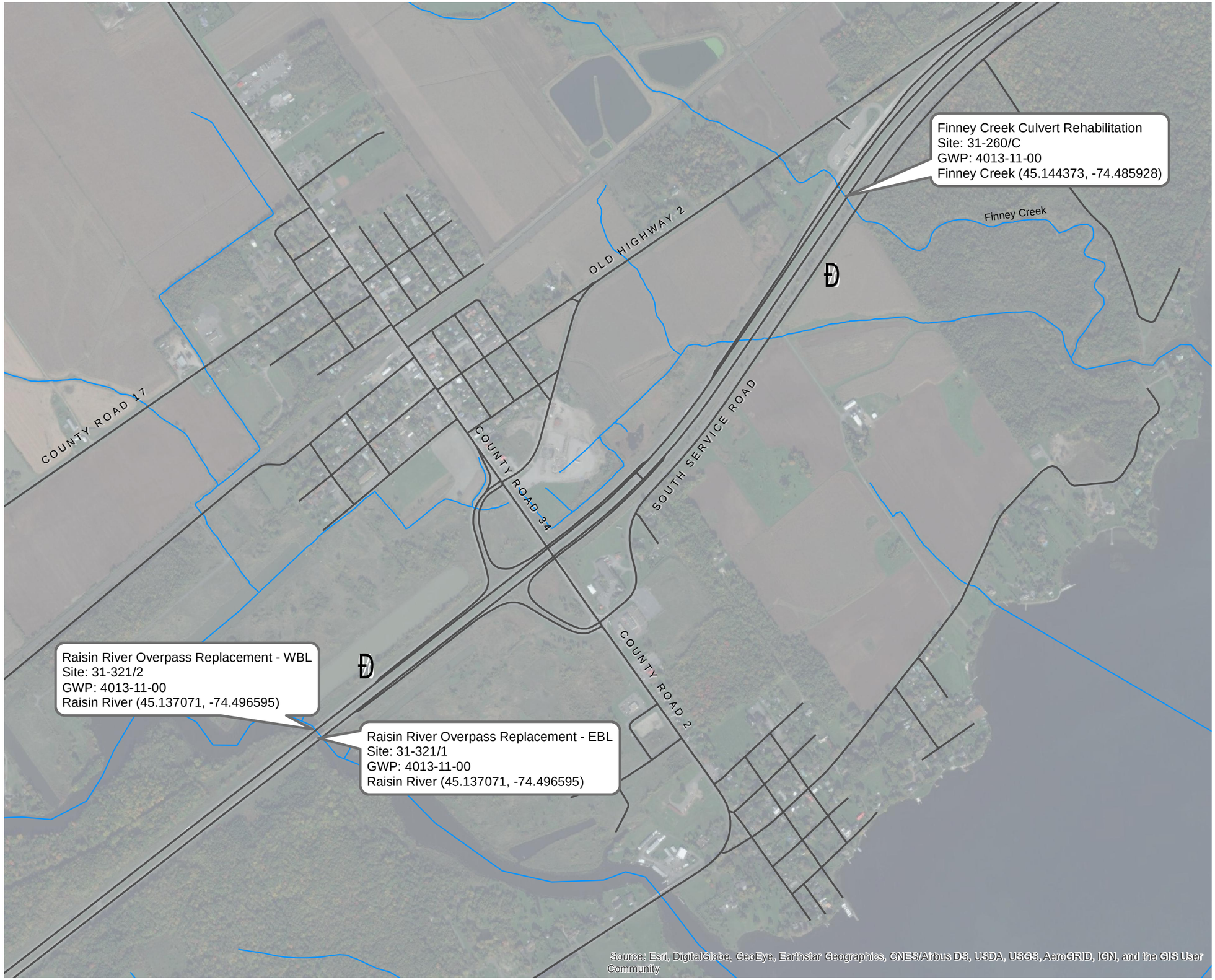
2

DILLON CONSULTING

PROJECT: 17-5180

DATE: 04/24/17

Attachment 2



Ontario

Ministry of Transportation, Ontario

Highway and Bridge Design Services on Retainer Agreement No. 4016-E-0012

Assignment 4: Raisin River Bridge and Finney Creek Culvert

Study Area

Legend

- Watercourse
- Road

0 50 100 200 Meters

2

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: MMS
MAP CHECKED BY: KR
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 17-5180

DATE: 04/24/17

Attachment 3

Ontario

Ministry of Transportation, Ontario

Highway and Bridge Design Services on Retainer Agreement No. 4016-E-0012

Assignment 5: Hawkesbury Creek and Tributary of Hawkesbury Creek Culverts on County Road 17

Study Area

Legend

- Watercourse
- Road

0 25 50 100 Meters

2

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: MMS
MAP CHECKED BY: KR
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 17-5180

DATE: 04/24/17

Attachment 4

Waterbody Name and location (GPS coordinates)	**Watercourse classification (i.e., warmwater, coldwater)**	**Habitat information/ locations (fish passage barriers, known spawning habitats, etc.)**	**Historical data on fish species present, including whether the subject waterbody is considered to support any vulnerable, threatened or endangered aquatic species**	**MNR fisheries management objectives, if applicable**	**MNR interpretation of fish and fish habitat sensitivity (scale of high, moderate, low or unknown as per DFO's Risk Management Framework**	**In-water timing windows for construction**
Unnamed Watercourse (ID: 1) (45.440639, -74.735200)						
Unnamed Watercourse (ID: 2) (45.4456, -74.7274)						

Unnamed Watercourse (ID: 3) (45.4481, -74.7196)						
Unnamed Watercourse (ID: 4) (45.4515, -74.7024)						
Unnamed Watercourse (ID: 5) (45.4546, -74.6965)						
Unnamed Watercourse (ID: 6) (45.4612, -74.6901)						

Unnamed Watercourse (ID: 7) (45.467, -74.6814)						
Unnamed Watercourse (ID: 8) (45.472, -74.6696)						
Unnamed Watercourse (ID: 9) (45.4803, -74.6508)						
Unnamed Watercourse (ID: 10) (45.4821, -74.6423)						

Unnamed Watercourse (ID: 11) (45.4899, -74.6255)						

Waterbody Name and location (GPS coordinates)	**Watercourse classification (i.e., warmwater, coldwater)**	**Habitat information/ locations (fish passage barriers, known spawning habitats, etc.)**	**Historical data on fish species present, including whether the subject waterbody is considered to support any vulnerable, threatened or endangered aquatic species**	**MNR fisheries management objectives, if applicable**	**MNR interpretation of fish and fish habitat sensitivity (scale of high, moderate, low or unknown as per DFO's Risk Management Framework**	**In-water timing windows for construction**
Unnamed Watercourse (45.465715, -74.681107)						

Waterbody Name and location (GPS coordinates)	**Watercourse classification (i.e., warmwater, coldwater)**	**Habitat information/ locations (fish passage barriers, known spawning habitats, etc.)**	**Historical data on fish species present, including whether the subject waterbody is considered to support any vulnerable, threatened or endangered aquatic species**	**MNR fisheries management objectives, if applicable**	**MNR interpretation of fish and fish habitat sensitivity (scale of high, moderate, low or unknown as per DFO's Risk Management Framework**	**In-water timing windows for construction**
Finney Creek (45.144373, -74.485928)						
Raisin River (45.137071, -74.496595)						

Ministry of Transportation, Ontario
Bridge and Highway Design and Construction Administration
Hawkesbury Creek/Tributary of Hawkesbury Creek (Assignment #05, WP 4203-15-00)

Waterbody Name and location (GPS coordinates)	**Watercourse classification (i.e., warmwater, coldwater)**	**Habitat information/ locations (fish passage barriers, known spawning habitats, etc.)**	**Historical data on fish species present, including whether the subject waterbody is considered to support any vulnerable, threatened or endangered aquatic species**	**MNR fisheries management objectives, if applicable**	**MNR interpretation of fish and fish habitat sensitivity (scale of high, moderate, low or unknown as per DFO's Risk Management Framework**	**In-water timing windows for construction**
Hawkesbury Creek (45.596482, -74.621644)						
Tributary to Hawkesbury Creek (45.596994, -74.619822)						

Appendix F

Existing Conditions Report

MMM GROUP

Prepared for: Ontario Ministry of Transportation

TERRESTRIAL ECOSYSTEM EXISTING CONDITIONSREPORT

MEGA 6 BRIDGES

HAWKESBURY CREEK - CNR OVERHEAD (SN. 27-50) & HIGHWAY 34 UNDERPASS AT COUNTY ROAD 17 (SN. 27-51)

W.P. 4098-13-01 | February 2017

WSP | MMM GROUP

Terrestrial Ecosystem Existing Conditions Report

Mega 6 Bridges

Hawkesbury Creek - CNR Overhead (Site No. 27-50) &
Highway 34 Underpass at County Road 17 (Site No. 27-51)

W.P. 4098-13-01

February 2017

Prepared for Ministry of Transportation

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Appendix B: Species of Conservation Concern Screening Table

1.0 INTRODUCTION

The Ministry of Transportation (MTO) retained MMM Group Limited (MMM), a subsidiary of WSP Global, to undertake the preliminary design for the replacement of Hawkesbury Creek & CNR Overhead (Site No. 27-50) and Highway 34 Underpass at County Road 17 (Site No. 27-51) in the County of Prescott and Russell. Refer to Figure 1 for site location.

The existing bridges are contiguous to one another and occur within an area of commercial, residential and open space land use. These bridges convey County Road 17 traffic over Highway 34, Hawkesbury Creek and the CNR track, just west of the Town of Hawkesbury, in a general east to west direction.

The Hawkesbury Creek – CNR structure is a 3-span slab on reinforced cast-in-place concrete T-beam. The bridge is approximately 57 m long and 16 m wide. Constructed in 1955, the bridge received its last rehabilitation in 1997.

The Highway 34 Underpass at County Road 17 is located approximately 50 m east of the Hawkesbury Creek – CNR bridge. The structure is a single span reinforced slab with a length of 17.98 m. Constructed in 1954, the bridge has had numerous rehabilitations with the last having been carried out in 2007.

This report documents the terrestrial ecosystem existing conditions in the vicinity of these two structures. The results of the vegetation and wildlife data collection and analysis are presented herein.

2.0 BACKGROUND INFORMATION

Two sources were used to provide background information on environmentally significant species and designated natural areas in the vicinity of the site. The Ministry of Natural Resources and Forestry (MNRF) in Kemptville District was contacted on June 2, 2015 for information on species at risk (SAR) and provincially designated natural areas. Species at risk are species designated under the provincial Endangered Species Act, 2007 (ESA) or under the federal Species at Risk Act (SARA) as either Extirpated, Endangered, Threatened or Special Concern depending on level of risk. Examples of provincially designated natural areas are: Area of Natural and Scientific Interest, Provincially Significant Wetland, Environmentally Significant Area, Provincial Park and Conservation Area. MNRF's Natural Heritage Information Centre (NHIC) online database was searched for records of designated natural areas and species of conservation concern within one kilometre of the structure. Species of conservation concern (SCC) are SAR and provincially rare species. Species ranked by the NHIC as S1, S2 or S3 are considered provincially rare.

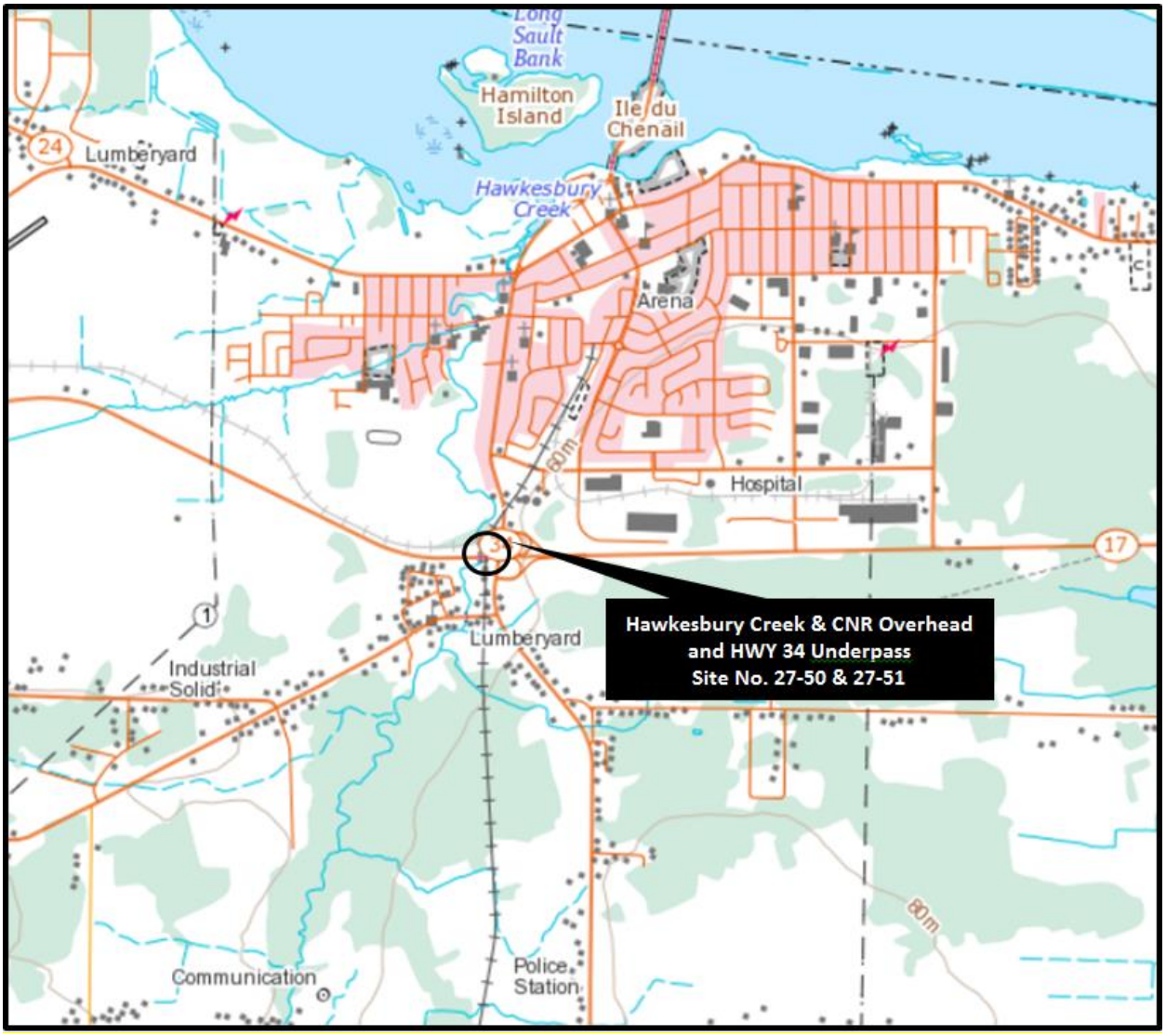

Figure 1: Site Location

MNRF responded on August 6, 2015 (Appendix A). They indicated that no SAR were known for the vicinity of the bridge but that there are significant woodlands and unevaluated wetlands nearby. The site locations do not fall within the jurisdiction of a Conservation Authority. The NHIC online database contains a record for one SAR, spiny softshell (*Apalone spinifera*) and no provincially rare species or designated natural areas.

3.0 METHODS

Prior to the site visit, preliminary vegetation communities were delineated using air photo interpretation. Field investigations were conducted on June 8, 2015 and included classification of vegetation communities defined using the Ecological Land Classification (ELC) for Southern Ontario: First Approximation (Lee et al., 1998) with 2008 code updates (Lee, 2008) for communities which could not be well described by the first approximation codes (as per recent ELC guidelines). Investigations also included a search for wildlife, wildlife habitat and evidence of wildlife (e.g. tracks, scat, dens). Efforts were made to identify plant and wildlife SAR while in the field, and to search for migratory bird nests on the structures and adjacent to the structures.

4.0 EXISTING CONDITIONS

4.1 Physiography and Geology

The Hawkesbury Creek - CNR bridge and Highway 34 Underpass at County Road 17 sites are found within the Russell and Prescott Sand Plains physiographic region (Chapman and Putnam 1984). This region is characterized by a group of large sand plains separated by clays of the lower Ottawa Valley. The site is located at the interface of a sand plains physiographic landform to the west of Highway 34 and a till plains physiographic landform to the east. The surficial deposits are very shallow over exposed Paleozoic bedrock (OGS, 2010) of the Rockcliffe Formation consisting of middle Ordovician limestone, dolostone, shale, arkose and sandstone (OGS, 2011).

4.2 Vegetation

The sites occur in the Upper St. Lawrence Forest Region. The area lies in a lowland through which the waters of the Great Lakes system drain. It is a transitional zone between the southern deciduous forests of eastern North America and mixed deciduous-conifer forest. In this region the dominant forest cover is composed of Sugar Maple and Beech with Red Maple, Yellow Birch, Basswood, White Ash, Largetooth Aspen, and Red and Bur Oaks. Local occurrences of White Oak, Red Ash, Grey Birch, Rock Elm, Blue-Beech, and Bitternut Hickory can also be found. In settled areas American Elm is particularly common. Butternut, Eastern Cottonwood, and Slippery Elm can be found sporadically in river valleys. Poorly-drained areas frequently contain hardwood swamps dominated by Black Ash. In general, broadleaved forests can be found in areas with deep calcareous soils, while conifers are more dominant on shallow, acid or eroding materials. Common coniferous species include Eastern Hemlock, Eastern White Pine,

White Spruce and Balsam Fir. Stands of eastern White Pine and Red Pine can be found on coarse textured soils. Wetter sites may contain Black Spruce and Eastern White Cedar. Eastern White Cedar is also found on dry, rocky and stony sites. Extensive settlement and clearing has taken place over much of this forest region (Rowe, 1972).

The site also occurs in Ecodistrict 6E-16 in Ecoregion 6E (Lake Simcoe Rideau). This ecoregion extends from Lake Huron in the west to the Ottawa River in the east.

The study area is surrounded by low density residential and commercial land associated with the town of Hawkesbury. The southeast quadrant of the CNR overhead contains a large, paved lot with a farm road access to the riparian forested areas and a wooden watercourse crossing structure. Refuse piles occur along this access road.

Details of the vegetation communities are provided below and shown in Figure 2. Please note that GPS points shown on Figure 2 have an accuracy of ± 3-8 m.

Upland Communities

Fresh-Moist White Elm Lowland Deciduous Forest Type (FOD7-1)

Located southwest of the Hawkesbury Creek structure along the riverbanks of Hawkesbury creek this vegetation type was dominated by a canopy dominated by White Elm (*Ulmus americana*) and Manitoba Maple (*Acer negundo*), with occasional Hybrid Poplar (*Populus x canadensis*) and Black Cherry (*Prunus serotina*), and sparse Trembling Aspen (*Populus tremuloides*) and Black Ash (*Fraxinus nigra*). The dense subcanopy was abundant with Common Buckthorn (*Rhamnus cathartica*) with occasional young Trembling Aspen. The moderately dense shrub layer is abundant with Black Cherry saplings, and occasional Red Raspberry (*Rubus idaeaus*), Riverbank Grape (*Vitis riparia*), Sugar Maple (*Acer saccharum*) saplings, Honeysuckles (*Lonicera sp.*), and Alternate-leaved Dogwood (*Cornus alternifolia*). The ground layer is moderately dense, containing occasional abundant Thicket Creeper (*Parthenocissus vitacea*), Avens (*Geum sp.*), and occasional Sensitive Fern (*Onoclea sensibilis*). A Butternut was found in in the east unit of this vegetation type, at the boundary of a unit of Forb Mineral Meadow Marsh Type.

Dry-Fresh Poplar Deciduous Forest Type (FOD3-1)

Found northwest and southwest of the Hawkesbury-CNR bridge, this vegetation type had a semi-closed canopy with abundant with Eastern Cottonwood (*Populus deltoides*) with a subcanopy of occasional White Elm (*Ulmus americana*) with sparse young Sugar Maple. The moderately dense shrub layer was abundant with Riverbank Grape and contained occasional Common Buckthorn. The dense ground layer was abundant with Kentucky Bluegrass (*Poa pratensis*) and Riverbank Grape with occasional Tall Goldenrod (*Solidago altissima*), Canada Anemone (*Anemone canadensis*) and Poison Hemlock (*Conium maculatum*).

Legend

- Butternut Location
- ELC Boundaries
- Railway

ELC Communities

CUM1-1	Dry- Moist Old Field Meadow Type
CUP3	Coniferous Plantations
CVR_4	Residential - Rural Property
FOD3-1	Dry- Fresh Poplar Deciduous Forest Type
FOD5	Dry- Fresh Sugar Maple Deciduous Forest Ecosite
FOD5-2	Dry- Fresh Sugar Maple- Beech Decidupus Forest Type
FOD7-1	Fresh - Moist White Elm Lowland Deciduous Forest Type
FOD8-1	Fresh- Moist Poplar Deciduous Forest Type
MAM2-2	Reed-canary Grass Mineral Meadow Marsh Type
MAM2-10	Forb Mineral Meadow Marsh Type
MAMM2-7	Ostrich Fern Forb Mineral Meadow Marsh Type
MAS3-1	Cattail Organic Shallow Marsh Type
SWD	Deciduous Swamp
SWT3-1	Alder Organic Thicket Swamp Type

30 15 0 30 60 90 Metres

M:\Ecology Group\Jobs\201534150003 - Mega 6 (PHOTOS and GIS only)\Mapping\MXD\ELC - Group A.mxd

Client: **Ministry of Transportation**

Title: **Hawkesbury Creek – CNR bridge and Highway 34 Underpass**
Site: SN 27-50 & SN 27-51
Existing Terrestrial Conditions

Prepared by: WSP | MMM GROUP

15M-00657-05-00A-NE1 | Scale as Shown | Review: LA

Date: February 2017

Figure: 2

Dry-Fresh Sugar Maple Deciduous Forest Ecosite (FOD5)

Found along the east banks of Hawkesbury Creek, north and south of the bridge (SN 27-51), this ecosite had a dense canopy abundant with White Elm and Sugar Maple, with occasional Basswood (*Tilia americana*), Black Cherry, Large Tooth Aspen (*Populus grandidentata*), and sparse Black Ash on the riverside slopes. A single Butternut (*Juglans cinerea*) was found in this unit, south of County Road 17, at the edge of the deciduous swamp (SWD) unit found along the riverbanks. The dense shrub layer was abundant with Nannyberry (*Viburnum lentago*), Virgin's Bower (*Clematis virginiana*) and contained occasional Staghorn
Sumac (*Rhus typhina*). The dense ground layer was abundant with Field Horsetail (*Equisetum arvense*), and occasional Coltsfoot (*Tussilago farfara*), with sparse Virginia Strawberry (*Fragaria virginiana*).

Dry-Fresh Sugar Maple-Beech Deciduous Forest Type (FOD5-2)

Found in the southwest quadrant of the CNR overhead, this vegetation type had a dense canopy dominated by abundant Sugar Maple with occasional American Beech (*Fagus grandifolia*), Black Cherry, and White Elm. The shrub layer contained occasional Choke Cherry (*Prunus virginiana*), Honeysuckles, and Common Buckthorn. The variable ground layer contained sparse areas with occasional Red Trillium (*Trillium erectum*) and Jack-in-the-Pulpit (*Arisaema triphyllum*) and areas dense with ferns such as Ostrich Fern (*Matteuccia struthiopteris*), Sensitive Fern (*Onoclea sensibilis*), and Interrupted Fern (*Osmunda claytoniana*). Two Butternut trees were found at the edge of this unit and the Forb Mineral Meadow Marsh (MAM2-10).

Fresh-Moist Poplar Deciduous Forest Type (FOD8-1)

Found in the northwest quadrant of the CNR overhead, this vegetation type is immediately adjacent to FOD3-1, but has a moister moisture regime and ground flora. The canopy was moderately dense and abundant with Eastern Cottonwood and Trembling Aspen, with occasional Manitoba Maple and Black Ash. The shrub layer contained abundant Common Buckthorn The ground layer was abundant with Canada Anemone, Poison Hemlock, and Canada Goldenrod, with occasional Sedges (*Carex spp.*), Tall Agrimony (*Agrimonia gryposepala*), and Red Baneberry (*Actaea rubra*).

There are also patches of this vegetation type in the northeast quadrant of the Highway 34 underpass. They contain a canopy of abundant Trembling Aspen and occasional Balsam Poplar (*Populus balsamifera*) and White Elm. Common Buckthorn, Tatarian Honeysuckle (*Lonicera tatarica*) and Red-osier Dogwood (*Cornus stolonifera*) occur in the understorey and Red Raspberry and Flat-top Fragrant Goldenrod (*Euthamia graminifolia*) in the ground cover. Next to the culvert adjacent to Highway 34 are patches of Coltsfoot on the bank and watercress (*Nasturtium* sp.) in the watercourse.

Dry to Moist Old Field Meadow Type (CUM1-1)

Found in all quadrants, this ELC type variable in composition based on location and soil moisture.

Few trees and shrubs exist in this vegetation type, sparse young Manitoba Maple and White Elm were found in these units. The dense ground layer contained abundant Canada Anemone, Tall Goldenrod, Kentucky Bluegrass, and Hog Peanut (*Amphicarpaea bracteata*), with occasional Cow Vetch (*Vicia cracca*), Red Raspberry, White Clover (*Trifolium repens*), Rose (*Rosa sp.*), Thicket Creeper, Riverbank Grape, Bouncing Bet (*Saponaria officinalis*), and Poison Hemlock. Other common species of cultural meadows including: Kentucky Bluegrass, Wild Parsley (*Pastinaca sativa*), Red Clover (*Trifolium pratense*), Smooth Brome (*Bromus inermis*), Burdock (*Arctium minius*), Creeping Thistle (*Cirsium arvense*), Common Milkweed (*Asclepias syriaca*), Wild Carrot (*Daucus carota*), and Field Horsetail were also present but, in lesser amounts.

An inclusion of Sumac Mineral Cultural Thicket type (CUT1-1) was observed in the unit on the south edge of County Road 17, west of Hawkesbury Creek. This inclusion was dominated by a dense shrub layer of Staghorn Sumac. Other inclusions occur in the drainage ditches of the southeast and northeast quadrants of the Highway 34 Underpass at County Road 17. They are dominated Broad-leaf Cattail (*Typha latifolia*) and also contain occasional Purple Loosestrife (*Lythrum salicaria*).

Mineral Cultural Thicket Ecosite (CUT1)

Observed from west of the CNR tracks, this unit was found adjacent to a residential lot in complex with Old Field Meadow (CUM1-1). Although the unit could not be observed in detail, the shrub layer was abundant with Manitoba Maple and Staghorn Sumac with a ground layer consistent with the previously described flora in the Old Field Meadow units (CUM1-1).

Coniferous Plantation Ecosite (CUP3)

These small units of planted landscape trees were dominated by tall White Spruce trees (*Picea glauca*); the ground layer vegetation was consistent with the adjacent Old Field Meadow units (CUM1-1). The White Spruce trees in the southeast quadrant of the Highway 34 Underpass at County Road 17 are accompanied by a large patch of Staghorn Sumac.

Residential-Rural Property (CVR_4)

This ELC unit represents the residential property found northwest of the Highway 34 Underpass at County Road 17. The vegetation on this property is landscaped trees and gardens and is not inventoried as a part of the natural terrestrial ecosystem.

Wetland Communities

Deciduous Swamp (SWD)

Small deciduous swamp units are found in low-lying areas in the floodplain to Hawkesbury Creek, south of County Road 17. The moderately dense canopy contains occasional Black Ash and Large Tooth Aspen while the dense subcanopy is abundant with Domestic Apple (*Malus pumila*) and occasional White Elm, with sparse Manitoba Maple. The dense shrub layer contains occasional Staghorn Sumac, Red Raspberry, Riverbank Grape, Virginia Creeper, Virgin's Bower, Nannyberry, young Manitoba Maple, and Common Buckthorn. The ground layer was abundant with Canada Goldenrod (*Solidago canadensis*), Sensitive Fern, Ostrich Fern, Poison Hemlock, and Canada Anemone, with occasional Tall Meadow-rue (*Thalictrum pubescens*), Red Baneberry, and Field Horsetail.

Alder Organic Thicket Swamp Type (SWT3-1)

This vegetation type was observed in the floodplain to Hawkesbury Creek north of County Road 17 and west of Highway 34. The sparse canopy contained White Elm, Manitoba Maple, and Red Ash. The dense shrub layer was dominated by Speckled Alder (*Alnus incana* subsp. *rugosa*) with occasional Riverbank Grape and sparse Staghorn Sumac and Nannyberry. The ground layer was abundant with Dwarf Raspberry (*Rubus pubescens*), and contained occasional Spotted Touch-me-not (*Impatiens capensis*), Canada Goldenrod, and Current (*Ribes sp.*), with sparse Thicket Creeper, Graceful Sedge (*Carex gracillima*), other Sedges (*Carex spp.*), Avens, and seedlings of Red Osier Dogwood (*Cornus stolonifera*). A soil sample taken in this location found greater than 40 cm of Organic humic soils.

Reed-canary Grass Mineral Meadow Marsh Type (MAM2-2)

This vegetation type was observed in the western floodplain to Hawkesbury Creek, north of County Road 17. Few trees or shrubs exist in this unit, save some young White Elm and occasional Speckled Alder, Common Buckthorn, and Riverbank Grape, and sparse Tatartian Honeysuckle (*Lonicera tatarica*), and European Highbush Cranberry (*Viburnum opulus* subsp*. opulus*). The ground layer was dominated by Reed Canary Grass (*Phalaris arundinacea*), with abundant Poison Hemlock, and Canada Goldenrod and occasional Bouncing Bet, Red Baneberry, Sensitive Fern, Early Meadow Rue (*Thalictrum dioicum*), Spotted Touch-me-not, and Spotted Joe-Pye Weed (*Eupatorium maculatum*). A soil sample taken in this location found stony mineral soils underlying a 2 cm organic litter layer.

Ostrich Fern Forb Mineral Meadow Marsh Type (MAMM2-7)

This unit is found north of County Road 17 in a drainage area west of the CNR tracks. The ground layer is abundant with Ostrich Fern, Bracken Fern (*Pteridium aquilinum*), Field Horsetail,

and Virgin's Bower, with occasional Interrupted Fern, and Canada Goldenrod with sparse Poison Hemlock and Reed Canary Grass.

Forb Mineral Meadow Marsh Type (MAM2-10)

Found in the Hawkesbury Creek floodplain, both north and south of County Road 17, this vegetation type was variable in composition by unit. In all units trees and shrubs were sparse with only sparse White Elm, Speckled Alder, Staghorn Sumac, Virgin's Bower, and Tatarian Honeysuckle. The ground layer was dense with forbs including abundant Canada Goldenrod, Poison Hemlock, Spotted Touch-me-not and Reed Canary Grass with occasional Bouncing Bet, Sensitive Fern, Early Meadow-rue, Ostrich Fern, Red Trillium, Jack-in-the-pulpit, Avens, Bedstraw (*Galium sp.*) with sparse Stinging Nettle (*Urtica dioica*), Northern Water Horehound (*Lycopus americanus*), and Blue Flag (*Iris versicolor*).

Cattail Organic Shallow Marsh Type (MAS3-1)

This vegetation type was found north of County Road 17, between the CNR line and Hawkesbury Creek. Sparse shrubs of Nannyberry were found in the shrub layer. The ground layer was dominated by Cattails (*Typha angustifolia* and *T. latifolia*) with abundant Reed Canary Grass and occasional Sensitive Fern. Standing water was observed at ground level at the time of field investigations. A soil auger taken in this unit found 50 cm of organic mesic soils over clay.

4.3 Wildlife

Wildlife opportunity in the study area is enhanced by Hawkesbury Creek, which increases habitat diversity and offers a corridor for movement. The mix of forests, thickets, meadows and marshes along the creek is habitat preferred by many wildlife species. Due to the proximity of urban development, however, wildlife use is limited to species tolerant of disturbed conditions. Species observed during field investigations are indicated below.

Birds

Two forest edge species, Eastern Phoebe (*Sayornis phoebe*) and American Robin (*Turdus migratorius*), were seen at the Hawkesbury Creek - CNR Overhead structure tending nests attached to the underside of the bridge. There were also two inactive Eastern Phoebe nests under the bridge. Eastern Phoebe and American Robin are designated migratory birds under the *Migratory Birds Convention Act* (MBCA), which provides them with protection for their nests and nesting activity. No nests were found under the Highway 34 Underpass at County 17 Road. This bridge has a smooth underside and offers minimal opportunities for bird nesting.

Other forest edge species noted include American Crow (*Corvus brachyrhynchos*), Blue Jay (*Cyanocitta cristata*), Great-crested Flycatcher (*Myiarchus crinitus*), Least Flycatcher (*Empidonax minimus*), and a Red-Eyed Vireo (*Vireo olivaceus*) that was sitting on a nest containing eggs. Several thicket species were present including Nashville Warbler (*Oreothlypis ruficapilla*), Yellow Warbler (*Setophaga petechia*) and American Redstart (*Setophaga ruticilla*). The American Redstart, a species that prefers thickets near watercourses, was exhibiting nesting behavior northwest of the Hawkesbury Creek – CNR Overhead structure. The marshes contained a Common Yellowthroat (*Geothlypis trichas*) and a Song Sparrow (*Melospiza melodia*). Upstream on Hawkesbury Creek was a Mallard (*Anas platyrhynchos*) with young. Other species observed south of the study area that may occur near the bridge include American Goldfinch (*Carduelis tristis*), Gray Catbird (*Dumetella carolinensis*), Blue-headed Vireo (*Vireo solitarius*), Common Grackle (*Quiscalus quiscula*) and Mourning Dove (*Zenaida macroura*).

Reptiles

The SAR Snapping Turtle (*Chelydra serpentina*) was observed on a sandy bar at the edge of Hawkesbury Creek approximately 90 m upstream of the bridge. No turtle nests were seen during the survey but nesting may be possible on the road and rail embankments. There are rocks along the river and woody debris piles along the access road that may be used by snakes; however, no snakes were observed during the survey.

Amphibians

The wetlands, meadows and forests provide habitat for amphibians and an American Toad (*Anaxyrus americanus*) was seen in the thicket swamp by the upstream rail bridge. A Green Frog (*Lithobates clamitans*) was heard south of the study area, a species also likely to occur in marshes within the study area.

Mammals

A Red Fox (*Vulpes vulpes*) was seen in the southwest quadrant of the Highway 34 Underpass at County Road 17. It displayed territorial behavior before disappearing south of the study area, possibly to a den. There were dens in the road embankments of both south quadrants of the Highway 34 underpass that likely belong to Woodchuck (*Marmota monax*). Tracks of a Northern Raccoon (*Procyron lotor*) were found along the creek. One or more of these species could be using trails found in the study area that connect the forest to the bridge abutments and road embankments.

Insects

A Canadian Tiger Swallowtail (*Papilio canadensis*) was seen foraging over the meadow areas.

4.4 Species at Risk

Two SAR species were observed during the surveys: Butternut and Snapping Turtle. Four Butternut trees were documented in the study area, and their locations are shown previously on Figure 2. These Butternut trees were located approximately 31 m, 95 m, 83 m and 84 m from the Hawkesbury Creek – CNR Overhead structure, respectively. The observed SAR and the Spiny Softshell identified in the NHIC database are assessed in Appendix B for potential to be impacted by the proposed works. Based on the assessment in Appendix B, Snapping Turtle and Spiny Softshell may be impacted by the proposed bridge works.

5.0 DESIGN AND CONSTRUCTION CONSIDERATIONS

The proposed works for the Hawkesbury Creek - CNR Overhead structure has the potential to directly impact one Butternut observed approximately 31 m from the structure. At the time of field investigations, guidance from the MNRF was that works within 25 m of a Butternut could constitute harm and may require further investigation. However, more recent draft guidelines from the MNRF have proposed draft habitat regulation up to 50 m from the stem. Further investigations and/or consultation with the MNRF regarding SAR should be undertaken as a part of detailed design.

The proposed works may also impact Snapping Turtle and Spiny Softshell, which are listed as SAR under the ESA. If the works occur during the bird breeding period (April 5 to August 15), they will disrupt the nesting of migratory birds protected under the MBCA. Vegetation clearing and excavation outside the breeding bird period, and, if necessary, bird nesting prevention measures, are sufficient to mitigate these impacts.

6.0 REFERENCES

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APPENDIX A: AGENCY CONSULTATION

Lorraine Adderley

From: Jenny Enoae
Sent: June-02-15 10:14 AM
To: kerry.reed@ontario.ca
Cc: Jenny Enoae
Subject: Project Information Request - MTO Mega 6 Project
Attachments: MNRF Info Request Letter from MMM Group Ltd..pdf; MTO Eastern Mega 6 Bridges.kmz

Hello Ms. Reed,

Please find attached an information request letter, as per the MTO / DFO / MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Highway Undertakings (2006), for the MTO Mega 6 Project. The Mega 6 Project involves the rehabilitation of 21 structures in various areas within the Eastern Region.

Please let me know if you have any questions.

Your timely response is greatly appreciated.

Regards,

Jenny

Jenny Enoae, M.Sc.
Project Ecologist - Fisheries
Ecology Department

MMM Group Limited
100 Commerce Valley Drive West
Thornhill, ON Canada L3T 0A1
t: 905.882.4211 x1382 | f: 905.882.0055 |c: 416.885.0721
EnoaeJ@mmm.ca | www.mmmgrouplimited.com

MMM Group Limited
100 Commerce Valley Drive West,
Thornhill, Ontario, L3T 0A1
t: 905.882.1100 | f: 905.882.0055

www.mmm.ca

June 2, 2015
3415003

Kerry Reed
Ministry of Natural Resources and Forestry
Kemptville
Provincial Government Bldg, 1st Flr
10 Campus Dr
PO Box 2002
ON K0G1J0

Subject: Information Request for the Preliminary Design of the Proposed Rehabilitation of 21 Structures (Mega 6) in Various Locations in Eastern Region

Dear Ms. Reed,

In accordance with the MTO / DFO / MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Highway Undertakings (2006), this letter is to provide notification to the Ministry of Natural Resources and Forestry (MNRF) that the Ministry of Transportation (MTO) is undertaking works in various locations within your region for the rehabilitation of 21 structures (refer to the attached Goggle Earth KMZ file). The following list of structures are proposed for rehabilitation, those highlighted in blue are fisheries structures:

- 3-540 - #15 E-S Ramp over S-W Ramp Highway 416/417
- 3-542/1 & 3-542/2 – Richmond Road U/P EBL & WBL
- 3-543/2 & 3-543/1 – Baseline Road U/P Highway 416 WBL & EBL
- 3-550/1 & 3-550/2 – Jock River Bridge SBL & NBL
- 3-552 – Barnsdale Road U/P
- 3-553 – Bankfield Road U/P
- 3-554 – Century Road U/P
- 3-357 – Highway 44 U/P
- 3-569 – Mcgee Road U/P
- 3-570 – Richardson Road U/P
- 3-288 – Highway 7 Connection Interchange O/H
- 27-198 – Regional Road #8 U/P
- 27-50 – Hawkesbury Creek & CNR Overhead
- 3-39/1 & 3-39/2 – Richmond Road U/P NBL & SBL
- 3-40 – Pinecrest Avenue U/P

- 3-41 – Woodroffe Avenue U/P
- 3-42 – Maitland Avenue U/P

As per Step 3 of the MTO / DFO / MNRF Fisheries Protocol, we request that MNRF please complete the attached Table 1 listing all watercourse crossings within the study area.

I also ask that you please provide the following background information, if available:

- Fish dot community data / files;
- Significant natural features;
- Species at Risk (SAR) site review;
- Natural heritage features;
- Wetlands (Provincially significant or unevaluated);
- Area of Natural or Scientific Interests (ANSI); and
- Other significant natural features

Please feel free to contact the undersigned at (905) 882-4211 ext. 1382 if you have any questions regarding this information. We look forward to your response.
Yours very truly,

MMM GROUP

Jenny Enoae, M.Sc.
Project Ecologist - Fisheries
Ecology Department

Enclosure: Google Earth KMZ file
Table 1: MNRF Background Fish and Fish Habitat Information Summary Request

Table 1: MTO Mega 6 Project: MNRF Background Fish and Fish Habitat Information Summary Request

Waterbody Name and Location (GPS coordinates)	Watercourse Classification (i.e. warmwater, coldwater)*	Habitat Type (i.e. watercourse, wetland, pond, lake, etc.)	Existing Habitat Information and Locations (fish passage barriers, known spawning habitats etc.)*	Historical Data on Fish Species Present (including whether the waterbody is considered to support aquatic Species at Risk)*	MNRF Fisheries Management Objectives (if applicable)*	MNRF Interpretation of Fish and Fish Habitat Sensitivity (Scale of Low, Moderate, or High or Unknown)*	MNRF Specified In-water Timing Windows for Construction*
3-550/1 & 3-550/2 – Jock River Bridge SBL & NBL (approximate location: 18 T 438736 5010856)		Permanent Watercourse					
27-198 – Regional Road #8 U/P[1] (approximate location: 18 T 469967 5020836)		Drainage feature connected to a permanent watercourse ~700 m west of Regional Road #8 U/P					
27-50 – Hawkesbury Creek & CNR Overhead (approximate location: 18 T 529502 5049277)		Permanent Watercourse					

***MNRF to provide available information in these fields.**

[1] Information requested is for the watercourse feature ~700 m to the west of the bridge

Lorraine Adderley

From: Inforequest, Kemptville (MNRF) <Kemptville.Inforequest@ontario.ca>
Sent: August-06-15 12:47 PM
To: Jenny Enoae
Cc: Inforequest, Kemptville (MNRF)
Subject: MNR Kemptville District Information Request (2015_KVD-3140) Response
Attachments: ESA_Infosheet-InfoRequest.pdf; NHIC-LIO_Infosheet-InfoRequest.pdf; 2015_KVD-3140 _Response.pdf; Mega 6_MMM_StructureSummary.xlsx

Importance: High

Hello,

Jenny Enoae
MMM Group Limited

Please find attached a response to your information request for project 'Proposed Rehab/Replacement of 17 Bridge Locations Across KVD; File Name MTO Mega 5 Bridge Rehab/Replacement'.

Sincerely,

Information Request Services
Kemptville District
Ministry of Natural Resources

Ministry of Natural Resources and Forestry

Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

Ministère des Richesses naturelles et des Forêts

District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Ontario

Thu. Aug 6, 2015

Jenny Enoae
MMM Group Limited
100 Commerce Valley Dr. West
Thornhill, Ontario
L3T 0A1
(905) 882-4211
enoaej@mmm.ca

Attention: Jenny Enoae

Subject: Information Request - Infrastructure (Drain, Bridge, Culvert)
Project Name: Proposed Rehab/Replacement of 17 Bridge Locations Across KVD; File Name MTO Mega 5 Bridge Rehab/Replacement
Site Address: Many Locations Across Kemptville District; Mainly Ottawa Area
Our File No. 2015_KVD-3140

Natural Heritage Values

The Ministry of Natural Resources and Forestry (MNRF) Kemptville District has carried out a preliminary review of the area in order to identify any potential natural resource and natural heritage values.

Natural heritage features and values contribute to the province's rich biodiversity and provide habitat for a variety of species. The following Natural Heritage values were identified:

- Fish Nursery, Carps and Minnows Nursery Area
- Fish Nursery, Northern Pike Nursery Area
- Fish Nursery, Rock Bass Nursery Area
- Fish Nursery, Walleye Nursery Area
- River, Jock River
- Stream, Hawkesbury Creek
- Stream, Shaws Creek
- Unevaluated Wetland (Not evaluated per OWES)

Ministry of Natural Resources and Forestry

Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

Ministère des Richesses naturelles et des Forêts

District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Municipal Official Plans contain additional information related to natural heritage features. Please see the local municipal Official Plan for more information such as specific policies and direction pertaining to activities which may impact natural heritage features. For planning advice or Official Plan interpretation, please contact the local municipality.

Where natural values and natural hazards exist (e.g., floodplains), there may be additional approvals and permitting required from the local Conservation Authority. The MNRF strongly recommends contacting the local Conservation Authority for further information and approvals. Please see the MNRF Kemptville Information Guide (2012) for contact information pertaining to Conservation Authorities located within the Kemptville District area.

For additional information and online mapping tools, please see the Natural Heritage Information Centre (NHIC), where additional data and files can be downloaded in both list and digital format. In addition sensitive species information can be requested and accessed through the NHIC at NHICrequests@ontario.ca.

In Addition, the following Fish species were identified: banded killifish, bluntnose minnow, bridle shiner, brook stickleback, brown bullhead, central mudminnow, common carp, common shiner, creek chub, eastern blacknose dace, fathead minnow, golden shiner, greater redhorse, johnny darter/tesselated darter, logperch, mottled sculpin, muskellunge, northern pike, northern redbelly dace, Phoxinus sp., pumpkinseed, rock bass, shorthead redhorse, silver redhorse, smallmouth bass, spottail shiner, walleye, white sucker. Please refer to attached summary document for specific details on fish species.

Water

Where the site is adjacent to or contains a watercourses or waterbodies, additional considerations apply. If any in-water works are to occur, there are timing restriction periods for which work in water can take place (see below). Appropriate measures should be taken to minimize and mitigate impact on water quality and fish habitat, including:

- including the installation of sediment and erosion control measures;
- avoiding removal alteration or covering of substrates used for fish spawning, feeding, over-wintering or nursery areas; and
- debris control measures should be put in place to manage falling debris (e.g. spalling).

A work permit from the MNRF may be required pending further details regarding the proposed works. No encroachment on the bed or banks of the waterbody (e.g. abutments, embankments, etc.) is permitted until MNRF approval and clearance has been issued. In order for MNRF staff to determine when a work permit is required, additional information can include:

Ministry of Natural Resources and Forestry

Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

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District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
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- Detailed drawings (existing and proposed)
- Location mapping
- Registered Plan survey
- Site photographs
- Public Lands Act Forms - application forms, ownership form and landowner notification form.

The MNRF does not have any water quality or quantity data available. We recommend that the Ministry of the Environment and Climate Change be contacted for such data along with the local Conservation Authority. For further information regarding fish habitat and protocols, please refer to the following interagency, document, *Fish Habitat Referral Protocol for* Ontario at: http://www.MNRF.gov.ca/264110.pdf

Timing restriction periods in MNRF Kemptville District*:

Warmwater → March 15 – June 30
→ March 15 – July 15 for St. Lawrence River & Ottawa River
Coldwater → October 1 – May 31
Mixed lakes → October 1 – June 30 (Big Rideau & Charleston)

* *Please note: Additional timing restrictions may apply as it relates to Endangered and Threatened Species, including works in both water and wetland areas.*

	FISH SPECIES	TIMING WINDOW
Spring:	Walleye	March 15 to May 31
	Northern Pike	March 15 to May 31
	Lake Sturgeon	May 1 to June 30
	Muskellunge	March 15 to May 31
	Largemouth/Smallmouth Bass	May 1 to July 15
	Rainbow Trout	March 15 to June 15
	Other/Unknown Spring Spawning Species	March 15 to July 15

	FISH SPECIES	TIMING WINDOW
Fall:	Lake Trout	October 1 to May 31
	Brook Trout	October 1 to May 31
	Pacific Salmon	September 15 to May 31
	Lake Whitefish	October 15 to May 31
	Lake Herring	October 15 to May 31
	Other/Unknown Fall Spawning Species	October 1 to May 31

Ministry of Natural Resources and Forestry

Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

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10, promenade Campus
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Additional approvals and permits may be required for the proposed works as it relates to the Fisheries Act. Please contact your local Conservation Authority and the Department of Fisheries and Oceans to determine requirements and next steps. Where the Fisheries Act is triggered and habitat compensation, mitigation measures or best management practices are being considered; as the MNRF is charged with the management of Provincial fish populations, the MNRF requests ongoing involvement in such discussions in order to ensure population conservation. Furthermore, local Conservation Authorities may also have additional approvals for works in and adjacent to water and wetland features. Finally, Transport Canada's Navigable Waters Protection Division may require review and approval of the proposed project. Please contact these local agencies directly for more information.

Timing restrictions apply from October 16 – March 15 to protect at-risk hibernating turtles. If the proposed works are to occur during this time, the MNRF recommends fencing off the site in early fall to prevent turtles from hibernating there. Caution should also be taken during the turtle nesting season in June and early July as turtles use embankments and other terrestrial site for nesting. During the active season (April 1 – October 30) the MNRF recommends a thorough sweep of the area before works begin to encourage any turtles using the site to move away.

Where drainage works are proposed within wetland areas, the MNRF is concerned is the impacts to the hydrology and ecology of the wetland, which may have impacts on species and their habitats. For example, changing water levels as a result of drainage works may impact turtles or nesting birds, some of which may be protected under legislation such as the Endangered Species Act or the Fish and Wildlife Conservation Act. Therefore a consideration for direct and indirect impacts to species and their habitats is imperative.

Where drainage works occur within the originally approved drainage footprint, as per the Drainage Act, there are no Public Land's Act requirements from the MNRF. However, other MNRF legislation may apply including, but not limited to the Endangered Species Act, 2007

MNRF is streamlining and automating its approvals processes for natural resource-related activities. Some activities that may otherwise contravene the ESA may be eligible to proceed without a permit from MNRF provided that regulatory conditions are met for the ongoing protection of species at risk and their habitats. To proceed under the regulation with ongoing maintenance and improvement of drainage infrastructure that would adversely affect endangered or threatened species or their habitat, a person must register with the Ministry of Natural Resources and Forestry and follow the rules in regulation.

For more information please check out the following link http://www.ontario.ca/environment-and-energy/ditch-and-drainage-work-and-endangered-or-threatened-species

Ministry of Natural Resources and Forestry

Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

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10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Species at Risk

With the new Endangered Species Act (ESA, 2007) in effect, it is important to understand which species and habitats exist in the area and the implications of the legislation. A review of the Natural Heritage Information Centre (NHIC) and internal records and aerial photograph interpretation indicate that there is a potential for the following Threatened (THR) and/or Endangered (END) species on the site or in proximity to it:

- Barn Swallow (THR)
- Blanding's Turtle (THR)
- Bobolink (THR)
- Butternut (END)
- Eastern Meadowlark (THR)
- Whip poor will (THR)

Please refer to the attached summary document for detailed SAR lists. All Endangered and Threatened species receive individual protection under section 9 of the ESA and receive general habitat protection under Section 10 of the ESA, 2007. Thus any potential works should consider disturbance of possible important habitat (e.g. nesting sites). Please note that as of June 30, 2013 general habitat protection applies to all Threatened and Endangered species. The habitat of these listed species is protected from damage and destruction and certain activities may require authorization(s) under the ESA. Please keep this date in mind when planning any species and habitat surveys

Species receiving General Habitat protection:

- Barn Swallow (THR)
- Blanding's Turtle (THR)
- Bobolink (THR)
- Butternut (END)
- Eastern Meadowlark (THR)
- Whip poor will (THR)

If the proposed activity is known to have an impact on the species mentioned above or any other SAR, an authorization under the Endangered Species Act, 2007 (ESA) may be required. It is recommended that MNRF Kemptville be contacted prior to any activities being carried out to discuss potential survey and mitigation measures to avoid contravention of the ESA.

Habitat has been identified within the project area that appears suitable for one or more species listed by SARO as Special Concern (SC). In Addition, one or more Special Concern species has been documented to occur either on the site or nearby. Species listed as Special Concern are not

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Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

Ministère des Richesses naturelles et des Forêts

District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

protected under the ESA, 2007. However, please note that some of these species may be protected under the Fish and Wildlife Conservation Act. Species of Special Concern for consideration:

- Bridle Shiner (SC)
- Eastern Musk Turtle (SC)
- Milksnake (SC)
- Snapping Turtle (SC)

If any of these or any other species at risk are discovered throughout the course of the work, and/or should any species at risk or their habitat be potentially impacted by on site activities, MNRF should be contacted immediately and operations be modified to avoid any negative impacts to species at risk or their habitat until further direction is provided by MNRF.

Please note that information regarding species at risk is based on documented occurrences only and does not include an interpretation of potential habitat within or in proximity to the site in question. Although this data represents the MNRF's best current available information, it is important to note that a lack of information for a site does not mean that additional features and values are not present. i.e.: Species at Risk (SAR) or their habitat could still be present at the location or in the immediate area. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed; or their habitat is not damaged or destroyed through the activities carried out on the site. The MNRF continues to strongly encourage ecological site assessments to determine the potential for SAR habitat and occurrences. When a SAR or potential habitat for a SAR does occur on a site, it is recommended that the proponent contact the MNRF for technical advice and to discuss what activities can occur without contravention of the Act. If an activity is proposed that will contravene the ESA (such as Section 9 or 10), the proponent must contact the MNRF to discuss the potential for a permit (Section 17). For specific questions regarding the Endangered Species Act (2007) or SAR, please contact a district Species at Risk Biologist at sar.kemptville@ontario.ca. For more information regarding the ESA (2007), please see attached ESA Information Sheet.

As of July 1, 2013, the approvals processes for a number of activities that have the potential to impact SAR or their habitat were changed in an effort to streamline approvals processes while continuing to protect and sustainably manage Ontario's natural resources. For those activities that require registration with the Ministry, businesses and individuals will be able to do so through a new online system. The online system will also include information to help guide individuals and businesses through the new processes. For further information on which activities are authorized through this new online registration process and how to apply, please refer to the following website:

Ministry of Natural Resources and Forestry

Kemptville District

10 Campus Drive
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Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

Ministère des Richesses naturelles et des Forêts

District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

http://www.MNRF.gov.on.ca/en/About/2ColumnSubPage/STDPROD_104342.html. General inquiries may be directed towards Kemptville District MNRF, while questions and comments involving the new online forms can be directed to the Registry Approvals Service Centre (RASC) at 1-855-613-4256 or MNRF.rasc@ontario.ca.

Please note: The advice in this letter may become invalid if:

- The Committee on the Status of Species at Risk in Ontario (COSSARO) re-assesses the status of the above-named species OR adds a species to the SARO List such that the section 9 and/or 10 protection provisions apply to those species.
- Additional occurrences of species are discovered.
- Habitat protection comes into force for one of the above-mentioned species through the creation of a habitat regulation (see general habitat protection above).

This letter is valid until: Fri. Aug 5, 2016

Sincerely,

Erin Seabert
Fish & Wildlife Technical Specialist
erin.seabert@ontario.ca

Encl.\
-ESA Infosheet
-NHIC/LIO Infosheet

MTO - Mega 6 Project - MNRF Kemptville

Structure	UTM Zone	UTM E	UTM N	Fisheries	Geo Twp	Lot	Con	Potential SAR	Other Possible Natural Heritage Features	Fisheries Sensitivity	In-water timing window	Fish community
3-540 - #15 E-S Ramp over S-W Ramp Highway 416/417	18T	436101	5021138		Nepean	15	2 on the Ottawa R.	butternut, milksnake, snapping turtle, barn swallow	none documented			
3-542/1 & 3-542/2 – Richmond Road U/P EBL & WBL	18T	436373	5020567		Nepean	15	2 on the Ottawa R.	butternut, milksnake, snapping turtle, barn swallow	none documented			
3-543/2 & 3-543/1 – Baseline Road U/P Highway 416 WBL & EBL	18T	436472	5020327		Nepean	15	2 on the Ottawa R.	butternut, milksnake, snapping turtle, barn swallow	none documented			
3-550/1 & 3-550/2 – Jock River Bridge SBL & NBL	18T	438736	5010856	X	Nepean	14	4	butternut, milksnake, snapping turtle, barn swallow, eastern musk turtle, Eastern Meadowlark, Bobolink, Bridle Shiner	significant woodlands nearby. Jock River, carps and minnow nusery area, walleye, rock bass, and northern pike nursery nearby	low sensitivity	see info request response	Species documented: brown bullhead, white sucker, common carp, northern pike, muskellunge, johnny darter/tesselated darter, banded killifish, pumpkinseed, smallmouth bass, silver redhorse, shorthead redhorse, golden shiner, common shiner, spottail shiner, bluntnose minnow, fathead minnow, creek chub, central mudminnow, bridle shiner, greater redhorse, rock bass, walleye, logperch
3-552 – Barnsdale Road U/P	18T	441211	5008390		Nepean	6	3	butternut, milksnake, snapping turtle, barn swallow, eastern musk turtle, Eastern Meadowlark, Bobolink	Significant woodlands nearby			
3-553 – Bankfield Road U/P	18T	442129	5006518		Nepean	1	3	butternut, milksnake, snapping turtle, barn swallow, eastern musk turtle, Eastern Meadowlark, Bobolink	none documented			
3-554 – Century Road U/P	18T	443101	5004785		North Gower	5	2	butternut, milksnake, snapping turtle, barn swallow, eastern musk turtle, Eastern Meadowlark, Bobolink	Significant woodlands nearby			
3-357 – Highway 44 U/P	18T	417150	5018238		Huntley	15	5	Butternut, Barn swallow, Blanding's turtle, milksnake, snapping turtle, Whip-poor-will	significant woodlands and unevaluated wetlands nearby			

3-569 – Mcgee Road U/P	18T	419728	5016471	X	Huntley	11	5	Butternut, Barn swallow, Blanding's turtle, milksnake, snapping turtle, Bobolink, Eastern Meadowlark, Whip-poor-will	significant woodlands and unevaluated wetlands nearby. No watercourse documented here	low sensitivity	see info request response	Fish Species documented in nearby Huntley Creek: brown bullhead, white sucker, brook stickleback, pumpkinseed, golden shiner, common shiner, bluntnose minnow, fathead minnow, creek chub, central mudminnow, Phoxinus sp., eastern blacknose dace, northern redbelly dace, mottled sculpin, johnny darter/tesselated darter
3-570 – Richardson Road U/P	18T	421875	5014278		Huntley	5	5	Butternut, Barn swallow, Blanding's turtle, milksnake, snapping turtle, Bobolink, Eastern Meadowlark	significant woodlands and unevaluated wetlands nearby			
3-288 – Highway 7 Connection Interchange O/H	18T	423553	5013482		Huntley	3	4	Butternut, Barn swallow, Blanding's turtle, milksnake, snapping turtle	significant woodlands and unevaluated wetlands nearby			
27-198 – Regional Road #8 U/P	18T	469967	5020836	X	Cumberland	26	8	Butternut, Barn swallow, milksnake, snapping turtle, Bobolink, Eastern Meadowlark	none documented. No watercourse Documented at this UTM (nearest is Shaw's Creek)	low sensitivity	see info request response	Fish species documented in Shaw's Creek: Golden shiner and pumpkinseed
27-50 – Hawkesbury Creek & CNR Overhead	18T	529502	5049277	X	Vest Hawkesbur	11	1		significant woodlands and unevaluated wetlands nearby. Hawkesbury Creek on-site	low sensitivity	see info request response	no fish species data available
3-39/1 & 3-39/2 – Richmond Road U/P NBL & SBL	18T	436888	5021642		Nepean	17	2 on the Ottawa R.	butternut, milksnake, snapping turtle, barn swallow	none documented			
3-40 – Pinecrest Avenue U/P	18T	438126	5022090		Nepean	21	2 on the Ottawa R.	Butternut, Barn Swallow	none documented			
3-41 – Woodroffe Avenue U/P	18T	439833	5023352		Nepean	26	2 on the Ottawa R.	Butternut, Barn Swallow	none documented			
3-42 – Maitland Avenue U/P	18T	440912	5024378		Nepean	29	2 on the Ottawa R.	Butternut, Barn Swallow	none documented			

APPENDIX B: SPECIES OF CONSERVATION CONCERN SCREENING TABLE

Appendix B: SCC Screening Table

SPECIES OF CONSERVATION CONCERN	PREFERRED HABITAT	SRANK	COSEWIC	MNR	SARA Status	SARA Schedule	HABITAT PRESENT WITHIN STUDY AREA	OBSERVATIONS DURING FIELD SURVEYS
Plant SAR								
Butternut (*Juglans cinerea*)	Grows best in rich, moist, and well-drained soils often found along streams, well-drained gravel sites, especially those made up of limestone and seldom found on dry, rocky and sterile soils (Nielsen 2003). Butternut is a shale intolerant species, which prefers rich, moist and well-drained soils, and is often found along the edges of streams and rivers. It can grow alone or in small groups in deciduous forests. Young seedlings and saplings can tolerate up to 60% crown closure. Common associates include basswood, black cherry, beech, black walnut, elm, hickory, oak, red maple, sugar maple, white ash and yellow birch (FGCA 2011).	S3?	END	END	END	1	Appropriate habitat for this species exists in the study area. Four Butternut trees were observed in the study area on upland areas of the banks of Hawkesbury Creek.	Four individuals were observed in the study area.
Reptile SAR								
Spiny Softshell (*Apalone spinifera spinifera*)	Spiny Softshells have been found in a variety of habitats, including marshy creeks, swift-flowing rivers, lakes, impoundments, bays, marshy lagoons, ditches and ponds near rivers. Common habitat features of these sites include a soft bottom that is sandy or muddy, sandbars and mud flats, and some aquatic vegetation. Habitat components that appear to be essential are: sand or gravel nesting areas (close to the water and relatively clear of vegetation); shallow muddy or sandy areas to bury in; deep pools for hibernation; basking areas; and suitable habitat for crayfish and other food species. These habitat features may be distributed over a considerable area, as long as the intervening habitat doesn't prevent the turtles from travelling between them (SARA Registry).	S3	THR	THR	THR	1	There are few sandy bars and basking areas in the study area but the species may be present.	No observations.
Snapping Turtle (*Chelydra serpentina*)	Preferred habitat includes permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernate together in groups in mud under water; home range size ~28 ha in area. Species usually found in large bodies of water, and sometimes in small ponds as well (OMNR 2000). Often use gravel shoulders along roads for nest sites (MNR Factsheet 2009).	S3	SC	SC	SC	1	Yes. The creek has areas of sluggish flow, and contains aquatic vegetation for foraging, sandy bars for basking and embankments for nesting.	One individual was seen.

MNR Factsheet 2009. Snapping Turtle (*Chelydra serpentina*). Queen`s Printer for Ontario 2009.
OMNR 2000. Significant Wildlife Habitat Guide. Ministry of Natural Resources
SARA Registry (Species at Risk Act Public Registry) http://www.sararegistry.gc.ca
FGCA. (Forest Gene Conservation Association). http://www.fgca.net/home/default.aspx
Nielsen, C., M. Cherry, B. Boysen, A. Hopkin, J. McLaughlin, T. Beardmore. 2003. COSEWIC status report on the the butternut Juglans cinerea in Canada in COSEWIC assessment and status report on the butternut Juglans cinerea in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-32 pp.

DILLON CONSULTING

MINISTRY OF TRANSPORTATION, ONTARIO

Fish and Fish Habitat Impact Assessment Report

Hawkesbury Bridge Replacements, Assignment 14
GWP 4203-15-00

February 2019 – 17-5180

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B MMM Fish and Fish Habitat Existing Conditions Report (February 2017)

C 2017 Photographs

D MNRF 2017 Correspondence

E Aquatic Effects Assessment Table (Template 10.3)

F Project Notification Form

1.0 Introduction

The Ministry of Transportation, Ontario (MTO) retained Dillon Consulting Limited (Dillon) to complete a series of structural rehabilitations and replacements under Retainer in Eastern Ontario. The assignments are being completed following MTO's *Class Environmental Assessment (EA) for Provincial Transportation Facilities* (2000) and include both preliminary and detail design projects.

This project is being completed under the Retainer and includes the replacement of two structures on County Road 17 in the Town of Hawkesbury, namely, Hawkesbury Creek/CNR Overhead (Site No. 27-50) and Highway 34 Overpass at County Road 17 (Site No. 27-51) (**Figure 1**).

The replacement of the two structures is being completed as a Group "B" project and a Transportation Environmental Study Report (TESR) will be prepared for public review.

This Fish and Fish Habitat Impact Assessment Report is for the replacement works of the two bridges. The Hawkesbury Creek/CNR Overpass at SN 27-50 is a three-span slab (two abutments, two footings with five columns each) on reinforced cast-in-place concrete T-beam that crosses over Hawkesbury Creek. The bridge is approximately 57 m long and 16 m wide. The Highway 34 Overpass and County Road 17 Bridge at 27-51 is a single span, rigid frame, cast-in-place, reinforced concrete structure with clear span of approximately 18.0 m that crosses over Highway 34. Both the existing Hawkesbury Creek/CNR Overhead and Highway 34 Overpass lie on the same horizontal alignment and vertical crest along County Road 17.

This report has been prepared in accordance with MTO's E*nvironmental Guide for Fish and Fish Habitat* (MTO 2009) and follows the new MTO/Fisheries and Oceans Canada (DFO)/Ministry of Natural Resources and Forestry (MNRF) *Pilot Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings*; Version 3, 2016 (The Protocol).

Ontario

MTO LARGE VALUE RETAINER - EAST REGION

ASSIGNEMENT No. 14 - HAWKESBURY

Project Location

FIGURE 1

- Project Location
- Railway
- Local Roads
- Arterial
- Highway
- Watercourse
- Waterbody

0 125 250 500 m

SCALE 1:15,015

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: LK/SFG
MAP CHECKED BY: DL/MB
MAP PROJECTION: NAD 1983 UTM Zone 18N

DILLON CONSULTING

PROJECT: 17-5180
STATUS: DRAFT
DATE: 5/8/2018

FILE LOCATION: G:\GIS\175180 MTO Large Value Retainer\mxd\Hawkesbury\TEAR\Figure 1 Study Area.mxd

2.0 Description of Project Work

The proposed bridge replacements for the Hawkesbury Creek/CNR Overhead (Site 27-50) and Highway 34 Overpass (Site 27-51) are shown on the General Arrangement Drawings (**Appendix A**).

As proposed, two new bridges will be constructed with the finished location of the structures on the same basic alignment as the existing structures. The Hawkesbury Creek/CNR Overhead will be changed from a three-span to a two-span structure with a total span length increased from 57.0 m to 71.0 m. The support structure of three columns on a single concrete footing will replace the existing five columns on a single footing. The location of the new columns and footing will be located slightly closer to Hawkesbury Creek than the current pier. The Highway 34 Overpass will be replaced with a single span bridge, and its length will be increased from 16 m to 36 m.

In general, the project work on both structures will be completed in the following stages:

- Installation of sediment and erosion control measures isolating the work area from the floodplain and waterways
- Construction of temporary access roads to access footings and columns within floodplain (Hawkesbury Creek/CNR Overhead only)
- Construction of temporary and permanent bridge structures including: temporary piers and abutments, permanent new footing and columns (Hawkesbury/CNR only)
- Shut-down of traffic on existing structures
- Lateral-slide of new structures from temporary location to permanent location
- Activation of traffic on new structures
- Removal of the existing, unused structures including currently existing structures and temporary structures (abutments, footings, columns, etc.)
- Deactivation of temporary access roads in floodplain (Hawkesbury Creek/CNR Overhead only)
- Stabilization of sites including grading and vegetative plantings
- Removal of sediment and erosion control measures.

Construction activities are anticipated to commence in January 2020 and be completed by the end of 2020. Additional details specific to each structure are provided below.

Hawkesbury Creek/CNR Overhead: The existing Hawkesbury Creek/CNR Overhead will remain open and operational at its current location while the new bridge is built on temporary support structures immediately adjacent north/downstream of the existing structures. These temporary structures will include extending both bank abutments (existing locations located out of floodplain) at each end of the bridge span and constructing both a temporary and permanent middle pier adjacent to the current column and footing location within the floodplain. This temporary pier and permanent column and footing structure will be slightly closer (~3.7 m closer) to Hawkesbury Creek than the current location

but still outside of the observed high water mark along the creek bank, which is defined by DFO as the average level to which a body of water rises so as to leave a mark on the land. On completion of the new structure, the existing bridge will be removed and the new bridge slid laterally into place. Post-lateral slide, all temporary structures and existing unused structures will be removed from the floodplain and the site stabilized. It is anticipated that temporary access roads into the floodplain will be required to access the site of the temporary pier, new centre columns and footing, and for removal of existing column and footings (x2) post-construction. Access to the column and footing sites from either side of the creek will be from a single point of entry and no temporary fording or crossing of Hawkesbury Creek is required. Work on both end-of-bridge abutments will be out of the high water mark and standard sediment and erosion control measures described below will mitigate potential impacts to the aquatic environment.

To prepare for the placing of the temporary pier and new, permanent footing, the rock armouring at the base of the existing footing and existing asphalt capping over the armouring will need to be removed. The armour stone will be set aside for reuse post construction while the asphalt capping is removed completely from the site. The set aside armour stone will be on site of construction but well outside of the high water mark and active floodplain. Likewise, the salvaged armour stone will be stored in a safe manner representing a minimum risk to Hawkesbury Creek. Upon completion of the construction, the salvaged armour stone will be placed to protect the new footing. New armour stone will also be placed along the shoreline to replace sections that have washed out.

Sediment and erosion control measures including but not limited to: sediment fencing, straw bales/checks, coir rolls, and grading will be implemented, installed and maintained within the floodplain throughout all work phases.

Highway 34 Overpass: Temporary end abutments will be constructed immediately adjacent to the existing bridge. The new bridge will be constructed on the temporary location. Upon completion, traffic on the existing bridge will cease and the existing bridge removed. The new bridge will then be laterally slid into place. On completion of the lateral slide and activation of traffic on the new bridge, all temporary structures will be removed and the site cleaned and stabilized. The Highway 34 Overpass is greater than 30 m (~90m north) from a tributary of Hawkesbury Creek; however, ramp re-configuration north of County Road 17 and east of Highway 34 (N/S – W on ramp) will result in works occurring within 30 m of the tributary. No in-stream or works in the floodplain are anticipated for the Highway 34 Overpass Bridge replacement and ramp works, and standard sediment and erosion control measures described below are expected to mitigate potential impacts from site-run-off into the aquatic environment of Hawkesbury Creek or its tributary.

3.0 Summary of Existing Fish and Fish Habitat Conditions

Through background review, agency consultation and field investigations, the existing conditions within Hawkesbury Creek and its tributary are well understood and are outlined in the *Fish and Fish Habitat Existing Conditions Report; Mega 6 Bridges, 27-50 Hawkesbury Creek CNR Overhead WP. 4098-10-01, 27-51 Highway 34 Underpass at County Road 17 W.P. 4203-15-00* (MMM, February 2017) (**Appendix B**). MMM biologists completed the initial field work on June 8, 2015, and October 15, 2015, in accordance with Section 4 and Section 4E – Field Investigations of MTO's *Environmental Guide for Fish and Fish Habitat*. Watercourse field record forms and habitat map forms were used to collect and document information including digital photographs to show existing conditions. Habitat assessments were completed over two broad reaches from 75 m upstream to 250 m downstream of the bridge (total length assessed = 325 m). Hawkesbury Creek and its tributary are shown on **Figure 2**.

Hawkesbury Creek had previously been classified by the MNRF as being a permanent flowing watercourse with a warm-water thermal regime and a low fish habitat sensitivity rating given the presence of common baitfish species and general habitat features (i.e., non-specific or specialized vegetation or substrates). More recent 2017 correspondence from MNRF has indicated that Hawkesbury Creek is considered to have a moderate habitat sensitivity and is managed for a combined warmwater/coolwater fish community that includes "…Carps, Minnows, Northern Pike, Muskellunge, Smallmouth Bass, White Sucker, Sunfishes and Suckers" (**Appendix D**). MNRF also identified River Redhorse (*Moxostoma carinatum*), a species listed as Special Concern provincially and federally, as potentially being present (**Appendix D**). A review of the DFO aquatic Species at Risk (SAR) mapping (July 2017) suggests that no aquatic SAR are present in this portion of Hawkesbury Creek, but does indicate the potential presence of Channel Darter (*Percina copelandi*; federally Threatened) downstream at the Ottawa River and mouth of Hawkesbury Creek.

A *Constraint Map* image and habitat description drawings depicting the physical and biological conditions are found on page 13 in MMM (2017) (**Appendix B**). On May 31, 2017, a Dillon biologist attended the site to record photographs. A summary of site-specific photographs from 2017 are provided in **Appendix C**.

Hawkesbury Creek flows in a northerly direction towards the Ottawa River with the confluence approximately 2.0 km downstream of the Hawkesbury Creek/CNR Overhead at County Road 17. Overall, Hawkesbury Creek is a slightly meandering channel consisting of riffles, runs and pools. Upstream of the bridge crossing on Hawkesbury Creek, the average wetted width was approximately 10 m with an average depth of 1.0 m (see **Photo 1**, **Appendix C**). The channel morphology of this reach was Run/Riffle (60/40%). Substrates, in order of dominance, consisted of a mixture of gravel, cobble and sand though cobble and some boulders (suspected to be from failed bank armouring upstream) were the dominant

Ontario

MTO LARGE VALUE RETAINER - EAST REGION

ASSIGNEMENT No. 14 - HAWKESBURY

Natural Heritage Features

FIGURE 2

- Railway
- Roads
- Watercourse
- Study Area
- Unevaluated Wetland
- Woodland

0 10 20 40 m

SCALE 1:1,500

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: LK
MAP CHECKED BY: JW
MAP PROJECTION: NAD 1983 UTM Zone 18N

DILLON CONSULTING

PROJECT: 17-5180
STATUS: DRAFT
DATE: 5/9/2018

FILE LOCATION: G:\GIS\175180 MTO Large Value Retainer\mxd\Hawkesbury\TEAR\Figure 2 Natural Heritage Features.mxd

substrate in riffle sections. Available in-stream cover for fish was limited to undercut banks, boulders/cobble, emergent aquatic vegetation and some overhanging bank vegetation. The banks along this reach rise quickly from the wetted width averaging 3 m to 4 m above water level. While pockets of armour stone are found along sections of the banks including a heavy protection area around one of the piers closest to the creek, the unarmoured sections show minor areas of erosion as noted by undercut banks. The riparian zone vegetation consists primarily of grasses and sedges while beyond the riparian zone, the vegetation community is dominated by deciduous forest canopy trees over lowland deciduous willow understory.

Downstream of the bridge, the channel runs relatively straight through the area of investigation. The channel width and depth, substrate types, instream cover and riparian zones of this lower reach are similar to the upstream reach. The banks downstream of the bridge are steep and lined with large boulders likewise attributing to the straight channelization. Bank erosion was observed throughout this reach. Under the bridge, minor vegetation growth dominated by cultural species was observed (see **Photo 2** and **Photo 3**, **Appendix C**). Approximately 90 m downstream of the bridge, the CNR bridge crosses Hawkesbury Creek. This bridge narrows the creek through concrete wing-walls. Approximately 18 m further downstream of this weir (~108 m downstream of bridge), a concrete weir is present, which may represent a seasonal barrier to upstream fish passage (MMM 2017).

Fish collection by MMM in 2015 resulted in the capture of two species of common baitfish; Longnose Dace (*Luxilus cornutus*) and Common Shiner (*Rhinichthys cataractae*) (MMM, 2017). Abundant relic freshwater mussel shells were observed along the east bank, 25 m downstream of the bridge. Two species of mussel were identified from those relic samples; Fat mucket and Giant floater, both common species in Ontario (MMM, 2015).

While it is anticipated there will be no in-water works or works within the floodplain associated with the tributary of Hawkesbury Creek, habitat assessments were completed by MMM (2017) on the 140 m section within the Highway 34 interchange right-of-way. The reach of the tributary that could be accessed upstream of Highway 34 exhibited minimal flow and was choked with vegetation (MMM, 2017). Further habitat descriptions for that tributary can be found in **Appendix B**. During the assessment of the tributary, unidentified young-of-the-year (YOY) baitfish were observed (MMM, 2017).

4.0 Impact Assessment

In general, unmitigated bridge replacement works have the potential to impact fish and fish habitat in the following ways:

- Riparian vegetation clearing resulting in an increase in erosion potential, change in shade cover and loss of external nutrient and energy inputs
- Removal of aquatic vegetation, if present, resulting in a loss of habitat structure and cover, including changed sediment concentrations, water temperature, food supply, nutrient concentration and dissolved oxygen levels
- Removal of accumulated debris and riparian vegetation that is important for cover and food production
- Potential mortality, entrapment or entrainment of fish in machinery (e.g., by-pass pumps, screens) or materials (e.g., dams, barriers) used during construction
- Disruption of fish passage and interruption of critical life stages (e.g., spawning, migration)
- Potential partial constriction of flow through the placement of materials or structures in the water
- Siltation at the site and sedimentation to downstream fish habitat
- Introduction of deleterious substances to the watercourse, including concrete/other construction debris and petroleum products from heavy machinery.

In order to determine the impact of the proposed bridge replacement work, the DFO *Pathways of Effects* (PoE) diagrams from the MTO *Environmental Guide to Fish and Fish Habitat*, June 2009 (the Guide) were reviewed and assessed against the planned construction activities (as described in **Section 2.0**).

Based on the description of activities provided above, while no actual in-water work is anticipated, some works are considered within the high water mark or active floodplain within 30 m of Hawkesbury Creek and its tributary. As per the Guide, the following relevant land-based, water/land-based and water-based pathways were used to assess the possible effects on fish and fish habitat:

- **Vegetation clearing** (L1) along the banks to provide access for construction activities may be required
- **Grading** (L2) resulting from site preparation activities for access and construction around the bridge piers and ramp re-configuration works north of County Road 17 and east of Highway 34
- **Excavation** (L3) resulting from removal of asphalt capping and existing armouring, excavation of locations for new piers (temporary and permanent), and pier removal (temporary and existing)
- **Use of industrial equipment** (B2) for grading, excavation, removal of old piers, installation of new piers; both temporary and permanent
- **Placement of Materials in Water** (W1) from the armouring within the high water mark around the new footing and possibly along upstream bank at points of erosion

- **Debris management** (W4) from the removal of all existing bridge structures (piers and bridge platform) and temporary support structures (temporary pier).

To identify potential residual effects after mitigation measures are incorporated into the design and/or methods of construction, an *Aquatic Effects Assessment Table* (Template 10.3) was completed and is included in **Appendix E**. Appropriate mitigation measures are expected to minimize or avoid the majority of potential negative impacts and no residual effects of the works are expected at the creek crossing after reasonable measures have been implemented. Specific construction activities proposed that have the potential to cause residual effects are outlined in **Table 1**.

Table 1: Impacts and Residual Effects for Bridge Replacement Activities

Activity	Impact	Residual Effect
Placement of materials or structures potentially within the high water mark: There will be a disruption of shoreline habitat resulting from changing mixed vegetated/armour banks to armour banks. Additionally, rip rap stone will be placed within the high water mark to mediate areas of existing erosion.	**Change in bank cover and structure:** While approximately 26 m^2 of creek bank will be affected by armouring, only approximately 50% may be within the high water mark. Therefore ~ 13m^2 of indirect habitat may be disrupted until vegetation re-establishes. Within this area, there will be ~10 m^2 of rock protection within the high water mark.	**Potential residual effects from changes in:** Placement of rock protection along this section of bank will be medium term but low impact as the banks in this section were armoured already and vegetation had established in those existing conditions. Approximately 23 m^2 of indirect habitat will be affected. Potential residual effects are anticipated to be negligible.

In summary, due to the construction activities, no harmful alterations to direct fish habitat are anticipated though a minor disruption to indirect fish habitat may occur:

- There will be the addition of two piers; one temporary and one permanent with the permanent footing and columns being approximately 3.7 m closer to the creek than the existing. The temporary pier and new permanent footing are not within the high water mark but are likely within the active floodplain within 30 m of the creek. The total footprint of permanent structure to be installed above the high water mark is ~58.5 m^2 (4.5 wide x 13.0 long).
- The replacement of armouring at the new footing and placement of rip-rap armouring along eroded sections of shoreline represents a combined total of 23 m^2 of disrupted indirect fish habitat.

The above undertakings are not anticipated to result in a loss of wetted area available as direct fish habitat but will affect immediate indirect fish habitat along the banks within the high water mark.

5.0 Mitigation

This section summarizes specific mitigation measures for the proposed in-stream activities. Examples of mitigation measures include the use of erosion/sediment controls and timing restrictions. Measures to be undertaken include:

- To protect sensitive life stages/processes of resident fish, in-water work can occur between **July 16** and **March 14** (no in-water works between March 15 and July 15), of any given year to protect spring spawning species, including Bass species
- Appropriate erosion and sediment control measures must be installed around the work area to prevent migration of loose soils and accumulated sediment downstream or to adjacent areas
    - Effective sediment and erosion control will follow MTO's E*nvironmental 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
- 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
- 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 river
- All disturbed terrestrial riparian areas will be restored to preconstruction conditions or better with a native grass seed mix and stabilized to prevent erosion.

With the mitigation described above, there are also no anticipated impacts to SAR that may be located in the vicinity of or downstream of the project.

6.0 Project Likelihood of Causing Serious Harm to Fish

Works associated with bridge replacement activities will result in the following impacts:

- Disruption of ~23 m^2 of indirect fish habitat within the high water mark due to the installation of rock protection at the new bridge footing and sections of eroded shoreline adjacent to Hawkesbury Creek.

6.1 Application of the Protocol

As per Step 1 of the Protocol, based on the proposed replacement activities for the Hawkesbury Creek/CNR Overhead and proximity of works to Hawkesbury Creek and its tributary, the following are noted. The works are within 30m of the high water mark of a permanently flowing, fish bearing watercourse and it was determined that the activities could cause impacts to a commercial, recreational or Aboriginal fishery. In accordance with Step 2 of the Protocol, through background review and agency consultation with the MNRF, it was determined that the site does not host any aquatic provincially or federally protected SAR but does provide habitat that supports a fishery and a potential species of Special Concern (River Redhorse). Following Step 3 of the Protocol, it was determined the project does not meet the conditions of any current BMP as outlined in the MTO *Best Management Practices Manual for Fisheries* (May 2018). Per Step 4, this report documents the required fisheries assessment of works to determine the likelihood that the project may result in serious harm to fish. Causing serious harm to fish is prohibited under the *Fisheries Act* unless first authorized by DFO.

Based on the above, and the results of the Aquatic Effects Assessment, the project is considered to be not likely to result in serious harm to fish (Step 5). As such, a *Project Notification Form* has been completed and has been provided as **Appendix F**.

7.0 Conclusion

Through the Aquatic Effects Assessment, it has been determined that the removal and bridge replacement works at the Hawkesbury Creek/CNR Overhead, and associated ramp activities, are not likely to result in serious harm to fish. Based on the scope of work planned for the bridge replacement and the results of this Fish and Fish Habitat Impact Assessment, a Project Notification Form has been prepared and attached for MTO review.

DILLON CONSULTING LIMITED
LONDON, ONTARIO

Mark Brobbel, M.Sc.
Fisheries Assessment Specialist

8.0 References

MMM Group. MTO Mega 3: Fish and Fish Habitat Existing Conditions Report; Mega 6 Bridges – 27-50 Hawkesbury Creek CNR Overhead W.P. 4098-10-01, 27-51 Highway 34 Underpass at County Road 17 W.P. 4203-15-00, February 2017.

Ministry of Transportation of Ontario. Best Management Practices Manual for Fisheries. Draft for Pilot. Version 2.3. May 2018.

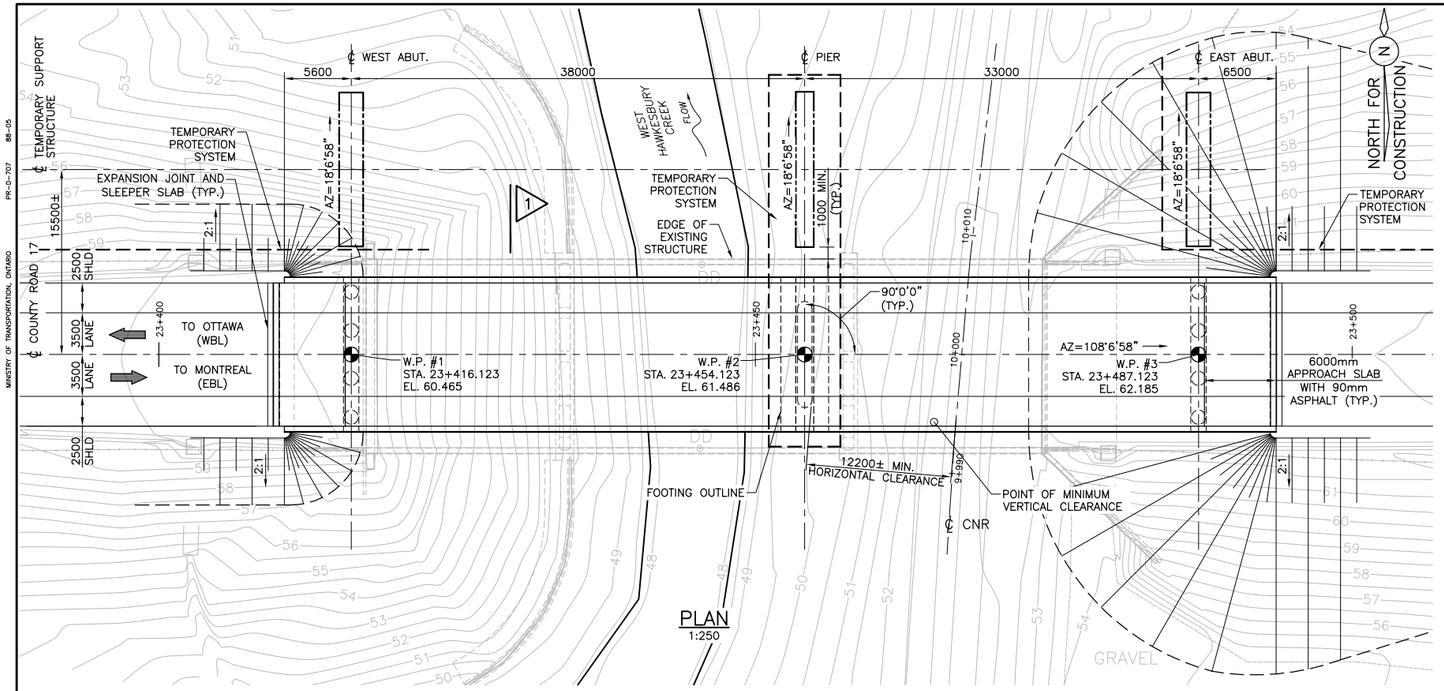
Ministry of Transportation of Ontario. Environmental Guide for Fish and Fish Habitat. June 2009.

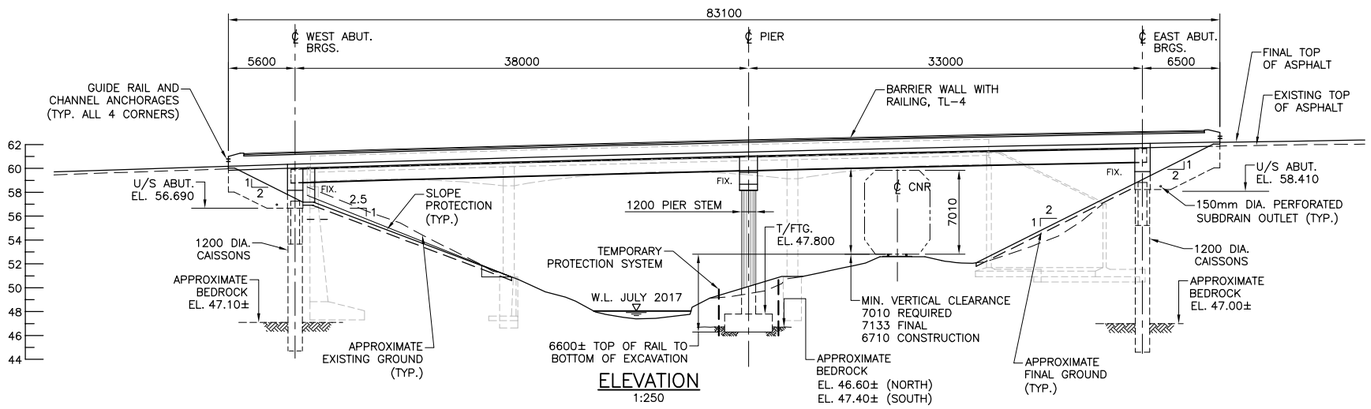
Ministry of Transportation of Ontario, Fisheries and Oceans Canada, Ministry of Natural Resources and Forestry. 2016. MTO/DFO/MNRF Revised Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings – Version 3.

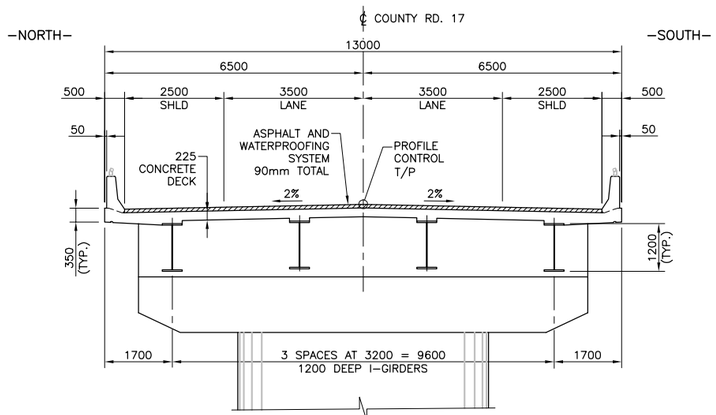
Ministry of Transportation Ontario. 2007. Environmental Guide for Erosion and Sediment Control During Construction of Highway Projects – Part of the Environmental Standards and Practices, February 2007.

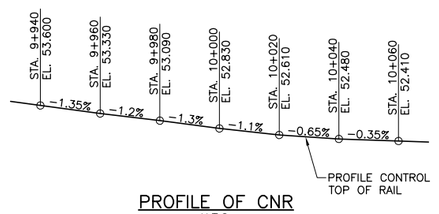
Appendix A

General Arrangement Drawings









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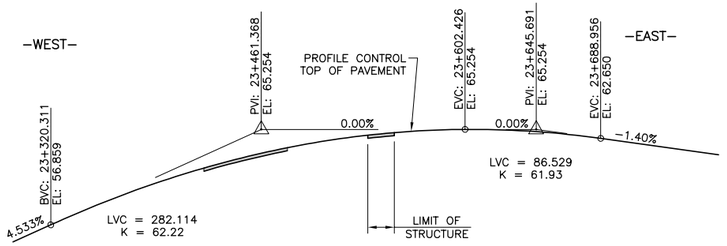

PROFILE OF COUNTY ROAD 17
N.T.S.

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0.019 x 2.0 RIB
STA. 23+415.120 CR17
8.553 LT.

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

LIST OF ABBREVIATIONS

WP	WORK POINT
T/P	TOP OF PAVEMENT
T/FTG	TOP OF FOOTING
SHLD	SHOULDER
U/S	UNDERSIDE
N.T.S	NOT TO SCALE

LIST OF DRAWINGS

1. GENERAL ARRANGEMENT
2. BOREHOLE LOCATIONS AND SOIL STRATA
3. BOREHOLE LOCATIONS AND SOIL STRATA
4. CONSTRUCTION STAGING I
5. CONSTRUCTION STAGING II
6. REMOVALS
7. FOUNDATION DETAILS
8. FOUNDATION REINFORCEMENT
9. ABUTMENT DETAILS
10. ABUTMENT REINFORCEMENT
11. PRECAST WINGWALL DETAILS
12. PRECAST WINGWALL REINFORCEMENT
13. PIER DETAILS
14. PIER REINFORCEMENT
15. STRUCTURAL STEEL I
16. STRUCTURAL STEEL II
17. STRUCTURAL STEEL III
18. STRUCTURAL STEEL IV
19. DECK DETAILS I
20. DECK DETAILS II
21. DECK REINFORCEMENT I
22. DECK REINFORCEMENT II
23. DECK REINFORCEMENT III
24. BARRIER WALL
25. RAILINGS FOR BARRIER WALL
26. 6000mm PRECAST APPROACH SLABS
27. EXPANSION JOINT AND SLEEPER SLAB
28. STANDARD DETAILS

DISTRICT

CONT. No.
WP No. 4098-13-01

HAWKESBURY BRIDGE REPLACEMENT
HAWKESBURY CREEK – CNR O/H
AND HIGHWAY 34 O/P

HAWKESBURY CREEK – CNR O/H
GENERAL ARRANGEMENT

ch2m

SHEET

METRIC

GENERAL NOTES

1. CLASS OF CONCRETE

CLASS OF CONCRETE SHALL BE 30 MPa

CLASS OF CONCRETE FOR PRECAST ELEMENTS IS SHOWN ON PRECAST ELEMENTS DRAWINGS.

2. CLEAR COVER TO REINFORCING STEEL

FOOTINGS & CAISSONS		100 ± 25
DECK	TOP	70 ± 20
	BOTTOM	40 ± 10
PIER CAPS		70 ± 10
REMAINDER – UNLESS OTHERWISE NOTED		70 ± 20

3. REINFORCING STEEL

REINFORCING STEEL SHALL BE GRADE 400W.

UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES FOR REINFORCING STEEL BARS SHALL BE CLASS B.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

GLASS FIBRE REINFORCED POLYMER REINFORCING BARS SHALL BE GRADE III AS SPECIFIED IN THE CONTRACT DRAWINGS. THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GLASS FIBRE REINFORCED POLYMER BARS.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12-1, UNLESS INDICATED OTHERWISE.

4. STRUCTURAL STEEL

ALL STRUCTURAL STEEL SHALL CONFORM TO CSA STANDARD CAN/CSA-G40.20-04/G40.21-04 (REAFFIRMED 2009) GRADE 350AT.

CONSTRUCTION NOTES

THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGN DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT AND INFORM THE CONTRACT ADMINISTRATOR.

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PRELIMINARY
NOT FOR CONSTRUCTION

APPLICABLE STANDARD DRAWINGS

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OPSD 3419.100	BARRIERS AND RAILINGS, STEEL BEAM GUIDE RAIL AND CHANNEL ANCHORAGE
OPSD 3941.200	FIGURES IN CONCRETE-SITE NUMBER AND DATE LAYOUT

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DATE	BY	DESCRIPTION

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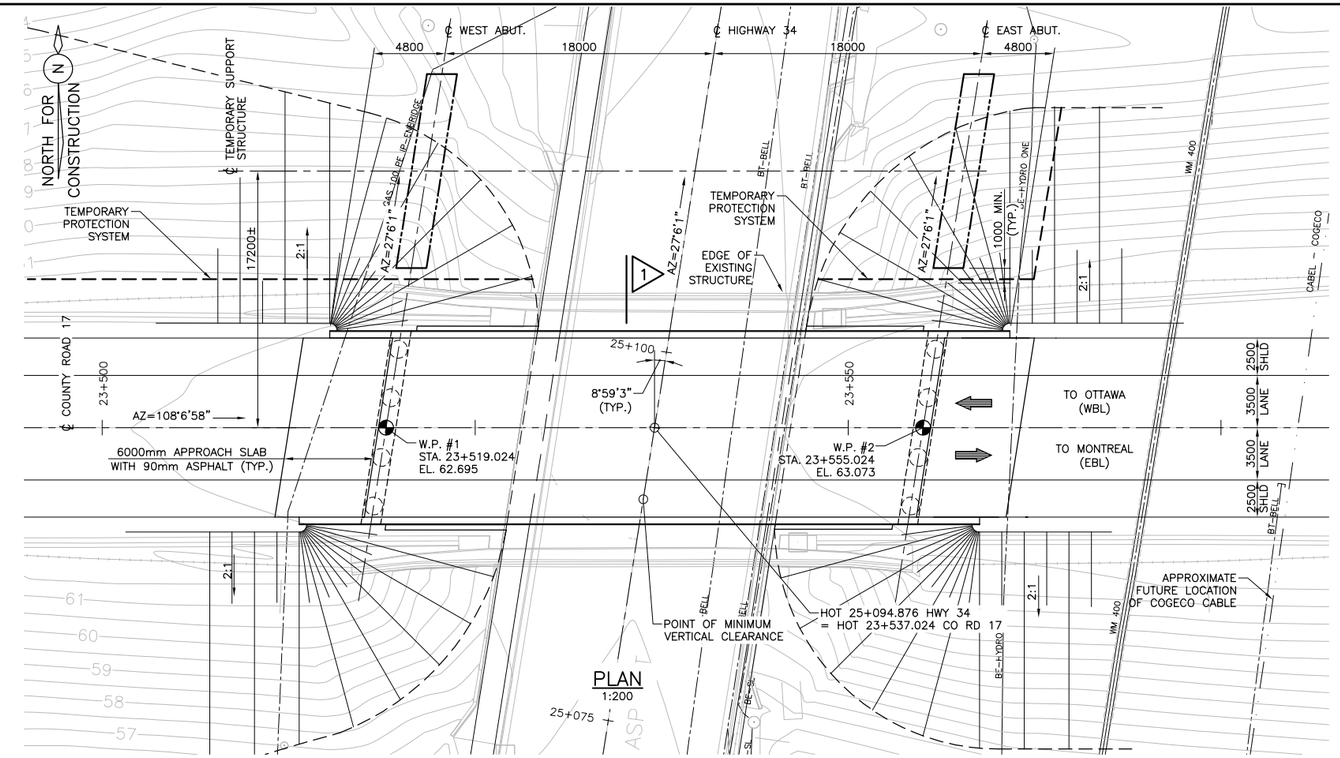

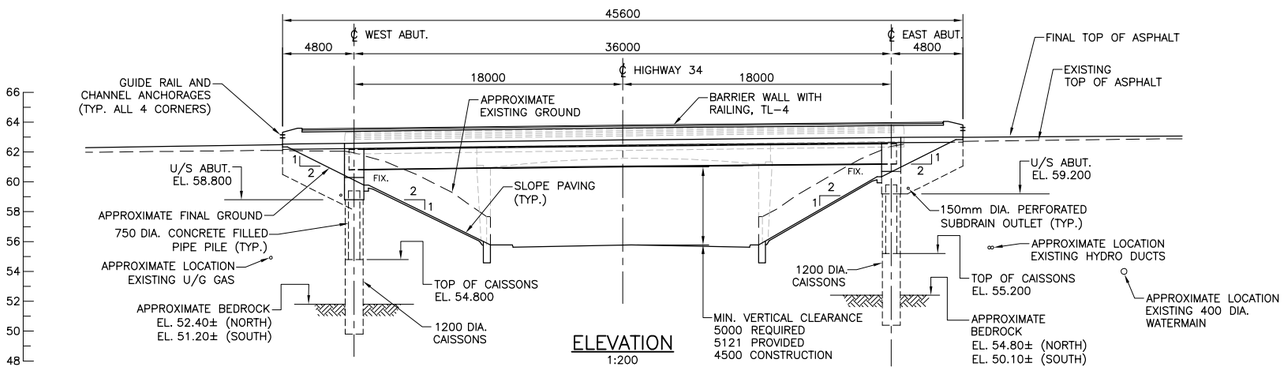

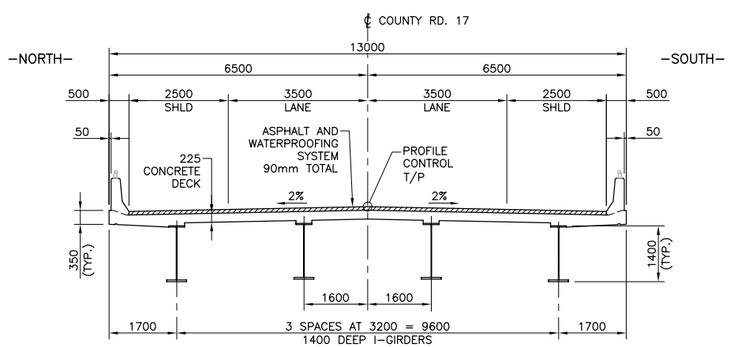

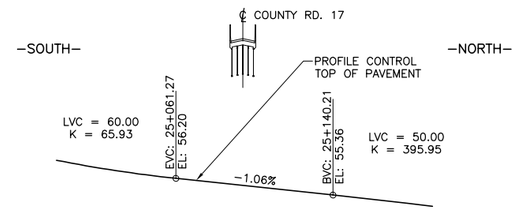

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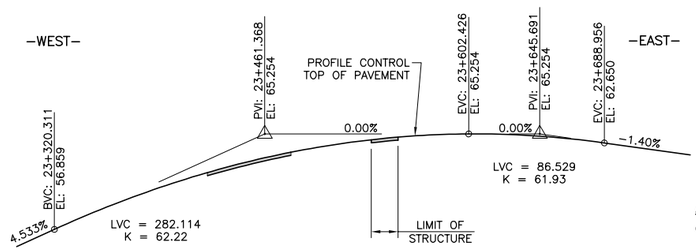

PROFILE OF COUNTY ROAD 17
N.T.S.

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U/S	UNDERSIDE
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22. DETAILS OF CONCRETE SLOPE PAVING
23. STANDARD DETAILS

DISTRICT

CONT. No.

WP No. 4140-16-01

HAWKESBURY BRIDGE REPLACEMENT
HAWKESBURY CREEK - CNR O/H AND HIGHWAY 34 O/P

SHEET

HIGHWAY 34 O/P
GENERAL ARRANGEMENT

ch2m

METRIC

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HCP 101
0.019 x 2.0 RIB
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8.553 LT.

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100mm ON ORIGINAL DRAWING

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MINISTRY OF TRANSPORTATION, ONTARIO PR-D-707 88-05

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Appendix B

MMM Fish and Fish Habitat Existing Conditions Report (February 2017)

MMM GROUP

Prepared for: Ministry of Transportation Ontario

FISH AND FISH HABITAT EXISTING CONDITIONS REPORT

MEGA 6 BRIDGES – 27-50 HAWKESBURY CREEK CNR OVERHEAD W.P. 4098-10-01
27-51 HIGHWAY 34 UNDERPASS AT COUNTY ROAD 17 W.P. 4203-15-00

February 2017

WSP | MMM GROUP

Fish and Fish Habitat Existing Conditions Report

Mega 6 Bridges

27-50 Hawkesbury Creek CNR Overhead

W.P. 4098-10-01

27-51 Highway 34 Underpass at County Road 17

W.P. 4203-15-00

FINAL

Prepared for:

Ministry of Transportation Ontario

February 2017

Submitted by:

MMM / WSP

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Appendices

Appendix A: Agency Consultation

Appendix B: Field Collection Records

Appendix C: Representative Photographs

1.0 INTRODUCTION

The Ministry of Transportation (MTO) has retained MMM Group (MMM), a subsidiary of WSP Global, to provide environmental information for the preliminary investigation and replacement alternatives analysis for the replacement of site (SN) 27-50 Hawkesbury Creek and CNR Overhead and SN 27-51 Highway 34 Underpass at County Road 17, under the re-scoping agreement, 4014-E-0015. Refer to **Table 1** and **Figure 1** for site locations. The existing bridges are contiguous to one another and they are within an area of commercial, residential and open space land use. These bridges convey County Road 17 traffic over Highway 34, Hawkesbury Creek and the CNR track, just west of the Town of Hawkesbury, in a general east to west direction.

The existing bridge at SN 27-50 is a 3-span slab on reinforced cast-in-place concrete T-beam. The bridge is approximately 57 m long and 16 m wide. Constructed in 1955, the bridge received its last rehabilitation in 1997.

The existing bridge at SN 27-51 is a single span, rigid frame, cast-in-place, reinforced concrete structure with a clear span of approximately 18.0 m. The structure is skewed at 7°57' to the Highway 34 centreline. The overall structure width is approximately 18.1 m, which is comprised of a 16.2 m wide roadway (curb-to-curb) and two 0.99 m wide safety curbs supporting concrete parapet walls with metal handrails. Constructed in 1954, the bridge received its last rehabilitation in 2014. There is a Tributary of Hawkesbury Creek approximately 90 m north of SN 27-51 that crosses through the E-W on-ramp loop and under Highway 34. Although it is beyond 30 m from SN 27-51, it is documented within this report as the scope (and area of disturbance) for the potential replacement of this structure is unknown at this time.

This report documents the fish and fish habitat component of the project. More specifically, this report describes the existing fish and fish habitat conditions at SN 27-50 and SN 27-51. As this assignment is not a detailed design of the replacement of these structures, the report does not assess impacts to fish and fish habitat. However, a general overview of design and construction considerations as they pertain to fish and fish habitat is provided in the report.

The existing conditions information described in this report can be used to complete future assessments when the final design details are available in accordance with the versions of the MTO / DFO / OMNR Fisheries Protocol for Protecting Fish and Fish Habitat on Provincial Highway Undertakings (the Protocol) and MTO Environmental Guide for Fish and Fish Habitat (*Fish Guide*) in effect at the time.

Table 1: Location of Work

Culvert	Watercourse	Highway	Township	Location (UTM Coordinates)
Site 27-50	Hawkesbury Creek	County Road 17	Township of Prescott and Russell	18 T E: 529502; N: 5049286
Site 27-51	Tributary of Hawkesbury Creek	County Road 17	Township of Prescott and Russell	18 T E: 529670; 5049327

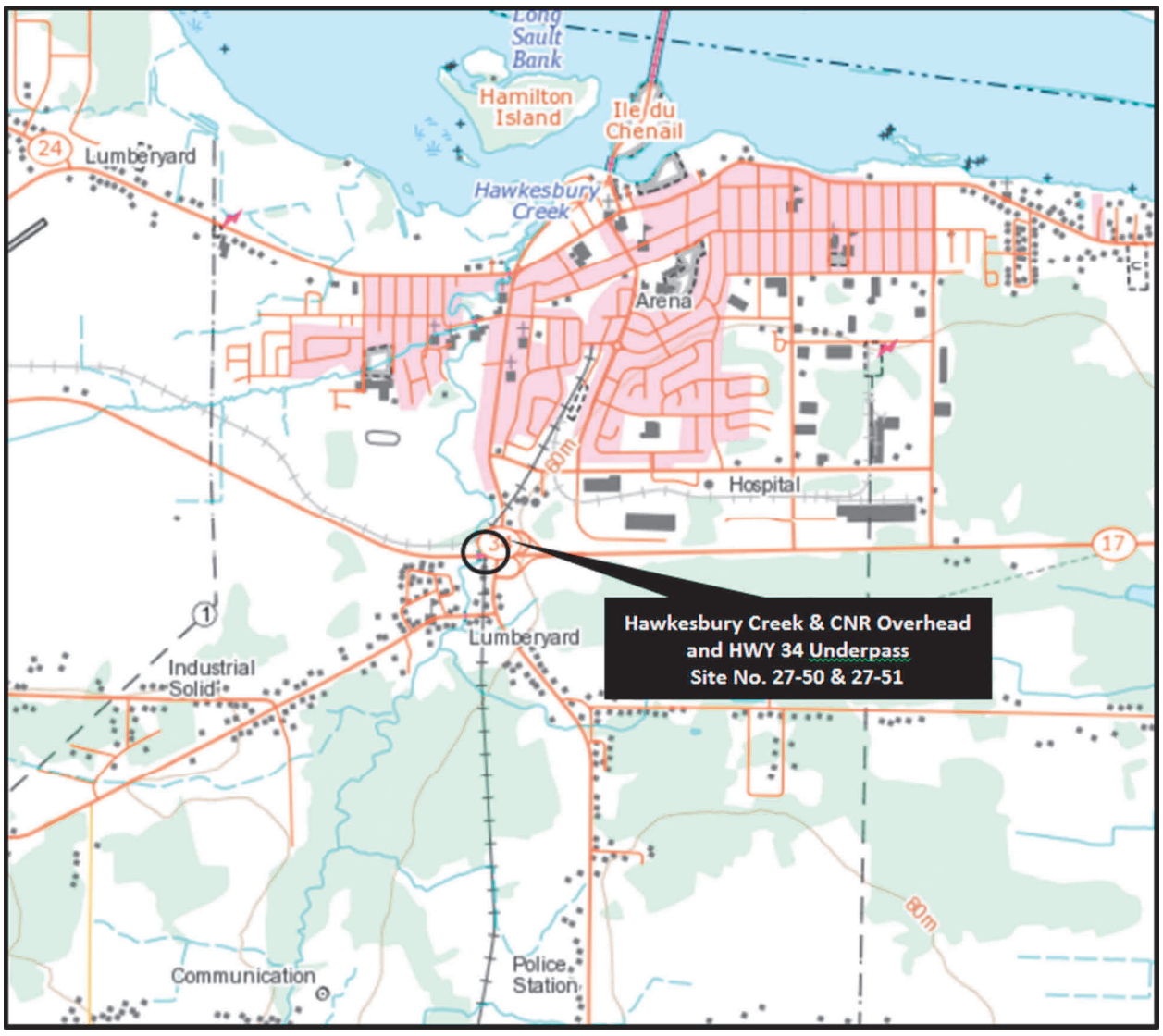


Figure 1: SN 27-50 & 27-51 Key Plan

2.0 APPROACH

Various sources of background data were consulted at the outset of the project. The Natural Heritage Information Centre (NHIC) Database was used to investigate the potential for Species at Risk (SAR) within the project limits. The Ministry of Natural Resources and Forestry (MNRF) (Erin Seabert, Fish and Wildlife Technical Specialist, Kemptville District MNRF) was contacted on August 6 and December 14, 2015 to provide available fish and fish habitat information (e.g., sensitive or specialized habitat functions, habitat classification, associated management status, thermal regime, and construction in-water timing window). In addition to the fisheries information requested, MNRF was also asked to provide any additional information regarding known or potential use by SAR. All agency consultation is provided in **Appendix A**.

A summary of background information sources reviewed include:

- topographic mapping, drainage maps and aerial photography;
- Fisheries and Oceans Canada (DFO) SAR Distribution Mapping;
- MNRF's NHIC Biodiversity Explorer database; as well as, discussions with Kemptville MNRF Biologists regarding potential SAR; and,
- consultation with Kemptville MNRF Biologists to identify and discuss fisheries information and to request sensitivity of fish and fish habitat information.

Documentation of the existing fish and fish habitat conditions of the crossing reaches was carried out according to *Section 4* of *Fish Guide* (MTO, 2009).

2.1 Field Investigations

Field surveys, including habitat mapping and fisheries community sampling, were conducted by MMM Ecologists on June 8 and October 1, 2015.

Field investigations were conducted generally in accordance with "Section 4 – Field Investigations" of the *Fish Guide*. The collection of fish habitat information during the field investigations encompassed the following parameters:

- channel dimensions, general gradient and profile;
- bank characteristics (e.g. height and erosion);
- flow characteristics, including evidence of groundwater discharge;
- morphology and substrates;
- in-water cover opportunities (e.g. woody debris, undercut banks, boulders, vegetation);
- riparian vegetation;
- presence of physical barriers to fish movement;

- presence of potential critical or specialized habitat areas including potential spawning areas, good nursery cover, holding habitat (deeper refuge pools);
- disturbances and past habitat alterations (e.g. channelization, potential pollutant point sources); and
- potential habitat enhancement opportunities.

Habitat features were documented on *Watercourse Field Record Forms* and *Fish Habitat Mapping (***Appendix B**) and photographed; representative photographs are shown in **Appendix C**.

Prior to fish community investigations, a *License to Collect Fish for Scientific Purposes* (License No. 1081563) was obtained from the MNRF Kemptville District for SN 27-50. Fish community sampling was carried out on October 1, 2015 in accordance with the Protocol. All fish captured were released unharmed back into the watercourse. The results were documented on *Fish Community Inventory Forms*, which are provided in **Appendix B**.

3.0 EXISTING FISH AND FISH HABITAT CONDITIONS

The following sections describe the existing fish and fish habitat conditions at and within the SN 27-50 and SN 27-51 study areas. The results are summarized in **Table 3** at the end of **Section 3.0**.

3.1 Species at Risk

The term SAR is used to describe species that are:

- “designated” by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which may be listed under the Species at Risk Act (SARA); and,
- “designated” by the Committee on the Status of Species At Risk In Ontario (COSSARO), including those (Endangered and Threatened) listed and regulated under Ontario's Endangered Species Act (ESA; 2007).

Consultation with Kemptville MNRF, as well as, a review of the NHIC Database and DFO SAR Mapping, indicated that there are no aquatic fish SAR in the vicinity of the study areas.

3.2 Site 27-50 Hawkesbury Creek

Hawkesbury Creek associated with SN 27-50 exhibits permanent flow and direct fish habitat up and downstream of County Road 17. The watercourse flows in a south to north direction under County Road 17. The watercourse is relatively large and a slightly meandering system. It appears to drain directly to the Ottawa River approximately 2 km downstream of the SN 27-50 structure. Refer to **Figure 2** for the Constraint Mapping. Habitat mapping for this site was completed on June 8, 2015 and fish sampling collection was completed on October 1, 2015.

3.2.1 Fish Habitat

Upstream of SN 27-50

Within the upstream assessed reach, Hawkesbury Creek flows as a defined channel and is fairly homogenous throughout. At the time of survey, there was sufficient flow observed (turbid waters) and morphology was a mix of runs (60%) and riffles (40%). The average wetted width was 10 m and depth averaged 1 m. Substrates within the runs are gravel (50%), cobble (40%) and sand (10%). Whereas substrates within the riffles are dominated by larger coarse materials, boulder (95%) and cobble (5%). There is minor in-stream cover provided by undercut banks (10%), boulders (10%), cobble (5%), emergent vegetation (5%) and minor amounts of overhanging vegetation (<5%). The banks appear to be stable with vegetation and exhibit minor areas of erosion noted by undercut banks. Banks within this reach are relatively high, averaging 3-4 m in height. The riparian vegetation consists primarily of grasses and sedges. Beyond the riparian zone, vegetation communities within this reach are dominated by Dry- Fresh Poplar Deciduous Forest Type, Dry- Fresh Sugar Maple Deciduous Forest Ecosite, and Fresh- Moist Willow Lowland Deciduous Forest Type. Approximately 50 m upstream of the SN 27-50 structure, a closed footbridge is present and spans the width of the watercourse. The footings of this structure are heavily armoured with armour stone and some slumping has occurred into the watercourse. Fish were observed within this reach and there were no barriers observed.

Downstream of SN 27-50

Hawkesbury Creek flows under the existing bridge relatively straight. The piers are beyond the active channel and (assumed) bankful channel. The banks under the bridge are fairly steep and the channel is lined with large boulders. There is erosion noted throughout this reach. There is minor vegetation growth, dominated by cultural species, under the bridge. A gravel path is present on the left bank between the channel and pier. The CNR railway is located along the east abutment. There are deck drains present on the bridge that directly discharge into Hawkesbury Creek.

Within the assessed reach, the watercourse exhibits similar morphological characteristics as the upstream reach (refer to the '*upstream'* description). Approximately 90 m downstream of SN 27-50, there is a CNR Bridge that crosses the watercourse. The bridge narrows the watercourse and as such the active channel abuts the wingwalls of the CNR Bridge. Approximately 18 m downstream of the CNR Bridge, a weir is present. At the time of survey, it was difficult to see the weir as flow was substantial. This could pose as a seasonal barrier to fish movement upstream during periods of low flow.

3.2.1.1 Fish Community

Fish community sampling was carried out on October 1, 2015 using minnow traps within the highway Right of Way (ROW) with the results documented in **Table 2**.

The aquatic habitat was found to support a fish community consisting of two baitfish species that are common in Ontario. Overall, the fish community sampled was consistent with what would be expected within the aquatic habitat present. Based on the field survey, it appears that Hawkesbury Creek within the assessed reaches supports direct fish use with potential habitat for these common species to carry out their daily life cycles.

There were abundant mussel shells observed along the right bank approximately 25 m downstream of the structure. These species were identified as Fat Mucket (*Lampsilis siliquoidea*) and Giant Floater (*Pyganodon grandis*). Both species are common in Ontario and are not at risk.

Table 2: Hawkesbury Creek Fish Community

Common Name	*Scientific Name*
Common Shiner	*Luxilus cornutus*
Longnose Dace	*Rhinichthys cataractae*

3.3 Tributary of Hawkesbury Creek

The Tributary of Hawkesbury Creek appears to be a permanently flowing watercourse which flows in an east to west direction, approximately 90 m north of SN 27-51. It flows parallel to County Road 17, originating east of the off-ramp to Highway 34 in a wetland feature. It then flows under the off-ramp and the on-ramp (to County Road 17 Westbound) through an approximately 35 m long box culvert. It then flows for approximately 135 m through the interchange loop and under Highway 34 through a box culvert. It likely discharges into Hawkesbury Creek, approximately 130 m downstream, however this was not field-verified due to limited access to private property. Refer to **Figure 2** for the Constraint Mapping. Habitat mapping for this site was completed on October 1, 2015.

The habitat descriptions below are in reference to Highway 34 i.e. east of Highway 34 is 'upstream' whereas west of Highway 34 is 'downstream'.

3.3.1 Fish Habitat

Upstream of Highway 34

Within the upstream assessed reach, Tributary of Hawkesbury Creek flows westerly through a defined flow path with undefined banks through most of the channel. There is abundant watercress throughout the channel and was densely observed at the culvert inlet and outlet of the off-ramp culvert which indicates the reach is supported by groundwater inputs and as such flows within Tributary of Hawkesbury Creek are likely to be permanent.

At the time of survey, there was nominal flow observed furthest upstream (i.e. at the culvert inlet of the off-ramp to Highway 34) and morphology was dominantly riffles. The average wetted width was 2.5 m and depth averaged 0.3 m. Substrates are primarily fine, dominated by sand (40%), muck (40%), and clay (20%). The channel was choked with vegetation consisting primarily of Reed Canary Grass (*Phalaris arundinacea*), other grasses, sedges and cattails and watercress. Abundant in-stream cover is provided by emergent / submergent vegetation (90%) and minor amounts of overhanging vegetation (<5%). The banks are undefined due to the vegetation and softer substrates and are relatively low given the low gradient channel characteristics. The riparian vegetation consists primarily of grasses, sedges and cattails. As the flow path approaches the culvert inlet at Highway 34, there is a steep step – pool sequence over bedrock and tree roots. The wetted width of this drop was approximately 0.75 m. The drop extends over 25 m in length and is approximately over 2 m in height. The channel widens substantially at the culvert inlet of Highway 34 as the box culvert is approximately 2 m in width. Sheet flow was observed within the culvert. Watercress is present within the channel at this location and at the culvert inlet and outlet at Highway 34. Highway drainage along the ditches drain into the channel.

Fish were observed only within the uppermost upstream reaches i.e. at the culvert outlet of the off-ramp. Both the densely choked channel and the steep drop likely act as a barriers to fish movement.

Downstream of Highway 34

This reach was not assessed as the culvert outlet and channel is bounded by private residences and permission to enter was not obtained. However, it was noted that the channel narrows substantially from the culvert outlet, approximately 2 m within the culvert to roughly 0.5 m. The channel appears to be more open within this reach as compared to what was obverted in the upstream reaches. From the culvert outlet, watercress was observed within the channel.

3.3.1.1 Fish Community

Fish community sampling was carried out on October 1, 2015 using dip nets.

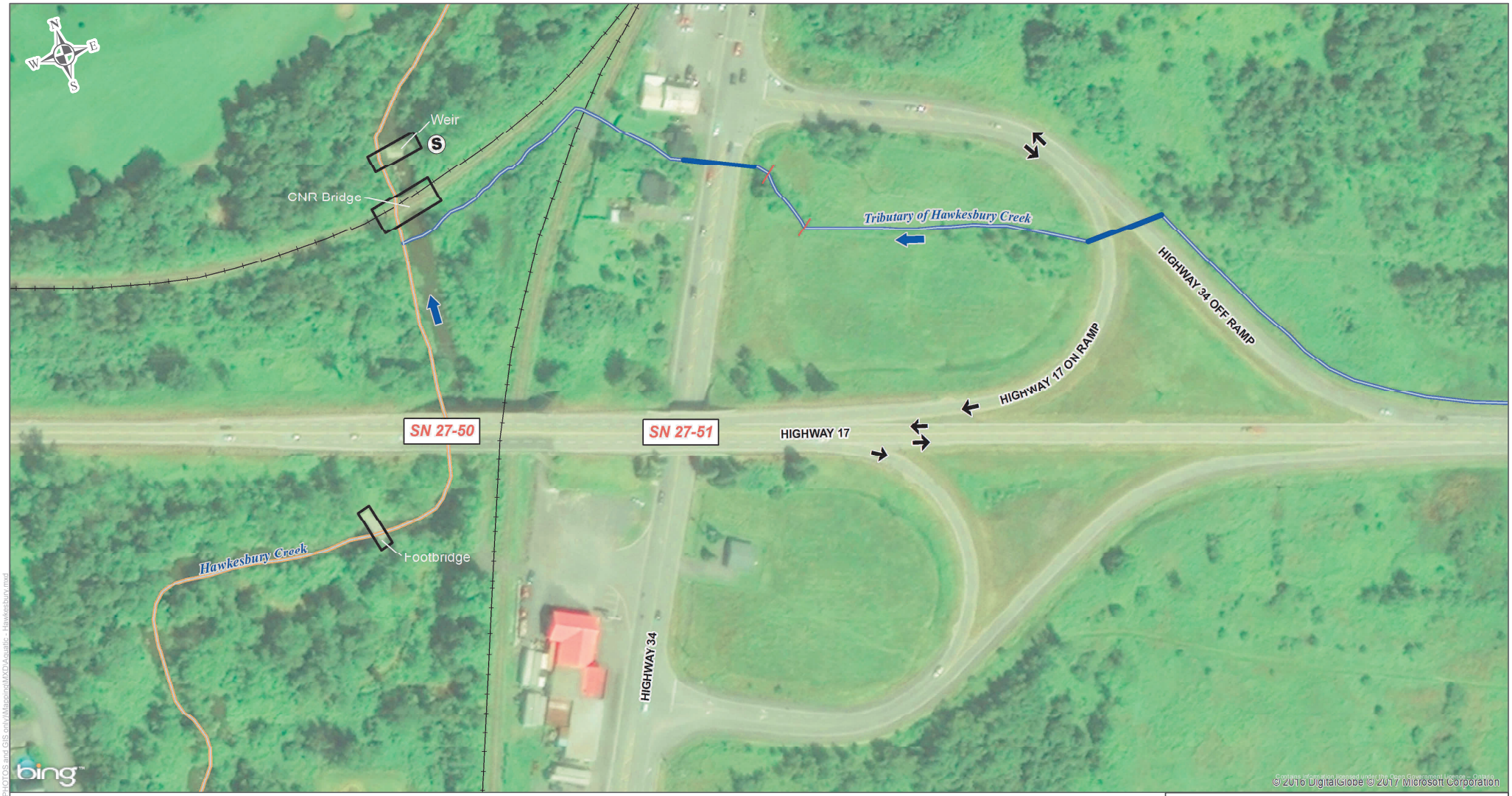
The aquatic habitat was found to support a fish community consisting of Young of the Year (YOY) baitfish species. Fish were only collected at the culvert outlet of the off-ramp. Given the barrier present at Highway 34, it is likely that these baitfish species are restricted to the upstream reaches where they are able to carry out their daily life cycles. Overall, given the permanency of the feature and the baitfish species observed, the Tributary of Hawkesbury Creek supports direct fish use.

3.4 Existing Fish and Fish Habitat Conditions Summary

The following table provides a summary of the fish community and fish habitat present in the study areas.

Table 3: Existing Fish and Fish Habitat Conditions Summary at SN 27-50 and SN 27-51

Site & Watercourse Name	Flow (Permanent/ Intermittent/ Ephemeral)	Thermal Regime (Warm/ Cool/Cold)	Substrate Type	Vegetation (Riparian & In-stream)	Supports a Fishery (Direct, Indirect or None)	Fish Species Present
Site 27-50 Hawkesbury Creek	Permanent	Warmwater	Homogenous upstream and downstream Runs: Gr (50%) Co (40%) Sa (10%) Riffles: Bo (95%) Co (5%)	Riparian: forest, grasses, sedges In-water: Filamentous algae; Water Plantain	Direct	Longnose Dace Common Shiner
Site 27-51 Tributary of Hawkesbury Creek	Permanent	Coldwater (due to watercress presence)	Upstream Riffles: Sa (40%) Mu (40%) Cl (20%)	Riparian: Cultural meadow, grasses, sedges In-water: Watercress, cattail, grasses	Upstream: Direct Downstream: Unknown	YOY Baitfish



Legend

Barriers

- S — Seasonal Barrier to Fish Movement
- Permanent Barrier to Fish Movement
- Direction of Traffic
- Flow Direction
- Railway
- Culvert
- Permanent Watercourse

Thermal Regime

- Coldwater
- Warmwater

30 15 0 30 60 90 Metres

Client:	Ministry of Transportation
Title:	Hawkesbury Creek – CNR Bridge and Highway 34 Underpass Site: SN 27-50 & SN 27-51 Fish Habitat Constraint Mapping
Prepared by:	WSP | MMM GROUP
15M-00657-05-00A-NE1	Scale as Shown | Review: JE
Date: January 2017	Figure: 2
© Queen's Printer for Ontario	

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4.0 DESIGN AND CONSTRUCTION CONSIDERATIONS

Based on the re-scoping agreement, 4014-E-0015, the existing fish and fish habitat information documented in this report is intended to provide information for the preliminary investigation and replacement alternatives analysis for the replacement of SN 27-50 Hawkesbury Creek and CNR Overhead and SN 27-51 Highway 34 Underpass at County Road 17. This section describes construction-related impacts associated with bridge replacements on fish and fish habitat and describes design-related considerations that should be considered. Once the project moves forward with detail design, an impact assessment report should be completed following the latest version of the Protocol that is currently in place.

Typical construction-related impacts associated with bridge replacements include risk of erosion and sediment influx and downstream transport, potential for introduction of contaminants or debris, and disturbance / stress to local fish (if in-water work is required). These impacts can be managed with proper implementation of standard mitigation measures.

4.1 Site 27-50 Hawkesbury Creek

It is recommended that the existing deck drains, which drain directly to Hawkesbury Creek be removed if possible and drainage directed to the vegetated areas along the embankments of County Road 17 prior to entering the watercourse. In addition, it is recommended that any temporary or permanent footprint below the bankfull channel (2-year flow) be avoided to reduce negative impacts to fish and fish habitat. It is assumed that this is possible given the current location of the bridge piers (i.e. out of the active channel). If in-water works cannot be avoided, construction must abide by the warmwater timing window (i.e. no work between March 15 to July 15). Specific mitigation measures need to be determined upon detail design for the replacement of SN 27-50 and method of construction. As stated above, an impact assessment should be completed upon finalization of the design details in accordance with the latest version of the Protocol.

4.2 Site 27-51 Highway 34 Underpass at County Road 17

Given the Tributary of Hawkesbury Creek is greater than 30 m from SN 27-51, it is unlikely that an impact assessment is required for the replacement of this structure. However, standard mitigation measures such as erosion and sediment control around the work area is recommended to be installed to prevent sediment transport to the watercourse as road drainage that runs along / under the bridge and along Highway 34 outlets to this watercourse.

If any works are within 30 m, an impact assessment should be completed following the latest version of Protocol and specific mitigation measures would need to be determined upon detail design for those works that are within 30 m and are associated with the replacement of SN 27-51 and its method of construction.

REFERENCES

NHIC (Natural Heritage Information Centre). 2014. Biodiversity Explorer Website: [accessed 2015].

Ministry of Transportation. June 2009. *Environmental Guide for Fish and Fish Habitat*.

Seabert, E. Ministry of Natural Resources and Forestry – Kemptville District, Natural Heritage Biologist Intern. Personal Communication. August 6 and December 14, 2015.

APPENDIX A

Agency Consultation

MMM Group Limited
100 Commerce Valley Drive West,
Thornhill, Ontario, L3T 0A1
t: 905.882.1100 | f: 905.882.0055

www.mmm.ca

June 2, 2015
3415003

Kerry Reed
Ministry of Natural Resources and Forestry
Kemptville
Provincial Government Bldg, 1st Flr
10 Campus Dr
PO Box 2002
ON K0G1J0

Subject: Information Request for the Preliminary Design of the Proposed Rehabilitation of 21 Structures (Mega 6) in Various Locations in Eastern Region

Dear Ms. Reed,

In accordance with the MTO / DFO / MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Highway Undertakings (2006), this letter is to provide notification to the Ministry of Natural Resources and Forestry (MNRF) that the Ministry of Transportation (MTO) is undertaking works in various locations within your region for the rehabilitation of 21 structures (refer to the attached Goggle Earth KMZ file). The following list of structures are proposed for rehabilitation, those highlighted in blue are fisheries structures:

- 3-540 - #15 E-S Ramp over S-W Ramp Highway 416/417
- 3-542/1 & 3-542/2 – Richmond Road U/P EBL & WBL
- 3-543/2 & 3-543/1 – Baseline Road U/P Highway 416 WBL & EBL
- 3-550/1 & 3-550/2 – Jock River Bridge SBL & NBL
- 3-552 – Barnsdale Road U/P
- 3-553 – Bankfield Road U/P
- 3-554 – Century Road U/P
- 3-357 – Highway 44 U/P
- 3-569 – Mcgee Road U/P
- 3-570 – Richardson Road U/P
- 3-288 – Highway 7 Connection Interchange O/H
- 27-198 – Regional Road #8 U/P
- 27-50 – Hawkesbury Creek & CNR Overhead
- 3-39/1 & 3-39/2 – Richmond Road U/P NBL & SBL
- 3-40 – Pinecrest Avenue U/P

- 3-41 – Woodroffe Avenue U/P
- 3-42 – Maitland Avenue U/P

As per Step 3 of the MTO / DFO / MNRF Fisheries Protocol, we request that MNRF please complete the attached Table 1 listing all watercourse crossings within the study area.

I also ask that you please provide the following background information, if available:

- Fish dot community data / files;
- Significant natural features;
- Species at Risk (SAR) site review;
- Natural heritage features;
- Wetlands (Provincially significant or unevaluated);
- Area of Natural or Scientific Interests (ANSI); and
- Other significant natural features

Please feel free to contact the undersigned at (905) 882-4211 ext. 1382 if you have any questions regarding this information. We look forward to your response.
Yours very truly,

MMM GROUP

Jenny Enoae, M.Sc.
Project Ecologist - Fisheries
Ecology Department

Enclosure: Google Earth KMZ file
Table 1: MNRF Background Fish and Fish Habitat Information Summary Request

Table 1: MTO Mega 6 Project: MNRF Background Fish and Fish Habitat Information Summary Request

Waterbody Name and Location (GPS coordinates)	Watercourse Classification (i.e. warmwater, coldwater)*	Habitat Type (i.e. watercourse, wetland, pond, lake, etc.)	Existing Habitat Information and Locations (fish passage barriers, known spawning habitats etc.)*	Historical Data on Fish Species Present (including whether the waterbody is considered to support aquatic Species at Risk)*	MNRF Fisheries Management Objectives (if applicable)*	MNRF Interpretation of Fish and Fish Habitat Sensitivity (Scale of Low, Moderate, or High or Unknown)*	MNRF Specified In-water Timing Windows for Construction*
3-550/1 & 3-550/2 – Jock River Bridge SBL & NBL (approximate location: 18 T 438736 5010856)		Permanent Watercourse					
27-198 – Regional Road #8 U/P[1] (approximate location: 18 T 469967 5020836)		Drainage feature connected to a permanent watercourse ~700 m west of Regional Road #8 U/P					
27-50 – Hawkesbury Creek & CNR Overhead (approximate location: 18 T 529502 5049277)		Permanent Watercourse					

***MNRF to provide available information in these fields.**

[1] Information requested is for the watercourse feature ~700 m to the west of the bridge

MTO - Mega 6 Project - MNRF Kemptville

Structure	UTM Zone	UTM E	UTM N	Fisheries	Geo Twp	Lot	Con	Potential SAR	Other Possible Natural Heritage Features	Fisheries Sensitivity	In-water timing window	Fish community
3-540 - #15 E-S Ramp over S-W Ramp Highway 416/417	18T	436101	5021138		Nepean	15	2 on the Ottawa R.	butternut, milksnake, snapping turtle, barn swallow	none documented			
3-542/1 & 3-542/2 – Richmond Road U/P EBL & WBL	18T	436373	5020567		Nepean	15	2 on the Ottawa R.	butternut, milksnake, snapping turtle, barn swallow	none documented			
3-543/2 & 3-543/1 – Baseline Road U/P Highway 416 WBL & EBL	18T	436472	5020327		Nepean	15	2 on the Ottawa R.	butternut, milksnake, snapping turtle, barn swallow	none documented			
3-550/1 & 3-550/2 – Jock River Bridge SBL & NBL	18T	438736	5010856	X	Nepean	14	4	butternut, milksnake, snapping turtle, barn swallow, eastern musk turtle, Eastern Meadowlark, Bobolink, Bridle Shiner	significant woodlands nearby. Jock River, carps and minnow nusery area, walleye, rock bass, and northern pike nursery nearby	low sensitivity	see info request response	Species documented: brown bullhead, white sucker, common carp, northern pike, muskellunge, johnny darter/tesselated darter, banded killifish, pumpkinseed, smallmouth bass, silver redhorse, shorthead redhorse, golden shiner, common shiner, spottail shiner, bluntnose minnow, fathead minnow, creek chub, central mudminnow, bridle shiner, greater redhorse, rock bass, walleye, logperch
3-552 – Barnsdale Road U/P	18T	441211	5008390		Nepean	6	3	butternut, milksnake, snapping turtle, barn swallow, eastern musk turtle, Eastern Meadowlark, Bobolink	Significant woodlands nearby			
3-553 – Bankfield Road U/P	18T	442129	5006518		Nepean	1	3	butternut, milksnake, snapping turtle, barn swallow, eastern musk turtle, Eastern Meadowlark, Bobolink	none documented			
3-554 – Century Road U/P	18T	443101	5004785		North Gower	5	2	butternut, milksnake, snapping turtle, barn swallow, eastern musk turtle, Eastern Meadowlark, Bobolink	Significant woodlands nearby			

3-357 – Highway 44 U/P	18T	417150	5018238		Huntley	15	5	Butternut, Barn swallow, Blanding's turtle, milksnake, snapping turtle, Whip-poor-will	significant woodlands and unevaluated wetlands nearby			
3-569 – Mcgee Road U/P	18T	419728	5016471	X	Huntley	11	5	Butternut, Barn swallow, Blanding's turtle, milksnake, snapping turtle, Bobolink, Eastern Meadowlark, Whip-poor-will	significant woodlands and unevaluated wetlands nearby. No watercourse documented here	low sensitivity	see info request response	Fish Species documented in nearby Huntley Creek: brown bullhead, white sucker, brook stickleback, pumpkinseed, golden shiner, common shiner, bluntnose minnow, fathead minnow, creek chub, central mudminnow, Phoxinus sp., eastern blacknose dace, northern redbelly dace, mottled sculpin, johnny darter/tesselated darter
3-570 – Richardson Road U/P	18T	421875	5014278		Huntley	5	5	Butternut, Barn swallow, Blanding's turtle, milksnake, snapping turtle, Bobolink, Eastern Meadowlark	significant woodlands and unevaluated wetlands nearby			
3-288 – Highway 7 Connection Interchange O/H	18T	423553	5013482		Huntley	3	4	Butternut, Barn swallow, Blanding's turtle, milksnake, snapping turtle	significant woodlands and unevaluated wetlands nearby			
27-198 – Regional Road #8 U/P	18T	469967	5020836	X	Cumberland	26	8	Butternut, Barn swallow, milksnake, snapping turtle, Bobolink, Eastern Meadowlark	none documented. No watercourse Documented at this UTM (nearest is Shaw's Creek)	low sensitivity	see info request response	Fish species documented in Shaw's Creek: Golden shiner and pumpkinseed
27-50 – Hawkesbury Creek & CNR Overhead	18T	529502	5049277	X	West Hawkesbury	11	1		significant woodlands and unevaluated wetlands nearby. Hawkesbury Creek on-site	low sensitivity	see info request response	no fish species data available
3-39/1 & 3-39/2 – Richmond Road U/P NBL & SBL	18T	436888	5021642		Nepean	17	2 on the Ottawa R.	butternut, milksnake, snapping turtle, barn swallow	none documented			
3-40 – Pinecrest Avenue U/P	18T	438126	5022090		Nepean	21	2 on the Ottawa R.	Butternut, Barn Swallow	none documented			
3-41 – Woodroffe Avenue U/P	18T	439833	5023352		Nepean	26	2 on the Ottawa R.	Butternut, Barn Swallow	none documented			
3-42 – Maitland Avenue U/P	18T	440912	5024378		Nepean	29	2 on the Ottawa R.	Butternut, Barn Swallow	none documented			

Ministry of Natural Resources and Forestry

Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

Ministère des Richesses naturelles et des Forêts

District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Ontario

Thu. Aug 6, 2015

Jenny Enoae
MMM Group Limited
100 Commerce Valley Dr. West
Thornhill, Ontario
L3T 0A1
(905) 882-4211
enoaej@mmm.ca

Attention: Jenny Enoae

Subject: Information Request - Infrastructure (Drain, Bridge, Culvert)
Project Name: Proposed Rehab/Replacement of 17 Bridge Locations Across KVD; File Name MTO Mega 5 Bridge Rehab/Replacement
Site Address: Many Locations Across Kemptville District; Mainly Ottawa Area
Our File No. 2015_KVD-3140

Natural Heritage Values

The Ministry of Natural Resources and Forestry (MNRF) Kemptville District has carried out a preliminary review of the area in order to identify any potential natural resource and natural heritage values.

Natural heritage features and values contribute to the province's rich biodiversity and provide habitat for a variety of species. The following Natural Heritage values were identified:

- Fish Nursery, Carps and Minnows Nursery Area
- Fish Nursery, Northern Pike Nursery Area
- Fish Nursery, Rock Bass Nursery Area
- Fish Nursery, Walleye Nursery Area
- River, Jock River
- Stream, Hawkesbury Creek
- Stream, Shaws Creek
- Unevaluated Wetland (Not evaluated per OWES)

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10 Campus Drive
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Municipal Official Plans contain additional information related to natural heritage features. Please see the local municipal Official Plan for more information such as specific policies and direction pertaining to activities which may impact natural heritage features. For planning advice or Official Plan interpretation, please contact the local municipality.

Where natural values and natural hazards exist (e.g., floodplains), there may be additional approvals and permitting required from the local Conservation Authority. The MNRF strongly recommends contacting the local Conservation Authority for further information and approvals. Please see the MNRF Kemptville Information Guide (2012) for contact information pertaining to Conservation Authorities located within the Kemptville District area.

For additional information and online mapping tools, please see the Natural Heritage Information Centre (NHIC), where additional data and files can be downloaded in both list and digital format. In addition sensitive species information can be requested and accessed through the NHIC at NHICrequests@ontario.ca.

In Addition, the following Fish species were identified: banded killifish, bluntnose minnow, bridle shiner, brook stickleback, brown bullhead, central mudminnow, common carp, common shiner, creek chub, eastern blacknose dace, fathead minnow, golden shiner, greater redhorse, johnny darter/tesselated darter, logperch, mottled sculpin, muskellunge, northern pike, northern redbelly dace, Phoxinus sp., pumpkinseed, rock bass, shorthead redhorse, silver redhorse, smallmouth bass, spottail shiner, walleye, white sucker. Please refer to attached summary document for specific details on fish species.

Water

Where the site is adjacent to or contains a watercourses or waterbodies, additional considerations apply. If any in-water works are to occur, there are timing restriction periods for which work in water can take place (see below). Appropriate measures should be taken to minimize and mitigate impact on water quality and fish habitat, including:

- including the installation of sediment and erosion control measures;
- avoiding removal alteration or covering of substrates used for fish spawning, feeding, over-wintering or nursery areas; and
- debris control measures should be put in place to manage falling debris (e.g. spalling).

A work permit from the MNRF may be required pending further details regarding the proposed works. No encroachment on the bed or banks of the waterbody (e.g. abutments, embankments, etc.) is permitted until MNRF approval and clearance has been issued. In order for MNRF staff to determine when a work permit is required, additional information can include:

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Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

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District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
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- Detailed drawings (existing and proposed)
- Location mapping
- Registered Plan survey
- Site photographs
- Public Lands Act Forms - application forms, ownership form and landowner notification form.

The MNRF does not have any water quality or quantity data available. We recommend that the Ministry of the Environment and Climate Change be contacted for such data along with the local Conservation Authority. For further information regarding fish habitat and protocols, please refer to the following interagency, document, *Fish Habitat Referral Protocol for* Ontario at: http://www.MNRF.gov.ca/264110.pdf

Timing restriction periods in MNRF Kemptville District*:

Warmwater → March 15 – June 30
→ March 15 – July 15 for St. Lawrence River & Ottawa River
Coldwater → October 1 – May 31
Mixed lakes → October 1 – June 30 (Big Rideau & Charleston)

* *Please note: Additional timing restrictions may apply as it relates to Endangered and Threatened Species, including works in both water and wetland areas.*

	FISH SPECIES	TIMING WINDOW
Spring:	Walleye	March 15 to May 31
	Northern Pike	March 15 to May 31
	Lake Sturgeon	May 1 to June 30
	Muskellunge	March 15 to May 31
	Largemouth/Smallmouth Bass	May 1 to July 15
	Rainbow Trout	March 15 to June 15
	Other/Unknown Spring Spawning Species	March 15 to July 15

	FISH SPECIES	TIMING WINDOW
Fall:	Lake Trout	October 1 to May 31
	Brook Trout	October 1 to May 31
	Pacific Salmon	September 15 to May 31
	Lake Whitefish	October 15 to May 31
	Lake Herring	October 15 to May 31
	Other/Unknown Fall Spawning Species	October 1 to May 31

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District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

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Additional approvals and permits may be required for the proposed works as it relates to the Fisheries Act. Please contact your local Conservation Authority and the Department of Fisheries and Oceans to determine requirements and next steps. Where the Fisheries Act is triggered and habitat compensation, mitigation measures or best management practices are being considered; as the MNRF is charged with the management of Provincial fish populations, the MNRF requests ongoing involvement in such discussions in order to ensure population conservation. Furthermore, local Conservation Authorities may also have additional approvals for works in and adjacent to water and wetland features. Finally, Transport Canada's Navigable Waters Protection Division may require review and approval of the proposed project. Please contact these local agencies directly for more information.

Timing restrictions apply from October 16 – March 15 to protect at-risk hibernating turtles. If the proposed works are to occur during this time, the MNRF recommends fencing off the site in early fall to prevent turtles from hibernating there. Caution should also be taken during the turtle nesting season in June and early July as turtles use embankments and other terrestrial site for nesting. During the active season (April 1 – October 30) the MNRF recommends a thorough sweep of the area before works begin to encourage any turtles using the site to move away.

Where drainage works are proposed within wetland areas, the MNRF is concerned is the impacts to the hydrology and ecology of the wetland, which may have impacts on species and their habitats. For example, changing water levels as a result of drainage works may impact turtles or nesting birds, some of which may be protected under legislation such as the Endangered Species Act or the Fish and Wildlife Conservation Act. Therefore a consideration for direct and indirect impacts to species and their habitats is imperative.

Where drainage works occur within the originally approved drainage footprint, as per the Drainage Act, there are no Public Land's Act requirements from the MNRF. However, other MNRF legislation may apply including, but not limited to the Endangered Species Act, 2007

MNRF is streamlining and automating its approvals processes for natural resource-related activities. Some activities that may otherwise contravene the ESA may be eligible to proceed without a permit from MNRF provided that regulatory conditions are met for the ongoing protection of species at risk and their habitats. To proceed under the regulation with ongoing maintenance and improvement of drainage infrastructure that would adversely affect endangered or threatened species or their habitat, a person must register with the Ministry of Natural Resources and Forestry and follow the rules in regulation.

For more information please check out the following link http://www.ontario.ca/environment-and-energy/ditch-and-drainage-work-and-endangered-or-threatened-species

Ministry of Natural Resources and Forestry

Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

Ministère des Richesses naturelles et des Forêts

District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Ontario

Species at Risk

With the new Endangered Species Act (ESA, 2007) in effect, it is important to understand which species and habitats exist in the area and the implications of the legislation. A review of the Natural Heritage Information Centre (NHIC) and internal records and aerial photograph interpretation indicate that there is a potential for the following Threatened (THR) and/or Endangered (END) species on the site or in proximity to it:

- Barn Swallow (THR)
- Blanding's Turtle (THR)
- Bobolink (THR)
- Butternut (END)
- Eastern Meadowlark (THR)
- Whip poor will (THR)

Please refer to the attached summary document for detailed SAR lists. All Endangered and Threatened species receive individual protection under section 9 of the ESA and receive general habitat protection under Section 10 of the ESA, 2007. Thus any potential works should consider disturbance of possible important habitat (e.g. nesting sites). Please note that as of June 30, 2013 general habitat protection applies to all Threatened and Endangered species. The habitat of these listed species is protected from damage and destruction and certain activities may require authorization(s) under the ESA. Please keep this date in mind when planning any species and habitat surveys

Species receiving General Habitat protection:

- Barn Swallow (THR)
- Blanding's Turtle (THR)
- Bobolink (THR)
- Butternut (END)
- Eastern Meadowlark (THR)
- Whip poor will (THR)

If the proposed activity is known to have an impact on the species mentioned above or any other SAR, an authorization under the Endangered Species Act, 2007 (ESA) may be required. It is recommended that MNRF Kemptville be contacted prior to any activities being carried out to discuss potential survey and mitigation measures to avoid contravention of the ESA.

Habitat has been identified within the project area that appears suitable for one or more species listed by SARO as Special Concern (SC). In Addition, one or more Special Concern species has been documented to occur either on the site or nearby. Species listed as Special Concern are not

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protected under the ESA, 2007. However, please note that some of these species may be protected under the Fish and Wildlife Conservation Act. Species of Special Concern for consideration:

- Bridle Shiner (SC)
- Eastern Musk Turtle (SC)
- Milksnake (SC)
- Snapping Turtle (SC)

If any of these or any other species at risk are discovered throughout the course of the work, and/or should any species at risk or their habitat be potentially impacted by on site activities, MNRF should be contacted immediately and operations be modified to avoid any negative impacts to species at risk or their habitat until further direction is provided by MNRF.

Please note that information regarding species at risk is based on documented occurrences only and does not include an interpretation of potential habitat within or in proximity to the site in question. Although this data represents the MNRF's best current available information, it is important to note that a lack of information for a site does not mean that additional features and values are not present. i.e.: Species at Risk (SAR) or their habitat could still be present at the location or in the immediate area. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed; or their habitat is not damaged or destroyed through the activities carried out on the site. The MNRF continues to strongly encourage ecological site assessments to determine the potential for SAR habitat and occurrences. When a SAR or potential habitat for a SAR does occur on a site, it is recommended that the proponent contact the MNRF for technical advice and to discuss what activities can occur without contravention of the Act. If an activity is proposed that will contravene the ESA (such as Section 9 or 10), the proponent must contact the MNRF to discuss the potential for a permit (Section 17). For specific questions regarding the Endangered Species Act (2007) or SAR, please contact a district Species at Risk Biologist at sar.kemptville@ontario.ca. For more information regarding the ESA (2007), please see attached ESA Information Sheet.

As of July 1, 2013, the approvals processes for a number of activities that have the potential to impact SAR or their habitat were changed in an effort to streamline approvals processes while continuing to protect and sustainably manage Ontario's natural resources. For those activities that require registration with the Ministry, businesses and individuals will be able to do so through a new online system. The online system will also include information to help guide individuals and businesses through the new processes. For further information on which activities are authorized through this new online registration process and how to apply, please refer to the following website:

Ministry of Natural Resources and Forestry

Kemptville District

10 Campus Drive
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Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

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Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

http://www.MNRF.gov.on.ca/en/About/2ColumnSubPage/STDPROD_104342.html. General inquiries may be directed towards Kemptville District MNRF, while questions and comments involving the new online forms can be directed to the Registry Approvals Service Centre (RASC) at 1-855-613-4256 or MNRF.rasc@ontario.ca.

Please note: The advice in this letter may become invalid if:

- The Committee on the Status of Species at Risk in Ontario (COSSARO) re-assesses the status of the above-named species OR adds a species to the SARO List such that the section 9 and/or 10 protection provisions apply to those species.
- Additional occurrences of species are discovered.
- Habitat protection comes into force for one of the above-mentioned species through the creation of a habitat regulation (see general habitat protection above).

This letter is valid until: Fri. Aug 5, 2016

Sincerely,

Erin Seabert
Fish & Wildlife Technical Specialist
erin.seabert@ontario.ca

Encl.\
-ESA Infosheet
-NHIC/LIO Infosheet

Enoae, Jenny

From: Inforequest, Kemptville (MNRF) <Kemptville.Inforequest@ontario.ca>
Sent: December-14-15 9:08 AM
To: Jenny Enoae
Subject: RE: MNR Kemptville District Information Request (2015_KVD-3140) Response

March 15-July 15, yes

From: Jenny Enoae [mailto:EnoaeJ@mmm.ca]
Sent: October-01-15 12:16 PM
To: Inforequest, Kemptville (MNRF)
Subject: FW: MNR Kemptville District Information Request (2015_KVD-3140) Response
Importance: High

Hello,

With regards to the information that was provided in the attached email. I would like to confirm the in-water timing window restriction for Site 27-50 Hawkesbury Creek. At the bridge crossing, the creek outlets to the Ottawa River approximately 2 km downstream; therefore I would like to confirm that the in-water timing restriction is March 15 to July 15.

Regards,

Jenny

Jenny Enoae, M.Sc.
Project Ecologist - Fisheries
Ecology Department

MMM Group Limited
t: 905.882.4211 x1382 | f: 905.882.0055 |c: 416.885.0721

From: Inforequest, Kemptville (MNRF) [mailto:Kemptville.Inforequest@ontario.ca]
Sent: August-06-15 12:47
To: Jenny Enoae
Cc: Inforequest, Kemptville (MNRF)
Subject: MNR Kemptville District Information Request (2015_KVD-3140) Response
Importance: High

Hello,

Jenny Enoae
MMM Group Limited

Please find attached a response to your information request for project 'Proposed Rehab/Replacement of 17 Bridge Locations Across KVD; File Name MTO Mega 5 Bridge Rehab/Replacement'.

Sincerely,

Information Request Services
Kemptville District
Ministry of Natural Resources

Ontario

Ministry of Natural Resources

Ministère des Richesses naturelles

Licence to Collect Fish for Scientific Purposes

Permis pour faire la collecte de poissons à des fins scientifiques

Licence No. / N° de permis	1081563
Local Reference No. / N° de référence local	
Issuer Account No. / N° de compte du délivreur de permis.	10000846

This licence is issued under Part I of the Fish Licensing Regulation made under the Fish and Wildlife Conservation Act, 1997 to:

Ce permis est délivré en vertu de la Partie I du règlement sur la délivrance de permis de pêche formulé conformément à la Loi sur la protection du poisson et de la faune de 1997 à:

	Last Name / Nom de famille	First Name / Prénom	Middle Name / Second Prénom
Name of Licencee / Nom du titulaire du permis	Ms. Enoae	Jenny	

Name of Business/Organization/Affiliation (if applicable) / Nom de l'entreprise/de l'organisme/de l'affiliation (le cas échéant)

MMM Group Limited

	Street Name & No./PO Box/RR#/Gen. Del./ N° rue/C.P./R.R./poste restante		
Mailing address of Licencee / *Adresse postale du titulaire du permis*	100 Commerce Valley Drive West		
	City/Town/Municipality / Ville/village/municipalité	Province/State / Province/État	Postal Code/Zip Code / Code Postal/Zip
	Thornhill	ON	L3T 0A1

to collect the species, size and quantites of fish from the waters as set out below.
Pour faire la collecte des espèces suivantes (stade et nombre indiqués ci-dessous):

Species / Espèces	Eggs / Oeuf	Juvenile / Fretin	Adults / Adulte	Numbers / Nombre	Name of Waterbody / Nom de l'étendue d'eau
All Species as encountered	X	X	X	99999	Hawkesbury Creek 18T 529502.00 m E 5049286.00 m N See attached map

Yes/Oui ☐ Additional species/Waterbody list attached / Liste d'espèces/d'étendue d'eau additionnelles ci-jointe

Purpose of collection / *But de la collecte*: Inventory / Assessment

Licence Dates / *Dates du permis*	Effective Date / Date d'entrée en vigueur (YYYY-MM-DD)	Expiry Date / Date d'expiration (YYYY-MM-DD)
	2015-10-01	2015-12-31

Licence conditions: This licence is subject to the conditions contained in Schedule A if included. / Ce permis doit respecter les conditions de l'annexe A si celle-ci est jointe.

Conditions du permis: Yes/Oui ☐ No/Non ☒ Schedule A included. / Annexe A ci-jointe

Issued by (please print) / Délivré par (veuillez écrire en caractères d'imprimerie)	Signature of issuer / Signature du délivreur	Date of Issue/Date de délivrance (YYYY-MM-DD)
Scott Lee		2015-10-01

Signature of Licencee / Signature du titulaire du permis	Date (YYYY-MM-DD)
	2015-10-01

Personal information contained on this form is collected under the authority of the Fish and Wildlife Conservation Act, 1997 and will be used for the purpose of licencing, identification, enforcement, resource management and customer service surveys. Please direct further inquiries to the District Manager of the MNR issuing district.

Les renseignements personnels dans ce formulaire sont recueillis conformément à la Loi sur la protection du poisson de la faune, 1997 , et ils seront utilisés aux fins de délivrance de permis, d'identification, d'application des règlements, de gestion des ressources et de sondage sur les services a la clientèle. Veuillez communiquer avec le chef du district du MRN qui délivré le permis si vous avez des questions.

FW0032 (04/00)

Licence to Collect Fish for Scientific Purposes
Permis pour faire la collecte de poissons à des fins scientifiques
Schedule A - Licence Conditions
Annexe A - Conditions du permis

Licence No. 1081563
No de permis _____

This licence is subject to the conditions listed below.

1. This Licence is valid to collect for the persons, species, numbers, and calendar year indicated.

2. Mandatory report forms documenting the sampling conducted under this licence must be submitted to the licence issuer within 30 days of the termination date, but in no case later than January 31 next following the year of issue. The Mandatory Report form (Part 1) must be completed for each Sampling Program and the Site Collection Reports (Part 2) must be completed for each collection site. A separate map clearly indicating the location of each collection site must be attached to the Site Collection Reports. Attach the Site Collection Reports and maps to the Mandatory Report Form and submit to the "Planning Biologist, Ministry of Natural Resources, Kemptville District, 10 Campus Drive, P.O. Box 2002, Kemptville, ON, K0G 1J0 ". The submission of a satisfactory report is a prerequisite to any subsequent renewals.

3. Before carrying out any operation under the licence in any area the licensed person shall inform the Area Supervisor or District/Lake Manager of his or her intentions at least one week before commencing work and include information as to the type of operation, location, duration, and the names of personnel involved.

4. A copy of the original licence must be at the designated collections sites while sampling is occurring and carried by the licenced person or a designated assistant.

5. This licence is not valid in Provincial Parks, park reserves, or National Parks without the written permission from the authorized person in charge of the area concerned.

6. This licence does not allow access to any property without permission of the landowner.

7. Name of assistants covered under this Licence are as follows: Jenny Enoae, Patricia Mohr, Dallas Taylor, Alexander Stettler and any other MMM Group staff as required.

8. Capture gear shall be inspected regularly and live holding traps must be inspected at least once daily. All capture gear shall be clearly marked with the licencee name and the licence number of this licence.

9. Licencee may collect fish with: Backpack Electrofisher, Dip Nets, Miinow Traps.

10. All persons working under the authority of this licence must be trained in proper fish handling procedures prior to conducting any activity authorized by the licence.

11. All persons using electrofishing equipment must be certified for use of that equipment prior to conducting any activity authorized by this licence.

12. The licencee shall follow the best management practices for the collection, handling, transportation and holding of fish identified in FS Bulletin 2008-01 (June 10, 2008)

13. included with the licence in order to minimize the risk of spreading aquatic invasive species and diseases.

14. All field equipment must be de-contaminated prior to use on each water body in order to prevent the spread of exotic species and disease

15. Due to potential spawning activity by resident or migratory fish species, visual inspection of all sampling areas must be done prior to sampling with seine or dip nets. Should spawning activity or redds be observed all sampling must be stopped in order to prevent disturbance to the fish and habitats.

16. Unless specified otherwise, all captured fish will be released alive at the capture site except for voucher specimens, approved permanent collections and/or when further examination is necessary in the laboratory. Voucher specimens shall be deposited in the Royal Ontario Museum collection for taxonomic verification and voucher retention.

17. Any person acting under the authority of this licence, shall immediately report the capture of any invasive species (e.g. ruffe, tubenose goby,round goby, rusty crayfish, Asian carp, etc.) found outside its previously known range (as determined by the distribution information available at: www.invadingspecies.com/indexen.cfm, to the appropriate Area Biologist at the local MNR District office. Any such specimens captured outside of their established range (not already naturalized) shall be euthanized (not returned to the water) and kept for identification purposes.

18. Unless specifically authorized by a separate Endangered Species Act (ESA) permit and/or Federal Species at Risk Act (SARA) permit, no person shall attempt to catch a Species at Risk.

19. Any person acting under the authority of this licence, shall photograph and release live any fish Species at Risk captured (e.g. atlantic salmon, redside dace, black redhorse, river redhorse, channel darter, eastern sand darter, northern brook lamprey (and american brook lamprey for comparison). The photographs must be forwarded to the appropriate Area Biologist or Species At Risk Biologist at the local MNR District office for identification and confirmation.

20. GPS coordinates (UTM) of the capture location must be submitted for any species at risk, as per the Species at Risk in Ontario (SARO) list that are encountered during this project and submitted to MNR.

21. Sampling must cease immediately in an area when a fish Species at Risk is caught.

22. Sampling locations must be reported using GPS location data using: Projection: Universal Transverse Metres.

Signature of Licencee / Signature du titulaire du permis

Date
oct. 7, 2015


Hawkesbury Creek - 27-50 fisheries
Spence Ave
Jerome St
Clement St
Martin St
James St
Laquet St
March Crescent
Fauteux St
Henry Crescent
Sandy Hill Rd
34
17
© 2015 Google
Google earth
2007
18 T 528631.46 m E 5050136.14 m N elev 51 m eye alt 1.35 km

APPENDIX B

Field Collection Records

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
3415003	Site 97.50	08	06	2015

Is STREAM REALIGNMENT required for this section:

Yes (No) Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
JE & DT	Overcast	14:45	17:15

PHOTOS NUMBERS AND DESCRIPTIONS: 3207 - 3257

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
Hawkesbury Creek	Ottawa River	27-50	

LOCATION OF CROSSING: - Regional Road 17 over Hawksbury Creek & CNR

UTM EASTING & NORTHING:	MTO CHAINAGE:
18T 529508 E 5049297 N	—
TOWNSHIP: Munic. Hawkesbury	MNR DISTRICT: Kemptville

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Residential Rd / Highway / CNR	Residential / Commercial / Roads

EXISTING STRUCTURE TYPE

(Bridge)	Box Culvert	Open Foot Culvert	CSP	N/A

Other Describe: Size (w x h) m2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
U/S & ROW & D/S	Homogenous throughout - all reaches

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	X		X			—

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
~325 m	—

SUB-SECTION(S)	(Run)	Pool	(Riffle)	Flats	Inside culvert	Other
Percentage of area	60%		40%			
mean depth wetted (m)	1m		0.50			
mean width wetted (m)	10		8			
Mean bankfull width (m)	—		—			
Mean bankfull depth(m)	—		—			
Substrate	CO/GR/SA 40% 50% 10%		BO/CO 95% 5%			

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	X			
Right Upstream Bank	X			

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Large Woody Debris	Organic debris	Vascular plants	None
	10%	10%	5%	Instream — Overhanging —	—	Instream — Overhanging <5%	—

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1% <10%	None

VEGETATION TYPE (%):	Submergent	Floating	Emergent 100%	None
Predominant Species	/	/	grasses	—

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	~~NONE~~	weir	

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	NO	NO	—

POTENTIAL ENHANCEMENT OPPORTUNITIES:

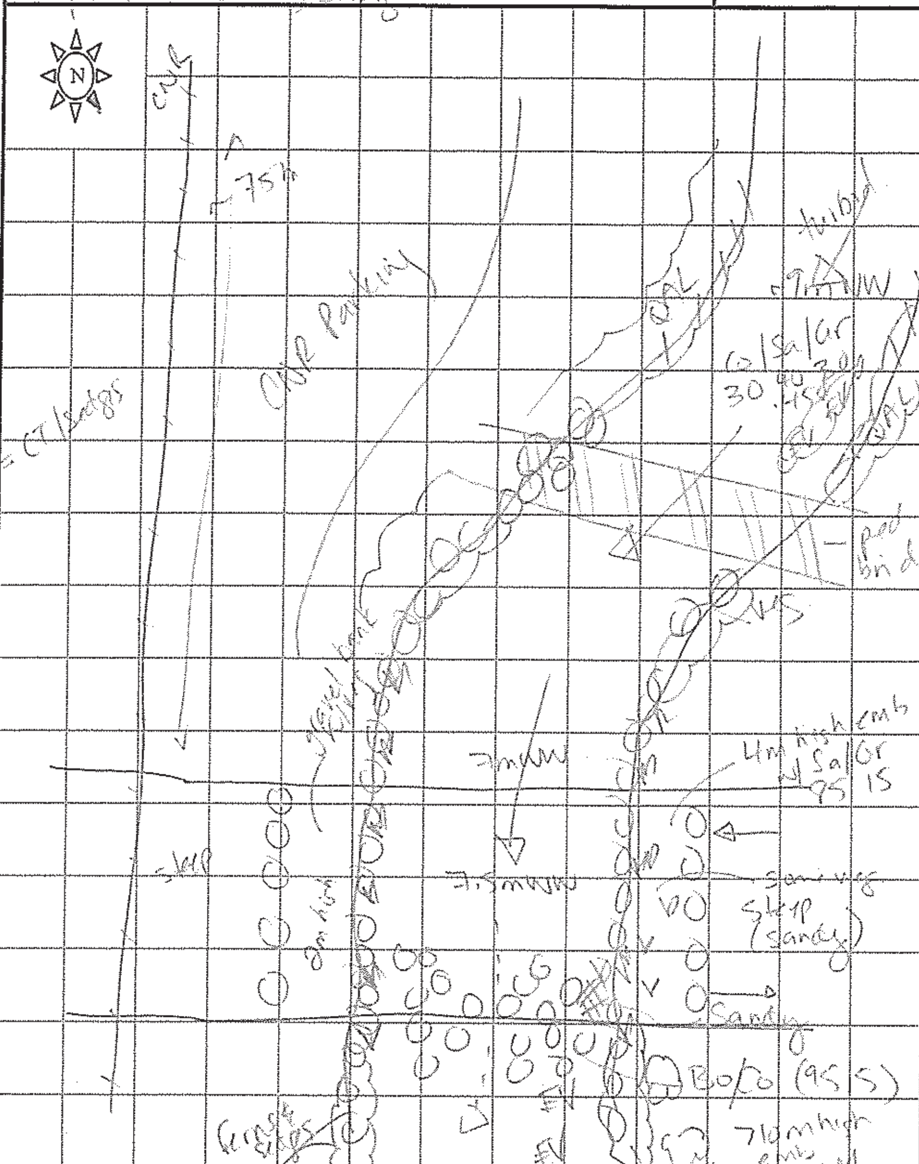
d/s reach - weir d/s of CNR Bridge
- assume seasonal barrier for sportfish; perm. barrier for forage/bait fish species
18T 529510 E 5049412 N.

COMMENTS :

Additional Notes Appended? No Yes number of pages _____

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Hwy 17 @ Hawksbury Bridge	ROW + u/S	75	NTS

PROJECT #:	3415003
MAPPER:	JE
NAME OF WATERBODY:	Hawkesbury Creek
CROSSING #:	27-50 (1)
STATION #:	27-50
DATE: DD-MMM-YY	08-JUN-2015



LEGEND

- **10d** depth (cm)
- **6w** width
- ➡ ~~Riffle~~ Flat -- Riffle
- ⇨ Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- **CT** Cattail
- **SV/FV** Submerg/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- ////// Eroded Bank
- **XXX** Riprap / Other Stabilization
- Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- ® Riparian Tree
- Seep/Spring
- -------- Undercut Bank
- ▬ Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- Culvert

PROFILE: Horz. Scale Vert. Scale

→ Bo/Co banks 90 10 w/ grasses & CUM along interface

→ 90% Run 10% Riffle

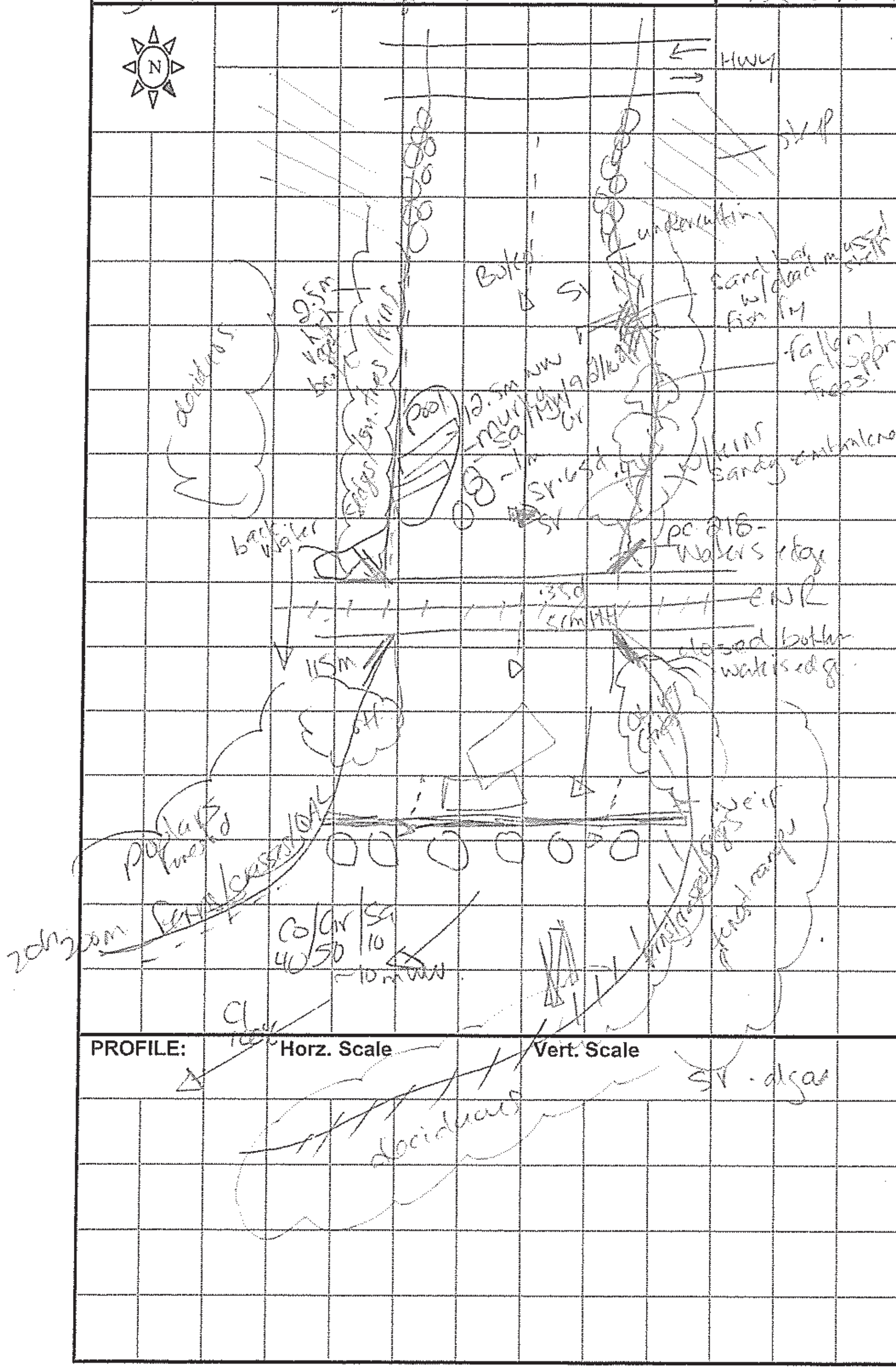
→ turbid

Cond. - 400 μS/cm
TDS - 309 ppm
pH - 7.9
W.T. - 15.4°C
DO - 9.31 ppm

BFW & D - not done - high flows

45°35'47"N
74°37'18"W 50m Elevation
HB - Hawksbury Bridge

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Hwy 17 @ Hawksbury Bridge	D/S	250 m	NTS



PROJECT #: 3415003

MAPPER: JE

NAME OF WATERBODY: Hawkesbury Creek

CROSSING #: 1

STATION #: 27-50

DATE: DD-MMM-YY 08-JUN-15

LEGEND

10d depth (cm)
6w width
➡ Riffle Flat - - - Riffle
⇨ Run/Glide
⬭ Pool
▒ Island/Bar
░ Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
* * * Debris
CT Cattail
SV/FV Submerg/Float Veg
EV Emergent Vegetation
W Watercress
Fe Iron Staining
/////// Eroded Bank
XXX Riprap / Other Stabilization
Instream Log/Tree
^^^ Dam/Weir/Obstruction
® Riparian Tree
Seep/Spring
-------- Undercut Bank
▬ Barrier to Fish Movement
-S- Seasonal Barrier
-x--x- Fence line
Culvert

Mussel Shell #1
Shell #2

GENERAL INFORMATION

PROJECT #	PROJECT DESCRIPTION	DAY	MONTH	YEAR
3415003-400	Mega 6-Hawkesbury	15	Oct	2015

COLLECTORS:	TIME STARTED	TIME FINISHED
JE PM		

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
	Calm	Rippled	Wavy	Rough
Overcast, raining	O	O	X	O

GENERAL LOCATION

NAME OF WATERBODY	LOCATION OF STATION
Hawkesbury Creek	
TOWNSHIP	**MNR DISTRICT**
Hawkesbury	Kemptville

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream	25	9	7.1	—	10	—
downstream						
Culvert / Hwy ROW underpass						

WATER COLOUR:	Colourless X	Yellow/brown O	Blue/green O	Turbid O	Other O

GEAR

ELECTROFISHER O

Length (m)	Settings:	Seconds:

NETS and TRAPS

MINNOW TRAP O # 4	DIP NET O	TRAP NET O
SEINE O	GILL O	OTHER O specify
HAULS (#)	Period Of Time (24 hour clock)	
	Set time 18:30	Clear time 10:30
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m): .35
	Largest (cm):	Maximum (m): .6

SAMPLE COLLECTION

FISH KEPT?	# OF BAGS	PRESERVATIVE:			
O Yes X No		Formalin O	Frozen O	Alcohol O	Other O

COMMENTS

Additional Notes Appended? X No o Yes number of pages 1

(list page)

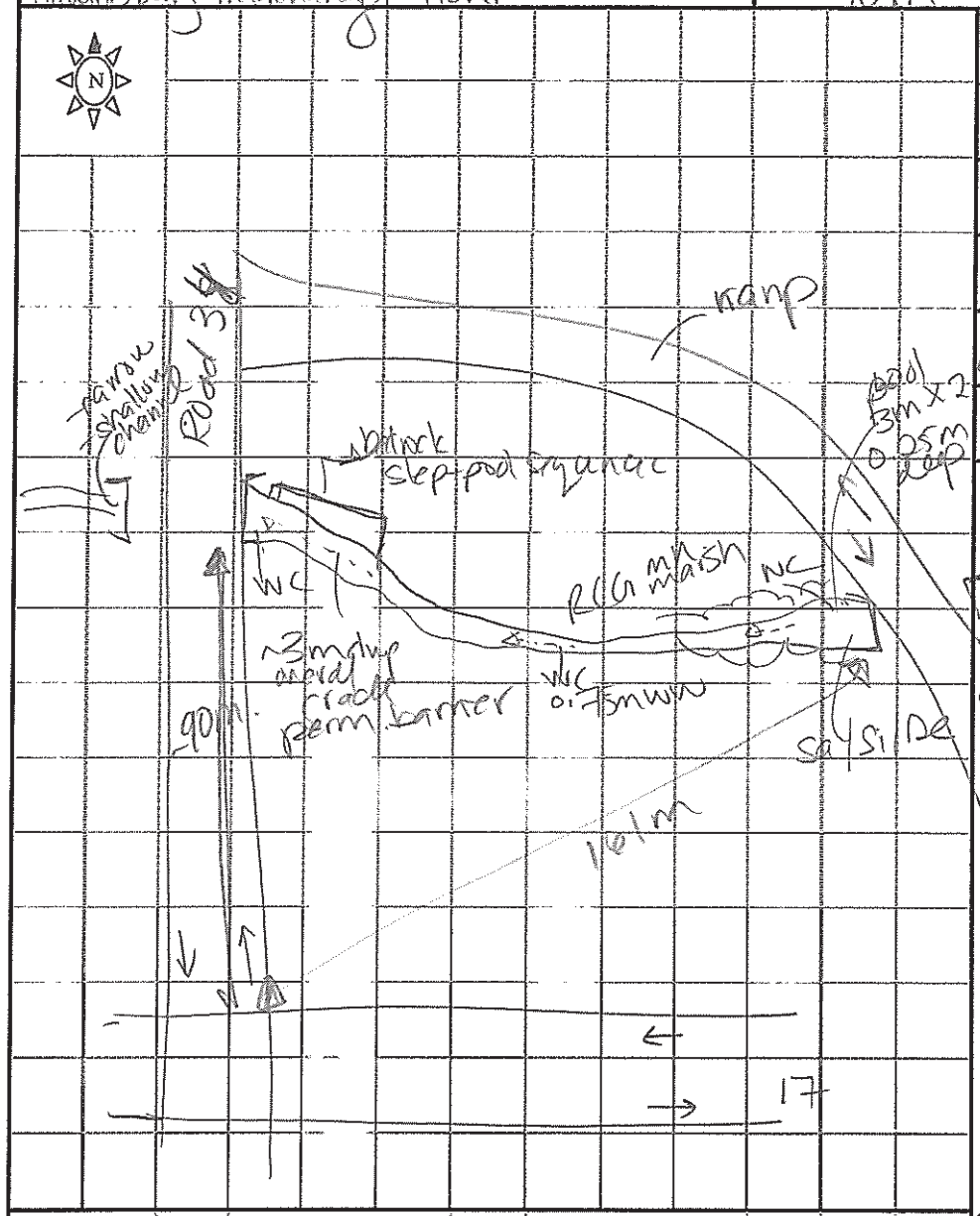
CAPTURE INFORMATION

PROJECT NO.: | **STATION NO.:**

NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
MT1	None				
MT2	None				
MT3	529504 5049292				
1	Longnose Dace	1	Ø	45	juv.
PT1	18T529505 5049292				
3	Common Shiner	3	Ø	110-120	Adult

Circle number if a sample was kept
PAGE 1 **of** 1 **Number all pages**

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Hawkesbury Interchange	Rond	~140m	NTS.



PROJECT #:	
	3415002.400
MAPPER:	JE
NAME OF WATERBODY:	Unknown.
CROSSING #:	1
STATION #:	1
DATE: DD-MMM-YY	15-OCT-15

LEGEND

- 10d depth (cm)
- 6w width
- - - ->Riffle
- ~~Riffle~~ Flat
- Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- /////// Eroded Bank
- XXX Riprap / Other Stabilization
- Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- ® Riparian Tree
- Seep/Spring
- -------- Undercut Bank
- — Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- Culvert

PROFILE:	Horz. Scale	Vert. Scale

- WC groundwater-fed channel
- Toe of zone of impact

APPENDIX C

Representative Photographs

Appendix C

2017 Photographs

Photo 1 – Hawkesbury Creek May 31, 2017 Upstream view of Hawkesbury Creek from bridge crossing.	
Photo 2 – Hawkesbury Creek May 31, 2017 Looking downstream at bridge crossing.	

Photo 3 – Hawkesbury Creek May 31, 2017 Looking at east bank at existing amouring and footing.	
Photo 4 – Hawkesbury Creek May 31, 2017 Looking toward east bank from west bank of creek.	

Appendix D

MNRF 2017 Correspondence

Ministry of Natural Resources and Forestry

Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

Ministère des Richesses naturelles et des Forêts

District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Ontario

Tue. Jun 20, 2017

Eric Vanderleeuw
Dillon Consulting
130 Dufferin Avenue, Suite 1400
London, Ontario
N6A 5R2
(519) 438-1288 ext 1209
evanderleeuw@dillon.ca

Attention: Eric Vanderleeuw

Subject: Information Request - Developments
Project Name: MTO HWY 417 & 34 Road Work
Site Address:
Our File No. 2017_KVD-4008

Natural Heritage Values

The Ministry of Natural Resources and Forestry (MNRF) Kemptville District has carried out a preliminary review of the above mentioned area in order to identify any potential natural resource and natural heritage values.

The following Natural Heritage values were identified for the general subject area:

- Evaluated Wetland, HWY 417 Marsh (Evaluated-Other, not Provincially Significant) – Site ID 2 & 3
- Fish Nursery, Blue Gill Nursery Area – Raisin River
- Fish Nursery, Largemouth Bass Nursery Area – Raisin River
- Fish Nursery, Walleye Nursery Area – Raisin River
- Inactive Pit or Quarry, 5947 – Site ID 4.

Municipal Official Plans contain information related to natural heritage features. Please see the local municipal Official Plan for more information, such as specific policies and direction pertaining to activities which may impact natural heritage features. For planning advice or Official Plan interpretation, please contact the local municipality. Many municipalities require environmental impact studies and other supporting studies be carried out as part of the development application

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Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

Ministère des Richesses naturelles et des Forêts

District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

process to allow the municipality to make planning decisions which are consistent with the Provincial Policy Statement (PPS, 2014).

The MNRF strongly encourages all proponents to contact partner agencies and appropriate municipalities early on in the planning process. This provides the proponent with early knowledge regarding agency requirements, authorizations and approval timelines; Ministry of the Environment and Climate Change (MOECC) and the local Conservation Authority may require approvals and permitting where natural values and natural hazards (e.g., floodplains) exist.

As per the Natural Heritage Reference Manual (NHRM, 2010) the MNRF strongly recommends that an ecological site assessment be carried out to determine the presence of natural heritage features and species at risk and their habitat on site. The MNRF can provide survey methodology for particular species at risk and their habitats.

The NHRM also recommends that cumulative effects of development projects on the integrity of natural heritage features and areas be given due consideration. This includes the evaluation of the past, present and possible future impacts of development in the surrounding area that may occur as a result of demand created by the presently proposed project.

Wildland Fire

MNRF woodland data shows that some sites contain adjacent woodlands. The lands should be assessed for the risk of wildland fire as per PPS 2014, Section 3.1.8 "*Development shall generally be directed to areas outside of lands that are unsafe for development due to the presence of hazardous forest types for wildland fire. Development may however be permitted in lands with hazardous forest types for wildland fire where the risk is mitigated in accordance with wildland fire assessment and mitigation standards".* Further discussion with the local municipality should be carried out to address how the risks associated with wildland fire will be covered for such a development proposal. Please see the Wildland Fire Risk Assessment and Mitigation Guidebook (2016) for more information.

Significant Woodlands

MNRF woodland data shows that some sites contain adjacent significant woodlands. Section 2.1.5 b) of the PPS states: *Development and site alteration shall not be permitted in significant woodlands unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.* The 2014 PPS directs that significant woodlands must be identified following criteria established by the Ontario Ministry of Natural Resources and Forestry, i.e. the Natural Heritage Reference Manual (NHRM), 2010. Where the local or County Official Plan has not yet updated significant woodland mapping to reflect the 2014 PPS, all wooded areas should be reviewed on a site specific basis for significance. The MNRF Kemptville District modelled

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Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
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Fax: 613 258-3920

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District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

locations of significant woodlands in 2011 based on NHRM criteria. The presence of significant woodland on site or within 120 metres should trigger an assessment of the impacts to the feature and its function from the proposed development.

Significant Wildlife Habitat

Section 2.1.5 d) of the PPS states: *Development and site alteration shall not be permitted in significant wildlife habitat unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.* It is the responsibility of the approval authority to identify significant wildlife habitat or require its identification. The MNRF has several guiding documents which may be useful in identification of significant wildlife habitat and characterization of impacts and mitigation options:

- Significant Wildlife Habitat Technical Guide, 2000
- The Natural Heritage Reference Manual, 2010
- Significant Wildlife Habitat Mitigation Support Tool, 2014
- Significant Wildlife Habitat Criteria Schedule for Ecoregion 5E and 6E, 2015

The habitat of special concern species (as identified by the Species at Risk in Ontario list) and Natural Heritage Information Centre tracked species with a conservation status rank of S1, S2 and S3 may be significant wildlife habitat and should be assessed accordingly.

Aggregates

The above mentioned area is in proximity to a licenced aggregate operation.

The zone of influence around pits is 300 metres and the zone of influence around quarries is 500 metres, as identified by the Ministry of Environment and Climate Change D-Series guidelines. The guideline is applicable when a new sensitive land use (such as residential dwellings) is proposed within the influence area of a pit, quarry or mineral aggregate reserve.

To determine whether the proposed project will preclude or hinder the existing aggregate operation or the establishment of a new pit or quarry, the municipality may request a compatibility study.

The locations of licenced aggregate operations can be found online at https://www.ontario.ca/environment-and-energy/find-pits-and-quarries.

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Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
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Fax: 613 258-3920

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District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Ontario

Water

If any in-water works are to occur, there are timing windows for which work in water should not take place (see below). Appropriate measures should be taken to minimize and mitigate impact on water quality and fish habitat, including:

- installation of sediment and erosion control measures;
- avoiding the removal, alteration, or covering of substrates used for fish spawning, feeding, over-wintering or nursery areas; and
- debris control measures to manage falling debris (e.g. spalling).

Timing windows (no in-water works) in MNRF Kemptville District*:

Warmwater and Coolwater	**→ March 15 – June 30**
St. Lawrence River & Ottawa River	→ March 15 – July 15
Coldwater	→ October 1 – May 31
Big Rideau Lake & Charleston Lake	→ October 1 – June 30

* *Please note: Additional timing restrictions may apply as they relate to endangered and threatened species for works in both water and wetland areas.*

Timing windows when in-water work is restricted – based on species presence:

	FISH SPECIES	TIMING WINDOW (No in-water works)
Spring:	Walleye	March 15 to May 31
	Northern Pike	March 15 to May 31
	Lake Sturgeon	May 1 to June 30
	Muskellunge	March 15 to May 31
	Largemouth/Smallmouth Bass	May 1 to July 15
	Rainbow Trout	March 15 to June 15
	Other /Unknown Spring Spawning Species	March 15 to July 15

	FISH SPECIES	TIMING WINDOW (No in-water works)
Fall:	Lake Trout	October 1 to May 31
	Brook Trout	October 1 to May 31
	Pacific Salmon	September 15 to May 31
	Lake Whitefish	October 15 to May 31
	Lake Herring	October 15 to May 31
	Other /Unknown Fall Spawning Species	October 1 to May 31

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Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

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10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Site ID & Thermal Regime:	Fish Species Present	Fisheries Management Objectives	Habitat Sensitivity
1 Unknown	Unknown, with the exception of Central Mudminnow and Brook Stickleback	Maintain or increase forage and coarse fish recruitment. Protect all waterbodies that have only forage fish populations, especially headwater streams, wetlands and ponds.	Unknown
2 Unknown	Unknown	Maintain or increase forage and coarse fish recruitment. Protect all waterbodies that have only forage fish populations, especially headwater streams, wetlands and ponds.	Unknown
3 Unknown	Unknown	Maintain or increase forage and coarse fish recruitment. Protect all waterbodies that have only forage fish populations, especially headwater streams, wetlands	Unknown

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Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

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District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

		and ponds.	
4 Coolwater	Northern Redbelly Dace Bluntnose Minnow Johnny Darter Fathead Minnow Brook Stickleback White Sucker Brassy Minnow Creek Chub Common Shiner Central Mudminnow	Maintain or increase forage and coarse fish recruitment. Protect all waterbodies that have only forage fish populations, especially headwater streams, wetlands and ponds.	Moderate
5 Coolwater	Unknown	Maintain or increase forage and coarse fish recruitment. Protect all waterbodies that have only forage fish populations, especially headwater streams, wetlands and ponds.	Unknown
6 Coolwater	Unknown	Maintain or increase forage and coarse fish recruitment. Protect all waterbodies that have only forage fish populations, especially headwater streams, wetlands and ponds.	Unknown

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Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
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Fax: 613 258-3920

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7 Unknown	Unknown	Maintain or increase forage and coarse fish recruitment. Protect all waterbodies that have only forage fish populations, especially headwater streams, wetlands and ponds.	Unknown
8 Unknown	Unknown	Maintain or increase forage and coarse fish recruitment. Protect all waterbodies that have only forage fish populations, especially headwater streams, wetlands and ponds.	Unknown
9 Unknown	Unknown	Maintain or increase forage and coarse fish recruitment. Protect all waterbodies that have only forage fish populations, especially headwater streams, wetlands and ponds.	Unknown
10 Unknown	Unknown	Maintain or increase forage and coarse fish recruitment.	Unknown

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Postal Box 2002
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		Protect all waterbodies that have only forage fish populations, especially headwater streams, wetlands and ponds.	
11 Unknown	Unknown	Maintain or increase forage and coarse fish recruitment. Protect all waterbodies that have only forage fish populations, especially headwater streams, wetlands and ponds.	Unknown
Raisin River (Assignment 4) Coolwater	Northern Pike Pumpkinseed Round Goby Golden Shiner Common Carp Johnny Darter Black Crappie Yellow Perch Banded Killifish Gizzard Shad Logperch Rock Bass White Sucker Common Shiner Tadpole Madtom Smallmouth Bass Brook Silverside Brown Bullhead	Managed primarily for the Coolwater Sport Fish Species: Walleye Sauger Northern Pike, and Yellow Perch.	High

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Postal Box 2002
Kemptville ON K0G 1J0
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Fax: 613 258-3920

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Tél.: 613 258-8204
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	White Perch Blackchin Shiner Bluntnose Minnow Longnose Gar Spottail Shiner Largemouth Bass Walleye Sauger Bluegill Channel Catfish Quillback Freshwater Drum American Eel Lake Sturgeon Bowfin Mimic Shiner Stonecat Silver Redhorse Shorthead Redhorse Fantail Darter Sunfishes Fallfish Muskellunge Emerald Shiner Greater Redhorse		
Finney Creek (Assignment 4) Coolwater	Iowa Darter Fathead Minnow Brook Stickleback Alewife Creek Chub Central Mudminnow Bridle Shiner Sand Shiner Blacknose Shiner Northern Pike Pumpkinseed Round Goby Golden Shiner Common Carp	Managed primarily for the Coolwater Sport Fish Species: Walleye Northern Pike, and Yellow Perch.	High

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Kemptville District

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Kemptville ON K0G 1J0
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Fax: 613 258-3920

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	Johnny Darter Black Crappie Yellow Perch Banded Killifish Gizzard Shad Logperch Rock Bass White Sucker Common Shiner Tadpole Madtom Smallmouth Bass Brook Silverside Brown Bullhead White Perch Blackchin Shiner Bluntnose Minnow Longnose Gar Spottail Shiner Largemouth Bass Walleye		
Hawkesbury Creek (Assignment 5) Coolwater	Carps Minnows Northern Pike Muskellunge Smallmouth Bass White Sucker Sunfishes Suckers	Managed primarily for the Coolwater and Warmwater Sport Fish Species.	Moderate
Trib to Hawkesbury Creek (Assignment 5) Unknown	Unknown	Maintain or increase forage and coarse fish recruitment. Protect all waterbodies that have only forage fish populations, especially headwater streams, wetlands and ponds.	Unknown

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Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

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Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Additional approvals and permits may be required under the Fisheries Act. Please contact Fisheries and Oceans Canada to determine requirements and next steps. There may also be approvals required by the local Conservation Authority or Transport Canada. As the MNRF is responsible for the management of provincial fish populations, we request ongoing involvement in such discussions in order to ensure population conservation.

Species at Risk

A review of the Natural Heritage Information Centre (NHIC) and internal records and aerial photograph interpretation indicate that there is a potential for the following threatened (THR) and/or endangered (END) species on the site or in proximity to it:

- American Eel (END)
- Barn Swallow (THR)
- Blanding's Turtle (THR)
- Butternut (END)
- Cutlip Minnow (THR)
- Lake Sturgeon (THR)

Site ID:	**Species At Risk (or Habitat) Potentially Present**
1	Unknown
2	Blanding's Turtle Snapping Turtle Butternut Eastern Ribbonsnake
3	Blanding's Turtle Snapping Turtle Butternut Eastern Ribbonsnake
4	Blanding's Turtle Snapping Turtle Eastern Ribbonsnake
5	Snapping Turtle
6	Snapping Turtle Butternut
7	Unknown
8	Unknown

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Tel.: 613 258-8204
Fax: 613 258-3920

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9	Butternut
10	Butternut
11	Blanding's Turtle Snapping Turtle Butternut Eastern Ribbonsnake
Raisin River (Assignment 4)	Blanding's Turtle Snapping Turtle Eastern Musk Turtle Barn Swallow Eastern Ribbonsnake Cutlip Minnow American Eel Lake Sturgeon Northern Map Turtle River Redhorse
Finney Creek (Assignment 4)	Blanding's Turtle Snapping Turtle Butternut Eastern Ribbonsnake Bridle Shiner American Eel Northern Map Turtle
Hawkesbury Creek (Assignment 5)	Blanding's Turtle Snapping Turtle Butternut Eastern Ribbonsnake Northern Map Turtle River Redhorse
Trib to Hawkesbury Creek (Assignment 5)	Unknown

All endangered and threatened species receive individual protection under section 9 of the ESA and receive general habitat protection under Section 10 of the ESA, 2007. Thus any potential works should consider disturbance to the individuals as well as their habitat (e.g. nesting sites). General habitat protection applies to all threatened and endangered species. Note some species in Kemptville District receive regulated habitat protection. The habitat of these listed species is protected from damage and destruction and certain activities may require authorization(s) under

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Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

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District de Kemptville

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Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

the ESA. For more on how species at risk and their habitat is protected, please see: https://www.ontario.ca/page/how-species-risk-are-protected.

If the proposed activity is known to have an impact on any endangered or threatened species at risk (SAR), or their habitat, an authorization under the ESA may be required. It is recommended that MNRF Kemptville be contacted prior to any activities being carried out to discuss potential survey protocols to follow during the early planning stages of a project, as well as mitigation measures to avoid contravention of the ESA. Where there is potential for species at risk or their habitat on the property, an Information Gathering Form should be submitted to Kemptville MNRF at sar.kemptville@ontario.ca.

The Information Gathering Form may be found here:
http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/FormDetail?OpenForm&ACT=RDR&TAB=PROFILE&ENV=WWE&NO=018-0180E

For more information on the ESA authorization process, please see:
https://www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization

Habitat has been identified within the project area that appears suitable for one or more species listed by SARO as Special Concern (SC). One or more special concern species has been documented to occur either on the site or nearby. Species listed as special concern are not protected under the ESA, 2007. However, please note that some of these species may be protected under the Fish and Wildlife Conservation Act and/or Migratory Birds Convention Act. Again, the habitat of special concern species may be significant wildlife habitat and should be assessed accordingly. Species of special concern for consideration (**see table above, in Species At Risk section)**:

- Bridle Shiner (SC)
- Eastern Musk Turtle (SC)
- Eastern Ribbonsnake (SC)
- Monarch (SC) **– at every site**
- Northern Map Turtle (SC)
- River Redhorse (SC)
- Snapping Turtle (SC)

If any of these or any other species at risk are discovered throughout the course of the work, and/or should any species at risk or their habitat be potentially impacted by on site activities, MNRF should be contacted and operations be modified to avoid any negative impacts to species at risk or their habitat until further direction is provided by MNRF.

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Kemptville ON K0G 1J0
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Fax: 613 258-3920

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Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Please note that information regarding species at risk is based largely on documented occurrences and does not necessarily include an interpretation of potential habitat within or in proximity to the site in question. Although this data represents the MNRF's best current available information, it is important to note that a lack of information for a site does not mean that additional features and values are not present. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the activities carried out on the site.

The MNRF continues to strongly encourage ecological site assessments to determine the potential for SAR habitat and occurrences. When a SAR or potential habitat for a SAR does occur on a site, it is recommended that the proponent contact the MNRF for technical advice and to discuss what activities can occur without contravention of the Act. For specific questions regarding the Endangered Species Act (2007) or SAR, please contact MNRF Kemptville District at sar.kemptville@ontario.ca.

The approvals processes for a number of activities that have the potential to impact SAR or their habitat have recently changed. For information regarding regulatory exemptions and associated online registration of certain activities, please refer to the following website: https://www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization.

Please note: The advice in this letter may become invalid if:

- The Committee on the Status of Species at Risk in Ontario (COSSARO) re-assesses the status of the above-named species OR adds a species to the SARO List such that the section 9 and/or 10 protection provisions apply to those species; or
- Additional occurrences of species are discovered on or in proximity to the site.

This letter is valid until: Wed. Jun 20, 2018

The MNRF would like to request that we continue to be circulated on information with regards to this project. If you have any questions or require clarification please do not hesitate to contact me.

Sincerely,

Joffre Côté
(FLS) Management Biologist
joff.cote@ontario.ca

Ministry of Natural Resources and Forestry

Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

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District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

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Encl.\
-ESA Infosheet & -NHIC/LIO Infosheet

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10 Campus Drive
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Fax: 613 258-3920

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10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Ontario

December 8, 2017

SUBJECT: UPDATED IN-WATER WORK TIMING GUIDELINES IN KEMPTVILLE DISTRICT

To: all interested parties

The Ministry of Natural Resources and Forestry Kemptville District Office has recently reviewed and updated its In-water Work Timing Guidelines. These guidelines are intended to provide the timing for in-water work related to an activity, in order to protect fish during spawning and other critical life stages. Timing guidelines are based on species* presence and are therefore subject to change if new information becomes available.

Timing Guidelines in Kemptville District are:

Waterbody (and applicable geography or Fisheries Management Zone)	Timing Guidelines (no in-water works)
○ St. Lawrence River (FMZ 20)	March 15 – July 15 (Spring spawning species)
○ Ottawa River – Lac Des Chats (FMZ 12)	October 1 to July 15 (Spring and fall spawning species, including Lake Trout and Lake Whitefish)
○ Ottawa River – Lac Deschenes (FMZ 12)	October 15 to July 15 (Spring and fall spawning species, including Cisco)
○ Ottawa River – Lac Dollard des Ormeaux (FMZ 12)	January 1 to July 15 (Winter and spring spawning species, including Burbot)
○ Big Rideau Lake (South Burgess and South Elmsley Twps) ○ Charleston Lake (Lansdowne and Escott Twps) ○ Crow Lake (South Crosby Twp)	October 1 to June 30 (Spring and fall spawning species, including Lake Trout)
○ Bass Lake (South Elmsley Twp) ○ Lower Rideau Lake (South Elmsley Twp) ○ Bob's Lake (South Sherbrooke Twp) ○ Christie Lake (South Sherbrooke Twp) ○ Dalhousie Lake (Dalhousie Twp) ○ Davern Lake (South Sherbrooke Twp) ○ Farren Lake (South Sherbrooke Twp) ○ Grippen Lake (Leeds Twp) ○ Indian Lake (South Crosby Twp) ○ Little Long Lake (Lansdowne Twp) ○ Millpond Lake (South Burgess) ○ Otter Lake (South Elmsley, South Burgess and Bastard Twps)	October 15 to June 30 (Spring and Fall spawning species, including Lake Whitefish and Cisco)

○ Otty Lake (North Burgess and North Elmsley Twps) ○ Pike Lake (North Burgess Twp) ○ Silver Lake (South Sherbrooke Twp) ○ Redhorse Lake (Lansdowne Twp) ○ Tay River (South Sherbrooke, Bathurst, Drummond and North Elmsley Twps) ○ Wolfe Lake (North Crosby Twp)	
○ Bennett Lake (Bathurst Twp) ○ Crosby Lake (North Crosby Twp) ○ Big Rideau Lake (South Burgess, Bastard and South Elmsley Twps) ○ Gananoque River (Leeds Twp) ○ Lac Georges (Plantagenet and Alfred Twps) ○ Gillies Lake (Lanark Twp) ○ Little Crosby Lake (North Crosby Twp) ○ McLaren Lake (North Burgess Twp) ○ Mississippi Lake (Drummond, Beckwith and Ramsay Twps) ○ Mississippi River (Beckwith, Ramsay, Pakenham and Fitzroy Twps) ○ Raisin River below Martintown dam (Charlottenburgh Twp) ○ Rideau River (Wolford, Oxford, Montague, Marlborough, South Gower, North Gower, Osgood, Nepean and Gloucester Twps) ○ South Lake (Leeds Twp) ○ South Nation River below Plantagenet weir (Plantagenet Twp) ○ Upper Rideau Lake (North Crosby Twp) ○ Westport Sand Lake (North Crosby Twp)	January 1 – June 30 (Winter and spring spawning species, including Burbot)
○ Small rivers and streams (denoted on 1:50,000 National Topographic System maps as being one-lined) ○ All other waterbodies in FMZ 18	March 15 to June 30 (Spring spawning species)

**Additional timing guidelines may apply as they relate to endangered and threatened species for works in both water and wetland areas. Timing guidelines are subject to change, depending on species found in a given waterbody.*

Should you have any questions, please do not hesitate to contact Joffre Côté, Management Biologist (at 613-258-8214 or joff.cote@ontario.ca) or Jane Devlin, Management Biologist (at 613-258-8418 or jane.devlin@ontario.ca).

Sincerely,

John Boos

Resources Management Supervisor
Kemptville District Office
Ministry of Natural Resources and Forestry

Appendix E

Aquatic Effects Assessment Table (Template 10.3)

DILLON CONSULTING	**Template 10.3 Aquatic Effects Assessment Summary Table**	**Waterbody: Hawkesbury Creek and Tributary**	**Page 1 of 4**
	Project No.: 17-5180	**Prepared By: Mark Brobbel**	
	Project Name: Hawkesbury Bridge Replacements	**Date: April 23, 2018**	

Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measures	Potential Residual Effects	Serious Harm? (Yes/No/ Uncertain)	Rationale*
Vegetation Clearing (L1) May be required along the banks adjacent to abutments	Alteration of riparian vegetation	Riparian vegetation in area of construction is predominantly grasses only and will be re-seeded post construction.	None	No	N/A
	Bank stability and exposed soils	Erosion and sediment controls will be designed and installed to contain or isolate the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment. The site (including banks) will be stabilized (seeded and/or covered) prior to the removal of erosion and sediment controls.	None	No	N/A
Grading (L2)	Use of industrial equipment	See "Use of Industrial Equipment" POE.	---	---	---
	Vegetation clearing	See "Vegetation Clearing" POE.	---	---	---
	Bank stability and exposed soils	Erosion and sediment controls will be designed and installed to contain or isolate the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment. Disturbed areas on each side will be covered and stabilized upon completion.	None	No	N/A
	Increased erosion potential from change in slope	Erosion and sediment controls will be designed and installed to contain or isolate the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment.	None	No	N/A

Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measures	Potential Residual Effects	Serious Harm? (Yes/No/ Uncertain)	Rationale*
Excavation (L3) Temporary disturbance within the areas of the existing footing and adjacent/east of existing footing for placement of new permanent footing and temporary pier	Use of industrial equipment	See "Use of Industrial Equipment" POE.	---	---	---
	Change in channel stability	Channel stability is expected to be maintained.	None	No	N/A
	Resuspension and entrainment of sediment	Sheet pile cofferdams will be used to isolate the work areas around the piers.	None	No	N/A
	Vegetation clearing	See "Vegetation Clearing" POE	---	---	---
	Removal of topsoil	At the site of the temporary pier, top soil will be stripped and place up-bank from construction area for reuse upon removal. Top soil will be on level ground and surrounded by a silt fence. No topsoil is anticipated present at site of new, permanent footing as are is protected with rock armouring and asphalt capping.	None	No	N/A
	Increased erosion potential	Erosion and sediment controls will be designed and installed to contain or isolate the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment. New slopes will be flattened where feasible and will be stabilized with rock protection upon completion.	None	No	N/A

Use of Industrial Equipment (B2) For constructing temporary access roads to work sites, grading, excavation of location for footings and pier, removal of temporary and existing structures, placement of rock armouring around footing and at select bank failure location at site, re-grading of site to like or better conditions on completion	Increased erosion potential	Erosion and sediment controls will be designed and installed to contain or isolate the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment. The site (including banks) will be stabilized (seeded and/or covered) prior to the removal of erosion and sediment controls (where applicable).	None	No	N/A
Placement of Materials in water (W1) •While approximately 26 m^2 of creek bank will be affected by armouring, only approximately 50% may be within the high water mark. Therefore ~ 13m^2 of indirect habitat may be disrupted until vegetation re-establishes •Along the shoreline at locations of failed armouring, there will be ~10 m^2 of rock protection added within the high water mark.	Use of industrial equipment	See "Use of Industrial Equipment" POE.	---	---	---
	Partial constriction of flow	Placement of the armouring around the footing shall be within the existing footprint of the current armouring and asphalt capping. Stone used along banks at areas of existing bank failure shall be placed to mimic existing bank slope and channel curvature. Rock shall not extend out into the creek.	Negligible	No	Armouring currently exists in locations to be re-armoured post-construction. Likewise, select placing of stone along the creek shall be out of the water and to replace sections of failed armouring.
	Input of contaminants	New armour stone shall be free of contaminants. No concrete rubble to be used as armouring.	---	---	---

Debris Management (W4) Removal of the existing 2 footings, 1 temporary pier, and entire existing bridge deck over the creek valley - Removal of existing bridge structures will be in pieces directly out of creek valley and floodplain. - Decking may be used to prevent sections of bridge deck from falling into creek.	Use of industrial equipment	See "Use of Industrial Equipment" POE.	---	---	---
	Input of contaminants	Temporary decking may be constructed to prevent debris falling directly into the creek. Structures removed shall be directly out of the floodplain with no dragging. Likewise, if accidental fall of material ends in the creek, the material shall be removed immediately and by direct lift (no dragging).	None	No	N/A

***Interpretation of Serious Harm to Fish (as per the Fisheries Protection Policy Statement)**

1. **The expected duration of impacts (**For example, is the duration short enough that it does not diminish the ability of fish to carry out one or more of its life processes? It is important to note that, for many projects, the duration of impact will be longer than the duration of the work taking place in or near the water)
2. **The geographic scale of impacts** (For example, is the scale small enough that the disturbance will not displace fish that would otherwise be occupying the habitat?)
3. **The availability and condition of nearby fish habitat** (Is the habitat that is being altered or destroyed the only habitat of its type and quality in the area of the project?)
4. **The impact on the relevant fish (stocks)** (For example, are the fish that are affected by the proposed project likely to experience increased mortality rates, increased stress and reduced fitness as a result of direct injury or reduced habitat function such that a localized effect on a fish population or stock is possible?)

Appendix F

Project Notification Form

MTO PROJECT NOTIFICATION FORM

MTO Project Title: Hawkesbury Bridge Replacements	**MTO Project W.P. No.:** 4203-15-00

PART 1: PROPONENT INFORMATION

Ministry of Transportation Office: Kingston		**MTO Region:** Eastern Region
Mailing Address: 1355 John Counter Blvd.		
City/Town: Kingston	**Province:** Ontario	**Postal Code:** K7L 5A3

MTO Service Provider: Dillon Consulting Limited/Jacobs	**MTO Project Manager:** Gizelle Cotton
Telephone #: (613) 667-1842	**Telephone #:** (613) 547-1799
Email: Tim.Dickinson@jacobs.com	**Email:** Gizelle.Cotton@ontario.ca

PART 2: PROJECT INFORMATION

Federal or Provincial aquatic Species at Risk (SAR) present within project limits: YES ○ NO ◉ **List Species:**	SAR Location:

Description of Fish and Fish Habitat Present at the Worksite, if applicable (i.e. species, substrate type, vegetation):
Hawkesbury Creek flows in a northerly direction towards the Ottawa River with the confluence approximately 2.0 km downstream of the Hawksbury Creek/CNR Overhead at County Road 17 (see Figures 1 and 2 of Fish & Fish Habitat Impact Assessment). MNRF has indicated that Hawkesbury Creek is considered to have a moderate habitat sensitivity and is managed for a combined warmwater/coolwater fish community that includes "…Carps, Minnows, Northern Pike, Muskellunge, Smallmouth Bass, White Sucker, Sunfishes and Suckers" (see Appendix D of Fish & Fish Habitat Impact Assessment).

MMM biologists completed field work on June 08 and October 15, 2015 (see Appendix B of Fish & Fish Habitat Impact Assessment). Watercourse field record forms and habitat map forms were used to collect and document information including digital photographs to show existing conditions. Habitat assessments were completed over 2 broad reaches from 75m upstream to 250m downstream of the bridge. On May 31, 2017 a Dillon biologist attended the site to record photographs (see Appendix C of the Fish & Fish Habitat Impact Assessment). Upstream of the bridge crossing on Hawkesbury Creek, the average wetted width was approximately 10m with an average depth of 1.0m. The channel morphology of this reach was Run/Riffle (60/40%). Substrates, in order of dominance, consisted of a mixture of gravel, cobble and sand though cobble and some boulders (suspected to be from failed bank armouring upstream) were the dominant substrate in riffle sections. Available in-stream cover for fish was limited to undercut banks, boulders/cobble, emergent aquatic vegetation and some overhanging bank vegetation. Downstream of the bridge, the channel runs relatively straight through the area of investigation. The channel width and depth, substrate types, instream cover and riparian zones of this lower reach are similar to the upstream reach. Fish collection by MMM in 2015 resulted in the capture of 2 species of common baitfish: Longnose Dace and Common Shiner. The reach of the tributary that could be accessed upstream of Highway 34 exhibited minimal flow and was choked with vegetation (Appendix B of Fish and Fish Habitat Impact Assessment). During the assessment of the tributary in 2015, unidentified young-of-the-year (YOY) baitfish were observed.

Location of Project: Interchange of Highway 34 and County Road 17	**Geographic Coordinates (Lat/Long):** Latitude: 45 deg. 35.775 N Longitude: 74 deg. 37.240 W
Name of Nearest Community: Hawkesbury, Ontario	**Name of Waterbody(ies):** Hawkesbury Creek and tributary

Description of Works/Undertakings/Activities:

Two new bridges will be constructed with the finished location of the structures on the same basic alignment as the existing structures. The Hawkesbury Creek/CNR Overhead will be changed from a 3-span to a 2-span structure with a total span length increased from 57.0m to 71.0m. The location of the new columns and footing will be located slightly closer to Hawkesbury Creek than the current pier. The Highway 34 Overpass will be replaced with a similar structure to the current structure.

In general, the project work on both structures will be completed in the following stages:

- installation of sediment and erosion measures isolating the work area from the floodplain and waterways;
- construction of temporary access roads to access footings and columns within floodplain (Hawkesbury Creek/CNR Overhead only);
- construction of temporary and permanent bridge structures including: temporary piers and abutments, permanent new footing and columns (Hawkesbury Creek/CNR only);
- lateral-slide of new structures from temporary location to permanent location;
- activation of traffic on new structures;
- removal of the existing, unused structures including currently existing structures and temporary structures (abutments, footings, columns, etc.);
- deactivation of temporary access roads in floodplain (Hawkesbury Creek/CNR Overhead only);
- stabilization of sites including grading and vegetative plantings

Construction activities are anticipated to commence in January 2020 and be completed by the end of 2020. For the Hawkesbury Creek/CNR Overhead bridge, there will be the addition of two piers; one temporary and one permanent with the permanent footing and columns being approximately 3.7m closer to the creek than the existing. The temporary pier and new permanent footing are not within the high water mark but are likely within the active floodplain within 30m of the creek. The replacement of armouring at the new footing and placement of rip-rap armouring along eroded sections of shoreline represents a combined total of 23 m2 of disrupted indirect fish habitat.

Proposed Start Date of Works/Undertakings/Activities: (YYYY/MM/DD)	**Proposed End Date of Works/Undertakings/Activities: (YYYY/MM/DD)**
2020/01/06	2020/12/31

Attached Documents and Photos (check all that apply):

Site Map ☒ **Site Photos** ☒

Drawings ☐ **Template 10.1** ☐ **Template 10.2** ☒ **Template 10.3** ☒

Other: 2017 MNRF Correspondence (App. D); Note: Template 10.2 shown as Table 3 of App. B

PART 3: TYPE OF NOTIFICATION

☐ **Step 3 - Best Management Practice**

Which BMP(s) are you following?

(COMPLETE PARTS 1-3 AND 5 ONLY)

☒ **Step 4 - No likelihood of causing serious harm to fish** **(COMPLETE ALL PARTS)**

PART 4: MEASURES TO AVOID HARM (CHECK APPLICABLE MEASURES TO BE INCLUDED IN CONTRACT)

Mitigation Measures	Applicable Contract Provisions
Timing Constraints: ☒ Temporary in-water will be completed during the in-water work timing window from July 16 to March 14.	☒ SSP101F23 - Table A ☒ OPSS 182
Dewatering/Flow Control: ☒ All in-water work shall be completed in the dry by isolating and dewatering the work area or by temporary flow control around the work area	☒ OPSS 185 ☒ OPSS 518
Erosion and Sediment Control: ☒ Vegetation removal shall be limited to only the extent required for the proposed works ☒ Use of effective sediment and erosion control measures shall be implemented and maintained to function as intended ☒ Sediment and erosion controls shall remain in place and maintained until such time as the vegetation has taken sufficiently to provide adequate protection for the watercourse	☒ OPSS 805 ☒ SSP 805F01 ☒ Operational Constraint - Erosion and Sediment Control
Culvert Installation: ☐ Culvert(s) shall be embedded a minimum of 10% ☐ Low flow channel shall be installed to ensure fish passage	☐ OPSS 182 ☐ OPSS 823
Protection of Fish: ☒ Safe fish passage shall be maintained/provided ☒ Any fish trapped in the isolated area during de-watering shall be captured and released as directed in the Licence to Collect Fish for Scientific Purposes ☒ Water intakes or outlet pipes shall have screens to prevent entrainment or impingement of fish	☒ OPSS 182
Equipment and Machinery: ☒ All equipment shall be clean and in good working order (no leaks of fuel, grease or oils) and a spill management plan shall be kept on site ☒ Areas for refuelling and maintenance of machinery shall be 30m or as far away as practicable from any waterbody	☒ OPSS 100 ☒ OPSS 182
Materials Management: ☒ All construction debris, including removed sheet piling and litter shall be removed on a regular basis ☒ Stockpiles shall be located and isolated to ensure material will not enter any watercourse ☒ Excess materials shall be disposed of in accordance with the Contract Documents	☒ OPSS 100 ☒ OPSS 180 ☒ OPSS 182

Mitigation Measures	Applicable Contract Provisions
Site Restoration: ☒ All disturbed areas shall be restored to original site conditions or better	☒ OPSS 182 ☐ OPSS 802 (Topsoil) ☐ OPSS 803 (Sodding) ☐ OPSS 804 (Seed and Cover)
Oversight: ☐ A MTO Qualified Fisheries Contracts Specialist shall monitor the site for compliance with the contract documents relating to the protection of fish and fish habitat and installation and maintenance of mitigation measures	☐ SSP101 F23 - Table B
Additional Mitigation Measures (list measures):	**Additional Contract Provisions (list relevant Special Provisions, Items, OPSSs, OPSDs, etc.):** ☐ SSP101 F23 - Table C

PART 5: SIGNATURE

I, the undersigned, have reviewed the fish and fish habitat information and the proposed mitigation measures. In accordance with the MTO/DFO/MNRF Fisheries Protocol, and have determined that the proposed works will not likely result in serious harm to fish.

Name: Mark Brobbel

Signature: 

Date: February 15, 2019