

Adelaide Wind Energy Centre **Natural Heritage Records Review Report**

Prepared for:
NextEra Energy Canada
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NATURAL RESOURCE SOLUTIONS INC.


Aquatic, Terrestrial and Wetland Biologists

**Adelaide Wind Energy Centre
Natural Heritage Records Review Report**

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Report submitted on January 6, 2012



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1.0 Project Description

Natural Resource Solutions Inc. (NRSI) was retained in April 2011 by GL Garrad Hassan on behalf of NextEra Energy Canada to conduct a natural environment resource assessment in accordance with the Renewable Energy Approval (REA) Regulation. This assessment includes a records review, site investigation, evaluation of significance, and impact assessment of any potentially significant natural features at a proposed 60MW wind energy generating facility in Middlesex County and Township of Adelaide Metcalfe, Ontario. The analysis of the natural heritage features and biological factors affecting the proposed site is one issue being considered. Other factors, such as water bodies, land ownership, social impacts, and cultural impacts are also being assessed by other team members, and will be addressed under separate covers as outlined by the REA Regulation.

The Adelaide Wind Energy Centre („Adelaide“), proposed by NextEra Energy Canada, is located in the geographic Township of Adelaide Metcalfe, approximately 13km northwest of the Town of Strathroy. The general project area is roughly bordered by Centre Road, Townsend Line, Sexton Road, and Napperton Drive. In addition, a transmission line is proposed to run north along Kerwood Road from Cuddy Drive north to Nairn Road. This transmission line is then proposed to continue eastward along Nairn Road to an existing 500kV line and substation located west of Petty Street. The Adelaide wind energy generating facility is proposed to consist of up to thirty-eight GE 1.6-100 (1.62 MW) turbines for a total installed capacity of up to 61.56 MW. The proposed GE 1.6-100 turbine is a 3-bladed, upwind, horizontal-axis turbine. The total rotor diameter of the turbine is 100 m, resulting in a swept area of 7,854 m², and is designed to operate at between 9.75 and 16.18 revolutions per minute (rpm). The turbine rotor and nacelle are mounted on top of an 80m tubular tower which is manufactured in sections from steel plate. Each turbine is mounted on a steel reinforced concrete foundation and equipped with a transformer, located outside the base of the tower.

As identified by the REA Regulation, the proposed layout of these features is collectively referred to as the „project location“. In accordance with Section 25 of the Renewable Energy Approval (REA) Regulation (O. Reg. 359/09 of the Environmental Protection Act), NRSI has conducted a thorough records review of available background resources

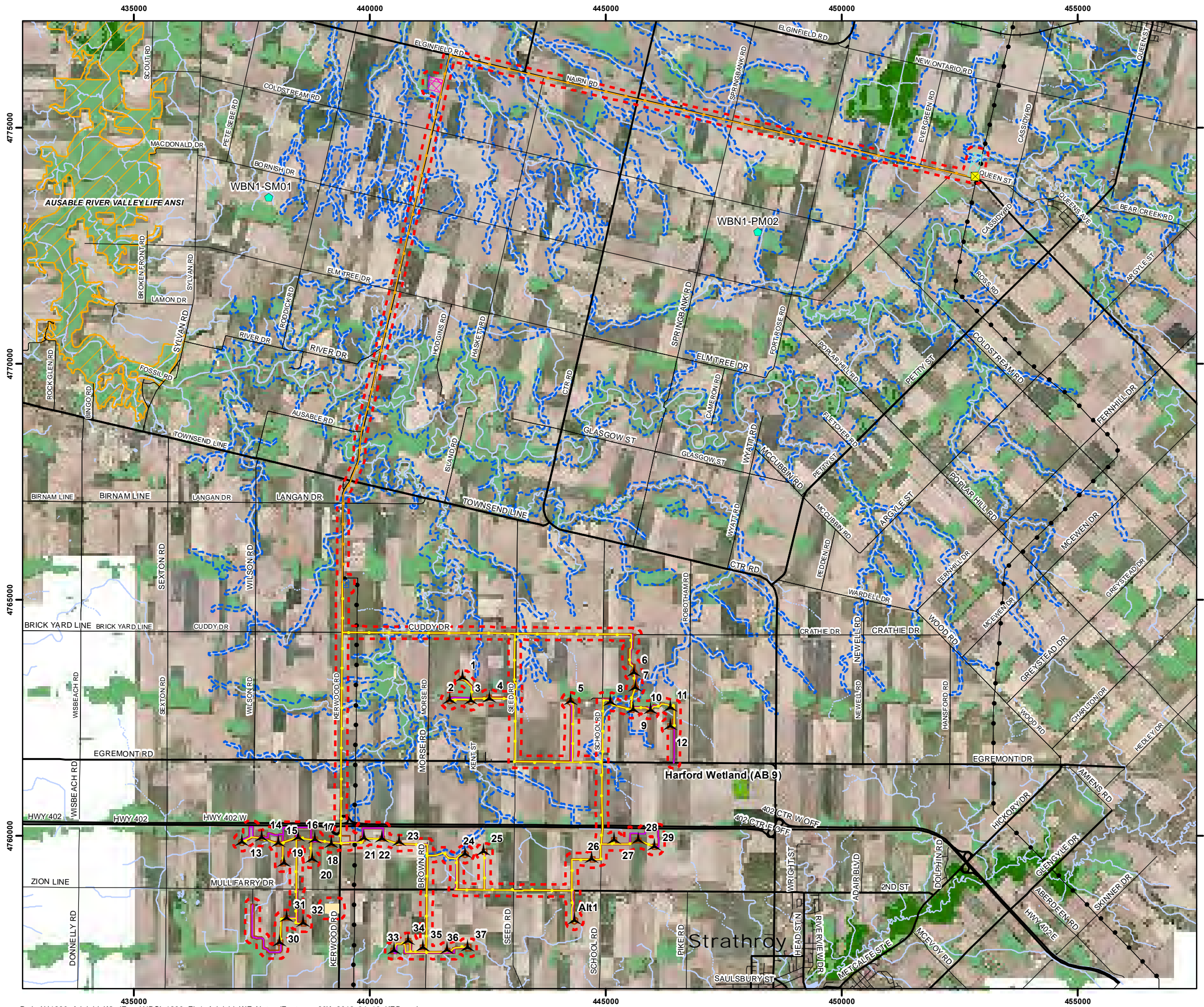
to identify any potentially significant natural features within 120m of the project location. This includes areas within 120m of turbine blade tip as well as any areas that may be used as temporary lay-down areas, crane pads, access roads, connector, distribution and transmission lines. For the purposes of this report, NRSI will refer to the areas within 120m of the project location as the „project area“.

The project area is dominated by rotational agricultural crops of wheat, corn and soybeans. Other land uses, including hayfields and agricultural pasture, are also expected to be present within the project area. Natural features are generally small and isolated from other features; however, several large contiguous woodlands are present within the Adelaide project area. Habitats within the project area are expected to include woodlands, swamps, meadows, thickets, drainage ditches, ponds, creeks and hedgerows. See Figure 1 for a map of the project area and natural features.

As part of this project, NRSI has considered all aspects relating to provincially Threatened and Endangered species. However, since these species are addressed as part of the *Endangered Species Act* (2007), they have not been discussed within any of these Natural Heritage Assessment reports. These species will be address in full detail, including a description and results of field assessments, potential impacts, and recommended mitigation measures, within the *Species At Risk Report* which will be submitted as part of the *Approval and Permitting Requirements Document (APRD)* to be submitted to the MNR under a separate cover, where necessary.

Figure 1

Adelaide Wind Energy Centre Project Area and Natural Features



Legend

- Project Area (120m Buffer)
- Turbine
- Point of Common Coupling (PCC)
- ◆ MET Station
- Access Road
- Interconnection Line
- Collector System
- Project Location
- Staging Area
- Interconnection Facilities
- Substation
- Switching Yard
- Existing Transmission Line
- Railroad
- Primary Road
- Secondary Road
- Waterbody
- Intermittent Watercourse
- Permanent Watercourse
- Provincially Significant Wetland (PSW)
- Other Wetland
- Wooded
- ANSI, Life Science
- ANSI, Earth Science
- Regulation Limit (ABCA)

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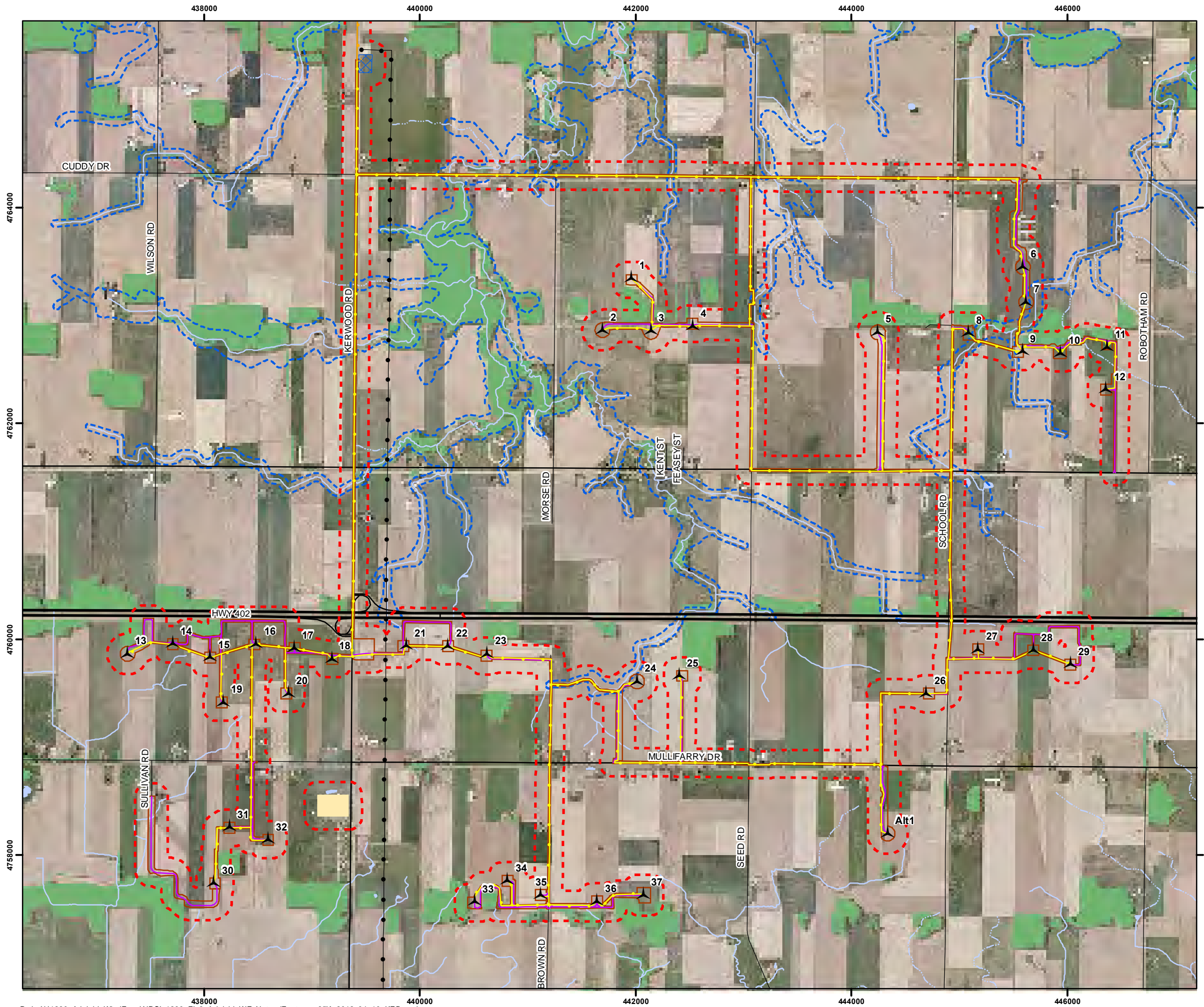
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Figure 2

Adelaide Wind Energy Centre Project Area and Natural Features



- Legend**
- Project Area (120m Buffer)
 - Turbine
 - Point of Common Coupling (PCC)
 - MET Station
 - Access Road
 - Collector System
 - Interconnection Line
 - Project Location
 - Staging Area
 - Interconnection Facilities
 - Substation
 - Existing Transmission Line
 - Railroad
 - Highway
 - Primary Road
 - Secondary Road
 - Intermittent Watercourse
 - Permanent Watercourse
 - Waterbody
 - Provincially Significant Wetland (PSW)
 - Other Wetland
 - Wooded
 - ANSI, Life Science
 - ANSI, Earth Science
 - Regulation Limit (ABCA)

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Project: 1230 Date: April 10, 2012	NAD83 - UTM Zone 17 Scale: 1:35,000 (11x17")
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2.0 REA Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals Under Part V.0.1 of the Act*, (herein referred to as the REA Regulation) made under the *Environmental Protection Act* identifies the requirements for the development of renewable energy projects in Ontario. In accordance with the REA Regulation, the Adelaide Wind Energy Centre, classified as a Class 4 wind facility, is required to complete a REA.

Section 25 of the REA Regulation requires proponents of Class 4 wind projects to undertake a natural heritage records review to identify whether the project location is:

1. in a provincial park or conservation reserve
2. within 120m of a provincial park or conservation reserve
3. in a natural feature
4. within 50 m of an area of natural and scientific interest (earth science), or
5. within 120 m of a natural feature that is not an area of natural and scientific interest (life science)

Natural Features are defined in Section 1.1 of the REA Regulation to be all or part of:

- (a) an area of natural and scientific interest (ANSI) (earth science)
- (b) an ANSI (life science)
- (c) a coastal wetland
- (d) a northern wetland
- (e) a southern wetland
- (f) a valleyland
- (g) a wildlife habitat, or
- (h) a woodland.

Subsection 3 of Section 25 of the REA Regulation requires the proponent to prepare a report “setting out a summary of the records searched and the results of the analysis” (O. Reg. 359/09). This Natural Heritage Records Review Report has been prepared to meet these requirements.

Species at Risk (SAR) species that have been designated as Threatened or Endangered within Ontario, are warranted protection under the *Endangered Species Act* (2007). Although NRSI has considered these species during all stages of records review, site investigation, and evaluation of significance, they will be addressed in detail in a separate *APRD* to be submitted at a later date.

3.0 Records Review Methodology

In accordance with the REA regulation, NRSI biologists consulted several information sources and agencies for the purposes of assessing natural features and wildlife habitat within 120m of the project location. The results of this consultation process have been documented throughout the following report, and have been summarized in Table 1 below.

Table 1. Summary of Records Consulted for the Adelaide Wind Energy Centre

Information Source	Consultation Date (s)	Type of Records Reviewed
Ministry of Natural Resources, Renewable Energy Operations Team	August 30, 2011	Provincial Parks Conservation Reserves Areas of Natural and Scientific Interest (LS) Areas of Natural and Scientific Interest (ES) Woodlands Wetlands Valleylands Significant Wildlife Habitat
Environment Canada / Canadian Wildlife Service (Rob Read)	August 5, 2011 and September 19, 2011	No records received as of the date of this report
Middlesex County Natural Heritage Study (2003)	August 9, 2011	Woodlands Wetlands Significant Wildlife Habitat
Middlesex County Official Plan (2006)	August 9, 2011	Areas of Natural and Scientific Interest (LS) Areas of Natural and Scientific Interest (ES) Woodlands Wetlands Significant Wildlife Habitat
Ausable Bayfield Conservation Authority (Andrew Bicknell)	August 5, 2011, and September 19, 2011	No records received as of the date of this report
St. Clair Region Conservation Authority (Dallas Cundick & Chris Durand)	August 12, 2011	Woodlands Wetlands Significant Wildlife Habitat
Township of Adelaide Metcalfe Official Plan	August 9, 2011	Areas of Natural and Scientific Interest (LS) Areas of Natural and Scientific Interest (ES) Woodlands Wetlands Significant Wildlife Habitat
Ministry of Natural Resources, NHIC and Biodiversity Explorer	July 22, 2011	Areas of Natural and Scientific Interest (Life Science) Areas of Natural and Scientific Interest (Earth Science) Wetlands Significant Wildlife Habitat
Ministry of Natural Resources, Land Information Ontario	July 2011	Provincial Parks Conservation Reserves Areas of Natural and Scientific Interest (LS) Areas of Natural and Scientific Interest (ES) Woodlands Wetlands Significant Wildlife Habitat
Ministry of Northern Development, Mines, and	September 13, 2011	Significant Wildlife Habitat

Forestry		
Ontario Herpetofaunal Atlas	July 18, 2011	Significant Wildlife Habitat
Atlas of the Mammals of Ontario	July 18, 2011	Significant Wildlife Habitat
Ontario Breeding Bird Atlas	July 18, 2011	Significant Wildlife Habitat
Christmas Bird Count	September 19, 2011	Significant Wildlife Habitat
Bird Studies Canada, BirdMap Canada	September 19, 2011	Significant Wildlife Habitat; Important Bird Areas
Final Environmental Screening Report/Environmental Impact Statement for Adelaide Wind Farm (Golder Associates 2009)	July 2011	Woodlands Wetlands Significant Wildlife Habitat

4.0 Natural Areas

For the purposes of the Natural Heritage Assessment reporting, NRSI has used the term natural area to identify features that have already been given a provincial or federal designation, including provincial parks, conservation reserves, and Areas of Natural and Scientific Interest (ANSI). Information obtained on each of these natural areas has been outlined below.

4.1 Provincial Parks and Conservation Reserves

No provincial parks or conservation reserves have been identified within 120m of the Adelaide Wind Energy Centre project location.

4.2 Areas of Natural and Scientific Interest – Life Science

No Life Science (LS) Areas of Natural and Scientific Interest (ANSI) were identified within 120m of the Adelaide Wind Energy Centre project location.

4.3 Areas of Natural and Scientific Interest – Earth Science

No Earth Science (ES) Areas of Natural and Scientific Interest were identified within 50m of the Adelaide Wind Energy Centre project location.

4.4 Other

Two Environmentally Significant Areas (ESA) are located within the project area of the Adelaide Wind Energy Centre.

The first ESA is roughly located southeast of the intersection of Kerwood Road and Cuddy Drive and has been identified by the Township of Adelaide Metcalfe (Township of Adelaide Metcalfe 2011). The northern boundary of this regionally significant ESA extends within 120m of the proposed cabling route for the Adelaide Wind Energy Centre project area.

The second ESA is roughly located northeast of the intersection of Kerwood Road and Townsend Line and has been identified by the Ausable-Bayfield Conservation Authority. This natural area has been designated as an ESA because of its large size and floodwater retention capabilities. The area retains water from Adelaide Creek, although

the majority of the woodland contains typical upland species because of the dryness of the floodplain (Ausable Bayfield Conservation Authority n.d.).

In addition to the two above mentioned ESAs, the St. Clair Region Conservation Authority has identified a significant natural area, Kerwood Bluff, in the vicinity of the Adelaide Wind Energy Centre. This natural area is predominantly deciduous forest with a swamp community along the creek, which dissects this natural feature. Kerwood Bluff has 5 deciduous vegetation associations including a silver maple swamp. The area is topographically flat except for a hill caused by the bluff and contains both a natural watercourse as well as a drainage ditch. This natural feature falls within 120m of the project location and will be further examined in the site investigation phase of the project.

Since these natural feature types are not specifically identified by the REA Regulation, they will be considered in more detail as woodland, wetland, valleyland, and wildlife habitat, but will not be discussed further under any of the natural area categories.

5.0 Woodlands

Information collected from the sources identified above suggests that the project location overlaps with 19 woodlands, and is within 120m of an additional 46 woodlands. These woodlands are expected to be dominated by mid-aged to mature deciduous tree species; however, young woodlands, treed plantations, or occasional coniferous woodlands may also be present within 120m of the project location. Available basemapping indicates that these 65 woodlands found within 120m of the project location range in size from 0.2ha to 137.2ha.

The 19 woodlands that are overlapped by project locations are expected to be deciduous forests, composed of species that are characteristic of the region (Ecodistrict 7E). The majority of these woodlands are overlapped slightly by the project disturbance area and other project locations, such as access roads. The extent to which the project location overlaps woodlands is variable and will be further examined and addressed in the site investigation phase of the project when site-specific feature boundaries are confirmed during field investigations. It is anticipated that field surveys will confirm that in many instances the project location is adjacent to these woodlands, with no direct overlap.

Similar to the overlapping woodlands, the remaining 46 woodlands within 120m of the project area are expected to be deciduous forests. These woodlands are scattered throughout the project area, and are found within 120m of all types of project components, including turbines, access roads, cabling and transmission line (see Figures 1 and 2). Species associations and distances of these woodlands to project locations will be confirmed during the site investigation phase of this project.

6.0 Wetlands

A single wetland feature, Harford Wetland, has been identified through this comprehensive records review. This wetland, although not within 120m of the project location was been identified by the Ausable Bayfield Conservation Authority (ABCA) as being in the general vicinity of the project location. Harford Wetland is located southwest of the intersection of Egremont Drive and Centre Road. Additional information was requested from ABCA; however no further details were received by NRSI as of the date of this report. This wetland is more than 120m from the nearest project location and will not be considered in more detail as part of this Natural Heritage Assessment.

Information provided by the Ministry of Natural Resources on August 30, 2011 indicated that the various woodlands in, and within 120m of, the project location need to be investigated to determine presence of swamps.

The presence/absence of wetlands will be confirmed during the site investigation.

7.0 Valleylands

Information pertaining to valleylands is generally maintained by the local Conservation Authorities. Through correspondence with the St. Clair Region Conservation Authority and Ausable Bayfield Conservation Authority, no specific information on valleylands within 120m of the Adelaide Wind Energy Centre was provided to NRSI. Furthermore, the background information provided by the MNR did not specifically identify any known valleylands within the Adelaide project area.

A more detailed review of potential valleylands will occur as part of the site investigation phase of this project.

8.0 Wildlife Habitat

As part of the REA process, NRSI biologists have examined available records associated with the presence of wildlife habitat within 120m of the Adelaide Wind Energy Centre. For the purposes of this series of Natural Heritage Assessment reports, NRSI has separated the discussion on wildlife habitat into four broad categories, following the Significant Wildlife Habitat Technical Guide (MNR 2000). These four categories are seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of species of conservation concern, and animal movement corridors. Each of these broad wildlife habitat categories are described in the following sections.

8.1 Seasonal Concentration Areas

The records review process did not reveal any known seasonal concentration areas, as summarized in Table 2. The presence of potential seasonal concentration areas within 120m of the project location will be confirmed during the site investigation phase of the project.

Although no confirmed seasonal concentration areas have been identified, background information has indicated that several concentration areas have the potential to be present within the Adelaide project area. Each of these habitats is discussed in Table 2 below, including information on whether further consideration is required during the site investigation phase of this project.

Table 2. Summary of Seasonal Concentration Areas Identified Near the Adelaide Wind Energy Centre

Seasonal Concentration Areas	Present in or Within 120m of Project Location	Details	Site Investigation Required (Y/N)
Winter Deer Yards	No	Winter deer yards are not common in the general area.	No
Moose Late Winter Habitat	N/A	Does not apply to the project location.	No
Colonial-Nesting Bird Breeding Habitat (swallows)	Unknown		Yes
Colonial-Nesting Bird Breeding Habitat (tree/shrub)	Unknown		Yes
Colonial-Nesting Bird Breeding Habitat (ground)	Unknown		Yes

Waterfowl Stopover and Staging Areas (terrestrial)	Unknown		Yes
Waterfowl Stopover and Staging Areas (aquatic)	Unknown		Yes
Waterfowl Nesting Habitat	Unknown		Yes
Shorebird Migratory Stopover Areas	N/A	Project location is greater than 5km from the Great Lakes shoreline.	N/A
Landbird (including songbird) Migratory Stopover Areas	N/A	Project location is not located within 5km of Lake Erie.	N/A
Raptor Winter Feeding and Roosting Areas	Unknown	Christmas bird count occurrence of rough legged hawk in vicinity of project.	Yes
Wild Turkey Winter Range	N/A	Does not apply to project location	N/A
Turkey Vulture Summer Roosting Areas	N/A	Does not apply to project location	N/A
Reptile Hibernacula (snakes)	Unknown		Yes
Bat Hibernacula	Unknown	Ministry of Northern Development, Mines and Forestry was consulted; there are no abandoned mines but there is inferred karst topography and potential caves within 120m of the project location. Site investigation will be conducted.	Yes
Bat Maternity Colonies	Unknown	There are 65 woodlands within 120m of the project location that will be further examined during site investigation.	Yes
Migratory Butterfly Stopover Areas	N/A	Project location is greater than 5km from Great Lakes.	N/A

8.2 Rare Vegetation Communities and Specialized Wildlife Habitat

The records review process did not reveal any known rare vegetation communities and/or specialized wildlife habitat; however, their presence within 120m of the project location will be confirmed during the site investigation phase of the project.

Although it is unknown whether any rare vegetation communities or specialized wildlife habitats are present within 120m of the project location, background information has indicated that many of these natural features have the potential to be present. Each of these rare vegetation communities and specialized wildlife habitats are discussed in

Table 3 below, including information on whether further consideration is required during the site investigation phase of this project.

Table 3. Summary of Rare Vegetation Communities and Specialized Wildlife Habitat Identified Near the Adelaide Wind Energy Centre

Wildlife Habitat	Present Within 120m of Project Location	Details	Site Investigation Required (Y/N)
Alvars	Unknown	Basemapping does not indicate the presence of this habitat.	Yes
Tall-grass Prairies	Unknown		Yes
Savannahs	Unknown		Yes
Rare Forest Types	Unknown	There are 65 woodlands within 120m of the project location that will be further examined during site investigation.	Yes
Talus Slopes	Unknown	Basemapping does not indicate the presence of this habitat.	Yes
Rock Barrens	Unknown	Basemapping does not indicate the presence of this habitat.	Yes
Sand Barrens	Unknown	Basemapping does not indicate the presence of this habitat.	Yes
Great Lakes Dunes	N/A	The distance from the Great Lakes is too far from the project location.	N/A
Forests Providing High Diversity of Habitats	N/A	N/A	No
Old-growth or Mature Forest Stands	Unknown	There are 65 woodlands within 120m of the project location that will be further examined during site investigation.	Yes
Foraging Areas with Abundant Mast	N/A	Does not apply to project location	N/A
Turtle Nesting Habitat	Unknown		Yes
Turtle-Over-wintering Habitat	Unknown		Yes
Woodland Raptor Nesting Habitat	Unknown	There are 4 woodlands within 120m of the project location that are at least 30ha in size.	Yes
Osprey Nesting and Bald Eagle, Foraging, and Perching Habitat	Unknown		Yes
Moose Calving Areas	N/A	Does not apply to the project location; site investigation is not necessary.	N/A
Moose Aquatic Feeding Areas	N/A	Does not apply to the project location; site investigation is not necessary.	N/A
Mineral Licks	N/A	Does not apply to the project location.	N/A

Mink, Otter, Marten, and Fisher Denning Sites	Unknown	Riparian areas for mink dens need to be considered at site investigation. Otter, marten and fisher denning sites do not need to be considered at site investigation.	Yes
Highly Diverse Areas	N/A	N/A	No
Cliffs	No	Basemapping and Ontario Geological Survey mapping indicate there are no cliffs within 120m of the project location.	No
Seeps and Springs	Unknown		Yes
Amphibian Breeding Habitat (woodland)	Unknown	There are 65 woodlands within 120m of the project location that will be further examined for suitable habitat during site investigation.	Yes
Amphibian Breeding Habitat (wetland)	Unknown		Yes

8.3 Habitats of Species of Conservation Concern

Species of conservation concern include all species that have been designated as a species of Special Concern according to the Species At Risk in Ontario (SARO) or have been given a provincial S-Rank of S1-S3, but have not been designated as either Endangered or Threatened within Ontario. Species At Risk (provincially Threatened or Endangered) will be addressed separately in an *Approval and Permitting Requirements Document* to address the *Endangered Species Act (2007)*.

A summary of habitats of species of conservation concern that may be located near the Adelaide Wind Energy Centre can be found below in Table 4.

Table 4. Summary of Habitats of Species of Conservation Concern Identified Near the Adelaide Wind Energy Centre

Wildlife Habitat	Present Within 120m of Project Location	Details	Site Investigation Required (Y/N)
Marsh Bird Breeding Habitat	Unknown		Yes
Woodland Area Sensitive Breeding Birds	Unknown	15 woodlands have been identified as having interior habitat	Yes
Open Country Breeding Bird Habitat	Unknown	Ontario Breeding Bird Atlas was consulted and site investigation will be conducted.	Yes
Shrub/Early Successional Bird Breeding Habitat	Unknown		Yes
Terrestrial Crayfish	Unknown		Yes
Special Concern Species	Unknown	These species are further discussed in subsequent sections of this report.	Yes
S1-S3, and SH Species and Communities	Unknown	These species are further discussed in subsequent sections of this report.	Yes

Through a query of the records consulted in this review (reference Table 1), a total of 67 species of conservation concern that have been identified within the vicinity of the Adelaide Wind Energy Centre. These records include 9 historical sightings, prior to 1980, which are expected to represent historical populations and are unlikely to be present within 120m of the project location. The remaining 58 current (1980-2011) species records represent a variety of species groups, including 10 birds, 4 reptiles, 1 mammal, 5 odonates, and 38 plant species. Each of these species is discussed in more detail in the following sections.

8.3.1 Birds

NRSI has identified a total of 10 bird species of conservation concern that have the potential to occur within the vicinity of the Adelaide Wind Energy Centre. Each of these 10 species is identified in Table 5. There were no documented important bird areas found during the records review.

Table 5. Bird Species of Conservation Concern Identified Near the Adelaide Wind Energy Centre

Scientific Name	Common Name	S-Rank	SARO Status	COSEWIC Status
<i>Asio flammeus</i>	Short-eared Owl ¹	S2N, 4B	SC	SC
<i>Calcarius lapponicus</i>	Lapland Longspur ²	S3B		
<i>Chlidonias niger</i>	Black Tern ¹	S3B	SC	NAR
<i>Clangula hyemalis</i>	Long-tailed Duck ²	S3B		
<i>Haliaeetus leucocephalus</i>	Bald Eagle ¹	S2N, S4B	SC	NAR
<i>Larus marinus</i>	Great Black-backed Gull ²	S2B		
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker ¹	S4B	SC	THR
<i>Seiurus motacilla</i>	Louisiana Waterthrush ^{1,3}	S3B	SC	SC
<i>Vermivora chrysoptera</i>	Golden-winged Warbler ¹	S4B	SC	THR
<i>Wilsonia citrina</i>	Hooded Warbler ¹	S3B	SC	THR

¹ Ontario Breeding Bird Atlas (Cadman et. al 2007)

² Christmas Bird Count (National Audubon Society 2011)

³ Biodiversity Explorer Record (OMNR 2011)

Provincial Rank (S-Rank)

S1: Critically Imperiled
 S2: Imperiled
 S3: Vulnerable
 S4: Apparently Secure
 SH: Historic

COSEWIC and SARO Status

END: Endangered
 THR: Threatened
 SC: Special Concern
 NAR: Not at Risk

Habitats for these species may be considered significant wildlife habitat, and will be reviewed in more detail during the site investigation and evaluation of significance phases of this project. Due to the potential for habitats of these species to represent significant wildlife habitat, brief habitat descriptions for each species have been provided below.

Bald Eagle

Bald eagle (*Haliaeetus leucocephalus*) habitat tends to consist of large continuous areas of deciduous or mixed woods around large lakes or rivers (OMNR 2000). This species requires 255ha areas of open woodlands with tall trees for nesting, shelter, feeding as well as roosting (OMNR 2000). Due to the high proportion of agricultural fields and fragmentation of woodlands in the vicinity of the project location, it is not likely that the bald eagle will have breeding habitat present in the Adelaide Wind Energy Centre project area. This species will not be carried forward to site investigation.

Black Tern

Black tern (*Chlidonias niger*) requires wetlands for breeding, and has been recorded within the OBBA and Biodiversity Explorer reference squares that overlap with the project area (Cadman et. al 2007, OMNR 2000). Black Terns

require open water near nest sites and prefer marshes >20ha in size. Based on project location mapping available, this habitat does not appear to be available; therefore, it is not likely that black tern will be present in the Adelaide Wind Energy Centre project location. Black tern will not be carried forward to site investigation.

Golden-winged Warbler

Golden-winged warbler (*Vermivora chrysoptera*) favors breeding habitat in areas of early successional vegetation, such as shrubby, grassy abandoned, fields with small deciduous trees bordered by low woodland and wooded swamps. Candidate habitat also includes alder bogs, deciduous damp woods, and shrubby clearings in deciduous woods with saplings and grasses or brier-woodland edges (OMNR 2000). Golden-winged warbler can also be found in field edges, hydro or utility right-of-ways, or recently logged areas (OMNR 2008). This species requires more than 10ha of continuous habitat (OMNR 2000). Habitat for the golden-winged warbler may be present within 120m of the project location in the form of fallow fields bordered by woodland areas and wooded swamps, deciduous damp woods and shrubby clearings in deciduous woods. This species and its habitat will be carried forward to the site investigation.

Great Black-backed Gull

Great black-backed gull (*Larus marinus*) requires flat rocky coastal islands, moorlands, rocky beaches or cliffs and nests in solitary or in small (rarely large) colonies (OMNR 2000). This habitat does not occur within 120m of the project location and will not be carried forward to the site investigation.

Hooded Warbler

In Ontario, hooded warbler (*Wilsonia citrine*) breeds mainly in the Carolinian Zone of southwestern Ontario, in the interiors of large upland tracts of mature deciduous and mixed forest along stream bottoms, and in ravines. It selects habitats in which small openings in the forest canopy have permitted a dense growth of low understory shrubs, and it abandons areas once the vegetation becomes too thin or too tall (OMNR 2008). Although habitat for this species possible occurs along the Ausable River, habitat does not exist within 120m of the project location and hooded warbler will not be carried forward to the site investigation.

Lapland Longspur

Lapland longspur (*Calcarius lapponicus*) winters on open ground such as fields and beaches (Sibley 2003). The Strathroy Christmas bird count (2009) indicated that this species has been observed in the vicinity of the project location (National Audubon Society 2011). Due to the abundance of wintering habitat for Lapland longspur, it is likely that it is present in the project area during winter months, however breeding habitat for this species is not present within the Adelaide Wind Energy Centre and it will not be carried forward to site investigation.

Long-tailed Duck

Long-tailed duck (*Clangula hyemalis*) breeds in subarctic and arctic wetlands and spends the winter in coastal marine waters and large freshwater lakes

(Robertson and Lavard 2002). This habitat does not exist within 120m of the project location and will not be carried forward to the site investigation.

Louisiana Waterthrush

Louisiana waterthrush (*Seiurus motacilla*) is usually found in steep, forested ravines with fast-flowing streams, woodland swamps or large tracts of deciduous or mixed forests. Canopy cover is essential and this bird nests on the ground (OMNR 2000). This species would likely inhabit areas near the Ausable River where steep, forested ravines exist in fast-flowing water; however, these areas are not within 120m of the project location. Therefore, this species and its habitat will not be carried forward to the site investigation.

Red-headed Woodpecker

Red-headed woodpecker (*Melanerpes erythrocephalus*) lives in open woodland and woodland edges, especially in oak savannahs and riparian forest. They can be found in fields or pastures, orchards and small woodlots (OMNR 2000). These habitats contain a higher density of dead trees, which they commonly use for nesting and perching (OMNR 2008). As well, red-headed woodpeckers require a tree with a diameter at breast height of at least 40cm for tree cavity nesting and require around 4ha for territory (OMNR 2000). Habitat for this species may exist within 120m of the project location and will be carried forward to the site investigation.

Short-eared Owl

Short-eared owl (*Asio flammeus*) habitat consists of grasslands, open areas or meadows that are grassy or bushy. This species is a ground nester and requires 75-100ha of contiguous open habitat (OMNR 2000). The short-eared owl population has declined largely due to the destruction of wetlands by drainage for agriculture (OMNR 2000). It is possible that large areas of meadows, pastures, and hayfields may be present within the project area, and therefore support habitat for this species. Habitat for the short-eared owl will be carried forward to the site investigation phase of this project.

As a result of the review of species of conservation concern that may be present within the project area and preferred habitats of each species, NRSI biologists have determined that several of these species are expected to be present within, or near, the Adelaide Wind Energy Centre project area based on available background information. Most of these species, if present, are most likely to be breeding within the nearby woodlands or hedgerow habitats, and are unlikely to use the active agricultural fields where the majority of project location is proposed.

8.3.2 Herpetofauna

A total of 4 reptile species of conservation concern have been documented within the vicinity of the project area. Each of these species, including provincial and federal status, have been identified in Table 6 below.

Table 6. Herpetofauna Species of Conservation Concern Identified Near the Adelaide Wind Energy Centre

Scientific Name	Common Name	S-Rank	SARO Status	COSEWIC Status
<i>Chelydra serpentine serpentina</i>	Common Snapping Turtle	S5	SC	SC
<i>Graptemys geographica</i>	Northern Map Turtle	S3	SC	SC
<i>Lampropeltis triangulum triangulum</i>	Eastern Milksnake	S3	SC	SC
<i>Thamnophis sauritus septentrionalis</i>	(Eastern) Ribbonsnake (Great Lakes population)	S3	SC	SC

Provincial Rank (S-Rank)

S1: Critically Imperiled
S2: Imperiled
S3: Vulnerable

COSEWIC and SARO Status

END: Endangered
THR: Threatened
SC: Special Concern

If any suitable habitats of these species are found within the project area, they may be considered candidate significant wildlife habitat, and should be reviewed in more detail during the site investigation and evaluation of significance phases of this project. Due to the potential for habitats of these species to represent significant wildlife habitat, brief habitat descriptions for each species have been provided below.

Common Snapping Turtle

Common snapping turtles (*Chelydra serpentine serpentina*) can inhabit permanent, or semi-permanent, bodies of water, marshes, bogs, or rivers and streams with soft, muddy substrates (OMNR 2000). This species of Special Concern can often be found nesting considerable distances from aquatic habitats. It is possible that this species may be found within the watercourses or ponds within the project area, and may travel through the project area looking for breeding locations. Candidate habitat for this species will be considered during site investigation.

Northern Map Turtle

Northern map turtle (*Graptemys geographica*) has been recorded within the general vicinity of the project area (Oldham and Weller 2000). This species of Special Concern typically prefers large open water systems with soft, muddy bottoms (OMNR 2000). This species will sometimes travel considerable distances from aquatic habitats and will often use aquatic corridors for travel

(OMNR 2000). Available basemapping obtained from LIO and aerial photography indicated that watercourses and open water habitat within the project area is limited. This species is more likely associated within shoreline habitats and is not likely to be found in the Adelaide Wind Energy Centre project area. This species will not be carried forward to site investigation.

Eastern Milksnake

Eastern milksnake (*Lampropeltis triangulum triangulum*) is a species of Special Concern and is also known to be a habitat generalist, often found in open woodlands, fields, and farm buildings (OMNR 2000). Habitat of this type is abundantly available in the project area, and there are several records of this species from within the project area. It is possible that the eastern milksnake is present within the Adelaide Wind Energy Centre project area. Candidate habitat for this species will be considered during site investigation.

(Eastern) Ribbonsnake (Great Lakes population)

Eastern ribbonsnakes (*Thamnophis sauritus*) are a species of Special Concern which live in open grassy areas with low, dense vegetation near bodies of shallow, permanent and calm water (OMNR 2000). Habitat of this type is available within the project area, and this species may be occasionally found along vegetated watercourses within the Adelaide Wind Energy Centre project area. Candidate habitat for this species will be considered during site investigation.

As a result of the review of herpetofaunal species of conservation concern that may be present within the project area and preferred habitats of each species, NRSI biologists have determined that several of these species may be present within, or near, the Adelaide Wind Energy Centre project area. Most of these species, if present, are most likely to occur near watercourses, wetlands, or fresh-moist woodlands with vernal pooling. The occurrence of these species will be further examined in the site investigation phase of the project: common snapping turtle, eastern milksnake and eastern ribbonsnake.

8.3.3 Mammals

A detailed records review has identified one mammal species of conservation concern that may occur within the vicinity of the Adelaide Wind Energy Centre. This species and its habitat are further discussed below. NRSI biologists will continue to examine potential habitats and document all mammal species encountered during the site investigation and evaluation of significance phases of this project.

Woodland Vole

Woodland vole (*Microtus pinetorum*) is found in mature deciduous forest in the Carolinian forest zone with loose sandy soil and deep humus, as well as

grasslands, meadows and orchards with groundcover of duff or grass (OMNR 2000). Habitat for this species may be present within the project area in the form of mid-age to mature deciduous forest, grasslands and meadows and will be carried forward to the site investigation.

8.3.4 Vegetation

Thirty-eight vegetation species of conservation concern have been documented within the vicinity of the project area. Each of these species, including provincial and federal status, has been identified in Table 7 below.

Table 7. Vegetation Species of Conservation Concern Identified Near the Adelaide Wind Energy Centre

Scientific Name	Common Name	S-Rank	SARO Status	COSEWIC Status
<i>Allium tricoccum</i> var. <i>burdickii</i>	Narrow-leaved Wild Leek ¹	S1?		
<i>Aplectrum hyemale</i>	Puttyroot ¹	S2		
<i>Arisaema dracontium</i>	Green Dragon ¹	S3	SC	SC
<i>Aristida longespica</i> var. <i>longespica</i>	Slim-spiked Three-awned Grass ¹	S2		
<i>Arnoglossum plantagineum</i>	Tuberous Indian-plantain ¹	S3	SC	SC
<i>Astragalus neglectus</i>	Cooper's Milk-vetch ¹	S3		
<i>Carex careyana</i>	Carey's Sedge ¹	S2		
<i>Carex meadii</i>	Mead's Sedge ¹	S2		
<i>Carex tetanica</i>	Rigid Sedge ¹	S3		
<i>Carex trichocarpa</i>	Hairy-fruited Sedge ¹	S3		
<i>Conioselinum chinense</i>	Chinese Hemlock Parsley ¹	S2		
<i>Coreopsis tripteris</i>	Tall Tickweed ¹	S2		
<i>Cypripedium arietinum</i>	Ram's-head Lady's-slipper ¹	S3		
<i>Diarrhena obovata</i>	Ovate Beak Grass ¹	S1		
<i>Elymus curvatus</i>	Awnless Wild Rye ¹	S2S3		
<i>Erigenia bulbosa</i>	Harbinger-of-spring ¹	S3?		
<i>Euonymus atropurpureus</i>	Burning Bush ¹	S3		
<i>Fraxinus profunda</i>	Pumpkin Ash ¹	S2?		
<i>Galium pilosum</i>	Hairy Bedstraw ¹	S3		
<i>Gentianella quinquefolia</i>	Stiff Gentian ¹	S2		
<i>Hypericum prolificum</i>	Shrubby St. John's-wort ¹	S2		
<i>Hypoxis hirsute</i>	Yellow Stargrass ¹	S3		
<i>Liatris aspera</i>	Tall Blazing Star ¹	S2		
<i>Lithospermum latifolium</i>	American Gromwell ¹	S3		
<i>Lythrum alatum</i>	Winged Loosestrife ¹	S3		
<i>Muhlenbergia tenuiflora</i>	Slim-flowered Muhly ¹	S2		
<i>Packera paupercula</i> var. <i>pseudotomentosa</i>	False Tomentose Balsam Groundsel ¹	S2S3		
<i>Panicum rigidulum</i>	Redtop Panic Grass ¹	S3		

<i>Phlox subulata</i>	Moss Phlox ¹	S1?		
<i>Pycnanthemum tenuifolium</i>	Slender Mountain-mint ¹	S3		
<i>Ratibida pinnata</i>	Gray-headed Prairie Coneflower ¹	S3		
<i>Scirpus expansus</i>	Woodland Bulrush ¹	S1		
<i>Scutellaria parvula</i> var. <i>missouriensis</i>	Leonard's Small Skullcap ¹	S3		
<i>Solidago riddellii</i>	Riddell's Goldenrod ¹	S3	SC	SC
<i>Solidago rigida</i> ssp. <i>rigida</i>	Stiff Goldenrod ¹	S3		
<i>Triosteum perfoliatum</i>	Perfoliate Tinkersweed ¹	S1		
<i>Vernonia gigantea</i>	Giant Ironweed ¹	S1?		
<i>Viola striata</i>	Striped Cream Violet ¹	S3		

¹Biodiversity Explorer Record (OMNR 2011)

Provincial Rank (S-Rank)

S1: Critically Imperiled
S2: Imperiled
S3: Vulnerable

COSEWIC and SARO Status

END: Endangered
THR: Threatened
SC: Special Concern

Each of the 38 species of conservation concern is typical of natural habitats and is unlikely to occur within active agricultural fields. Habitat for species of conservation concern may be considered significant wildlife habitat, and as such, habitats for these species should be considered during the site investigation phase of this project. Due to the potential for habitats of these species to represent significant wildlife habitat, brief habitat descriptions for each species have been provided below.

American Gromwell

American gromwell (*Lithospermum latifolium*) grow in river floodplains, woods and open areas near edges of woods (OMNR 2000). Habitat for this plant species may occur within 120m of the project location in the form of open areas along wooded edges. American gromwell and its habitat will be carried forward to the site investigation.

Awnless Wild Rye

Awnless wild rye (*Elymus curvatus*) is found in moist or damp soils of open forests, thickets, grasslands, ditches, and disturbed ground as well as on bottomlands (USDA n.d.). Habitat for this species may be present within 120m of the project location in the form of open forests, thickets, grasslands, ditches and bottomland. This species and its habitat will be carried forward to the site investigation.

Burning Bush

Burning bush (*Euonymus atropurpureus*) can be found in dry to moist thickets and woods (OMNR 2000), which have the potential to be present within 120m of the project location and will be carried forward to the site investigation.

Carey's Sedge

Carey's sedge (*Carex careyana*) typically grows in mesic to dry-mesic hardwood forests or in floodplain woods (OMNR 2000). Since it is likely that this habitat occurs in the vicinity of the Adelaide Wind Energy Centre, it is possible that this species occurs in the project area.

Chinese Hemlock Parsley

Chinese hemlock parsley (*Conioselinum chinense*) plants can be found in calcareous cedar swamps, wet borders of streams and rivers, seepage slopes in wet coniferous woods, swampy thickets, as well as moist clearings and damp roadsides (OMNR 2000). Of these habitats, it is most likely that there will be swampy thickets or wet borders of streams in the project area. Due to the possibility of Chinese hemlock parsley habitat in the project area, site investigations should be conducted to see if this species occurs.

Cooper's Milk-vetch

Cooper's milk-vetch (*Astragalus neglectus*) prefers open woods and is frequently found on limestone plains (OMNR 2000). Habitat for this species may be present within 120m of the project location in the form of open woods. This species and its habitat will be carried forward to the site investigation.

False Tomentose Balsam Groundsel

False tomentose balsam groundsel (*Packera paupercula* var. *pseudotomentosa*) is found in dry-sandy or gravelly-to-rocky soils in grasslands, barrens, savannas, wooded bluffs, and dunes (Mahoney & Kowal 2008). Habitat for this species is not expected to occur within 120m of the project location and will not be carried forward to the site investigation.

Giant Ironweed

Giant ironweed (*Vernonia gigantea*) is found in mesic prairies, thickets, moist woods, roadsides and grassy meadows (OMNR 2000). Habitat for this species may be present within 120m of the project location in the form of thickets, moist woods, roadsides and grassy meadows. This species and its habitat will be carried forward to the site investigation.

Gray-headed Prairie Coneflower

Gray-headed prairie coneflower (*Ratibida pinnata*) is found in prairies and in open sandy woods (OMNR 2000). Habitat for this species is not expected to occur within 120m of the project location and will not be carried forward to the site investigation.

Green Dragon

Green dragon (*Arisaema dracontium*) is found in wet bottomlands along rivers and creeks (OMNR 2000). Due to the presence of creeks in several areas of the Adelaide Wind Energy Centre, it is possible that this species may be found within the project area.

Hairy Bedstraw

Hairy bedstraw (*Galium pilosum*) grows in dry, sandy woods and thickets and can occasionally be found in dry sandy fields (OMNR 2000). Habitat for this species is not expected to occur within 120m of the project location and will not be carried forward to the site investigation.

Hairy-fruited Sedge

Hairy-fruited sedge (*Carex trichocarpa*) naturally grows on riverbanks (OMNR 2000). As there are several watercourses in the project area, it is possible that hairy-fruited sedge may be present within the project area.

Harbinger-of-Spring

Harbinger-of-spring (*Erigenia bulbosa*) grows in rich, moist deciduous woods, open, wooded river floodplains and bottomlands, as well as streambanks and limestone shingle shores (OMNR 2000). Habitat for harbinger-of-spring may occur within 120m of the project location in the form of rich, moist deciduous woods and streambanks. This species and its habitat will be carried forward to the site investigation.

Leonard's Small Skullcap

Leonard's small skullcap (*Scutellaria parvula* var. *missouriensis*) thrive in prairies and rocks outcrops (OMNR 2000), which are not present within 120m of the project location and will not be carried forward to the site investigation.

Mead's Sedge

Mead's sedge (*Carex meadii*) is found in the prairies (OMNR 2000). Habitat for this species does not exist within 120m of the project location and will not be carried forward to the site investigation.

Moss Phlox

Moss phlox (*Phlox subulata*) is found in open, sandy and rocky woods as well as sandy roadsides and lakeshores (OMNR 2000). Habitat for moss phlox may occur within 120m of the project location in the form of sandy roadsides and will be carried forward to the site investigation.

Narrow-leaved Wild Leek

Narrow-leaved wild leek (*Allium tricoccum* var. *burdickii*) is found in rich woods (OMNR 2000), which may be present within 120m of the project location and will be carried forward to the site investigation.

Ovate Beak Grass

Ovate beak grass (*Diarrhena obovata*) is found in riparian woodlands (OMNR 2000), which may be present within 120m of the project location and will be carried forward to the site investigation.

Perfoliate Tinkersweed

Perfoliate tinkersweed (*Triosteum perfoliatum*) grows in rich deciduous woods (OMNR 2000), which are potentially present within 120m of the project location and will be carried forward to the site investigation.

Pumpkin Ash

Pumpkin Ash (*Fraxinus profunda*) thrives in moist woods (OMNR 2000), which are potentially present within 120m of the project location and will be carried forward to the site investigation.

Puttyroot

Puttyroot (*Aplectrum hyemale*) grows in moist deciduous forest (OMNR 2000), which is highly characteristic of this area of southwestern Ontario. It is possible that habitat for this species occurs in the project area, and the presence of puttyroot will be further investigated during the site investigation phase of this project.

Ram's-head Lady's-slipper

Ram's-head lady's-slipper (*Cypripedium arietinum*) grows in cedar woodlands on limestone plains, in wooded fens and on sandy sites (OMNR 2000). Habitat for this species is not expected to occur within 120m of the project location and will not be carried forward to the site investigation.

Redtop Panic Grass

Redtop panic grass (*Panicum rigidulum*) grows in sandy and rocky shores of lakes and rivers in acidic soil (OMNR 2000). Habitat for this species is not expected to occur within 120m of the project location and will not be carried forward to the site investigation.

Riddell's Goldenrod

Riddell's goldenrod (*Solidago riddellii*) grows in wet, marshy ground, old fields and prairies (OMNR 2000). Habitat for this plant species may be present within 120m of the project location in the form of old fields and will be carried forward to the site investigation.

Rigid Sedge

Rigid sedge (*Carex tetanica*) prefers moist grasslands, sandy shores as well as ditches, prairies and seepages (OMNR 2000). Habitat for this sedge is not expected to exist within 120m of the project location and will not be carried forward to the site investigation.

Shrubby St. John's-wort

Shrubby St. John's-wort (*Hypericum prolificum*) species is typically found in old fields, meadows, and open forested habitats (OMNR 2000); therefore, it may be present within the project area.

Slender Mountain-mint

Slender mountain-mint (*Pycnanthemum tenuifolium*) grows in dry open areas (OMNR 2000), which likely occur within 120m of the project location and will be carried forward to the site investigation.

Slim-flowered Muhly

Slim-flowered muhly (*Muhlenbergia tenuiflora*) is found in rich, deciduous forests, often on rocky or sandy soil (OMNR 2000). Habitat for this species potentially occurs within 120m of the project location in the form of rich, deciduous forests and will be carried forward to the site investigation.

Slim-spiked Three-awned Grass

Slim-spiked three-awned grass (*Aristida longespica* var. *longespica*) can be found in dry to moist sandy fields and sandy openings in prairies (OMNR 2000). Habitat for this species may be present within 120m of the project location in the form of dry to moist sandy fields. This species and its habitat will be carried forward to the site investigation.

Stiff Gentian

Stiff Gentian (*Gentianella quinquefolia*) can be found in moist soil, roadsides, streambanks, edges of woods and prairie habitats (OMNR 2000). Habitat for this plant species may occur within 120m of the project location in the form of moist roadsides, streambanks and edges of woods. This species and its habitat will be carried forward to the site investigation.

Stiff Goldenrod

Stiff Goldenrod (*Solidago rigida* ssp. *rigida*) is found in dry, sandy soils in prairies and waste places (OMNR 2000). Habitat for this species is not expected to occur within 120m of the project location and will not be carried forward to the site investigation.

Striped Cream Violet

Striped cream violet (*Viola striata*) grows in rich, floodplain forests and low, wet woods (OMNR 2000), which is expected to occur in the project location and will be carried forward to the site investigation.

Tall Blazing Star

Tall blazing star (*Liatris aspera*) can be found in open, sandy woods, dry roadsides and sandy prairies (OMNR 2000). Habitat for this species potentially occurs within 120m of the project location in the form of dry roadsides and will be carried forward to the site investigation.

Tall Tickweed

Tall tickweed (*Coreopsis tripteris*) occurs in damp prairies, thickets and open woods (OMNR 2000). Habitat for this species potentially exists within 120m of the project location in the form of thickets and open woods. This species and its habitat will be carried forward to the site investigation.

Tuberous Indian-plantain

Tuberous Indian-plantain (*Arnoglossum plantagineum*) prefers open sunny areas in wet, calcareous meadows or shoreline fens, specifically along Lake Huron (COSEWIC 2002). Habitat for this species is not expected to be present within 120m of the project location and will not be carried forward to the site investigation.

Winged Loosestrife

Winged loosestrife (*Lythrum alatum*) is known to occur in wet meadows, moist prairies, open woods as well as wet, disturbed areas (OMNR 2000). It is possible that winged loosestrife habitat is present in the project area and the presence of this species should be further explored during the site investigation phase of this project.

Woodland Bulrush

Woodland bulrush (*Scirpus expanses*) grows near seeps and stream edges (OMNR 2000), of which streams edges are found within 120m of the project location and will be carried forward to the site investigation.

Yellow Stargrass

Yellow stargrass (*Hypoxis hirsute*) grows in dry open sandy woods and wet to dry meadows and prairies (OMNR 2000). Habitat for this species is potentially present within 120m of the project location in the form of wet to dry meadows. Yellow stargrass and its habitat will be carried forward to the site investigation.

By investigating the qualities and composition of suitable habitat for these species of conservation concern, NRSI biologists have determined that several of these species are expected to be present within, or near, the Adelaide Wind Energy Centre project area. The occurrence of these species will be further examined in the site investigation phase of the project.

8.3.5 Other Wildlife

A detailed records review has identified 5 other wildlife species of conservation concern that may occur within the vicinity of the Adelaide Wind Energy Centre. These species are further described below and summarized in Table 8. NRSI biologists will continue to examine potential habitats and document all wildlife species encountered during the site investigation and evaluation of significance phases of this project.

Table 8. Other Wildlife of Conservation Concern Identified Near the Adelaide Wind Energy Centre

Scientific Name	Common Name	S-Rank	SARO Status	COSEWIC Status
<i>Argia sedula</i>	Blue-ringed Dancer ¹	S2		
<i>Argia translata</i>	Dusky Dancer ¹	S2		
<i>Asterocampa clyton</i>	Tawny Emperor ¹	S2S3		
<i>Enallagma basidens</i>	Double-striped Bluet ¹	S3		
<i>Gomphus graslinellus</i>	Pronghorn Clubtail ¹	S3		

¹ Biodiversity Explorer Record (OMNR 2010)

Provincial Rank (S-Rank)	COSEWIC and SARO Status
S1: Critically Imperiled	END: Endangered
S2: Imperiled	THR: Threatened
S3: Vulnerable	SC: Special Concern

Habitats of these species are considered candidate significant wildlife habitat, and if suitable habitat are expected to be present they should be reviewed in more detail during the site investigation and evaluation of significance phases of this project. Due to the potential for habitats of these species to represent significant wildlife habitat, brief habitat descriptions for each species have been provided below.

Blue-ringed Dancer

Blue-ringed dancer (*Argia sedula*) is found near large rivers, creeks and streams that are often well vegetated and can also be found around lakes and ditches (Lam 2004). Habitat for this species may occur within 120m the project location in the form of creeks and streams that are well vegetated as well as in the form of ditches. This species and its habitat will be carried forward to the site investigation.

Double-striped Bluet

The double-striped Bluet (*Enallagma basidens*) is found at lakes and ponds and is often found in temporary habitats with little vegetation. They can also be occasionally found in slow streams (Lam 2004). Habitat for this species may be present within the project area and will be carried forward to the site investigation.

Dusky Dancer

Dusky dancer (*Argia translata*) can be found on various-sized rivers, creeks, streams and wind-swept lakes that have wind erosive features. This damselfly is rarely found near ponds (Lam 2004). Habitat for this species is not expected to be present within 120m of the project location and will not be carried forward to the site investigation.

Tawny Emperor

Tawny emperor (*Asterocampa clyton*) can be found in open woodlands and roadsides where there is hackberry (Holmes et al. 1991). Habitat for this butterfly may be present within 120m of the project location in the form of open woodlands

and roadsides if hackberry is present. This species and its habitat will be carried forward to the site investigation.

Pronghorn Clubtail

Pronghorn clubtail (*Gomphus graslinellus*) is found near ponds, lakes and slow streams (Jones et al. 2008). Habitats for this dragonfly may be present within 120m of the project location in the form of ponds and slow streams and will be carried forward to the site investigation.

8.3.6 Species of Conservation Concern Summary

A detailed records review has identified several species of conservation concern that may be present within the Adelaide project area. Through a detailed review of critical habitat of each of these species and expected habitat within the project area, NRSI has determined that 38 species have the potential to have preferred habitat within the Adelaide project area. All species of conservation concern identified by this records review have been identified in Table 9 below, including whether habitat requirements warrant further consideration during the site investigation phase of this project.

Table 9. Summary of Species of Conservation Concern with Habitat Present Within the Adelaide Wind Energy Centre Project Area

Scientific Name	Common Name	Details	Site Investigation Required (Y/N)
Birds			
<i>Asio flammeus</i>	Short-eared Owl	Habitat consists of grasslands, open areas or meadows that are grassy or bushy. ¹	Yes
<i>Calcarius lapponicus</i>	Lapland Longspur	Winters on open ground such as fields and beaches. ² Breeding grounds are not present in southern Ontario.	No
<i>Clangula hyemalis</i>	Long-tailed Duck	Breeds in subarctic and arctic wetlands, winters in open water along the edges of the Great Lakes. ³	No
<i>Chidonias niger</i>	Black Tern	Requires open water near nest sites and prefer marshes >20ha in size. ¹	No
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Habitat consists of large continuous areas of deciduous or mixed woods around large lakes or rivers. ¹	No
<i>Larus marinus</i>	Great Black-backed Gull	Nests on coastal islands, rocky beaches or cliffs in small colonies. Winters along the edge of the large open water bodies. ¹	No
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	Favours open woodlands such as oak savannahs, orchards and small	Yes

		woodlots. Typically these habitats contain dead trees of ≥40 cm dbh. Territories are approximately 4 ha. ¹	
<i>Seiurus motacilla</i>	Louisiana Waterthrush	Steep forested ravines with fast flowing creeks, wooded swamps, large deciduous forests.	Yes
<i>Vermivora chrysoptera</i>	Golden-winged Warbler	Prefers early successional habitat such as shrubby abandoned fields. Also along hydro corridors and recently logged areas. Requires more than 10 ha of continuous habitat.	Yes
<i>Wilsoni citrine</i>	Hooded Warbler	Breeds in large tracts of Carolinian forest and mixed forest along stream bottoms. Typically selects forests with a dense understory. ¹	No
Mammals			
<i>Microtus pinetorum</i>	Woodland Vole	Found in mature deciduous forest as well as grassland, orchards with a ground cover of grasses or duff. ¹	Yes
Herptofauna			
<i>Chelydra serpentina serpentine</i>	Common Snapping Turtle	Inhabits permanent or semi-permanent bodies of water, marshes, bogs or rivers and streams with soft, muddy substrates. ¹	Yes
<i>Graptemys geographica</i>	Northern Map Turtle	Habitat consists of large open water systems with soft, muddy bottoms. ¹	No
<i>Lampropeltis t. triangulum</i>	Eastern Milksnake	Habitat often consists of open woodlands, fields, and farm buildings. ¹	Yes
<i>Thamnophis sauritus septentrionalis</i>	(Eastern) Ribbonsnake (Great Lakes population)	Habitat consists of open grassy areas with low, dense vegetation near bodies of shallow, permanent and calm water. ¹	Yes
Vegetation			
<i>Allium tricoccum var. burdickii</i>	Narrow-leaved Wild Leek	Grows in Rich woods. ¹	Yes
<i>Aplectrum hyemale</i>	Puttyroot	Grows in moist deciduous forest. ¹	Yes
<i>Arisaema dracontium</i>	Green Dragon	Grows in wet bottomlands along rivers and creeks. ¹	Yes
<i>Aristida longespica var. longespica</i>	Slim-spiked Three-awned Grass	Grows in dry to moist sandy fields and sandy openings in prairies. ¹	Yes
<i>Arnoglossum plantagineum</i>	Tuberous Indian-plantain	Grows in open sunny areas in wet, calcareous meadows or shoreline fens, specifically along Lake Huron. ¹	No
<i>Astragalus neglectus</i>	Cooper's Milk-vetch	Grows in open woods and is frequently found on limestone plains. ¹	Yes
<i>Carex careyana</i>	Carey's Sedge	Grows in mesic to dry-mesic hardwood forests or in floodplains. ¹	Yes
<i>Carex meadii</i>	Mead's Sedge	Grows in prairies. ¹	No

<i>Carex tetanica</i>	Rigid Sedge	Grows in moist grasslands, sandy shores as well as ditches, prairies and seepages. ¹	No
<i>Carex trichocarpa</i>	Hairy-fruited Sedge	Grows on riverbanks. ¹	Yes
<i>Conioselinum chinense</i>	Chinese Hemlock Parsley	Grows in wet borders of streams and rivers, swampy thickets as well as moist clearings and damp roadsides. ¹	Yes
<i>Coreopsis tripteris</i>	Tall Tickweed	Grows in damp prairies, thickets and open woods. ¹	Yes
<i>Cypripedium arietinum</i>	Ram's-head Lady's-slipper	Grows in cedar woodlands on limestone plains, in wooded fens and on sandy sites. ¹	No
<i>Diarrhena obovata</i>	Ovate Beak Grass	Grows in riparian woodlands. ¹	Yes
<i>Elymus curvatus</i>	Awnless Wild Rye	moist or damp soils of open forests, thickets, grasslands, ditches, and disturbed ground as well as on bottomlands. ⁴	No
<i>Erigenia bulbosa</i>	Harbinger-of-spring	Grows in rich, moist deciduous woods, open, wooded river floodplains and bottomlands, as well as streambanks and limestone shingle shores. ¹	Yes
<i>Euonymus atropurpureus</i>	Burning Bush	Grows in dry to moist thickets and woods. ¹	Yes
<i>Fraxinus profunda</i>	Pumpkin Ash	Grows in moist woods. ¹	Yes
<i>Galium pilosum</i>	Hairy Bedstraw	Grows in dry, sandy woods and thickets and can occasionally be found in dry sandy fields.	No
<i>Gentianella quinquefolia</i>	Stiff Gentian	Grows in moist soil, roadsides, streambanks, edges of woods and prairie habitats. ¹	Yes
<i>Hypericum prolificum</i>	Shrubby St. John's-wort	Grows in old fields, meadows, and open forested habitats. ¹	Yes
<i>Hypoxis hirsute</i>	Yellow Stargrass	Grows in dry open sandy woods and wet to dry meadows and prairies. ¹	Yes
<i>Liatris aspera</i>	Tall Blazing Star	Grows in open, sandy woods, dry roadsides and sandy prairies. ¹	Yes
<i>Lithospermum latifolium</i>	American Gromwell	Grows in river floodplains, woods and open areas near edges of woods. ¹	Yes
<i>Lythrum alatum</i>	Winged Loosestrife	Grows in wet meadows, moist prairies, open woods as well as wet, disturbed areas. ¹	Yes
<i>Muhlenbergia tenuiflora</i>	Slim-flowered Muhly	Grows in rich, deciduous forests, often on rocky or sandy soil. ¹	Yes
<i>Packera paupercula</i> var. <i>pseudotomentosa</i>	False Tomentose Balsam Groundsel	Grows in dry-sandy or gravelly-to-rocky soils in grasslands, barrens, savannas, wooded bluffs, and dunes. ¹	No
<i>Panicum</i>	Redtop Panic	Grows in sandy and rocky shores of	No

<i>rigidulum</i>	Grass	lakes and rivers in acidic soil. ¹	
<i>Phlox subulata</i>	Moss Phlox	Grows in open, sandy and rocky woods as well as sandy roadsides and lakeshores. ¹	Yes
<i>Pycnanthemum tenuifolium</i>	Slender Mountain-mint	Grows in dry open areas. ¹	Yes
<i>Ratibida pinnata</i>	Gray-headed Prairie Coneflower	Grows in prairies and in open sandy woods. ¹	No
<i>Scirpus expansus</i>	Woodland Bulrush	Grows near seeps and stream edges. ¹	Yes
<i>Scutellaria parvula</i> var. <i>missouriensis</i>	Leonard's Small Skullcap	Grows in prairies and rocks outcrops.	No
<i>Solidago riddellii</i>	Riddell's Goldenrod	Grows in wet, marshy ground, old fields and prairies. ¹	Yes
<i>Solidago rigida</i> ssp. <i>rigida</i>	Stiff Goldenrod	Grows in dry, sandy soils in prairies and waste places. ¹	No
<i>Triosteum perfoliatum</i>	Perfoliate Tinkersweed	Grows in rich deciduous woods. ¹	Yes
<i>Vernonia gigantea</i>	Giant Ironweed	Grows in mesic prairies, thickets, moist woods, roadsides and grassy meadows. ¹	Yes
<i>Viola striata</i>	Striped Cream Violet	Grows in rich, floodplain forests and low, wet woods. ¹	Yes
Other Wildlife			
<i>Argia sedula</i>	Blue-ringed Dancer	Found near large rivers, creeks and streams that are often well vegetated and can also be found around lakes and ditches. ⁵	Yes
<i>Argia translata</i>	Dusky Dancer	Found on various-sized rivers, creeks, streams and wind-swept lakes that have wind erosive features. ⁵	No
<i>Asterocampa clyton</i>	Tawny Emperor	Found in open woodlands and roadsides where there is hackberry. ⁶	Yes
<i>Enallagma basidens</i>	Double-striped Bluet	Found at lakes and ponds and is often found in temporary habitats with little vegetation. ¹	Yes
<i>Gomphus graslinellus</i>	Pronghorn Clubtail	Found near ponds, lakes and slow streams. ⁵	Yes

¹ Significant Wildlife Habitat: Technical Guide (OMNR 2000)

² The Sibley Field Guide to Birds of Eastern North America (Sibley 2003)

³ The Birds of North America Online (Robertson and Savard 2002)

⁴ Plant Database (USDA n.d)

⁵ Damselflies of the Northeast (Lam 2004)

⁶ The Ontario Butterfly Atlas (Holmes et al. 1991)

8.4 Animal Movement Corridors

The records review process did not reveal any known animal movement corridors within 120m of the project location. Available basemapping indicated that there were several linear features, including treed fencerows and naturalized drains, within 120m of the project location. The suitability of these features to be amphibian animal movement corridors will be examined during the site investigation phase of the project.

9.0 Summary of Records Review

In accordance with the REA Regulation, NRSI biologists have completed a comprehensive review of available background information pertaining to the Adelaide Wind Energy Centre project area. This complete review has been provided in the preceding sections, and has been summarized in Tables 10-12 below.

The results of the records review of natural areas, including provincial parks, woodlands, and wetlands, is provided in Table 10 below. This table identifies which natural features need to be carried forward to the site investigation phase of the project based on information collected during this review.

Table 10. Summary of Natural Feature Records Review

Natural Feature	Present Within 120m of Project Location	Present Within Project Location	Carried Forward to Site Investigation (Y/N)
Provincial Park	No	No	No
Conservation Reserve	No	No	No
Earth Science ANSI	No	No	No
Life Science ANSI	No	No	No
Wetland	Unknown	Unknown	Yes
Woodland	Yes	Yes	Yes
Valleyland	Unknown	Unknown	Yes

The results of the records review of wildlife habitat is provided in Table 11 below. This table summarizes the presence of the full range of potential wildlife habitats within the project area. The purpose of this table is to guide the site investigation to further refine what types of wildlife habitats are within the project area. Any wildlife habitats that have already been confirmed to be either not applicable to the project area or known to not occur within the project area will not be discussed in subsequent Natural Heritage Assessment reports for the Adelaide Wind Energy Centre.

Table 11. Summary of Wildlife Habitat Records Review

Wildlife Habitat	Present Within 120m of Project Location	Present Within Project Location	Carried Forward to Site Investigation (Y/N)
Winter Deer Yards	No	No	No
Colonial-Nesting Bird Breeding Habitat (swallows)	Unknown	Unknown	Yes
Colonial-Nesting Bird Breeding Habitat (tree/shrub)	Unknown	Unknown	Yes
Colonial-Nesting Bird Breeding Habitat (ground)	Unknown	Unknown	Yes
Waterfowl Stopover and Staging Areas (terrestrial)	Unknown	Unknown	Yes
Waterfowl Stopover and Staging Areas (aquatic)	Unknown	Unknown	Yes
Waterfowl Nesting Habitat	Unknown	Unknown	Yes
Shorebird Migratory Stopover Areas	N/A	N/A	No
Landbird (including songbird) Migratory Stopover Areas	N/A	N/A	No
Raptor Winter Feeding and Roosting Areas	Unknown	Unknown	Yes
Wild Turkey Winter Range	N/A	N/A	No
Turkey Vulture Summer Roosting Areas	N/A	N/A	No
Reptile Hibernacula (snakes)	Unknown	Unknown	Yes
Bat Hibernacula	Unknown	Unknown	Yes
Bat Maternity Colonies	Unknown	Unknown	Yes
Amphibian Breeding Habitat (woodland)	Unknown	Unknown	Yes
Amphibian Breeding Habitat (wetland)	Unknown	Unknown	Yes
Migratory Butterfly Stopover Areas	N/A	N/A	No
Alvars	Unknown	Unknown	Yes
Tall-grass Prairies	Unknown	Unknown	Yes
Savannahs	Unknown	Unknown	Yes
Rare Forest Types	Unknown	Unknown	Yes
Talus Slopes	Unknown	Unknown	Yes
Rock Barrens	Unknown	Unknown	Yes
Sand Barrens	Unknown	Unknown	Yes
Great Lakes Dunes	N/A	N/A	No
Forests Providing High Diversity of Habitats	N/A	N/A	No
Old-growth or Mature Forest Stands	Unknown	Unknown	Yes
Foraging Areas with Abundant Mast	N/A	N/A	No
Turtle Nesting Habitat	Unknown	Unknown	Yes
Turtle-Over-wintering Habitat	Unknown	Unknown	Yes
Woodland Raptor Nesting Habitat	Unknown	Unknown	Yes
Osprey Nesting/Bald Eagle, Foraging, and Perching Habitat	Unknown	Unknown	Yes

Moose Calving Areas	N/A	N/A	No
Mineral Licks	N/A	N/A	No
Mink, Otter, Marten, and Fisher Denning Sites	Unknown	Unknown	Only Mink denning sites will be carried forward to site investigation.
Highly Diverse Areas	N/A	N/A	No
Cliffs	No	No	No
Seeps and Springs	Unknown	Unknown	Yes
Amphibian Movement Corridors	Unknown	Unknown	Yes
Marsh Bird Breeding Habitat	Unknown	Unknown	Yes
Woodland Area Sensitive Breeding Birds	Unknown	Unknown	Yes
Open Country Breeding Bird Habitat	Unknown	Unknown	Yes
Shrub/Early Successional Bird Breeding Habitat	Unknown	Unknown	Yes
Terrestrial Crayfish	Unknown	Unknown	Yes
Special Concern Species	Unknown	Unknown	Yes
S1-S3, and SH Species and Communities	Unknown	Unknown	Yes

Following a full review of available records applicable to the Adelaide Wind Energy Centre, the following table has been prepared to outline the results of the records review as it specifically relates to the REA Regulation. Table 12, below, outlines the presence of natural areas and wildlife habitat that have the potential to overlap with, or occur within 120m of, the project location.

Table 12. Summary of Records Review of the Adelaide Wind Energy Centre

Criteria	Result
1. Within 120m of a Provincial Park or Conservation Reserve	The Adelaide Wind Energy Centre project location is not within 120m of a Provincial Park or Conservation Reserve.
2. In a Natural Feature	The results of this records review indicate that project components (i.e. disturbance area, cabling, access roads etc...) of the Adelaide Wind Energy Centre overlap with 19 natural areas. These natural areas are woodlands that are expected to consist of deciduous forest with vegetation associations that are representative of this region of southwestern Ontario. The extent to which project locations overlap natural areas is variable and will be further examined and addressed in the site investigation phase of the project.
3. Within 50m of a ANSI-ES	No Earth Science (ES) ANSI features are located within 50m of the project location.
4. Within 120m of a Natural Feature	
a) ANSI-LS	No Life Science (LS) ANSI features are located within 120m of the project location.

b) Coastal Wetland	No coastal wetlands are present within 120m of the project location.
c) Northern Wetland	No northern wetlands are present within 120m of the project location.
d) Southern Wetland	No southern wetlands have been identified within 120m of the project location. Wetlands may be located within woodland boundaries.
e) Valleyland	No valleylands have been identified within 120m of the project location.
f) Wildlife Habitat	<p>Sixty-five woodlands have been identified within 120m of the Adelaide Wind Energy Centre project location. These woodlands have the potential to provide several types of candidate Suitable Wildlife Habitat (SWH).</p> <p>Several linear features, including treed fencerows and naturalized drains, have been identified within 120m of the project location. These features have the potential to act as SWH, specifically providing animal movement corridors and/or habitat for species of conservation concern.</p> <p>All of these wildlife habitats should be examined during the site investigation phase and/or the evaluation of significance phase of this project to identify other habitat features and identify the significance of each natural feature.</p>
g) Woodland	Several woodlands have been identified during the records review process, including sixty-five woodlands within 120 m of the project location. Basemapping indicates that these woodlands range in size from 0.2ha to 137.2ha. These woodlands are expected to be primarily dominated by mid-aged to mature deciduous tree species; however young woodlands, treed plantations, or occasional coniferous woodlands may also be present within 120m of the project location.

10.0 References

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