

# **Appendix A**

## **Fish and Fish Habitat Existing Conditions Tables**



Table 1: Existing Fish and Fish Habitat Conditions Summary Table (Template D2A)

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
<p><b>Waterbody Name:</b> Tributary to Penville Creek – 1</p> <p><b>Crossing Locations:</b> C10-A-A (WC-1)</p>	2022-06-09	Intermittent	Cool (MNRF, 2019a)	<p><b>Indirect</b></p> <p><b>Habitat:</b> No defined channel and no flowing water could be observed. Dense phragmites were present for approximately 80 m along the east ditch along Highway 400 and for approximately 40 m east downstream of the culvert outlet. The phragmites were present within the entire highway ROW within the assessed reach.</p>	Muck, detritus, silt.	NA – no defined feature observed.	Dense phragmites.	<p><b>Opportunity:</b> Remove invasive phragmites.</p>	N/A
<p><b>Waterbody Name:</b> Tributary to Penville Creek – 1</p> <p><b>Crossing Locations:</b> C10-A-B, C10-A-C (WC-1)</p>	2022-06-09	Permanent	Cool (MNRF, 2019a)	<p><b>Direct</b></p> <p><b>Upstream Habitat:</b> C10-A-B – consisted predominately of runs (90%) with sparse riffles (10%). No pools were noted, and no fish were observed during the site visit. No barriers to fish passage were noted throughout the ROW.</p> <p><b>Downstream Habitat:</b> C10-A-C – the ROW portion of the channel was straightened but consisted of runs, pools, riffles, and flats. Grasses lined the channel banks, and no riparian trees or shrubs were noted. Within the modified portion of the channel downstream, dense cattails were</p>	<p><b>Upstream:</b> Silt/sand/gravel.</p> <p><b>Downstream:</b> silt/sand/cobble/muck.</p>	<p><b>Upstream:</b> runs (90%) with sparse riffles (10%).</p> <p><b>Downstream:</b> runs (50%), riffles (30%), pools (10%), flats (10%).</p>	<p>Cattails and phragmites patches at the downstream end.</p>	<p><b>Opportunity:</b> Remove invasive phragmites.</p> <p>Restore channel form at impacted/straightened section where the soil has been pushed into bankfull limits.</p>	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat	
				present for approximately 80 m as the channel travelled east between two residential properties. The channel banks throughout this portion of the reach were less prominent, and flow appeared to disperse through the cattails. Soil has also been pushed into the bankfull limits on the north side of the channel, which may have altered the flow path of the channel. Further downstream, the channel meanders south through a narrow (10 m) grassed area between a gravel driveway and manicured lawn. This area was predominantly riffles and runs with cobble and gravel substrate. Riparian trees provided shade over the watercourse, and defined banks were present throughout this section.						
<b>Waterbody Name:</b> Tributary to Penville Creek – 1  <b>Crossing Locations:</b> C10-A-1, C10-A-2, C10-A-3 and C10-A-4 (WC-1)	2020-09-14 and 2020-09-21	Permanent	Cool (MNRF, 2019a)	<b>Direct</b>  <b>Upstream Habitat:</b> Permanent watercourse runs south through the agricultural field before becoming channelized adjacent to Highway 400. The Channel upstream of the Highway crossing is deeply incised (evidence of high flow periods) and densely vegetated. Banks were steep but stable due to vegetation. Undercut banks and organic debris provided minimal instream cover. Bank vegetation provided overhanging cover that	<b>Upstream:</b> Silt/clay/gravel  <b>Downstream:</b> Clay/silt/gravel/cobble	<b>Upstream:</b> Channelized, narrow width, incised and a 90% run with 10% riffle morphology.  <b>Downstream:</b> Channelized, wide channel deeply incised, and a 70% run, 10% flat and	<b>Upstream:</b> no vascular macrophytes or woody debris to provide in-stream cover. Bank and overhanging vegetation are dense and dominated by vascular macrophytes and wet meadow herbaceous species.  <b>Downstream:</b> no aquatic macrophytes providing in-stream cover. Bank vegetation is dense and dominated by vascular	<b>Opportunity:</b> Channelized watercourse morphology from C10-A-2 to the culvert inlet at C10-A-4 could be naturalized.	N/A	

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				<p>resulted in 90 – 100% shore cover. Riparian vegetation was dominated by wet meadow herbaceous cover and the occasional riparian shrub.</p> <p><b>Downstream Habitat:</b> Permanent watercourse which runs west through the Highway ROW and into an agricultural field to the west. Channel is widened in this reach, with a more naturalized substrate morphology (i.e., run, riffle and pool sections). Banks were steep but stable due to vegetation. The in-stream cover was low and was comprised of cobble and overhanging banks. Shore cover was low (1-29%). The riparian buffer between the agricultural field and the channel was approx. 15 m across. Riparian vegetation was dominated by wet meadow herbaceous cover and the occasional riparian shrub.</p>		10% riffle morphology.	macrophytes and wet meadow herbaceous species.		
<p><b>Waterbody Name:</b></p> <p><b>Crossing Locations:</b> C10-A-5, (WC-1b)</p>	2022-06-09	Intermittent	Warmwater (AECOM, 2022)	<p><b>Indirect</b></p> <p><b>Habitat:</b> WC-1b was dominated by dense cattails within and along the banks of the channel. Cattails were present throughout the entire cross-section of the feature. Lands directly on either side of the channel consisted of active agricultural cropland. The</p>	Silt/sand/gravel/muck.	Straightened/channelized.	Cattails.	<b>Opportunity:</b> Restore/widen riparian vegetation lands.	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				average depth was approximately 3 cm, and the average wetted width was 0.8 m. The channel was historically altered/straightened between the two farm fields downstream, which gave the channel defined, steep banks. The entire channel length observed consisted of a run, with no pools observed. No substrate sorting was noted, and the channel had a U-shaped cross-section with no clear transition between the bottom of the channel and the banks.					
<b>Waterbody Name:</b>  <b>Crossing Locations:</b> C10-A-6, (WC-1c)	2022-06-09	Ephemeral/ Intermittent	Warm (NDMNR F, 2022)	<b>Not fish Habitat</b>  <b>Upstream Habitat:</b> a channelized drainage system with large riverstone bank stabilization in place. The feature morphology was confined to largely the culvert inlet pool (20%), which was approximately 30cm deep, and inside the culvert (80%). An approximately 3m drop in elevation was present just before the culvert inlet, creating a possible barrier to fish passage. Water was present in the culvert inlet, but it should be noted that it had rained significantly within the 72hrs prior to the inspection.  <b>Downstream Habitat:</b> wetland feature with no defined channel beyond the culvert outlet. A	Silt (80%)/sand (20%)	Culvert inlet plunge pool (20%); inside culvert (80%)	Water-tolerant terrestrial vegetation and cattails were present throughout the feature, choking the "channel" both in the upstream and downstream reaches	<b>Opportunity:</b> Remove debris jam from culvert outlet and downstream of culvert; repair bottom of the culvert	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				debris jam was present at the culvert outlet. Approximately 5m downstream from the culvert outlet.					
<b>Waterbody Name:</b> Tributary to Fraser Creek – 1  <b>Crossing Locations:</b> C10-B-1 and C10-B-2 (WC-2a)	2020-09-14	Ephemeral	Warm (MNRF, 2019a)	<b>Not Fish Habitat</b>  <b>Habitat:</b> Ephemeral drainage swale in an actively farmed agricultural field. No substrate sorting and no defined channel were observed. Swale is actively farmed through and appears to be planted/tilled regularly.	topsoil/sand/clay.	N/A	Agriculture	N/A	N/A
<b>Waterbody Name:</b> Tributary to Fraser Creek – 2  <b>Crossing Locations:</b> C10-C-1 and C10-C-2 (WC-2)	2020-09-14 and 2021-06-02	Permanent (dries up downstream at crossing C10-C-2).	Warm (MNRF, 2019a)	<b>Direct</b>  <b>Upstream Habitat:</b> Moderate flow, natural morphology. Channel lined with heavy woody debris provides instream and overhanging cover. Undercut banks and boulders provide additional instream cover. Evidence of high flows and eroding banks on both sides of the channel. The surrounding forest provides 90-100% shore cover.	<b>Upstream:</b> Clay/cobble.  <b>Downstream:</b> Clay/silt/muck	<b>Upstream:</b>  <b>Summer:</b> run/pool/riffle  <b>Spring:</b> no pools observed.  <b>Downstream:</b>  <b>Summer:</b> pool/riffle (i.e., cobble substrates, dry during the investigation)	The surrounding forest is dominated by willow and cedar species, lowland shrubs.	<b>Constraints:</b> Vulnerable (severe erosion) left bank at C10-C-2 crossing. Log jams observed may hinder fish passage, most notably during low flow conditions.  Potential seasonal obstructions due to low flow.	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				<p><b>Downstream Habitat:</b> Channel was partially dry during the investigation; water was only present in pools sections. The substrate was consistent throughout the reach. Steep incised valley lands surrounding channel. Surrounding forest provides 90-100% shore cover.</p> <p><b>Spring:</b> No aquatic vegetation observed. No aquatic life noted - no fish, frogs, tadpoles observed.</p>		<b>Spring:</b> flats		<p><b>Opportunities:</b></p> <p>Restore and repair left bank erosion; remove seasonal obstructions to fish passage; and remove invasive species present on site.</p>	
<p><b>Waterbody Name:</b> Tributary to Fraser Creek – 3</p> <p><b>Crossing Locations:</b> C11-A-1 (WC-3)</p>	<p>2020-09-21</p> <p>And</p> <p>2021-06-02</p>	Permanent	Warm (MNRF, 2019a)	<p><b>Direct</b></p> <p><b>Upstream Habitat:</b> Natural watercourse flows south through a wet meadow that transitions to a dense thicket below the north ROW. Watercourse exhibits a natural channel and substrate morphology. Channel is heavily incised, and the left bank is severely eroded. Evidence of high flow periods and sediment deposition. Surrounding thicket provides 90-100% shore cover.</p> <p><b>Spring:</b> Channel has a natural meandering profile through the forested area. Steep slightly unstable banks provide undercut cover and resulted in a large amount of instream and overhanging woody debris. Pools were observed, most notably at upstream end and center ROW point that provide refuge during summer months for fish. Small-</p>	<p><b>Upstream:</b> Clay/cobble/silt/boulder</p> <p><b>Downstream:</b> clay/silt/ sand</p>	<p><b>Upstream:</b> Run/riffle/ pool</p> <p><b>Downstream:</b> Flat/ pool</p>	<p><b>Upstream:</b> Dense thicket dominated by riparian shrubs (dogwood, cherry) and trees (green ash, buckthorn, elm) surrounds channel, no in-stream vegetation.</p> <p><b>Downstream:</b> Dense overhanging vegetation consisting of aquatic macrophytes, wet meadow herbaceous species and riparian shrub. Limited instream cover consisting of aquatic macrophytes and undercut banks.</p>	<p><b>Constraint:</b> Banks were slightly unstable, works in the area should consider avoiding and/or stabilizing these areas.</p>	N/A



Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				<p>bodied fish were observed at both pool locations.</p> <p><b>Downstream Habitat:</b> Semi-channelized watercourse flows out of the thicketed area upstream in a southwest direction through agricultural fields. There is a thin riparian buffer parallel to the channel. This reach had a deeper, more incised channel that contained deeper water that flowed at a slower velocity. Banks were both unstable due to high flow periods. Dense vegetation provided seasonal stability to the steep, vulnerable banks. Surrounding herbaceous and shrub vegetation provides 60-90% shore cover.</p> <p><b>Spring:</b> Similar channel morphology and characteristics as upstream end. No significant pools features observed at downstream end. Channel enters farm field and channelized drainage swale between two farm fields, which probably provides poor fish habitat. Clay substrate noted through run sections at downstream end.</p>					
<b>Waterbody Name:</b>	2020-09-21 and	Ephemeral	Warm (MNRF, 2019a)	<p><b>Not Fish Habitat</b></p> <p><b>Habitat:</b> Phragmites lined channel is approximately 20 cm</p>	Silt/sand/clay	N/A	Dense in channel vegetation growth dominated by phragmites and cattail near the channel outlet into C11-	N/A	N/A



Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
Tributary to Fraser Creek – 4  <b>Crossing Locations:</b> C11-A-2 (WC-4)	2021-06-02			wide. The substrate looks wet, but the channel was dry upon inspection.  <b>Spring:</b> Indirect fish habitat. Feature consists of a farm field drainage swale at the upslope end to the east, which originates in an actively cropped farm field. A poorly defined eroded swale was observed in the hedge row, and a tile drain outlet was noted in the forested area which outlets into a man-made ditch. The ditch runs along the southern edge of the forested area, 3-5 m into the forest from the fields edge. Drainage channel outlets into C11-A-1 near a phragmites patch. Channel was entirely dry at time of site visit.			A-1. Narrow riparian buffer (1 m) on both sides of the channel.		
<b>Waterbody Name:</b> Tributary to Fraser Creek – 5  <b>Crossing Locations:</b> C12-A-1 (WC-5)	2020-09-17 and 2021-06-02	Ephemeral (upstream of pond), permanent (pond), intermittent (downstream of pond).	Warm (MNR, 2019a)	<b>Indirect</b> (channel); <b>Direct</b> (pond)  <b>Habitat:</b> Swale runs north through thicket and forest. The ground was wet and muddy throughout, but there was no defined banks/channel. The thicket was dominated by willow trees, buckthorn, sensitive fern, jewelweed wet and riparian species. A small cattail depression at the origin of the swale contains stagnant water. No substrate sorting, small pockets of standing water in cattails. Sparse trees and dense shrubs shade area to the	Clay/detritus/silt/muck	N/A	Small depression was filled with phragmites and cattail. Swale runs through dense forest/thicket.  Pond: Submerged aquatic vegetation was present along the shoreline, and sparse cattails were present at the northwest end of the pond. Algae was also present along the border of the pond.	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				<p>northeast of road. Feature enters wooded lands further to the northeast on private lands.</p> <p>Approximately 180 m downstream (northeast) of Sideroad 10, the feature outlets into an online pond. The pond is approximately 15 m wide and 60 m long, with a depth of greater than 2 m. The pond outlets at the northeast end of the pond, crosses a residential driveway, and continues to flow through a forested area. The pond itself has sparse riparian trees that provided minimal shading, and the lands surrounding the pond were manicured lawn. An abundance of small-bodied fish were observed, and seine pulls were competed along the shoreline. Downstream of the pond, the channel was poorly defined with non-continues banks and substrate sorting in some sections of the channel. Average wetted depth was less than 3 cm, and the wetted width was 0.8 m on average.</p>					
<b>Waterbody Name:</b> Tributary to	2020-09-18 and	Intermittent	Warm (MNRF, 2019a)	<b>Direct</b>	Muck/detritus	N/A	Swale is densely vegetated with cattail and phragmites. Riparian vegetation is a mixture of	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
Fraser Creek – 5  <b>Crossing Locations:</b> C13-A-1 (WC-5)	2021-06-02			<p><b>Habitat:</b> Natural swale through meadow and agricultural field. Riparian buffer runs parallel to the swale and is approximately 15 m wide. There is no defined channel nor distinct morphology present.</p> <p><b>Spring:</b> Entire feature within the ROW consists of a 15 m grassed area with a channelized feature through the middle. Dense grasses noted along the wetted channel with clear water observed. No pools observed. Channel originated from hedgerow upstream to the north and enters scrubland to the south with sparse shrubs and trees. Patch of phragmites noted at the downstream end. Farm field access road cuts through center of grasses riparian feature and disrupts channel flow and form.</p>			wet and dry tolerant species.		
<b>Waterbody Name:</b> Tributary to Fraser Creek – 6  <b>Crossing Locations:</b> C14-A-1 (WC-6)	2020-09-18 and 2021-06-02	Ephemeral	Warm (MNRF, 2019a)	<p><b>Not fish habitat</b></p> <p><b>Habitat:</b> Swale with origin in small wetland depression surrounded by thicket that is dominated by wet tolerant species. There was no standing water present at the time of inspection. There is no defined channel nor distinct morphology present upstream or downstream of ROW crossing area. Lowland swale feature with no defined edges was noted in the forested</p>	Muck/detritus	N/A	Forest (white birch, poplar, conifer), with wetland depression and wet open meadow.	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				area downstream of the ROW, but area was dry with no standing water and no wet soils. Approximately 200 m downstream there is a poorly defined feature that was dry, with cattails and pockets of moist soils.					
<b>Waterbody Name:</b> Pond 1  <b>Crossing Locations:</b> NA	2022-06-09	N/A	N/A	<b>Not fish habitat</b>  <b>Habitat:</b> The pond is an offline feature. The pond was an oval shaped and measures approximately 15 m wide and 25 m long, with a depth of over 1 m. The surround lands consisted of dense forested lands and shrubs. The middle of the pond was open water, but no fish were observed during the field investigation. Cattails were present along the shoreline, and riparian trees/shrubs provided shading of approximately 25% of the pond.	Detritus/muck.	N/A	Cattails	N/A	N/A
<b>Waterbody Name:</b> Tributary to West Holland River – 3  <b>Crossing Locations:</b> (WC-7)	NA	Ephemeral	Warm (AECOM, 2021)	<b>Not fish habitat</b>  <b>Upstream Habitat:</b> WC-7 flows southwest in a similar manner as WC-8 through an actively farmed agricultural field. WC-7 was not investigated in the field because there was not a crossing location associated with this feature, but it appears to be a poorly defined ephemeral drainage swale	N/A	N/A	Agricultural crop	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				similar to WC-7. Therefore, this feature is not fish habitat.					
<b>Waterbody Name:</b> Tributary to West Holland River – 1  <b>Crossing Locations:</b> C16-A-1 (WC-9)	2020-09-18, 2021-06-15, and 2021-08-12	Permanent	Warm (MNRF, 2019a)	<b>Direct</b>  <b>Upstream Habitat:</b> Watercourse has a moderate flow that drains east through an industrial area, then continues under a railway crossing heading south/southeast until its confluence with West Humber River. Valley land surrounding channel is dense thicket/forest on the upstream reaches then open wet meadow/wetland towards the downstream reach. Watercourse has a natural morphology and is deeply incised through a primarily clay substrate. Channel is completely shaded by thicket and woody debris overhanging the channel.  <b>Downstream Habitat:</b> Watercourse enters a wetland feature with multiple channels and backwater locations. No defined bankfull or channel banks. with riparian grass hummocks and deep (>1 m) water observed. Dense riparian grasses and cattails.	<b>Upstream:</b> Clay/gravel/silt/cobble  <b>Downstream:</b> muck	<b>Upstream:</b> Flat/run/ pool  <b>Downstream:</b> Flat/  Pool	<b>Upstream:</b> upstream is dominated by an agricultural thicket/deciduous swamp community that transitions into a shallow cattail marsh community close to the rail crossing and downstream.  <b>Downstream:</b> Overhanging cattails and grasses shaded parts of the channel; grass hummocks provide additional shading.	<b>Constraints:</b> N/A  <b>Opportunities:</b> Maintain wetland and cattail marsh to the extent possible to ensure Northern Pike spawning habitat.	Mapped Northern Pike spawning habitat
<b>Waterbody Name:</b> Tributary to	2020-09-18, 2021-06-15, and	Ephemeral	Warm (MNRF, 2019a)	<b>Not fish habitat</b>	Clay/ sand (dry)	N/A	Agricultural crop	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
West Holland River – 2  <b>Crossing Locations:</b> C16-A-2 and C16-A-3 (WC-8)	2021-08-12			<p><b>Upstream (A-3):</b> Data for this agricultural swale was taken at approx. 15 m downstream from the crossing location. Watercourse has its origin in an agricultural field west of a hedgerow where the investigation was completed. The watercourse was a dry swale that transected multiple agricultural fields (soy). The swale seems to have a natural meander and a poorly defined channel; however, the surrounding crop was not growing within the channel, suggesting that the swale may have flow during spring and high flow periods. During the spring field visit, the entire drainage swale was dry and planted with crops.</p> <p><b>Downstream (A-2):</b> Downstream habitat homogenous to upstream habitat.</p>					
<b>Waterbody Name:</b> Tributary to West Holland River – 1  <b>Crossing Locations:</b> C16-A-4 (WC-9)	2022-06-09	Ephemeral	Warm (MNRF, 2019a)	<p><b>Not fish habitat</b></p> <p><b>Habitat:</b> a poorly defined swale feature with no defined banks nor flow was observed during the site visit. The feature crosses a farm access road via a partially crushed, old CSP culvert.</p>	topsoil	Swale feature	Terrestrial grasses were growing throughout the feature	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
<b>Waterbody Name:</b> West Holland River  <b>Crossing Locations:</b> C17-A-1 (WC-10)	2020-09-15 and 2021-06-14	Permanent	Warm (MNRF, 2019a)	<b>Direct</b>  <b>Upstream Habitat:</b> River flows in a northeast direction. Wide (+ 90 m), deep and slow-moving river bordered by wetland (open fen and shallow marsh) on the west bank and a narrow wetland (shallow marsh) riparian buffer that transitions to agriculture on the east bank. Banks were stable and are bordered by thick vegetative growth; no signs of erosion were observed. Water is turbid and sediment laden. River displays a natural morphology. Algae blooms observed during the investigation suggests nutrient loading from surrounding agricultural drains and adjacent agriculture practices.  <b>Downstream Habitat:</b> Downstream habitat feature homogenous to upstream habitat.	It is estimated to be dominated by silt/ muck/ clay.	Flat (homogenous throughout investigated reach)	<p>Instream vegetation was dominated emergent and submergent (dominated by cattail and aquatic macrophytes along the shoreline and floating (dominated by duckweed and along the river's littoral zone). Little overhanging cover or shade in main channel</p> <p>Riparian grass and scrub land. Agricultural crop land use to the east, forested lands and wetland to the west. Cattail thicket along shoreline can be walked through during spring conditions (was not possible to walk through during 2020 investigations)</p>	N/A	<p>Acts as a migratory corridor for fish to reach upstream spawning habitat and specialized habitats that fish use for spawning, nursery (e.g. slower moving areas with instream cover).</p> <p>Confirmed spawning habitat for muskellunge species (MNRF, 2019).</p>
<b>Waterbody Name:</b> Tributary to West Holland River – 2  <b>Crossing Locations:</b> C17-B-1 (WC-11)	2020-09-15 And 2021-06-14	Permanent	Warm (MNRF, 2019a)	<b>Direct</b>  <b>Upstream Habitat:</b> Wide (+ 5m), deep and channelized agricultural drain that collects and conveys all the surrounding agricultural drains in the adjacent fields. The channel flows south through the alignment to its confluence with the West Holland	Silt/muck/detritus.	Flat	Cattails, milfoil, duckweed	<b>Constraint:</b> Downstream right bank classified as unstable and vulnerable during spring investigations.  <b>Opportunity:</b>	N/A



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				<p>River, approximately 20 m from the south ROW. Highly productive, evidence of intensive nutrient loading. Water in the channel obscured by a thick layer of duckweed and algae blooms.</p> <p><b>Downstream Habitat:</b></p> <p><b>Summer investigation:</b> Downstream habitat feature homogenous to upstream habitat.</p> <p><b>Spring investigation:</b> Steep berm bank on west side separating channel from West Holland River. Small shrubs and riparian cattails along the west bank, with a narrow (1m) strip of cattails before actively farmed crop field on the east side.</p>				Restore and stabilize vulnerable bank.	
<p><b>Waterbody Name:</b> Unnamed Drain – 1</p> <p><b>Crossing Locations:</b> C17-C-1 (WC-12)</p>	<p>2020-09-15 And 2021-06-14</p>	Ephemeral	Warm (MNRF, 2019a)	<p><b>Not fish habitat</b></p> <p><b>Habitat:</b> Channelized agricultural drain through a cornfield. No water was present in the channel upon inspection. The soil was dry, and there was dense vegetative growth within the channel.</p>	N/A	N/A	Agriculture	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
<b>Waterbody Name:</b> Unnamed Drain – 2  <b>Crossing Locations:</b> C17-D-1 (WC-13)	2020-09-15 And 2021-06-14	Ephemeral	Warm (MNRF, 2019a)	<b>Not fish habitat</b>  <b>Habitat:</b> Channelized agricultural drain through a cornfield. No water was present at the time of inspection. However, the soil was still saturated, and there was minimal vegetation growth in the channel. Banks were shallow; however, there was a defined U shape to the channel. The channel substrate is composed of the same fine silt and clay soil present in the surrounding agricultural fields.	N/A	N/A	Agriculture	N/A	N/A
<b>Waterbody Name:</b> Unnamed Drain – 3  <b>Crossing Locations:</b> C17-E-1 (WC-14)	2020-09-15 And 2021-06-14	Ephemeral	Warm (MNRF, 2019a)	<b>Not fish habitat</b>  <b>Habitat:</b> Conditions are the same as what was recorded for the C17-D-1 crossing location.	N/A	N/A	Agriculture	N/A	N/A
<b>Waterbody Name:</b> Unnamed Drain – 4  <b>Crossing Locations:</b> C17-F-1 (WC-15)	2020-09-15 And 2021-06-14	Ephemeral	Warm (MNRF, 2019a)	<b>Not fish habitat</b>  <b>Habitat:</b> Conditions are the same as what was recorded for the C17-D-1 crossing location.	N/A	N/A	Agriculture	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
<b>Waterbody Name:</b> Unnamed Drain – 5  <b>Crossing Locations:</b> C18-A-1 (WC-16)	2020-09-15 and 2021-06-14	Ephemeral	Warm (MNRF, 2019a)	Direct – poor seasonal habitat.  Small-bodied fish were observed in channel. Fish likely accessed the ditch during overnight rainfall. Poor seasonal habitat at best. Fish become stranded after rainfalls.  <b>Habitat:</b> Channelized agricultural drain adjacent to access road and mixed vegetable crop. The channel's upstream reach was dry with saturated soil, and the downstream reach contained standing water. The channel was narrow (0.5 m wide), the banks were shallow, and there was no in-stream vegetative growth. The ground is composed of the same fine silt and clay soil present in the surrounding agricultural fields.	Summer: Clay/silt/sand  Spring:  Downstream: Muck	Flat	Agriculture	<b>Opportunity:</b> Downstream outlet into the ditch at Hochreiter Road is elevated, which cuts off access into the ditch.  <b>Constraint:</b> Downstream banks are unstable and vulnerable	N/A
<b>Waterbody Name:</b> Unnamed Drain – 6  <b>Crossing Locations:</b> C18-B-1 (WC-17)	2020-09-15 And 2021-06-14	Ephemeral	Warm (MNRF, 2019a)	<b>Not fish habitat</b>  <b>Habitat:</b> Channelized agricultural drain through cabbage crop. Channel was dry upon investigation; however, the soil was partially saturated in sections. Banks were steep straight banks with a deeply incised channel. Channel contained minimal vegetation growth. The ground is composed of the same fine silt and clay soil	Silt/clay/sand	N/A	Agriculture	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				present in the surrounding agricultural fields.					
<b>Waterbody Name:</b> Unnamed Drain	2020-09-15 And 2021-06-14	Ephemeral	Warm (MNRF, 2019a)	<b>Not fish habitat</b>  <b>Habitat:</b> Channelized agricultural drain through cabbage crop. Channel was dry upon investigation. Banks were steep straight banks with a deeply incised channel. No direct connection to Hochreiter Road ditch. The ground is composed of the same fine silt and clay soil present in the surrounding agricultural fields.	Silt/clay/sand	N/A	Agriculture	N/A	N/A
<b>Waterbody Name:</b> Unnamed Drain – 7	2020-09-15 and 2021-06-14	Ephemeral	Warm (MNRF, 2019a)	<b>Not fish habitat</b>  <b>Habitat:</b> Conditions are the same as what was recorded for the C18-B-1 crossing location.	Silt/clay/sand	N/A	Agriculture	N/A	N/A
<b>Waterbody Name:</b> Unnamed Drain – 8	2020-09-15 And 2021-06-14	Intermittent	Warm (MNRF, 2019a)	<b>Direct</b>  <b>Habitat:</b> Channelized roadside / agricultural drain that collects flow from all the surrounding agricultural drains and drains west into C17-B-1 and, ultimately, the West Holland River. Channel is deeply incised, and the banks are steep and	Silt/muck/clay	Flat	Agriculture  Spring: milfoil and algae	<b>Opportunity/Constraint:</b>  Downstream and upstream left banks were vulnerable upon spring inspection while downstream and upstream right bank	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				densely vegetated. There was no in-stream vegetation or shore cover. The water was turbid (dark brown) and appeared to be slow or stagnant.				was eroding upon spring inspection.  Downstream fish passage obstructions were observed.	
<b>Waterbody Name:</b> Unnamed Drain – 9  <b>Crossing Locations:</b> C18-E-1 (WC-22)	2020-09-15, and 2021-08-12	Ephemeral	Warm (MNRF, 2019a)	<b>Not fish habitat</b>  <b>Habitat:</b> Channelized roadside drain that runs on the parallel, 10 m south of Hochreiter Road. Channel was dry upon investigation. Channel runs through a forest dominated with deciduous species (white cedar and sugar maple dominated). Banks are shallow, and the channel was not well defined. Channel was densely lined with woody debris; however, there was no vegetation growth. Shore cover was high (90-100%) due to the surrounding forest community. Ground cover was partially saturated soil and leaf litter. Not directly connected to fish habitat.	N/A	N/A	Forest	N/A	N/A
<b>Waterbody Name:</b> Tributary to West Holland – 2  <b>Crossing Locations:</b>	2020-09-16 and 2021-06-14	Permanent	Warm (MNRF, 2019a)	<b>Direct</b>  <b>Habitat: Summer:</b> Channelized roadside drain that runs parallel to Bathurst Street. The channel flows north to another sizeable agricultural drain through forest and agricultural fields until its confluence with the West Holland	Silt/detritus/muck/clay	Flat	The surrounding forest is dominated by white cedar, sugar maple, birch and ash. Wet meadow herbaceous species dominate bank vegetation. There was no in-stream vegetation present.	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
C18-F-1 (WC-24)				<p>River. The deeply incised channel contains slow to stagnant flow. Banks are well vegetated and stable, although steep. There is limited in-stream cover that is dominated by woody debris and leaf litter. Shore cover is dense and dominated by forest (White Cedar, Sugar Maple dominated).</p> <p><b>Spring:</b> No observable flow throughout assessed area. Deep 80cm pool of standing water at SW corner of Dense overhanging trees provide 80+% shading through assessed area. Assessed channels appear to be ditch features that were created near wetland or lowland features that now hold water - may not be watercourse features with flow.</p>					
<p><b>Waterbody Name:</b> Tributary to West Holland – 3</p> <p><b>Crossing Locations:</b> C18-G-1 (WC-23)</p>	2020-09-15, 2021-06-16, and 2021-08-12	Intermittent	Warm	<p><b>Direct</b></p> <p><b>Habitat:</b></p> <p><b>Summer:</b> The crossing location for C18-G-1 is in the adjacent forest, where a small ephemeral swale runs through the forest and connects with the road drainage along Bathurst Street. However, upon investigation, the watercourse is channelized along Bathurst Street as a roadside drain. The roadside drain flows north and drains into C18-E-1 at the Bathurst Street and</p>	Silt/ detritus/ muck/ clay	Flat	The surrounding forest is dominated by white cedar, sugar maple, birch and ash. Wet meadow herbaceous species dominate bank vegetation—limited aquatic macrophytes dominated by cattail.	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				Hochreiter Road intersection. The deeply incised channel contains slow to stagnant flow. Banks are well vegetated and stable, although steep. There is limited in-stream cover that is dominated by woody debris, aquatic macrophyte and leaf litter. Shore cover is dense and dominated by forest (White Cedar, Sugar Maple dominated).					
<b>Waterbody Name:</b> Tributary to East Holland River  <b>Crossing Locations:</b> C18-H-1 (WC-23)	2020-09-15 and 2021-06-14	Intermittent	Warm (MNRF, 2019a)	<b>Direct</b>  <b>Habitat: summer:</b> The roadside drain collects flow from several road drains along the east side of Bathurst Street and flows north to a large drain that ultimately conveys all flow into East Holland River. The deeply incised channel contains slow to stagnant flow. Banks are well vegetated and stable, although steep. The in-stream cover was moderate and was dominated by aquatic macrophytes and woody debris. Shore cover is low and dominated by riparian shrubs and overhanging woody debris.  <b>Spring:</b> No flow observed throughout assessed downstream reach. No flow direction observed at entrance culvert underneath marina driveway. Dense duckweed and	Silt/ detritus/ muck/ clay	Flat	Surrounding riparian buffer was dominated by willow and wet tolerant herbaceous species. Beyond the riparian buffer, there is mowed grass and a cultural meadow. Aquatic macrophytes provide in-stream cover and are dominated by sedges and rushes with cattails and milfoil present	N/A	N/A



Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				cattails at northeast channel at Bathurst and marina entrance. East along marina entrance on south side, channel is well shaded by overhanging trees and woody debris with minimal floating or emerging aquatic vegetation in this area.					
<b>Waterbody Name:</b> East Holland River  <b>Crossing Locations:</b> C20-A-1 (WC-25)	2020-09-16 and 2021-06-15	Permanent	Warm (MNRF, 2019a)	<b>Direct</b>  <b>Upstream Habitat:</b> River flows north to its confluence with the Main branch of the Holland River. Wide (+ 80 m), deep and slow-moving river bordered by wetland (MAS3 and SWD6 and Golf course) on the east bank and a narrow wetland (CUM1 and SWD3 and Marina) west bank. Banks were stable and are bordered by thick vegetative growth; no signs of erosion were observed. Water is turbid and sediment laden. River displays a natural morphology.  <b>Downstream Habitat:</b> Downstream habitat feature homogenous to upstream habitat.	Estimated to be dominated by silt/muck/clay.	Flat (homogenous throughout investigated reach)	Instream vegetation was dominated by emergent and submergent (cattail and milfoil) along the shoreline and floating (duckweed and pond lilies) along the river's littoral zone.	N/A	Acts as a migratory corridor for fish to reach upstream spawning habitat and specialized habitats that fish use for spawning, nursery (e.g. slower moving areas with instream cover).  Confirmed spawning habitat for muskellunge species (MNRF, 2019).

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
<b>Waterbody Name:</b> Silver Lakes Golf Course Pond  <b>Crossing Locations:</b> C20-B-1	2020-09-16	Permanent	Unknown	<b>Not fish habitat</b>  <b>Habitat:</b> The pond is next to Hole 2 on the golf course. The golf course maintains the area surrounding the pond right up to within 0.5m of the riparian zone. The riparian zone is comprised of wetland vegetation, and the banks are sloped. Discussions with the maintenance superintendent revealed that the river floods over Hole 2 and impacts this pond every couple of years (AECOM, 2020).	Estimated to be dominated by clay/silt/sand	Pond – not connected to East Holland River.  Shore cover shaded 1-29% of pond.	Along the edge of the pond, submergent and emergent vegetation was dominated. The most dominant species included: duckweed, white water lily, coon-tail, cattails	N/A	N/A
<b>Waterbody Name:</b> Holborn Drain  <b>Crossing Locations:</b> C22-A-1 (WC-27)	2020-09-16 and 2021-06-15	Permanent pond with intermittent drainage channel to the south.	Warm (MNRF, 2019a)	<b>Direct</b>  <b>Habitat: summer:</b> The crossing location for C22-A-1 is in the middle of an agricultural area where the water feature separates two fields that were actively being farmed. The water feature, which flows north, consisted of a wetland area with an approximate 3m riparian buffer upstream of the ROW and two water retention ponds on the downstream side of the ROW. The agricultural field on the west side of the watercourse was wet at the time of inspection, and a water pump was observed in most southern water retention pond.  <b>Spring:</b> Channel was dry north of culvert to the pond. Pond was	Estimated to be dominated by Silt/clay/muck	<b>Upstream:</b> channelized 100% flats (homogeneous throughout the area of investigation)  <b>Downstream:</b> channelized	<b>Upstream:</b> emergent and floating vegetation dominated. cattails, duckweed, grass  <b>Downstream:</b> Floating and emergent vegetation dominated: duckweed, cattails. goldenrod, asters	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				covered in consistent layer of algae and duckweed. Pond connects to additional pond further north under farm access road. Drainage ditches enter channel from hedgerows to the east and west, both of which were also dry. Pond is used for watering field - pumps installed.					
<b>Waterbody Name:</b> Ravenshoe/ Boag Drain  <b>Crossing Locations:</b> C23-A-1 (WC-27)	2020-09-16 and 2021-06-15	Intermittent	Warm (MNRF, 2019a)	<b>Not fish habitat</b>  <b>Upstream Habitat: Spring:</b> Channelized roadside drain that runs parallel with 2 <sup>nd</sup> Concession Road. Channel looked as if it had been dredged recently (within the past year or so). Both banks appeared slightly unstable throughout the entire reach. However, the left bank was protected by vegetation, while the right bank was vulnerable to erosion. <b>Summer:</b> Dry ditch feature with sparse cattails and grasses. No water observed throughout entire ROW, and no direct connections observed to nearby watercourses. Sod farm to the east, crop field to the west.  <b>Downstream Habitat:</b> Downstream habitat feature homogenous to upstream habitat.	N/A	N/A	Dominated by emergent vegetation within ditch line. (dominant species was cattails)	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
<b>Waterbody Name:</b> Tributary to Ravenshoe/ Boag Drain – 1  <b>Crossing Locations:</b> C24-A-1 (WC-28)	2020-09-17 and 2021-06-17	Ephemeral	Warm (MNRF, 2019a)	<b>Not fish habitat</b>  <b>Habitat:</b> Dry agricultural swale with no defined feature and actively planted crops.	N/A	N/A	Agricultural crops.	N/A	N/A
<b>Waterbody Name:</b> Tributary to Ravenshoe/ Boag Drain – 2  <b>Crossing Locations:</b> C25-A-1 (WC-29)	2020-09-17 and 2021-06-17	Ephemeral	Warm (MNRF, 2019a)	<b>Indirect</b>  <b>Habitat:</b> No defined channel through grass swale separating two actively farmed crop fields. A small ponded area (15x15m) was present in the northern end of the assessment area, potentially caused by small earth berm from access road construction. Pond has cattails and shallow waters. Swale captures overland flow from farm fields, no water present in swale other than ponded area.	N/A	N/A	Agricultural crops, goldenrod, aster, grass sp.	N/A	N/A
<b>Waterbody Name:</b> Tributary to Ravenshoe/ Boag Drain – 3	2020-09-17 and 2021-06-17	Ephemeral	Warm (MNRF, 2019a)	<b>Not fish habitat</b>  <b>Habitat:</b> Dry agricultural swale in actively farmed field with no defined feature.	N/A	N/A	Dominated by goldenrod and grass species	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
<p><b>Crossing Locations:</b> C25-B-1 (WC-30)</p> <p>Summer 2020: Watercourse observed from Leslie Road 130 m d/s from crossing due to PTE Access</p>									
<p><b>Waterbody Name:</b> Tributary to Ravenshoe/ Boag Drain – 4</p> <p><b>Crossing Locations:</b> C25-C-1 (WC-31)</p>	<p>2020- 09-17 and 2021- 08-12</p>	<p>Pond – permanent; channel upstream/downstrea m – intermittent.</p>	<p>Warm (MNRF, 2019a)</p>	<p><b>Direct</b></p> <p><b>Habitat:</b> Online man-made pond with drop structure outlet. Dense grasses and cattails with sparse riparian trees. Downstream of pond - 30 metres wide riparian section with grasses and trees between two active crop fields. Pond drop outlet structure appears to be a type of hicken-bottom feature, but unclear. May be simple overflow type structure. Not passable upstream for fish. May allow unintended downstream passage of fish during storm events. Earth berm approximately 5 m wide at top, and 8 m from top to bottom on downstream (west) side. Channel is dry downstream of outlet pool with moist soils. No pools or standing water observed. Patch of Phragmites around outlet pool.</p>	<p>Silt/muck</p>	<p>Flat</p>	<p>Dominated by cattails and grasses with some phragmites</p>	<p><b>Constraint:</b> Upstream banks both slightly unstable and vulnerable.</p> <p><b>Opportunity:</b> Online pond creates fish passage barrier and alters flow of watercourse.</p>	<p>N/A</p>

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
<b>Waterbody Name:</b> Tributary to Maskinonge (Jersey) River – 1  <b>Crossing Locations:</b> C25-A-2 and C26-A-1 (WC-32)	2020-09-16 and 2021-06-17	Intermittent	Warm (MNRF, 2019a)	<b>Indirect</b>  <b>Upstream Habitat: C26-A-1:</b> This section was dry upon inspection, with the majority of plant species present being drought tolerant terrestrial species. There was no defined channel, but the crossing was in a valley created by the adjacent agricultural field and Highway 404. It appeared that the channel might diverge at culvert when it does run. Just over 200m upstream from the crossing, the channel becomes more defined with steep banks and exposed tree roots.  <b>Downstream Habitat: C25-A-2:</b> This section was dry at the culvert at the time of inspection. Once beyond the section of the water feature that was altered for the highway, the feature opened into a wetland. Wetland vegetation species were dominated by cattail and phragmites. The wetland became channelized approximately 200m downstream from the crossing. The channel's flow is controlled by the wetland vegetation that thickly grows over the entire water feature.	Silt/sand/muck/detritus	<b>Upstream:</b> swale  <b>Downstream:</b> Wetland, small meandering channel within wetland observed during fluvial geomorphology assessment.	<b>Upstream:</b> Dominated by grasses, asters, and goldenrods, but there were cattails present. Riparian grasses and shrubs along drainage swale for 50 m before swale enters forested area. 50 m.  <b>Downstream:</b> dominated by cattail and phragmites	N/A	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
<b>Waterbody Name:</b>  <b>Crossing Locations:</b> C27-A-1, (WC-33)	2022-05-19	Permanent	Warm (MNRF, 2019a)	<b>Direct</b>  <b>Habitat:</b> naturalized, meandering channel with a riffle run morphology. Clear water was flowing south to north. Some bank slumping was observed but the banks were well vegetated with water tolerant species. Woody debris was observed throughout the reach and shore cover was moderate (60-90%).	Silt (65%), sand (25%), boulder (5%), gravel (5%)	Run (95%), riffle (5%)	Unidentified submergent vegetation and various grass species	N/A	N/A
<b>Waterbody Name:</b>  <b>Crossing Locations:</b> C28-A-1, (WC-34)	2022-05-19	Permanent	Warm (MNRF, 2019a)	<b>Direct</b>  <b>Upstream Habitat:</b> Wetland feature with no defined banks throughout most of reach; water was present, but not confined within the wetland feature. A pool was present at the culvert inlet. Vegetation cover was high (90-100%) and was dominated by phragmites and cattails.  <b>Downstream Habitat:</b> channelized feature that narrows by riprap placement at the culvert exit and remains slightly incised. Bank erosion was observed on the left bank and undercut banks were observed throughout the reach. The in stream cover was moderate (60%) and was comprised of the undercut banks	<b>Upstream:</b> wetland feature: detritus, silt, muck  <b>Culvert pool:</b> Cobble, gravel, sand  <b>Downstream:</b> muck (60%), silt (30%), and detritus (10%).	<b>Upstream:</b> wetland (90%); culvert pool (10%)  <b>Downstream:</b> run (60%); pool (40%).	<b>Upstream:</b> phragmites, cattails, herbaceous vegetation  <b>Downstream:</b> Phragmites, cattails, herbaceous vegetation	<b>Opportunity:</b> Remove phragmites  Stabilize eroding banks.	N/A



Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type (in order of dominance)	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat
				and the vascular macrophytes, both instream (20%) and overhanging (50%).					

\* Fish habitat is defined in subsection 2(1) of the Fisheries Act to include all waters frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes. The types of areas that can directly or indirectly support life processes include but are not limited to spawning grounds and nursery, rearing, food supply and migration areas.

**Table Description:**

Waterbody ID	Name of waterbody and Crossing # / Station
Date	Insert date field investigations occurred (DD/MM/YYYY), as applicable
Flow	Ephemeral, Intermittent, Permanent
Thermal Regime	Warm, Cool, Cold
Fish Habitat	Direct, Indirect, Not Fish Habitat
Substrate Type	Boulder, cobble, rubble, gravel, sand, muck, etc.
Channel Morphology	E.g., Riffles, runs, pools, undercut banks, etc.
Vegetation	Riparian & In-stream species; emergent, submergent and floating aquatic vegetation
Constraints and Opportunities	E.g., Perched culvert, eroding bank, fish passage barrier, undersized CSP
Significant Fish Habitat	E.g., specialized habitat that supports critical life functions, areas contributing to fisheries productivity, etc.

Table 2: Fish Community Summary (Template D2B)

Waterbody ID	Date	Fish Species Present	Year Class(es)	Species at Risk Present	In-water Works Timing Window
C10-A-A (WC-1): Tributary to Penville Creek		<ul style="list-style-type: none"> <li>Indirect fish habitat</li> </ul>			<ul style="list-style-type: none"> <li>In-water work is permitted from July 16 – March 14.</li> </ul>
C10-A-B to C10-A-4 (WC-1): Tributary to Penville Creek	<ul style="list-style-type: none"> <li>June 9, 2022</li> <li>June 1, 2021</li> <li>June 9, 2022</li> </ul>	<ul style="list-style-type: none"> <li>C10-C-C: Electrofished upstream flats and pools: five (5) Brook Stickleback and one (1) Blacknose Dace</li> <li>C10-A-1: Electrofished runs throughout Study Area: five (5) Blacknose Dace and three (3) Creek Chub captured</li> <li>C10-A-4: Electrofished deep pool at culvert inlet: eleven (11) Creek Chub and one (1) Blacknose Dace captured</li> <li>MNRF, 2019a : Blacknose Dace, Blacknose Shiner, Bluntnose Minnow, Brassy Minnow, Brook Stickleback, Brown Bullhead, Common Shiner, Creek Chub, Fathead Minnow, Finescale Dace, Johnny Darter, Largemouth Bass, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, Rock Bass, White Crappie and White Sucker.</li> </ul>	<ul style="list-style-type: none"> <li>Adult and juvenile.</li> </ul>	<ul style="list-style-type: none"> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>In-water work is permitted from July 16 – March 14.</li> </ul>
C10-A-5 (WC-1b)		<ul style="list-style-type: none"> <li>Indirect fish habitat</li> </ul>			<ul style="list-style-type: none"> <li>In-water work is permitted from July 16 – March 14.</li> </ul>
C10-A-6 (WC-1c)		<ul style="list-style-type: none"> <li>Not fish habitat</li> </ul>			
C10-B-1 and C10-B-2: Tributary to Fraser Creek – 1		<ul style="list-style-type: none"> <li>Not fish habitat</li> </ul>			
C10-C-1 and C10-C-2 (WC-2): Tributary to Fraser Creek – 2	<ul style="list-style-type: none"> <li>June 2, 2021</li> </ul>	<ul style="list-style-type: none"> <li>No fish captured during electrofishing attempt by AECOM. No fish observed</li> <li>MNRF, 2019a: Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Fathead Minnow, Golden Shiner, Goldfish, Hornyhead Chub, Johnny Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Smallmouth Bass, White Sucker and Yellow Perch.</li> </ul>	<ul style="list-style-type: none"> <li>NA</li> </ul>	<ul style="list-style-type: none"> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>In-water work is permitted from July 16 – March 14.</li> </ul>
C11-A-1 (WC-3): Tributary to Fraser Creek – 3	<ul style="list-style-type: none"> <li>June 2, 2021</li> </ul>	<ul style="list-style-type: none"> <li>Electrofished multiple deeper pools in Study Area: fifteen (15) Creek Chub, two (2) Northern Redbelly Dace, one (1) Brook Stickleback captured</li> <li>MNRF, 2019a: Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp., Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed and White Sucker.</li> </ul>	<ul style="list-style-type: none"> <li>Adult and juvenile.</li> </ul>	<ul style="list-style-type: none"> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>In-water work is permitted from July 16 – March 14.</li> </ul>
C11-A-2 (WC-4): Tributary to Fraser Creek – 4		<ul style="list-style-type: none"> <li>Not fish habitat</li> </ul>			
C12-A-1 (WC-5): Tributary to Fraser Creek – 5		<ul style="list-style-type: none"> <li>Indirect fish habitat</li> </ul>			<ul style="list-style-type: none"> <li>In-water work is permitted from July 16 – February 28.</li> </ul>
C13-A-1 (WC-5): Tributary to Fraser Creek – 5	<ul style="list-style-type: none"> <li>June 2, 2021</li> </ul>	<ul style="list-style-type: none"> <li>Attempted to dip net channel – too shallow to electrofish. No fish captured</li> <li>MNRF, 2019a: Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp., Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed and White Sucker.</li> </ul>	<ul style="list-style-type: none"> <li>NA</li> </ul>	<ul style="list-style-type: none"> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>In-water work is permitted from July 16 – March 14.</li> </ul>

Waterbody ID	Date	Fish Species Present	Year Class(es)	Species at Risk Present	In-water Works Timing Window
C14-A-1 (WC-6): Tributary to Fraser Creek – 6		<ul style="list-style-type: none"> <li>Not fish habitat</li> </ul>			
Pond 1		<ul style="list-style-type: none"> <li>Not fish habitat</li> </ul>			
C16-A-1 (WC 9): Tributary to West Holland River – 1	<ul style="list-style-type: none"> <li>August 12, 2021</li> </ul>	<ul style="list-style-type: none"> <li>Electrofished; captured Creek Chub and Brook Stickleback</li> <li>MNRF, 2019a: Blacknose Dace, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Carps and Minnows, Central Mudminnow, Common Shiner, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Johnny Darter, Largemouth Bass, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Rock Bass, White Sucker, Yellow Perch (record from 300 m u/s of C16-A-1 crossing).</li> </ul>	<ul style="list-style-type: none"> <li>Adult and juvenile.</li> </ul>	<ul style="list-style-type: none"> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>In-water work is permitted from July 16 – February 28.</li> </ul>
C16-A-2 (WC-8): Tributary to West Holland River – 2; WC-7: Tributary to West Holland River – 3		<ul style="list-style-type: none"> <li>Not fish habitat</li> </ul>			
C16-A-3 (WC-9): Tributary to West Holland River – 1	<ul style="list-style-type: none"> <li>August 12, 2021</li> </ul>	<ul style="list-style-type: none"> <li>Electrofished run and pool features in upstream ZDA: thirteen (13) Creek Chub and one (1) Brook Stickleback captured</li> <li>MNRF, 2019a: Blacknose Dace, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Carps and Minnows, Central Mudminnow, Common Shiner, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Johnny Darter, Largemouth Bass, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Rock Bass, White Sucker and Yellow Perch.</li> </ul>	<ul style="list-style-type: none"> <li>Adult and juvenile.</li> </ul>	<ul style="list-style-type: none"> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>In-water work is permitted from July 16 – February 28.</li> </ul>
C16-A-4 (tributary to WC 9)		<ul style="list-style-type: none"> <li>Not fish habitat</li> </ul>			
C17-A-1 (WC-10): West Holland River	<ul style="list-style-type: none"> <li>NA</li> </ul>	<ul style="list-style-type: none"> <li>Fish sampling not attempted due to sufficient background information available for the West Holland River</li> <li>MNRF, 2019a: Rock Bass, Brook Stickleback, Northern Pike, Johnny Darter/ Tessellated Darter, Pumpkinseed, Largemouth Bass, Emerald Shiner, Yellow Perch, Black Crappie, Walleye, Common Carp, Golden Shiner, Bluntnose Minnow and Spottail Shiner.</li> <li>Pers Comm: American Eel.</li> </ul>	<ul style="list-style-type: none"> <li>NA</li> </ul>	<ul style="list-style-type: none"> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>In-water work is permitted from July 16 – February 28.</li> </ul>
C17-B-1, C18-A-1, C18-D-1 (WC-11, 16, 20, 21)	<ul style="list-style-type: none"> <li>June 15, 2021</li> </ul>	<ul style="list-style-type: none"> <li>C17-B-1: Two minnow traps set in channel: one (1) Northern Redbelly Dace captured</li> <li>C18-A-1: Small-bodied fish observed in agricultural drain but were too small to dip net/capture</li> <li>MNRF, 2019a: Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch.</li> </ul>	<ul style="list-style-type: none"> <li>Adult Northern Redbelly Dace</li> <li>YoY small-bodied fish</li> </ul>	<ul style="list-style-type: none"> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>In-water work is permitted from July 16 – March 14.</li> </ul>
C17-C-1 to C17-F-1; C18-B-1, C18-C-1, C18-E-1 (WC-12-15, 17-19, 22)		<ul style="list-style-type: none"> <li>Not fish habitat</li> </ul>			
C18-F-1 to C18-H-1 (WC-23 to WC-24)	<ul style="list-style-type: none"> <li>June 15, 2021</li> </ul>	<ul style="list-style-type: none"> <li>Minnow traps set in each of the three locations, but no fish were captured</li> <li>MNRF, 2019a: Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch.</li> </ul>	<ul style="list-style-type: none"> <li>NA</li> </ul>	<ul style="list-style-type: none"> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>In-water work is permitted from July 16 – March 14.</li> </ul>

Waterbody ID	Date	Fish Species Present	Year Class(es)	Species at Risk Present	In-water Works Timing Window
C20-A-1 (WC-25): East Holland River	■ NA	<ul style="list-style-type: none"> <li>■ Fish sampling not attempted due to sufficient background information available for the East Holland River</li> <li>■ MNRF, 2019a: Brown Bullhead, Bowfin, Common Carp, Northern Pike, Pumpkinseed, Largemouth Bass, Golden Shiner, Spottail Shiner, Black Crappie, Rock Bass, Yellow Perch and Fathead Minnow.</li> <li>■ Pers comm: American Eel.</li> </ul>	■ NA	■ No	■ In-water work is permitted from July 16 – February 28.
C20-B-1 (WB-1): Silver Lakes Golf Course Pond		■ Not fish habitat			
C22-A-1 (WC-26): Holborn Drain	■ Sept 17, 2020	<ul style="list-style-type: none"> <li>■ Minnow traps were set in the pond feature in the ROW: four (4) pumpkinseed and four (4) Brown Bullhead were captured</li> <li>■ MNRF, 2019a: Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.</li> </ul>	■ Juvenile	■ No	■ In-water work is permitted from July 16 – February 28.
C23-A-1 (WC-27): Ravenshoe/ Boag Drain		■ Not fish habitat			
C24-A-1 (WC-28): Tributary to Ravenshoe/ Boag Drain – 1		■ Not fish habitat			
C25-A-1 (WC-29): Tributary to Ravenshoe/ Boag Drain – 2		■ Indirect fish habitat			■ In-water work is permitted from July 16 – March 14.
C25-B-1 (WC-30): Tributary to Ravenshoe/ Boag Drain – 3		■ Not fish habitat			
C25-C-1 (WC-31): Tributary to Ravenshoe/ Boag Drain – 4	■ August 12, 2021	<ul style="list-style-type: none"> <li>■ The pond feature in ROW was electrofished: one (1) Brook Stickleback and sixteen (17) Creek Chub were captured</li> <li>■ MNRF, 2019a: Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.</li> </ul>	■ Adult and juvenile.	■ No	■ In-water work is permitted from July 16 – February 28.
C26-A-1 and C25-A-2 (WC-32): Tributary to Maskinonge (Jersey) River – 1		■ Indirect fish habitat			■ In-water work is permitted from July 16 – March 14.
C27-A-1 (WC-33): Maskinonge (Jersey) River	■ May 19, 2022	<ul style="list-style-type: none"> <li>■ MNRF, 2019a: Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Emerald Shiner, Etheostoma sp., Fathead Minnow, Golden Shiner, Hornyhead Chub, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Mimic Shiner, Mottled Sculpin, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Redfin Shiner, White Sucker and Yellow Perch.</li> </ul>	■ NA	■ No	■ In-water work is permitted from July 16 – March 14.
C28-A-1 (WC-34): Tributary to Maskinonge (Jersey) River – 3	■ May 19, 2022	<ul style="list-style-type: none"> <li>■ Downstream of the feature was electrofished, and conductivity was too high to shock, but one (1) Northern Redbelly Dace and thirty (30) Brook Stickleback were captured via dip netting.</li> <li>■ MNRF, 2019a: Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Emerald Shiner, Etheostoma sp., Fathead Minnow, Golden Shiner, Hornyhead Chub, Johnny Darter, Johnny Darter/</li> </ul>	■ Adult and juvenile.	■ No	■ In-water work is permitted from July 16 – March 14.

Waterbody ID	Date	Fish Species Present	Year Class(es)	Species at Risk Present	In-water Works Timing Window
		Tessellated Darter, Largemouth Bass, Mimic Shiner, Mottled Sculpin, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Redfin Shiner, White Sucker and Yellow Perch.			

Notes: 1 In-water work timing window based on MNRF guidelines (2013).  
2 In-water work timing window confirmed in correspondence with MNRF Midhurst District.  
3 historic record, no longer considered present