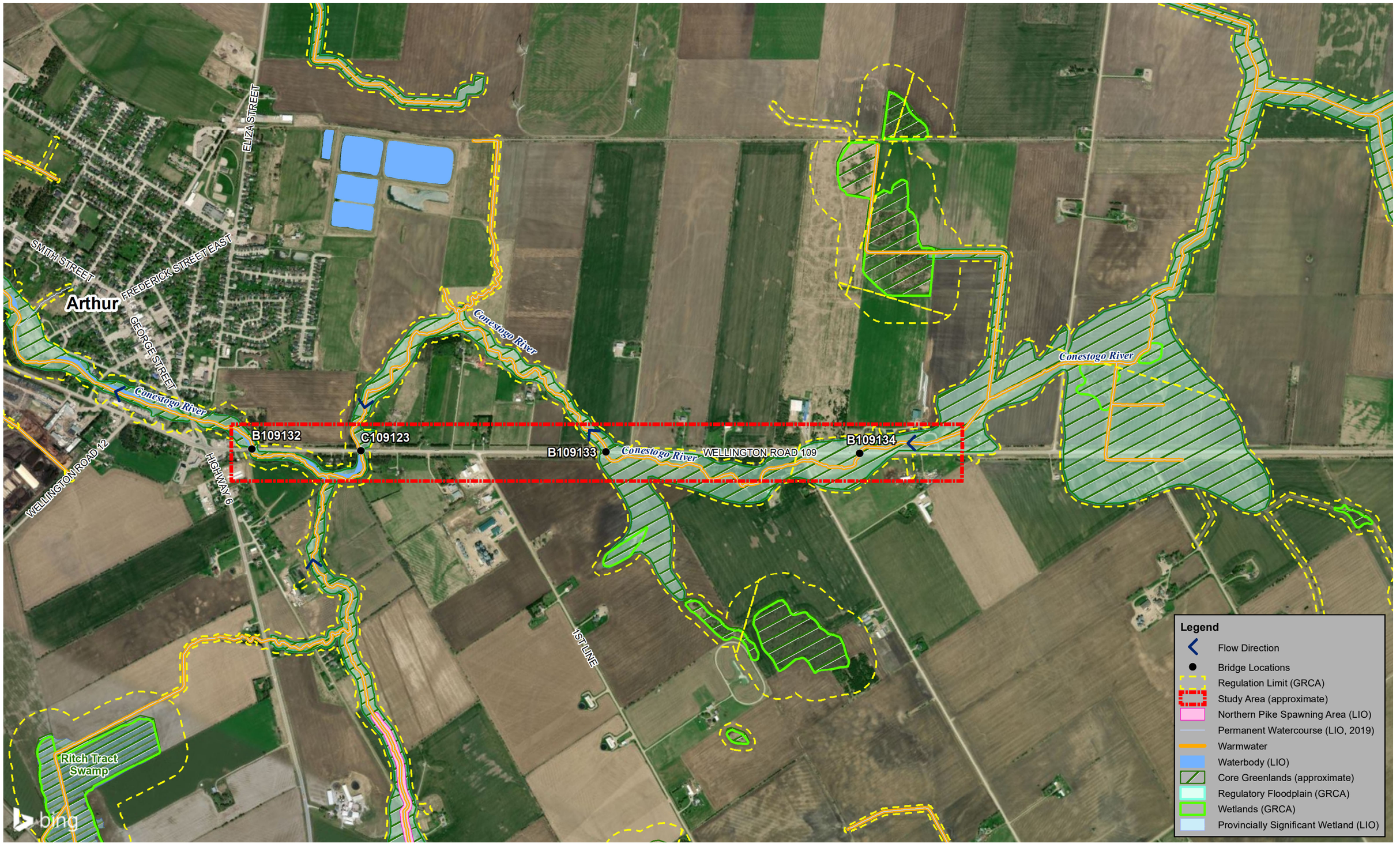
APPENDIX H

Natural Environment

Appendix H – Environmental Appendices List

- Figure H.1 - Existing Conditions and Natural Heritage Features
- Figure H.2 (Plates 1 And 2) – ELC Vegetation Communities, Wildlife Habitat and Grading Limits
- Representative Photographs
- Table H.1 – Vascular Plant List
- Table H.2 – Conestogo River Fish List
- Table H.3 – Breeding Bird and Incidental Wildlife List
- Wellington County Regional SAR List
- Aquatic Habitat Mapping



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WELLINGTON ROAD 109 MUNICIPAL CLASS EA

Existing Conditions and Natural Heritage Features

0 200 400 Meters
1:15,000

N

Date: December 2022

Project No: 17M-01271-02

Figure No: H.1.

Conestogo River
GEORGE STREET
HIGHWAY 6
WELLINGTON ROAD 109
1ST LINE
B109132
C109123
B109133
Unit 1a MAM2-2 / MAS2-1
Unit 3 SWD4-1
CUM1-1
Unit 5 HR
CUM1-1 / Mowed Lawn
Unit 1c MAM2-2 / MAS2-1
Unit 7c SWM1-1 / CUP3
Unit 11a MAM2-2
Unit 5 HR
CUM1-1 /Mowed Lawn
Residential
Unit 2 FOC4-1
Unit 6a CUW1 / SWD4-1
Unit 1b MAM2-2
Unit 7b SWM1-1 / CUP3
Unit 4 CUW1
Unit 7a SWM1-1 / CUP3
Unit 6b SWD4-1 / CUW1
Unit 8 HR
Unit 10 SWD / MAM2-2
Unit 9 HR
MAM2-2
CUW1

Legend

- Flow Direction
- Bridge Locations
- Snapping Turtle Wintering Areas (small ponds)
- Study Area (approximate)
- Grading Limits
- Right-of-Way
- Permanent Watercourse (LIO, 2019)
- ELC

CUM1-1: Dry - Moist Old Field Meadow
CUP3: Coniferous Plantation
CUW1: Mineral Cultural Woodland
FOC4-1: Fresh - Moist White Cedar Coniferous Forest
FOD7: Fresh - Moist Lowland Deciduous Forest
HR: Hedgerow
MAM2-2: Reed-canary Grass Mineral Meadow Marsh
MAS2-1: Cattail Mineral Shallow Marsh
SWD: Decidous Swamp
SWD4-1: Willow Mineral Deciduous Swamp
SWM1-1: White Cedar - Hardwood Mineral Mixed Swamp

WELLINGTON ROAD 109 MUNICIPAL CLASS EA

ELC Vegetation Communities, Wildlife Habitat and Grading Limits

Plate 1

0 100 200 Meters 1:5,000

N

Date: December 2022

Project No: 17M-01271-02

Figure No: H.2.

13 Dec 2022

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WELLINGTON ROAD 109 MUNICIPAL CLASS EA

ELC Vegetation Communities, Wildlife Habitat and Grading Limits

Plate 2

0 100 200
Meters
1:5,000

N

Date: December 2022

Project No: 17M-01271-02

Figure No: H.2.

13 Dec 2022

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Bridge B109132 Photographs:

Photo 1: upstream (south) side of the bridge

Photo 2: looking upstream and east of the bridge. Also shows vegetation in the SE quadrant

Photo 3: west bank and vegetation in the SW quadrant

Photo 4: looking downstream (north) from bridge

Photo 5: east bank and vegetation in the NE quadrant

Photo 6: west bank and vegetation in the NW quadrant

Photo 7: small pond found in the floodplain in the NW quadrant of the bridge (where Snapping Turtle was found)

Photo 8: west bridge abutment (taken from north side)

Photo 9: east bridge abutment (taken from south side)

Bridge C109123
Photographs:

Photo 10: looking downstream (north) of bridge

Photo 11: west bank and vegetation in the SW quadrant

Photo 12: east bank and vegetation in the SE quadrant

Photo 13: looking upstream (south) of bridge

Photo 14: east bank and vegetation in the NE quadrant

Photo 15: west bank and vegetation in the NW quadrant

Photo 16: north side of existing bridge

Photo 17: existing channel through the structure (taken from the north side)

Photo 18: east abutment

Photo 19: west abutment

Photo 20: existing channel at downstream (south) end of bridge

Bridge B109133 Photographs:

Photo 21: looking upstream (south) of bridge

Photo 22: west bank (gabion) and vegetation in the SW quadrant

Photo 23: east bank and vegetation in the SE quadrant

Photo 24: looking downstream (north) of the bridge

Photo 25: east bank and vegetation in the NE quadrant

Photo 26: west bank and vegetation in the NW quadrant

Photo 27: south (upstream) side of bridge

Photo 28: existing channel through the structure (looking south)

Photo 29: east abutment

Photo 30: west abutment

Bridge B109134 Photographs:

Photo 31: looking upstream (north) of bridge

Photo 32: east bank and vegetation in the NE quadrant

Photo 33: west bank and vegetation in the NW quadrant

Photo 34: looking downstream (south) of bridge

Photo 35: west bank and vegetation in the SW quadrant

Photo 36: east bank and vegetation in the SE quadrant

Photo 37: existing channel through the structure (looking south)

Table H.1. Vascular plant list for the WR109 study area by vegetation area

SCIENTIFIC NAME	COMMON NAME	FAMILY	CC[1]	CW[1]	G_RANK[3]	S_RANK[4]	COSEWIC[5]	SARA[6]	SARO[7]	NATIVE STATUS[9]	WELLINGTON COUNTY (Frank & Anderson 2009)[8]	WELLINGTON DUFFERIN (Riley et al. 1989)[8]	Unit 1a 1c (MAM2 2/MAS2 1)	Tree Clump 1	Unit 2 (FOC4 1)	CUM1 1	Unit 3 (SWD4 1)	Unit 4 (CUW1)	Unit 5 (HR)	Unit 6A/6B (SWD4 1 / CUW1)	Unit 7A 7C (SWM1 1/CUP3)	Unit 8 / 9 (HR)	Unit 10 (SWD / MAM2 2)	Unit 11A 11D (MAM2 2)	Unit 12 A / 12B (CUP3)
Acer negundo	Manitoba Maple	Sapindaceae	0	0	G5	S5				N		X			X		X	X		X	X				X
Acer platanoides	Norway Maple	Sapindaceae		5	GNR	SNA				I		X													X
Acer x freemanii	Freeman's Maple	Sapindaceae	6	-5	GNA	SNA				N				X			X		X						
Achillea millefolium	Common Yarrow	Asteraceae		3	G5	SNA				I		X				X									
Alisma triviale	Northern Water-plantain	Alismataceae	1	-5	G5	S5				N														X	
Ambrosia artemisiifolia	Common Ragweed	Asteraceae	0	3	G5	S5				N		X				X									
Anthemis cotula	Stinking Chamomile	Asteraceae		3	G5	SNA				I		X				X									
Arctium minus	Common Burdock	Asteraceae		3	GNR	SNA				I		X				X									
Asclepias syriaca	Common Milkweed	Asclepiadaceae	0	5	G5	S5				N		X				X			X				X		
Asparagus officinalis	Garden Asparagus	Asparagaceae		3	G5?	SNA				I		X				X									
Brassica rapa	Field Mustard	Brassicaceae		5	GNR	SNA				I		X				X									
Bromus inermis	Smooth Brome	Poaceae		5	G5	SNA				I		X				X									
Centaurea sp.	Knapweed sp.	Asteraceae														X									
Chenopodium album	Common Lamb's-quarters	Amarathaceae		3	G5	SNA				I		X				X								X	
Cichorium intybus	Wild Chicory	Asteraceae		5	GNR	SNA				I		X				X									
Cirsium arvense	Canada Thistle	Asteraceae		3	G5	SNA				I		X				X									
Cirsium vulgare	Bull Thistle	Asteraceae		3	GNR	SNA				I		X				X									
Convolvulus arvensis	Field Bindweed	Convolvulaceae		5	GNR	SNA				I		X				X									
Cornus alternifolia	Alternate-leaved Dogwood	Cornaceae	6	3	G5	S5				N		X							X		X				
Cornus sericea	Red-osier Dogwood	Cornaceae	2	-3	G5	S5				N		X												X	
Crataegus sp.	Hawthorn sp.	Rosaceae																	X		X				
Cypripedium parviflorum var. pubescens	Large Yellow Lady's-slipper	Orchidaceae	5	0	G5T5	S5				N		X									X				
Daucus carota	Wild Carrot	Apiaceae		5	GNR	SNA				I		X				X									
Dipsacus fullonum	Common Teasel	Caprifoliaceae		3	GNR	SNA				I		X				X									
Echinocystis lobata	Wild Cucumber	Cucurbitaceae	3	-3	G5	S5				N		X												X	
Elymus repens	Quackgrass	Poaceae		3	GNR	SNA				I		X				X									
Epilobium hirsutum	Hairy Willowherb	Onagraceae		-3	GNR	SNA				I		X				X								X	
Equisetum fluviatile	Water Horsetail	Equisetaceae	7	-5	G5	S5				N		X												X	
Erigeron strigosus	Rough Fleabane	Asteraceae	4	3	G5	S5				N		X				X									
Euthamia graminifolia	Grass-leaved Goldenrod	Asteraceae	2	0	G5	S5				N		X	X											X	
Eutrochium maculatum	Spotted Joe Pye Weed	Asteraceae	3	-5	G5T5	S5				N		X	X			X									
Fraxinus americana	White Ash	Oleaceae	4	3	G5	S4				N		X													X
Fraxinus pennsylvanica	Green Ash	Oleaceae	3	-3	G5	S4				N					X		X	X	X	X	X		X	X	X
Fraxinus sp.	Ash sp.	Oleaceae													X										

SCIENTIFIC NAME	COMMON NAME	FAMILY	CC[1]	CW[1]	G_RANK[3]	S_RANK[4]	COSEWIC[5]	SARA[6]	SARO[7]	NATIVE STATUS[9]	WELLINGTON COUNTY (Frank & Anderson 2009)[8]	WELLINGTON DUFFERIN (Riley et al. 1989)[8]	Unit 1a 1c (MAM2 2/MAS2 1)	Tree Clump 1	Unit 2 (FOC4 1)	CUM1 1	Unit 3 (SWD4 1)	Unit 4 (CUW1)	Unit 5 (HR)	Unit 6A/6B (SWD4 1 / CUW1)	Unit 7A 7C (SWM1 1/CUP3)	Unit 8 / 9 (HR)	Unit 10 /SWD / MAM2 2)	Unit 11A 11D (MAM2 2)	Unit 12 A / 12B (CUP3)
Galeopsis tetrahit	Common Hemp-nettle	Lamiaceae		3	GNR	SNA				I		X	X												
Galium mollugo	Smooth Bedstraw	Rubiaceae		5	GNR	SNA				I		X				X									
Geum aleppicum	Yellow Avens	Rosaceae	2	0	G5	S5				N		X							X		X				
Hemerocallis fulva	Orange Daylily	Xanthorrhoeaceae		5	GNA	SNA				I		X				X									
Hesperis matronalis	Dame's Rocket	Brassicaceae		3	G4G5	SNA				I		X				X								X	
Impatiens capensis	Spotted Jewelweed	Balsaminaceae	4	-3	G5	S5				N		X												X	
Juncus effusus ssp. solutus	Soft Rush	Juncaceae	4	-5	G5T5	S5?				N		X	X											X	
Juniperus virginiana	Eastern Red Cedar	Cupressaceae	4	3	G5	S5				N		X				X									
Lactuca serriola	Prickly Lettuce	Asteraceae		3	GNR	SNA				I		X				X									
Leucanthemum vulgare	Oxeye Daisy	Asteraceae		5	GNR	SNA				I		X				X									
Lonicera morrowii	Morrow's Honeysuckle	Caprifoliaceae		3	GNR	SNA				I					X										
Lonicera tatarica	Tatarian Honeysuckle	Caprifoliaceae		3	GNR	SNA				I		X							X		X				
Lotus corniculatus	Garden Bird's-foot Trefoil	Fabaceae		3	GNR	SNA				I		X				X									
Lycopus uniflorus	Northern Water-horehound	Lamiaceae	5	-5	G5	S5				N		X	X												
Malus pumila	Common Apple	Rosaceae		5	G5	SNA				I		X													X
Medicago lupulina	Black Medick	Fabaceae		3	GNR	SNA				I		X				X									
Mentha canadensis	Canada Mint	Lamiaceae	3	-3	G5	S5				N			X											X	
Oenothera biennis	Common Evening-primrose	Onagraceae	0	3	G5	S5				N		X				X									
Parthenocissus vitacea	Thicket Creeper	Vitaceae	4	3	G5	S5				N		X									X				
Persicaria lapathifolia	Pale Smartweed	Polygonaceae	2	-3	G5	S5				N		X												X	
Persicaria maculosa	Spotted Lady's-thumb	Polygonaceae		-3	G3G5	SNA				I		X				X									
Phalaris arundinacea var. arundinacea	Reed Canarygrass	Poaceae	0	-3	G5TNR	S5				I		X	X											X	
Picea abies	Norway Spruce	Pinaceae		5	G5	SNA				I		X										X			X
Picea glauca	White Spruce	Pinaceae	6	3	G5	S5				N		X									X				
Picea sp.	Spruce sp.	Pinaceae																X							
Pinus nigra	Austrian Pine	Pinaceae		5	GNR	SNA				I														X	X
Pinus strobus	Eastern White Pine	Pinaceae	4	3	G5	S5				N		X							X						X
Pinus sylvestris	Scots Pine	Pinaceae		3	GNR	SNA				I		X					X		X	X	X				
Plantago major	Common Plantain	Plantaginaceae		3	G5	SNA				I		X				X									
Poa pratensis ssp. pratensis	Kentucky Bluegrass	Poaceae		3	G5T5	SNA				I		X				X									
Populus alba	White Poplar	Salicaceae		5	G5	SNA				I		X								X					
Populus deltoides ssp. deltoides	Eastern Cottonwood	Salicaceae	4	0	G5T5	S5				N		X					X	X		X	X	X	X		
Populus tremuloides	Trembling Aspen	Salicaceae	2	0	G5	S5				N		X									X				
Prunus virginiana	Chokecherry	Rosaceae	2	3	G5	S5				N		X							X		X				
Ranunculus hispidus var. caricetorum	Bristly Buttercup	Ranunculaceae	8	0	G5					N		X	X												

SCIENTIFIC NAME	COMMON NAME	FAMILY	CC[1]	CW[1]	G_RANK[3]	S_RANK[4]	COSEWIC[5]	SARA[6]	SARO[7]	NATIVE STATUS[9]	WELLINGTON COUNTY (Frank & Anderson 2009)[8]	WELLINGTON DUFFERIN (Riley et al. 1989)[8]	Unit 1a 1c (MAM2 2/MAS2 1)	Tree Clump 1	Unit 2 (FOC4 1)	CUM1 1	Unit 3 (SWD4 1)	Unit 4 (CUW1)	Unit 5 (HR)	Unit 6A/6B (SWD4 1 / CUW1)	Unit 7A 7C (SWM1 1/CUP3)	Unit 8 / 9 (HR)	Unit 10 /SWD / MAM2 2)	Unit 11A 11D (MAM2 2)	Unit 12 A / 12B (CUP3)
Rhamnus cathartica	European Buckthorn	Rhamnaceae		0	GNR	SNA				I		X			X	X		X			X		X		
Rubus idaeus ssp. strigosus	North American Red Raspberry	Rosaceae	2	3	G5T5	S5				N		X				X									
Rumex crispus	Curled Dock	Polygonaceae		0	GNR	SNA				I		X				X									
Sagittaria latifolia	Broad-leaved Arrowhead	Alismataceae	4	-5	G5	S5				N		X												X	
Salix alba	White Willow	Salicaceae		-3	G5	SNA				I			X							X					
Salix eriocephala	Cottony Willow	Salicaceae	4	-3	G5	S5				N		X					X							X	
Salix euxina	Crack Willow	Salicaceae		0	GNR	SNA				I							X							X	
Salix interior	Sandbar Willow	Salicaceae	1	-3	G5	S5				N			X											X	
Salix sp.	Willow sp.	Salicaceae														X					X				
Scirpus atrovirens	Dark-green Bulrush	Cyperaceae	3	-5	G5	S5				N		X												X	
Scutellaria lateriflora	Mad-dog Skullcap	Lamiaceae	5	-5	G5	S5				N		X												X	
Setaria pumila	Yellow Foxtail	Poaceae		0	GNR	SNA				I		X				X									
Solanum dulcamara	Bittersweet Nightshade	Solanaceae		0	GNR	SNA				I		X				X					X				
Solidago altissima var. altissima	Eastern Tall Goldenrod	Asteraceae	1	3	G--T5	S5				N		X	X			X									
Sonchus asper	Prickly Sow-thistle	Asteraceae		3	GNR	SNA				I		X				X									
Sorbus aucuparia	European Mountain-ash	Rosaceae		5	G5	SNA				I		X			X		X		X		X				
Sparganium eurycarpum	Broad-fruited Burreed	Typhaceae	3	-5	G5	S5				N		X												X	
Symphyotrichum lanceolatum ssp. lanceolatum	Eastern Panicled Aster	Asteraceae	3	-3	G5T5	S5				N		X				X									
Symphyotrichum lateriflorum var. lateriflorum	Calico Aster	Asteraceae	3	0	G5T5	S5				N		X												X	
Symphyotrichum novae-angliae	New England Aster	Asteraceae	2	-3	G5	S5				N		X				X									
Tanacetum vulgare	Common Tansy	Asteraceae		5	GNR	SNA				I		X				X									
Taraxacum officinale	Common Dandelion	Asteraceae		3	G5	SNA				I		X				X									
Thuja occidentalis	Eastern White Cedar	Cupressaceae	4	-3	G5	S5				N		X		X	X	X	X	X	X		X				
Trifolium pratense	Red Clover	Fabaceae		3	GNR	SNA				I		X				X									
Tussilago farfara	Coltsfoot	Asteraceae		3	GNR	SNA				I		X	X											X	
Typha angustifolia	Narrow-leaved Cattail	Typhaceae		-5	G5	SNA				I		X	X											X	
Typha latifolia	Broad-leaved Cattail	Typhaceae	1	-5	G5	S5				N		X												X	
Ulmus americana	White Elm	Ulmaceae	3	-3	G4	S5				N		X	X		X										
Ulmus rubra	Slippery Elm	Ulmaceae	6	0	G5	S5				N		X					X								
Urtica dioica ssp. gracilis	Slender Stinging Nettle	Urticaceae	2	0	G5T5	S5				N		X	X												
Valeriana officinalis	Common Valerian	Caprifoliaceae		3	GNR	SNA				I		X				X									
Verbascum thapsus	Common Mullein	Scrophulariaceae		5	GNR	SNA				I		X				X									
Viburnum opulus ssp. trilobum	Highbush Cranberry	Adoxaceae	5	-3	G5TNR	S5				N		X							X		X				
Vicia cracca	Tufted Vetch	Fabaceae		5	GNR	SNA				I		X				X									

PLANT LIST LEGEND

Scientific Name, Common Name and Family

Based on VASCAN and NHIC (February 28, 2020)

VASCAN: http://data.canadensys.net/VASCAN/search

NHIC: https://www.sdc.gov.on.ca/sites/MNRF-PublicDocs/EN/ProvincialServices/ONTARIO_SPECIES_LISTS.zip

[1] Coefficient of Conservatism, Coefficient of Wetness, Weediness, and Physiology/Habit

Oldham, M. J., W. D. Bakowsky and D. A. Sutherland. 1995. Floristic Quality Assessment System for Southern Ontario. Natural Heritage Information Centre, Ministry of Natural Resources. Peterborough, Ontario.

NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

CC and CW values reflect updates by NHIC, current as of February 28, 2020).

CC:	Coefficient of Conservatism. Rank of 0 to 10 based on plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters.
CW:	Coefficient of Wetness. Value between 5 and –5. A value of –5 is assigned to Obligate Wetland (OBL) and 5 to Obligate Upland (UPL), with intermediate values assigned to the remaining categories. *NOTE*: NHIC has simplified the values, and includes only -5, -3, 0, 3 and 5.
Weediness:	Weediness Score, assigned to all non-native species and range from -1 (low impact of the species on natural areas) to -3 (high impact of the species on natural areas).
Habit:	Physiology/Habit. The growth form of the species (e.g. forb, shrub, tree).

[3] G-Rank (Global)

Global Status from Nature Serve (via NHIC, February 28, 2020)

NS: http://explorer.natureserve.org/

NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

Global (G) Conservation Status Ranks

G1:	Critically Imperiled - At very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
G2:	Imperiled - at high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
G3:	Vulnerable - At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
G4:	Apparently Secure - At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
G5:	Secure - At very low risk or extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.
G#G#:	Range Rank – A numeric range rank (e.g., G2G3, G1G3) is used to indicate the range of uncertainty about the exact status of a taxon or ecosystem type. Ranges cannot skip more than two ranks (e.g., GU should be used rather than G1G4).
GX:	Presumed Extinct - Not located despite intensive searches and virtually no likelihood of rediscovery.
GH:	Possibly Extinct - Known from only historical occurrences but still some hope of rediscovery. Examples of evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species has been

	searched for unsuccessfully, but not thoroughly enough to presume that it is extinct or eliminated throughout its range.
GU:	Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
GNR:	Unranked – Global rank not yet assessed.
GNA:	Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities. A global conservation status rank may be not applicable for several reasons, related to its relevance as a conservation target. For species, typically the species is a hybrid without conservation value, or of domestic origin. For ecosystems, the type is typically non-native (e.g, many ruderal vegetation types), agricultural (e.g. pasture, orchard) or developed (e.g. lawn, garden, golf course).
?:	Inexact Numeric Rank – Denotes inexact numeric rank; this should not be used with any of the Variant Global Conservation Status Ranks or GX or GH.
T#:	Infraspecific Taxon (trinomial) - The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same principles outlined above. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1. A T subrank cannot imply the subspecies or variety is more abundant than the species, for example, a G1T2 subrank should not occur. A vertebrate animal population (e.g., listed under the U.S. Endangered Species Act or assigned candidate status) may be tracked as an infraspecific taxon and given a T rank; in such cases a Q is used after the T-rank to denote the taxon's informal taxonomic status.
Q:	Questionable taxonomy that may reduce conservation priority – Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a lower priority (numerically higher) conservation status rank. The “Q” modifier is only used at a global level and not at a national or subnational level.
C:	Captive or Cultivated Only – Taxon or ecosystem at present is presumed or possibly extinct or eliminated in the wild across their entire native range but is extant in cultivation, in captivity, as a naturalized population (or populations) outside their native range, or as a reintroduced population or ecosystem restoration, not yet established. The “C” modifier is only used at a global level and not at a national or subnational level. Possible ranks are GXC or GHC. This is equivalent to “Extinct” in the Wild (EW) in IUCN’s Red List terminology (IUCN 2001).

[4] S-Ranks (Provincial)

Provincial Status from the NHIC (February 28, 2020)

NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) 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.

S1:	Critically Imperiled – At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.
S2:	Imperiled – At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
S3:	Vulnerable – At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
S4:	Apparently Secure – At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
S5:	Secure – At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.
S#S#:	Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
SX:	Presumed Extirpated – Species or ecosystem is believed to be extirpated from the jurisdiction (province). Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered. [equivalent to “Regionally Extinct” in IUCN Red List terminology]

SH:	Possibly Extirpated (Historical) – Known from only historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty. Examples of such evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species or ecosystem has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present in the jurisdiction.
SNR:	Unranked – subnational conservation status not yet assessed.
SU:	Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA:	Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities (e.g., long distance aerial and aquatic migrants, hybrids without conservation value, and non-native species.
?:	Inexact or Uncertain - Denotes inexact or uncertain numeric rank.
T#:	Infraspecific Taxon (trinomial) - The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same principles outlined above. For example, the subnational rank of a critically imperiled subspecies of an otherwise widespread and common species would be S5T1. A T subrank cannot imply the subspecies or variety is more abundant than the species, for example, a S1T2 subrank should not occur. A vertebrate animal population may be tracked as an infraspecific taxon and given a T rank; in such cases a Q is used after the T-rank to denote the taxon's informal taxonomic status.

[5] COSEWIC (Committee on the Status of Endangered Wildlife in Canada)

The federal review process is implemented by COSEWIC (Status as of February 28, 2020)
The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is an independent advisory panel to the Minister of Environment and Climate Change Canada that meets twice a year to assess the status of wildlife species at risk of extinction.

https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html

EXT:	Extinct – A species that no longer exists.
EXP:	Extirpated – A species no longer existing in the wild in Canada, but occurring elsewhere.
END:	Endangered – A species facing imminent extirpation or extinction.
THR:	Threatened – A species likely to become endangered if limiting factors are not reversed.
SC:	Special Concern – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
NAR:	Not At Risk – A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
DD:	Data Deficient – Available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction.

[6] SARA (Species at Risk Act) Status and Schedule

Federal status from the Government of Canada's Species at Risk Public Registry (Status as of February 28, 2020)

http://www.registrelep-sararegistry.gc.ca/
The Act establishes Schedule 1, as the official list of species at risk in Canada. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed species are implemented. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

EXT:	Extinct – A species that no longer exists.
EXP:	Extirpated – A species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END:	Endangered – A species that is facing imminent extirpation or extinction.
THR:	Threatened – A species likely to become endangered if limiting factors are not reversed.
SC:	Special Concern – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

[7] SARO (Species At Risk in Ontario)

Provincial status from MNRF (Status as of February 28, 2020)

https://www.ontario.ca/environment-and-energy/species-risk-ontario-list

The provincial review process is implemented by the MNR's Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is an independent advisory panel to the Ontario Ministry of Natural Resources and Forestry that assesses the status of species at risk of extinction.

EXP:	Extirpated – Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario.
END:	Endangered – Lives in the wild in Ontario but is facing imminent extinction or extirpation.
THR:	Threatened – Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.
SC:	Special Concern – Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.

[8] Regional Status

Wellington-Dufferin,

Riley, J. e.t al. 1989. The Distribution and Status of the Vascular Plants of Central Region. Ontario Ministry of Natural Resources, Central Region, Richmond Hill, ON.

Codes are defined as follows:

E:	Endangered - "For the purposes of this checklist, an endangered species is considered to be one regulated under Ontario's Endangered Species Act. The only species so regulated is the Cucumber Tree (*Magnolia acuminata*)."
N:	Nationally Rare – rare in every province in which it occurs. A rare species is one that because of biological characteristics, occurs at edge of range, exists in low numbers, or in very restricted areas in the region under consideration.
P:	Provincially Rare – a species S-ranked (S1-SX) from the National Museum's "Atlas of Rare Vascular Plants of Ontario" (Argus et.al. 1982-88).
R:	Regionally Rare – Native species are considered regionally rare if the species in considered rare wherever it occurs in Central Region especially in areas where recent local determinations of rarity have been made and/or if it is considered provincially rare in the portions in which species' status is insufficiently documented. Only naturally occurring populations are considered.
X:	Occurs within the region.
+ or I:	Introduced species.

Wellington County (includes City of Guelph)

Frank, R and A. Anderson. 2009. The Flora of Wellington County. Wellington County Historical Society.

Codes are defined as follows:

R1:	Most rare or growing on only 1-3 sites.
R2:	Rare and growing on 4-6 sites.
R3:	Uncommon and growing on 7-10 sites.

[9]Native Status

Based on VASCAN and NHIC (February 28, 2020)

VASCAN:	http://data.canadensys.net/VASCAN/search
NHIC:	https://www.sdc.gov.on.ca/sites/MNRF-PublicDocs/EN/ProvincialServices/ONTARIO_SPECIES_LISTS.zip

Codes are defined as follows:

N	Native
I	Introduced

Table H.2: Conestogo River Fish Species at the Four Bridge Crossings along WR 109

FISH SPECIES	Bridge B109132	Bridge C109123	Bridge B109133	Bridge B109134
Blackside Darter (*Percina maculate*)	X			
Bluntnose Minnow (*Pimephales notatus*)	X		X	
Brassy Minnow (*Hybognathus hankinsoni*)	X			
Bridle Shiner (*Notropis bifrenatus)*	X			
Brook Stickleback (*Culaea inconstans*)		X	X	X
Central Mudminnow (*Umbra limi*)				X
Central Stoneroller (Campostoma anomalum)		X	X	
Common Shiner (*Luxilus cornutus*)	X	X	X	X
Creek Chub (*Semotilus atromaculatus*)	X	X	X	X
Emerald Shiner (Notropis atherinoides)	X			
Fathead Minnow *(Pimephales promelas)*			X	
Fantail Darter (*Etheostoma flabellare*)	X			
Golden Shiner (*Notemigonus crysoleucas*)				
Johnny Darter (*Etheostoma nigrum*)	X			
Northern Hog Sucker (*Hypentelium nigricans*)	X			
Northern Pike (*Esox Lucius*)			X	X
Northern Redbelly Dace		X	X	X
Pumpkinseed (*Lepomis gibbosus*)			X	
Rainbow Darter *(Etheostoma caeruleum)*	X			
Rock Bass *(Ambloplites rupestris)*	X		X	
River Chub (*Nocomis micropogon)*	X			
Smallmouth Bass (Micropterus dolomieu)	X	X		
Stonecat (Noturus flavus)	X			
Striped Bass (*Morone saxatilis*)	X			
White Sucker (*Catastomus commersoni*)	X	X	X	X

All Fisheries Species and Location Information provided by MNRF

Table H.3: Breeding Bird List for WR 109 EA

Common Name	Scientific Name	Grank[1]	Srank[2]	SARO (ESA) Status[3]	COSEWIC Status[4]	SARA Status[5]	SARA Schedule[5]	Wellington County[6]	MNR Area Sensitive[7]	Area Sensitive Birds Ecoregion 6E[7]	Habitat Use[8]	NHIC Tracked	Protected Under MBCA	B109132		B109133		B109134		C109123		WR109 Study Area		Comments
														Highest Breeding Abundance	Highest Breeding Code	Highest Breeding Abundance	Highest Breeding Code	Highest Breeding Abundance	Highest Breeding Code	Highest Breeding Abundance	Highest Breeding Code	Highest Breeding Abundance	Highest Breeding Evidence	
American Crow	*Corvus brachyrhynchos*	G5	S5B								E	N		1	X	1	X	3	X	1	X	**6**	**Observed**	Observed flying overhead study area.
American Goldfinch	*Spinus tristis*	G5	S5B					3			E	N	✓	3	H,S	2	H,S			3	T	**8**	**Probable**	
American Robin	*Turdus migratorius*	G5	S5B								E	N	✓	1	H,S	1	T	2	H,S	5	FY	**9**	**Confirmed**	
Baltimore Oriole	*Icterus galbula*	G5	S4B								E	N	✓	1	H,S							**1**	**Possible**	
Barn Swallow	*Hirundo rustica*	G5	S4B	THR	SC	THR	1	3++				N	✓	4	X	2	X	2	X	2	X	**10**	**Observed**	Observed foraging overhead study area. No nests on structures.
Belted Kingfisher	*Megaceryle alcyon*	G5	S4B									N		1	T			1	H	3	H	**5**	**Probable**	
Black-capped Chickadee	*Poecile atricapillus*	G5	S5					4			I/E	N	✓			2	H			3	P,T	**5**	**Probable**	
Blue Jay	*Cyanocitta cristata*	G5	S5								I/E	N		2	T							**2**	**Probable**	
Bobolink	*Dolichonyx oryzivorus*	G5	S4B	THR	THR	THR	1	2++			E	N	✓	1	H,S			1	D,H,S	1	D	**3**	**Possible**	In grasslands >100m beyond ROW.
Brown-headed Cowbird	*Molothrus ater*	G5	S4B								E	N		1	H					1	H	**2**	**Possible**	
Canada Goose	*Branta canadensis*	G5	S5								M/F	N	✓			30	X			2	X	**32**	**Observed**	Observed flying overhead study area.
Cedar Waxwing	*Bombycilla cedrorum*	G5	S5B								E	N	✓	1	H	2	H	4	T	4	H	**11**	**Probable**	
Chipping Sparrow	*Spizella passerina*	G5	S5B								E	N	✓	1	H,S							**1**	**Possible**	
Cliff Swallow	*Petrochelidon pyrrhonota*	G5	S4B					3				N	✓	2	N,P	100	NY	80	NE			**182**	**Confirmed**	2017: 2 nests on B109132; 61 nests on B109133; 42 nests on B109134. 2020: 21 nests on B109132; 100 nests on B109133; 27 nests on B109134
Common Grackle	*Quiscalus quiscula*	G5	S5B								E	N		2	T	2	H,S	4	T	10	H,S	**18**	**Probable**	
Downy Woodpecker	*Picoides pubescens*	G5	S5								I/E	N	✓	1	H,S					2	P	**3**	**Probable**	
Eastern Kingbird	*Tyrannus tyrannus*	G5	S4B					3			E	N	✓			2	P	1	H,S			**3**	**Probable**	
Eastern Meadowlark	*Sturnella magna*	G5	S4B	THR	THR	THR	1	2++				N	✓					1	H,S	2	H,S	**3**	**Possible**	In grasslands >100m beyond ROW.
Eastern Phoebe	*Sayornis phoebe*	G5	S5B					3			I/E	N	✓	1	T					1	H,S	**2**	**Probable**	
Eastern Wood-pewee	*Contopus virens*	G5	S4B	SC	SC	SC	1				I/E	N	✓							1	H,S	**1**	**Possible**	Heard singing in woodland beyond ROW.
European Starling	*Sturnus vulgaris*	G5	SNA								E	N		11	H,S			26	T	7	FY	**44**	**Confirmed**	
Gray Catbird	*Dumetella carolinensis*	G5	S4B					4			I/E	N								1	H,S	**1**	**Possible**	
Great Blue Heron	*Ardea herodias*	G5	S4								S/B, M/F	N	✓					1	X	1	X	**2**	**Observed**	Observed flying overhead study area.
Great Crested Flycatcher	*Myiarchus crinitus*	G5	S4B								I/E	N	✓							2	P	**2**	**Possible**	
House Sparrow	*Passer domesticus*	G5	SNA								E	N		4	H	4	T	5	T	1	H	**14**	**Probable**	
House Wren	*Troglodytes aedon*	G5	S5B								E	N	✓	1	H,S					1	H,S	**2**	**Possible**	
Killdeer	*Charadrius vociferus*	G5	S5B,S5N									N	✓			1	H,S	2	T			**3**	**Probable**	
Mourning Dove	*Zenaida macroura*	G5	S5								E	N	✓	1	H,S					1	H,S	**2**	**Possible**	
Northern Cardinal	*Cardinalis cardinalis*	G5	S5								I/E	N	✓	1	H,S	1	H,S			1	H,S	**3**	**Possible**	
Red-eyed Vireo	*Vireo olivaceus*	G5	S5B								I/E	N	✓							1	H,S	**1**	**Possible**	
Red-winged Blackbird	*Agelaius phoeniceus*	G5	S4								E	N		6	FY	4	T	8	A,N,P,T	2	P,T	**20**	**Confirmed**	
Rock Pigeon	*Columba livia*	G5	SNA									N	✓	3	H			3	H,S			**6**	**Possible**	
Savannah Sparrow	*Passerculus sandwichensis*	G5	S4B					1	X	X		N	✓			1	T	2	H,S	1	H,S	**4**	**Probable**	
Song Sparrow	*Melospiza melodia*	G5	S5B								E	N	✓	4	T	3	T	2	T	4	P,T	**13**	**Probable**	
Turkey Vulture	*Cathartes aura*	G5	S5B					3				N								1	X	**1**	**Observed**	
Warbling Vireo	*Vireo gilvus*	G5	S5B								E	N	✓							1	T	**1**	**Probable**	
Yellow Warbler	*Setophaga petechia*	G5	S5B								E	N	✓	1	H,S							**1**	**Probable**	
				4	**4**	**4**	**4**	**11**	**1**	**1**	**~**	**0**	**28**	**24**		**16**		**18**		**29**		**37**		

Table H.3 Cont'd: Incidental Wildlife List for WR 109 EA

Common Name	Scientific Name	Grank[1]	Srank[2]	SARO (ESA) Status[3]	COSEWIC Status[4]	SARA Status[5]	SARA Schedule[5]	Wellington County[6]	MNR Area Sensitive[7]	Habitat Use[8]	NHIC Tracked	B109132	B109133	B109134	C109123	WR109 Study Area	Comments
Herpetofauna																	
American Toad	*Anaxyrus americanus*	G5	S5								N		1			**1**	
Green Frog	*Lithobates clamitans*	G5	S5								N	1				**1**	
Midland Painted Turtle	*Chrysemys picta marginata*	G5T5	S4		SC						N	2				**2**	2 adults observed basking in wetland adjacent to bridge in NW quadrant during early spring emergence survey on April 13, 2017. This likely represents an overwintering area.
Snapping Turtle	*Chelydra serpentina*	G5	S4	SC	SC	SC	1				Y	1				**1**	1 adult observed basking in wetland adjacent to bridge in NW quadrant during early spring emergence survey on April 13, 2017. This likely represents an overwintering area.
Insects																	
Monarch	*Danaus plexippus*	G5	S2N,S4B	SC	END	SC	1				Y				1	**1**	
Mammals																	
Ermine	*Mustela erminea*	G5	S5								N				1	**1**	Roadkill
Raccoon	*Procyon lotor*	G5	S5								N	tracks	tracks	tracks	tracks	**tracks**	Tracks under structures
Red Fox	*Vulpes vulpes*	G5	S5								N	tracks				**tracks**	Tracks under structure
White-tailed Deer	*Odocoileus virginianus*	G5	S5								N	tracks			tracks	**tracks**	Tracks under structures/along watercourse

WILDLIFE LIST LEGEND

[1]G-Rank (global)
Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

G1	Extremely rare - usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to Extinction.
G2	Very rare - usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to Extinction.
G3	Rare to uncommon - usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
G4	Common - usually more than 100 occurrences; usually not susceptible to immediate threats.
G5	Very common - demonstrably secure under present conditions.

[2]S-Rank (provincial)
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) 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.

S1	Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2	Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3	Vulnerable - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4	Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5	Secure - Common, widespread, and abundant in the nation or state/province.
S#S#	Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
SAN	Non-breeding accidental.
SE	Exotic - not believed to be a native component of Ontario's fauna.
SZN	Non-breeding migrants/vagrants.
SZB	Breeding migrants/vagrants.

[3]SARO (Species at Risk in Ontario) Status
Provincial status from MECP (Status as of Jan 2020)
https://www.ontario.ca/page/species-risk-ontario

The provincial review process is implemented by the Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is an independent advisory panel to the Ontario Ministry of Environment, Conservation and Parks (MECP) that assesses the status of species at risk of extinction.

MECP Conservation Status Ranks

EXT	Extinct - A species that no longer exists anywhere in the world.
EXP	Extirpated - A species that lives somewhere in the world, lived at one time in the wild in Ontario, but no longer lives in the wild in Ontario.
END	Endangered - A species that is facing imminent Extinction or extirpation.
THR	Threatened - A species that is likely to become Endangered if steps are not taken to address factors threatening to lead to its Extinction or extirpation.
SC	Special Concern – A species that may become Threatened or Endangered because of a combination of biological characteristics and identified threats.

[4]COSEWIC (Committee on the Status of Endangered Wildlife in Canada)
The federal review process is implemented by COSEWIC (Status as of Jan 2020)

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is an independent advisory panel to the Minister of Environment and Climate Change Canada that meets twice a year to assess the status of wildlife species at risk of extinction.
https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html

COSEWIC Conservation Status Ranks
EXT Extinct - A species that no longer exists.
EXP Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.
END Endangered - A species facing imminent extirpation or Extinction.
THR Threatened - A species likely to become Endangered if limiting factors are not reversed.
SC Special Concern (formerly vulnerable) - A species that may become a Threatened or an Endangered species because of a combination of biological characteristics and identified threats.
NAR Not At Risk - A species that has been evaluated and found to be not at risk of Extinction given the current circumstances.
DD Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of Extinction.

[5]SARA (Species at Risk Act) Status and Schedule
Federal status from the Government of Canada's Species at Risk Public Registry (Status as of Jan 2020)
https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

EXT Extinct - A wildlife species that no longer exists.
EXP Extirpated **-** A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END Endangered - A wildlife species that is facing imminent extirpation or Extinction.
THR Threatened - A wildlife species that is likely to become Endangered if nothing is done to reverse the factors leading to its extirpation or Extinction.
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.

Schedule 1: is the official list of species that are classified as Extirpated, Endangered, Threatened and Special Concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as Endangered or Threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as Special Concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are Extirpated, Endangered, Threatened and Special Concern, the prohibitions do not apply to species of Special Concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

[6] Regional Status
Wellington County
Conservation rankings for birds of the Grand River basin: a tool for conservation and management. June 2000. Bird Studies Canada and the Grand River Conservation Authority.

Document: http://www.bsc-eoc.org/download/gcra_mainreport.pdf
Technical Appendix: http://www.bsc-eoc.org/download/gcra_appendices.pdf

Levels 1-4 are a relative ranking within each habitat grouping based on a scoring system, which took into account: Jurisdictional Responsibility (JR, a scale-dependent measure related to breeding distribution within a given spatial unit); Preservation Responsibility (PR, a scale-independent measure based on the biological characteristics of the species); and, Area Sensitivity (AS, a scale-independent measure related to the habitat-area requirements of the species).

There are 3 habitat groups: Forest, Open Country/Grassland and Marsh. There is no difference in importance among species within a given category (Level 1 to 4), regardless of habitat group.

Level 1 is the highest priority (highest scoring in habitat group) and Level 4 is the lowest priority (lowest scoring in habitat group, but still considered a "priority species").

++ denotes 'Endangered' or 'Threatened' status at the provincial or federal level;
* denotes 'vulnerable' status at the provincial or federal level

[7] MNR Area Sensitive Species
Area Sensitivity is defined as species requiring large areas of suitable habitat in order to sustain population numbers
From: Ministry of Natural Resources and Forestry. 2015. Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E. January, 2015. Regional Operations Division, Southern Region Resources Section. 39pp.

[8] Habitat Use
I=interior species, I/E=interior edge species, E=edge species (Freemark and Collins, 1989); M/F=Marsh/Fen, S/B=Treed Swamp/Bog. Interior bird species require habitat which is often found 100m from the forest edge while Interior/Edge species are found within both interior and edge habitat. Often Interior and Interior/Edge are more sensitive to urban encroachment as they require these large, relatively undisturbed forest habitats to support viable populations. The increasing urbanization of rural areas often results in increased parasitism and predation as well as disturbance from human recreational activities (e.g. illegal bike trails, dumping and pets.) (Freemark, K. and Collins, B. 1989. *Landscape ecology of birds breeding in temperate forest fragments*. – In: Hagan III, J. M. and Johnston, D. W. (eds), Ecology and conservation of neotropical migrant landbirds. Smithsonian Inst. Press, pp. 443–454)

[9] Ontario Breeding Bird Atlas - Breeding Evidence Codes

OBSERVED
X Species observed in its breeding season (no breeding evidence).

POSSIBLE
H Species observed in its breeding season in suitable nesting habitat.
S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

PROBABLE
P Pair observed in suitable nesting habitat in nesting season.
T Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more apart, at the same place.
D Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.
V Visiting probable nest site
A Agitated behaviour or anxiety calls of an adult.
B Brood Patch on adult female or cloacal protuberance on adult male.
N Nest-building or excavation of nest hole.

CONFIRMED
DD Distraction display or injury feigning.
NU Used nest or egg shells found (occupied or laid within the period of the survey).
FY Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.
AE Adult leaving or entering nest sites in circumstances indicating occupied nest.
FS Adult carrying fecal sac.
CF Adult carrying food for young.
NE Nest containing eggs.
NY Nest with young seen or heard.

County of Wellington

Date Generated: July-17-17

Amphibian	SARO	Protection	Habitat Information	Timing Windows	Survey Protocol
Jefferson Salamander *Ambystoma jeffersonianum*	END	Species Protection and Habitat Regulation	Inhabits deciduous and mixed deciduous forests with suitable breeding areas which generally consist of ephemeral (temporary) bodies of water that are fed by spring runoff, groundwater, or springs.	Active: March – October Hibernates: October – March Breeding: Late March - Mid April	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Unisexual Ambystoma - Jefferson-dominated *Ambystoma laterale - jeffersonianum*	END	Species Protection and General Habitat Protection	Inhabits deciduous and mixed deciduous forests with suitable breeding areas which generally consist of ephemeral (temporary) bodies of water that are fed by spring runoff, groundwater, or springs.	Active: March – October Hibernates: October – March Breeding: Late March - Mid April	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Bird	**SARO**	**Protection**	**Habitat Information**	**Timing Windows**	**Survey Protocol**
Acadian Flycatcher *Empidonax virescens*	END	Species Protection and General Habitat Protection	Generally requires large areas of mature, undisturbed forest; avoids the forest edge; often found in well wooded swamps and ravines.	Migrate South before Winter	Follow Breeding Bird Survey Protocol
Bald Eagle *Haliaeetus leucocephalus*	SC	N/A	Prefers deciduous and mixed-deciduous forest; and habitat close to water bodies such as lakes and rivers. They roost in super canopy trees such as Pine.	Breed and Nest - April or May Some Migrate South when waterbodies freeze over	Follow Breeding Bird Survey Protocol
Bank Swallow *Riparia riparia*	THR	Species Protection and General Habitat Protection	It nests in a wide variety of naturally and anthropogenically created vertical banks, which often erode and change over time including aggregate pits and the shores of large lakes and rivers.	Migrate South before Winter	Follow Breeding Bird Survey Protocol. Colony and Roost information should be recorded and submitted using Bird Studies Canada's Ontario Bank Swallow Project data forms (2010).
Barn Owl *Tyto alba*	END	Species Protection and Habitat Regulation	Generally prefer low-elevation, open country; often associated with agricultural lands, especially pasture. Nests are located in buildings, hollow trees and cavities in cliffs.	Active Year Round Some leave for the Winter	Follow Breeding Bird Survey Protocol Night surveys may be helpful as they are very vocal

Barn Swallow *Hirundo rustica*	THR	Species Protection and General Habitat Protection	Prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	Migrate South before Winter	Follow Breeding Bird Survey Protocol
Black Tern *Chlidonias niger*	SC	N/A	Generally prefer freshwater marshes and wetlands; nest either on floating material in a marsh or on the ground very close to water	Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Bobolink *Dolichonyx oryzivorus*	THR	Species Protection and General Habitat Protection	Generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands	Migrate South for the Winter	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol
Canada Warbler *Cardellina canadensis*	SC	N/A	Generally prefers wet coniferous, decidiuous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	Arrive in Early May Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Cerulean Warbler *Setophaga cerulea*	THR	Species Protection and General Habitat Protection	Generally found in mature deciduous forests with an open understorey; also nests in older, second-growth deciduous forests.	Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Chimney Swift *Chaetura pelagica*	THR	Species Protection and General Habitat Protection	Historically found in deciduous and coniferous, usually wet forest types, all with a well developed, dense shrub layer; now most are found in urban areas in large uncapped chimneys	Nesting - Late April to Mid-May Migrate South in September or Early October	Chimney Swift Monitoring Protocol. Bird Studies Canada, March 2009

Common Nighthawk *Chordeiles minor*	SC	N/A	Generally prefer open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops).	Migrate South for the Winter	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol
Eastern Meadowlark *Sturnella magna*	THR	Species Protection and General Habitat Protection	Generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	Migrate South for the Winter	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol
Eastern Whip-poor-will *Caprimlugus vociferus*	THR	Species Protection and General Habitat Protection	Generally prefer semi-open deciduous forests or patchy forests with clearings; areas with little ground cover are also preferred; In winter they occupy primarily mixed woods near open areas.	Nesting: May - July	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Eastern Wood-Pewee *Contopus virens*	SC	N/A	Associated with deciduous and mixed forests. Within mature and intermediate age stands it prefers areas with little understory vegetation as well as forest clearings and edges.	Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Golden-winged Warbler *Vermivora chrysoptera*	SC	N/A	Generally prefer areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas.	Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Henslow's Sparrow *Ammodramus henslowii*	END	Species Protection and General Habitat Protection	Generally found in old fields, pastures and wet meadows. They prefer areas with dense, tall grasses, and thatch, or decaying plant material	Migrate South for the Winter	Follow Breeding Bird Survey Protocol

Least Bittern *Ixobrychus exilis*	THR	Species Protection and General Habitat Protection	Generally located near pools of open water in relatively large marshes and swamps that are dominated by cattail and other robust emergent plants	Migrate South for the Winter	Follow Marsh Monitoring Protocol; 10 day window of male calling (variable timing). Does not respond well to playback. Very difficult to detect.
Loggerhead Shrike *Lanius ludovicianus*	END	Species Protection and General Habitat Protection	Generally prefer a combination of pasture or other grassland with scattered low trees and shrubs. They build their nests in small trees or shrubs.	Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Louisiana Waterthrush *Seiurus motacilla*	THR	Species Protection and General Habitat Protection	Generally inhabits mature forests along steeply sloped ravines adjacent to running water. It prefers clear, cold streams and densely wooded swamps	Migrate South for the Winter	Follow Breeding Bird Survey Protocol or Marsh Monitoring Protocol
Northern Bobwhite *Colinus virginianus*	END	Species Protection and General Habitat Protection	Generally inhabits a variety of edge and grassland type - habitats including non-intensively farmed agricultural lands.	Acitve Year Round	Follow Breeding Bird Survey Protocol
Olive-sided Flycatcher *Contopus cooperi*	SC	N/A	Generally prefers natural forest edges and openings adjacent to rivers or wetlands. Commonly nest in conifers such as White and Black Spruce, Jack Pine and Balsam Fir.	Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Red-Headed Woodpecker *Melanerpes erythrocephalus*	SC	N/A	Generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks	Active from May to September	Follow Breeding Bird Survey Protocol
Short-eared Owl *Asio flammeus*	SC	N/A	Generally prefers a wide variety of open habitats, including grasslands, peat bogs, marshes, sand-sage concentrations, old pastures and agricultural fields	Active Year Round	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol

Wood Thrush *Hylocichla mustelina*	SC	N/A	Nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. Prefers large forest mosaics, but may also nest in small forest fragments.	Migrate South for the Winter Arrive in Ontario in mid to late spring	Follow Breeding Bird Survey Protocol
Yellow-breasted Chat *Icteria virens*	END	Species Protection and General Habitat Protection	Generally prefer dense thickets around wood edges, riparian areas, and in overgrown clearings	Migrate South for the Winter Arrive in Ontario Early May	Follow Breeding Bird Survey Protocol

Fish	SARO	Protection	Habitat Information	Timing Windows	Survey Protocol
Black Redhorse *Moxostoma duquesnei*	THR	Species Protection and General Habitat Protection	Generally lives in moderately sized rivers and streams, with generally moderate to fast currents	Active Year Round	For information please contact your local MNRF office, CA or DFO
Redside Dace *Clinostomus elongatus*	END	Species Protection and Habitat Regulation	Generally found in pools and slow-moving areas of small headwater streams with a moderate to high gradient	Spawning occurs in May Timing Window is Coldwater - June 1 - September 15	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol
Silver Shiner *Notropis photogenis*	THR	Species Protection and General Habitat Protection	Generally prefer moderate to large, deep, relatively clear streams with swift currents, and moderate to high gradients	Spawning occurs in May and June	For information please contact your local MNRF office, CA and/or DFO

Insect	SARO	Protection	Habitat Information	Timing Windows	Survey Protocol
Monarch Butterfly *Danaus plexippus*	SC	N/A	Exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	Usually migrate south in late September and October	Watch for adults along roadsides and in open fields. Caterpillars feed on milkweeds: Common milkweed grows in open disturbed habitats (fields, roadsides, etc) and swamp milkweed grows in wet habitats (along streams, lakes, marshes) Adults can be spotted from a distance; caterpillars must be looked for carefully on the host plant.

Rusty-patched Bumble Bee *Bombus affinis*	END	Species Protection and General Habitat Protection	Generally inhabits a range of diverse habitats including mixed farmland, sand dunes, marshes, urban and wooded areas. It usually nests underground in abandoned rodent burrows	Active from early Spring to late Fall	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
West Virginia White *Pieris virginiensis*	SC	N/A	Generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor.	Adult butterfly emerges from pupa in late March; flies only in April and May	Watch for adults within moist, deciduous woodlands Caterpillars feed on the two-leaved toothwort: Toothwort grows in damp, open, rich hardwood woodlands and blooms from April to June. Adults can be spotted from a distance; caterpillars must be searched for carefully by checking host plant
Mammal	**SARO**	**Protection**	**Habitat Information**	**Timing Windows**	**Survey Protocol**
Eastern Small-footed Myotis *Myotis leibii*	END	Species Protection and General Habitat Protection	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark.	Hibernates in caves and mines during winter	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Gray Fox *Urocyon cinereoargenteus*	THR	Species Protection and General Habitat Protection	Generally prefers deciduous forests, marshes, swampy areas, and urban areas	Active Year Round	Opportunistically or by examining tracks in winter and summer
Little Brown Myotis *Myotis lucifugus*	END	Species Protection and General Habitat Protection	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh).	Hibernates during winter	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol

Northern Myotis *Myotis septentrionalis*	END	Species Protection and General Habitat Protection	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Often asssociated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns etc.)	Hibernates during winter	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Tri-colored Bat *Perimyotis subflavus*	END	Species Protection and General Habitat Protection	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Can be in trees or dead clusters of leaves or arboreal lichens on trees. May also use barns or similar structures.	Hibernates during winter	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Mollusc	**SARO**	**Protection**	**Habitat Information**	**Timing Windows**	**Survey Protocol**
Rainbow Mussel *Villosa iris*	SC	N/A	Most abundant in shallow, well-oxygenated reaches of small- to medium-sized rivers and sometimes lakes, on substrates of cobble, gravel, sand and occasionally mud	Active Year Round	Please reference: Mackie, G, T.J Morris, and D Ming. "Protocol for the Detection and Relocation of Freshwater Mussel Species at Risk in Ontario Great Lakes Area (OGLA)." Fisheries and Oceans Canada. (2008): Print.
Wavy-rayed Lampmussel *Lampsilis fasciola*	THR	Species Protection and Habitat Regulation	Generally inhabit clear rivers and streams of a variety of sizes, where the water flow is steady and the substrate is stable	Active Year Round	Please reference: Mackie, G, T.J Morris, and D Ming. "Protocol for the Detection and Relocation of Freshwater Mussel Species at Risk in Ontario Great Lakes Area (OGLA)." Fisheries and Oceans Canada. (2008): Print.
Plant	**SARO**	**Protection**	**Habitat Information**	**Timing Windows**	**Survey Protocol**
American Chestnut *Castanea dentata*	END	Species Protection and General Habitat Protection	Found in deciduous forest communities; this tree prefers arid forests with acid and sandy soils.	Flowers occur in Late Spring and Early Summer	Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters Use a plant field guide to distinguish from similar species Perform detailed floristic inventory Look for distinictive fruits on the ground
American Ginseng *Panax quinquefolius*	END	Species Protection and General Habitat Protection	Grows in rich, moist, undisturbed and relatively mature deciduous woods in areas of neutral soil (such as over limestone or marble bedrock).	Flowering begins in June and continues until August The fruit develop from July to August and ripen in August and September	Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters Use a plant field guide to distinguish from similar species

Butternut *Juglans cinerea*	END	Species Protection and General Habitat Protection	Generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows	Flowers from April to June. Fruits reach maturity during the month of September or October	Walk slowly and systematically in grid fashion through suitable habitat pausing every 30 meters for a detailed scan of trees within sight. Areas with dense foliage or many saplings will require a more intensive survey to detect sapling butternut. Use Butternut Health Assessment Protocol if planning on removing trees.
Hill's Pondweed *Potamogeton hillii*	SC	N/A	Generally grows in clear, cold ponds and slow- moving streams where the water is alkaline	Flowers in Summer	Survey in appropriate aquatic habitat Use a plant field guide to distinguish from similar species

Reptile	SARO	Protection	Habitat Information	Timing Windows	Survey Protocol
Blanding's Turtle *Emydoidea blandingii*	THR	Species Protection and General Habitat Protection	Generally occur in freshwater lakes, permanent or temporary pools, slow-flowing streams, marshes and swamps. They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae. They dig their nest in a variety of loose substrates, including sand, organic soil, gravel and cobblestone. Overwintering occurs in permanent pools that average about one metre in depth, or in slow-flowing streams.	Eggs are laid in June, with hatchlings emerging in late September and early October.	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol
Butler's Gartersnake *Thamnophis butleri*	END	Species Protection and General Habitat Protection	Generally prefers open habitats, such as dense grasslands and old fields, where there are small marshes and seasonal wet areas	Active: early April - mid-September Mating: early spring (April) Hatching: June and July	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol

Eastern Ribbonsnake *Thamnophis sauritus*	SC	N/A	Generally occur along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	Hibernate: October - April Mating: Early Spring Hatching: Early Fall (September)	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Massassauga Rattlesnake *Sistrurus catenatus*	THR	Species Protection and General Habitat Protection	Generally occur in habitats ranging from tall grass prairie to cedar bogs to shorelines. All habitats require canopies that are not too open, but they also require access to spots where they can get warm enough to effectively digest their food and reproduce. Sufficient moisuture is also required for them to survive the winter, so they are often associated with wetlands or small, wet depressions in the terrain.	Active: Late April - October	Survey for gestating females in appropriate gestation sites Comprehensive survey of habitat for individuals at least 3 days during the active season Survey suitable hibernation sites in late Fall or early Spring during emergence
Snapping Turtle *Chelydra serpentina*	SC	N/A	Generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	Nesting: Late May and June Hibernate: October - April	Scan offshore rocks and logs for basking turtles (10am-2pm) Snorkel in desired aquatic habitat Nesting Season: Search known or preferred nesting habitat areas for females

Spotted Turtle *Clemmys guttata*	END	Species Protection and General Habitat Protection	Generally prefers the shallow, slow-moving and unpolluted water of ponds, bogs, marshes, ditches, vernal pools and sedge meadows. It can also be found in woodland streams and near the sheltered shores of shallow bays	Hibernate: September - April Breed: May - Early June Nesting: Mid - Late June	Stalk silently along shorelines and from vantage points scan emergent clumps of vegetation, logs, rocks and shorelines for basking turtles and watch for turtles in shallow ponds/pools Wade very slowly through wetland edges being extremely quiet and careful to ensure you see the turtle before it sees you Nesting season: search nesting habitat areas for females Wetlands can be scanned from a greater distance using a spotting scope High quality 10 power binoculars are essential Surveys should be done by looking for basking turtles in early Spring as they come out of hibernation Minimum of 2 days of surveys in appropriate weather (warm sunny spring days) at suitable sites

Aquatic Habitat Assessment

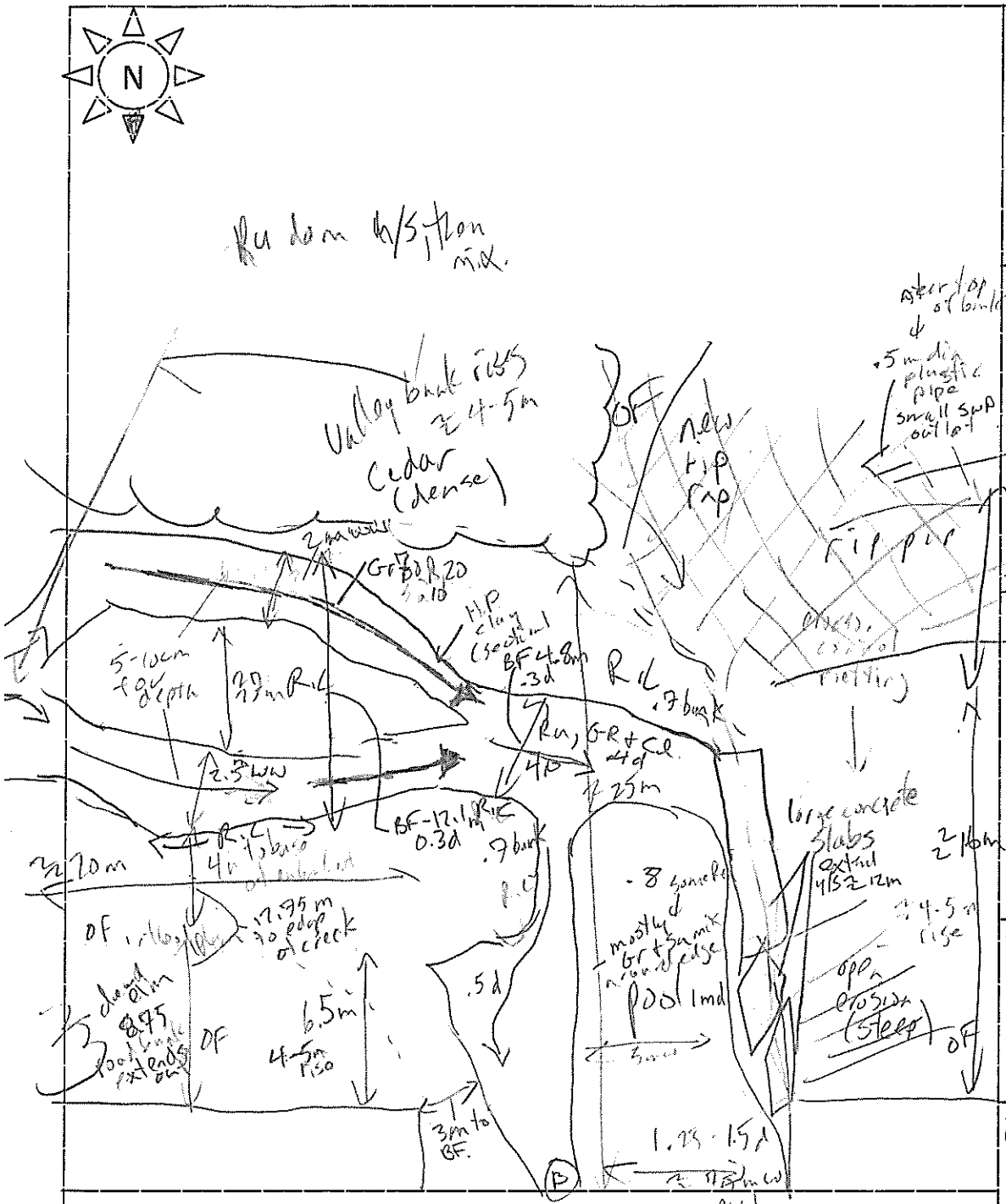
Aug, 14, 2017 & Aug, 19, 2020 Page: 1 of 2

WSP | MMM GROUP

Project Name / #: Bridge B109132 **Date:** ↓ **Time:** 0930 **Photos:** yes

Watercourse Name: Conestogo River **Location:** upstream of bridge **Length:** ~50m **Observers:** A.D.

Zone: 17T **Easting:** 539901 **Northing:** 4852887 **Water Temp:** ~20°C **Air Temp:** 23 **% Overhead Cover:** 10



Physical Characteristics:
- 10d — Depth (cm)
- 6w — Width (m)
- — Riffle
- — Flat
- — Run/Glide
- — Pool

Substrate:
- — Island/Bar
- — Fine Substrate
- Sa, Si, M — Sand, Silt, Muck
- ##### — Gravel Substrate
- — Cobble
- Sh — Shale
- B — Boulder
- **** — Debris

Vegetation:
- CT — Cattail
- RC — Reed Canary
- SV — Submergent Vegetation
- FV — Floating Vegetation
- EV — Emergent Vegetation
- Gr — Grasses
- R — Riparian Tree
- — Forested Area

Banks:
- /////// — Eroded Bank
- xxxxxxx — Riprap/other Stabilization
- — — — — Undercut Bank
- TH — Thatch

Barriers:
- — Instream Log/Tree
- ^^^^^^ — Dam/Weir/Obstruction
- — Barrier to fish movement
- S — Seasonal Barrier
- -X- - -X- — Fenceline
- — Culvert

Habitat Indicators:
- Fe — Iron Staining
- — Seep/Spring
- W — Watercress

Profile: Horizontal Scale: Vertical Scale:

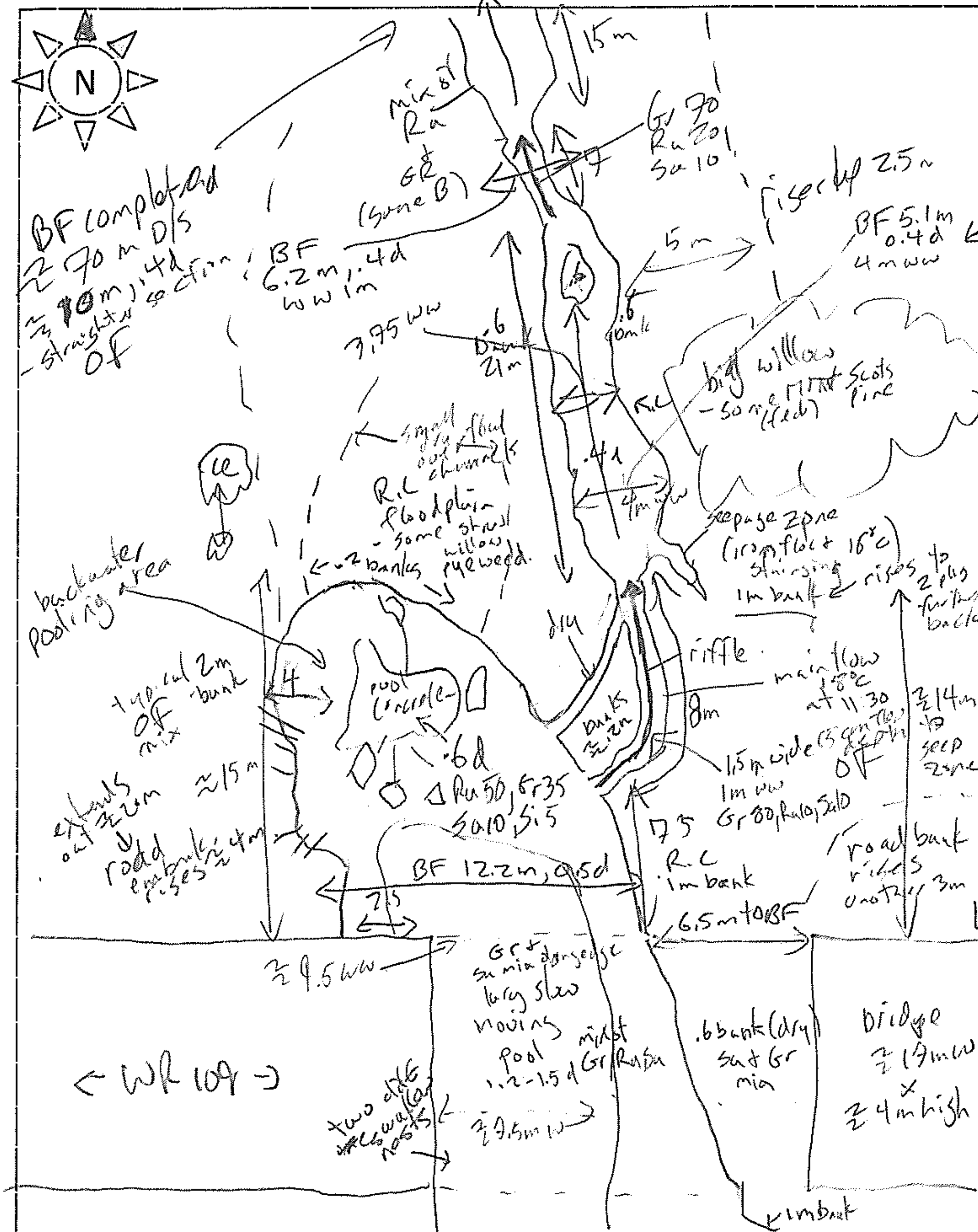
Aquatic Habitat Assessment

Page: 2 of 2

Project Name / #: B109132 **Date:** Aug. 14, 2017 + Aug. 18, 2020 **Time:** 11:10 **Photos:** yes

Watercourse Name: Conestogo River **Location:** downstream of bridge **Length:** ≈50m **Observers:** A.D.

Zone: ____ **Easting:** 537887 **Northing:** 4852904 **Water Temp:** 20°C **Air Temp:** 23°C **% Overhead Cover:** 10



Physical Characteristics:
- 10d — Depth (cm)
- 6w — Width (m)
- — Riffle
- — Flat
- — Run/Glide
- — Pool

Substrate:
- — Island/Bar
- — Fine Substrate
- Sa, Sl, M — Sand, Silt, Muck
- #### — Gravel Substrate
- ooo — Cobble
- Sh — Shale
- (B) — Boulder
- **** — Debris

Vegetation:
- CT — Cattail
- RC — Reed Canary
- SV — Submergent Vegetation
- FV — Floating Vegetation
- EV — Emergent Vegetation
- Gr — Grasses
- (R) — Riparian Tree
- — Forested Area

Banks:
- ////// — Eroded Bank
- xxxxxxx — Riprap/other Stabilization
- — — — — Undercut Bank
- TH — Thatch

Barriers:
- — Instream Log/Tree
- ^^^^^^ — Dam/Weir/Obstruction
- — Barrier to fish movement
- S — Seasonal Barrier
- -X- - -X- — Fenceline
- — Culvert

Habitat Indicators:
- Fe — Iron Staining
- — Seep/Spring
- (W) — Watercress

Profile: Horizontal Scale: Vertical Scale:

North (u/s) of WR109

Aquatic Habitat Assessment

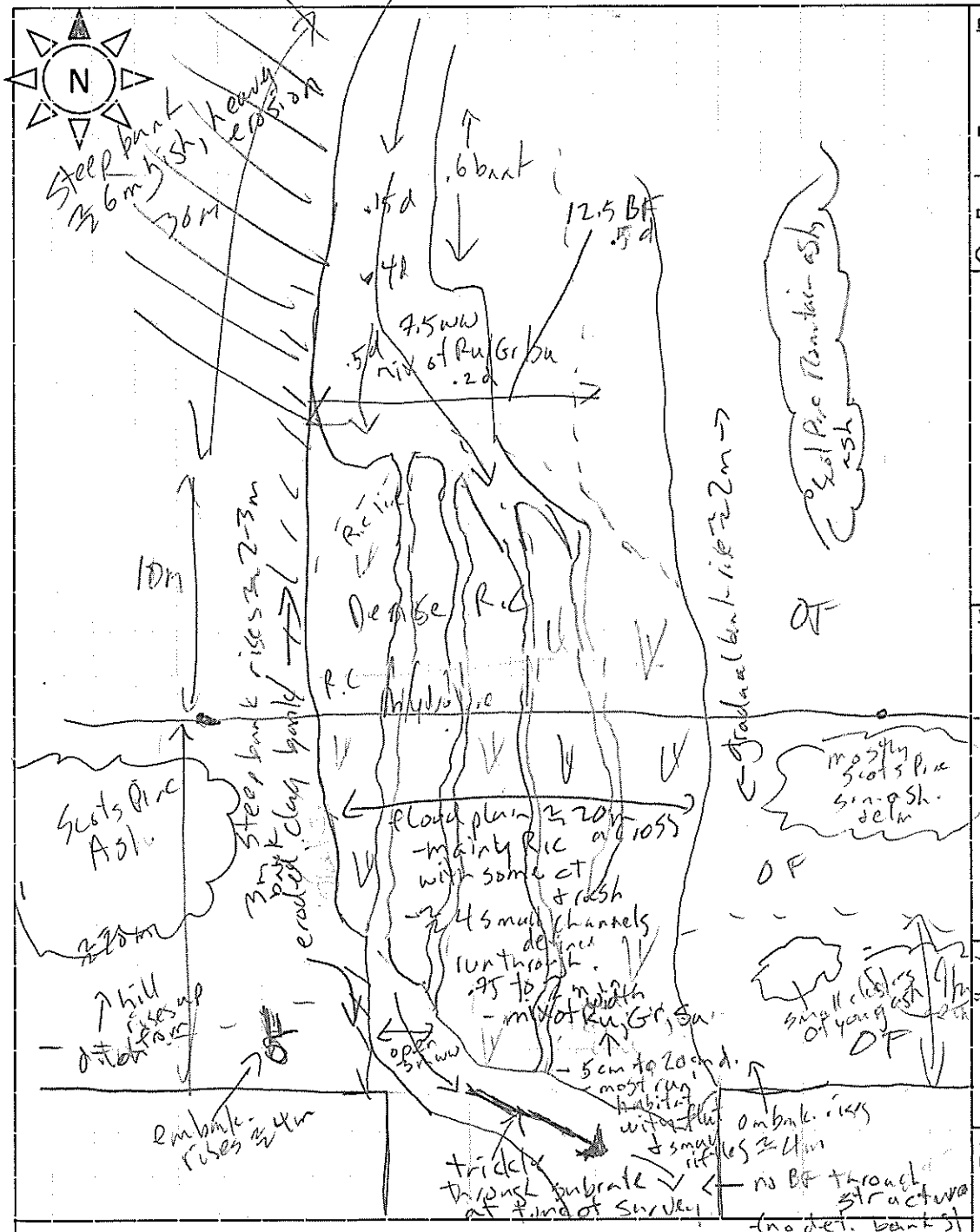
Aug. 15, 2019 + Aug. 19, 2020 (Bridge)

Page: 1 of 2

Project Name / #: C109123 **Date:** → **Time:** 12:15 **Photos:** yes

Watercourse Name: Conestogo River **Location:** upstream of bridge **Length:** ~250 m **Observers:** A.D

Zone: 17T **Easting:** 538346 **Northing:** 4853038 **Water Temp:** 21 **Air Temp:** 23 **% Overhead Cover:** 85% Reed Canary grass



Physical Characteristics:
- 10d — Depth (cm)
- 6w — Width (m)
- — Riffle
- — Flat
- — Run/Glide
- — Pool

Substrate:
- — Island/Bar
- — Fine Substrate
- Sa, Si, M — Sand, Silt, Muck
- ##### — Gravel Substrate
- — Cobble
- Sh — Shale
- (B) — Boulder
- **** — Debris

Vegetation:
- CT — Cattail
- RC — Reed Canary
- SV — Submergent Vegetation
- FV — Floating Vegetation
- EV — Emergent Vegetation
- Gr — Grasses
- (R) — Riparian Tree
- — Forested Area

Banks:
- ////// — Eroded Bank
- xxxxxxx — Riprap/other Stabilization
- — — — — Undercut Bank
- TH — Thatch

Barriers:
- — Instream Log/Tree
- ^^^^^^ — Dam/Weir/Obstruction
- — Barrier to fish movement
- S — Seasonal Barrier
- -X- - -X- — Fenceline
- — Culvert

Habitat Indicators:
- Fe — Iron Staining
- — Seep/Spring
- (W) — Watercress

Profile: Horizontal Scale: Vertical Scale:

South (D/S) of WR109 (4 within)

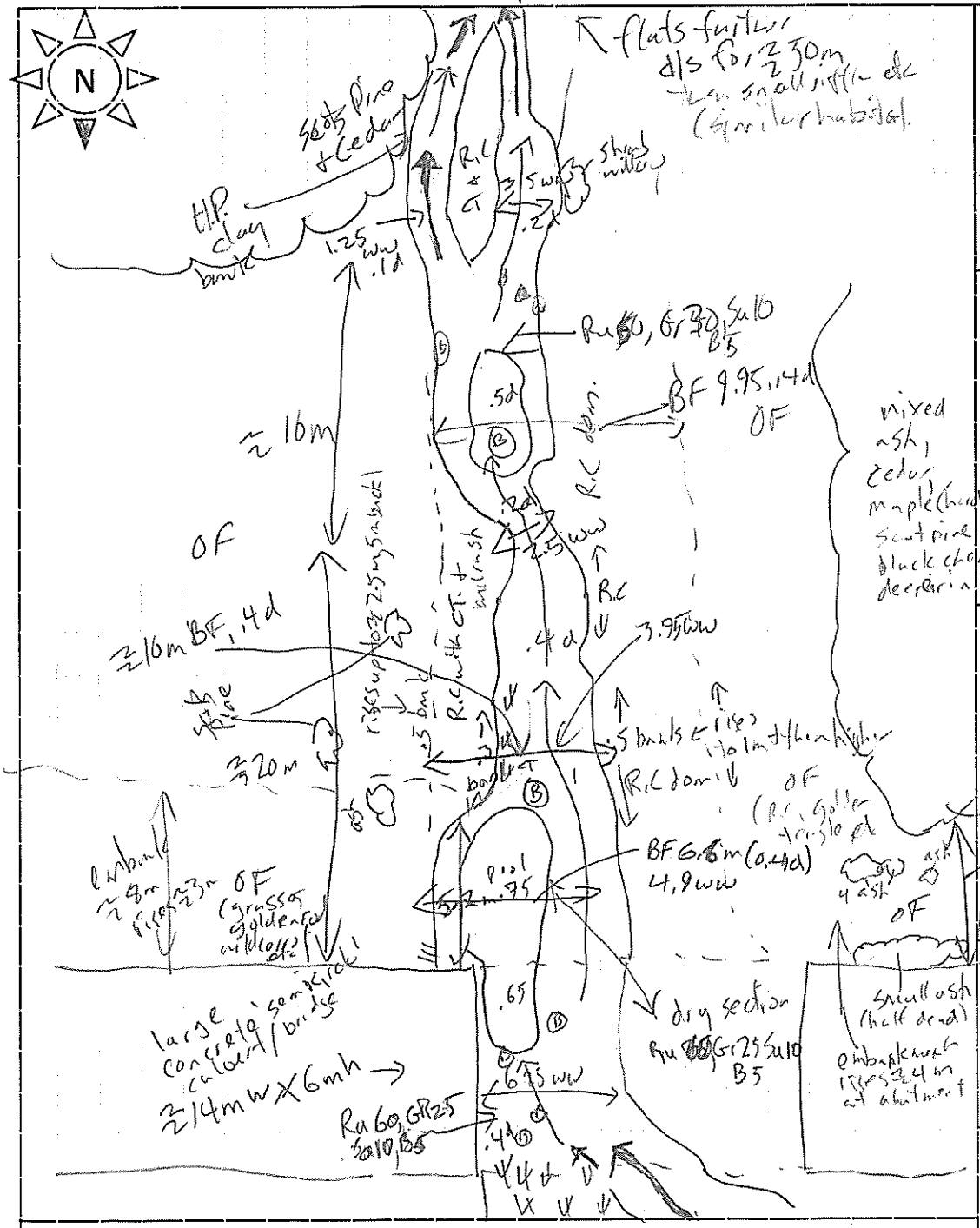
Aquatic Habitat Assessment

Aug 15, 2017 Page: 2 of 2
Aug. 19, 2020

Project Name / #: C109123 (Bridge) **Date:** ↓ **Time:** 10:15 **Photos:** yes

Watercourse Name: Conestoga River **Location:** downstream of bridge **Length:** ~250m **Observers:** A.D

Zone: ____ **Easting:** 538354 **Northing:** 4853018 **Water Temp:** 21 **Air Temp:** 23 **% Overhead Cover:** 15



Profile: Horizontal Scale: Vertical Scale:

Physical Characteristics:
- 10d — Depth (cm)
- 6w — Width (m)
- — Riffle
- — Flat
- — Run/Glide
- — Pool

Substrate:
- — Island/Bar
- — Fine Substrate
- Sa, Si, M — Sand, Silt, Muck
- #### — Gravel Substrate
- — Cobble
- Sh — Shale
- (B) — Boulder
- **** — Debris

Vegetation:
- CT — Cattail
- RC — Reed Canary
- SV — Submergent Vegetation
- FV — Floating Vegetation
- EV — Emergent Vegetation
- Gr — Grasses
- (R) — Riparian Tree
- — Forested Area

Banks:
- /////// — Eroded Bank
- xxxxxxx — Riprap/other Stabilization
- — — — — Undercut Bank
- TH — Thatch

Barriers:
- — Instream Log/Tree
- ^^^^^^ — Dam/Weir/Obstruction
- — Barrier to fish movement
- S — Seasonal Barrier
- -X- -X- — Fenceline
- — Culvert

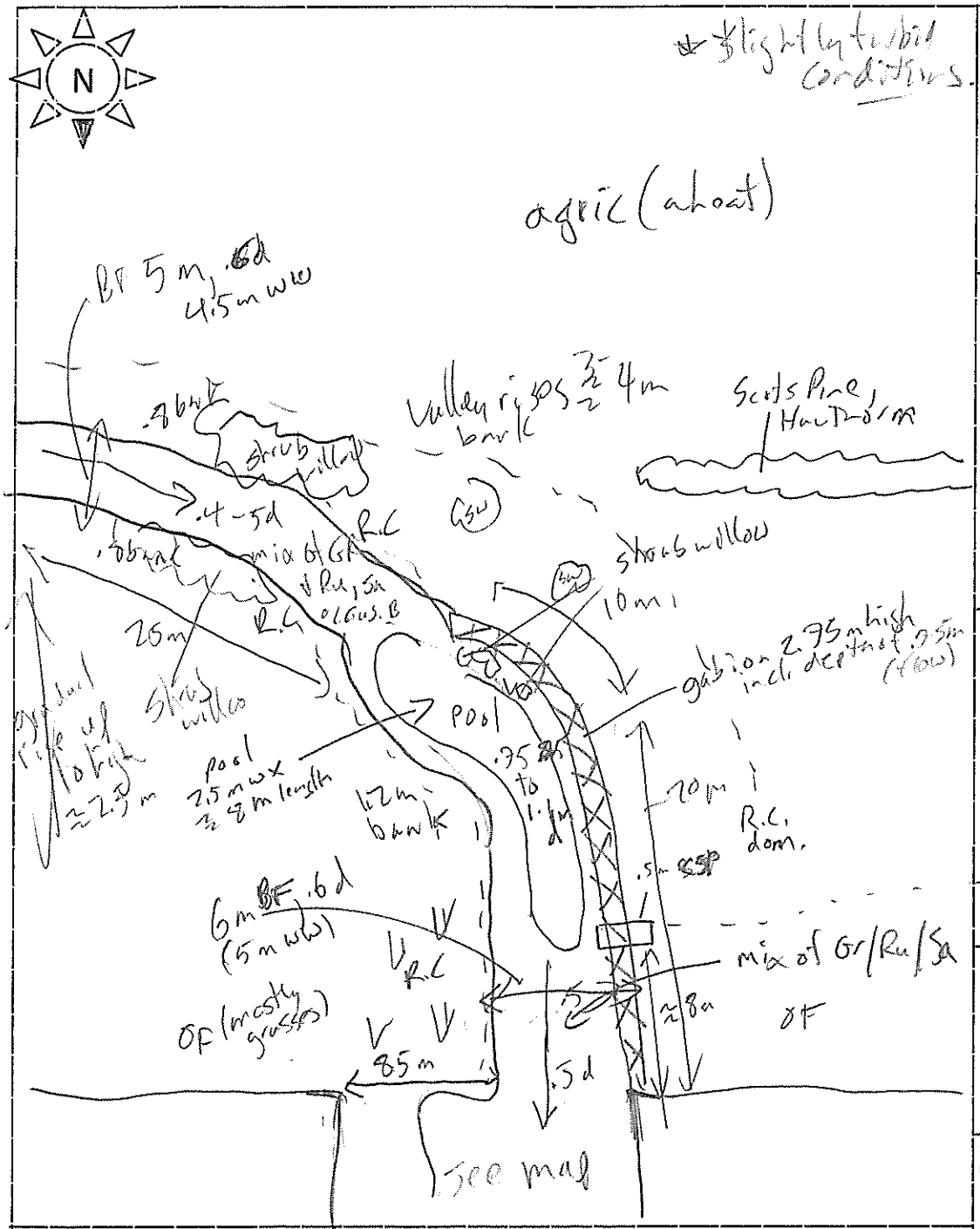
Habitat Indicators:
- Fe — Iron Staining
- — Seep/Spring
- (W) — Watercress

Aquatic Habitat Assessment + Aug. 19, 2020 Page: 1 of 2

Project Name / #: B109133 **Date:** Aug. 15/17 **Time:** 1600 **Photos:** yes

Watercourse Name: Conestoga River **Location:** upstream of bridge **Length:** ≈50m **Observers:** A.D.

Zone: 17T **Easting:** 539379 **Northing:** 4853331 **Water Temp:** 21 **Air Temp:** 24 **% Overhead Cover:** 5



Profile: Horizontal Scale: Vertical Scale:

Physical Characteristics:
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Barriers:
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- ^^^^^^ — Dam/Weir/Obstruction
- — Barrier to fish movement
- S — Seasonal Barrier
- -X- - -X- — Fenceline
- — Culvert

Habitat Indicators:
- Fe — Iron Staining
- — Seep/Spring
- (W) — Watercress

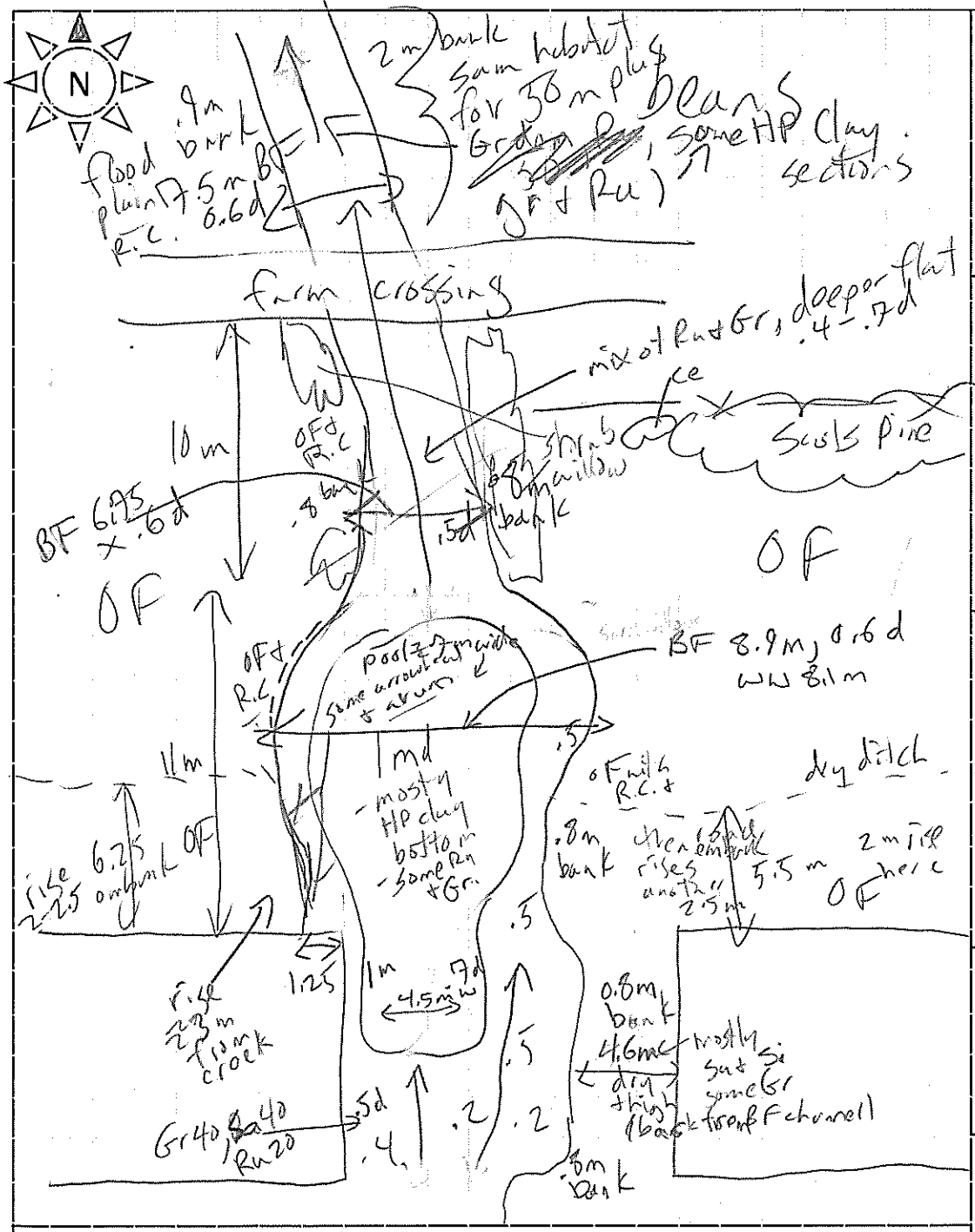
North / D/S of WR 109 (Twining)

Aquatic Habitat Assessment Page: 2 of 2

Project Name / #: B109133 (Bridge) And Aug. 19, 2020 **Date:** Aug. 15/17 **Time:** 1445 **Photos:** yes

Watercourse Name: Conestoga River **Location:** downstream of Bridge **Length:** ~50m **Observers:** A.D

Zone: 17T **Easting:** 539373 **Northing:** 4853348 **Water Temp:** 21 **Air Temp:** 24 **% Overhead Cover:** 5



Physical Characteristics:
- 10d — Depth (cm)
- 6w — Width (m)
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- — Flat
- — Run/Glide
- — Pool

Substrate:
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- — Fine Substrate
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Vegetation:
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Banks:
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Barriers:
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- ^^^^^^ — Dam/Weir/Obstruction
- — Barrier to fish movement
- S — Seasonal Barrier
- -X---X- — Fenceline
- — Culvert

Habitat Indicators:
- Fe — Iron Staining
- — Seep/Spring
- (W) — Watercress

Profile: Horizontal Scale: Vertical Scale:

North/u/s of CR104 Aug. 14/2017 + Aug. 19 2020

Aquatic Habitat Assessment

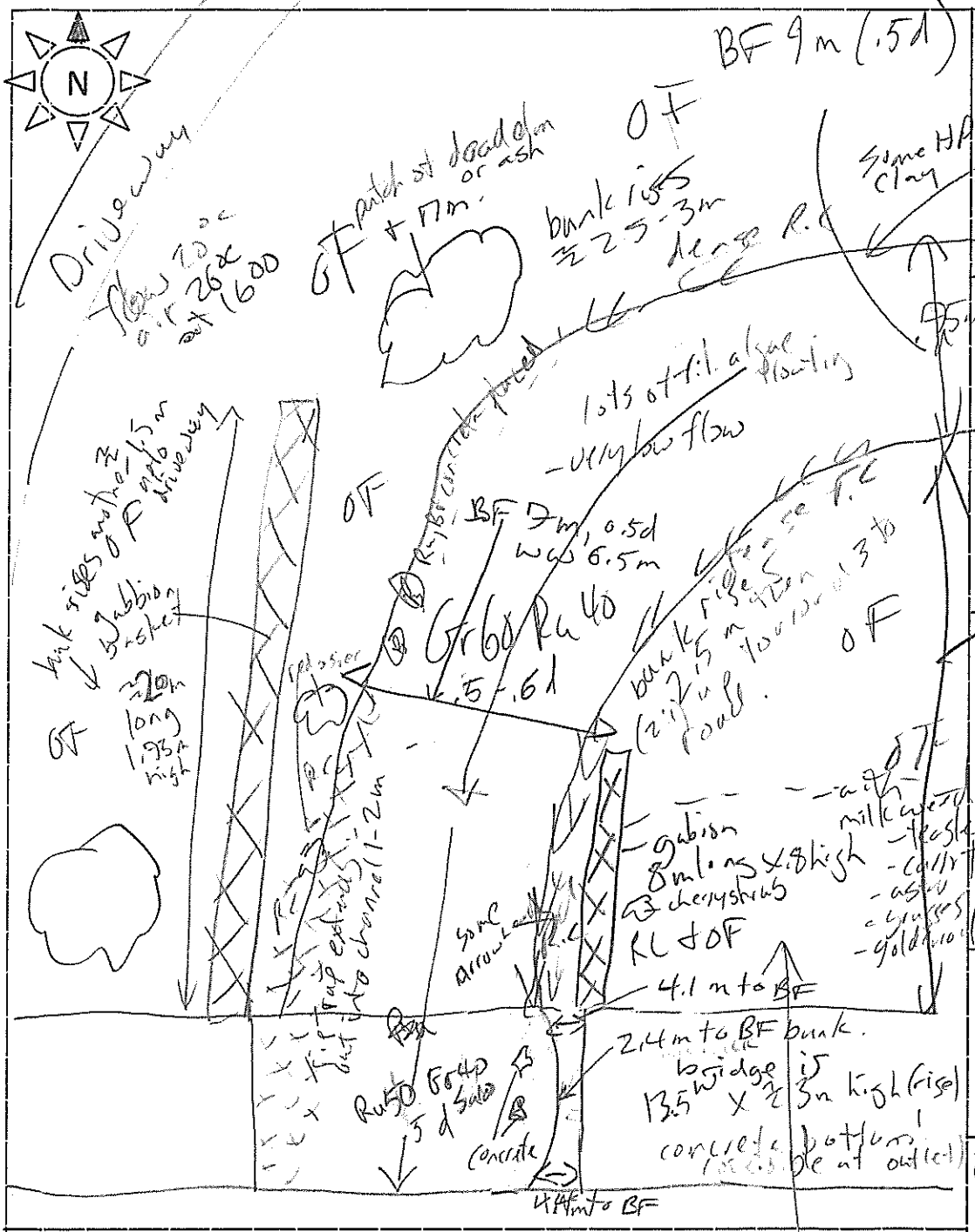
Page: 1 of 2

WSP | MMM GROUP

Project Name / #: 109134 (Bridge) **Date:** **Time:** 1306 **Photos:** yes

Watercourse Name: Conestogo River **Location:** upstream of bridge **Length:** ≈ 50 m **Observers:** A.D

Zone: 17T **Easting:** 540435 **Northing:** 4853669 **Water Temp:** 20°C **Air Temp:** 23°C **% Overhead Cover:** 5



Profile: Horizontal Scale: Vertical Scale:

Physical Characteristics:
- 10d — Depth (cm)
- 6w — Width (m)
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- Flat
- Run/Glide
- Pool

Substrate:
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- Forested Area

Banks:
- /////// — Eroded Bank
- xxxxxxx — Riprap/other Stabilization
- — — — Undercut Bank
- TH — Thatch

Barriers:
- Instream Log/Tree
- ^^^^^^ — Dam/Weir/Obstruction
- — Barrier to fish movement
- S — Seasonal Barrier
- -X- - -X- — Fenceline
- — Culvert

Habitat Indicators:
- Fe — Iron Staining
- — Seep/Spring
- W — Watercress

South D/s of WR109

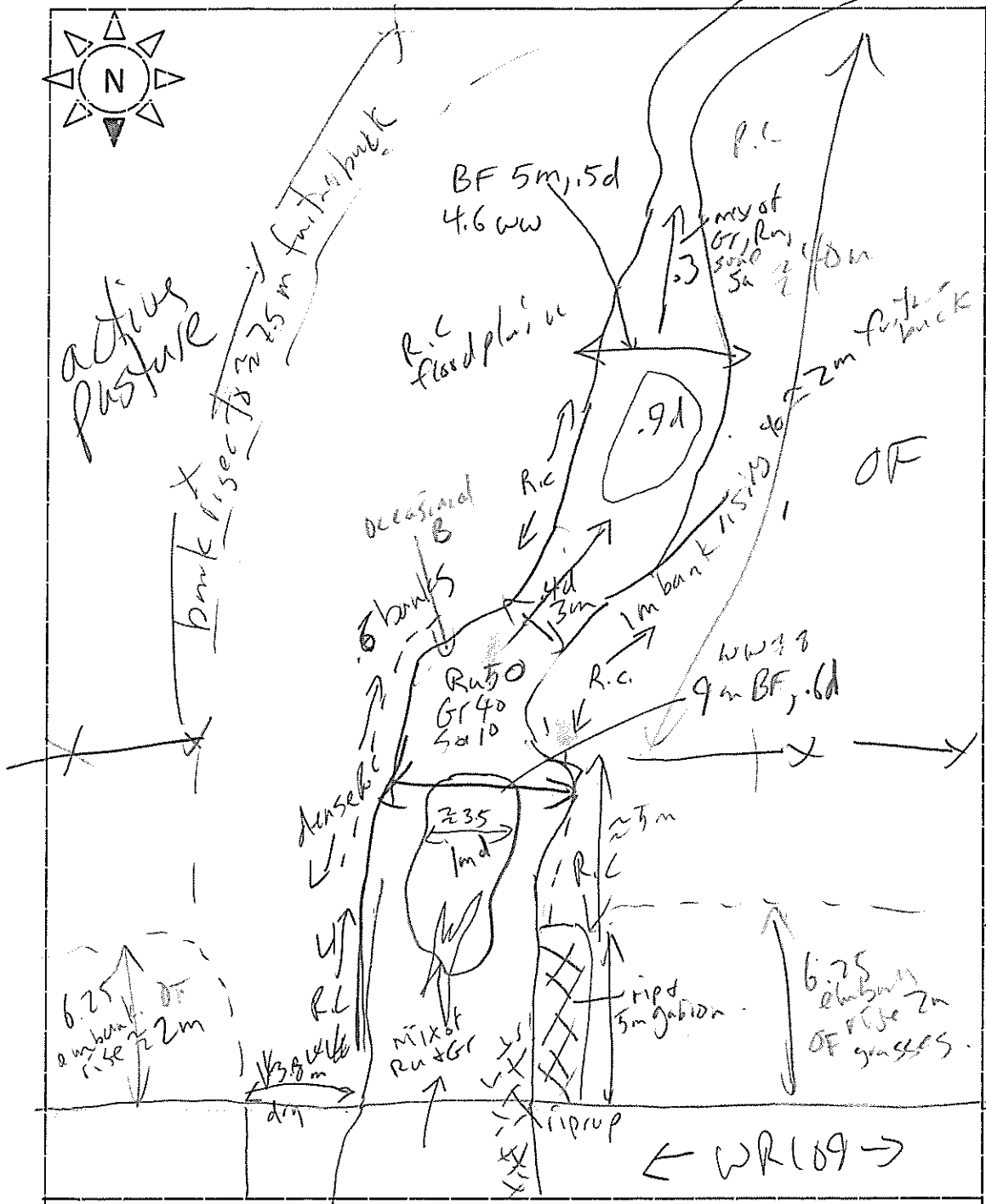
Aquatic Habitat Assessment

WSP | MMM GROUP

Project Name / #: B109 134 (Bridge) **Date:** Aug. 14/17 **Time:** 1430 **Photos:** Yes

Watercourse Name: Conestogo River **Location:** downstream of bridge **Length:** ≈50m **Observers:** A.D

Zone: 17T **Easting:** 540433 **Northing:** 4853645 **Water Temp:** 20°C **Air Temp:** 23°C **% Overhead Cover:** 5



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Habitat Indicators:
- Fe — Iron Staining
- — Seep/Spring
- (W) — Watercress

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