APPENDIX E:
TERRESTRIAL HABITAT

Appendix E-1 Wildlife Habitat Assessment for the Enbridge Gas Windsor Pipeline Replacement (Ecoregion 7E)

Wildlife Habitat Type	Criteria	Methods	Habitat Assessment
SEASONAL CONCENTRATION AREAS			
Waterfowl Stopover and Staging Area (Terrestrial and Aquatic)	Field with evidence of annual spring flooding from meltwater or runoff; aquatic habitats such as ponds, marshes, lakes, bays, and watercourses used during migration, including large marshy wetlands	ELC surveys, wildlife habitat assessments, and air photo interpretation will be used to assess features within the Study Area that may support waterfowl stopover and staging areas.	No flooded fields were observed during spring 2019 field investigations.
Shorebird Migratory Stopover Area	Beaches and un-vegetated shorelines of lakes, rivers, and wetlands.	ELC surveys and air photo interpretation will be used to assess features within the Study Area that may support migratory shorebirds.	Natural unvegetated shoreline habitat was absent from the Study Area.
Raptor Wintering Area	Combination of fields and woodland (>20 ha).	ELC surveys and air photo interpretation will be used to assess features within the Study Area that may support wintering raptors.	Qualifying upland habitat in the Study Area was of insufficient size to support raptor wintering.
Bat Hibernacula	Hibernacula may be found in caves, mine shafts, underground foundations and karsts.	ELC surveys, wildlife habitat assessments, and air photo interpretation will be used to assess features within the Study Area that may support bat hibernacula.	Crevices, caves or abandoned mines were absent from the Subject Property and Study Area.
Bat Maternity Colonies	Maternity colonies considered significant wildlife habitat are found in forested ecosites.	ELC surveys, wildlife habitat assessments, and air photo interpretation will be used to assess features within the Study Area that may support bat maternity colonies.	Forest habitat was present in the Study Area which may support bat maternity colonies.
Turtle Wintering Areas	Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen. Water has to be deep enough not to freeze and have soft mud substrate.	ELC surveys, wildlife habitat assessments and air photo interpretation will be used to assess features within the Study Area that may support areas of permanent standing water but not deep enough to freeze.	To be determined during 2019 field investigations.
Reptile Hibernaculum	Rock piles or slopes, stone fences, crumbling foundations	ELC surveys and wildlife habitat assessments will be used to document features that may support snake hibernacula.	To be determined during 2019 field investigations.

Appendix E-1 Wildlife Habitat Assessment for the Enbridge Gas Windsor Pipeline Replacement (Ecoregion 7E)

Wildlife Habitat Type	Criteria	Methods	Habitat Assessment
Colonial-Nesting Bird Breeding Habitat (Bank and Cliff)	Eroding banks, sandy hills, steep slopes, rock faces or piles	ELC surveys, wildlife habitat assessments, and air photo interpretation will be used to assess features within the Study Area that may support colonial bird breeding habitat.	To be determined during 2019 field investigations.
Colonial-Nesting Bird Breeding Habitat (Tree/Shrubs)	Dead trees in large marshes and lakes, flooded timber, and shrubs, with nests of colonially nesting heron species.	ELC surveys and wildlife habitat assessments will be used to assess features within the Study Area that may support colonial bird breeding habitat (Trees/Shrubs).	Large marshes and lakes were absent from the Study Area.
Colonial-Nesting Bird Breeding Habitat (Ground)	Rock islands and peninsulas in a lake or large river.	ELC surveys and air photo interpretation will be used to assess features within the Study Area that may support colonial bird breeding habitat (Ground).	Large lakes or rivers were absent from the Study Area.
Migratory Butterfly Stopover Areas	Meadows and forests that are a minimum of 10 ha and are located within 5km of Lake Erie.	GIS analysis was used to measure distance from the Lake Ontario shoreline.	A short section of the Study Area is located < 5 km from the Lake Erie shoreline, however it does not contain patches of undisturbed natural vegetation which would support butterflies during migration.
Landbird Migratory Stopover Areas	Woodlands of a minimum size located within 5km of Lake Ontario.	GIS analysis was used to measure distance from the Lake Ontario shoreline.	A short section of the Study Area is located < 5 km from the Lake Erie shoreline, however it does not contain woodlands.
Deer Winter Congregation Areas	Deer winter congregation's areas are mapped by MNRF and species use surveys are not required.	The LIO database and MNRF consultation were used to identify deer winter congregation areas.	Records of deer winter congregation areas were not identified by MNRF in the Study Area.
RARE VEGETATION COMMUNITIES			
Sand Barren, Alvar, Cliffs and Talus Slopes	Sand barren, Alvar, Cliff and Talus ELC Community Classes, and other areas of exposed bed rock and patchy soil development, near vertical exposed bedrock and slopes of rock rubble.	ELC surveys and air photo interpretation were used to assess vegetation communities in the Study Area.	These communities were absent from the Study Area.

Appendix E-1 Wildlife Habitat Assessment for the Enbridge Gas Windsor Pipeline Replacement (Ecoregion 7E)

Wildlife Habitat Type	Criteria	Methods	Habitat Assessment
Old-growth Forest	Relatively undisturbed, structurally complex; dominant trees > 100 years' old.	ELC surveys and air photo interpretation were used to assess vegetation communities in the Study Area.	Old growth characteristics were not observed within woodlands in the Study Area.
Tallgrass Prairie and Savannah	Open canopy habitats (tree cover < 60%) dominated by prairie species.	ELC surveys and air photo interpretation were used to assess vegetation communities in the Study Area.	These communities were absent from the Study Area.
Other Rare Vegetation Communities	Provincially Rare S1, S2 and S3 vegetation communities listed by the NHIC.	ELC surveys and air photo interpretation will be used to assess vegetation communities in the Study Area.	To be determined during 2019 field investigations.
SPECIALIZED HABITAT FOR WILDLIFE			
Waterfowl Nesting Area	Upland habitats adjacent to wetlands (within 120m).	ELC surveys, wildlife habitat assessment, and airphoto interpretation will be used to assess features within the Study Area that may support nesting waterfowl.	To be determined during 2019 field investigations.
Bald Eagle and Osprey nesting, Foraging, and Perching Habitat	Treed communities adjacent to rivers, lakes, ponds, and other wetlands with stick nests of Bald Eagle or Osprey.	ELC surveys, air photo interpretation and wildlife habitat assessment will be used to assess features within the Study Area that may support nesting, foraging and perching habitat for large raptors.	To be determined during 2019 field investigations.
Woodland Raptor Nesting Habitat	Forested ELC communities >30 ha with 10 ha of interior habitat.	ELC surveys, wildlife habitat assessment, and GIS analysis were used to assess features within the Study Area that may support nesting habitat for woodland raptors.	Suitable interior forest habitat was absent from the Study Area.
Turtle Nesting Areas	Exposed soil, including sand and gravel in open sunny areas near wetlands.	ELC surveys, wildlife habitat assessment and air photo interpretation will be used to assess features within the Study Area that may support turtle nesting areas.	To be determined during 2019 field investigations.
Seeps and Springs	Any forested area with groundwater at surface within the headwaters of a stream or river system	Evidence of groundwater upwelling, including seeps and springs, was recorded during ELC surveys.	To be determined during 2019 field investigations.
Amphibian Breeding Habitat (Woodland and Wetland)	Treed uplands with vernal pools, and wetland ecosites	ELC surveys will be used to assess features within the Study Area that may support woodland breeding amphibians.	To be determined during 2019 field investigations.

Appendix E-1 Wildlife Habitat Assessment for the Enbridge Gas Windsor Pipeline Replacement (Ecoregion 7E)

Wildlife Habitat Type	Criteria	Methods	Habitat Assessment
Woodland Area-sensitive Bird Breeding Habitat	Large mature forest stands, woodlots >30ha and >200m from the forest edge.	ELC surveys, airphoto interpretation, and GIS analysis were used to determine whether woodlots that occurred within the Study Area that were >30 ha with interior habitat present (>200 m from edge).	Suitable large forest stands were absent from the Study Area.
HABITAT FOR SPECIES OF CONSERVATION CONCERN			
Marsh Bird Breeding Habitat	Wetlands with shallow water and emergent aquatic vegetation.	ELC surveys and airphoto interpretation were used to identify marshes with shallow water and emergent vegetation that may support marsh breeding birds.	Wetland communities (marsh) in the Study Area are likely too small to support the required threshold of breeding marsh birds.
Open Country Bird Breeding Habitat	Large grasslands and fields (>30ha).	ELC surveys, air photo interpretation, and GIS analysis were used to identify grassland communities within the Study Area that may support area-sensitive breeding birds.	Non-agricultural grassland communities >30 ha were absent from the Study Area.
Shrub/Early Successional Bird Breeding Habitat	Large shrub and thicket habitats (>10ha).	ELC surveys, air photo interpretation and GIS analysis were used to identify large communities that may support shrub/early successional breeding birds.	Early successional communities > 10 ha were absent from Study Area.
Terrestrial Crayfish	Wet meadows and edges of shallow marshes.	ELC surveys were used to identify shallow marsh and meadow marsh communities that occurred within the Study Area; searches for crayfish chimneys will be conducted during wildlife habitat assessments.	To be determined during 2019 field investigations.
SPECIES OF CONSERVATION CONCERN			
Candidate habitat for Species of Conservation Concern to be assessed during 2019 field investigations			
ANIMAL MOVEMENT CORRIDORS			
Amphibian Movement Corridor	Corridors may be found in all ecosites associated with water. Determined based on identifying significant amphibian breeding habitat (wetland).	Identified after Amphibian Breeding Habitat - Wetland is confirmed. Movement corridors should be considered when amphibian breeding habitat is confirmed as SWH from Amphibian Breeding Habitat (Wetland).	Amphibian movement corridors are likely present along all drainage ditches and watercourses in the Study Area. Disturbance to wetland communities will be avoided.

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Appendix E-2: Habitat Potential in the Study Area for Threatened or Endangered Species

Species	Habitat Preference	Habitat Potential
PLANTS		
Butternut	Found in a variety of habitats throughout Southern Ontario, including woodlands and hedgerows (Farrar, 1995).	No Butternut trees were recorded by Stantec in the Study Area during 2018 field investigations. Suitable habitat exists for this species along the proposed pipeline route within any deciduous or mixed woodlands and hedgerows. Additional field investigations in targeted areas will be completed in 2019.
Pink Milkwort	Grows in moderately moist to dry, sandy, prairie habitats (MNRF, 2014a).	Suitable habitat for the species may be present in the Study Area. A botanical inventory will be completed in 2019 to confirm species presence or absence.
Spoon-leaved Moss	Found in a variety of habitat types, including cedar swamps, deciduous woodlots, pine plantations, and hawthorn-juniper scrub. Within these habitats, Spoon-leaved moss tends to grow in or at the border of low-lying areas affected seasonally by standing water (COSEWIC, 2003a).	Suitable habitat for the species may be present in the Study Area. A botanical inventory will be completed in 2019 to confirm species presence or absence.
American Chestnut	Grows in rich mixed and deciduous forests, frequently with oak; most populations have been decimated by chestnut blight (Nixon, 1997). Typical habitat is upland deciduous forest on acid to neutral, sandy soil (COSEWIC, 2004a).	No American Chestnut trees were recorded by Stantec in the Study Area during 2018 field investigations. Suitable habitat for the species may be present in the Study Area. A botanical inventory will be completed in 2019 to confirm species presence or absence.
Eastern Prairie Fringed-Orchid	Grows in wetlands, fens, swamps and tallgrass prairie; has been found in ditches and railroad rights-of-way (MNRF, 2014b).	Suitable habitat for the species may be present in the Study Area. A botanical inventory will be completed in 2019 to confirm species presence or absence.
Spotted Wintergreen	Occurs in a variety of forested habitats including coniferous, mixed, and deciduous forests, as well as dry sand communities (Freeman, 2009).	Suitable habitat for the species may be present in the Study Area. A botanical inventory will be completed in 2019 to confirm species presence or absence.
Slender Bush-clover	Specific habitat requirements include dry or dry-mesic sites on sandy soils, exposed mineral soil and the presence of a specific association of prairie forbs (COSEWIC, 2000).	Suitable habitat for the species may be present in the Study Area. A botanical inventory will be completed in 2019 to confirm species presence or absence.
White Colicroot	Habitats include open moist prairie, old fields, roadsides, and edges of wooded areas with sandy soil that has a coarse texture (Species at Risk Public Registry, No date).	Suitable habitat for the species may be present in the Study Area. A botanical inventory will be completed in 2019 to confirm species presence or absence.

Appendix E-2: Habitat Potential in the Study Area for Threatened or Endangered Species

Species	Habitat Preference	Habitat Potential
Dwarf Hackberry	Found in alvar woodlands as well as dry, open sandy woods (Oldham and Brinker, 2009).	No Dwarf Hackberry was recorded by Stantec in the Study Area during 2018 field investigations. Suitable habitat for the species may be present in the Study Area. A botanical inventory will be completed in 2019 to confirm species presence or absence.
Blue Ash	Found on floodplains, well-drained sand and on limestone outcrops (Farrar 1995).	No Blue Ash trees were recorded by Stantec in the Study Area during 2018 field investigations. Suitable habitat for the species may be present in the Study Area. A botanical inventory will be completed in 2019 to confirm species presence or absence.
Kentucky Coffee-tree	Found on deep rich soils (Farrar, 1995). Prefers full sun in woodlands and at marsh edges, but may occur in a variety of habitats in full sun (ROM, 2008).	No Kentucky Coffee-trees were recorded by Stantec in the Study Area during 2018 field investigations. Suitable habitat for the species may be present in the Study Area. A botanical inventory will be completed in 2019 to confirm species presence or absence.
Dense Blazing-star	Fresh to moist tall grass prairie habitats. Moisture regime may range from dry-mesic to very moist, and may be found in openings in oak savannahs, dune woodlands, interdune meadows, and along linear corridors such as roadside ditches, railways and hydro corridors (COSEWIC, 2010a).	Suitable habitat for the species may be present in the Study Area. A botanical inventory will be completed in 2019 to confirm species presence or absence.
Purple Twayblade	Habitats include oak woodland and savannah, mixed deciduous forest, shrub thicket, shrub alvar, deciduous swamp and conifer plantations. Grows in sun to partial shade (MNRF, 2014c).	Suitable habitat for the species may be present in the Study Area. A botanical inventory will be completed in 2019 to confirm species presence or absence.
Willow-leaved Aster	Found in thickets, meadows and prairies, as well as in oak savannahs in the Windsor area. Sometimes present along railways, roadsides and old abandoned fields (COSEWIC 2003b).	Suitable habitat for the species may be present in the Study Area. A botanical inventory will be completed in 2019 to confirm species presence or absence.
MOLLUSCS		
Proud Globelet	Found on wooded hillsides or in ravines (MNRF, 2016). In Ontario, this species may be restricted to the Black Oak Heritage Forest and an adjacent former industrial site within the City of Windsor.	The Study Area is outside the known occurrence for this species.

Appendix E-2: Habitat Potential in the Study Area for Threatened or Endangered Species

Species	Habitat Preference	Habitat Potential
REPTILES		
Eastern Foxsnake	The Carolinian population of Eastern Foxsnake is primarily found in open habitats such as old fields, prairies, marshes and dune shorelines. Foxsnakes may also use a variety of anthropogenic habitats with low human activity such as fields, hedgerows, canals, abandoned buildings, cottages and dump sites. (Eastern Foxsnake Recovery Team, 2010). Brush piles, table rocks, tree stumps, root systems of downed trees and driftwood are also often used for shelter and basking sites (COSEWIC, 2008).	Suitable habitat occurs for this species along the full extent of the proposed pipeline route. Habitat assessments will be completed in 2019.
Massasauga	Found in four regions of Ontario, along the eastern shores of Georgian Bay, on the Bruce Peninsula, in an area near Windsor and in the Wainfleet Bog on the northeast shore of Lake Erie. Semi-open habitats are needed for cover and basking and include wet prairies, sedge meadows, old fields, peatlands, bedrock barrens and coniferous forests (Rowell, 2012).	The Study Area is outside the known occurrence for this species. The nearest population is located in the Ojibway Prairie Preserve, approximately 10 km from the Study Area.
Butler's Gartersnake	Primarily associated with tall-grass prairie habitats, but also found in successional lands, meadows, herbaceous forest edges and along drainage swales and small bodies of water (COSSARO, 2011).	Suitable habitat for this species may be present in the Study Area. Habitat assessments will be completed in 2019.
Five-lined Skink	Carolinian populations of this species inhabit the forests around Lakes Erie, St. Clair, and Huron. They primarily inhabit clearings such as stabilized sand dunes, open forest areas, and wetlands where they find shelter, most often under plant debris, such as decomposing tree trunks; they may also use artificial structures including construction materials and wooden boardwalks (COSEWIC, 2007).	Suitable habitat for this species may be present in the Study Area. Habitat assessments will be completed in 2019.
Queensnake	Rocky, gravelly, or slate stream-bed substrates, with a swift to moderate current and woodland surroundings (COSEWIC, 2010). Restricted to relatively small sections of a few rivers and wetlands in southwestern Ontario; highly specialized and rarely found more than 3 m from water.	The Study Area is outside the known range for this species. The nearest population is located within the Canard River, approximately 10 km from the Study Area.
Eastern Spiny Softshell	Found along lakes and large rivers. Requires sandy beaches or riverbanks for nesting, shallow soft-bottomed water bodies to function as nurseries or refugia, basking areas and deep pools for thermoregulation, and riffle areas for foraging (COSEWIC 2002).	Suitable habitat for this species is absent from the Study Area. The nearest populations are located along Lake St. Clair and the St. Clair River, more than 10 km from the Study Area.

Appendix E-2: Habitat Potential in the Study Area for Threatened or Endangered Species

Species	Habitat Preference	Habitat Potential
Spotted Turtle	Unpolluted habitats of slow-moving, shallow waters of ponds, bogs, fens, marshes, vernal pools and sedge meadows. Vegetation structures such as sphagnum moss, sedge tussocks, cattails, water lilies and hydrophilic shrubs, as well as soft-bottom substrates, are important components of aquatic habitats (COSEWIC, 2004).	Suitable habitat for this species is absent from the Study Area.
Blanding's Turtle	Lakes, ponds, and marshes; prefers shallow water with abundant aquatic vegetation and a soft bottom (MacCulloch, 2002).	Suitable habitat for this species may be present in the Study Area, however the Study Area is outside the known range for this species. The nearest records are from the Canard River and along Lake St. Clair, more than 10 km from the Study Area.
BIRDS		
Bank Swallow	Bank Swallows excavate nests in exposed earth banks along watercourses and lakeshores, roadsides, stockpiles of soil, and the sides of sand and gravel pits (Falconer et al., 2016). Any suitable habitat may be present if stockpiles of soil are present or in areas of sand/gravel extraction.	Potential habitat will be identified during field surveys in 2019.
Barn Swallow	Nest on walls or ledges of barns and other human-made structures such as bridges, culverts or other buildings; forages in open areas for flying insects (COSEWIC 2011).	Suitable nesting habitat is available in barns and old structures; however, no structures are proposed for removal.
Bobolink	Nests primarily in forage crops with a mixture of grasses and broad-leaved forbs, predominantly hayfields and pastures (COSEWIC 2010b).	Suitable habitat is present within the Study Area. Habitat use will be determined through breeding bird surveys conducted in June 2019.
Eastern Meadowlark	Meadows, hayfields and pastures; also, other open habitat types including mown lawn (COSEWIC 2011b). Prefers large (~5 ha), low-lying wet grasslands with abundant litter (COSEWIC 2011b).	Suitable habitat is present within the Study Area. Habitat use will be determined through breeding bird surveys conducted in June 2019.
Yellow-breasted Chat	Prefers scrubby, early successional habitat; recorded in shrub thickets, woodland edges, hedgerows, regenerating abandoned fields and young coniferous plantations, and in hydro and rail rights-of-way (Cadman et al. 2007).	Suitable habitat for the species may be present in the Study Area. Breeding bird surveys will be completed in 2019 to confirm species presence or absence.

Appendix E-2: Habitat Potential in the Study Area for Threatened or Endangered Species

Species	Habitat Preference	Habitat Potential
Prothonotary Warbler	Found in deciduous swamps and floodplains; nests exclusively in tree cavities or specially-constructed nest boxes, usually overhanging open water (Cadman et al., 2007).	Suitable deciduous swamp or floodplain forest are absent from the Study Area.
Barn Owl	Favours pastures, hayfields, marshes and other grassy habitats that support mice and vole populations. Nests in barns, church steeples, silos, cavities in large trees and artificial nest boxes (Cadman et al., 2007).	Suitable nesting habitat is available in barns and old structures; however, no structures are proposed for removal.
Eastern Whip-poor-will	Open woodlands with frequent clearings. Preferred nesting sites contain shaded leaf litter or pine needles and generally occur along wooded edges or in clearings without any herbaceous growth. The species is considered to be area-sensitive, preferring 100 hectares of suitable habitat for breeding (Cadman et al. 2007).	Suitable large, open woodlands are absent from the Study Area.
Least Bittern	Nests in freshwater marshes where dense aquatic vegetation occurs with woody vegetation and open water. They are found most commonly in marshes greater than 5 ha in size (Gibbs et al., 1992).	Suitable large marshes are absent from the Study Area.
American White Pelican	Breeds on remote islands in freshwater lakes, and occasionally in brackish or saltwater locations; lakes are small, remote, and typically low bedrock islands (Cadman et al., 2007).	Lakes are absent from the Study Area.
Cerulean Warbler	Breeds mainly in mature deciduous or swamp forest. The species generally prefers tracts over 100 ha in size but it has been found to breed in woodlots as small as 10 ha (Hamel, 2000).	Suitable mature deciduous forest may be present in the Study Area, however limited to no tree removal is anticipated.
Chimney Swift	Chimney Swifts primarily use chimneys for roosting and nesting, and only rarely nest in large hollow trees (Fitzgerald et al., 2014; Zanchetta et al., 2014).	There may be available chimneys along the proposed route, but no structures are proposed for removal.

Appendix E-2: Habitat Potential in the Study Area for Threatened or Endangered Species

Species	Habitat Preference	Habitat Potential
MAMMALS		
Small-footed Myotis	Small-footed myotis hibernate in caves and abandoned mines in winter, and roost under rocks, in rock outcrops, buildings, under bridges, or in caves, mines, or hollow trees in the spring and summer (MNRF 2017).	Suitable roosting habitat is available in barns and old structures; however, no structures are proposed for removal.
Little Brown Myotis	Trees, buildings and bridges for roosting; trees for nesting; caves and mines for hibernation (COSEWIC 2013).	Suitable roosting habitat is available in barns and old structures; however, no structures are proposed for removal. Candidate maternity roost trees were identified within suitable ELC communities. Limits of clearing, if any clearing is proposed, to be determined in 2019.
Northern Myotis	Caves provide overwintering habitat (COSEWIC 2013). Rarely uses human-made structures for roosting (COSEWIC 2013).	Candidate maternity roost trees were identified within suitable ELC communities. Limits of clearing, if any clearing is proposed, to be determined in 2019.
Tri-colored Bat	Found in a variety of habitats; caves provide overwintering habitat (COSEWIC 2013).	Candidate maternity roost trees were identified within suitable ELC communities where clearing is proposed. Limits of clearing, if any clearing is proposed, to be determined in 2019.
American Badger	Open grasslands, agricultural areas and open parklands with deep soils (Eder, 2002).	Suitable habitat for this species may be present in the Study Area. Habitat assessments will be completed in 2019.
Gray Fox	A variety of vegetation communities, but always near trees and groundcover. Grey Fox prefers foraging in woods rather than open areas (Eder, 2002).	Suitable habitat for this species may be present in the Study Area. Habitat assessments will be completed in 2019.

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