BURNSIDE

Bridge and Transportation Network Study for Bridges 21-WG, 29-WG and 30-WG
Natural Heritage Report

Township of Centre Wellington
1 MacDonald Square
Elora ON N0B 1S0

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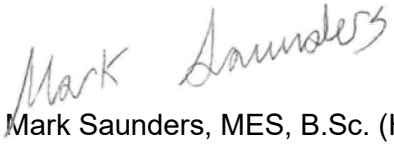

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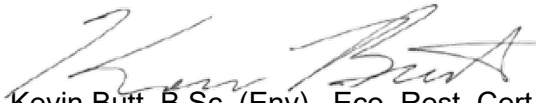

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1.0 Introduction

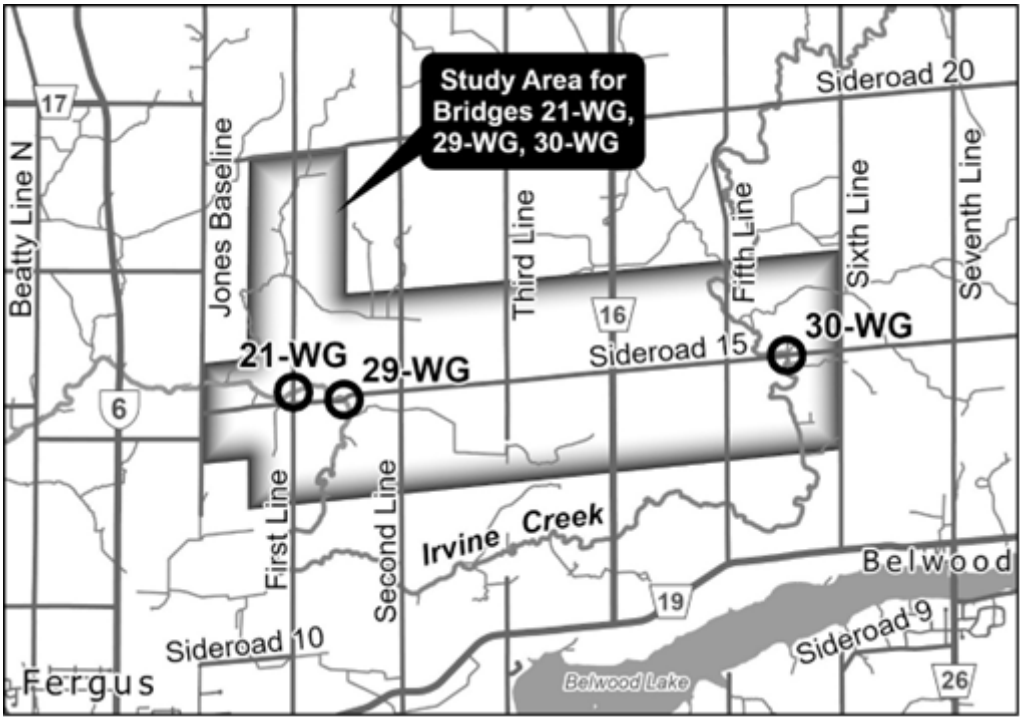
R.J. Burnside & Associates Limited (Burnside) has been retained by the Township of Centre Wellington (Township) to complete a Bridge and Transportation Network Study for Bridges 21-WG, 29-WG, and 30-WG located northeast of the community of Fergus (Figure 1).

This Natural Heritage Report documents the existing natural heritage conditions, both terrestrial and aquatic, in a 120 m study area around each respective bridge. The natural features associated with Irvine Creek and its associated bridge crossings are a part of larger connected natural systems comprised of varied forests, hedgerows, wetlands, meadow and thicket communities that comprise Wellington County's Natural Heritage System.

This report will inform the preferred alternative decision by identifying natural feature constraints that will need to be protected or mitigated from short-term or long-term impacts.

A review of existing documents and databases was used to identify the presence, or potential presence, of the natural features and their associated policy constraints, supported by a field investigation by Burnside ecologists.

Figure 1: Study Area



2.0 Methodology

The following sources of information were used to determine the ecological constraints in the vicinity of each structure.

- Aerial photographic imaging and 1:10,000 Ontario Base Mapping (OBM)
- Department of Fisheries and Oceans (DFO) Aquatic SAR mapping (2023)
- Ministry of Natural Resources and Forestry (MNRF) Make a Map: Natural Heritage Areas to identify natural heritage features and Natural Heritage Information Centre (NHIC) data of rare wildlife species on, and in the vicinity of, the subject lands: 1x1 km^2 Squares: 17NJ4644, 17NJ4645, 17NJ4844, 17NJ4744, 17NJ4845, 17NJ5048, 17NJ5049, 17NJ5149, and 17NJ5148
- MNRF Land Information Ontario (LIO) database
- MNRF Aquatic Resource Area (ARA) summary data
- Ontario Hydrology Network (OHN) mapping
- The Ontario Breeding Bird Atlas (OBBA) 2001-2005 – 10x10 km^2 Square 17NJ44 and 17NJ54
- Ontario Reptile and Amphibian Atlas (ORAA) – 10x10 km^2 Square 17NJ44 and 17NJ54
- Ontario Insect Atlas (OIA) 2005 – 2021 – 10x10 km^2 Square 17NJ44 and 17NJ54
- iNaturalist records
- eBird records

- GRCA Regulated Areas and Features Mapping
- Township of Centre Wellington Official Plan (2023)
- Wellington County Official Plan (2022)

In addition, field investigations were carried out, as follows:

- An Ecological Land Classification (ELC) and botanical inventory were undertaken from the road ROW. ELC communities were described according to the updated Second Approximation 2008 codes (Lee, 2008) with reference to Ecological Land Classification for Southern Ontario: First Approximation and Its Application (Lee et al. 1998) for units that could not be adequately described by the 2008 codes. Approximations of communities were made where permission to enter was not available and work was completed from the publicly-owned road right-of-way. Air photos were used to delineate the features, as needed.
- Wetland boundary delineation was completed in accordance with the Ontario Wetland Evaluation System (OWES) protocol. Wetland Staking was completed with Tony Zammit (Watershed Ecologist) and Jessica Conroy (Planner) from the GRCA at bridge 30-WG. Site visits with the GRCA also took place at bridge 21-WG and 29-WG to confirm the absence of wetlands.
- Each bridge structure was surveyed by a Burnside ecologist for evidence of breeding birds, primarily Cliff Swallow and Barn Swallow nests.
- Visual aquatic habitat survey.
- Onsite meeting with Indigenous Community Field Liaison Representatives. Billye Bomberry and Matthew Turner from Haudenosaunee Development Institute were in attendance.

A summary of conditions during field investigations is presented in Table 1.

Table 1: Natural Environment Field Investigations

Field Study	Methodology	Staff Involved	Date(s)	Time of Day	Weather Conditions		
					Precipitation/Cloud Cover	Temperature (°C)	Wind (Beaufort Wind Scale)[1]
Ecological Land Classification	Ecological Land Classification for Southern Ontario (Lee et al.,1998) of entire property.	Sarah Yoshida, Ecologist	June 11, 2025	1000 - 1620	No precipitation Clear	17°C on arrival 25°C on departure	3
Wetland Boundary Delineation	Ontario Wetland Evaluation System						
Aquatic Habitat Assessment	Ontario Ministry of Transportation (MTO) Fisheries Protocol - Environmental Guide for Fish and Fish Habitat (June 2009)	Mark Saunders	June 23, 2025	1030 - 1230	No precipitation Clear	29°C on arrival 31°C on departure	6 - Strong Breeze

Field Study	Methodology	Staff Involved	Date(s)	Time of Day	Weather Conditions		
					Precipitation/Cloud Cover	Temperature (°C)	Wind (Beaufort Wind Scale)[1]
Search for potential wildlife habitats	Survey throughout study areas to search for features that could provide habitat for wildlife or SAR habitat such as: Nests, reptile hibernacula, old barns, structures, uncapped chimneys, foundations, mature forest areas with cavities or other features suitable for bat roosting, turtle nesting or overwintering sites.	All staff	All site visits				
Incidental flora and fauna observations	Visual observations of animals, tracks or scat and compilation of a plant inventory during all site visits.	Sarah Yoshida, Ecologist	June 11, 2025	1000 - 1620	No precipitation Clear	17°C on arrival 25°C on departure	3

[1] Beaufort Wind Scale: 0 = calm, smoke rises vertically (0-2 km/hr); 1 = light air movement, smoke drifts (3-5); 3 = gentle breeze, wind felt on face; leaves rustle (6-11); 4 = moderate breeze, small branches moving, raises dust & loose paper (20-30); 5 = fresh breeze, small trees begin to sway (31-39); 6 = strong breeze, large branches in motion (40-50)

3.0 Background Review

3.1 County of Wellington Official Plan

Per Schedule B1 of the Wellington County OP, all three structures occur in association with the Couty of Wellington Core Greenlands system. The Greenlands in Wellington County are determined by their composition of natural features. Any wetland in Wellington County is considered significant. Additionally, in Wellington County, all streams and valleylands are considered significant, providing protection to these watercourses at all structures.

3.2 Terrestrial Environment

A review of NHIC demonstrates that bridge 30-WG are situated adjacent to the Living Springs Wetland Complex. All three structures are surrounded by the County Natural Heritage System (NHS). Based on a review of OBBA, ORAA, and OIA, the following SAR (endangered of Threatened) and Species of Special Concern (SCCO were identified as potentially being present within the Study Area.

Table 2: Species at Risk within the Study Area

COMMON NAME **(Source)	SCIENTIFIC NAME		Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description[5]	Habitat Present on the Subject Lands and/or Adjacent Lands?
Arthropods									
Monarch (Source: OIA)	*Danaus plexippus*		S2N, S4B	SC	END	END	1	Throughout their life cycle, Monarchs use three different types of habitats. Only the caterpillars (larvae) feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers. Monarchs spend the winter in Oyamel Fir forests found in central Mexico. The largest threat to Ontario Monarchs is habitat loss and fragmentation at overwintering sites in central Mexico where forests are being logged and converted into agricultural fields and pastures. Widespread pesticide and herbicide use throughout the Monarch's range may also limit recovery.[9]	Moderate potential. Suitable habitat may occur within the meadow marsh communities associated with Structures 21-WG and 29-WG as well as roadsides. Habitat is unlikely to be considered significant
Birds									
Bank Swallow (Source: OBBA)	*Riparia riparia*		S4B	THR	THR	THR	1	Prefers open habitats including, farmland, lake/river shorelines, grasslands, and wetlands. Nests in exposed earthen banks along shorelines and in artificial sites such as gravel pits.[6]	Moderate potential. May occur in association with the banks of Irvine Creek.
Barn Swallow (Source: OBBA)	*Hirundo rustica*		S4B	SC	SC	THR	1	Prefers farmland, lake/river shorelines, wooded clearings, urban populated areas, rocky cliffs, and wetlands. Nests inside or on exterior of buildings; under bridges and in road culverts; on rock faces, and in caves, etc.[7]	Moderate potential. May occur in association with the bridges at the crossings of Irvine Creek.
Bobolink (Source: NHIC, OBBA)	*Dolichonyx oryzivorus*		S4B	THR	SC	THR	1	Generally, prefers open grasslands and hay fields for nesting, typically featuring relatively tall vegetation. Sometimes uses large fields of winter wheat and rye in southwestern Ontario. Sensitive to vegetation structure and composition. Positively associated with high grass-to-forb ratios; moderate litter depth;	Low potential. May be supported within pastures and hayfields located on private lands well beyond bridge 29-WG.

COMMON NAME **(Source)	SCIENTIFIC NAME		Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description[5]	Habitat Present on the Subject Lands and/or Adjacent Lands?
								tolerate wetter portions of fields compared to Eastern Meadowlark (EAME) and more likely to nest closer to field centres rather than field margins. Lower tolerance to presence of patches of bare ground. Appear to prefer larger fields than EAME.[8]	
Canada Warbler (Source: OBBA)	*Cardellina canadensis*		S5B	SC	SC	THR	1	Generally, prefers wet coniferous, deciduous 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.[6]	Moderate potential. May occur in association with the deciduous swamp communities associated with structure 30-WG. Unlikely to be supported in association with Structure 21-WG and 29-WG
Eastern Meadowlark (Source: NHIC, OBBA)	*Sturnella magna*		S4B, S3N	THR	THR	THR	1	Generally prefers grassy pastures, meadows and hay fields. Prefers moderately tall grass with abundant litter cover, a high proportion of grass cover, moderate forb density, low proportions of shrub and woody vegetation cover, and low percent of bare ground. Prefers to nest in drier sites and frequently nests around field margins.[9]	Low potential. Suitable habitat observed within a Rye Field located south of bridge 29-WG on private lands well beyond the bridge.
Eastern Wood-Pewee (Source: NHIC, OBBA)	*Contopus virens*		S4B	SC	SC	SC	1	Prefers open space near the nest in the form of forest edges, clearings, roadways, and water. Does not require large areas of woods but occurs less frequently in woodlots surrounded by development than in those without.[6]	Moderate potential. May occur in association with the swamp and communities associated with structures 21-WG and 30-WG
Grasshopper Sparrow (Source: NHIC, OBBA)	*Ammodramus savannarum*	29-WG	S4B	SC	SC	SC	1	Prefers drier, sparsely vegetated grasslands, particularly rough or unimproved pastures with scattered forb and shrub growth, at least 30 ha in size. It will occasionally also use cultivated hayfields and cereal crops.[6]	Very low potential. May be supported within rye fields adjacent to bridge 29-WG located on private lands well beyond the structure.
Wood Thrush (Source: NHIC, OBBA)	*Hylocichla mustelina*	21-WG 30-WG	S4B	SC	THR	THR	1	Inhabits and breeds in woodlands ranging from small (3 ha) and isolated to large and contiguous. The presence of tall trees and a	Moderate potential. May occur in association with the deciduous swamp

COMMON NAME **(Source)	SCIENTIFIC NAME		Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description[5]	Habitat Present on the Subject Lands and/or Adjacent Lands?
								thick understorey are usually prerequisites for site occupancy.[6]	communities associated with bridge 30-WG and deciduous forests in association with bridge 21-WG. Unlikely to be supported in association with bridge 29-WG
Mammals									
Eastern Small-footed Myotis (Source: Burnside)	*Myotis leibii*	All	S2	END	END	END	1	Overwintering habitat: Caves and abandoned mines. According to the Recovery Strategy for the Eastern Small-footed Myotis in Ontario, summer/roosting habitats used by the species in Ontario are poorly understood, but elsewhere in its range it primarily roosts in open, sunny rocky habitats, and, occasionally, in buildings. Summer roosts for this species are believed to be located in close proximity to their hibernacula (i.e., less than 100 m). The species' preference for rocky habitats in summer may limit an individual's home range to those rocky areas which also contain hibernacula (i.e., karst areas and Canadian Shield areas containing abandoned mines with adits).[11]	Low potential. May occur in association with crossing structures.
Eastern Red Bat (Source: Burnside)	*Lasiurus borealis*	All	S4	END	END	0	0	Roost within the foliage of trees and shrubs in both deciduous and coniferous trees in forests of any age class. Eastern Red bats are known to avoid roosting within conifer species if deciduous trees are present. Typical roost trees are large in diameter and are as tall or taller than the surrounding canopy. Roost sites tend to be along southern aspects and are sheltered from the wind, with Eastern Red Bats being known to be select locations are that unlikely to experience temperature extremes. This	Moderate potential. May occur in association with the mixed swamp communities associated with structure 30-WG. Moderate potential to be supported within the treed riparian areas associated with structures 21-WG and 29-WG.

COMMON NAME **(Source)	SCIENTIFIC NAME		Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description[5]	Habitat Present on the Subject Lands and/or Adjacent Lands?
								species is known to utilize a number of roost trees during the season with average roosting areas spanning <1 ha during the summer months.[26]	
Hoary Bat (Source: Burnside)	*Lasiurus cinereus*		S4	END	END	0	0	Roost within the foliage of trees and shrubs in both deciduous and coniferous trees in forests of any age class. Typical roost trees are large in diameter and are as tall or taller than the surrounding canopy. Roost sites tend to be along southern aspects and are sheltered from the wind.[26]	Moderate potential. May occur in association with the mixed swamp communities associated with structure 30-WG. Moderate potential to be supported within the treed riparian areas associated with structures 21-WG and 29-WG.
Little Brown Myotis (Source: Burnside)	*Myotis lucifugus*	All	S3	END	END	END	1	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).[11]	Moderate potential. May occur in association with the swamp and forest mixed swamp communities associated with structures 21-WG and 30-WG. Moderate potential to be supported within the treed riparian areas associated with structure 29-WG.
Northern Myotis (Source: Burnside)	*Myotis septentrionalis*	All	S3	END	END	END	1	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: Often associated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns, etc.)[11]	Moderate potential. May occur in association with the swamp and forest mixed swamp communities associated with structures 21-WG and 30-WG. Moderate potential to be supported within the

COMMON NAME **(Source)	SCIENTIFIC NAME		Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description[5]	Habitat Present on the Subject Lands and/or Adjacent Lands?
									treed riparian areas associated with structure 29-WG.
Silver-haired Bat (Source: Burnside)	*Lasionycteris noctivagans*	All	S4	END	END	0	0	Primarily roost under large sheets of exfoliating bark and within tree cavities. This species will typically roost within a variety of large diameter coniferous and deciduous roost trees. High-quality roost trees include trees with heart-rot infections at the site of limb breakages that have resulted in the creation of well-protected inner chambers. Members of this species, including lactating females, are well documented to roost switch. Silver-haired bats are also known to occasionally roost on or within buildings but only when treed habitats are scarce.[26]	Moderate potential. May occur in association with the mixed swamp communities associated with structure 30-WG. Moderate potential to be supported within the treed riparian areas associated with structures 21-WG and 29-WG.
Tri-colored Bat (Source: Burnside)	*Perimyotis subflavus*	All	S3?	END	END	END	1	Overwintering habitat: Deepest parts of caves and mines where temperature is the least variable. Maternal Roosts: Less is known about roosts of Tri-colored Bats. Most roost sites found within forested habitats. May roost in clumps of dead foliage and lichens. In more anthropogenically modified landscapes, maternity roosts may be barns or similar human-made structures.[11]	Moderate potential. May occur in association with the deciduous forest and swamp communities associated with structures 21-WG and 30-WG. Low potential to be supported within the treed riparian areas associated with structure 29-WG.

COMMON NAME **(Source)	SCIENTIFIC NAME		Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description[5]	Habitat Present on the Subject Lands and/or Adjacent Lands?
Plants									
Black Ash (Source: Burnside)	*Fraxinus nigra*	30-WG	S4	END	THR		0	Black Ash is a shade intolerant species. Occurs in riparian areas, floodplains, and wetlands including swamps and bogs.[10]	High potential. May be supported in association with the mixed swamp community adjacent to structure 30-WG. May also be present in association with the riparian habitats adjacent to structure 21-H+GW and 29-WG.
Butternut (Source: Burnside)	*Juglans cinerea*	All	S2?	END	END	END	1	Butternut grows best in rich, moist and well-drained soils or limestone gravel sites. They are less commonly found in dry, rocky and sterile soils. They generally grow alone or in small groups in deciduous forests that are commonly comprised of Basswood, Black Cherry, Beed, Black Walnut, Elm, Hemlock, Hickory, Oak, Red Maple, Sugar Maple, Poplar, White Ash and Yellow Birch.6 In Ontario, they can be found throughout the southern Ontario, south of the Canadian Shield.[10]	Low potential. May occur in upland habitats associated with all three structures.
Hill's Pondweed (Source: Oldham and Brinker, 20059)	*Potamogeton hillii*	None	S2S3	SC	SC	SC	1	Occurs within cold, clear, alkaline water of open wetlands, small slow-moving streams, ponds, and marshes.[12]	No potential. Suitable habitat absent.
Reptiles and Amphibians									
Midland Painted Turtle (Source: ORAA)	*Chrysemys picta marginata*	All	S4	No Status	SC	SC	1	Generally, prefers waterbodies such as ponds, marshes, lakes and slow-moving creeks that have a soft bottom and provide abundant basking sites and aquatic vegetation.[10]	High potential. May be supported within Irvine Creek at all three structures.
Snapping Turtle (Source: ORAA, NHIC)	*Chelydra serpentina*	All	S4	SC	SC	SC	1	Generally, inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or	High potential.

COMMON NAME **(Source)	SCIENTIFIC NAME		Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description[5]	Habitat Present on the Subject Lands and/or Adjacent Lands?
								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.[9]	May be supported within Irvine Creek at all three structures.
Western Chorus Frog (Source: ORAA)	*Pseudacris maculata*	30-WG	S4	No status	THR (Great Lakes - St Lawrence population in Canada)	THR (Great Lakes - St Lawrence population in Canada)	1	The Western Chorus Frog is primarily a lowland terrestrial species. In marshes or wooded wetland areas, it is found on the ground or in low shrubs and grass. Like all other frogs, the Western Chorus Frog requires both terrestrial and aquatic habitats in close proximity. For breeding and tadpole development, it requires seasonally dry temporary ponds devoid of predators, particularly fish. It is very rarely found in permanent ponds. In southern Ontario, its range is bounded by the United States border in the south, Georgian Bay in the northwest, and south of Algonquin Park and up the Ottawa River valley to the vicinity of Eganville in the east.[7, 8, 10]	Low potential. May occur in association with the Living Springs Wetland complex at Structure 30-WG.

1 Provincial S-Rank: S1 to S3 are provincially tracked (S1-critically imperiled; S2-imperiled; S3-vulnerable). Breeding (B) status qualifier: Conservation status refers only to the breeding population of the species in the province. Non-breeding (N) status qualifier: Conservation status refers only to the non-breeding population of the species in the province.

2 SARO: Official Species at Risk in Ontario list under the ESA, 2007. Status Coding – Endangered (END), Threatened (THR), Special Concern (SC)

3 COSEWIC: Committee on the Status of Endangered Wildlife in Canada

4 SARA and Schedule: Species at Risk Act; The Act establishes Schedule 1 as the official list of wildlife SAR

5 Cadman, M.D., et al. (eds). 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706 pp

6 Species at Risk Public Registry https://species-registry.canada.ca/

7 McCracken, J.D. et al. 2013. Recovery Strategy for the Bobolink (Dolichonyx oryzivorus) and Eastern Meadowlark (Sturnella magna) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario, viii + 88 pp.

8 SARO List Species Descriptions (Species at risk in Ontario | ontario.ca)

9 Ontario Nature Reptile and Amphibian Atlas (ON Reptile & Amphibian Atlas (ontarioinsects.org))

10 MNR SARO List Species Descriptions (http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/MNR_SAR_CSSR_SARO_LST_EN.html)

11 Humphrey, C. 2017. Recovery Strategy for the Eastern Small-footed Myotis (Myotis leibii) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. vii + 76 pp.

12 Oldham, M.J., and S.R. Brinker. 2009. Rare Vascular Plants of Ontario, Fourth Edition. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Peterborough, Ontario. 188 pp. Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide (SWHTG) & Appendices. 151 pp.

4.0 Existing Conditions

The following sections document the terrestrial and aquatic natural heritage features and functions at each structure.

4.1 Terrestrial Environment

A review of NHIC shows that bridge 30-WG is situated on the border of Evaluated Provincially Significant Wetland (PSW), Living Springs Wetland Complex. Structure 30-WG is also located within the Irvine Creek Life Science Regionally Significant Area of Natural and Scientific Interest. Bridges 21-WG and 29-WG do not occur in association with either the previously identified ANSI or mapped wetlands.

Based on a review of the OBBA, ORAA, and OIA, the following SAR (Endangered or Threatened) and Species of Conservation Concern (SCC) were identified as potentially being present on or adjacent to the subject lands (see Table 2) for all three bridges.

4.1.1 Terrestrial Natural Heritage Features at Each Structure

Bridge 21-WG

In total, five ELC communities are present within the Study Area associated with the structure. The natural heritage system adjacent to this structure consists of narrow bands of forested lands.

An active Cliff Swallow (*Petrochelidon pyrrhonota*) colony comprised of over 20 nests is present under the bridge deck. No other species of bird were observed nesting on the structure.

A summary of natural heritage conditions is provided in Table 3 and is illustrated on Figure 2.

Table 3: Summary of Conditions at Bridge 21-WG

ELC Code	ELC Description	Provincially Significant Wetlands/Other Wetlands	Woodlands	Candidate Significant Wildlife Habitat	Endangered and Threatened Species[1]
MEGM3-5 (CUM1)	Smooth Brome Graminoid Meadow Type	n/a	n/a	Monarch (SC)	No
FODM7 (FOD7)	Fresh – Moist Lowland Deciduous Forest Ecosite	n/a	Yes	Bat Maternity Colonies Bald Eagle & Osprey Nesting, Foraging & Perching Habitat Eastern Wood-pewee (SC) Wood Thrush (SC)	Eastern Red Bat (END) Hoary Bat (END) Northern Myotis (END) Little Brown Myotis (END) Silver-haired Bat (END) Tri-colored Bat (END) Butternut (END)
OAG	Agricultural	n/a	n/a	No	No
TAGM5	Fencerow	n/a	n/a	No	Eastern Red Bat (END) Hoary Bat (END) Northern Myotis (END) Little Brown Myotis (END) Silver-haired Bat (END) Tri-colored Bat (END)
OAO	Open Water	n/a	n/a	Waterfowl Stopover & Staging Areas (Aquatic)	No

[1] SARO: Official Species at Risk in Ontario list under the ESA, 2007. Status Coding – Endangered (END), Threatened (THR), Special Concern (SC)

Bridge 29-WG

The natural heritage system adjacent to this structure is narrow, with hedgerows of trees or shrubs and meadows separating the watercourse from the agricultural lands and rural residential areas.

In total, eight ELC communities occur in association with this structure. No birds were noted to be breeding on this structure.

A summary of natural heritage conditions is provided in Table 4 and is illustrated on Figure 3.

Table 4: Bridge 29-WG

ELC Code	ELC Description	Provincially Significant Wetlands/Other Wetlands	Woodlands	Candidate Significant Wildlife Habitat	Endangered and Threatened Species
MEMM4 (CUM1)	Fresh - Moist Mixed Meadow Ecosite	No	No	Monarch (SC)	No
THDM3-2	Native Shrub Deciduous Hedgerow Thicket Type	No	No	Monarch (SC)	No
TAGM5a	Fencerow	No	No	Monarch (SC)	Eastern Red Bat (END) Hoary Bat (END) Northern Myotis (END) Little Brown Myotis (END) Silver-haired Bat (END) Tri-colored Bat (END)
TAGM5b	Fencerow	No	No	No	No
OAG	Agricultural	No	No	No	No
CVR	Residential	No	No	No	No
ME	Meadow	No	No	No	No
OAO	Open Water	No	No	Waterfowl Stopover & Staging Areas (Aquatic)	No

Bridge 30-WG

This structure is located within the Living Springs Wetland Complex provincially-significant wetland complies. Southeast of the structure, a mature coniferous swamp is present, while a deciduous swamp is located to the northwest, well beyond the existing structure. Deciduous woodlands and meadows are located immediately adjacent to the structure to the northeast, northwest, and southwest of the structure.

Wetland boundary delineation was completed at this structure with the GRCA. Due to issues with cell service, the wetland boundary west of the bridge 30-WG is not 100% accurate and should be considered approximate. It should also be noted that the mapped wetland boundary span >0.5 ha. The wetland boundary east of the structure is accurate.

A summary of natural heritage conditions is provided in Table 5 and is illustrated on Figure 4.

Table 5: Bridge 30-WG

ELC Code	ELC Description	Provincially Significant Wetlands/Other Wetlands	Woodlands	Candidate Significant Wildlife Habitat	Endangered and Threatened Species
MEGM3 (CUM1)	Dry - Fresh Graminoid Meadow Ecosite	No	No	Raptor Wintering Area Monarch (SC)	No
WODM4-1 (CUW1)	Hawthorn / Apple Deciduous Woodland Type	No	No	Raptor Wintering Area	No
FOCM4-1	Fresh-Moist White Cedar Coniferous Forest Ecosite	No	Yes	Raptor Wintering Area Bald Eagle & Osprey Nesting, Foraging & Perching Habitat	Hoary Bat (END) Northern Myotis (END) Little Brown Myotis (END) Silver-haired Bat (END)
FOCM6	Naturalized Coniferous Plantation	No	Yes	Raptor Wintering Area Deer Yarding Areas Deer Winter Congregation Areas Bald Eagle & Osprey Nesting, Foraging & Perching Habitat Deer Movement Corridors Eastern Wood-pewee Wood Thrush	Hoary Bat (END) Northern Myotis (END) Little Brown Myotis (END) Silver-haired Bat (END)
TAGM1	Plantation	No	No	No	Silver-haired Bat (END) Hoary Bat (END)
TAGM5	fencerow	No	No	No	Silver-haired Bat (END) Hoary Bat (END)
MAM	Meadow Marsh	Yes	No	Marsh Breeding Bird Habitat Terrestrial Crayfish	

ELC Code	ELC Description	Provincially Significant Wetlands/Other Wetlands	Woodlands	Candidate Significant Wildlife Habitat	Endangered and Threatened Species
SWCM1-2	White Cedar – Conifer Mineral Coniferous Swamp Type	Yes	Yes	Amphibian Breeding Habitat (Woodland) Deer Yarding Areas Deer Winter Congregation Areas Bald Eagle & Osprey Nesting, Foraging & Perching Habitat Terrestrial Crayfish Deer Movement Corridors Eastern Wood-pewee Wood Thrush	Hoary Bat (END) Northern Myotis (END) Little Brown Myotis (END) Silver-haired Bat (END) Black Ash (END)
SWDM4 (SWD4)	Mineral Deciduous swamp ecosite	Yes	Yes	Bat Maternity Colonies Bald Eagle & Osprey Nesting, Foraging & Perching Habitat Seeps and Springs Amphibian Breeding Habitat (Woodland) Canada Warbler (SC) Eastern Wood-pewee (SC) Wood Thrush (SC) Terrestrial Crayfish Deer Movement Corridors	Eastern Red Bat (END) Hoary Bat (END) Northern Myotis (END) Little Brown Myotis (END) Silver-haired Bat (END) Tri-colored Bat (END) Black Ash (END)
OAO	Open Water			Waterfowl Stopover & Staging Areas (Aquatic) Snapping Turtle (SC) - Confirmed	No

Incidental Wildlife (all bridges)

Table 6 provides a list of the incidental wildlife recorded during ecologist site visits.

Table 6: Incidental Wildlife Observations

Common Name	Scientific Name	SRank	ESA	Structure	Comments
American Redstart	*Setophaga ruticilla*	S5B		29-WG	
American Robin	*Turdus migratorius*	S5		21-WG 29-WG 30-WG	
American Crow	*Corvus brachyrhynchos*	S5		30-WG	
American Goldfinch	*Spinus tristis*	S5		30-WG	
Baltimore Oriole	*Icterus galbula*	S4B		30-WG	
Barn Swallow	*Hirundo rustica*	S4B	SC	29-WG	Flyover, not nesting on the structure.
Black-and-White Warbler	*Mniotilta varia*	S5B		30-WG	
Black-throated Green Warbler	*Setophaga virens*	S5B		30-WG	
Black-capped Chickadee	*Poecile atricapillus*	S5		30-WG	
Blue Jay	*Thryothorus ludovicianus*	S4		30-WG	
Brown-headed Cowbird	*Molothrus ater*	S5		30-WG	
Carolina Wren	*Thryothorus ludovicianus*	S4		29-WG 30-WG	
Cedar Waxwing	*Bombycilla cedrorum*	S5		21-WG 29-WG 30-WG	
Chipping Sparrow	*Spizella passerina*	S5B,S3N		30-WG	
Cliff Swallow	*Petrochelidon pyrrhonota*	S4S5B		21-WG	
Common Yellowthroat	*Geothlypis trichas*	S5B,S3N		30-WG	
Eastern Kingbird	*Tyrannus tyrannus*	S4B		21-WG 29-WG	

Common Name	Scientific Name	SRank	ESA	Structure	Comments
Eastern Phoebe	*Sayornis phoebe*	S5B		30-WG	
Grackle	*Quiscalus quiscula*	S5		21-WG	
Great Egret	*Ardea alba*			30-WG	Foraging
Great Crested Flycatcher	*Myiarchus crinitus*	S5B		30-WG	
Hermit Thrush	*Catharus guttatus*	S5B,S4N		30-WG	
House Wren	*Troglodytes aedon*	S5B		30-WG	
Indigo Bunting	*Passerina cyanea*	S5B		21-WG	
Mourning Dove	*Geothlypis philadelphia*	S5B		29-WG	
Mourning Warbler	*Geothlypis philadelphia*	S5B		30-WG	
Northern Cardinal	*Cardinalis cardinalis*	S5		30-WG	
Red-bellied Woodpecker	*Melanerpes carolinus*	S5		30-WG	
Red-winged Blackbird	*Agelaius phoeniceus*	S5		21-WG 29-WG 30-WG	
Song Sparrow	*Melospiza melodia*	S5		29-WG 30-WG	
Warbling Vireo	*Vireo gilvus*	S5B		29-WG	
Willow Flycatcher	*Empidonax traillii*	S4B		30-WG	
Yellow Warbler	*Setophaga petechia*	S5B		29-WG 30-WG	
Green Frog	*Rana clamitans*	S5		29-WG	
Snapping Turtle	*Chelydra serpentina*	S4		30-WG	

Provincial S-Rank: S1 to S3 are provincially tracked (S1-critically imperiled; S2-imperiled; S3-vulnerable), S4 and S5 ranked species are considered to be secure in the province. Breeding (B) status qualifier: Conservation status refers only to the breeding population of the species in the province. Non-breeding (N) status qualifier: Conservation status refers only to the non-breeding population of the species in the province.

4.2 Aquatic Habitat Conditions

A review of the MNRF's ARA data shows that all three structures are located along Irvine Creek a main tributary of the Grand River. The reach of Irvine Creek associated with structures 21-WG and 29-WG possess a cold thermal regime. The reach of Irvine Creek associated with structure 30-WG is classified as having a warm thermal regime before transitioning to a cold thermal regime south of Sideroad 15. Based on Burnside's review, these reaches of Irvine Creek share a common spring and fall-spawning fish community (Table 7), which would restrict in-water works from October 1 - July 14 of any year.

Table 7: Summary of Fish Species Historically Found within Irvine Creek

Species Name	Scientific Name	Thermal Regime
Blacknose Dace	*Rhinichthys atratulus*	Cool
Bluntnose Minnow	*Pimephales notatus*	Warm
Brassy Minnow	*Hybognathus hankinsoni*	Cool
Brook Silverside	*Labidesthes sicculus*	Warm
Brook Stickleback	*Culaea inconstans*	Cool
Brook Trout	*Salvelinus fontinalis*	Cold
Carps and Minnows		
Central Mudminnow	*Umbra limi*	Cool
Central Stoneroller	*Campostoma anomalum*	Cool
Common Shiner	*Luxilus cornutus*	Cool
Creek Chub	*Semotilus atromaculatus*	Cool
Fantail Darter	*Etheostoma flabellare*	Cool
Hornyhead Chub	*Nocomis biguttatus*	Cool
Iowa Darter	*Etheostoma exile*	Cool
Johnny Darter	*Etheostoma nigrum*	Cool
Least Darter	*Etheostoma microperca*	Warm
Longnose Dace	*Rhinichthys cataractae*	Cool
Mottled Sculpin	*Cottus bairdii*	Cool
Northern Pearl Dace	*Margariscus nachtriebi*	Cool
Rainbow Darter	*Etheostoma caeruleum*	Cool
River Chub	*Nocomis micropogon*	Cool
Rock Bass	*Ambloplites rupestris*	Cool
Rosyface Shiner	*Notropis rubellus*	Warm
White Sucker	*Catostomus commersonii*	Cool

The area is considered occupied habitat for Redside Dace, as identified in DFO's Species at Risk (SAR) mapping. Specifically, the area surrounding structure 30-WG is classified by DFO as Redside Dace habitat. Any in- or near-water works (e.g., road widening, structure rehabilitation, vegetation removal) within the regulated habitat for Redside Dace (defined as the meander belt plus 30 m) will require approval under Ontario's *Endangered Species Act* (ESA) and the federal *Species at Risk Act* (SARA), in accordance with standard *Fisheries Act* requirements.

In 2022, Burnside conducted physical fish community surveys approximately 3.3 km downstream of 30-WG (effectively at the same location as 16-WG) but did not capture Redside Dace.

However, in 2019, AECOM (2020) carried out a broader survey using environmental DNA (eDNA), a molecular detection method, conducted alongside physical sampling. Through eDNA analysis, Redside Dace were detected near 21-WG, 29-WG, and approximately 3.3 km downstream of 30-WG, the same site where Burnside's physical survey at 16-WG found no detections. However, consistent with Burnside's findings, AECOM also did not physically capture any Redside Dace during their field program.

4.2.1 Aquatic Natural Heritage Features at Each Structure

Burnside's aquatic ecologist visited the three structures on June 23, 2025, to characterize the existing aquatic features. Weather conditions were sunny with air temperatures averaged around 30°C. Summarized channel dimensions (i.e., information pertaining to morphology, wetted width/depth, substrate etc.) are available in Table 8.

Table 8: Existing Aquatic Habitat Conditions

Structure	Watercourse Names	Morphology	Wetted Width / Depth Upstream (m)	Wetted Width / Depth Downstream (m)	Upstream Dominate Substrates (%)	Downstream Dominate Substrates (%)	Fish Observed	Evidence of Groundwater Upwelling
21-WG	Irvine Creek	Flat	18.2/0.5	-	Cobble (70)	-	Y	N
			-	14.2/0.7	-	Gravel (40)	Y	N
29-WG		Flat	19.5/0.6	-	Cobble (80)	-	Y	N
			-	24.1/0.6	-	Cobble (50)	Y	N
30-WG		Pool	15.0/0.5	-	Sand/Mud (70)	-	Y	N
		Flat	-	14.3/0.4	-	Cobbles (40)	Y	N

Aquatic Natural Features at Each Structure

21-WG

Upstream

The upstream reach flowed north to south along a naturalized corridor surrounded by an agriculturally dominated landscape. Taller riparian trees on the east bank provided limited shading (<30% cover). Both riverbanks were heavily vegetated and generally stable. However, slight undercuts are common, and a large area of erosion has occurred along the west and east banks due to the ditches feeding into the watercourse.

The watercourse was characterized as a flat (18.2 m wide, 0.5 m deep) and appeared nearly uniform in width and depth throughout the observed area.

The dominant substrate was cobble (70% cover), with some sand and gravel interspaced. Scattered boulders were occasionally observed (<5% cover). Beyond rocks, there was little instream habitat complexity. Some instream woody debris (<5% cover) and emergent arrowhead vegetation (<5% cover) were observed along the sides of the riverbanks. Numerous small minnow species were observed throughout the area.

Downstream

The watercourse continues to flow north to south. The surrounding riparian habitat was similar to that observed upstream. However, the downstream reach was noticeably more exposed to sunlight (<10% cover), as there were fewer large trees and mostly overhanging grasses.

The morphological conditions were also characterized by a flat, although slightly wider and deeper than the upstream reach (19.5 m wide, 0.6 m deep). Banks were largely stable and lacked the downcutting from ditches. The substrate was more heterogeneous than upstream, with gravel (40% cover) and sand (30% cover) common near the riverbanks. At the same time, in the central channel, cobbles dominated (30% cover). Instream vegetation was limited to small patches of emergent arrowheads (<5% cover), and larger woody debris complexes were observed along the eastern shore, more than were observed upstream.

Habitat Improvement

Sources of pollution include agricultural lands (e.g., agricultural pesticides and fertilizers) and the roadway (i.e., gravel road source of fine sediments and salts).

29-WG

Upstream

The upstream reach flowed east to west, surrounded by a narrow line of riparian trees on the south bank with a grass-dominated north bank. Despite the vegetation, the watercourse was largely exposed to sunlight, with ~30% covered by overhanging trees. The vegetation helped to protect the banks, as there was minimal erosion. Some undercutting was observed along the north bank from natural processes and increased flows. The morphological condition was a flat (19.5 m wide, 0.6 m deep) with a substrate dominated by cobbles (80% cover) interspaced with gravel (10% cover) and a few small boulders (10% cover). Small patches of emergent macrophytes like arrowhead and grasses (5% cover) and submerged vegetation, likely Elodea spp. (5% cover), were observed within 2 m of either bank. Some large woody material (5% cover) were scattered across the width of the watercourse. Numerous small minnow species were observed throughout the area.

Downstream

The downstream reach was totally exposed, with no large trees within the 30 m observed. The banks were well-vegetated with grasses and riparian shrubs, and as a result, no major signs of erosion were observed. The morphological condition remained a flat, nearly unchanged from the upstream, except for widening (24.1 m wide, 0.6 m deep). The substrate was still dominated by cobbles (~50% cover), but there was noticeably more gravel and sand mixture (30% cover) and boulders (10% cover) than in the upstream reach. In-water vegetation was common, though not dense, within the first 2 m of the riverbanks, comprised exclusively of emergent arrowheads and grasses (10% cover). Some scattered instream woody debris (5% cover) provided additional habitat complexity.

Habitat Improvement

The immediate area was largely undeveloped, except for the roadway (i.e., gravel road source of fine sediments and salts).

30-WG

Upstream

The upstream section flowed west to east and was entirely exposed with no large riparian trees present or high grasses providing no observable cover. The banks were stable except for the minimal erosion observed at the structure's base in the form of undercutting. The morphological condition was a pool (15.0 m wide, 0.5 m deep). The substrates were fine, with mud and sand (70%) dominating, with scattered cobbles and boulders comprising the rest. Instream emergent grasses and arrowheads (30% cover) and submerged *Elodea* spp. (10%) were common. No instream woody debris was observed. Numerous small minnow species were observed throughout the area.

Downstream

The downstream reach continued to flow west to east and was exposed like the upstream section. The banks were well vegetated with high grasses and showed no signs of erosion. The morphological conditions transitioned into a flat (14.3 m wide, 0.4 m deep) and was somewhat channelized with a uniform width and depth. The substrate was heterogeneous, with cobbles (40% cover), gravel (30%), sand (20%), and a few boulders (10% cover) around the structure. There was little instream habitat complexity from woody debris (<5% cover) and emergent vegetation (<5% cover).

Habitat Improvement

The immediate area was largely undeveloped, except for the roadway (i.e., gravel road source of fine sediments and salts).

5.0 Impacts, Mitigation and Monitoring Guidelines

Impacts, mitigation measures and monitoring must be considered when selecting the preferred alternative. Table 9 provides a summary of impacts that are anticipated with bridge replacement, removal or rehabilitation (depending on extent of impact area and workzone), with guidelines for the mitigation measures and monitoring.

Table 9: Summary of Impacts, Mitigation and Monitoring for Natural Features

Feature	Description of Potential Effects	Mitigation Measures	Monitoring Activities
Effects on Ecological Features and Functions			
Wildlife (General)	Temporary displacement and disturbance to wildlife and habitat during the construction phase. May include SAR and Species of Special Concern.	The footprint of the proposed disturbed area shall be minimized as much as possible. In the event an animal is encountered during construction and does not move from the construction zone, the Contract Administrator should be notified. If the construction activities are such that continuing construction in the area would result in harm to wildlife, construction activities in that location should temporarily stop and the MNRF or MECP can be contacted for direction. If temporary perimeter exclusion fencing is used at a location, it should be installed to allow wildlife to leave the fenced area during vegetation clearing. Once the work area has been cleared, it can be securely fenced to prevent wildlife from returning. The excluded area should be searched immediately following fencing installation for any wildlife (including SAR) that may have become trapped. Any wildlife should be safely relocated or permitted to escape, to a suitable habitat. All works should stop immediately and MECP should be contacted if SAR is encountered within the area to ensure compliance with the ESA. Avoid vegetation clearing during sensitive times of the year for local wildlife, such as spring and early summer (during breeding and migration seasons). The new structure will allow for wildlife passage below the structure if feasible. Fencing to delineate the work zone will prevent encroachment into adjacent habitat supporting SAR and Species of Special Concern.	The Contractor will conduct regular monitoring of the erosion and sediment control measures to ensure they are acting as intended and are containing the work area.
Migratory Breeding Birds	Disturbance or destruction of migratory breeding bird nests / habitat may occur during construction phase (vegetation clearing)	To reduce the risk of contravening the federal Migratory Bird Convention Act, 1994 (MBCA), timing constraints shall be applied to avoid any limited vegetation clearing (including grubbing) and/or structure works (construction) during the active window for breeding birds, broadly from April 1 to August 31 for most species. Active nests (nests with eggs or young birds) of protected migratory birds, including SAR protected under the ESA, cannot be destroyed at any time of the year. If a nesting migratory bird (or SAR protected under ESA) is identified within or adjacent to the construction site (or during operations and maintenance activities) and the activities are such that continuing works in that area would result in a contravention of the MBCA or ESA, all activities should stop and the Contract Administrator (with assistance from an Avian Biologist) should discuss mitigation measures with the Town. If	If construction works occur during the active window for breeding birds, an Environmental Inspector should monitor the tarped or netted structure every two to three days to ensure that no bird nests are established on the bridge (some species such as Barn Swallow or Eastern Phoebe have been reported to attempt nesting on the exterior of the tarp material used for exclusion). Cliff Swallow nests should be removed from bridge 21-WG prior to the core breeding bird window.

Feature	Description of Potential Effects	Mitigation Measures	Monitoring Activities
		SAR are identified, all activities should stop and MECP should be contacted to ensure compliance with the ESA. The Contract Administrator can instruct the Contractor on how to proceed based on the mitigation measures established through discussions with the Township, the MECP and/or Environment Canada. To avoid contravention of the MBCA and/or ESA, the bridge structure should be completely excluded with tarping or netting material prior to the next active window for breeding birds (i.e., by end of March) if construction works are to occur during the active window for breeding birds (as noted above). Tarping or netting of the bridge ensures that breeding birds are excluded from nesting on or under the structure while the bridge is being replaced.	
SAR bat maternity-roosting habitat	Tree removals could impact wildlife	Trees that are identified as candidate bat maternal roosting habitat must be taken down outside the active bat window (active window is March 31 to October 1).	Further review is required to confirm the extent of impacts and whether surveys are required to determine absence or presence of SAR bats.
Trees	Loss of woody vegetation and creation of new forest edges causing new growing conditions such as sun exposure and weed invasion.	A tree inventory will be completed during the detailed design to characterize and confirm required removals. Impacts will be minimized to remaining trees by implementing measures such as tree protection or ESC fencing to protect trees from grading impacts near adjacent construction. ESC measures and other specified protection measures must be installed prior to commencement of any construction or vegetation disturbance. No access, storage or stockpile of materials or equipment should occur within the area protected by the ESC and other protection measures. A replanting plan may be required to compensate for tree loss.	An Environmental Inspector should be engaged during the construction phase to review ESC and other protection measures for deficiencies. Monitoring of mitigation / compensation plantings will be associated with plant warranty inspections.
Vegetation	Temporary disturbance of meadow, swamp, hedgerow, marsh, forest and plantation vegetation may be required for access and construction.	Tree protection fence and ESC measures will delineate the areas of access and construction to reduce impacts extending unnecessarily into adjacent lands. Seeding of native grasses and wildflowers may be required to revegetate the disturbed areas that will be illustrated in replanting plan.	An Environmental Inspector should be engaged during the construction phase to review ESC and other protection measures for deficiencies. Monitoring of mitigation / compensation plantings will be associated with plant warranty inspections.
Fish and Fish Habitat	In-water works may be required, and the proposed works could potentially result in HADD to fish habitat, and the death of fish by means other than fishing.	A qualified professional aquatic ecologist will submit a Request for Review to DFO for any bridge replacements or removals requiring in-water works. It is anticipated that a Letter of Advice will be obtained for the project based on the footprints of the structures and fish community present. During Detailed Design, correspondence shall be maintained with a qualified professional aquatic ecologist to determine appropriate mitigation measures and whether the proposal has potential to pose HADD to fish habitat and/or if the proposal has the potential to kill fish. Preferred mitigation measures include workzone isolation while maintaining flow downstream and fish salvage from the isolated	ESC monitoring during construction. Fish salvage prior to the commencement of any in-water works. Spill management plan to be created and measures to contain potential spills are to be on-site throughout construction.

Feature	Description of Potential Effects	Mitigation Measures	Monitoring Activities
		work area. Efforts will be made in consultation with the DFO to mitigate should HADD to fish habitat occur. A fish salvage must occur under a License to Collect Fish for a Scientific Purpose obtained from the MNRF. Near-water work and work below the annual high-water mark will adhere to the appropriate in-water work timing window to avoid potential impacts to resident and migratory fish species.	
Redside Dace (END) – Structure WG-30	In-water works may be required, and proposed works could potentially result in alteration to occupied Redside Dace habitat at Structure WG-30.	Approvals under the ESA, Fisheries Act, and SARA will need to be obtained and site specific mitigation measures developed during detailed design.	Monitoring for physical presence of Redside Dace will occur during fish salvage works and document their presence if encountered for ESA/SARA requirements.
Groundwater	Potential for localized groundwater quality impacts as a result of spills. Temporary dewatering in the work area.	Refueling of equipment and fuel storage shall be conducted in designated areas, at least 30 m away from the watercourses and any existing wells, with spill protection provided. The work area shall be dewatered as per recognized provincial standards and pumped into acceptable dewatering traps. These dewatering traps will be placed away from the watercourse to allow for infiltration prior to discharging to the watercourse.	ESC monitoring throughout construction. Spill management plan to be created and measures to contain potential spills are to be on-site throughout construction.
Surface Water / Hydrology / Stormwater	Potential for sediments to enter the water course due to stockpiling, excavation, and construction. Potential for localized water quality impacts in the case of spills. Potential for invasive species to enter the environment	The footprint of the disturbed area shall be minimized as much as possible, for example, vegetated buffers/setbacks will remain untouched adjacent to the watercourse, wherever possible. An ESC Plan shall be developed during the detailed design phase of the project, prior to construction. Implementation of the erosion and sediment control measures shall conform to recognized standard specifications, such as Ontario Provincial Standards Specification (OPSS), and the requirements of the GRCA. A permit from the GRCA under the Prohibited Activities, Exemptions and Permits Regulation (Ontario Regulation 41/24) will be required prior to conducting the proposed works as work is proposed within a flood Regulated Area. In-water operation of heavy equipment shall be prevented, as well as minimizing the operation of any equipment on the banks of the watercourse. Stockpiled material will be stored and stabilized a minimum of 30 m from the watercourse. All materials and equipment used for the purpose of site preparation and project completion will be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering the water. ESC measures (silt curtains, silt fence, rock check dams, etc.) shall be installed and maintained during the work phase, until the site has been stabilized. ESC measures will	Monitoring of surface water quality will be completed along with regular ESC monitoring as outlined above. Spill management plan to be created and measures to contain potential spills are to be on-site throughout construction.

Feature	Description of Potential Effects	Mitigation Measures	Monitoring Activities
		be inspected daily to ensure they are functioning and maintained as required. If ESC measures are not functioning properly, no further work will occur until the problem is resolved. Temporary mitigation measures shall be installed prior to the commencement of any clearing, grubbing, excavation, filling, or grading works and must be maintained on a regular basis, prior to, and after precipitation events. Water quality impacts related to surface water runoff shall be mitigated to avoid downstream impacts by controlling surface water run off within the boundaries of the site. All disturbed areas of the work site shall be stabilized immediately and revegetated as soon as conditions allow. All equipment fueling and maintenance shall be done at least 30 m from the watercourse to ensure that no deleterious substances enter the waterway. The Contractor shall be required to develop Spill Prevention and Contingency Plans for construction and operational phases of the project. Personnel will be trained in how to apply the Plans, and the Plans will be reviewed to strengthen their effectiveness and ensure continuous improvement. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. A hydrocarbon spill response kit will be on site at all times during the work. Spills will be reported to the Ontario Spills Action Center at 1-800-268-6060. All equipment and personal protective equipment must arrive on-site clean to prevent the potential transfer of invasive species (i.e., phragmites) to the local environment.	

6.0 Future Commitments

The following future commitments are recommended to be addressed following the selection of the preferred alternative, as detailed design is being carried out. Many of these commitments have been provided by Six Nations of the Grand River Elected Council from a previous, similar project and are applicable here.

- The wetland limits determined with GRCA for Bridge 30-WG should be avoided for temporary construction work (access or laydown), or permanent impacts (grading or structures).
- A review of preliminary grading areas of each site for SAR wildlife habitats such as bat roost trees and snake hibernacula should be completed.
- Agency permits, licenses and approvals should be determined that are required to carry out the work, including a GRCA permit to do work in regulated areas, Letter of Advice from the Department of Fisheries and Oceans, License to Collect Fish for a Scientific Purpose from the Ministry of Natural Resources and a Permit from Wellington County to remove trees under By-Law 5515-09.
- A tree inventory will be completed to determine and characterize required removals. The Six Nations of the Grand River Elected Council (SNGREC)'s list of plant species of interest and importance shall be reviewed to identify if vegetation proposed for removal is of interest to the SNGREC. Impacts to trees shall be minimized by implementing a tree protection plan in areas adjacent to construction or grading.
- If any Provincial SAR are identified during the tree inventory and/or associated detailed design studies, potential impacts will be mitigated to the extent possible and the MECP will be consulted with as needed to determine next steps and permitting requirements.
- A Request for Project Review to DFO and an Information Gathering Form (IGF) is required to be submitted to MECP to begin the permitting process under the ESA, Fisheries Act. The Submissions will include an aquatic habitat assessment memo, respective forms, site photos, and design drawings. Site specific mitigation measures will be developed during detailed design for Redside Dace avoidance measures.
- Plant species loss should be minimized where possible, and a re-vegetation plan using native species and seed mix should be created. A re-planting ratio of ten replanted trees per one removed tree shall be used for quantifying replacements, as per the request of the Six Nations of the Grand River Elected Council (SNGREC). Re-planting should be completed on-site to the extent possible. Where the required re-planting quantities are unable to be achieved within the Township right-of-way, the preference is for the Township to strive to reach an agreement with the immediately adjacent landowners to allow for replanting on-site, beyond the Township right-of-way. If on-site planting is not achievable, off-site plantings to reach the desired ratios are acceptable to the SNGREC.

- Plant species identified for replanting shall be selected from the SNGREC's list of species of Interest / Importance which are suitable for the proposed planting locations. The Kayanase Greenhouse is available for consultation regarding replanting initiatives during detailed design.
- Although not anticipated, any impacted wetland communities should be restored post-construction to ensure no net loss of wetlands.
- Near-bank cover plantings along the watercourse shall be included in the re-planting landscaping plan where possible, while considering the required offset of plantings from structures.
- Detailed Hydrologic and hydraulic modelling shall be completed to verify compliance of the proposed works with GRCA policies 8.1.15-8.1.16. The GRCA shall be consulted early in the detailed design stage to determine the scope of work for this exercise.
- An Erosion and Sediment Control (ESC) Plan shall be developed during the detailed design phase of the project in consultation with the GRCA and will conform to industry best management practices and recognized standard specifications such as Ontario Provincial Standards Specification (OPSS).
- Further investigations should be undertaken to ensure the proposed alternatives will not impact potential erosion hazards that may be present due to riverine slopes and/or the meander belt of the creek. The requirement for engineering assessments such as geotechnical or fluvial geomorphology should be confirmed with the GRCA at the detailed design stage.
- The geometry and alignment of structures should be reviewed during the detailed design stage.
- All bridge and SWM-related components of the projected shall be designed with consideration for increased precipitation due to Climate Change.
- Where erosion protection, channel regrading / stabilization or earth retaining structures are determined to be required, the use of "softer" means of protection shall be preferred over the use of hard surfaces unless it is unfeasible to do so.
- All Indigenous communities previously engaged shall be contacted, if there are any substantial changes to the project / process or if the Owner applies for subsequent permits from the Ministry (MECP) that may be of interest or concern to communities.
- The required erosion and sediment control measures shall be determined during detailed design to limit sediment migration and protect receiving watercourses. All disturbed areas of the construction site shall be stabilized and re-vegetated as soon as conditions allow.

7.0 References

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Figures

Bridge

Ecological Land Classification

Study Area

ELC Descriptions
OAG: Open Agriculture
FODM7: Fresh - Moist Lowland Deciduous Forest
MEGM3-5: Smooth Brome Graminoid Meadow
OAO: Open Aquatic
TAGM5: Fencerow

Sources:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.

Disclaimer:

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This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.

Datum: North American 1983 CSRS	
Coord. System: NAD 1983 CSRS UTM Zone 17N	
Projection: Transverse Mercator	
Central Meridian: 81°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
Page Orientation: 0°	Scale Factor: 0.99960

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Grid North

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Metres

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Client
TOWNSHIP OF CENTRE WELLINGTON

Figure Title
CENTRE WELLINGTON MCEA FOR 3 BRIDGES
ECOLOGICAL LAND CLASSIFICATION
21-WG

Drawn	Checked	Date	Figure No.
HN	SY	2025/08/29	2
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Bridge

Ecological Land Classification

Ecological Land Classification - Inclusion

Study Area

ELC Descriptions

CVR: Residential
ME: Meadow
MEMM3: Dry - Fresh Mixed Meadow
MEMM4: Fresh - Moist Mixed Meadow
OAG: Open Agriculture
OAO: Open Aquatic
SAS_1: Submerged Shallow Aquatic
SWTM2: Dogwood Mineral Deciduous Thicket Swamp
TAGM5: Fencerow
THDM3-2: Native Shrub Deciduous Hedgerow Thicket

Sources:

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Client

TOWNSHIP OF CENTRE WELLINGTON

Figure Title

CENTRE WELLINGTON MCEA FOR 3 BRIDGES

ECOLOGICAL LAND CLASSIFICATION 29-WG

Drawn	Checked	Date	Figure No.
HN	SY	2025/08/29	3
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Bridge

Wetland

Ecological Land Classification

Ecological Land Classification - Inclusion

Study Area

ELC Descriptions

FOCM4-1: Fresh - Moist White Cedar Coniferous Forest
FOCM6: Naturalized Coniferous Plantation
MAM: Meadow Marsh
ME: Meadow
MEGM3: Dry - Fresh Graminoid Meadow
OAO: Open Aquatic
SWCM1-2: White Cedar - Conifer Mineral Coniferous Swamp
SWDM4: Mineral Deciduous Swamp
SWTM2-1: Red-osier Dogwood Mineral Deciduous Thicket Swamp
TAGM1: Coniferous Plantation
TAGM5: Fencerow
WODM4-1: Hawthorn / Apple Deciduous Woodland

Sources:

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False Easting: 500,000m	False Northing: 0m
Page Orientation: 0°	Scale Factor: 0.99960

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Grid North

0 20 40 60 80

Metres

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Client

TOWNSHIP OF CENTRE WELLINGTON

Figure Title

CENTRE WELLINGTON MCEA FOR 3 BRIDGES

ECOLOGICAL LAND CLASSIFICATION 30-WG

Drawn	Checked	Date	Figure No.
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Appendix A

Environmental Land Classification Table

ELC Code 2008 (1998)	ELC Name	Description	Photo
Bridge 21-WG			
MEGM3-5 (CUM1)	Smooth Brome Graminoid Meadow Type	This community is present on the north side of bridge 21-WG. This community lacks and distinct canopy, subcanopy, or understory. Young willows and Basswood regeneration occurs rarely within this community. The groundcover is graminoid dominant and is comprised primarily of Smooth Brome (*Bromus inermis*) with lesser associates of Reed Canary Grass (*Phalaris arundinacea*), Quackgrass (*Elymus repens*), and Goldenrod (*Solidago spp.*)	 

ELC Code 2008 (1998)	ELC Name	Description	Photo
FODM7 (FOD7)	Fresh – Moist Lowland Deciduous Forest Ecosite	This community is present on the north and south sides of Bridge 21-WG, immediately abutting Irvine Creek. This community slopes steeply towards the watercourse. Standing Ash snags occur occasionally, and edge effects are prominent. The canopy layer of this community consists of White Willow (*Salix alba*), Basswood (*Tilia americana*), and White Cedar (*Thuja occidentalis*). The subcanopy is poorly defined and is dominated by White Cedar with lesser associates of Manitoba Maple (*Acer negundo*), and Basswood. The understory is dense and is comprised of regenerating Manitoba Maple, Alternate-leaved Dogwood (*Cornus alternifolia*), Hawthorn (*Crataegus spp.*) and Black Raspberry (*Rubus occidentalis*). Dominant groundcover species include Dame's Rocket (*Hesperis matronalis*), Garlic Mustard (*Alliaria petiolata*), Yellow Avens (*Geum aleppicum*), Ostrich Fern (*Matteuccia struthiopteris var. pensylvanica*), and Purple Meadow Rue (*Thalictrum dasycarpum*).	
OAG	Agricultural	This community is present north and south of Bridge 21-WG. This community is comprised of row crops.	
TAGM5	Fencerow	This community is present along the ROW of 1st Line. This community consists of Sugar Maples and common meadow species.	

ELC Code 2008 (1998)	ELC Name	Description	Photo
OAO	Open Water	This community occurs in association with Irvine Creek. Submerged and emergent aquatic macrophytes are present within this community along the banks of Irvine Creek but do not exceed 25% cover. Species present include Softstem Bulrush (*Schoenoplectus tabernaemontani*), Coontail (*Ceratophyllum demersum*), *Potomogeton spp.*, and Arrowhead (*Sagittaria latifolia*).	

ELC Code 2008 (1998)	ELC Name	Description	Photo
Bridge 29-WG			
MEMM4 (CUM1)	Fresh - Moist Mixed Meadow Ecosite	This community is present northeast of the structure and is dominated by Smooth Brome with lesser associates of Goldenrod and other common species such as Bull Thistle and Sneezeweed. Facultative wetland species such as Tall Meadow Rue (*Thalictrum pubescens*) and Reed Canary Grass are present but do not provide >50% cover. A Dogwood Mineral Deciduous Thicket Swamp Ecosite (SWTM2) inclusion is present in association with this community.	

ELC Code 2008 (1998)	ELC Name	Description	Photo
THDM3-2	Native Shrub Deciduous Hedgerow Thicket Type	This community is present along the northern margin of Irvine Creek west of the structure and was identified from the ROW from a distance. Species present include Willows, Ash regeneration and Manitoba Maple regeneration.	
TAGM5a	Fencerow	This community represents the narrow band of trees along the southern margins of Irvine Creek. Species present include White Willow, White Cedar, and Manitoba Maple.	

ELC Code 2008 (1998)	ELC Name	Description	Photo
TAGM5b	Fencerow	This community represents the narrow band of trees along the norther margins of Irvine Creek. Species present include Eastern Cottonwood and Norway Spruce.	
OAG	Agricultural	This community consists of row crops and Rye.	
CVR	Residential	This community is located on privately owned lands and was identified through air photo interpretation.	
ME	Meadow	This community is located on privately owned lands and was identified through air photo interpretation.	

ELC Code 2008 (1998)	ELC Name	Description	Photo
OAO	Open Water	This community represents Irvine Creek. A submerged shallow aquatic ecosite (SAS_1) inclusion is present in association with this community. Submerged and emergent aquatic macrophytes are present within this community along the banks of Irvine Creek but do not exceed 25% cover. Species present include Softstem Bulrush, *Elodea spp.*, *Potamogeton spp.*, and Arrowhead.	

ELC Code 2008 (1998)	ELC Name	Description	Photo
Bridge 30-WG			
MEGM3 (CUM1)	Dry - Fresh Graminoid Meadow Ecosite	This community is present northwest, southwest, and southeast of the structure. Informal trails are present in the southeastern MEGM3 community. This community is dominated by Smooth Brome with lesser associates of Reed Canary Grass, Tall Goldenrod, and Garlic Mustard. Facultative wetland and obligate wetland species such as Jewelweed, Angelica, Cow Parsnip, and Canada Anemone are present along the margins of this community near the interface with Irvine Creek. One inclusion, a Mixed Mineral Meadow Marsh Type (MAMM3) is present in association with this community southwest of bridge 30-WG. This inclusion consists of Reed Canary Grass with lesser associates of Jewelweed, Tall Goldenrod, and Fringed Sedge (*Carex crinita*).	 

ELC Code 2008 (1998)	ELC Name	Description	Photo
WODM4-1 (CUW1)	Hawthorn / Apple Deciduous Woodland Type	This community is present northeast of the structure. This community acks a distinct canopy and subcanopy. The understory is dominated by mid-aged Hawthorn (*Crataegus spp.*) with lesser associates of Apple, Balsam Poplar, and Alternate-leaved Dogwood. The groundcover layer is consistent with the MEGM3 community. A Dry – Fresh Coniferous Woodland Ecosite (WOCM1) inclusion is present in association with this community which consists of several rows of young Red Pine.	

ELC Code 2008 (1998)	ELC Name	Description	Photo
FOCM4-1	Fresh-Moist White Cedar Coniferous Forest Ecosite	The canopy is dominated by mature White Cedar with lesser associates of White Willow, White Spruce, and Balsam Poplar. The subcanopy layer is poorly developed but is dominated by White Cedar, White Spruce, and Manitoba Maple. A distinct understory and groundcover layer is absent due to the density of the White Cedar growth.	
FOCM6	Naturalized Coniferous Plantation	This community consists of planted White Spruce and is located adjacent to Irvine Creek.	

ELC Code 2008 (1998)	ELC Name	Description	Photo
TAGM1	Plantation	This community was identified from air photo interpretation and is located well beyond the structure.	
TAGM5	fencerow	This community consists of planted Norway Maples.	
MAM	Meadow Marsh	This community was identified from air photo interpretation and is located well beyond the structure.	
SWCM1-2	White Cedar – Conifer Mineral Coniferous Swamp Type	This community occurs on the southeast side of the structure. The canopy is dominated by mature white Cedar with lesser associates of White Willow, trembling Aspen and Tamarack. The subcanopy is poorly defined and is dominated by White Cedar with lesser associates of Trembling Aspen, and Yellow Birch. Due to the density of the canopy, a distinct understory is absent with the exception of the margins of this community. Similarly, the groundcover layer is poorly developed and consists of Sensitive Fern (*Onoclea sensibilis*) and Canada Aenome. An SWTM2-1 (Red-Osier Dogwood Mineral Deciduous Thicket Swamp) inclusion is present in association with this community.	
SWDM4 (SWD4)	Mineral Deciduous swamp ecosite	This community was identified from air photo interpretation and GRCA mapping and is located well beyond the structure. Identifiable canopy species visible from the ROW includes White Willow.	

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Appendix B

Significant Wildlife Habitat

Significant Wildlife Habitat Screening – Ecoregion 6E Criteria (2015)

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Table 1.1: Seasonal Concentration Areas of Animals					
Waterfowl Stopover & Staging Areas (Terrestrial) **Rationale:** Habitat important to migrating waterfowl.	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these ecosites.	Fields with sheet water during Spring (mid-March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agriculftural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects. • Any mixed species aggregations of 100 or more individuals required. • The flooded field ecosite habitat plus a 100-300 m radius area, dependent on local site conditions and adjacent land use is the SWH. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • **SWHMiST Index #7** provides development effects and mitigation measures.	No potential within the Study Area. The upland meadow and thicket community are not extenstive in size.
Waterfowl Stopover & Staging Areas (Aquatic) **Rationale:** Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and SWM ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water).	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck	**Studies carried out & verified presence of:** • Aggregations of 100 or more of listed species for 7 days, results in >700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH. • The combined area of the Ecological Land Classification (ELC) ecosites and a 100 m radius area is the SWH. • Wetland area and shorelines associated with sites identified within the SWHTG Appendix K are SWH. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • **SWHMiST Index #7** provides development effects and mitigation measures.	Moderate potential. May but supported along the reaches of Irvine Creek.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
			Red-breasted Merganser Brant Canvasback Ruddy Duck		
Shorebird Migratory Stopover Area **Rationale**: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	• Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. • Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. • Sewage treatment ponds and storm water ponds do not qualify as a SWH.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	**Studies confirming:** • Presence of 3 or more of listed species and >1000 shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period). • Whimbrel stop briefly (<24 hrs.) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100 m radius area. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • **SWHMiST Index #8** provides development effects and mitigation measures.	No potential within the Study Area. The ecosites are not present and the habitat criteria for Significant Wildlife Habitat is not present.
Raptor Wintering Area **Rationale**: Sites used by multiple species, a high number of individuals and used annually are most significant.	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC.	• The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. • Raptor wintering sites (hawk/owl) need to be **>** 20 ha, with a combination of forest and upland. • Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands. • Field area of the habitat is to be wind swept with limited snow depth or accumulation. • Eagle sites have open water, large trees and snags available for roosting.	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl **Special Concern:** Short-eared Owl Bald Eagle	**Studies confirm the use of these habitats by:** • One or more Short-eared Owls or; One or more Bald Eagle or; At least 10 individuals and two of the listed hawk/owl species. • To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects."	Moderate potential within the Study Area in association with bridge 30-WG. A number of upland communities occur in association wis extensive forest / swamp communities.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
	Upland: CUM; CUT; CUS; CUW. Bald Eagle: Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).			• **SWHMiST Index #10 and #11** provides development effects and mitigation measures.	
Bat Hibernacula **Rationale:** Bat hibernacula are rare habitats in all Ontario landscapes.	**Bat Hibernacula may be found in these ecosites:** CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. • Active mine sites should not be considered as SWH. • The locations of bat hibernacula are relatively poorly known.	Big Brown Bat Tri-coloured Bat	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200 m radius around the entrance of the hibernaculum for most development types and 1000 m for wind farms. • Studies are to be conducted during the peak swarming period (August to September). Surveys should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”. • **SWHMiST Index #1** provides development effects and mitigation measures.	No potential within the Study Area. The ecosites are not present and the habitat criteria for Significant Wildlife Habitat is not present.
Bat Maternity Colonies **Rationale:** Known locations of forested bat	Maternity colonies considered SWH are found in forested ecosites.	• Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario.	Big Brown Bat Silver-haired Bat	• Maternity Colonies with confirmed use by: – >10 Big Brown Bats – >5 Adult Female Silver- haired Bats	Moderate potential to be supported within the Study Area. Candidate habitat present within the wooded ecosites within the Study Area,

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
maternity colonies are extremely rare in all Ontario landscapes.	**All ELC ecosites in ELC Community Series:** FOD FOM SWD SWM	• Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25 cm dbh) wildlife trees. • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred.		• The area of the habitat includes the entire woodland, or a forest stand ELC ecosite or an ecoelement containing the maternity colonies. • Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”. • SWHMiST Index #12 provides development effects and mitigation measures.	
Turtle Wintering Areas **Rationale:** Generally, sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Snapping and Midland Painted Turtles. **ELC Community Classes:** SW, MA, OA and SA **ELC Community Series:** FEO and BOO For Northern Map Turtle: Open water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	• For most turtles, wintering areas are in the same general area as their core habitat. Water must be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH.	Midland Painted Turtle **Special Concern:** Northern Map Turtle Snapping Turtle	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (September–October) or spring (March–May). • Congregation of turtles is more common where wintering areas are limited and therefore significant. • **SWHMiST Index #28** provides development effects and mitigation measures for turtle wintering habitat.	No potential within the immediate vicinity of the bridges. Substrates in the immediate vicinity yof all structures consist of gravel, cobble, and sand. Soft mud substrates are absent. Suitable overwintering habitatmay occur in association with pools of Irvine Creek well beyond the structure.
Reptile Hibernaculum	For all snakes, habitat may be found in any ecosite other	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of	**Snakes**: Eastern Gartersnake Northern Watersnake	**Studies confirming:**	No potential in the immediate vicinity of bridges 21-WG, 29-WG, and 30-WG. No candidate hibernacula were encountered within the ROW or immediate vicinity,

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Rationale: Generally, sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and ecosites: FOC1 and FOC3.	features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line. • Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock groundcover. • Five-lined Skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures.	Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake **Special Concern:** Milksnake Eastern Ribbonsnake **Lizard: Special Concern:** (Southern Shield population): Five-lined Skink	• Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (e.g., foundation or rocky slope) on sunny warm days in Spring (April/May) and Fall (September/October). • **Note**: If there are Special Concern Species present, then site is SWH. • **Note:** Sites for hibernation possess specific habitat parameters (e.g., temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e., strong hibernation site fidelity). Other critical life processes (e.g., mating) often take place near hibernacula. The feature in which the hibernacula is located plus a 30 m radius area is the SWH. • **SWHMiST Index #13** provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for Skink is significant. • SWHMiST Index #37 provides development effects and mitigation measures for five-lined Skink wintering habitat.	Hibernacula features may be supported well beyond the ROW.
Colonially - Nesting Bird Breeding Habitat (Bank & Cliff) **Rationale:** Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles. Cliff faces, bridge abutments, silos, barns. **Habitat found in the following ecosites:** CUM1 CUT1 CUS1 BLO1 BLS1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	**Studies confirming:** • Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50 m radius habitat area from the peripheral nests. • Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • **SWHMiST Index #4** provides development effects and mitigation measures.	No potential within the Study Area. The habitat criteria for Significant Wildlife Habitat is not present

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
declining in Ontario.	BLT1 CLO1 CLS1 CLT1				
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) **Rationale:** Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	**Studies confirming:** • Presence of 2 or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300 m radius or extent of the Forest ecosite containing the colony or any island <15.0 ha with a colony is the SWH. • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells. • **SWHMiST Index #5** provides development effects and mitigation measures.	No potential within the Study Area. The habitat criteria for Significant Wildlife Habitat is not present
Colonially - Nesting Bird Breeding Habitat (Ground) **Rationale;** Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird). MAM1 – 6 MAS1 – 3 CUM CUT	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in low bushes in close proximity to streams and irrigation ditches within farmlands.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	**Studies confirming:** • Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern. • Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. • The edge of the colony and a minimum 150 m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0 ha with a colony is the SWH. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • **SWHMiST Index #6** provides development effects and mitigation measures.	No potential within the Study Area. The habitat criteria for Significant Wildlife Habitat is not present. Breeding records for Brewer's Blackbird are mainly restricted to the north shore of Lake Huron and Georgian Bay, as well as Sudbury/Manitoulin Island and NW Ontario; no breeding records currently exist for Southern and Eastern Ontario.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
	CUS				
Migratory Butterfly Stopover Areas **Rationale:** Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Combination of ELC Community Series; need to have present one Community Series from each land class. <u>Field</u>: CUM CUT CUS <u>Forest</u>: FOC FOD FOM CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	• A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present and will be located within 5 km of Lake Erie or Ontario. • The habitat is typically a combination of field and forest and provides the butterflies with a location to rest prior to their long migration south. • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes.	Painted Lady Red Admiral <u>Special Concern</u> Monarch	**Studies confirm:** • The presence of Monarch Use Days (MUD) during fall migration (August/October). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. • MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. • **SWHMiST Index #16** provides development effects and mitigation measures.	No potential within the Study Area. The habitat criteria for Significant Wildlife Habitat is not present. The subject lands are greater than 5 km from Lake Ontario.
Landbird Migratory Stopover Areas **Rationale:** Sites with a high diversity of species as well as high numbers are most significant.	**All ecosites associated with these ELC Community Series:** FOC FOM FOD SWC SWM SWD	• Woodlots >10 ha in size and within 5 km of Lake Ontario. • If woodlands are rare in an area of shoreline, woodland fragments 2-5 ha can be considered for this habitat. • If multiple woodlands are located along the shoreline those Woodlands <2 km from Lake Ontario are more significant. • Sites have a variety of habitats; forest, grassland and wetland complexes. • The largest sites are more significant. • Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5 km of Lake Ontario are Candidate SWH.	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1 All migrant raptors species: *Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997.* Schedule 7: Specially Protected Birds (Raptors)	**Studies confirm:** • Use of the habitat by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (April/May) and fall (August/October) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • **SWHMiST Index #9** provides development effects and mitigation measures.	No potential within the Study Area. The habitat criteria for Significant Wildlife Habitat is not present. The subject lands are greater than 5 km from Lake Ontario.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Deer Yarding Areas **<u>Rationale:</u>** Winter habitat for deer is considered to be the main limiting factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	**Note:** MNRF to determine this habitat. **ELC Community Series** providing a thermal cover component for a deer yard would include: FOM FOC SWM SWC **Or these ELC ecosites:** CUP2 CUP3 FOD3 CUT	• Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%. • MNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual". • Woodlots with high densities of deer due to artificial feeding are not significant.	White-tailed Deer	**No Studies Required:** • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40 cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH. • Deer Yards are mapped by MNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by MNRF will be available at local MNRF offices or via Land Information Ontario (LIO). • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area, then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST Index #2 provides development effects and mitigation measures.	Confirmed present. Stratum 2 overwintering habitat confirmed present in associatopm with Bridge 30-WG east of Sideroad 15. Deer overwintering habitat has not been identified in association with bridges 21-WG and 29-WG.
Deer Winter Congregation Areas **Rationale:** Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in	**All Forested ecosites with these ELC Community Series:** FOC FOM FOD SWC SWM SWD	• Woodlots will typically be >100 ha in size. Woodlots <100 ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • Large woodlots > 100 ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha. • Woodlots with high densities of deer due to artificial feeding are not significant.	White-tailed Deer	**Studies confirm:** • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF. • Use of the woodlot by white- tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF. • Studies should be completed during winter (January/February) when >20 cm of snow is on the ground using aerial survey techniques, ground or road surveys. or a pellet count deer density survey. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding	Confirmed present. Stratum 2 overwintering habitat confirmed present in associatopm with Bridge 30-WG east of Sideroad 15. Swamp and forested communities that occur in association with Irvine Creek span >100ha. Deer overwintering habitat have not been identified in association with bridges 21-WG and 29-WG.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions.	Conifer plantations much smaller than 50 ha may also be used.			area, then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • **SWHMiST Index #2** provides development effects and mitigation measures.	
Table 1.2.1: Rare Vegetation Communities					
Cliffs and Talus Slopes **Rationale:** Cliffs and Talus Slopes are extremely rare habitats in Ontario.	**Any ELC ecosite within Community Series:** TAO CLO TAS CLS TAT CLT	• A Cliff is vertical to near vertical bedrock >3 m in height. • A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.		• Most cliff and talus slopes occur along the Niagara Escarpment. • Confirm any ELC Vegetation Type for Cliffs or Talus Slopes. • **SWHMiST Index #21** provides development effects and mitigation measures.	No potential within the Study Area. The habitat criteria for Significant Wildlife Habitat is not present. The Niagara Escarpment is not present in the EIS study area.
Sand Barren **Rationale;** Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	**ELC ecosites:** SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	• Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered, but less than 60%.		• A sand barren area >0.5 ha in size. • Confirm any ELC Vegetation Type for Sand Barrens. • Site must not be dominated by exotic or introduced species (<50% vegetative cover is exotic sp.). • **SWHMiST Index #20** provides development effects and mitigation measures.	No potential within the Study Area. The habitat criteria for Significant Wildlife Habitat is not present.
Alvar **Rationale;** Alvars are extremely rare	ALO1 ALS1 ALT1 FOC1 FOC2	• An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss		**Field studies that identify:** • An Alvar site > 0.5 ha in size. • Four of the five Alvar Indicator Species at a Candidate Alvar site is Significant.	No potential within the Study Area. The habitat criteria for Significant Wildlife Habitat is not present.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
habitats in Ecoregion 6E.	CUM2 CUS2 CUT2-1 CUW2 **Five Alvar Indicator Species:** *Carex crawei* *Panicum philadelphicum* *Eleocharis compressa* *Scutellaria parvula* *Trichostema brachiatum* These indicator species are very specific to Alvars within Ecoregion 6E.	associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover. • Alvar is particularly rare in Ecoregion 6E where the only known sites are found in the western islands of Lake Erie.		• Site must not be dominated by exotic or introduced species (<50% vegetative cover is exotic sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses. • **SWHMiST Index #17** provides development effects and mitigation measures.	
Old Growth Forest **Rationale;** Due to historic logging practices and land clearance for agriculture, old growth forest is rare in the Ecoregion 6E.	**Forest Community Series:** FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.		**Field Studies will determine:** • If dominant trees species are >140 years old, then the area containing these trees is SWH. • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present). • The area of forest ecosites combined or an eco-element within an ecosite that contains the old growth characteristics is the SWH. • Determine ELC vegetation types for the forest area containing the old growth characteristics. • **SWHMiST Index #23** provides development effects and mitigation measures.	No potential within the Study Area. The habitat criteria for Significant Wildlife Habitat is not present.
Savannah **Rationale:**	TPS1 TPS2 TPW1	A Savannah is a tallgrass prairie habitat that has tree cover between 25–60%.		**Field studies confirm:**	No potential within the Study Area. The habitat criteria for Significant Wildlife Habitat is not present.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Savannahs are extremely rare habitats in Ontario.	TPW2 CUS2			• No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. • One or more of the Savannah indicator species listed in Appendix N should be present. **Note**: Savannah plant spp. list from Ecoregion 6E should be used. • Area of the ELC ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover is exotic sp.). • **SWHMiST Index #18** provides development effects and mitigation measures.	
Tallgrass Prairie **Rationale:** Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	• No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway Right of Ways (ROW) are not considered to be SWH. • A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.		**Field studies confirm:** • One or more of the Prairie indicator species listed in Appendix N should be present. **Note:** Prairie plant spp. list from Ecoregion 6E should be used. • Area of the ELC ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover is exotic sp.). • **SWHMiST Index #19** provides development effects and mitigation measures.	No potential within the Study Area. The habitat criteria for Significant Wildlife Habitat is not present.
Other Rare Vegetation Communities **Rationale:** Plant communities that often contain rare species which depend on the habitat for survival.	• Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG. • Any ELC ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.		• ELC ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M. • The MNRF/Natural Heritage Information Centre (NHIC) will have up to date listing for rare vegetation communities. **Field studies should confirm:** • If an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG. • Area of the ELC Vegetation Type polygon is the SWH. • **SWHMiST Index #37** provides development effects and mitigation measures.	No potential within the Study Area. No rare vegetation communities were identified during ELC field surveys.

Table 1.2.2: Specialized Habitats for Wildlife considered Significant Wildlife Habitat

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Waterfowl Nesting Area **Rationale;** Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	**All upland habitats located adjacent to these wetland ELC ecosites are Candidate SWH:** MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands (PSW).	• A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120 m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. • Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40 cm dbh) in woodlands for cavity nest sites.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	**Studies confirmed:** • Presence of 3 or more nesting pairs for listed species excluding Mallards, or; • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest. • **SWHMiST Index #25** provides development effects and mitigation measures.	No potential within the Study Area. The ecosite codes are not present and the habitat criteria for Significant Wildlife Habitat is not present.
Bald Eagle & Osprey Nesting, Foraging & Perching Habitat **Rationale;** Nest sites are fairly uncommon in Eco-region 6E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and	**ELC Forest Community Series:** FOD FOM FOC SWD SWM and SWC (directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top of a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree’s canopy. • Nests located on man-made objects are not to be included as SWH (e.g., telephone poles and constructed nesting platforms).	Osprey **Special Concern** Bald Eagle	**Studies confirm the use of these nests by**: • One or more active Osprey or Bald Eagle nests in an area. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH, maintaining undisturbed shorelines with large trees within this area is important. • For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800 m is dependent on-site lines from the nest to the development and inclusion of perching and foraging habitat. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant.	Moderate potential. The forest and swamp communities that occur in association with bridge 30-WG and the FODM7 community in association with bridge 29-WG may support Bald Eagle & Osprey Nesting, Foraging & Perching Habitat. Neither Bald Eagle or Osprey were recorded during either of Burnside’s site visits.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
scarcity of habitat.				• Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid-March to mid-August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • **SWHMiST Index #26** provides development effects and mitigation measures.	
Woodland Raptor Nesting Habitat **Rationale:** Nests sites for these species are rarely identified; these are area sensitive habitats and are often used annually by these species.	May be found in all forested ELC ecosites. **May also be found in:** SWC SWM SWD and CUP3	• All natural or conifer plantation woodland/forest stands >30 ha with >10ha of interior habitat. Interior habitat determined with a 200 m buffer. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers Hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	**Studies confirm:** • Presence of 1 or more active nests from species list is considered significant. • Red-shouldered Hawk and Northern Goshawk – A 400 m radius around the nest or 28 ha area of habitat is the SWH (the 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest). • Barred Owl – A 200 m radius around the nest is the SWH. • Broad-winged Hawk and Coopers Hawk– A 100 m radius around the nest is the SWH. • Sharp-Shinned Hawk – A 50 m radius around the nest is the SWH. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • **SWHMiST Index #27** provides development effects and mitigation measures.	Interior forest habitat is not supported within the Study Area. The forest and swamp communities that occur in association with bridge 30-WG may contribute to contiguous treed lands beyond the Study Area that support interior forest habitat.
Turtle Nesting Areas **Rationale;** These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	**Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC ecosites:** MAS1 MAS2 MAS3 SAS1 SAM1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.	Midland Painted Turtle <u>Special Concern Species:</u> Northern Map Turtle Snapping Turtle	**Studies confirm:** • Presence of 5 or more nesting Midland Painted Turtles. • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100 m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH. • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100 m area of habitat.	No potential on the Study Area . The habitat criteria for Significant Wildlife Habitat is not present at any of the three bridges.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
	SAF1 BOO1 FEO1			• Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • **SWHMiST Index #28** provides development effects and mitigation measures for turtle nesting habitat.	
Seeps and Springs **Rationale:** Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Seeps/Springs are areas where ground water comes to the surface. Often, they are found within headwater areas within forested habitats. Any forested ecosite within the headwater areas of a stream could have seeps/springs.	• Any forested area (with <25% meadow/field/ pasture) within the headwaters of a stream or river system. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	**Field Studies confirm:** • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat. • **SWHMiST Index #30** provides development effects and mitigation measures.	Moderate potential to be supported in association with the swamp communities present in association with the swamp communities of bridge 30-WG.
Amphibian Breeding Habitat (Woodland) **Rationale:** These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	All ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to	• Presence of a wetland, pond or woodland pool (including vernal pools) >500 m^2 (about 25 m diameter) within or adjacent (within 120 m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	**Studies confirm:** • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230 m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • **SWHMiST Index #14** provides development effects and mitigation measures.	Moderate potential to be supported in association with the swamp communities present in association with the swamp communities of bridge 30-WG.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
	migrating amphibians.				
Amphibian Breeding Habitat (Wetlands) **Rationale;** Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	**ELC Community Classes:** SW MA FE BO OA and SA. Typically, these wetland ecosites will be isolated (>120 m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g., Bull Frog) may be adjacent to woodlands.	• Wetlands >500 m^2 (about 25 m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	**Studies confirm:** • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3 or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • **SWHMiST Index #15** provides development effects and mitigation measures.	No potential within the Study Area. Suitable wetland communities are not suitably large to meet the criteria for SWH.
Woodland Area-Sensitive Bird Breeding Habitat **Rationale:** Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior	**All ecosites associated with these ELC Community Series:** FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs. old) forest stands or woodlots >30 ha. • Interior forest habitat is at least 200 m from forest edge habitat.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren **Special Concern:** Cerulean Warbler Canada Warbler	**Studies confirm:** • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • **Note**: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • **SWHMiST Index #34** provides development effects and mitigation measures.	Interior forest habitat is not supported within the Study Area. The forest and swamp communities that occur in association with bridge 30-WG may contribute to contiguous treed lands beyond the Study Area that support interior forest habitat. The following indicator species were incidentally encountered during Burnside’s site visit at Structure 30-WG: • Black-and-White Warbler • Black-throated Green Warbler

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
forest song birds.					
Table 1.3: Habitat for Species of Conservation Concern considered Significant Wildlife Habitat					
Marsh Breeding Bird Habitat **Rationale;** Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 **For Green Heron:** All SW, MA and CUM1 sites	• Nesting occurs in wetlands. • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water.	American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan **Special Concern:** Black Tern Yellow Rail	**Studies confirm:** • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes breeding by any combination of 5 or more of the listed species. • **Note**: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH. • Area of the ELC ecosite is the SWH. • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • **SWHMiST Index #35** provides development effects and mitigation measures.	Moderate potential. May be supported in association with the MAM community within the Study Area associated with bridge 30-WG.
Open Country Bird Breeding Habitat **Rationale;** This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	CUM1 CUM2	• Large grassland areas (includes natural and cultural fields and meadows) >30 ha. • Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e., no row cropping or intensive hay or livestock pasturing in the last 5 years). • Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. • The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow **Special Concern** Short-eared Owl	**Field Studies confirm:** • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owls is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • **SWHMiST Index #32** provides development effects and mitigation measures.	No potential within the Study Area. The ecosites and the habitat criteria for Significant Wildlife Habitat are not present.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Shrub/Early Successional Bird Breeding Habitat **Rationale;** This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	• Large field areas succeeding to shrub and thicket habitats >10 ha in size. • Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e., no row-cropping, haying or live-stock pasturing in the last 5 years). • Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. • Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands.	**Indicator Spp:** Brown Thrasher Clay-coloured Sparrow **Common Spp.** Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher **Special Concern:** Yellow-breasted Chat Golden-winged Warbler	**Field Studies confirm:** • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species. • A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as SWH. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • **SWHMiST cxlix Index #33** provides development effects and mitigation measures.	No potential within the Study Area. The ecosites and the habitat criteria for Significant Wildlife Habitat are not present.
Terrestrial Crayfish **Rationale:** Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM CUM1 with inclusions of above meadow marsh or swamp ecosites can be used by terrestrial crayfish.	• Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for Terrestrial Crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can’t be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed.	Chimney or Digger Crayfish (*Fallicambarus fodiens*) Devil Crayfish or Meadow Crayfish (*Cambarus diogenes*)	**Studies Confirm:** • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites. • Area of ELC ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH. • Surveys should be done April to August in temporary or permanent water. **Note** the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult. • **SWHMiST Index #36** provides development effects and mitigation measures.	Confirmed asbent within the Study Area in the immediate vicinity of the bridges. May be supported in the following communities well beyond Bridge 30-WG: • SWDM4 • MAM
Special Concern and	All plant and animal Element	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal	**Studies Confirm:**	Candidate Habitat for the following: • Monarch (SC)

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Rare Wildlife Species **Rationale:** These species are quite rare or have experienced significant population declines in Ontario.	Occurrences (EO) within a 1 or 10 km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	species; linking candidate habitat on the site needs to be completed to ELC ecosites.	species. Lists of these species are tracked by the NHIC.	• Assessment/inventory of the site for the identified Special Concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g., specific nesting habitat or foraging habitat. • **SWHMiST Index #37** provides development effects and mitigation measures.	• Canada Warbler (SC) • Eastern Wood-pewee (SC) • Wood Thrush (SC) • Snapping Turtle (SC) Confirmed present within the Study Area • Snapping Turtle (SC) in association with Bridge 30-WG
Table 1.4.1: Animal Movement Corridors					
Amphibian Movement Corridors **Rationale;** Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	• Movement corridors between breeding habitat and summer habitat. • Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat–Wetland) of this Schedule.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. • Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant. • Corridors should have at least 15 m of vegetation on both sides of waterway or be up to 200 m wide of woodland habitat and with gaps <20 m. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat. • **SWHMiST Index #40** provides development effects and mitigation measures.	No potential within the Study Area, Amphibian Breeding Habitat (wetland) is absent.
Deer Movement Corridors **Rationale:** Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule. • A deer wintering habitat identified by the MNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges).	White-tailed Deer	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering habitat should be unbroken by roads and residential areas. • Corridors should be at least 200 m wide with gaps <20 m and if following riparian area with at least 15 m of vegetation on both sides of waterway. • Shorter corridors are more significant than longer corridors, SWHMiST Index #39 provides development effects and mitigation measures.	High potential. Movement corridors may occur in association with Irvine Creek. Stratum 2 overwintering habitat confirmed present in associatopm with Bridge 30-WG east of Sideroad 15.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
dispersing individuals by minimizing their vulnerability while travelling.					
Table 1.5.1: Significant Wildlife Habitat Exceptions for Ecodistricts within EcoRegion 6E					
6E-14 **Mast Producing Areas** **Rationale:** The Bruce Peninsula has an isolated and distinct population of black bears. Maintenance of large woodland tracts with mast-producing tree species is important for bear.	**All Forested habitat represented by ELC Community Series**: FOM FOD	• Woodland ecosites >30 ha with mast-producing tree species, either soft (cherry) or hard (oak and beech). • Black bears require forested habitat that provides cover, winter hibernation sites, and mast- producing tree species. Forested habitats need to be large enough to provide cover and protection for black bears.	Black Bear	**All woodlands >30 ha with a 50% composition of these ELC Vegetation Types are considered significant:** FOM1-1 FOM2-1 FOM3-1 FOD1-1 FOD1-2 FOD2-1 FOD2-2 FOD2-3 FOD2-4 FOD4-1 FOD5-2 FOD5-3 FOD5-7 FOD6-5 SWHMiST Index #3 provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present.
6E- 17 **Lek** **Rationale:** Sharp-tailed grouse only occur on Manitoulin Island in Ecoregion 6E, Leks are an important habitat to maintain their /*population.	CUM CUS CUT	• The Lek or dancing ground consists of bare, grassy or sparse shrubland. There is often a hill or rise in topography. • Leks are typically a grassy field/meadow >15 ha with adjacent shrublands and >30 ha with adjacent deciduous woodland. Conifer trees within 500 m are not tolerated. • Grasslands (field/meadow) are to be >15 ha when adjacent to shrubland and >30 ha when adjacent to deciduous woodland. • Grasslands are to be undisturbed with low intensities of agriculture (light grazing or late haying).	Sharp-tailed Grouse	• Studies confirming Lek habitat are to be completed from late March to June. • Any site confirmed with sharp-tailed grouse courtship activities is considered significant. • The field/meadow ELC ecosites plus a 200 m radius area with shrub or deciduous woodland is the Lek habitat. • SWHMiST cxlix Index #32 provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?
		• Leks will be used annually if not destroyed by cultivation or invasion by woody plants or tree planting.			

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Appendix C

Photos

Structure 21-WG

Photo 1:Landscape surrounding the upstream reach. Facing north.

Photo 2: Upstream west riverbank. Facing northwest.

Photo 3: Upstream east riverbank. Facing east.

Photo 4: The upstream's east bank. Facing north.

Structure 21-WG

Photo 5 Outlet of bridge. Facing north.

Photo 6 Downstream west riverbank. Facing south.

Photo 7: Downstream emergent vegetation. Facing south.

Photo 8: Downstream east riverbank. Facing south.

Structure 29-WG

Photo 9: Upstream section. Facing east.

Photo 10: The north bank of the upstream area. Facing east.

Photo 11: The south bank of the upstream area. Facing south.

Photo: 12 Upstream section. Facing south.

Structure 29-WG

Photo 13: Downstream section. Facing west.

Photo 14: The north bank of the downstream area. Facing northwest.

Photo 15: The outlet of the structure. Facing northeast.

Photo 16: The south bank of the downstream area. Facing west.

Structure 30-WG

Photo 17: Upstream section. Facing west.

Photo 18: Upstream section. Facing southwest.

Photo 19: The south bank of the upstream area. Facing west.

Photo 20: Underneath the structure. Facing south

Structure 30-WG

Photo 21: Downstream section. Facing east.

Photo 22: The south bank of the downstream area. Facing southeast.

Photo 23: Inlet of the structure. Facing west.

R.J. Burnside & Associates Limited