MUNICIPALITIES OF NORTHERN BRUCE PENINSULA AND SOUTH BRUCE PENINSULA

NATURAL HERITAGE STUDY

WEST ROAD CLASS ENVIRONMENTAL ASSESSMENT

MARCH 2017

WSP

NATURAL HERITAGE STUDY

WEST ROAD CLASS EA

29.7 Kilometer Section of West Road
Oliphant to Ferndale, Bruce Peninsula

Project 151-62456-00
March 2017

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APPENDICES

1 EXECUTIVE SUMMARY

SPL Consultants Limited (now WSP Canada Inc.) conducted an environmental reconnaissance in 2015 to scope this 2016 Environmental Assessment of West Road. The study was required to assess whether potential road improvements along a 29.7 kilometer stretch of road, from Oliphant (Bruce Road 13) to Ferndale (Bruce Road 9), could take place without significant negative impact to natural heritage.

The study includes provincial and federal level policy and the concerns of the unceded territory of the First Nations. The County of Bruce and SON entered into discussions regarding field collaboration, expanding to higher level government liaison to shape this unique study. Thanks go to Brian Knox, Kerri Meier and Doran Ritchie for trusting in the process. WSP field crews were enhanced by the Ojibway perspective and this shared “boots on the ground’ field effort resulted in a study that includes both cultures.

Wildlife surveys spanned April through September with later bear den surveys at first snowfall in November and follow up in December to characterize the extent and location of sensitive areas and species.

Seasonal wildlife events surveyed included spring bird and salamander migration, amphibian evening breeding chorus, rattlesnake emergence from hibernaculae, spring through fall fishery, summer breeding birds and rare species inventories. Local citizens also assisted by sharing field records.

Five key wetland and wildlife corridors were identified as sensitive areas. Roadwork at those locations would trigger higher levels of mitigation such as eco-passage construction. The remainder of West Road can undergo road improvement with standard best management practices and mitigation.

Natural heritage is considerable, given the location on the Bruce Peninsula UNESCO Biosphere and a number of sensitive species occur near West Road including Eastern Massasauga Rattlesnake, orchids, Eastern Wood-Pewee, Red-shouldered hawk, Great Egret, Whip-poor-will, breeding congregations of Spotted Salamander, Wood Frog and the Western Chorus Frog. Large ranging mammals such as Black Bear and Fisher also cross West Road at certain locations and require careful mitigation. The Black Bear is a genetically distinct bear on the Bruce Peninsula. Our team ground-truthed bear sign and conducted bear den surveys with Saugeen Ojibway Nation’s black bear expert.

2 INTRODUCTION

2.1 POTENTIAL ROAD IMPROVEMENTS

Road improvements under consideration through the Environmental Assessment process range from road repair, rehabilitation and full reconstruction. The level of required work is dependent in part upon:

- Recommended mitigation in this report
- Existing vertical and horizontal road alignment
- Road elevation beyond the saturated horizon
- Adequacy of the granular material

The road base is proposed to be strengthened with a new surface in some reaches which requires that the existing road surface be pulverized and reshaped with new material before paving. Other reaches of the 29.7km may require road platform reconstruction. Machinery will vary by road section and the level of work and can include tandem trucks, hi-hoes, trim bulldozers and potential road pavers.

2.2 PURPOSE OF STUDY

The purpose of the study is to locate natural heritage and apply mitigation to safeguard sensitive ecology. The study also assesses the potential of roadwork to impact natural heritage and identifies where roadwork should be limited, and where road improvements can proceed with adherence to mitigation.

Natural heritage was evaluated consistent with the below framework:

- Saugeen Ojjibway Nation written concerns
- Town of North and South Bruce Official Plan (2001)
- Bruce County Official Plan (2010)
- Provincial Policy Statement (PPS, 2014)
- Species at Risk Act (SARA, 2002)
- Significant Wildlife Habitat 6E Criteria Schedules (MNRF, 2015)
- Natural Heritage Information Centre (NHIC) data via Lands Information Ontario (LIO)
- Endangered Species Act (ESA, 2007)
- Conservation Authorities Act

2.3 STUDY AREA

The study site is a 29.7 kilometer stretch of West Road from Oliphant to Ferndale on the Bruce Peninsula. Surveys included the road shoulder and 120m adjacent land. Beyond the main study area a broader landscape approach was also taken since the natural areas straddle the site and continue onward.

Wetland habitat in particular functioned for terrestrial, aquatic and avian species corridor, serving as a stopover for species such as the Great Egret and Red-shouldered hawk which used a number of connected wetlands repeatedly. Observing the movement of wildlife across the regional landscape provided vital information on where wildlife cross West Road. Conveyance of the wildlife at the five key sensitive areas along West Road would require a higher level of mitigation during any proposed roadwork. An example of this would be installation of day lit grated concrete eco-passages during culvert replacement, detailed in the impact assessment section 7.0.

3 RECORD REVIEWS

BACKGROUND INFORMATION

Background information on ecology was gathered from sources, including, but not limited to, the below list.

- Communication with SON elders
- Aerial photography and SAAR archive field notes (e.g. Howdenvale, Sucker Creek)
- Wildlife Atlases
- MNRF Owen Sound and Midhurst
- Mapping of any documented natural heritage such as Areas of Natural or Scientific Interest (ANSI), provincially significant wetlands, significant woodlands, valleylands, rare species
- Other studies regarding West Road (EcoKare 2010, AWS, 20)
- MNRF Natural Heritage Information Centre (NHIC) rare species mapping;
- Endangered Species Act
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC) species reports
- County of Bruce mapping, also lower and upper tier Official Plan policy
- Grey Sauble Conservation Authority Rare Fish Mapping Project

3.1 PHYSIOGRAPHIC LOCATION

West Road is located within the Bruce Peninsula physiographic region (Chapman and Putnam, 1984). The Huron Fringe physiographic region and the Bruce Peninsula physiographic region straddles the Bruce Peninsula on a portion of the study site. The Huron Fringe flanks Lake Huron shoreland, characterized by shorelines, terraces, gravel bars and sand dunes formed by Lake Algonquin and subsequent postglacial lakes Nipissing, Algoma, and Huron (Chapman and Putnam, 1973).

The Bruce Peninsula is dominated by a limestone dolostone bedrock plain with shallow or no soil. The Eastnor Swamp lies northwest of a small clay plain and drumlins localized near Mar. Distributed in various densities across the fissured Guelph Formation dolostone bedrock are dolostone and igneous boulders, and patches of small, waterworn dolostone slabs that presently form pavement alvar vegetation communities.

Vegetation and wildlife in this transitional zone reflect both boreal and southern Ontario species often living at the extent of their normal range as discussed in Section 3.2.

3.2 ECOLOGICAL LOCATION

West Road is part of a larger region known as Ecoregion -6E stretching to Lake Simcoe and Rideau. The ecoregions and subunit eco-districts of Ontario were created by Hills (1959) to assess the relative conservation needs in each unique area. Understanding the patterns of where plants and wildlife adapt to local landform and climate ensures that their relative abundance, or scarcity, is interpreted correctly before assigning conservation measures.

The landform is a bedrock of Paleozoic dolomite and limestone, predominantly of Ordovician and Silurian age. Ground moraine materials dominate with drumlins and interlobate moraine features such as the Oak Ridges and Saugeen Moraines. Most of the substrates provide a high capability to buffer the acidity of atmospheric deposition before it reaches surface waters (Environment Canada, 1988 in Crins et al., 2009).

The subunit eco-district is predominantly 6E-4 with the Lake Huron shoreland fringe of 6E-5 (Figure 3).

Figure 3: Ecoregions of Ontario with the 6E Lake Simcoe-Rideau Region

An overview of the Bruce Peninsula provides context for the site observations in Section 6.0.

Bruce Peninsula forests were lost to fire in the late 1800's and early 1900's, with the loss of most of the peninsula rim and talus forests and bedrock plain forest, and timber harvest. Harvest occurred historically for masts of boats, and tannin shipments to southern Ontario to tan leather footwear (Capen, 1852).

Thus, although present day forest cover is extensive at around 80%, it is mostly young. Forest cover is extensive however, with core woodlands and corridors stretching from Wiarton to Lion's Head and Whip-poor-will Bay to the tip of the Bruce Peninsula. Common forests are Sugar Maple- Yellow Birch-Hemlock-White Pine mixed woodlots with coniferous White Spruce-Balsam Fir and Black Spruce-Tamarack on saturated soils.

Breeding Birds: Birds in this transitional zone reflect both northern and southern Ontario birds. The cool conifer swamps support Olive-sided Flycatcher, Yellow-bellied Flycatcher, Ruby-crowned Kinglet, Swainson's Thrush, Philadelphia Vireo, Red Crossbill, Pine Siskin and Evening Grosbeak finches. Other species with northern affinities, include Common and Red- breasted Mergansers, Northern Goshawk, Common Raven, Golden-crowned Kinglet, Hermit Thrush, Magnolia Warbler, Yellow-rumped and Blackburnian Warblers, Dark-eyed Junco and Purple Finch as well as Black-throated Blue Warbler, Chestnut-sided Warbler and Yellow-bellied Sapsucker.

Wildlife: The peninsula supports at least 39 mammal species including the Canada Lynx, Black Bear, Fisher, River Otter, Snowshoe Hare, Eastern Cottontail, Gray Squirrel, Masked Shrew, Eastern Chipmunk, Woodchuck, Red Squirrel, Beaver, Deer Mouse, White-footed Mouse, Porcupine, Coyote, Red Fox, Raccoon, White-tailed Deer, Northern Short-tailed Shrew, Star-nosed Mole, Northern Flying Squirrel, Muskrat, Meadow Vole, Ermine, Long-tailed Weasel, Mink and Striped Skunk. The less common Southern Bog Lemming and Meadow Jumping Mouse also range on the Bruce Peninsula.

4 POLICY

The two year study was reviewed against the expressed concerns of SON, and the provincial natural heritage policies. Appendix D contains further policy detail beyond the introduction here within section 4.0.

4.1 SAUGEEN OJIBWAY NATION

The Saugeen Ojibway Nation outlined interests to the County of Bruce (Ritchie, 2015) in an initial letter which noted the following key concerns:

- Land Claim
- Commercial Fishery
- Traditional Harvest
- Natural Environment
- Cultural Heritage

SON noted provincial wetlands, ANSI and impact on local animal populations as concerns with species examples of Black Bear, Bald Eagle and Spotted Turtle.

WSP reviewed draft internal guidelines on how to conduct environmental studies (SAAR for SON, 2010), discussed the project with SON, and compared notes on our field methodologies including field data sheets (SON Ryan & WSP Sober).

Since SON environmental monitors would be assisting with field surveys, Sober and Ritchie organized an initial training workshop for monitors on April 22nd, 2016, further to SON and the County of Bruce arriving at an understanding for working together; discussed by the Chiefs of Nawash and Saugeen, and the Warden of the County of Bruce.

The workshop included reviewing a powerpoint presentation of sensitive and/or rare species and habitats Sober had previously identified in the regional study area over time, some on prior inventories with SON such as the Howdenvale Sunset Road inventories of rare species.

Monitors assisted during every key season and have been an invaluable help with characterizing the aquatic and terrestrial natural heritage. Field effort was exceptional as it often involved seeking and locating minute rare species that can easily be overlooked along roadside habitat, such as the Special Concern Dwarf Lake Iris and tracking secretive birds such as the Great Egret and the Black-crowned Night Heron.

Much of the seasonal inventories were conducted in challenging field conditions such as cold evenings to discern springtime breeding amphibians, crepuscular courting birds including Whip-poor-will and Common Nighthawks, and trekking long distance to survey for elusive turtles and snakes such as the Spotted turtle and the Eastern Massasauga Rattlesnake respectively.

Monitors also assisted with research literature on the potential to impact sensitive species by roadside winter treatments and road surface improvements that bring increased vehicular speeds to sections of West Road.

A heartfelt thanks goes out to Adrienne Brennan, Jordane Chegahno, Justin Ritchie, Blane Roote with environmental office support and field presence of Kathleen and Doran.

Joseph Pitawanakwat joined our field crew and shared his knowledge of traditional medicinal plants as well as harvest with his traditional ecological knowledge approach. Species in the Ontario paradigm that for instance carry a “common” conservation status such as Boneset, Joe-Pye-Weed, Indian Paintbrush, Basswood, fungi polypores carry medicinal significance. Joe notes that Nightshade stem bark, Canada anemone, goldenrod, sorrels, and milkweed root are used in most important compound medicines made by woodlands people. This work is better because of the varied perspectives and values shared by SON.

The GPS locations Justin assisted with in the field were provided to the County of Bruce mapping department where Justin Kraemer translated “boots on the ground” to accurate archive records for future monitoring. Thank you Justin for sharing the excellent mapping expertise.

4.2 PROVINCIAL POLICY STATEMENT

Provincial tests are outlined in a policy statement under the Ontario Planning Act known as the Provincial Policy Statement (PPS) and respective upper and lower tier Official Plans.

The natural heritage section of the PPS are used to describe the various possible key natural features and functions for consistency with environmental policy during future lower level EIS.

The PPS recognizes key natural environment attributes below, detailed in Appendix C.

- significant areas of natural and scientific interest
- significant wetlands and coastal wetlands

- significant woodlands
- significant valleylands
- significant wildlife habitat
- significant habitat of rare, threatened or endangered species
- Significant woodlands in Ecoregions 6E,7E(excluding islands in Lake Huron, St.Mary's River)
- Significant valleylands in Ecoregions 6E,7E excluding islands in Lake Huron, St.Mary's River
- fish habitat

4.3 COUNTY OF BRUCE OFFICIAL PLAN

The local County of Bruce Official Plan (2010) protects natural heritage and support water zones by identifying specific areas including:

- 100 metre buffer zone or 2 year time of Travel (WHPA-B) for Wellhead Protection Areas
- Intake Protection Zone 1 or 2 for Intake Protection Zones
- Karst topography
- Hazard lands as identified by Grey Sauble Conservation Authority
- Locally significant wetlands

Protection goals for the natural environment are described in Section 4.3.2 which states *"the natural resources of the County shall be protected and managed in order to maintain the preserve a healthy living environment for existing and future generations"*.

The County of Bruce West Road improvements contemplated in the Class EA comply with the environmental area concerns noted in Section 4.3.3 below for environmental impact studies:

"4.3.3. Requirements for Environmental Impact Studies

In order to achieve County objectives for the protection of the natural environment, development proponents shall be required to prepare an EIS for any proposal that is:

i) In, or within 120 metres of, a provincially significant wetland;
ii) In, or within 60 metres of, a locally significant wetland;
iii) In, or within 120 metres of, the habitat of threatened or endangered species;
iv) In, or within, 120 metres of, a significant woodland, significant valleyland, significant wildlife habitat, deer wintering areas;
v) In, or within 120 metres of, fish habitat;
vi) Within the '100 Metre Buffer Zone' or '2 Year Time of Travel (WHPA-B)' for Wellhead Protection Areas or within a 'Intake Protection Zone 1 (IPZ-1)' or 'Intake Protection Zone 2 (IPZ-2)' for Intake Protection Zones;
vii) Within known areas of karst topography;
viii) In, or within 50 metres of Areas of Natural and Scientific Interest (ANSI) Earth Science."

4.3.1 MUNICIPALITY OF NORTHERN BRUCE PENINSULA

The Northern Bruce Peninsula (NBP) Official Plan identifies policy areas below, and outlines requirements for conducting an Environmental Impact Study (EIS) consistent with the County OP.

- Tobermory and Lion's Head Secondary and Urban Areas
- The Hamlet of Ferndale

The remainder of NBP is covered by the County Official Plan.

4.4 MUNICIPALITY OF SOUTH BRUCE PENINSULA OFFICIAL PLAN

The Official Plan five year review is in progress, therefore we are referencing the adopted 2001 plan with office consolidations to October 2012.

The OP outlines requirements for conducting an EIS consistent with the County OP.

- Provincial and locally significant wetlands where development is prohibited due to the ecological importance of the resources
- Valleyland, woodland and fish or wildlife habitat owned by the Crown or
- Environmental hazard land areas susceptible to flood or erosion

The Official Plan provides criteria for the consultant to assess the level of significance and apply the appropriate level of development control.

4.5 FEDERAL FISHERIES ACT

Fisheries interests are shared by all policy directives at Provincial and Federal levels.

Reporting is consistent with the most recent Federal Fisheries Act changes as summarized below, with liaison amongst the EIS consultant and SON Environmental Office to incorporate concerns about the commercial fishery.

Guiding policy for fish habitat and management underwent recent change when Federal Bills C-38 and C-45 received royal assent (2012), amending Section 35 of the Fisheries Act. Changes came into effect on November 25, 2013. Rather than prohibiting harmful alteration, disruption or destruction of fish habitat (HADD), the prohibition is against carrying out works or activities resulting in "serious harm" to fish. The serious harm is defined as "death of fish or any permanent alteration to, or destruction of, fish habitat part of a commercial, recreational or Aboriginal fishery."

The shift from all fish to only identified fisheries and respective value of the fishery to First Nation changed the way fish habitat is defined.

Federal policy directs us to use the new factors below:

- Contribution to a productive commercial, recreational or Aboriginal fishery
- Meeting MNR fisheries management objectives;
- Public interest

Natural Heritage Information Centre database records were reviewed for any new rare fish or mussel locations. Kathleen Ryan was the regional coordinator at SON, and also active in fisheries research. Kathleen was contacted and she expressed SON concern regarding the potential of West Road road improvements, and in particular any culvert replacement, to impact the nearby Lake Huron littoral zone.

Nearshore waters of Lake Huron provide spawning habitat for Whitefish, known to develop in their first year in these shallow waters. Whitefish are a valued commercial fish species of SON. Any substantial tributaries crossing West Road therefore, would be of interest to SON in maintaining the water quality and quantity flowing into Lake Huron.

The Grey Sauble Conservation Authority (GSCA) provides watershed management focused on flood and erosion control to safeguard human life and structures, with regulatory powers extending to wetland habitats as well that are greater than 2 hectares in size. Ontario Regulation 166/06 requires written permission from the GSCA for development, interference with Wetlands and Alterations to Shorelines and Watercourses. Areas of flooding are taken into consideration during the detail and design phase of roadworks.

5 STUDY APPROACH

5.1 STUDY APPROACH

5.1.1 BACKGROUND DATA

Before conducting our fieldwork, we consulted existing information sources for potential rare species, provincial wetlands, ANSI, and other sensitive areas. Information was gleaned from:

OMNRF Mapping (Owen Sound and Midhurst Branches)
OMNRF Aerial Photography
SAAR Archive Field Notes (e.g. Howdenvale, Sucker Creek)
OMNRF Rare Species Occurrence Report Mapping (NHIC)
Ecological Life Science Inventories (PSW, ANSI)
Lower and Upper Tier Policy and Environmental Protection Area Mapping
Naturalist Species Lists
OMNRF Areas of Natural and Scientific Interest (ANSI) and NHIC Mapping
Inter-disciplinary studies (e.g. hydrogeology study) and current science
Atlas Projects (e.g. Breeding Bird, Herpetofaunal and Mammal Atlas)

The County of Bruce provided map layers for provincially significant wetlands (PSW), unevaluated wetlands, hazard lands, life science areas of natural and scientific interest (ANSI), rare species, woodlands and karst.

A search of the OMNRF Natural Heritage Information Centre (NHIC) mapped database (MNRF, 2015a) was conducted to determine the existence and approximate location of recorded occurrences of Endangered or Threatened species on the Site. In addition to the NHIC database search, the Ontario Breeding Bird Atlas (OBBA) (Bird Studies Canada et al., 2006) and Ontario Reptile and Amphibian Atlas (Ontario Nature, 2015) were consulted to determine if there were Endangered or Threatened species known to be present within the vicinity of the Site. Both atlases use 100 km by 100 km blocks, further subdivided into 10 km by 10 km squares to compartmentalize geographical areas.

Appendix A contains the January 2016 maps as well as the 2017 summary map.

5.2 FIELD EFFORT

Original reconnaissance of the West Road study area was undertaken in 2015 with April, June, August, September and October inspections. The 2015 reconnaissance indicated potential sensitivities for survey in 2016, including:

- Grassland breeding birds in decline (Bobolink, Eastern Meadowlark)
- Rare Whip-poor-will, Common Nighthawk, American Woodcock, Piping Plover
- Rare Eastern Massasauga Rattlesnake, Western Chorus Frog, Spotted Turtle
- Rare flora including mapping of potential conifer patches for rare orchid support
- Bat foraging at treed swamp edges
- Neo-tropical breeding birds as indicators of functioning interior forest patch

Table 5.2 field effort was circulated to review agents, then increased in response to comments in part by ratepayers. WSP also met with SON on March 14, 2016, and participated in a Field Workshop for Survey Techniques on April 26 at Saugeen.

Table 5.2 Field Effort

DATE	SURVEY TYPE	TIME / DURATION	WEATHER CONDITIONS*
March 20-22, 2016*	Spring Herpetofauna I	Dusk and Midnight Evening Chorus	Require at least 4 Celsius. Rain is accepted in the standards but no winds 4 evenings *(weathered out to one moonlit evening with initial salamander emergence then retreat
April 20-24	Spring Herpetofauna II	Dusk and Midnight Evening Chorus	“ “ Approximately 3 evenings
April 6– May 10	Nightjar Surveys	Moonlit	Full Moon. 2 evenings
April 14-16	Turtle Emergence EMR I	Daylight vernal pools Daylight hibernaculae	Maximum 3 days. Pools, fen, marsh, drains Following Provincial Protocols
May 16	Breeding Bird	6:30 - 8:30 a.m.	Clear with no chill. Must be precipitation and wind free. 10 point count stations, 4 visits
May 2	Spring Ephemeral ELC I	Daylight ground-truthing	No precipitation. 10 point count stations 2 days
May 10	Spring Vegetation	Daylight ground-truthing	No precipitation. 10 point count stations 2 days
May 11, 16 June 15	Aquatic Survey Turtle Survey Fish Inspections EMR II Basking	Daylight	Clear with no chill. 4 days combined at Turtle Survey Stations and Fish Stations at CSP
June 5 July 5,6	Breeding Bird Point Counts I Cyprinids	6:30 – 8:30 a.m.	Clear with no chill. Includes specialized survey such as grassland birds, Barn Swallow, Piping Plover 4 days
June 15, 29 July 29, 30	ELC II EMR III Movement	Daylight ground-truthing	No precipitation. 10 point count stations 3 days along field transects 20m apart
August	Butternut Health Assessment	Daylight ground-truthing	Not weather dependent 2 days along field transects 20m apart
August 18	Fall Flowering Rare Grass Identification Orchidacea Swamps	Daylight ground-truthing	Dry conditions. Stratified to potential habitat including sand dune edges, thus 1 day

Additional field effort was expended on turtle nest habitat and migration searches. A late fall bear den survey was undertaken in the mild November and early December with SON after areas of track were documented in November with the first snow.

The field effort was seasonal and capturing key wildlife congregation events to characterize the study site. The approach taken during wildlife surveys is described in this section and follows accepted standards.

5.2.1 BREEDING BIRD SURVEYS

Bird surveys were undertaken seasonally to assess the value of the habitat along West Road for migrating, courting, feeding and breeding birds.

Initial reconnaissance surveys conducted by roadside walking prioritized areas of high potential for different kinds of birds; the northern Ferndale flats agrarian landscape for instance had the greatest potential for open grassland ground nesting birds and Barn Swallows in barns. Subsequent surveys conducted in 2016 were conducted to Canada Wildlife Service standards for early morning bird chorus in suitable weather and confirmed breeding Eastern Meadowlark, Grasshopper Sparrow and Bobolink.

Evening and moon lit surveys were conducted for dusk courting guilds including the goat-suckers. Surveys included searches for Whip-poor-will, Common Nighthawk and American Woodcock by call and at times with visual confirmation.

Migrants were surveyed during spring and fall evenings as greater numbers of birds, and bats, move in the evening vs. day. Surveys included target searches for Sandhill Crane, Bald Eagles, Barn and Bank Swallows as well as local Lake Huron shoreline rarities such as the Piping Plover and Black Tern.

Area sensitive forest birds and birds of the interior were surveyed by the ten minute point count method of forest station, recording the location of the bird song during the June breeding timetable for birds since there is mitigation specific to interior forests for adjacent roadwork.

5.2.2 ABORIGINAL FISHERY

Amendments to the Fisheries Act note that surveys are to “provide for the sustainability and ongoing productivity of commercial, recreational and Aboriginal fisheries.”

The commercial Whitefish fishery is a confirmed valuable Aboriginal fishery using this legal provincial current description. The SON Environmental Office also confirms the commercial fishery and research regarding spawning grounds for Whitefish.

Our study did not sample Lake Huron waters however we did sample surfacewater features crossing West Road. This was done with a combination of dip netting, ‘G’-Type minnow trapping and direct visual observation.

5.2.3 HERPETOFAUNA AND BATS

Some of the herpetofaunal surveys were time sensitive including the first moonlit spring survey for salamander migration to vernal pools for breeding. Head-lamps were used in the fog and the locations of salamanders crossing West Road were noted along with the location of the vernal pool. This potential breeding habitat was then later assessed for egg masses and later again in May for any hatches.

Amphibian surveys were conducted at the timing windows for the frog species; for instance in late March and early April for the Wood Frog song at dusk chorus and then closer to midnight for the louder second chorus. The number of frogs heard are recorded as an estimate.

Vernal pool function was undertaken in the spring of 2016 for species noted during our reconnaissance including the imperiled Western Chorus Frog and the Spotted Salamander. Locations of concentrated activity

were mapped with follow up mitigation recommendations. Vernal pools can contain high levels of biodiversity with crustose and foliose lichen as well as algae, bryophytes and mosses (e.g. *Placynthium nigrum*).

Bats are present and gleaning insects at dusk along the open forest edges of West Road, as well as other openings in the forest such as hydro-electric corridors and wetland openings. WSP surveyed the nearby forests for any significant tall softwood cavity trees, and the presence of bats. Trees suitable for roosts were identified for retention.

5.2.4 EASTERN MASSASAUGA RATTLESNAKE

The provincial recovery team notes the Bruce Peninsula EMR are a relatively large population. The goal of the recovery plan is to retain current distribution, structure and connectivity among local (sub) populations throughout the Peninsula (MNR, 2005). Critical habitat includes the hibernaculae and gestation sites which are considered significant wildlife habitat (SWH) under the PPS while feeding, breeding and corridor movement zones have more flexibility in planning based upon site specific needs.

Seasonal surveys followed the EMR Working Group protocols and instructions received during MNRF workshops, detailed here for reviewers.

HIBERNACULAE

EMR hibernate in varied habitats on the Bruce Peninsula including forested areas with little soil, yet opportunity to access shallow groundwater through tree roots, rock cuts, sphagnum moss cover and areas of uprooted trees, although their options are not limited to these observed examples. In our local experience snakes emerge from hibernaculae as early as March if temperatures warrant, but usually between April and May. Given that they are cold-blooded the field surveys for snakes took place as recommended between 10 am – 3 pm with the best sighting occurring at 1 pm.

Our roadside and adjacent lands roving surveys located limited areas of directly open karstic fissures, and these areas were mapped. The karst overlapped with a treed swamp location of rare orchidaceae and has been targeted for mitigation.

- Time of day – 10am – 3pm
- Weather conditions – daytime maximum >10^{o}C, with intermittent sun, winds <24km/hr
- Location – search identified potential hibernation habitat
- Search time – 1 hour/ha

GESTATION

Gestation sites for females bearing live young have also been varied on the peninsula, including warm grassy margins of shore fens, exposed bedrock on beaches, blow down tree root structures and also in dappled sunlight at forest edges. We have observed the EMR to show preference for granitic vs. dolostone rocks along cobble shores and when testing the rock surface (e.g. granitic mica) it is the warmer choice for incubating.

Although EMR were always being searched for during field days, the summer months from June through August yielded only one EMR in robust sedges and Reed Canary Grass within a shrub swamp edge. Searches in year two benefited from more survey effort with a field crew of 4. Weather included both sunny and cloudy searches; I note our best EMR results have been documented during cloudy, yet warm (> 24C) summer days.

I do not think the low EMR sightings reflect low abundance, just a reflection that this is a cryptic species well camoflauged at swamp edges that few traverse. It is a good swimmer and hides well.

- Time of year – late June to mid-August
- Time of day – weather dependent – see below
- Weather conditions – on mainly sunny days between 8am – 11am and 3pm – 5pm. On overcast warm days (ideal days) eastern massasaugas could be out the entire day. Winds must be <24km/hr. Above 30^{o}C snakes will seek cover, are less visible and searching is not recommended.
- Location – search the identified potential gestation habitat.
- Search time – for complex habitat (>10 structures/ha) search 2 hours/ha. For simple habitat (<10 structures/ha) search 1 hour/ha. Note: structures include table rocks, logs, stumps, shrubs, raised cobble beaches, rock piles, trash piles, etc.
- Number of visits – 3 days/year spread over a minimum 21 day period. Two years accounts for the possibility of missing gravid females as they may not be visible and not bear live young on a particular year.

Our 2015 - 2016 field surveys meet these provincial criteria.

FOOD, COURTSHIP AND CORRIDORS

Any wetland on site is potential habitat for a food source of warm blooded Meadow Voles, Jumping Field Mice and others. Our surveys of wetland – forest ecotones did not uncover EMR and this type of search, although undertaken, has little chance of observing the EMR (EMR Working Group, 2012).

We can apply the knowledge however that the EMR often stick to moister wetland edges vs. selecting open limestone barrens to avoid dessication, and recommend conservation strategies and mitigation to protect the integrity of the surfacewater linkages for the EMR associated with the observed location of snake activity.

5.2.5 MAMMALS

Large mammals were noted through binoculars, close direct visual observation and indirectly by animal signs including their track, scat, rubs and prey during migration and summer range. Areas of broad wildlife corridor movement were mapped with respective mitigation.

5.2.6 FLORA

Current aerial photography available from the County of Bruce was assessed before field surveys were undertaken. Key habitats such as wetland - forest edges were then later ground-truthed with boots on the ground reconnaissance surveys to determine the extent and type of vegetation communities.

Plant species were identified both in the field and in the lab if seed (achene) characteristics for grasses or sedges required viewing in greater detail for identification. Plant communities were named using the **Nested Ecological Land Classification (ELC) Community Unit** terminology of Lee, Bowles et al., (1998); a dichotomous ranking key providing a provincial standard for identifying and mapping vegetation communities and ultimately determining relative abundance and function for conservation purposes.

SAAR archive fieldnotes were reviewed for the area and search efforts were based on prior records as well from NHIC; SAAR noted Dwarf Lake Iris, Stiff Yellow Flax, Hills Thistle and Spike rush, similar to NHIC records which include orchidaceae as well. Our field inspections targeting potential rarities also based upon earlier ANSI and PSW records.

5.3 TRADITIONAL HARVEST

There are many species honoured by SON in traditional crafts, useful for medicines, ceremony and sustenance. These sensitive areas need to be respected outside of the typical standards of a Class EA, ensuring continued sustainability of the resources while honouring confidentiality as required.

5.4 CONFIDENTIALITY

Rare and/or useful species can sometimes be coveted by collectors, harvested for sale, or killed by poachers. Species can be at risk if their location is disclosed. This could be particularly harmful to small patches of fungi harvested annually by SON, and respect is required to avoid overharvest by larger numbers of people. For these reasons sensitive species mapping will **not** be disclosed or illustrated beyond disclosing a general location for the purpose of mitigation by a 10km block. This is also the protocol of MNRF for the Natural Heritage Information Centre.

5.4.1 AVIFAUNA

Early morning bird chorus was recorded during the June breeding period on two occasions, consistent with the Canada Wildlife Survey standards, to discern breeding birds from incidental observations of birds simply

flying over the site. Breeding season was supplemented with shoulder season spring and fall observations during migration.

Special timing was required for birds courting at dusk or during moonlit evenings. Some of these surveys were conducted in tandem with other wildlife surveys such as the spring amphibian dusk and near midnight surveys of frog species as they are calling the same time as the Whip-poor-will.

Bird song is attributed to bird species and documented. Locations are mapped along with resident and migrant bat species observed. Forest adjacent to West Road with abundant cavities for bat roost tree value was identified for maintenance following MNRF 2015 guidelines.NHIC specified grassland birds including the Bobolink, Eastern Meadowlark, Grasshopper, Vesper and Savannah Sparrows within the northern Ferndale Flats portion of the study area which is principally open farmland. Open meadow Loggerhead Shrike have also been documented (NHIC, 2009) they were part of the bird surveys. SAAR archives document migrating and nesting Sandhill Crane in the 1990s within 2km of this site, therefore a search for Sandhill Crane was also built into the study approach.

Color Plate 1: Sandhill Crane 2km west of site.

SAAR archives within the municipality also indicate potential for Common Snipe, American Woodcock and Whip-poor-will which require dusk and moonlit surveys following CWS and BSC (Canada Wildlife Service and Bird Studies Canada) protocols, in particular for the number of moonlit surveys.

Bird species are listed in Appendix B.

5.4.2 MAMMALS

Roving reconnaissance for mammal species was undertaken during all four seasonal surveys. Highlights of the surveys include confirmation of fisher and black bear. Mammal species are listed in Appendix B.

Regarding black bear, it is easy to under-census this animal because it is mostly nocturnal, and often arboreal when foraging within trees on leaves, fruit, nuts and buds. Bear also hide young up trees until they return from foraging (en sensu, Banfield, 1974). Bear also range far, roaming around twenty kilometers for females, with males ranging ten times this distance. Traditional foraging areas include blueberry patches, beech nuts and/or spawning fish and these areas are returned to seasonally with long treks documented up to 100km. This is also why a landscape approach is essential, incorporating water bodies.

The potential for cumulative impact to black bear habitat, via combined and varied land uses over time on this landscape around West Road, was evaluated by inspecting habitat for bear sign at the following times:

June-July mating

Mid-October-November denning

Late April-early May emergence from dens

April-November foraging

The First Nations, Saugeen Ojibway Nation (SON), was contacted for expertise and collaboration on assigning adequate forest setback widths for continued black bear movement across the forested uplands of the site. Hearty thanks go out to the SON expert on bear, Mr. Doran Ritchie, for assisting in the field and sharing knowledge.

Bear den surveys followed the late November bear sign due to the first snow, and the search pattern spread radially from the area of bear tracks. We travelled approximately 1km on either side of West Road into adjacent upland and lowland habitats. Suitable den structures were photographed and their locations mapped.

6 KEY NATURAL HERITAGE ELEMENTS

This Section identifies natural heritage features found near or within 120m of West Road.

Nature is summarized using the Provincial Policy Statement (PPS) categories for natural heritage.

Additional PPS definition for natural heritage is found in Appendix D.

6.1 FISH HABITAT

WSP confirmed cyprinids in all water bodies sampled. One of the locations supported young of the year Brown Trout in addition to cyprinid species. Protection measures are implemented for warmwater drainage and coolwater; none of the surfacewater features retained the 'cold' water target of 18 degrees Celcius in mid-summer required to be considered a coldwater feature.

Liaison with SON Environmental Office, personal accounts of fishermen and archive SAAR field surveys also confirm that Whitefish use the Lake Huron shoreline as a nursery. Written accounts of whitefish trade include fishing as far back as 1839.

6.2 SIGNIFICANT WETLANDS AND COASTAL WETLANDS

Wetlands are defined in the PPS (OMMAH, 2014) as lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. There are four major wetland types, which are classified as swamps, marshes, bogs, and fens. A significant wetland is defined as an area identified as provincially significant by the Ontario Ministry of Natural Resources using evaluation procedures established by the province, as amended from time to time (OMMAH, 2014). Accordingly, it is the responsibility of the MNRF to both identify and classify wetlands as significant in Ontario. The MNRF Natural Heritage Areas Mapping (2015a), and Official Plan map schedules, were reviewed for the presence of wetlands on or within 120 m of the Site.

Wetlands are areas that have been saturated with water long enough for soil to become waterlogged allowing water tolerant plants to grow. Wetlands can occur where the water table is close to or at the surface and are usually in low-lying areas or along edges of lakes and rivers. Wetlands provide a number of benefits such as flood prevention, improvement of water quality and provide wildlife habitat (MNRF).

Evaluated and unevaluated wetland meanders across West Road. Wetlands include cattail, shrub and treed swamps, open water and fens however no coastal meadow marsh.

WSP liaised with MNRF to confirm that the status of wetlands such as "Swamp North of Beattie Lake" have not been elevated since this can constitute a different spatial approach to mitigation.

One large treed swamp in the south portion of the site functioned as a stopover and feeding area for a number of birds including Sandhill Crane, Great Egret, Red-shouldered Hawk and Rough-legged hawk. These were observed during migration, breeding and feeding between forested areas and water sources including Patterson Lake, Wylie Lake, Sky Lake, Lake Huron and Beattie Lake.

6.3 HABITAT OF THREATHENED OR ENDANGERED SPECIES

The PPS (OMMAH, 2014) defines the significant habitat of endangered or threatened species as the habitat, as approved by the MNRF, that is necessary for the maintenance, survival and/or the recovery of a naturally occurring or reintroduced population of endangered or threatened species, and where those areas of occurrences are occupied or habitually occupied by the species during all or any part(s) of their life cycle. The MNRF is mandated to ensure accurate database information for the identification, listing and conduct of ongoing assessments for significant endangered species and their related habitats. Significant portions of the habitat of these species, such as the Massasauga Rattlesnake, are buffered from separation distances and thus meet the PPS and O.P. policy standard for the proposed roadworks.

Potential Loggerhead Shrike habitat on and near site (Cuddy internal maps, OMNR) was assessed in 2004, 2005 and 2016 with no shrike present. Shrike appear to select meadow with 25% low shrub cover (Sober, Shrike Abstract, Carden Plain, 2004) but were not found in the successional meadow of present day; the shrike do not seem to utilize grassland for nesting when shrub cover encroaches.

Table 6.3 details the potential for endangered, threatened and rare conservation status species.

Table 6.3 Endangered, Rare and Threatened Species Occurrences

SPECIES NAME	SARO[1]	COSEWIC[2]	HABITAT DESCRIPTION[3]	HABITAT POTENTIAL	FIELD OBSERVATION
Bank Swallow	THR	THR	Bank Swallows nest in burrows in natural and man-made settings, wherever there are silt or sand deposits. Nests are often along riverbanks and in aggregate pits.	Moderate	No nests on exposed sand dunes.
Barn Swallow	THR	THR	Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. This species forages over a wide area.	Moderate	Barns are most prevalent on the north Ferndale flats area of the study site. WSP did not observe nesting Barn Swallows.
Bobolink	THR	THR	This species builds its nests on the ground in dense grasses, such as those found in hay fields, tallgrass prairies and open meadows	High	Bobolink locations are mapped and setback during breeding season.
Butternut	END	END	This species is commonly found in riparian habitats, but is also found on rich, moist, well-drained loams, and well-drained gravels, particularly those of limestone origin	Moderate	This tree is approximately 5% of mixed stands generally, although none were documented on the ROW borders.

SPECIES NAME	SARO[1]	COSEWIC[2]	HABITAT DESCRIPTION[3]	HABITAT POTENTIAL	FIELD OBSERVATION
Canada Warbler	SC	THR	The species is found in a variety of forest types, but is most abundant in wet, mixed deciduous-coniferous forests with a well-developed shrub layer. Also found in riparian shrub forests	Low	Species not identified. Suitable habitat was not identified within 120 m of the Site
Cerulean Warbler	THR	END	Cerulean Warblers are found in mature deciduous forests containing large trees and an open under story	Low	Species not identified. Suitable habitat was not identified within 120 m of the Site
Chimney Swift	THR	THR	The species feeds in flocks around waterbodies due to the large amount of insects present. Nesting occurs in large, hollow trees or in the chimneys of houses in urban and rural areas.	Low	Species not identified. Suitable habitat was not identified within 120 m of the Site. Suitable nesting structures were not identified on the Site, but may exist within the general area
Common Nighthawk	SC	THR	The species nests in areas with little to no ground vegetation, such as logged or burned-over areas, forest clearing, rock barrens, etc.	High	Species identified courting in April-May
Eastern Meadowlark	THR	THR	This species prefers native grasslands, pastures and savannahs though will use a variety of other grassland habitats such as hayfields, weedy meadows, etc.	High	Species observed nesting in June
Eastern Whip-poor-will	THR	THR	This species avoids exposed, open areas or closed-canopy forests, and prefers rock or sand barrens with scattered trees, savannahs, and open conifer plantations	High	WSP located Whip-poor will.
Eastern Wood-Pewee	SC	SC	Eastern Wood-Pewees prefer deciduous and mixedwood forests. They are often observed sallying to capture flying insects from an exposed perch high in the canopy.	High	Species identified. Forest nest sites are mapped and have a temporal restriction of breeding season.
Golden-winged Warbler	SC	THR	Golden-winged Warblers are found in shrubby areas surrounded by woodland, such as utility right-of-ways, field edges, and logged areas	Low	Suitable habitat but no specimens heard.

SPECIES NAME	SARO[1]	COSEWIC[2]	HABITAT DESCRIPTION[3]	HABITAT POTENTIAL	FIELD OBSERVATION
Loggerhead Shrike	END	END	Loggerhead Shrikes prefer pastures, alvars, or other open grasslands with scattered small trees and shrubs	Moderate	Suitable habitat is available in overgrown Hawthorn meadow but not optimal as shrub incursion is >25%
Milksnake	SC	SC	Milksnakes can be found in a range of habitats including deciduous woodland edges, abandoned fields, rocky outcrops and alvars; often near wate.	Moderate	Suitable habitat at upland forest edges. One Milksnake noted under cover boards.
Olive-sided Flycatcher	SC	THR	The species lives in forest openings and edges, particularly where tall snags and dead trees can be used for foraging perches. Breeding habitat is frequently located along wooded riparian corridors or wetlands	High	Species identified. Suitable habitat identified within 120 m of the Site and the creek corridor was provided with timing restrictions.
Red-headed Woodpecker	SC	THR	Red-headed Woodpeckers are found in open deciduous woodlands, typically in areas with many dead trees	Moderate	Species not identified. Suitable habitat identified within 120 m of the Site
Snapping Turtle	SC	SC	The species is generally associated with shallow ponds, shallow lakes and streams with abundant vegetation. Suitable nesting habitat includes gravely or sandy areas along streams, gravel shoulders along roadsides, dams and aggregate pits.	High	Snapping turtle nests abound on most of the sand dune habitats. Exclusionary fencing should be installed at locations mapped.
Wood Thrush	SC	THR	This species is strongly associated with woodlands containing tall trees, usually deciduous forests but occasionally mixed wood forests as well. The presence of a thick understorey is usually a prerequisite for site occupancy.	High	Species identified. Suitable habitat identified within 120 m of the Site.

[1] Committee on the Status of Endangered Wildlife in Canada; and
[2] Species at Risk in Ontario Status; END – Endangered, THR – Threatened, SC – Special concern, '-' – Not Listed.

[3] Nature Conservancy conservation concern rankings (NHIC, 2010): G - Global Level, S - Sub-national Rank (Ontario), 1 - Critically Imperiled, 2 - Imperiled, 3 - Vulnerable, 4 - Apparently Secure, 5 – Secure, GNA – Not Applicable

REGIONALLY RARE FLORA

Shoreland rarities such as Low Calamint and Stiff Yellow Flax were noted outside of the study area closer to Lake Huron shores. WSP noted no evidence of wind dispersal of this seed and plants into the study area. Class EA Study surveys should include searches for such sensitive habitats including meadow marsh, fen and alvar (e.g. ALS1-1 Common Juniper Shrub Alvar present near Petrel Point. Alvar communities of the Bruce Peninsula are characterized often by repeat patterns of plants including Creeping Juniper, Common Juniper, Shrubby Cinquefoil amidst Poverty Grass with ground cover that can include Bearberry, Bristle-leaf, St. John's Wort, Rough Hair Grass, Tufted Hairgrass, White Camass, Balsam Ragwort.

Using the provincial Plant List and local species records of Johnson, Renfrew, Reznicek, Mahar, and others, there is potential for rare flora. Our sample list of potential rarities is not intended to be all inclusive.

Virginia Chain Fern	*Hart's Tongue Fern*	*Broad Beech Fern*	*Wall Rue*
Robert's Fern	*Oregon Woodsia*	*Lance-leaved Coreopsis*	*Indian Plantain*
Provancher's Fleabane	*Pine Drops*	*Clustered Broomrape*	*Golden Seal*
Green Violet	*Carex conoidea*	*Eleocharis rostellata*	*Low Nut Rush*
Iris lacustris	*Puttyroot*	*Late Coralroot*	*White-fringed Orchis*
Prairie White Fringed	*Large Round Leaved Orchid*	*Great Plains Ladies' Tresses*	
Sporobolus spp.	*Stipa spartea*	*Purple-stemmed Cliffbrake*	

In past studies we located rarities, including Virginia Chain Fern at Tobermory and one isolated location at Mud Lake, but the West Road site does not provide this same wetland habitat type for the species. We did locate *Eleocharis rostellata, Late Coralroot, Iris lacustris, Low Nut Rush, Indian Plantain* and *White-fringed Orchis.*

We searched archive records of the Heart's-tongue fern near Kemble and Woodford (Soper, 1954) for possible historical records on or near the study site but confirmed no records in that publication.

Plant species are detailed in Appendix B.

6.4 SIGNIFICANT WOODLANDS

Woodlands are defined as "treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor rcreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels," (OMMAH, 2014).

The woodlands at the study site are mixed and coniferous forests, FOM and FOC respectively using the Ecological Land Classification codes for the province. Some of the coniferous forests are treed swamps dominated by White Cedar, with a few supporting White Cedar and Black Ash.

Forest originally covered the north portion of the site but has been cleared for agricultural land use. Since regional forest cover is healthy the provincial criteria for a significant woodland, gauged to setting a conservation target for a discrete woodlot size, do not apply.

This does not mean portions of core, corridors and the linkages between them are not significant and worthy of identification and protection consistent with PPS sections on wildlife linkage. The 2016 studies investigated and mapped wildlife corridors which are discussed in the significant wildlife habitat section.

6.5 SIGNIFICANT VALLEYLANDS

The PPS (OMMAH, 2014) and lower and upper tier Official Plans, reflecting the PPS, describe valleylands as “a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year”. To be considered significant, valleylands must be ecologically important in terms of representation or amount, and must contribute to the quality and diversity of an identifiable geographic area or natural heritage system (OMMAH, 2014). Development and Site alteration may be permitted in significant valleylands if it has been demonstrated that there will be no significant negative impacts on the feature or its ecological function.

Valleylands are not documented on or 120m from the Site.

WSP located a potential significant valleyland during roving surveys in 2016. This is a prominent ridge and valley system and a topographical high point, associated with sand dune formations on one side, turtle nests and a bear den.

6.6 SIGNIFICANT AREAS OF NATURAL AND SCIENTIFIC INTEREST

Significant Areas of Natural and Scientific Interest (ANSI) are defined as areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education. General information and location of ANSIs are found on the NHIC website (http://nhic.mnr.gov.on.ca/nhic_.cfm).

There are three ANSI in the vicinity:

- Sauble Falls North ANSI
- Sucker Creek ANSI and
- Howdenvale ANSI

Sucker Creek and Howdenvale ANSI are the two main features that intercept with West Road.

Howdenvale Bay ANSI extends from Petrel Point vicinity to the top of Howdenvale Bay. This broad ANSI offers a mosaic of open fen, coniferous, mixed and treed swamps. A mixed and coniferous forest portion of the ANSI borders a portion of the West Road study area.

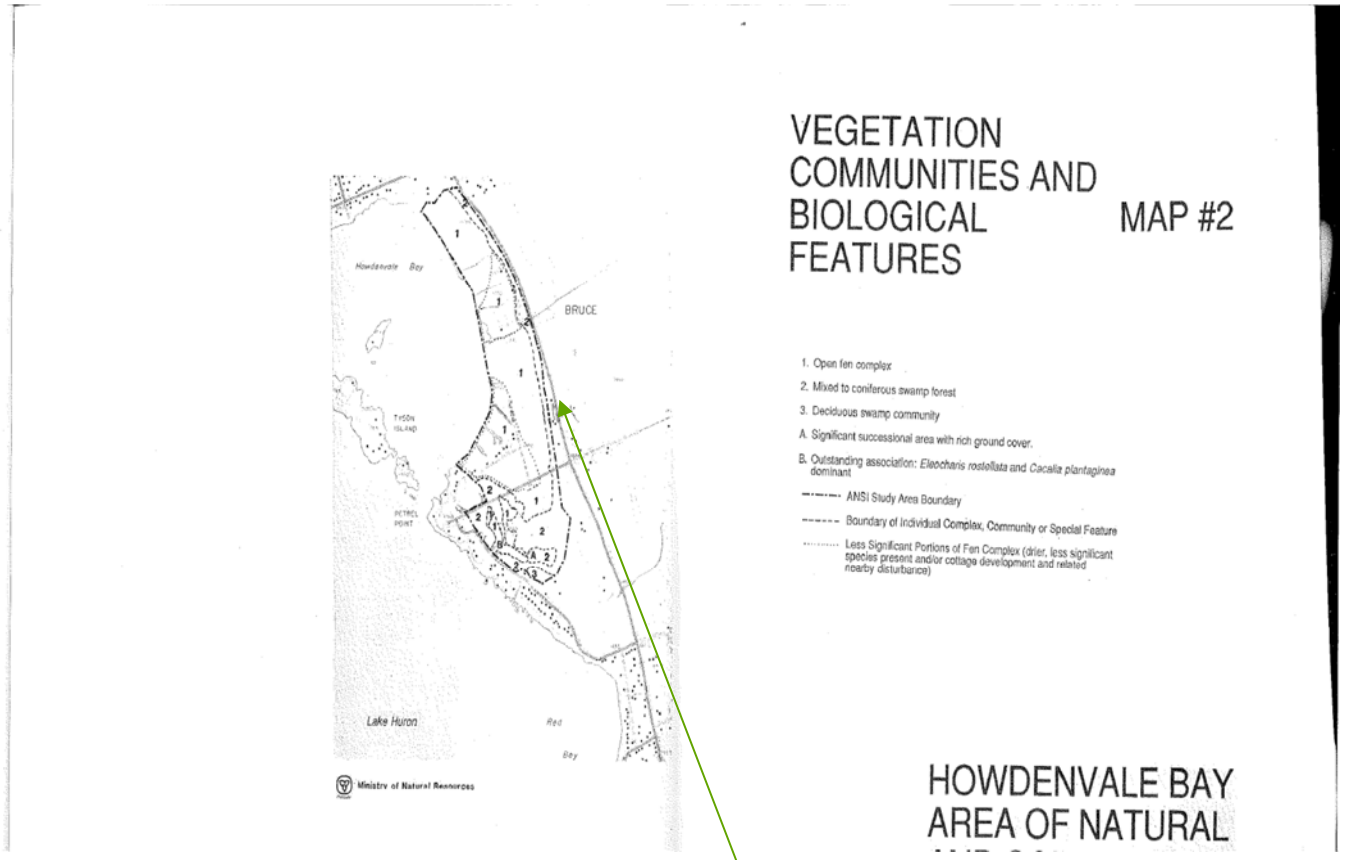

Figure 4 : Howdenvale Bay ANSI and the position of West Road

Howdenvale Bay ANSI supports rare flora including *Eleocharis rostellata* and *Cacalia plantaginea*. Johnson (1986) also observed *Scleria verticillata and Scirpus microcarpus,* along with *orchidaceae* including *Listera cordata, Platanthera clavellata, P. hookeri* and *Spiranthes diletata*. Original reporting was received with thanks from MNRF, reviewed and incorporated into the field search.

6.7 SIGNIFICANT WILDLIFE HABITAT

Wildlife habitat is defined as areas where plants, animals and other organisms live and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual life cycle and areas that are important to migratory or non-migratory species (OMMAH, 2014). Wildlife habitat is referred to as significant if it is ecologically important, in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System (OMMAH, 2014). Setbacks and mitigation of development near or in significant wildlife habitat must adhere to MNRF guidelines and standards.

2015 reconnaissance found significant wildlife habitat potential for black bear denning, snapping turtle nesting, spotted turtle nesting, frog and salamander vernal pools, whip-poor-will courtship, red-shouldered hawk stick nests and these areas were inventoried in greater detail during the 2016 seasonal surveys which

added digger crayfish chimneys, rare orchid riparian forest, an eastern massasauga rattlesnake basking site and grassland bird nesting sites.

Rare flora include alvar and fen affinity plants near Petrel Point such as Tuberous Indian-plantain, Great Plains ladies'-tresses, Beaked Spike Rush, Dwarf Lake Iris, Narrow-leaved Sundew and others which were part of the 2016 seasonal surveys.

6.8 SEASONAL CONCENTRATION AREAS

Areas of seasonal concentrations of animals are defined as "areas where animals occur in relatively high densities at specific periods in their life cycle and/or particular seasons." At these times, species are vulnerable to ecological interferences or weather impacts. Areas of seasonal concentration are typically small in comparison to the larger habitat areas used by species at other times of the year. The identification of habitats associated with seasonal concentrations of species is typically based on known occurrences (OMNR, 2000). An assessment was carried out to determine the potential for wildlife concentration areas on, or within 120m, of the Site. Resources and protocols outlined in the OMNR Significant Wildlife Habitat: Technical Guide (OMNR, 2000) and the Significant Wildlife Habitat Criterion Schedule for Ecoregion 6E (OMNR, 2014) were utilized to evaluate the potential for species concentration area occurrence.

A number of seasonal concentration areas exist near West Road including Great Egret stopover, migration and nest area, frog and salamander breeding ponds, herptile and black bear migration, bald eagle migration. Monarch Species of Concern were also observed using riverine Joe-Pye-Weed as a nectar source on a river well within the 5km criteria distance to a Great Lake assigned by Ecoregion 6E Guidelines for SWH.

Although our observed four Sandhill Crane during spring migration do not meet Eco-Region 6E criteria for significant wildlife habitat, WSP documents their wetland location as the wetland provides other values that do meet the criteria to be considered a seasonal concentration area, for Western Chorus Frog.

6.9 WILDLIFE CORRIDOR

Low level use was documented for deer in the form of track, pellet group, browse and antler rub. Wildlife observed on and near the Site included moles, voles, shrews, beaver, snow-shoe hare, red squirrel, raccoon, White-tailed deer, Black bear, mink, least weasel, fisher and red fox.

Moderate use by black bear was documented in early November crossing West Road in three locations.

All areas of documented track and suitable habitat to convey terrestrial wildlife were ground truthed by SON and WSP in December of 2016.

As noted earlier in the wetland section, avian corridors were also observed for birds including the Sandhill Crane, Great Egret, Red-shouldered Hawk, Rough-legged hawk. These birds were observed during migration, breeding and feeding times flying between Patterson Lake, Wylie Lake, Sky Lake, Beattie Lake inland waters and Lake Huron.

6.10 SIGNIFICANT NATURAL HERITAGE FEATURE SUMMARY

A summary of the significant Natural Heritage Features identified on or adjacent to the Site is provided in the following Table 6.10.1.

FEATURE	PRESENT	COMMENT
Fish Habitat	Yes	Cyprinids and young of the year Brown Trout
Significant ANSI or Natural Areas	Yes	Earth and Life Science ANSI Howdenvale Bay ANSI nearby
Threatened or Endangered Species Habitat	Yes	EMR, Eastern Wood -Pewee
Significant Wetland	Yes	Red Bay PSW
Significant Wildlife Habitat	Yes	Wildlife cores and seasonal wildlife corridors (e.g. snapping turtle nest sites, Red-shouldered hawk nest sites, black bear fall movement, Eastern Wood-Pewee forest interior, treed swamp orchid grove), Monarch nectaring riverine site within 5km of a Great Lake)
Significant Woodland	No	Regional forest cover ample with no minimum woodlot size for PPS “significance”. Special support areas provided by woodlands are identified as Significant Wildlife Habitat
Significant Valleyland	No	One main valley system located of potential significance, however buffered by separation distance from West Road and Right of Way
Sand Barrens, Savannahs and Tallgrass Prairies	Yes	Sand Barrens with SWH support (turtle nests)
Key Hydrologic Features (other than wetlands)	Yes	Potential Karst topography mapped

7 IMPACT ASSESSMENT

7.1 FISH HABITAT

7.1.1 SON WHITEFISH FISHERY

Aletichumaig (whitefish) are a valuable component of the SON fishery and way of life. Thus any work in water, or replacement of culverts at the surfacewater features crossing West Road can potentially impact on the downstream water quality, and quantity, of receiving waters to the nearby Lake Huron Whitefish nursery along portions of the shallow littoral zone. Changes in water quality and quantity can potentially impact the spawning shoals where West Road meanders closest to the shoreline. Young of the year Whitefish have been documented (Ryan, Sober) using shallow littoral zone in the spring before seeking deeper waters as they grow.

Correspondence from SON to the County of Bruce on the scope of consultation notes this concern for SON's commercial fishing rights and provides examples such as drainage changes such as ditching and the construction of culverts. SON (2014) also confirms that areas off the west coast of the peninsula are critical larval nurseries for Lake Whitefish, very sensitive areas that could be affected by increased road salting.

MITIGATION

BMP's would be discussed with SON before construction but include silt fencing, coco-mat, temporary stream diversion and pools to safeguard water quality during potential culvert replacement.

Culvert locations are well documented in the background work conducted by Morton (AWS, 2010).

7.2 SIGNIFICANT WETLANDS AND COASTAL WETLANDS

The Natural Heritage Reference Manual (OMNRF, 2012) describes animal movement corridors as habitats that link two or more wildlife habitats that are critical to the maintenance of a population, species, or group of species, or habitats with a key ecological function to enable wildlife to move, with minimum mortality between areas of SWH or core natural areas. The Significant Wildlife Habitat Technical Guide (OMNRF, 2012) further describes animal movement corridors as elongated, naturally vegetated parts of the landscapes used by animals to move from one habitat to another.

The character of West Road includes wetlands that in places meander up to the road shoulder. Articulation of wildlife across the wetland habitats was confirmed in 2016 with many avifauna, small and large mammals travelling from one wetland to another internal wetland. The Great Egret for example, used three bodies of water as stepping stones between feeding, courting and nest areas.

SAAR archives and current WSP surveys confirm a number of wildlife that rely upon wetlands for part of their life cycle including the Eastern Massasauga Rattlesnake, Northern Ribbonsnake, Northern Watersnake, Eastern Newt, Spotted Salamander, Eastern Redback Salamander, Western Chorus Frog, Wood frog, Gray Treefrog, Spring Peeper, Northern Leopard Frog, Snapping Turtle and Spotted Turtle.

WSP surveys confirmed five key sensitive areas for crossings of wetland and upland (Black Bear) wildlife, mapping the locations for the County, SON and MNRF files.

Four of the five wildlife crossing areas are wetlands with observed species including Spotted Salamanders, Green Frogs and Snapping Turtles. Turtle crossings were between egg laying sites on dune complexes, and open water foraging habitat. One of the five crossing areas was not wetland, conveying Fisher and Black Bear. Any potential road improvements at these key five sensitive areas would require higher levels of mitigation as discussed below.

Proposed road improvement on West Road in the vicinity of wetland, and some wildland forest habitat, can introduce risks to wildlife by exposing species to mortality on West Road from vehicles. The reasonable expectation is that improved road surfaces would result in more vehicles driving at faster speeds with less opportunity to stop and avoid the wildlife. Mitigation is detailed below.

MITIGATION

Any road improvements to West Road at the five key sensitive areas would a higher suite of mitigative tools at later design and detail stages to mitigate for car and animal interaction.

Specifically this type of higher level mitigation involves tools such as open grated concrete eco-passages, working examples of which can be seen Cypress Provincial Park. Dry ledges can also be installed in culverts; ledges are recommended to be at least 30cm high and should be provided every 150-300 feet if proposed along one of the five key sensitive areas. Further detail on this mitigation is provided below.

7.2.1 AMPHIBIAN AND SMALL MAMMAL DRY LEDGE

Crossing structures should be at least 30 cm high, provide low stature opening cover, be easily accessible, and, in optimal snake and amphibian crossing areas (5), be offered every 150-300 feet.

One way to convey wetland wildlife under West Road is by retro-fitting a culvert with a dry ledge along the inside wall of the culvert.

Research on the matter of construction materials finds that wood or concrete (Foreman, 2004;Meaney et al. 2007) has been effective vs. metal.

Table 1 and 2 provide a summary of the specifications.

Table 1: Retrofitting Existing Culverts with Dry Ledges for Wildlife Passage

Fauna Categorie Requirements	Otter	Reptiles	Small Rodents	Martens	Amphibians	Beaver, Fox, Badger
Minimal width of dry ledge	1 m	0.6 m	0.4 m	0.6 m	1 m	1 m
Minimal clearance above dry ledge	1.5 m	0.75 m	0.4 m	0.75 m	0.75 m	1.5 m

Retrofitting Existing Culverts in the Context of Maintenance Programs

Design of dry ledges for existing culverts makes a balance between minimal species requirements and hydraulic constraints. Therefore dimensions given are smaller.

Table 2. Requirements for terrestrial animals when culvert retrofitting.

Fauna Categorie Requirements	Otter	Reptiles	Small Rodents	Amphibians	Beaver, Fox, Badger
Minimal width of dry ledge	0.2 m	0.4 m	0.4 m	0.4 m	0.6 m
Minimal clearance over dry ledge	0.6 m	0.4 m	0.4 m	0.6 m	0.6 m

The standard, after giving basic dimensions also shows different possible designs, thus giving the engineer a palette of choices that can used in different situations. Dry ledges can be made of wood, concrete or stone.

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Table 2: Requirements for terrestrial wildlife

7.2.2 OPEN GRATE CULVERT

To allow for adequate rain, light, and air circulation, culverts are recommended to have an open top fitted with an open grate positioned flush with the road surface (Arizona Game and Fish Department Habitat Branch, 2006). This type of concrete culvert was installed at Cypress Provincial Park. Researchers suggest that vegetation cover at the entrance of the culvert may also play a significant role in the use of the passage by wildlife (Clevenger, A.P. et al 2001), and using grills at culvert entrances for smaller animals can discourage predators (Little, S.J., et al. 2002)

7.3 HABITAT OF THREATHENED OR ENDANGERED SPECIES

EMR activity at West Road ROW would require response in construction drawings to monitor road improvements relative to sensitive habitats where/if present. Mitigation can include the use of eco-passages such as the eco-passage installed at Cypress Lake Provincial Park (SAAR audit for SON).

GENERAL HERPTILE ECOPASSAGE BENEFIT

Herptiles such as the threatened status Snapping turtle would similarly benefit from travel through a daylit open grated concrete culvert.

Aresco (2005) employed temporary drift fences at four lane highways to test effectiveness in directing turtles into culverts to reduce highway mortality over a 2.5 year study during both drought and non-drought. The drift fence reduced turtle road kills and guided turtles to the under-highway culverts. Drift fence can be installed at a main wetland zone to test the effectiveness of this mitigative measure alongside eco-passages.

Eco-passages also mitigated for turtle crossing in Florida, monitored during the Lake Jackson Ecopassage Feasibility Study (CRTPA, 2005).

Attum et al (2008) studied landscape variables to assess whether wetland wildlife can benefit from mitigation most if the wetland area is also proximate to forested upland. Wetlands close to upland forest were observed to provide more connectivity and use than isolated wetlands. This supports our landscape approach of evaluating wetland-forest ecotones and recommending mitigation for turtle crossings at those nodes.

7.3.1 ROADWORKS

Road shoulder cut, fill, excavation and blasting can all result in direct loss of rare flora, and disperse nearby herptiles and fish from the area due to the vibration. We recommend no blasting or heavy machinery excavation at the five key wetland corridor and core areas without higher suites of mitigative tools beyond standard wildlife timing windows. Examples of additional mitigation that may be required include the use of vegetated buffers to dampen noise and site level accuracy for applying the timing windows to avoid the times of peak wildlife concentration. Knowledge of the local breeding, flowering, and migration events is required.

7.3.2 NOISE

Heavy equipment including loaders, flatbed trailer trucks, dump trucks and work crews affect wildlife. Some mammals and birds disperse into adjacent forest, and return when the disturbance is gone. The effort to establish a new territory is a cost to a bird, for example, because there is often an inhabitant in neighboring woodlands which costs the leaving bird effort for territory battles.

We recommend a general phasing of construction along West Road to limit the extent of noise disturbance. Timing restrictions can be placed on when and how long to run the noisy machinery, to maximize the baseline of wildlife we should be maintaining. Specifically:

- Restrict stockpiling topsoil in the ROW to avoid cavity nesting wildlife entry (e.g. Belted Kingfisher) which would then require conservation throughout the breeding season until young successfully fledge
- Restrict the duration of heavy machinery to outside of critical wildlife periods; dusk and dawn. This can be accomplished by restricting equipment operators to no earlier than 7:30 a.m. for start up and no later than 8:00 p.m. for completion of a workday in the peak wildlife production months of May 15-June 30.

A number of species with known conservation concern occur within the study site, at times along the right of way road shoulder itself, more often within the 120 metre lands adjacent to the existing West Road.

WSP provides additional detail on our methodology, findings, impact assessment and recommended mitigation in the next section, referenced against a broad landscape perspective to include wildlife corridors. This forms the basis of our conclusions on the five key areas, where any future road improvements with varying degrees of disturbance can only be considered with appropriate mitigation.

7.3.3 EASTERN MASSASAUGA RATTLESNAKE

Site Tenacity

Precambrian shield observations are in line with the Bruce Peninsula EMR fieldwork however on a broader point, in that Harvey and Weatherhead (2006) found most of the radio tagged EMR (>70%) stayed within 100m of their prior years hibernaculae, with an over-winter mortality of 23% over the three years similar to the 21% active season mortalities they recorded. Field results support our recommendation to treat the five key wildlife wetland corridors carefully.

The five key sensitive areas would require higher level mitigation if any improvment in current road surface were proposed, although current general maintenance and road repair for safety will continue.

Where culvert replacement may be required, opportunity to replace corrugated steel culverts with open grated cement eco passages which are daylit to encourage safe wildlife travel beneath the road, should be encouraged. Indeed, at the five key sensitive areas identified from seasonal surveys this is recommended.

Hibernaculae habitat is varied on the Bruce Peninsula. Freezing in water may be a primary factor contributing to the high rates of over winter mortality measured by field researchers (Shine and Mason, 2004), followed by starvation (Aleksiuk and Stewart, 1971) and dehydration (Constanzo, 1989). Over-winter mortality could also be caused by external factors unrelated to the site quality itself such as predators, disease, parasites and extreme weather such as a flood event. Current work by Yagi (2016) on this subject in laboratory controlled experiments is shedding further light on the conditions required by snakes during winter in the subterranean “life zone”.

Gregory (1984) felt that site fidelity to hibernation sites, and communal hibernation were expected responses to low hibernation site availability (Gregory, 1984), although our 2008 field observations at the Highway 69 site indicated some aggregation during hibernation.

Field research gleaned from tracking EMR over a three year period (Harvey and Weatherhead, 2006) found that snakes hibernated in a variety of habitats ranging from old tree root systems, rodent burrows and rock crevaces for a Bruce Peninsula site, with 32 snakes using 46 different hiberculae.

How far to snakes disperse?

Jellen and Kowalski tracked 16 free ranging neonates for up to 56 days before hibernation. The young snakes ranged over an area of 0.36 hectares in total, with average daily movements of 5.3 metres.

Daily movements were less than Jellen and Kowalski expected, but in line with our field observation of a subadult EMR in Port Carling, Ontario (Sober, pers. comm., 2008) of 82 metre mean daily movements in fall. Sober noted distance between hibernaculae and basking sites for a sample of the Parry Sound EMR to be 30m, while Reinart and Kodrick (1982) measured the distance between hibernaculae, foraging and gestation habitats within 200 metres for a Pennsylvania sample.

Staying relatively close to all critical habitats can decrease roadside mortality (Bonnet et al., 1999). Bonnet noted EMR use of specific micro-habitats (*Danthonia – Solidago-Liatrus and Danthonia-Polvitricum – Rubus* vegetation zones).

TABLE 2. COMPARISONS OF MOVEMENT FREQUENCY (%), ACTIVITY RANGE (HA), AND MEAN DAILY DISTANCE MOVED (M) BY AGE CLASS THROUGHOUT THE RANGE OF *Sistrurus catenatus*.

Location	Source	Age class	*n*	Movement frequency	Activity range	Mean daily distance moved
Cicero Swamp, NY	Johnson, 2000	Adult	15	69	26.2	19.5
Ontario, Canada	Weatherhead and Prior, 1992	Adult	12	60	25.0	56.0
Carlyle Lake, IL	Dreslik, 2005	Adult	48	60	4.4	12.3
Northeastern Indiana	Marshall et al., 2006	Adult	26	66	4.1	10.6
Northeastern Illinois	Wilson and Mauger, 1999	Adult	3	—	2.4	13.5
Western Pennsylvania	Reinert and Kodrich, 1982	Adult	25	—	1.0	9.1
Western Wisconsin	King, 1999	Neonate	32	—	2.3	—
Western Pennsylvania	This study	Neonate	12	70	0.36	5.3

How far do young EMR move from gestation sites?

For 16 days after their initial ecdysis, neonates were found within 11 and 16 metres of their mother's gestation site (n=5, n=12), and after 42 days, neonates had dispersed an average 44.5 and 83.3 metres (n=5, n=12) from gestation site. Some neonates appeared to trail their mother; one neonate remaining within 3.8 metres of the mothers path for 18 consecutive days. On 19 October 2005 (shortly before the over-wintering period), field researchers observed two neonates basking atop rodent burrows, a suitable over-wintering site and a distance of 20.0 m and 13.6 m from their mother's gestation site. The neo-nates daily activity range averaged 0.36 hectares, with a maximum range of 40.19m - 116.9 metres, and an average daily distance of 1.67 metres to 5.27 metres.

Types of Over-wintering habitat and mortality

Hibernation sites vary. The population studied on the Bruce Peninsula by Weatherhead and Prior (1992) were mostly found within forested areas, while in other parts of its range, the EMR have been documented in crayfish burrows (Maple, 1968; Reinert, 1978; Seigel, 1986), wetland hummocks (Johnson, 1995), and rock crevices (Wright, 1941).

A common feature of hibernation sites across the range seems to be access to the unfrozen portion of the water table (Johnson, 1995) and a south facing aspect. Southern exposure is a common feature of north-temperate hibernation sites (e.g., Carpenter, 1953; Drda, 1968; Macartney et al., 1989; Brown, 1991; Prior and Weatherhead, 1996) and presumably functions either to moderate subterranean temperatures or facilitate warming during emergence in the spring. Snakes may emerge in good health but with low body temperatures that hamper its ability to fight or flee predators (Angilletta et al., 2002)

When viewing the mortality of EMR during the active season and over-wintering mortalities, only 60% of snakes studied by Angilletta et al (200) survived from one year to the next. Given low annual survivorship and the intermittent reproduction of northern crotalids (Reinert, 1981; Brown, 1991; Holycross and Goldberg, 2001), most females would be unlikely to survive more than 2-3 reproductive episodes. This may have important life-history consequences in terms of investment in early reproduction (Shine, 2003); (Harvey, Danial et al., 2006).

During the 2016 surveys an EMR was located in the most southerly treed swamp, wetlands associated with the Hodgins Lake Management Area.

The level of mitigation is subject to the level of potential change being contemplated. The five key crossing areas identified would require higher suites of mitigation if potential road improvements were contemplated, to mitigate for potential increased vehicle speeds. This would trigger an additional suite of mitigation options.

7.4 SIGNIFICANT WOODLANDS

The largest forest patch on the central portion of the site can be considered a significant woodland because it provides enough interior forest from road edges to support forest interior wildlife and sensitive wildlife such as the Eastern Wood Pewee and the Ruffed Grouse respectively.

7.5 SIGNIFICANT VALLEYLANDS

We noted one substantial valley landform associated with sand dune topography and hardwood forest.

MITIGATION

This area is conserved via recommended signage for the turtle crossing. Information about black bear is subject to discussion on signage because of the poaching concerns if knowledge is made available.

7.6 SIGNIFICANT AREAS OF NATURAL AND SCIENTIFIC INTEREST

7.6.1 HOWDENVALE BAY

The vegetation communities so well inventoried by regional botanical expert Joseph Johnson were reviewed and incorporated into our search efforts as the ANSI is situated close to West Road, and at the northeast part falls within 120m study site adjacent lands.

Some of the ANSI coastal fen affinities (*Cacalia plantaginea, Eleocharis rostellata*) do not appear close to West Road as the fen is associated with Lake Huron and Howdenvale Bay. The treed swamp forests however do contain elements of the ANSI including orchidacea of significance.

Given the presence of other ecological features and functions such as secretive raptors and migration of Snapping turtle, as well as the possible migration of Spotted turtle, a 400m reach of West Road at this location has been recommended for eco-signage and no road surface improvement. Improvements in this sensitive zone would require MNRF approvals as well as a higher suite of mitigation.

Howdenvale Bay ANSI also supports rare flora including *Eleocharis rostellata* and *Cacalia plantaginea.* Johnson (1986) also observed *Scleria verticillata and Scirpus microcarpus,* along with *orchidaceae* including *Listera cordata, Platanthera clavellata, P. hookeri* and *Spiranthes diletata*. Original reporting was received with thanks from MNRF, reviewed and incorporated into the field search.

MITIGATION

Mitigation consistent for wetland supporting significant wildlife habitat includes recommended water quality monitoring, firstly to collect a baseline and then to assess change on a suggested five year interval period.

Sampling locations are associated with the drainage of:

- Howdenvale Bay ANSI
- Swamp North of Beattie Lake
- Sucker Creek ANSI
- Vernal Pool

Ecological parameters of water quality monitoring could be developed with the County of Bruce, SON, MNRF and OMOEE to ensure that pre and post water quality remain acceptable for wildlife.

Typical water chemistry (e.g. pH, DO2, temperature, TSS) is measured along with a few indicator species such as the abundance of frogs noted breeding and/or amphipods as a local example.

Monitoring for species presence, along with historical water quality parameters, provides a measure to assure the continued function of the wetland habitat for these species that may be receiving roadway de-icing effects from winter road maintenance. Rationale for consideration is provided below.

For example, MOE Policy 2 Systems where P exceeds 0.030 mg/L policies suggest:

Evaluations of existing conditions in problem areas shall be conducted and all reasonable and practical measures shall be taken to upgrade water quality to the Provincial Water Quality Objectives. Where new or expanded discharges are proposed, no further degradation will be permitted, and all practical measures shall be undertaken to upgrade water quality" (MOE, 1994).

7.6.2 ROAD SALTS

WSP and SON found a roadside vernal pool with the cross culvert rich in stonefly and mayfly. This crossing requires buffering from winter road salt drainage.

Freshwater insect larvae such as nymph Paragnetina gill cells are known to be affected by increased salinity (Kapoor and Zachariah 1973a, 1973b). Morphological and histochemical evidences indicate that these cells are involved in osmoregulation (Wigglesworth, 1933; Sohal and Copeland 1966; Wichard et al. 1973; Komnick 1977).

Mitigating for entry of road salts and de-icer compounds in particular adjacent to the five key sensitive areas is recommended and detailed below.

MITIGATION

Mitigation such as an infiltration trench with a planted low robust sedge border is one available option (Staples et al, 2004) for consideration if monitoring data indicate lower than expected densities of wetland breeders.

Based on our review of provincial, federal and Technical Reference Manuals, we recommend that the monitoring program incorporate the following concerns and evaluate for target health limits where known:

1. Turbidity values should not be elevated beyond baseline. Total suspended solids (Newcombe & MacDonald, 1991) show that over 25 mg/L, some decline in fisheries can be measured, from 80-400 mg/L TSS. Some fish species cannot be supported when turbidity levels are over 400 mg/L.

2. PH should not exceed 6-8 ranges (Canadian Water Quality Guidelines or CWQG, 1987).

3. High levels of suspended solids impede filtration of oxygen through the gill rakers of many fish, so we would recommend a healthy range level to fall between 25 mg/L-40 mg/L, CWQG note under 100 mg/L

– or preferably be allowed to fluctuate no greater than 10% above our recorded levels in spring.

Nitrate nitrogen toxicity to the aquatic community ranges widely, with LC50 or lethal concentration measured by fifty percent mortality studies measured mortality for salmonids from 7 to 6,000 mg/L concentrations (CWQG, 1987). The warm water species on site, however, exhibit known tolerance of nitrite as documented within the MOE Water Quality Guidelines.

A review of some highway research program results (NCHRP, 2013) concluded that proactive strategies to reduce chloride de-icers included anti-icing, de-icing, pre-wetting, roadway and pavement design, vegetation management, snow fences and vehicle-mounted spreaders before entry of chloride. Reactive strategies included the creation of infiltration trenching, vegetated swales, filter strips and detention ponds.

Discussion regarding the various mitigation options for winter road maintenance will continue through the Class EA process.

7.6.3 SUCKER CREEK ANSI

The broad 1000 hectare ANSI reaches from Lake Huron shores of alvars and fen wetlands through sand dune complexes and upland forests. Johnson (1984) set the south limit of the ANSI at West Road. This southern limit includes an open fen (vegetation community #3, 1984) which supported a Marsh hawk in 1984 and a calling Red-shouldered hawk.

Floral diversity in sedges was documented and some of the sedge species were noted by WSP on the 120 adjacent land to West Road including *Carex scirpoides, C. eburnean, C. crawei* as well as the coastal *Cladium mariscoides.* Our breeding bird morning chorus surveys did not uncover the prior documented Solitary Vireo.

The vegetation communities benefit from surrounding forest cover and a low level of development.

A small wetland oriented northwest of Beattie Lake occurs along this east-west stretch of West Road before encountering sand dune complexes and the sharp left turn onto Daddy Wier Road. The wetland supports cyprinids, Species of Concern Western Chorus Frog and non-listed Wood frog and Painted turtle.

MITIGATION

Maintain the same road surface for a 50m radius from the wetland habitat to deter motorists from speeding, with the goal of reducing roadside mortality of wetland species crossing West Road.

Ensure winter road maintenance is “wetland friendly” with no leachate of road de-icing material into the wetland with the onset of spring freshet and snowmelt.

If potential road improvements are proposed at any of the five key sensitive areas, higher suites of mitigation are triggered including eco-passage construction, dry ledge wildlife corridors within culverts and/or vegetation buffers and signage.

7.7 SIGNIFICANT WILDLIFE HABITAT

Diverse birds migrate along the Lake Huron shoreline, with some spillover into the inland open wetland habitats that cross parts of West Road. Species observed include migrating Bald Eagle in September, one Piping Plover lost in springtime May fogs, and summer nesters within the study area including Upland and Spotted Sandpiper, Common Snipe, American Woodcock and more boreal affinity Brown Creeper. Grassland breeders were more prevalent in the northerly farmed portion of the study area. April bird returns during evening migration resulted at times in birds grounding, resulting in one roadside mortality of an American Woodcock.

Herptiles travel across portions of West Road during critical breeding periods, and some areas of rare flora observed by our team will also require mitigation around the SWH and/or provision to re-locate and enhance habitat elsewhere as guided by the Species at Risk Act. Travel corridors include the black bear passage along Daddy Wier Road which requires mitigation.

MITIGATION

The phenomenon of birds 'going to ground' during spring migration is worthy of signage in this rich area of the Bruce Peninsula. This risk of birds colliding with a vehicle is not really linked to what kind of road you introduce, or how many cars; humans on those foggy spring nights conceivable also tend to 'go to ground' and stay home. The issue is that the open landmarks the birds navigate along, such as Lake Huron and the larger rivers including Sauble, cannot be seen. The birds collide as easily with a tree, dwelling, car or wildlife surveyor (pers. observ., Marshy Bay, North Channel).

Signage with a diagram of the wind thrust and recommended speed of travel at these crossings is recommended similar to the design for highway signs in Mexico as you approach Monarch wintering grounds. Note that the signage is more of a public awareness campaign vs. mitigation as the 'strikes' are low in number.

i.e. We covered prime areas of bird migration during fog conditions for various wildlife surveys at night, walking along road shoulders, and noted only one casualty in 2016, an American Woodcock.

Bear corridor protection includes ensuring that the currently gravel road does not receive a faster travel surface such as asphalt for a 400m reach around this forested crossing of West Road. Potential road improvements, if required for competing values such as human safety for sight lines, etc., would trigger higher suites of mitigation and discussion with SON.

7.7.1 DWARF LAKE IRIS

The Dwarf lake iris is a tiny flowering plant which occurs in the Bruce Peninsula and Manitoulin Island in Ontario (Small 2015). The Dwarf lake iris grows in sand or thin soils over gravel or bedrock and it flowers best in semi-open edge habitats (Higman et al 2002). Dwarf lake iris usually flowers from mid-May through early June (Higman et al 2002). The Dwarf lake iris is considered threatened in the United States and Canada (Small 2015). Dwarf lake iris is sensitive to mechanical disturbance or removal of its substrate (Higman et al 2002). It is ecologically resilient in the sense that it can tolerate light trampling and slight shading as well as removal of overstory (Higman et al 2002).

This plant is locally abundant along the Lake Huron shoreline, yet scarce provincially and globally.

In some sections of existing road shoulder the Dwarf Lake Iris appears to flourish, with small clusters of greater than 100 specimen plants.

These sporadic and concentrated amounts of the Iris may be associated with excavating nearby native soils and redistributing soil and seedbank during past era construction for rural residential areas.

The locations of Dwarf Lake Iris have been mapped and will serve as a working map layer for the County team when coordinating efforts at later stages to avoid the flora. If relocation is absolutely necessary this will involve further discussion with the MNRF and SON.

7.7.2 CRAYFISH

We documented substantial activity of an uncommon chimney building crayfish. Chimneys were observed in the toe of slope of two roadside ditches. These locations have been mapped for coordinating efforts at later construction stages to ensure the feature remains, notwithstanding the small (0.2ha) size of habitat.

7.7.3 SPARGANIUM EURYCARPUM

Giant or Broadfruit bur-reed is a perennial flowering plant with broad leaves and is categorized as emergent vegetation because of its affinity for shallow waters (Leif & Oelke 1990). It has a tolerance range of 32-968 mg/l of CaCO3 (Sletton & Larson 1984). Sparganium eurycarpum is a preferred casemaking material for Limnephilus indivisus (Usis & Foote 1991). Giant bur-reed seedlings are sensitive to shade and will not survive in shade or in cloudy water (Leif & Oelke 1990).

Monitoring the current baseline conditions of the water chemistry, applying site mitigation for any future culvert replacements at this location including silt curtains, coco-mat for streambank stabilization for instance, are important components of the follow up if culvert replacement or road shoulder alteration via cut and fill activity is proposed for this stream system.

7.7.4 WESTERN CHORUS FROG

The Western chorus frog feeds on various invertebrates but mainly on spiders and ants (Whitaker 1971). It was a threatened conservation status amphibian but has been downgraded to Species of Concern.

Breeding concentrations of these frogs were documented during evening amphibian chorus surveys.

This species migrates an average of 75m from their aquatic breeding site (Semlitsch & Bodie 2003). A stratified system of protection zones in key habitat areas is recommended for the protection of amphibians (Semlitsch & Bodie 2003). Semlitsch (1998) recommended setbacks of 164m during his studies, a distance which is not available for roads traversing wetlands.

Mitigation that is available includes eco-signage for this wetland portion of the Hodgins's Lake Management Area, and a small wetland north of Beattie Lake. Potential road improvements at any of the key five sensitive areas would trigger the higher suite of mitigative measures.

7.7.5 SPOTTED SALAMANDER

The Spotted salamander is a pool-breeding species that lives in small mammal burrows during their terrestrial phase; they are incapable of excavating their own burrows (Regosin et al 2004). The salamander has been tracked with phosphorescence in the field, moving from uplands an average 116m to the aquatic vernal pool for a few weeks to breed (Semlitsch 1998). A successful management plan addresses both the terrestrial habitat used by the salamander for a corridor and breeding pools (en sensu, Semlitsch 1998).

A small vernal pool within 20m of the ROW displayed the most activity for Spotted salamanders and has been mapped for the mitigation of no change in road surface or road shoulder, with special mitigation to plant robust vegetation on the roadside direction of the vernal pool.

The red-eft juvenile stage and the adult Eastern Newt were observed breeding, and moving from a vernal pool in the southern portion of the study site to adjacent forests in 2015 and 2016.

Published field experiments tracking these salamanders indicate they moved an average 1-70 metres nightly, further with high humidity and rain events. Following marked phosphorescent salamanders, experimentors recorded the greatest distances of 75-100 metres in an evening. Adults moved in a more direct and linear path than the efts (Figure 6).

MITIGATION

Conveyance of wildlife through existing culverts along West Road could be improved with dry ledges to facilitate travel under West Road to the adjacent wildlands at the five key sensitive areas identified in reporting.

The possible effects of winter road maintenance de-icing derivatives leachate into wetland habitat could be mitigated in part by installing a robust emergent vegetated buffer between wetland and ROW.

Improvement of road surface would trigger the highest suite of mitigation including construction of eco-passages, and dry ledge wildlife passage within culverts, for example.

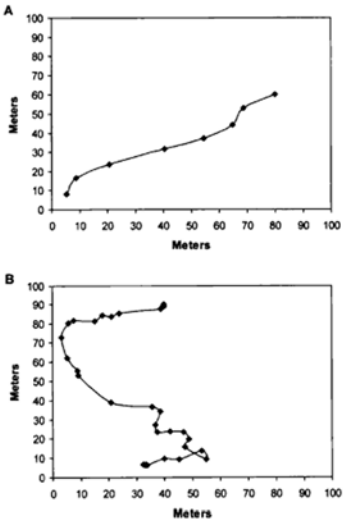


FIG. 1. Path shape and standardized measurement of representative adult (A) and eft (B) terrestrial movements. Points represent the locations marked during night trailing that were used to measure the shape and distance of the trail.

mass as a covariate. A one-way ANCOVA was also used to test the effect of stage, adult versus eft, on the average nightly distance moved, with mass again used as a covariate. The average nightly distance traveled was log transformed to achieve normality. We did not run statistical tests on the total distance traveled because this distance more reflected the success of the powder tracking and not the total emigration distance of an individual. To determine whether specific weather variables affected whether a newt moved from a refuge location, we used a stepwise logistic regression. To test whether weather variables affected the type of substrate used, we also used a stepwise logistic regression.

We measured the directionality of trails by calculating the ratio of trail displacement to total distance. A ratio value close to one indicated similar displacement and distance values as a result of a straight, unidirectional path. In contrast, a value close to zero indicated a relatively small displacement value and a localized path. An arcsine transformation was performed to achieve a normal distribution of the data. We performed a one-way ANOVA to test the effect of stage on the ratio of distance to displacement each night. The data from the first night of movement was excluded from each individual because we felt initial trail directions were biased by our presence during the release.

RESULTS

Field Tracking.—There was a wide range of variation in the distances traveled by *N. viridescens* adults and efts (Table 2). The mean nightly distance traveled for each individual ranged from 1–70 m. The majority of trails were short, because the mean nightly distance traveled averaged over all individuals was 14.6 m ± 2.6 SE, whereas the longest trails in a single night ranged from 75–100 m. Neither sex ($F_{1, 27} = 0.76$, $P = 0.39$; Fig. 2) nor stage ($F_{1, 40} = 2.01$, $P = 0.16$) had a significant effect on average nightly distance traveled. Mass was also not a significant factor in either comparison (males vs. females: $F_{1, 27} = 0.01$, $P = 0.92$; adults vs. efts: $F_{1, 40} = 0.24$, $P = 0.62$).

Weather conditions played a role in explaining newt movements. A stepwise logistic regression showed that average temperature ($P < 0.0001$) and maximum temperature ($P = 0.0139$) on the day of movement, as well as the amount of rain on the previous day ($P = 0.0414$), affected whether newts moved or stayed in refuge at the same location. Humidity ($P < 0.0001$) and the amount of rain on the previous day ($P = 0.0142$) had a positive relationship with the distance of travel when newts moved.

Although we did not find differences between the sexes or stages in distance moved, we found that there were different patterns of movement between adults and efts. The ratio of displacement to distance was significantly higher for adults than efts after the first night (mean ratio = 0.81 ± 0.03 SE for adults and 0.51 ± 0.14 SE for efts; $F_{1, 23} = 8.76$, $P = 0.007$), an indication that adult trails away from the pond were significantly more directional and linear than those of efts (Fig. 1).

We found that both adults and efts use a wide variety of microhabitats, including leaves, branches (woody debris less than 10 cm diameter), logs (woody debris more than 10 cm diameter), rocks, grass, and moss (Fig. 3). The largest percentages of newts were found near the surface under leaves (40.2%) and branches (29.5%), although newts were often found on exposed surfaces (16.4%). The trails also portrayed an extensive use of three dimensional habitat, including routes in and over logs, up the bases of trees and ferns, and drops from rocks. However, neither newts nor their trails

Figure 6: Eastern Newt Movement Patterns

Forest floor substrates where salamanders were observed included microhabitats of leaves, woody branch debris less than 10cm in diameter, logs of greater than 10cm, rock, grass and moss. The terrain is important since experimenters noted an extensive use of three dimensional habitat. Salamanders travelled into and over terrain; inside logs, climbing up tree and vascular plant stalks and climbing up and over rocks. This use of the terrain may help protect the salamanders from predators and should be retained in the areas indicated on our constraint map.

7.7.6 GREAT EGRET

The great egret is a wide-ranging migratory bird that preys on multiple species of fish (Sepúlveda et al 1999, Frederick et al 1999). Breeding of Great egrets occurs from May to June (Baine 2011). Great Egrets nest in shrubs, trees, or wetlands (Baine 2011). Disturbance of Great egret habitat leads to decreased foraging rate which is detrimental to the health of the Great egret population (Stolen 2003). A buffer zone of 100m is recommended to ensure the foraging and loafing habitats of the Great egret are undisturbed (Stolen 2003, Rodgers & Smith 1995).

The PSW supporting this Egret functions in tandem with other nearby waterbodies for this bird which forages in the PSW straddling West Road, then travels between Lake Huron and Patterson Lake.

MITIGATION

The nest site was located well distanced from West Road and will not be impacted, however the wetland has already been recommended as one of five key sensitive areas with signage for endangered species support. Any proposed road improvements at this wetland location, would trigger the higher levels of mitigation such as eco-passage construction, dry ledge wildlife corridor construction within culverts and/or vegetative buffers.

7.7.7 RED-SHOULDERED HAWK

Bloom notes this hawk is adaptable (Bloom et al 1993), however it displays secretive nesting habits and requires the ecotone of riparian forest (Portnoy & Dodge 1979) close to wetland as it forages on wetland species (Stewart, 1949). Riparian forest near a designated provincial wetland supports this bird, who has built a number of

Field researchers and professional foresters through ecologists have recommended a variety of setbacks for construction activity from this bird. Rashin & Frye (2013) suggested a construction exclusion zone of 100m to avoid displacing the bird. It is accepted that chronic noise is a critical factor influencing habitat quality for forest birds (Bayne et al 2008). An area of over 1.21km2 with predominantly mature woodland is sufficient habitat for one pair of Red-shouldered hawks (Bloom et al 1993). Red shouldered hawks require a minimum of 10ha of continuous forest in order to meet their territorial requirements but would prefer 100ha (James 2014). Maintenance of mature forest with little understory is recommended in a minimum area of 10ha around a nest (James 2014). Selective cutting of single trees or very small patches is possible (James 2014). Disturbance should be avoided in the nest area from mid-March to the end of June (James 2014).

Courting and nesting of the Red-shouldered hawk occurs from late February until late June (Stewart 1949). Tree removal should be prohibited within 300m of active nests and over 20ha of forest should be retained (Naylor et al 2004).

MITIGATION

The significant wildlife habitat of the hawk nests is setback 50m from West Road as per the SARA. It is also dually protected by our early recommendations of no improvement in road surface to mitigate for roadkill of wetland amphibians crossing West Road at this location.

Therefore no additional mitigation is required for the Red-shouldered hawk nests.

7.7.8 ORCHIDACEAE

The Bruce Peninsula is host to a dazzling array of orchid species. We noted abundant and diverse orchid species within and near some of the treed swamp wetland habitat types within 120m of West Road.

Road construction and winter maintenance both have the potential to impact the treed swamp habitat that supports the orchid grove.

This is because road shoulder sand and salt can enter the treed swamp during rain events and spring snowmelt. The ph requirements of the orchid family can be very specific, thus this effort to limit any change in receiving waters is warranted.

Species include the Showy Orchis, Small-whorled Yellow Orchid, Twayblade Orchid and Hooker's Orchid.

MITIGATION

Silt fencing can be erected at the road right of way limit. Also cautious application of roadside vegetation can be considered as a nutrient buffer for roadside derivatives; caution because the shrub buffer would need to be planted beyond the reach of the winter snow-plow blade..

7.7.8.1 SEASONAL CONCENTRATION AREAS AND WILDLIFE MOVEMENT CORRIDORS

Searching foraging/mating habitats and movement corridors to confirm use by eastern massasaugas has a relatively low probability of success because of lower snake densities and larger potential habitat areas.

In general, air temperature <15^{o}C, wind >24km/hr, and cold winds depress activity. Searches should concentrate on openings in forest, and higher elevations within low wet areas.

7.7.9 BLACK BEAR

Both the Saugeen Ojibway Nation and the Ministry of Natural Resources and Forestry (MNRF) have an expressed conservation interest for the Black Bear, a large ranging species associated with the healthy forest cover on the Bruce Peninsula.

According to the SON and the MNRF the Bruce Peninsula supports an isolated and distinct population of black bear. Discussions with SON confirm black bear carries special significance and value.

MNRF or SON did not have bear range mapping. MNRF provided Eco-Region 6E Significant Wildlife Habitat Guidelines helpful in characterizing potential bear habitat by vegetation community. Although we've found the bears don't den in just these vegetation community types (FOM1-1, FOM2-1, FOM3-1 ecological land classification types) it is a helpful tool alongside SON field expertise in this matter and SON values to outline these areas of Significant Wildlife Habitat.

Significant wildlife habitat for black bear was identified by WSP and SON. The key areas of large mammal corridor movement for the black bear, and associated denning areas, have been respected by our recommendation of no improvement in West Road surface treatment in those areas. Potential road improvements would trigger higher levels of mitigation and discussion with SON.

7.7.9.1 BEAR DEN SURVEYS

WSP undertook lower level bear den surveys as recommended in the 2015 reporting. SON environmental staff skilled in traditional harvest of bear with den survey expertise assisted with thanks (Ritchie with Skinner).

Mitigation prescriptions resulting from the field survey includes:

- No change in road or road shoulder at the key SWH areas identified
- Eco-signage if/as required to warn motorists of large mammal crossings
- No installation of vegetation buffers at large mammal crossings, to maintain site lines for motorists across the ROW, allowing for greater warning time to reduce or avoid vehicle-bear collisions

Evidence of bear included claw marks, scat, direct visual observation and den habitat. The ecology of black bear relative to mitigation prescriptions for roadside are discussed below.

7.7.9.2 CUMULATIVE IMPACT

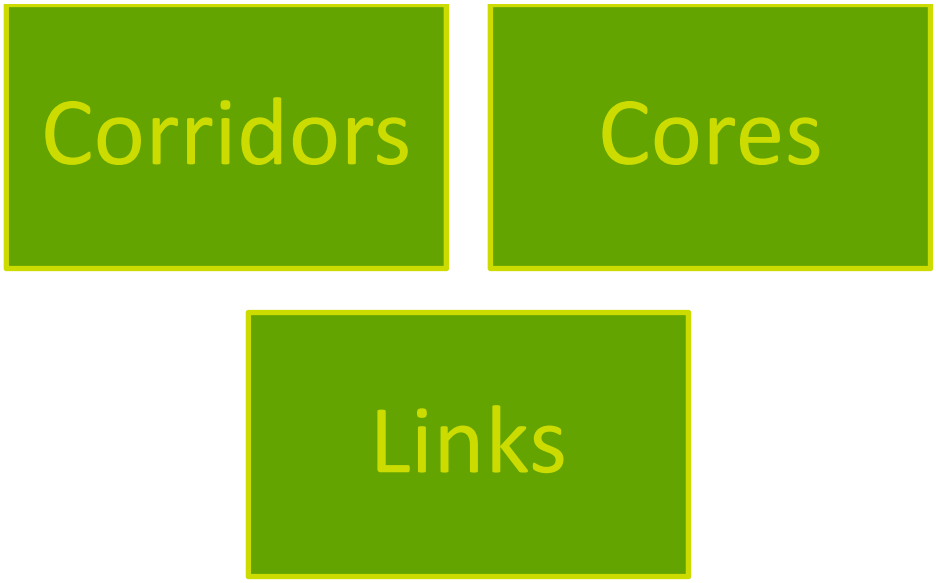
The northerly portion of the study site has undergone traditional farming with larger openings and does not represent cumulative future effects in this manner, however the central forested portion associated with the Daddy Wier 'dog-leg' tight corner and associated large forest patch, is a candidate for potential cumulative impact through possible future incremental removal of tree cover in that area for a myriad of future uses.

Potential land uses that can work incrementally to reduce the value of habitat for black bear include uses that remove forest in a substantive way such as residential subdivision development, solar energy farms, windfarms, commercial uses such as large storage buildings, some aggregate extractive uses, adult resort lifestyle communities, etc.

Road improvements on this central forested patch of Daddy Wier Road would represent an incremental and thus cumulative impact to black bear habitat value since improved roads carrying greater traffic at higher speeds would reasonably be linked to greater black bear mortality at the large mammal crossing areas.

The level of site tenacity for denning areas may also mean that increased road traffic could continue to represent bear-vehicular mortality if bear traditionally access their dens and do not disperse to colonize another area. Indeed, the amount of robust larger forest patches that convey bear via corridors to their core den areas, and the links between them, are limited on this narrow peninsula of land on the Bruce Peninsula.

Road surface treatment changes in this area of forested wildlife corridor would trigger the higher suite of mitigative tools and team discussion with SON.



Natural heritage reference manuals and guidelines published by the province to complement the Planning Act Provincial Policy Statement Natural Heritage Policy indicate minimum corridor widths are 50m (PPS NHRM), bolstered by the available scientific literature on natural heritage system conservation noting 100-200m widths. The Natural Heritage Reference Manual indicates 100m corridor widths, while the most recent scientific literature on this subject suggests that 200m corridor widths are most effective to maintain movement.

Two of the large mammal corridors overlap across West Road, thus a 400m length of West Road (at Daddy Wier Road section) has been recommended to remain in a low velocity type of road surface such as gravel or tar and chip.

This type of direct mitigation will assist in maintaining the conveyance of large mammals (and small mammals) across this portion of the forested landscape. Bear require the forested links to larger habitat as noted in published field results below.

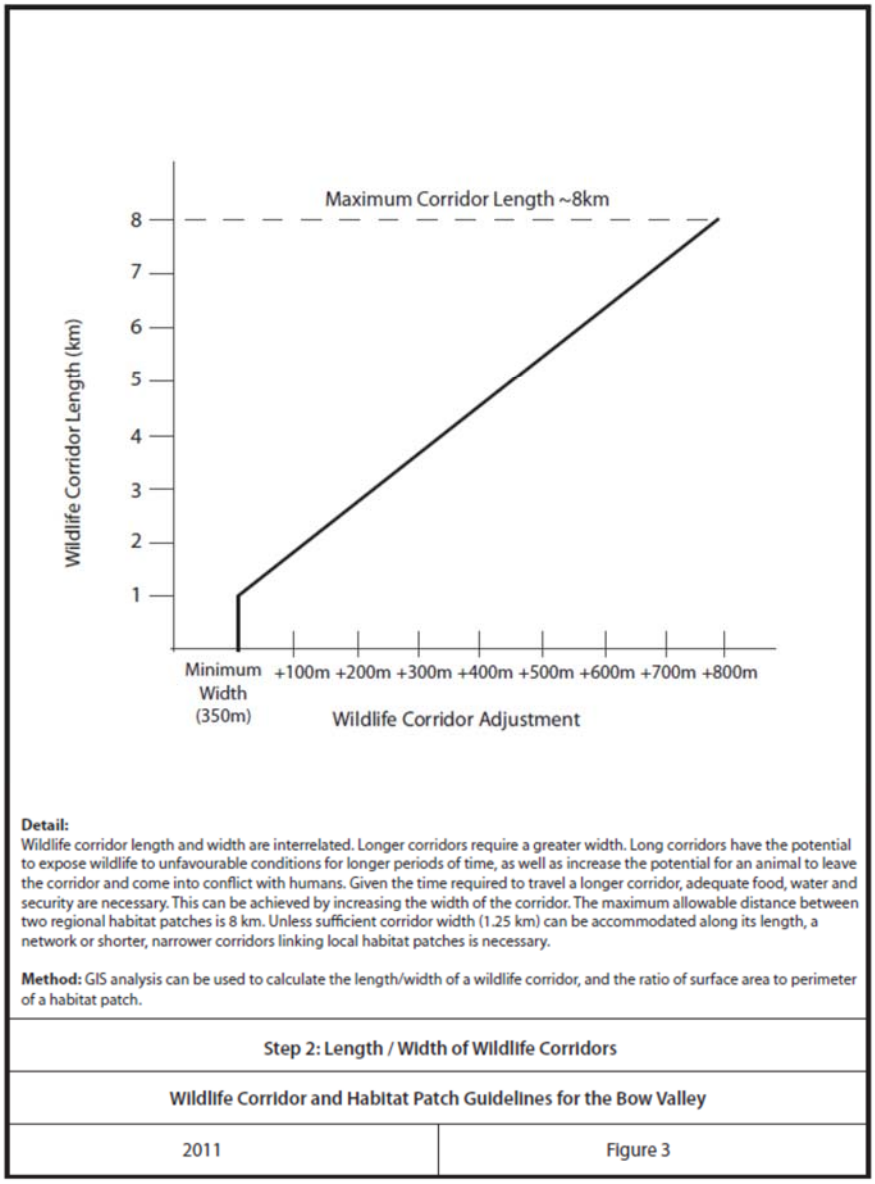


Figure 7: Larger ranging mammals in forest blocks of Banff, Alberta, are reviewed above to reference attaining maximum corridor width wherever possible for continued passage (Bow Corridor Ecosystem Advisory Group, Wildlife Corridor and Habitat Patch Guidelines for Bow Valley, 2012).

Wildlife corridor and habitat patch size field surveys were conducted for bear in Alberta. Eighteen radio-collared bear were monitored from 1982 to 1983 at 1310 locations. Tracking confirmed that male bear summer range size averaged 3205 ha and 6931 in the fall. Females used smaller areas, 872 hectares in the summer and 1712 in fall.

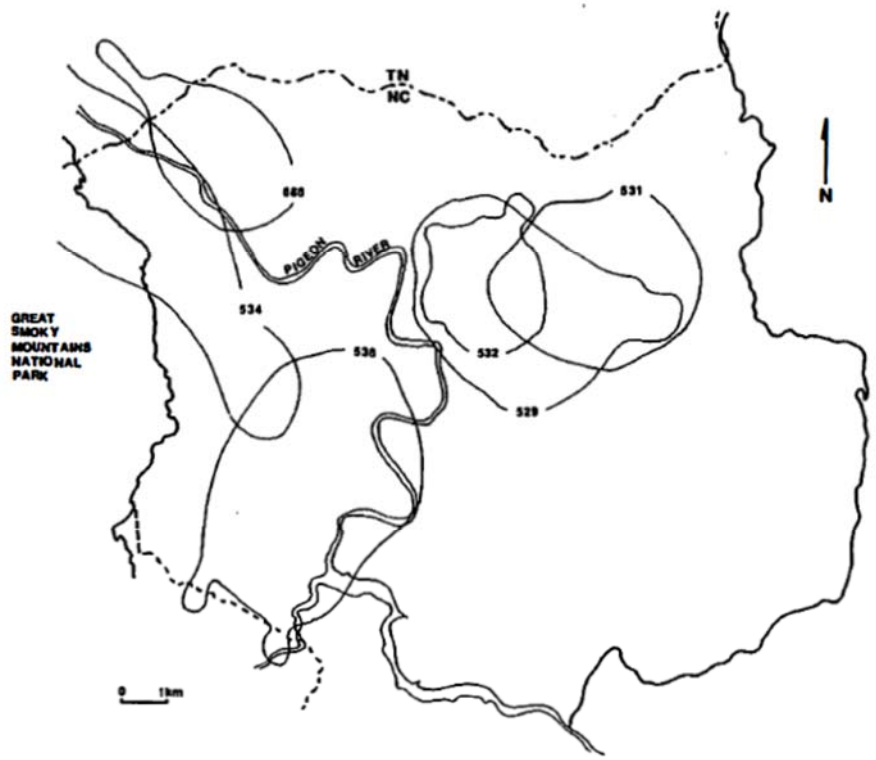


Figure 6. Annual home range overlap of radio collared female bears on Harmon Den and the Twelve Mile Strip, Pisgah National Forest, 1982. Home range boundaries drawn at 95th percentile of harmonic mean values for each animal's locations.

Figure 8: Bear range excerpted from field research

Another field study (Brody, 1982) in Pisgah National Forest found bear foraged in 50-70 year old Oak stands which peak in acorn production at that age.

Brody assessed the effects of roads fragmenting bear habitat in this similar ecozone to the Bruce Peninsula forest types, using regressional analysis on the bear crossing events vs. the density of roads. Brody concluded that logging road densities “may begin to restrict bear movement at densities of 1.25 km/km2 and open improved roads may begin to restrict bear movement at densities of 0.5km/km2.

This suggests that West Road and potential future road fabric do have an effect on bear movement. Brody recommended that ten percent of open areas be planted with mast trees so the food supply is consistently available to black bear over time (en sensu, 1984). Limits of the ROW can be enhanced with Red Oak plantings and/or 120m within private lands, with approvals, to bolster this food crop for bear without compromising safety sight lines for motorists on West Road.

Temporal Mitigation

Den habitat can include caves, fallen hollow logs, mossy hollows under spruce branches, even a rock crevice or windthrown stump (en sensu, Banfield, 1974). We find that our human presence in the form of voices and movement can rouse bears from hibernation in March when bear can emerge from dens for short forays (Sober, pers. comm.). From mid-April through early May, bear will remain close to the winter den. Any potential den habitat on or near the site should be conserved with adjacent sanctuary trees for adult bears to deposit cubs while foraging afield. Mid-April emergence is concurrent with the deeper forest hawk returns observed by Sober (MNRF, Timber Management Plan Raptor Surveys, 2000).

Heavy machinery operation at the central forest section of West Road (Daddy Wier Road 800m reach) should avoid this higher bear movement timing window of autumn and spring. Spring will coincide with half load restrictions and thus overlap with conservation interests (March-April). October fall bear crossings can be conserved best by limiting October roadwork, if proposed for that area, outside of October. This is not a restriction on general travel of trucks from one section of West Road to another since it is a travelled road. It speaks to one specific location on Daddy Weir Road for peak bear movement in March-April and October.

7.7.9.3 CULTURAL VALUES

Bear appear to use areas of transition in elevation and habitat change such as roads and water forest interfaces (Zorn and Quirouette). SON values black bear on many levels including as a spiritual clan totem (McGee, 1987).

Road Effects

Any future road improvements such as asphalt paving of currently gravel road sections of West Road could increase the amount, and the speed of traffic. This increase in traffic could increase vehicle-animal mortality. Potential improvements would trigger suites of mitigation beyond standard timing windows to address velocity.

Grizzly bears (Ursus arctos) in the Rock Mountains shifted home range away from areas of high road density (McLennan and Shakelton, 1988; Mace et al., 1996; Mattson, 1990) and Brody and Pelton (1989) found this also true for Black Bears (Ursus americanus). Roads increase the probability of vehicular – wildlife mortalities, in this instance vehicle-bear collisions, and increase the energy expended by bears to flee such an environment. Further, infra-structure simply fragments habitats (Seaman and Powerll, 1990; Shoen 1990, Lindzey and Meslow, 1977, Mattson, 1990 in Coady, 2001). When arterial roads such as Highway 6 displace bears, the isolated habitats and smaller populations may create their own effects such as less vigorous genetic strains over time from inbreeding – all contributing factors to a less resilient environment and a potential loss of biodiversity.

Bear have also been radio-collared on the Bruce Peninsula to assess the effect of roads. Eight black bear were radio-collared. Bear avoided Highway 6 by 0.5km, with greater avoidance of the secondary roads. Coady (2001) concluded that the volume of traffic rather than the type of road affected bear use. Parks Canada at times relocates bear, and of 255 ground relocations, road fabric still remained in the bears home range. This may simply indicate there are no truly wild areas left without road fabric over the large range of a black bear, but also that Coady's indication of traffic volume being the key deterent for the bear is correct.

On the Bruce Peninsula, population isolation and genetic drift indicate a unique isolated community of black bear on the West Road study site and peninsula, as reviewed below with the local Bruce Peninsula National

Park surveys on the black bear. Obbard et al (2016) estimated the population size of the black bears on the Bruce Peninsula north of Highway 21 noninvasively at 90 barbed wire hair corals, some of which included portions of the West Road study area.

The population was estimated to be 316 black bear+- 46.6 standard error at a 95% confidence interval, and that 97 of the bears (+-15.6SE, 95% CI) occupied Bruce Peninsula National Park. The survey was a collaboration amongst the OMNRF, Parks Canada Agency and the Saugeen Ojibway Nation. Field results indicated more male vs. female bears on or near the West Road study area, and a class structure of 202.2 bear older than one year in the sample size of 316 (+-29.8 SE, 95% CI). Sampling occurred in spring and the early summer with little evidence of large scale movements by bears during the study.

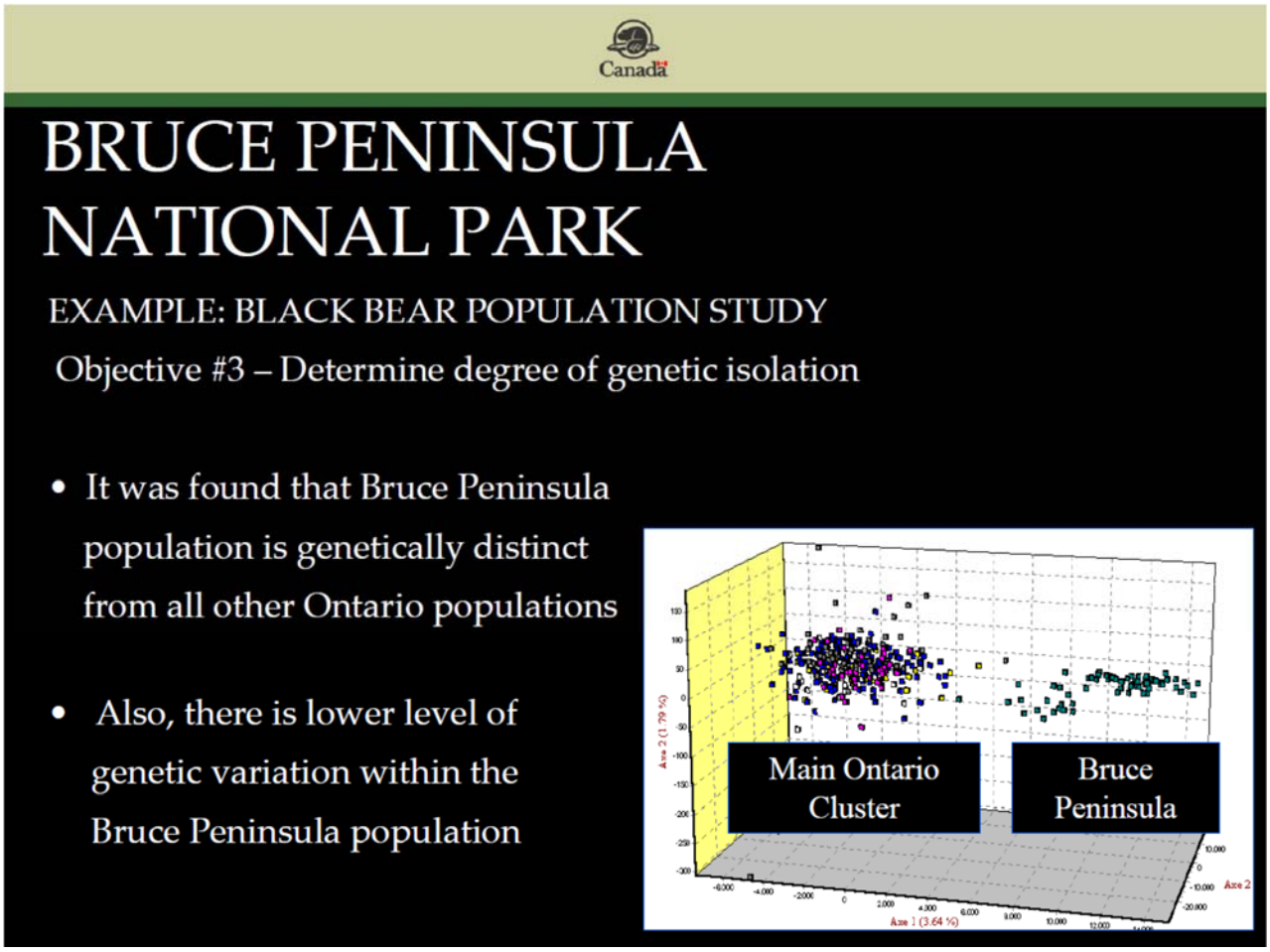


Figure 9: Bruce Peninsula National Park Powerpoint Presentation Excerpt

The Bruce Peninsula black bear survey worked with smaller sample sizes given the narrow peninsula of landform. The density of bears captured was 0.2 – 0.4 bears per square kilometer. Blood sampling and DNA analysis indicated a lower level of genetic variation, reflecting a low level of geographic dispersal. This is supported by other researchers including Kristensen (2013) who noted that dispersal is clearly tied to population structuring because it can mediate gene flow. Moyer et al (2006) sample size of thirty five bears assessing natal philopatry confirmed that genetically related bears were located closer to eachothers home

ranges than bears with no genetic relatedness. The extent of dispersal for Bruce Peninsula bears is a vital piece of information that can assist in mitigating for road mortality, and is a research need.

Female philopatry is expected with female offspring overlapping mothers' ranges. Males typically disperse farther after two years. Females settling near their mothers home range is however not the rule beyond the Bruce, and there are many different patterns observed for the levels of philopatry and population dispersal in other regions and habitats. For instance, some female Black Bear with overlapping range in northern Ontario did not exhibit a relationship between proximity and relatedness (Schenk et al., 1998). Hair snare studies conducted on the Bruce Peninsula by MNRF and Parks Canada (2012) with subsequent genetic analysis concluded that the black bear population is isolated.

Kristensen's 2013 Ph.D. thesis field data was subject to biostatistical rigor and provides solid data on the degree of relatedness (parent-offspring, full sibling, half sibling, unrelated) for each dyad pair. Kristensen assessed how relatedness differed in space to 95% confidence intervals to distances from 1km, 3, 6, 9, 15, 30 and 45km. The Tennessee sample analyzed by Kristensen did not have bear dispersal beyond 21km, while this pattern of female philopatry for the Ursidae family varies considerably (Schenk et al. 1998, Taylor et al. 2001, Stoen et al, 2006, Zhan et al..2007, Costello et al. 2008, Jerina and Adamic 2008, Zeyl et al, 2009,Hu et al. 2010 in Kristensen, 2013). Male emigration distance of a healthy sample size field experiment (n=43) was 22-62 km from natal range between the age of 1-3 years, settling into a permanent home range between 4 – 7 years. Females in the study settled closer to their natal range; 0-7 km with one female ranging greater than 20 km at age 5 (Costello, 2010).

Although it has often been reported that most subadult males disperse from their natal area whereas most females settle in or adjacent to it (Rogers 1987b; Schwartz and Franzmann 1992; Costello 2010), some observations suggest that dispersal may be a more complex process, influenced by population density. Indeed, interpopulation comparisons revealed variation in the age of sexual maturity and dispersal among males exposed to different density regimes (Lindzey and Meslow 1977; Rogers 1987a).

The potential effects of road widening for a recreational paved non-motorized shoulder on black bear movement, habitat use, activity and corridor crossing was studied in the Grand Teton National Park. Costello et al (2013) radio-collared thirty (30) bears. Their results are helpful and interesting; bears didn't shift their home ranges or reduce their corridor crossings, but altered the way they used the land near the crossing, selecting steeper slopes where available along the crossing area, and areas that provided greater vegetative cover. The bears also reduced their daytime activity by approximately 35% and overlapped with human recreational users thus less. Bears crossed the corridor more frequently in the morning and evening. This reflects the intelligence of the bear. Results also suggest we should not encourage trail systems along Daddy Wier Road because although the bears can re-schedule their crossing times to avoid humans, the shift to morning and evening can subject them to greater vehicle threat during those poor light conditions.

Knowing that the black bear of the study area are limited, isolated genetically, and subject to road fragmentation impacts, WSP has suggested bolstering their food crop by plantings as discussed below.

Bear Forage and Shelter Plantings

Bear scat shows that bears will eat twigs and stalks along with berries, and will also burrow for food. We have observed bears eating blueberries, moles, shrews (Short-tailed Shrew) and skink in Muskoka, pawing into decaying fallen logs for insects, salamanders and Iris tubers, Goldthread and potato grubs. Bear seek out honeybee nests in tree cavities and locate wasps and ants in burrows. Fruit and nut sources include Elderberry, Hazelnut, Beechnut, Oak and Blackberry. Black bear are opportunistic feeders and their diet can

also include crayfish and fish from the pond on site. In this regard, WSP recommends bolstering the food crop for bear by adjacent lands plantings in the forest.

Bear have been documented ranging from their summer range if forage base such as acorns from Red Oak are not plentiful; males ranging 26km with females travelling 10km during a 206 bear radio-collaring field survey in north-central Minnesotica (Noyce and Garshelis, 2011). Thus, directing some mast tree plantings proximate to bear den sites can perhaps reduce dispersal distances by supplying required food items.

Collaboration with the Saugeen Ojibway Nations (SON) would enrich the type of traditional harvest plants for aboriginal use as well. Plantings can include:

Rubus allegheniensis Blackberry

Vaccinium myrtilloides Blueberry

Vaccinium macrocarpon Large Cranberry

Vaccinium oxycoccos Small Cranberry

Viburnum lentago Nannyberry

Coptis groenlandicus Goldthread

Podophyllum Mayapple

Sambucus canadensis Elderberry

Ilex reticillata Winterberry

Cornus alternifolia Alternate-leaved Dogwood

Crataegus spp Hawthorn

Fagus grandifolia Beech

Quercus rubra Red Oak

The native flora of the site also suggests the following tree and shrub species should be included in privacy screening for small mammals beyond the black bear mitigation.

- Alternate-leaved Dogwood
- Leatherwood

Tree seedlings:

- Tamarack
- Black Cherry
- Trembling Aspen

Shrub level corridors would provide future sheltered pathways for the small and medium sized mammals of the site, which include the Snow-shoe hare, meadow vole and ground nesting upland sandpiper, American woodcock and common nighthawk observed here.

7.8 SIGNIFICANT NATURAL HERITAGE FEATURE SUMMARY

Table 7.8 Significant Feature Summary

FEATURE	PRESENT	COMMENT
Fish Habitat	Yes	Cyprinids and YOY Brown Trout in watercourses. Any work in water and/or culvert replacement requires mitigation to safeguard fishery and ultimate Lake Huron littoral zone outlet of streams since whitefish YOY require maintained water quality and quantity
Significant ANSI or Natural Areas	Yes	Ecology proximate to West Road at the Howdenvale and the Sucker Creek ANSI are sensitive crossings. Any potential road improvement would trigger additional suites of mitigation and MNRF approvals for consistency with SARA.
Threatened or Endangered Species Habitat	Yes	Rare species were located, mapped, and provided with specific mitigation on ROW or 120m adjacent lands. These include Eastern Massasauga Rattlesnake, Spotted Turtle, Eastern Wood Pewee
Significant Wetland	Yes	PSW and Local Wetlands that straddle West Road are identified as sensitive wildlife crossings. Any potential road improvements would trigger additional mitigation such as eco-passage construction, dry ledge wildlife culverts, vegetation buffers and eco signage for Snapping Turtle crossings
Significant Wildlife Habitat	Yes	Large mammal crossing signage is recommended at Daddy Wier Road with no road surface improvement along the 400m zone for black bear. Improvements would trigger higher suites of mitigation to manage vehicle speeds and discussion with SON. Heavy machinery if required at key five sensitive areas would trigger additional mitigation including timing windows to avoid breeding bird season for Great Egret but also for adjacent forest nesting Red-shouldered hawk
Significant Woodland	Yes	As above
Significant Valleyland	No	Potential significant valleyland identified but buffered by separation distance from West Road
Sand Barrens, Savannahs and Tallgrass Prairies	No	Sand barrens, savannahs and tallgrass prairies were not identified on or within 120 m of the Site.
Key Hydrologic Features (other than wetlands)	Yes	Potential karst identified within 120 m of the Site with mitigation including no excavation into shallow groundwater during any road improvement activity in that zone

8 MITIGATION SUMMARY

Best management practices apply for any of the potential roadworks as detailed in MTO regulations summarized below. These mitigative tools target erosion and sediment control, therefore a higher level of mitigation is also required. The second set of mitigation prescriptions is tailored to the natural heritage observed on and near the study site.

Best Management Practices

- Proper installation of filter cloth adjacent to water bodies to contain silt events
- Water truck for dust control
- Stockpile management; avoid stockpiling during bird nesting since Belted Kingfisher, Bank Swallow and others can excavate the stockpile which would then require barricading.
- Operate during fisheries windows (outside of fish spawning times)
- Install BMP's early and restore early with seed mix at ROW margins including native species

Mitigation tailored to the West Road neighboring ecology is summarized in table format on the following page.

All species listed have some level of conservation status ranging from Species of Concern through to Threatened conservation status.

TABLE 8 MITIGATION SUMMARY

ECOLOGY	MITIGATION	TIMING WINDOW
Barn Swallow	Barns with swallow activity were mapped and caution will be required for roadwork within 500 m.	May – June.
Bobolink	Setback construction 50m from Bobolink nest	April - May
Common Nighthawk	Restriction on heavy machinery at all courtship sites.	April – May.
Eastern Meadowlark	Restrict heavy machinery 10m from nest (this nest is proximate to ROW)	April – May or confirmation of no nest by qualified biologist.
Eastern Whip-poor-will	Restrict heavy machinery 50m from open nest	N/A.
Eastern Wood-Pewee	Restrict heavy machinery 50m from forest nest site	May – June.
Olive-sided Flycatcher	Restrict heavy machinery from the creekbank	April – May.
Snapping Turtle	Snapping turtle nests located on sand dunes. Exclusionary fencing should be installed at locations mapped.Signage. If road improvements are proposed, this triggers additional mitigation such as eco-passages limit further roadside mortality.	Avoid May-July for erecting signs close to nest sites
Wood Thrush	Species identified. Temporal restrictions recommended.	April – June 50 m from nest.
Key Wetland Crossings	A:Potential eco-passage improvment, amphibian and small mammal dry ledge and/or open grate concrete culvert.	Build eco-passage outside of April – July.
Eastern Massassauga Rattlesnake	A, as above	Avoid April – August construction at key wetland.
Significant Valleyland and dune system	A, as above Signage for turtle crossing posted 50 m from nests.	Install signage outside of peak season.
Large Mammal Crossing	Signage. Any potential road improvements would require mitigation to limit speed and discussion with SON	Signage can be installed January – March and July.
Vernal Pool Spotted Salamander Amphipod Breeding and Migration	A, as above Maintain current road surface for a 50 m radius. Ensure winter de-icing compound is wetland friendly or install a robust sedge linear swale for attenuation.	Construction of eco-passage should avoid April – May breeding.
Bird and Bat Migration	Signage. Eco-education regarding foggy evening migration.	Erect signage in October.
Dwarf Lake Iris	All locations on and near ROW are mapped. Safeguard specimens with snow fence.	Install post-bloom in May so all specimen flowers have been seen.
Crayfish Chimneys	Drainage ditch locations are mapped. Work on the Ferndale section must limit soil entry by installing filter cloth.	Avoid ROW disturbance in May.
Orchid Swamp	Maintain water quality and quantity by installing filter cloth at ROW limit to entry of deleterious substances.	N/A
Epi-karst	No excavation into shallow groundwater at that zone.	All seasons.
Crepuscular and Nocturnal Wildlife	Avoid night lighting. If required, use downward directed lighting to maintain night sky.	All seasons.

9 CONCLUSIONS

The two year study along 29.7 kilometers of West Road confirms there are five key sensitive areas where wetland wildlife may cross West Road, and conduct various parts of their life cycle adjacent to West Road. If potential road improvements are contemplated at any of the five key sensitive areas this triggers additional mitigation to safeguard the natural heritage features and functions. Mitigation can include construction of eco-passages, dry ledge wildlife culverts, vegetated buffers and eco signage. Mitigation has also been prescribed for the sensitive natural areas including provision for water quality and quantity controls if culverts are replaced and re-sized. The overall goal of the study was to first identify the key biodiversity, next assess the potential for road improvement to impact it, and finally to provide our recommended triage of mitigation for sensitive zones through to road construction with best management construction practices.

The 2016 wildlife surveys benefit from collaboration of field crews with the Saugeen Ojibway Nation and their respective experts including Doran Ritchie assisting with black bear survey and Joseph Pitawanakwat sharing medicinal plant and traditional harvest wisdom.

Cultural perspectives helped to focus the breadth of conservation areas. This assisted in refining a suite of mitigation measures for the flora we inventoried, and the seasonal concentration areas of turtles, snakes, shorebirds and larger roaming animals including Black Bear, Fisher, Beaver and Snow-shoe hare observed.

We welcome any questions or comments and also extend appreciation to landowners for new information such as that received from Mr. Pratt and the McDonalds.

Sincerely

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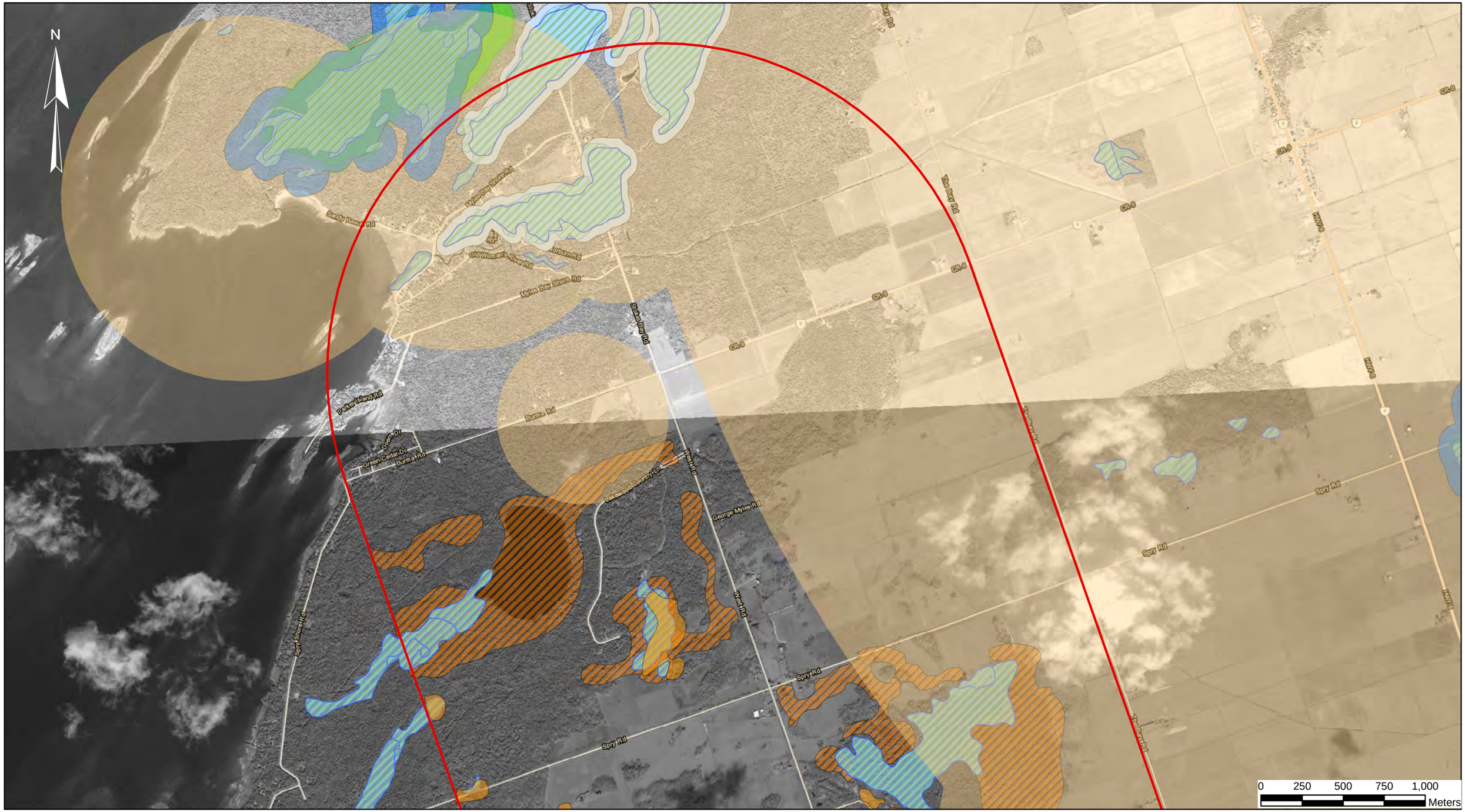
Appendix A

MAP LAYERS



Source: Esri World Imagery 2009 (updated February 2016); DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- West Road Section 2000m Zone of Study
- S1 Critically Imperiled Obs. Post 1980
- S2 Imperiled Observation Post 1980
- S3 Vulnerable Observations 1990
- Karst
- Provincially Significant Wetland
- Provincially Significant Wetland 120m Zone of Study
- Locally/Other Significant Wetland
- Locally/Other Significant Wetland 60m Zone of Study
- Wetland not evaluated
- Life Science ANSI
- Life Science ANSI 50m Zone of Study
- Hazard

Client: Bruce County		Project No.: 10001745-410	Drawing No.: 1
Drawn: SW	Approved: LLS	Title: NATURAL ENVIRONMENT MAP WEST ROAD- BURMA ROAD TO SPRY ROAD	
Date: January 2016	Scale: As Shown	Project: WEST ROAD BRUCE COUNTY, ONTARIO	
Original Size: Tabloid	Rev: 2		

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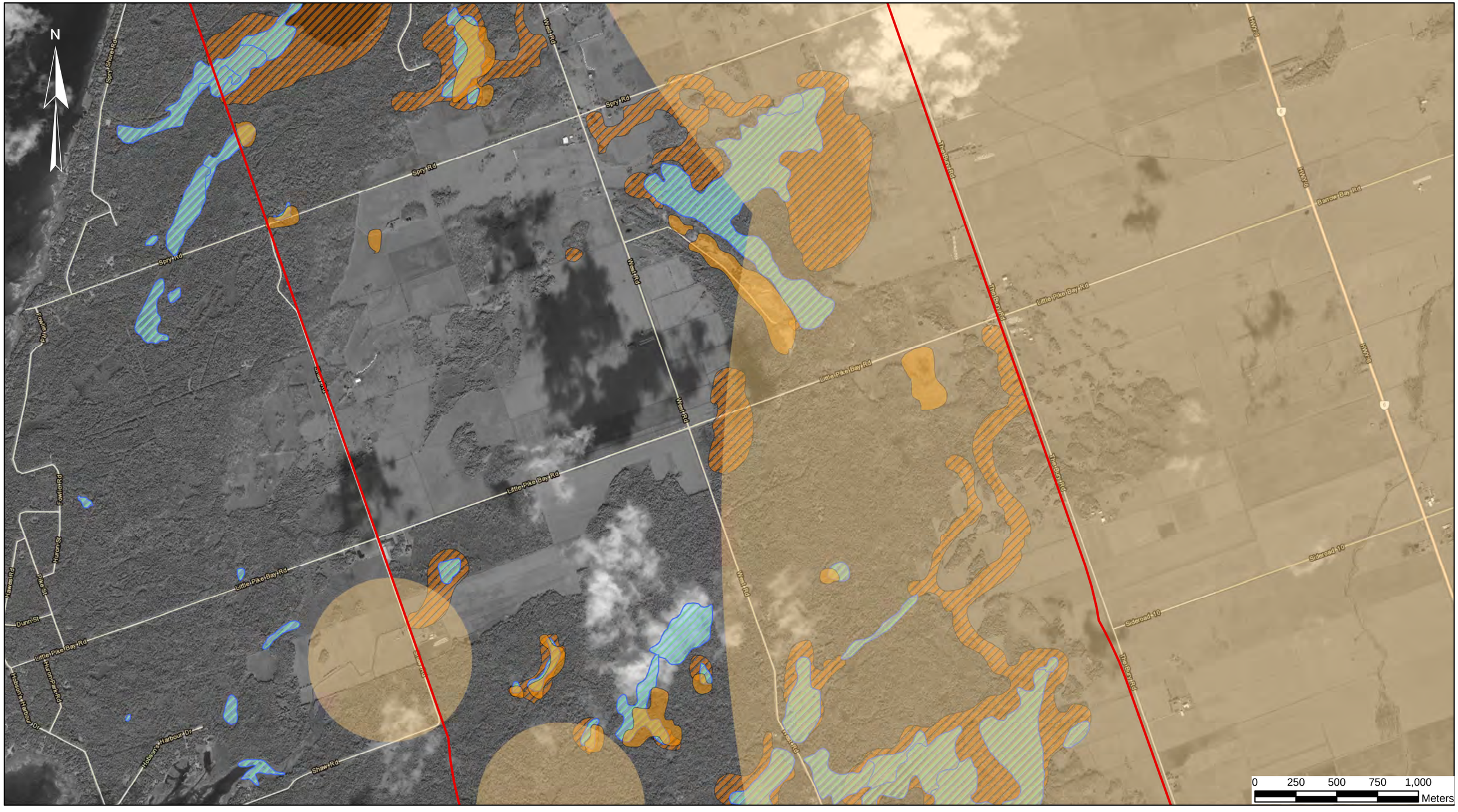

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LEGEND

- West Road Section 2000m Zone of Study
- S1 Critically Imperiled Obs. Post 1980
- S2 Imperiled Observation Post 1980
- S3 Vulnerable Observations 1990
- Karst
- Provincially Significant Wetland
- Provincially Significant Wetland 120m Zone of Study
- Locally/Other Significant Wetland
- Locally/Other Significant Wetland 60m Zone of Study
- Wetland not evaluated
- Life Science ANSI
- Life Science ANSI 50m Zone of Study
- Hazard

Client: Bruce County		Project No.: 10001745-410	Drawing No.: 2
Drawn: SW	Approved: LLS	Title: NATURAL ENVIRONMENT MAP WEST ROAD- SPRY ROAD TO SOUTH OF LITTLE PIKE BAY ROAD	
Date: January 2016	Scale: As Shown	Project: WEST ROAD BRUCE COUNTY, ONTARIO	
Original Size: Tabloid	Rev: 2		

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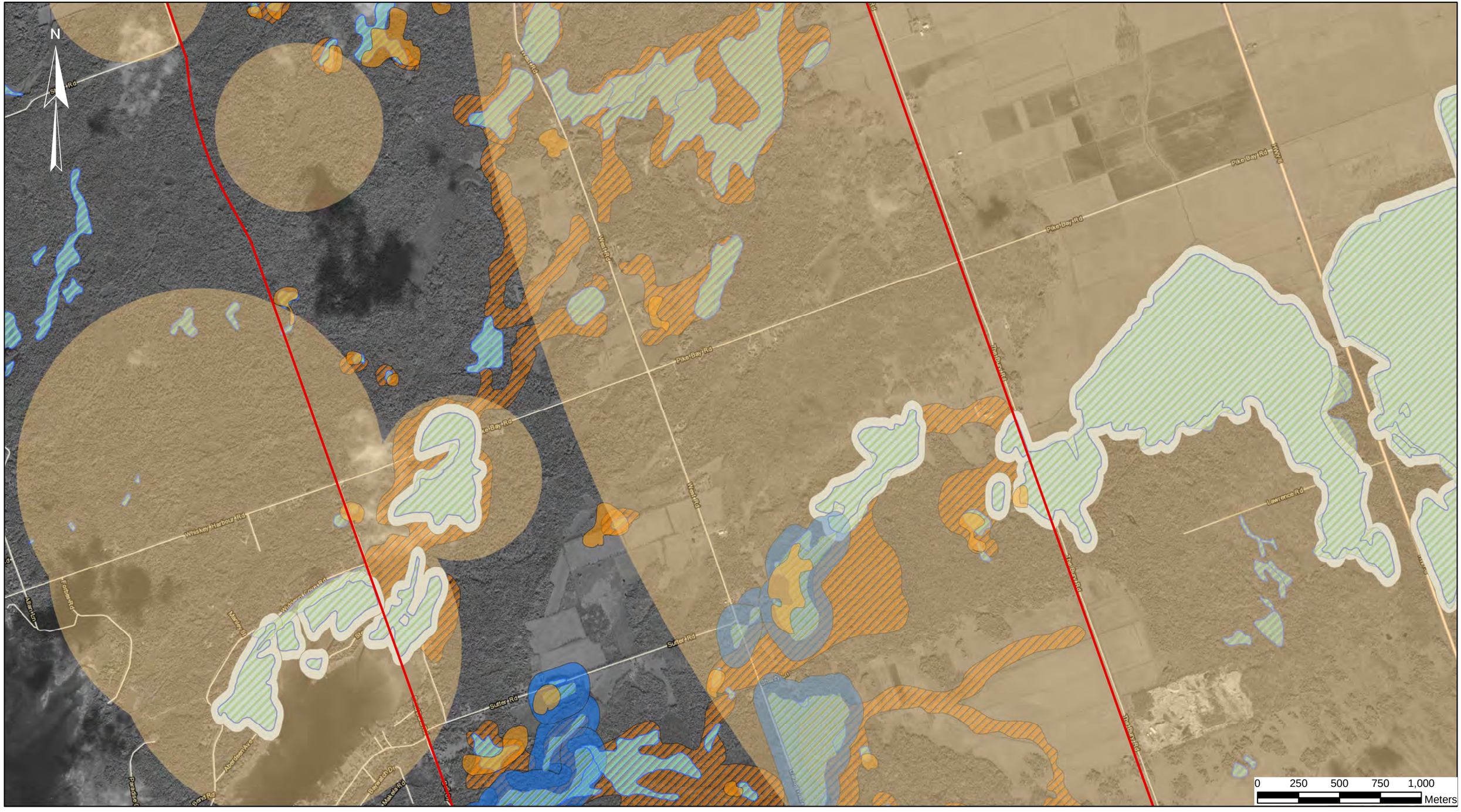

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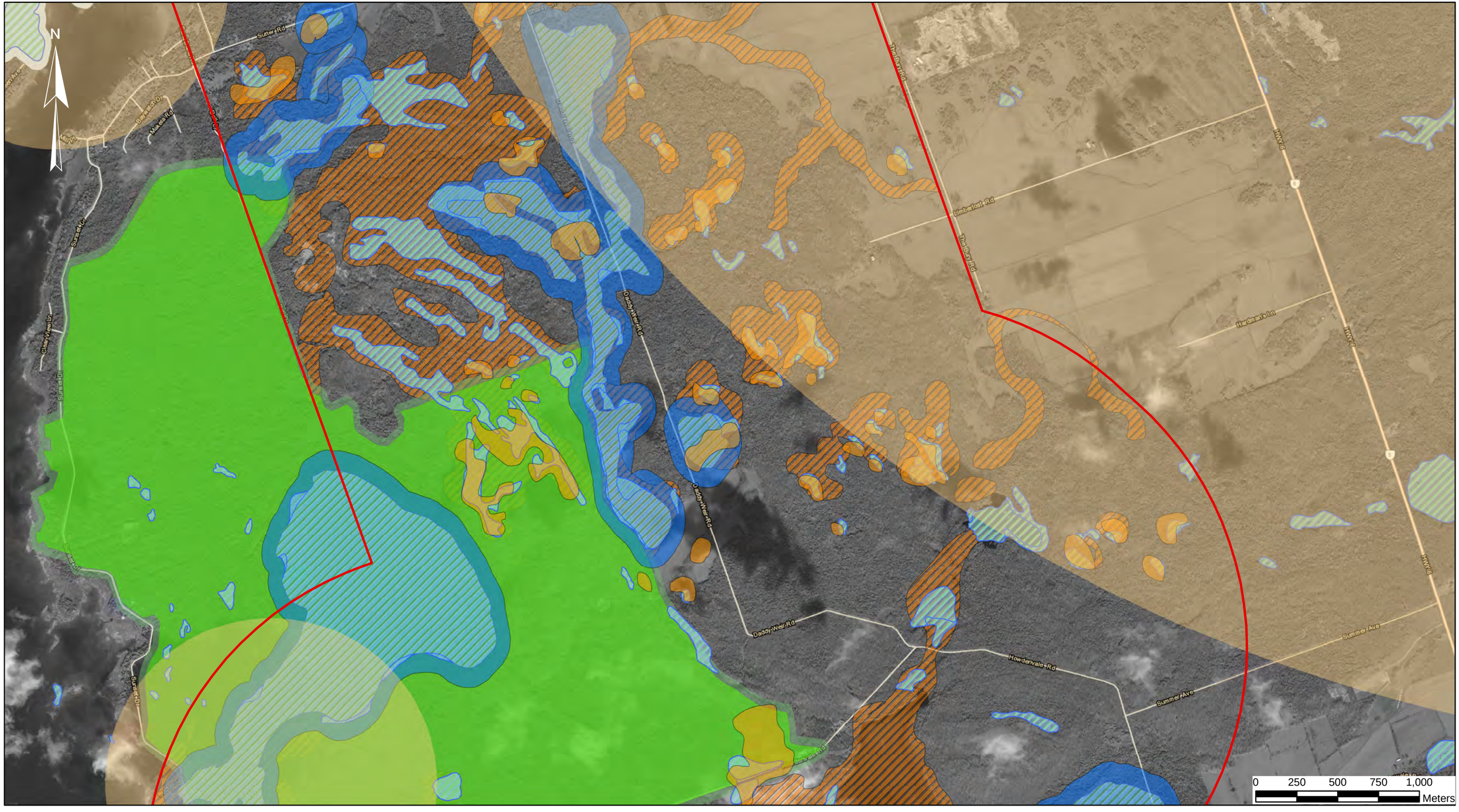
LEGEND

- West Road Section 2000m Zone of Study
- S1 Critically Imperiled Obs. Post 1980
- S2 Imperiled Observation Post 1980
- S3 Vulnerable Observations 1990
- Karst
- Provincially Significant Wetland
- Provincially Significant Wetland 120m Zone of Study
- Locally/Other Significant Wetland
- Locally/Other Significant Wetland 60m Zone of Study
- Wetland not evaluated
- Life Science ANSI
- Life Science ANSI 50m Zone of Study
- Hazard

Client: Bruce County		Project No.: 10001745-410	Drawing No.: 3
Drawn: SW	Approved: LLS	Title: NATURAL ENVIRONMENT MAP WEST ROAD- NORTH OF PIKE BAY ROAD TO DADDY WIER ROAD	
Date: January 2016	Scale: As Shown	Project: WEST ROAD BRUCE COUNTY, ONTARIO	
Original Size: Tabloid	Rev: 2	WSP Canada Inc. 14 Ronell Cresent, Unit 1 Collingwood, ON. L9Y 4J7 Tel: 705-445-0064 Fax: 705-445-0067 www.wspgroup.ca	



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LEGEND

- West Road Section 2000m Zone of Study
- S1 Critically Imperiled Obs. Post 1980
- S2 Imperiled Observation Post 1980
- S3 Vulnerable Observations 1990
- Karst
- Provincially Significant Wetland
- Provincially Significant Wetland 120m Zone of Study
- Locally/Other Significant Wetland
- Locally/Other Significant Wetland 60m Zone of Study
- Wetland not evaluated
- Life Science ANSI
- Life Science ANSI 50m Zone of Study
- Hazard

Client: Bruce County		Project No.: 10001745-410	Drawing No.: 4
Drawn: SW	Approved: LLS	Title: NATURAL ENVIRONMENT MAP WEST ROAD- DADDY WIER ROAD	
Date: January 2016	Scale: As Shown	Project: WEST ROAD BRUCE COUNTY, ONTARIO	
Original Size: Tabloid	Rev: 2		

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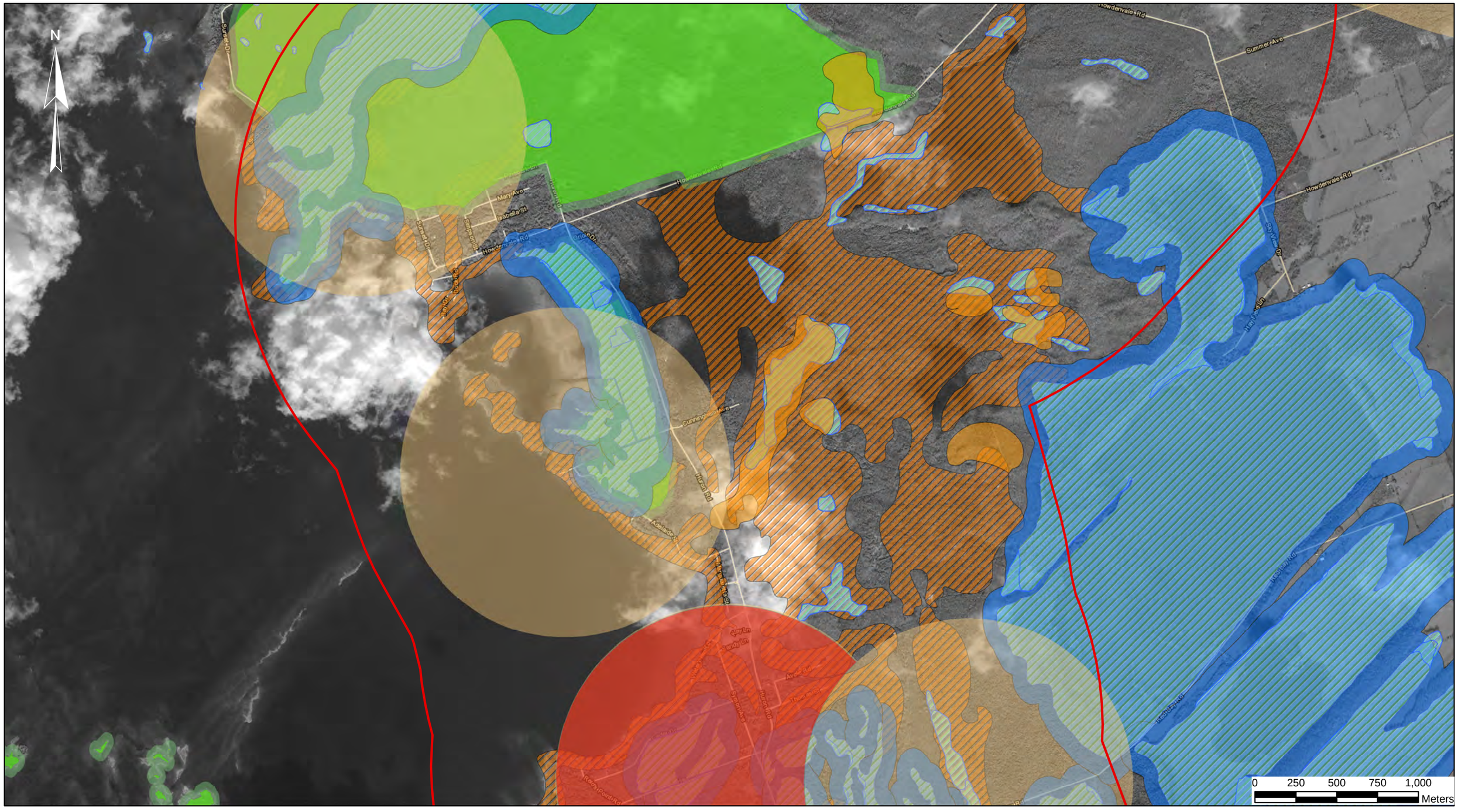

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LEGEND

- West Road Section 2000m Zone of Study
- S1 Critically Imperiled Obs. Post 1980
- S2 Imperiled Observation Post 1980
- S3 Vulnerable Observations 1990
- Karst
- Provincially Significant Wetland
- Provincially Significant Wetland 120m Zone of Study
- Locally/Other Significant Wetland
- Locally/Other Significant Wetland 60m Zone of Study
- Wetland not evaluated
- Life Science ANSI
- Life Science ANSI 50m Zone of Study
- Hazard

Client: Bruce County		Project No.: 10001745-410	Drawing No.: 5
Drawn: SW	Approved: LLS	Title: NATURAL ENVIRONMENT MAP WEST ROAD- HOWDENVALE ROAD TO NORTH OF RED BAY ROAD	
Date: January 2016	Scale: As Shown	Project: WEST ROAD BRUCE COUNTY, ONTARIO	
Original Size: Tabloid	Rev: 2		

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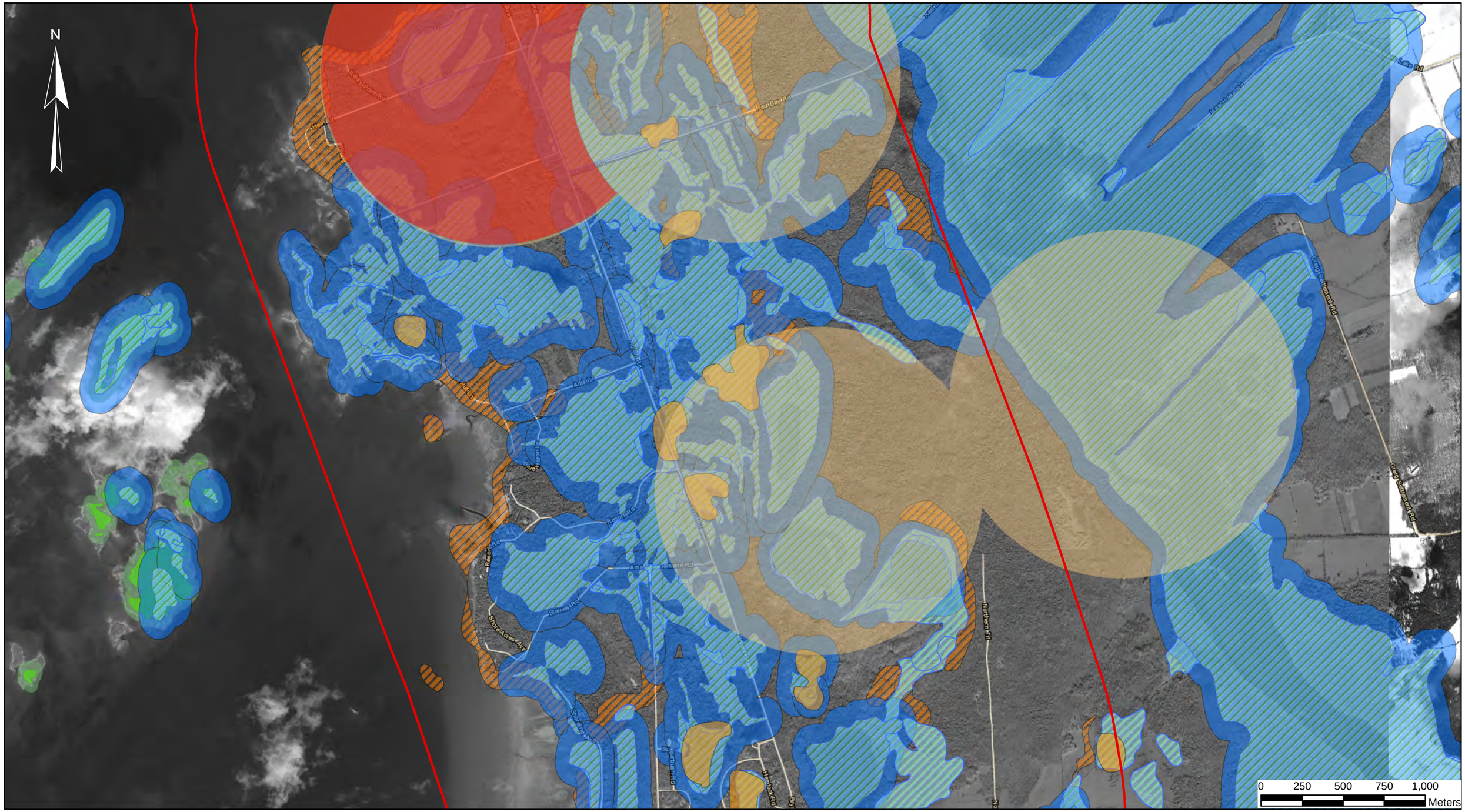

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LEGEND

- West Road Section 2000m Zone of Study
- S1 Critically Imperiled Obs. Post 1980
- S2 Imperiled Observation Post 1980
- S3 Vulnerable Observations 1990
- Karst
- Provincially Significant Wetland
- Provincially Significant Wetland 120m Zone of Study
- Locally/Other Significant Wetland
- Locally/Other Significant Wetland 60m Zone of Study
- Wetland not evaluated
- Life Science ANSI
- Life Science ANSI 50m Zone of Study
- Hazard

Client: Bruce County		Project No.: 10001745-410	Drawing No.: 6
Drawn: SW	Approved: LLS	Title: NATURAL ENVIRONMENT MAP WEST ROAD- RED BAY ROAD TO NORTH OF SPRY LAKE ROAD	
Date: January 2016	Scale: As Shown	Project: WEST ROAD BRUCE COUNTY, ONTARIO	
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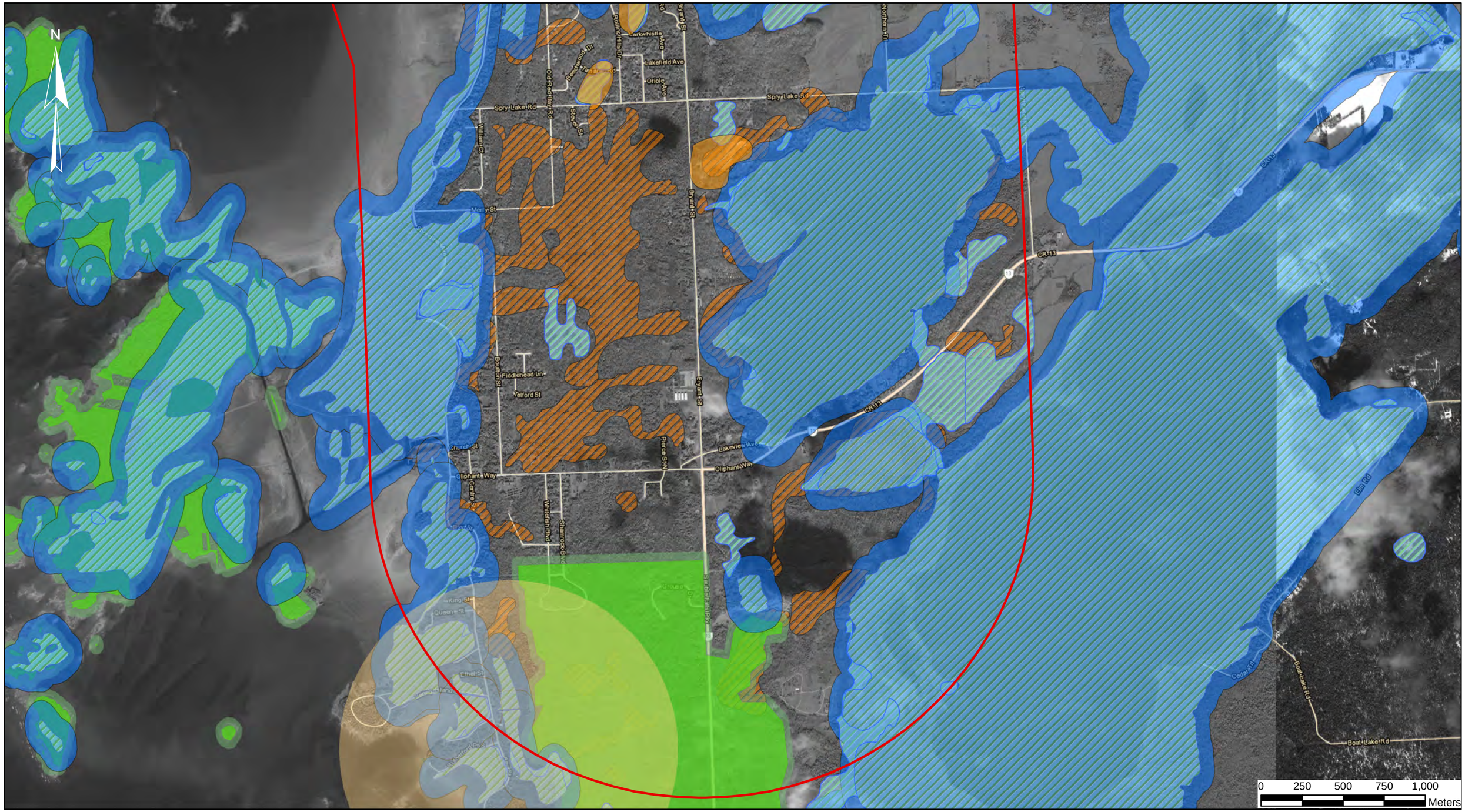

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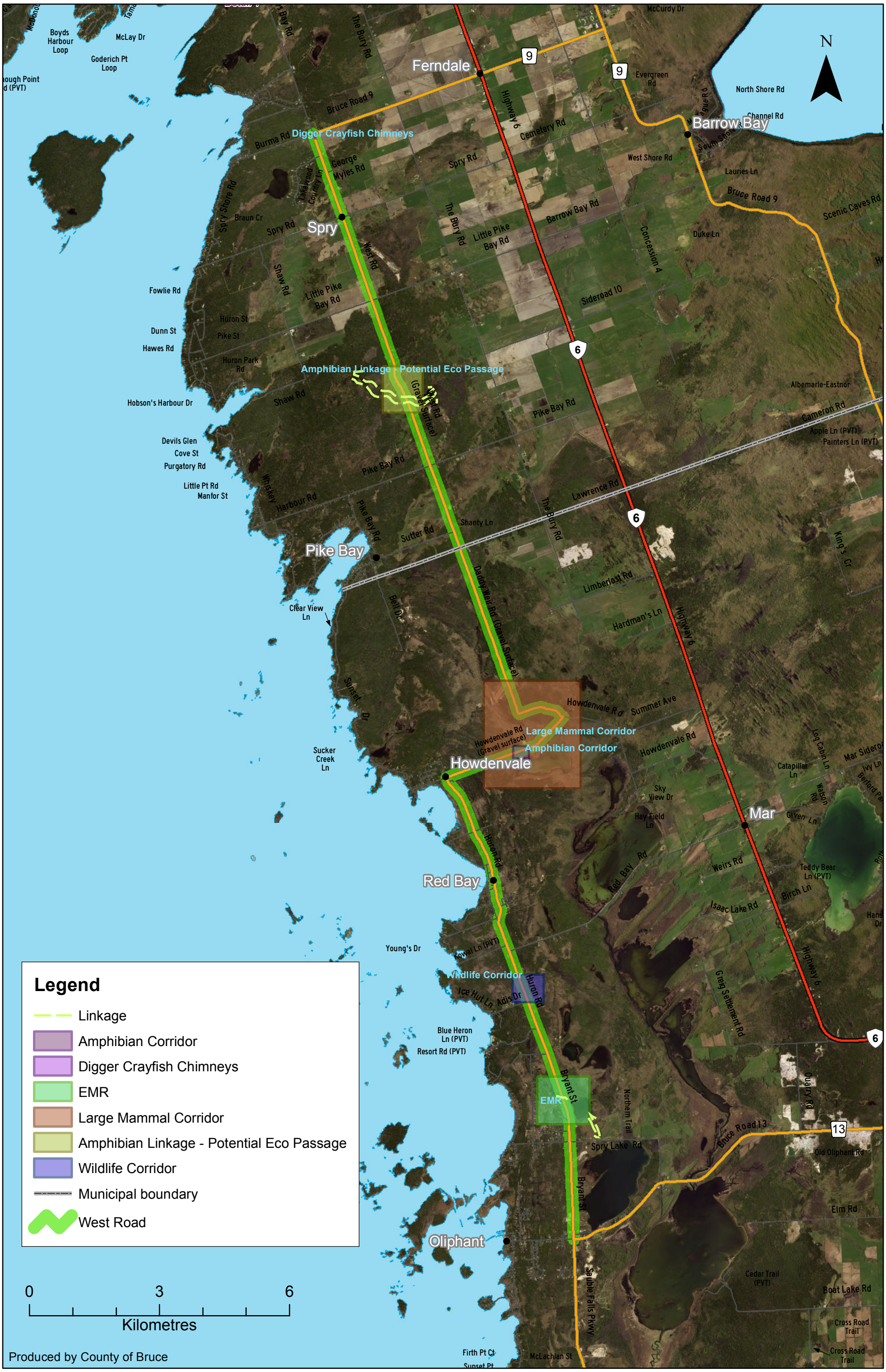
LEGEND

- West Road Section 2000m Zone of Study
- S1 Critically Imperiled Obs. Post 1980
- S2 Imperiled Observation Post 1980
- S3 Vulnerable Observations 1990
- Karst
- Provincially Significant Wetland
- Provincially Significant Wetland 120m Zone of Study
- Locally/Other Significant Wetland
- Locally/Other Significant Wetland 60m Zone of Study
- Wetland not evaluated
- Life Science ANSI
- Life Science ANSI 50m Zone of Study
- Hazard

Client: Bruce County		**Project No.:** 10001745-410	**Drawing No.:** 7
Drawn: SW	**Approved:** LLS	**Title:** NATURAL ENVIRONMENT MAP WEST ROAD- SPRY LAKE ROAD TO BRUCE ROAD 13	
Date: January 2016	**Scale:** As Shown	**Project:** WEST ROAD BRUCE COUNTY, ONTARIO	
Original Size: Tabloid	**Rev:** 2	WSP Canada Inc. 14 Ronell Cresent, Unit 1 Collingwood, ON. L9Y 4J7 Tel: 705-445-0064 Fax: 705-445-0067 www.wspgroup.ca	

West Road Area Observations



Appendix B

SPECIES LISTS

Bird Observations

Scientific Name	Common Name	GRank[1]	SRank[1]	COSEWIC[2]	SARO[3]
Branta canadensis	Canada Goose	G5	S5	-	-
Anas platyrhynchos	Mallard	G5	S5	-	-
Anas discors	Blue-winged Teal	G5	S4	-	-
Mergus merganser	Common Merganser	G5	S5B,S5N	-	-
Bonasa umbellus	Ruffed Grouse	G5	S4	-	-
Meleagris gallopavo	Wild Turkey	G5	S5	-	-
Botaurus lentiginosus	American Bittern	G4	S4B	-	-
Accipiter striatus	Sharp-shinned hawk	G5	S5	-	NAR
Buteo platypterus	Broad-winged hawk	G5	S5B	-	-
Buteo jamaicensis	Red-tailed hawk	G5	S5	NAR	NAR
Buteo lineatus	Red-shouldered hawk	G5	S4B	NAR	NAR
Falco sparverius	American Kestrel	G5	S4	-	-
Falco columbarius	Merlin	G5	S5B	NAR	NAR
Charadrius vociferus	Killdeer	G5	S5B,S5N		
Charadrius melodus	Piping Plover	G3	S1B	END	END
Actitis macularius	Spotted Sandpiper	G5	S5	-	-
Bartramia longicauda	Upland Sandpiper	G5	S4B	-	-
Gallinago delicata	Wilson's Snipe	G5	S5B	-	-
Scolopax minor	American Woodcock	G5	S4B	-	-
Chlidonias niger	Black Tern	G4	S3B	NAR	SC
Grus canadensis	Sandhill Crane	G5	S5B	-	-
Ardea alba	Great Egret	G5	S2B	-	-
Pandion haliaetus	Osprey	G5	S5B		
Haliaeetus leucocephalus	Bald Eagle	G5	S2N,S4B	NAR	SC
Zenaida macroura	Mourning Dove	G5	S5	-	-
Megascops asio	Eastern Screech-Owl	G5	S4	NAR	NAR
Chordeiles minor	Common Nighthawk	G5	S4B	THR	SC
Antrostomus vociferus	Whip-poor-will	G5	S4B	THR	THR
Archilochus colubris	Ruby-throated Hummingbird	G5	S5B	-	-
Megaceryle alcyon	Belted Kingfisher	G5	S4B	-	-
Sphyrapicus varius	Yellow-bellied Sapsucker	G5	S5B	-	-
Picoides pubescens	Downy Woodpecker	G5	S5	-	-
Picoides villosus	Hairy Woodpecker	G5	S5	-	-
Colaptes auratus	Northern Flicker	G5	S4B	-	-
Dryocopus pileatus	Pileated Woodpecker	G5	S5	-	-
Contopus virens	Eastern Wood-Pewee	G5	S4B	SC	SC
Empidonax alnorum	Alder Flycatcher	G5	S5B	-	-
Contopus cooperi	Olive-sided Flycatcher	G4	S4B	THR	SC
Sayornis phoebe	Eastern Phoebe	G5	S5B	-	-
Myiarchus crinitus	Great Crested Flycatcher	G5	S4B	-	-
Tyrannus tyrannus	Eastern Kingbird	G5	S4B	-	-
Vireo olivaceus	Red-eyed Vireo	G5	S5B	-	-
Cyanocitta cristata	Blue Jay	G5	S5	-	-
Corvus brachyrhynchos	American Crow	G5	S5B	-	-
Corvus corax	Common Raven	G5	S5	-	-
Progne subis	Purple Martin	G5	S4B	-	-
Tachycineta bicolor	Tree Swallow	G5	S4B	-	-
Stelgidopteryx serripennis	N. Rough-winged Swallow	G5	S4B	-	-
Hirundo rustica	Barn Swallow	G5	S4B	THR	THR
Poecile atricapillus	Black-capped Chickadee	G5	S5	-	-

Scientific Name	Common Name	GRank[1]	SRank[1]	COSEWIC[2]	SARO[3]
Sitta canadensis	Red-breasted Nuthatch	G5	S5	-	-
Sitta carolinensis	White-breasted Nuthatch	G5	S5	-	-
Certhia americana	Brown Creeper	G5	S5B	-	-
Troglodytes hiemalis	Winter Wren	G5	S5B	-	-
Sialia sialis	Eastern Bluebird	G5	S5B	NAR	NAR
Catharus fuscescens	Veery	G5	S5B	-	-
Catharus guttatus	Hermit Thrush	G5	S5B	-	-
Hylocichla mustelina	Wood Thrush	G4	S4B	THR	SC
Turdus migratorius	American Robin	G5	S5B	-	-
Dumetella carolinensis	Gray Catbird	G5	S4B	-	-
Mimus polyglottos	Northern Mockingbird	G5	S4	-	-
Toxostoma rufum	Brown Thrasher	G5	S4B	-	-
Sturnus vulgaris	European Starling	G5	SNA	-	-
Bombycilla cedrorum	Cedar Waxwing	G5	S5B	-	-
Bombycilla garrulus	Bohemian Waxwing	G5	SNA	-	-
Oreothlypis ruficapilla	Nashville Warbler	G5	S5B	-	-
Setophaga petechia	Yellow Warbler	G5	S5B	-	-
Setophaga caerulescens	Black-throated Blue Warbler	G5	S5B	-	-
Setophaga virens	Black-throated Green Warbler	G5	S5B	-	-
Dendroica coronata	Yellow-rumped Warbler	G5	S5B	-	-
Setophaga fusca	Blackburnian Warbler	G5	S5B	-	-
Mniotilta varia	Black-and-white Warbler	G5	S5B	-	-
Setophaga ruticilla	American Redstart	G5	S5B	-	-
Seiurus aurocapilla	Ovenbird	G5	S4B	-	-
Geothlypis trichas	Common Yellowthroat	G5	S5B	-	-
Cardellina canadensis	Canada Warbler	G5	S4B	THR	SC
Pipilo erythrophthalmus	Eastern Towhee	G5	S4B	-	-
Spizella passerina	Chipping Sparrow	G5	S5B	-	-
Spizella pusilla	Field Sparrow	G5	S4B	-	-
Passerculus sandwichensis	Savannah Sparrow	G5	S4B	-	-
Ammodramus savannarum	Grasshopper Sparrow	G5	S4B	SC	-
Melospiza melodia	Song Sparrow	G5	S5B	-	-
Melospiza georgiana	Swamp Sparrow	G5	S5B	-	-
Zonotrichia albicollis	White-throated Sparrow	G5	S5B	-	-
Cardinalis cardinalis	Northern Cardinal	G5	S5	-	-
Pheucticus ludovicianus	Rose-breasted Grosbeak	G5	S4B	-	-
Passerina cyanea	Indigo Bunting	G5	S4B	-	-
Dolichonyx oryzivorus	Bobolink	G5	S4B	THR	THR
Agelaius phoeniceus	Red-winged Blackbird	G5	S4	-	-
Sturnella magna	Eastern Meadowlark	G5	S4B	THR	THR
Quiscalus quiscula	Common Grackle	G5	S5B	-	-
Molothrus ater	Brown-headed Cowbird	G5	S4B	-	-
Icterus galbula	Baltimore Oriole	G5	S4B	-	-
Haemorhous purpureus	Purple Finch	G5	S4B	-	-
Carduelis tristis	American Goldfinch	G5	S5B	-	-
Passer domesticus	House Sparrow	G5	SNA	-	-
Aix sponsa	Wood Duck	G5	S5	-	-
Anas rubripes	American Black Duck	G5	S4	-	-
Anas clypeata	Northern Shoveler	G5	S4	-	-
Anas acuta	Northern Pintail	G5	S5	-	-
Lophodytes cucullatus	Hooded Merganser	G5	S5B,S5N	-	-
Mergus serrator	Red-breast Merganser	G5	S5B,S5N	-	-
Gavia immer	Common Loon	G5	S5B,S5N	NAR	NAR
Podilymbus podiceps	Pied-billed Grebe	G5	S4B,S4N	-	-

Scientific Name	Common Name	GRank[1]	SRank[1]	COSEWIC[2]	SARO[3]
Ardea herodias	Great Blue Heron	G5	S4	-	-
Butorides virescens	Green Heron	G5	S4B	-	-
Nycticorax nycticorax	Black-crown N. Heron	G5	S3B,S3N	-	-
Cathartes aura	Turkey Vulture	G5	S5B	-	-
Circus cyaneus	Northern Harrier	G5	S4B	NAR	NAR
Accipiter cooperii	Cooper's Hawk	G5	S4	NAR	NAR
Accipiter gentilis	Northern Goshawk	G5	S4	NAR	NAR
Columba livia	Rock Pigeon	G5	SNA	-	-
Larus delawarensis	Ring-billed Gull	G5	S5B,S4N	-	-
Larus argentatu	Herring Gull	G5	S5B,S5N	-	-
Sterna hirundo	Common Tern	G5	S4B	NAR	NAR
Coccyzus americanus	Yellow-billed Cuckoo	G5	S4B	-	-
Coccyzus erythropthalmus	Black-billed Cuckoo	G5	S5B	-	-
Bubo virginianus	Great Horned Owl	G5	S4	-	-
Strix varia	Barred Owl	G5	S5	-	-
Aegolius acadicus	Northern Saw-whet Owl	G5	S4	-	-
Chaetura pelagica	Chimney Swift	G5	S4B,S4N	THR	THR
Melanerpes erythrocephalus	Red-headed Woodpecker	G5	S4B	THR	SC
Melanerpes carolinus	Red-bellied Woodpecker	G5	S4	-	-
Empidonax flaviventris	Yellow-bellied Flycatcher	G5	S5B	-	-
Empidonax traillii	Willow Flycatcher	G5	S5B	-	-
Empidonax minimus	Least Flycatcher	G5	S4B	-	-
Vireo gilvus	Warbling Vireo	G5	S5B	-	-
Eremophila alpestris	Horned Lark	G5	S5B	-	-
Riparia riparia	Bank Swallow	G5	S4B	THR	THR
Petrochelidon pyrrhonota	Cliff Swallow	G5	S4B	-	-
Troglodytes aedon	House Wren	G5	S5B	-	-
Cistothorus palustris	Marsh Wren	G5	S4B	-	-
Regulus satrapa	Golden-crown Kinglet	G5	S5B	-	-
Regulus calendula	Ruby-crown Kinglet	G5	S4B	-	-
Polioptila caerulea	Blue-gray Gnatcatcher	G5	S4B	-	-
Setophaga americana	Northern Parula	G5	S4B	-	-
Setophaga pensylvanica	Chestnut-sided Warbler	G5	S5B	-	-
Setophaga magnolia	Magnolia Warbler	G5	S5B	-	-
Setophaga virens	Black-throated Green Warbler	G5	S5B	-	-
Setophaga pinus	Pine Warbler	G5	S5B	-	-
Parkesia noveboracensis	Northern Waterthrush	G5	S5B	-	-
Geothlypis philadelphia	Mourning Warbler	G5	S4B	-	-
Piranga olivacea	Scarlet Tanager	G5	S4B	-	-
Pooecetes gramineus	Vesper Sparrow	G5	S4B	-	-
Junco hyemalis	Dark-eyed Junco	G5	S5B	-	-

[1] Nature Conservancy conservation concern rankings (NHIC, 2010): G - Global Level, S - Sub-national Rank (Ontario), B - Breeding, N – Non-breeding, 1 - Critically Imperiled, 2 - Imperiled, 3 - Vulnerable, 4 - Apparently Secure, 5 - Secure.

Protection status: [2]COSEWIC - Committee on the Status of Endangered Wildlife in Canada; [3]SARO - Species at Risk in Ontario; END – Endangered, THR – Threatened, SC – Special concern, "-" – Not listed. [4]Ontario Breeding Bird Atlas breeding evidence (Bird Studies Canada, 2006): CONF – Confirmed, PROB – Probable, POSS - Possible

MAMMALS

Scientific Name	Common Name	GRank[1]	SRank[1]	COSEWIC[2]	SARO[3]
Mammals					
Ursus americanus	American Black Bear	G5	S5	NAR	NAR
Canis latrans	Coyote	G5	S5	-	-
Canis lupus occidentalis	Northern Gray Wolf	G4G5T4T5	S4	NAR	NAR
Odocoileus virginianus	White-tailed deer	G5	S5	-	-
Pekania pennanti	Fisher	G5	S5	-	-
Mephitis mephitis	Striped Skunk	G5	S5	-	-
Erethizon dorsatum	Porcupine	G5	S5	-	-
Procyon lotor	Northern Raccoon	G5	S5	-	-
Vulpes vulpes	Red Fox	G5	S5	-	-
Lepus americanus	Snowshoe Hare	G5	S5	-	-
Sylvilagus floridanus	Eastern Cottontail	G5	S5	-	-
Sciurus carolinensis	Eastern Gray Squirrel	G5	S5	-	-
Tamiasciurus hudsonicus	Red Squirrel	G5	S5	-	-
Tamias striatus	Eastern Chipmunk	G5	S5	-	-
Marmota monax	Woodchuck	G5	S5	-	-
Ondatra zibethicus	Muskrat	G5	S5	-	-
Mustela erminea	Ermine	G5	S5	-	-
Castor canadensis	Beaver	G5	S5	-	-
Condylura cristata	Star-nosed Mole	G5	S5	-	-
Microtus pennsylvanicus	Meadow Vole	G5	S5	-	-
Peromyscus maniculatus	Deer Mouse	G5	S5	-	-
Peromyscus leucopus	White-footed Mouse	G5	S5	-	-
Zapus hudsonius	Meadow Jumping Mouse	G5	S5	-	-
Synaptomys cooperi	Southern Bog Lemming	G5	S4	-	-
BUTTERFLIES					
Thorybes pylades	Northern Cloudywing	G5	S5	-	-
Poanes hobomok	Hobomok Skipper	G5	S5	-	-
Euphyes vestris	Dun Skipper	G5	S5	-	-
Papilio canadensis	Canadian Tiger Swallowtail	G5	S5	-	-
Pieris rapae	Cabbage White	G5	SNA	-	-
Colias philodice	Clouded Sulpher	G5	S5	-	-
Celastrina ladon	Spring Azure	G4G5	SU	-	-
Cercyonis pegala	Common Wood Nymph	G5	S5	-	-
Coenonympha tullia	Common Ringlet	G5	S5	-	-
Limenitis arthemis arthemis	White Admiral	GNR	S5	-	-
Danaus plexippus	Monarch	G4	S2N,S4B	SC	SC
Lethe anthedon	Northern Pearly-eye	G5	S5	-	-
Megisto cymela	Little Wood Satyr	G5	S5	-	-
Nymphalis antiopa	Mourning Cloak	G5	S5	-	-
Phyciodes tharos	Pearl Crescent	G5	S4	-	-
Polygonia interrogationis	Question Mark	G5	S5	-	-
Speyeria cybele	Great Spangled Fritillary	G5	S5	-	-
ODONATA					
Enallagma hageni	Hagen's Bluet	G5	S5	-	-
Ischnura verticalis	Eastern Forktail	G5	S5	-	-

Scientific Name	Common Name	GRank[1]	SRank[1]	COSEWIC[2]	SARO[3]
Aeshna canadensis	Canada Darner	G5	S5	-	-
Aeshna umbrosa	Shadow Darner	G5	S5	-	-
Anax junius	Common Green Darner	G5	S5	-	-
Epitheca canis	Beaverpond Baskettail	G5	S5	-	-
Leucorrhinia intacta	Dot-tailed Whiteface	G5	S5	-	-
Libellula quadrimaculata	Four-spotted Skimmer	G5	S5	-	-
Sympetrum internum	Cherry-faced Meadowhawk	G5	S5	-	-
HERPETOFAUNA					
	Wood Frog	G5	S5	-	-
	Western Chorus Frog	G5	S5	-	-
	Spring Peeper	G5	S5	-	-
	Green Frog	G5	S5	-	-
	American Toad	G5	S5	-	-
	Snapping Turtle	G5	S5	-	-
	Blandings Turtle sighting *	G	S	*eggshells Snapping Turtle	
	Spotted Salamander				
	Red-backed Salamander				
	Red Eft				
	DeKay Brown Snake				
	E. Massasauga Rattlesnake				
	Common Garter Snake				
	Ribbon Snake				

Note: We received information on a seasonal turtle crossing and potential Blanding's turtle from Mr. Douglas Pratt and the McDonald family, with subsequent permission to access the parcel, with thanks. Although we found evidence of Snapping vs. Blandings' turtles, this is one of five turtle crossings and nest sites that has received the highest level of conservation.

FISH					
	Blunt-nosed Minnow	G5	S5	-	-
	Brook Stickleback	G5	S5	-	-
	Redbelly Dace	G5	S5	-	-
	YOY Brown Trout	G5	S5	-	-
	Common Shiner	G5	S5	-	-

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WEST ROAD COMPOSITE VASCULAR FLORA LIST

Nomenclature and Order Follows Bruce-Grey Plant Committee, Checklist of Vascular Plants for Bruce and Grey Counties Ontario. Source: OMNRF, Owen Sound Field Naturalists, Saugeen Field Naturalists)

Equisetaceae	**HORSETAIL FAMILY**
Horsetail	*Equisetum variegatum*
Dwarf Scouring Rush	*E. scirpoides*
Wood Horsetail	*E. sylvaticum*
Field Horsetail	*E. arvense*
Marsh Horsetail	*E. palustre*
Lycopodiaceae	**CLUBMOSS FAMILY**
Common Clubmoss	*Lycopodium clavatum*
Ground Pine	*L. obscurum*
Shining Clubmoss	*L. lucidum*
Stiff Clubmoss	*L. annotinum*
Ground Cedar	*L. complanatum*
Selaginellaceae	**SPIKEMOSS FAMILY**
Meadow Spikemoss	*Selaginella eclipse*
Ophioglossaceae	**ADDER'S TONGUE FAMILY**
Rattlesnake Fern	*Botrychium virginianum*
Osmundaceae	**FLOWERING FERN FAMILY**
Royal Fern	*Osmunda regalis*
Cinnamon Fern	*O. cinnamomea*
Polypodaceae	**FERN FAMILY**
Crested Wood Fern	*Dryopteris cristata*
Spinulose Wood Fern	*D. carthusiana*
Ostrich Fern	*Matteucea struthiopteris*

Crested Wood Fern	*D. cristata*
Clinton's Wood Fern	*D. clintoniana*
New York Fern	*D. noveboracensis*
Northern Holly Fern	*Polystichum lonchitis*
Maidenhair Spleenwort	*Asplenium trichomanes*
Fragile Fern	*Cystopteris fragilis*
Bulbet Fern	*C. bulbifera*
Smooth Cliff-brake	*Pellaea glabella*
Slender Rock-brake	*Cryptogramma stelleri*
Rock Polypody	*Polypodium virginianum*

Aspleniaceae	**SPLEENWORT FERN FAMILY**
Maidenhair Spleenwort	*Adiantum trichomanes*
Northern Maidenhair Fern	*Adiantum pedatum*

Dennstaedtiaceae	**BRACKEN FERN FAMILY**
Bracken Fern	*Pteridium aquilinum*

Dryopteridaceae	**WOOD FERN FAMILY**
Marginal Shield Fern	*Dryopteris marginalis*
Oak Fern	*D. disjuncta*
Intermediate Wood Fern	*D. intermedia*
Sensitive Fern	*Onoclea sensibilis*

Thelypteridaceae	**HARDY FERN FAMILY**
Marsh Fern	*Thelypteris palustris*

Cupressaceae	**CYPRESS FAMILY**
White Cedar	*Thuja occidentalis*
Creeping Juniper	*Juniperus horizontalis*
Ground Juniper	*Juniperus communis*

Taxaceae	**YEW FAMILY**
Canada Yew	*Taxus Canadensis*

Pinaceae	**PINE FAMILY**
White Spruce	*Picea glauca*
Black Spruce	*P. mariana*
White Pine	*Pinus strobus*
Red Pine	*P. resinosa*
Eastern Hemlock	*Tsuga canadensis*
American arborvitae	*Thuja occidentalis*
Pinaceae	**PINE FAMILY CONTINUED**
Balsam Fir	*Abies balsamea*
Tamarack	*Larix laricina*
Typhaceae	**CATTAIL FAMILY**
Cattail	*Typha latifolia*
Narrow-leaved Cattail	*T. angustifolia*
Sparganiaceae	**SPARGANIUM FAMILY**
Broad-fruited Bur-reed	*Sparganium eurycarpum*
Stemless Bur-reed	*S. chlorocarpum*
American Bur-reed	*S. americum*
Small Bur-reed	*S. minimum*
Zosteraceae	**PONDWEED FAMILY**
Broad-leaved Pondweed	*Potamogeton natans*
Various-leaved Pondweed	*P. gramineus*
Curly Pondweed	P. crispus
Small Pondweed	*P. pusilus*
Large-leaved Pondweed	*P. amplifolius*
Juncaginaceae	**ARROW GRASS FAMILY**
Arrow Grass	*Triglochin palustris*
Seaside Arrowgrass	*T. maritima*
Alismataceae	**WATER PLANTAIN FAMILY**
Broad-leaved Arrowhead	*Sagittaria latifolia*
Water Plantain	*Alisma plantago-aquatica*

Hydrocharitaceae	**FROG'S-BIT FAMILY**
Canadian Waterweed	*Elodea Canadensis*
Gramineae	**GRASS FAMILY**
Fringed Brome	*Bromus ciliata*
Fowl Manna Grass	*Glyceria striata*
Canada Blue Joint Grass	*Calamagrostis canadensis*
Reed Canary Grass	*Phalaris arundinaceae*
Swamp Meadow Grass	*Poa palustris*
Annual Bluegrass	*Poa annua*
Kentucky Bluegrass	*P. pratensis*
Orchard Grass	*Dactylis glomerata*
Giant Reed	*Phragmites communis*
Tussock Grass	*Deschampsia caespitosa*
Poverty Oatgrass	*Danthonia spicata*
Timothy Grass	*Phleum pratense*
Cut-grass	*Leersia oryzoides*
Rough-leaved Rice Grass	*Oryzopsis asperifolia*
Sweetgrass	*Hierochloe odorata*
Cyperaceae	**SEDGE FAMILY**
Three-way Sedge	Dulichium arundinaceum
Twig Rush	Cladium mariscoides
Slender Spike Rush	Eleocharis elliptica
Marsh Spike Rush	E. palustris
Beaked Spike Rush	E. rostellata
Dark Green Bulrush	Scirpus atrovirens
Wool Grass	S. cyperinus
Sedge	S. rubrotinctus
Green-keeled Cottongrass	Eriophorum viridi-carinatum
White-beaked Sedge	Rhynchospora alba
Lesser Tussock Sedge	Carex diandra
Yellow Sedge	C. flava
Filiform Sedge	C. gracillima
Porcupine Sedge	C. hystericina
Bladder Sedge	C. intumescens
Hop Sedge	C. lupulina
Lake Sedge	C. lacustris
Cyperus-like Sedge	C. pseudo-cyperus
Three fruited Sedge	C. trisperma

Araceae	**ARUM FAMILY**
Jack-in-the-pulpit	Arisaema triphyllum
Lemnaceae	**DUCKWEED FAMILY**
Lesser Duckweed	Lemna minor
Columbian Water-meal	Wolffia Columbiana
Pontederiaceae	**PONDWEED FAMILY**
Pickerel weed	Pontederia cordata
Narrow-leaved	P. cordata var. lanceolata
Juncaceae	**RUSH FAMILY**
Baltic rush	*Juncus balticus*
Common rush	*J. effuses*
Dudley's rush	J. dudleyi
Knotted rush	J. nodosus
Smallhead rush	J. brachcephalus
Richardson's rush	J. alpinus
Liliaceae	**LILY FAMILY**
Wild Leek	Allium tricoccum
Sticky Tofieldia	Tofieldia glutinosa
Philadelphia Lily	Lilium philadelphicum
Bluebead Lily	Clintonia borealis
Wild Lily of the Valley	Mainthemum canadense
Solomon's Seal	Polygonatum pubescens
3-leaved False Solomon	Smilacina trifolia
Rose Twisted Stalk	Streptopus roseus
Wake-Robin	Trillium erectum
Great White Trillium	T. grandiflorum
Large-flowered Bellwort	Uvalaria grandiflora
Iridaceae	**IRIS FAMILY**
Blue-eyed Grass	Sisyrinchium mucronatum
Blue Flag	Iris versicolor
Dwarf Lake Iris	I. lacustris
White Camass	*Zigadenus elegans*
Red Trillium	*Trillium erectum*

Orchidaceae	**ORCHID FAMILY**
Yellow Lady-slipper	C. calceolus
Small YLS	Cypripedium calceolus var. parviflorum
Showy Lady-s slipper	C. reginae
Menzes Rattlesnake Plantain	Goodyera oblongifolia var. oblong
Dwarf Rattlesnake Plantain	G. repens
Northern Green Orchid	Platanthera hyperborea
Rose Pogonia	Pogonia ophioglossoides
Grass Pink	Calopogon pulchellus
Helleborine Orchid	Epipactis helleborine
Nodding Ladies Tresses	Spiranthes cernua
Hooded Ladies Tresses	S. romanzoffiana
Lesser Twayblade	*Listera cordata*
Early Coral-root	*Corallorhiza trifida*
Spotted Coral-root	*C. maculate*
White Adder's Mouth	*Malaxis monophylla*
Salicaceae	**WILLOW FAMILY**
Trembling Aspen	*Populus tremuloides*
Large-toothed Aspen	*Populus grandidentata*
Balsam Poplar	*Populus balsamifera*
Pussy Willow	*Salix discolor*
Shining Willow	*S. lucida*
Slender Willow	*S. petiolaris*
Autumn Willow	*S. serissima*
Hoary Willow	*S. candida*
Myricaceae	**BAYBERRY FAMILY**
Sweetgale	*Myrica gale*
Juglandaceae	**WALNUT FAMILY**
Black Walnut	*Juglans nigra*
Betulaceae	**BIRCH FAMILY**
Speckled Alder	*Alnus rugosa*
White Birch	*Betula papyrifera*
Yellow Birch	*B. allegheniensis*
Ironwood	*Ostrya virginiana*
Beaked Hazel	*Corylus cornuta*

Fagaceae	**BEECH FAMILY**
Red Oak	Quercus rubra
White Oak	Q. alba
Bur Oak	Q. macrocarpa
American Beech	Fagus grandifolia
Thymelaceae	**MEZERIUM FAMILY**
Leatherwood	Dirca palustris
Urticacaea	**NETTLE FAMILY**
False Nettle	Boehmeria cylindrica
Common Nettle	Urtica dioica
Aristolochiaceae	**BIRTHWORT FAMILY**
Ginger	Asarum canadense
Polygonaceae	**BUCKWHEAT FAMILY**
Water Smartweed	Polygonum amphibium
Great Water Dock	Rumex orbiculatus
Curled Dock	R. crispus
Chenopodiaceae	**GOOSEFOOT FAMILY**
Lamb's Quarters	Chenopodium album
Portulacaceae	**PURSLANE FAMILY**
Carolina Spring Beauty	Claytonia caroliniana
Caryophyllaceae	**PINK FAMILY**
Bladder Campion	Silene vulgaris
Rose Campion	Lychnis coronaria
Ceratophyllaceae	**HORNWORT FAMILY**
Coontail	Ceratophyllm demersum
Nymphaeaceae	**PONDWEED FAMILY**
Bull-head Lily	Nuphar variegatum

Ranunculaceae	**CROWFOOT FAMILY**
Tall Meadow Rue	*Thalictrum polygamum*
Anemone	*Anemone canadensis*
Thimbleweed	*A. virginiana*
Wild Columbine	*Aquilegia canadensis*
Marsh Marigold	Caltha palustris
Goldthread	Coptis groenlandica
Meadow Buttercup	Ranunculus acris
Swamp Buttercup	R. septentrionalis
Creeping Buttercup	R. repens
Red Baneberry	Acteae rubra
Doll's Eyes	A. pachypoda
Sharp-lobed Hepatica	Hepatica acutiloba
Berberidaceae	**BARBERRY FAMILY**
Blue Cohosh	Caulophyllum thalictroides
Common Barberry	Berberis vulgaris
Papaveraceae	**POPPY FAMILY**
Squirrel Corn	Dicentra canadensis
Dutchmen's Breeches	D. cucullaria
Bloodroot	Sanguinaria Canadensis
Cruciferae	**CABBAGE FAMILY**
Watercress	Nasturtium officionale
Crinkleroot	Dentaria diphylla
Hairy Rock Cress	Arabis hirsute
Sarraceniaceae	**PITCHER PLANT FAMILY**
Pitcher Plant	Sarracenia purpurea
Droseraceae	**SUNDEW FAMILY**
Round-leaved Sundew	Drosera rotundifolia
Linear-leaved Sundew	D. linearis (1km)

Saxifragaceae	**SAXIFRAGE FAMILY**
Wild Black Current	*Ribes americanum*
Wild Gooseberry	*R. cynosbati*
Hairy Gooseberry	*R. hirtellum*
Naked Mitrewort	*Mitella nuda*
Grass of Parnassus	*Parnassia glauca* (1km)
Rosaceae	**ROSE FAMILY**
Marsh Cinquefoil	*Potentilla palustris*
Shrubby Cinquefoil	*P. fruticosa*
Silverweed	*P. anserina*
Meadowsweet	*Spiraea alba*
Sand Cherry	*Prunus pumila*
Pincherry	*P. pensylvanica*
Black Cherry	*P. serotina*
Common Strawberry	*Fragaria virginiana*
Meadowsweet	*Spiraea alba*
Apple tree	*Pyrus malus*
Dwarf Serviceberry	*Amelanchier spicata*
Pringle's Hawthorn	*Crataegus pringlei*
Black Hawthorn	*C. douglasii*
Wild Strawberry	*Fragaria virginiana*
Shrubby Cinquefoil	*Potentilla fruticosa*
Common Blackberry	*Rubus allegheniensis*
Swamp Rose	*Rosa palustris*
Leguminosae	**BEAN FAMILY**
Cow Vetch	*Vicia cracca*
Linaceae	**FLAX FAMILY**
Stiff Yellow Flax	*Linun medium* (1km)
Geraniaceae	**GERANIUM FAMILY**
Herb Robert	Geranium robertianum
Polygalaceae	**MILKWORT FAMILY**
Fringed Polygala	*Polygala paucifolia*

Anacardiaceae	**CASHEW FAMILY**
Poison Ivy	*Rhus radicans*
Staghorn Sumac	*R. typhina*
Aquifoliaceae	**HOLLY FAMILY**
Winterberry	*Ilex verticillata*
Celastraceae	**BITTERSWEET FAMILY**
Bittersweet	*Celastrus scandens*
Aceraceae	**MAPLE FAMILY**
Sugar maple	*Acer saccharum*
Silver maple	*A. saccarinum*
Red maple	*A. rubrum*
Balsaminaceae	**TOUCH-ME-NOT FAMILY**
Touch-me-not	*Impatiens capensis*
Vitaceae	**GRAPE FAMILY**
Vitus riparia	*Wild Grape*
Tiliaceae	**BASSWOOD FAMILY**
Basswood	*Tilia americana*
Malvaceae	**MALLOW FAMILY**
Musk Mallow	*Malva moschata*
Guttiferae	**MANGOSTEEN FAMILY**
St. John's Wort	*Hypericum perforatum*
Violaceae	**VIOLET FAMILY**
Smooth Yellow Violet	*Viola pensylvanica*
Northern Bog Violet	*V. nephrophylla*
Dog Violet	*V. conspersa*

Elaeagnaceae	**OLEASTER FAMILY**
Buffaloberry	*Shepherdia canadensis*
Onagraceae	**WILLOW-HERB FAMILY**
Fireweed	*Epilobium angustifolium*
Evening Primrose	*Oenothera biennis*
Haloragaceae	**WATER MILFOIL FAMILY**
Water Milfoil	*Myriophyllum sp.*
Araliaceae	**IVY FAMILY**
Spikenard	*Aralia racemosa*
Wild Sarsaparilla	*A. nudicaulis*
Hyperaceae	**ST. JOHN'S WORT FAMILY**
Marsh St. John's Wort	*Triadenum fraseri*
Lythraceae	**LOOSESTRIFE FAMILY**
Water Willow	*Decodon verticillatus*
Purple Loosestrife	*Lythrum salicaria*
Cornaceae	**DOGWOOD FAMILY**
Red-osier Dogwood	*Cornus stolonifera*
Alternate-leaved	*C. alternifolia*
Bunchberry	*C. canadensis*
Round-leaf	*C. rugose* (1km)
Silky	*C. obliqua*
Pyrolaceae	**WINTERGREEN FAMILY**
Pink Pyrola	*Pyrola asarifolia*
Shinleaf	*P. elliptica*
Ericaceae	**HEATH FAMILY**
Trailing Snowberry	*Gaultheria hispidula*
Leatherleaf	*Chamaedaphne calyculata* (1km)

Trailing Arbutus	*Epigaea repens*
Bearberry	*Arctostaphylos uva-ursi*
Blueberry	*Vaccinium myrtilloides*
Swamp Cranberry	*V. oxycoccos* (1km)
Oleaceae	**OLIVE FAMILY**
Black Ash	*Fraxinus nigra*
Green Ash	*F. pennsylvanica*
White Ash	*F. americana*
Menyanthaceae	**BUCKBEAN FAMILY**
Buckbean	*Menyanthes trifoliata*
Asclepiadaceae	**MILKWEED FAMILY**
Swamp Milkweed	*Asclepias incarnate*
Common Milkweed	*A. syriaca*
Labitae	**MINT FAMILY**
Heal All	*Prunella vulgaris*
Wild Mint	*Mentha arvensis*
Northern Bugleweed	*Lycopus uniflorus*
Spearmint	*M. spicata*
Low Calamint	*Calamintha arkansana*
Scrophulariaceae	**FIGWORT FAMILY**
Small Flowered Gerardia	*Gerardia purpurea*
Common Mullein	*Verbascus thapsus*
Turtlehead	*Chelone glabra*
Speedwell	Veronica officinalis
Skullcap Speedwell	*V. scutellata*
Orobanchaceae	**BROOMRAPE FAMILY**
Beechdrops	*Epifagus virginiana* (1km)
Lentibulariaceae	**BLADDERWORT FAMILY**
Horned Bladderwort	*Utricularia cornuta* (1km)

Plantaginaceae **PLANTAIN FAMILY**

Common Plantain *Plantago major*
Narrowleaf Plantain *P. lanceolata*

Rubiaceae **BEDSTRAW FAMILY**

Sweet scented Bedstraw *Galium triflorum*
Marsh Bedstraw *G. palustre*
Partiridgeberry *Mitchella repens*

Caprifoliaceae **HONEYSUCKLE FAMILY**

Twinflower *Linnaeae borealis*
Wild Honeysuckle *Lonicera dioca*
Hairy Honeysuckle *L. hirsuta*
Canada Fly-Honeysuckle *L. canadensis*
Black Elderberry *Sambucus canadensis*
Elderberry *S. pubens*

Campanulaceae **HAIRBELL FAMILY**

Cardinal Flower *Lobelia cardinalis*
Marsh Harebell *Campanula aparinoides*
Harebell *C. rotundifolia*

Scrophulariaceae **FIGWORT FAMILY**

Common Mullein *Verbascum Thapsus*

Solanaceae **NIGHTSHADE FAMILY**

Enchanters Nightshade *Solanum dulcamara*

Rhamnaceae **BUCKTHORN FAMILY**

Alder-leaved Buckthorn *Rhamnus alnifolia*

Hypericaceae **ST.JOHNS' WORT FAMILY**

Marsh St. John's Wort *Triadenum fraseri*

Araliaeae	**GINSENG FAMILY**
Wild Sarsaparilla	*Aralia nudicaulis*
Umbelliferae	**PARSLEY FAMILY**
Queen Anne's Lace	*Daucus carota*
Sweet Cicely	Osmorhiza claytonia
Water Parsnip	Sium sauve
Dipsacaceae	**TEASEL FAMILY**
Teasel	*Dipsacus fullonum*
Primulaceae	**PRIMROSE FAMILY**
Starflower	*Trientalis borealis*
Birdseye Primrose	*Primula mistassinica*
Schrophulariaceae	**FIGWORT FAMILY**
Common Speedwell	*Veronica officinalis*
Common Mullein	*Verbascus Thapsus*
Turtlehead	*Chelone glabra*
Compositae	**COMPOSITE FAMILY**
Ragweed	*Ambrosia artemisifolia*
Pearly Everlasting	*Anaphalis margaritacea*
Common Burdock	*Arctium minus*
Large Leaved Aster	*Aster macrophyllus*
Nodding Beggarsticks	*Bidens cernua*
Common Fleabane	*Erigeron philadelphicus*
Chicory	*Cichorium intybus*
Hawkweed	*Hieracium aurantiacum*
Black Eyed Susan	*Rudbeckia hirta*
Canada Goldenrod	*Solidago canadensis*
Lance leaved Aster	*Aster lanceolatus*
Nodding Beggarticks	*Bidens cernua*
Spotted Joe-pye-weed	*Eupatorium maculatum*
Boneset	*E. perfoliatum*
Gray Goldenrod	*Solidago nemoralis*
Hairy Goldenrod	*S. hispida*

COMPOSITAE CONTINUED

Bog Goldenrod	*S. uliginosa*
Rough-leaved Goldenrod	*S. rugose*
Canadian Goldenrod	*S. Canadensis*
Ohio Goldenrod	*S. ohioensis*
Large-leaf Aster	*A. macrophyllus*
New England Aster	A. novae-angliae
Panicled Aster	A. simplex
Upland White Aster	*A. ptarmicoides*
Philadelphia Fleabane	*Erigeron philadelphicus*
Field Pussytoes	*Antennaria neglecta*
Western Yarrow	*Achillea lanulosa*
Oxeye Daisy	*Chrysanthemum leucanthemum*
Black-eyed Susan	*Rudbeckia serotina*
Indian Plantain	*Cacalia plantaginea* (1km)
Balsam Ragwort	*Senecio pauperculus*
Bull Thistle	*Cirsium vulgare*
Canada Thistle	*C. arvense*
Red-seeded Dandelion	*Taraxacum erythrospermum*
Common Dandelion	*T. officionale*
White Lettuce	*Prenanthes racemosa*
Tall Rattlesnake Root	*P. altissima*

Appendix C

PRINCIPLES FOR PROPONENTS IN SON TERRITORY

Principles for Proponents working in the Traditional Territories of the Saugeen Ojibway Nations

The Saugeen Ojibway Nations consist of the Chippewas of Saugeen and the Chippewas of Nawash Unceded First Nation. The traditional lands of the Saugeen Ojibway Nations extend east from Lake Huron to the Nottawasaga River and south from the tip of the Bruce Peninsula to the Maitland River system (11 miles south of Goderich). The traditional waters around these lands include the lakebed of Lake Huron from the shore to the US border and the lakebed of Georgian Bay to the halfway point.

The following principles will form the basis of any future relationship with the proponent and a negotiated protocol for consultation and accommodation.

1. Rights and Interests

The rights and interests of the Saugeen Ojibway Nations are as follows:

a) Pursuant to our 19th century Treaties with the Crown, the SON occupy large Reserves bordering Lake Huron or Georgian Bay. Because these reserve lands were exempted from the surrender in the Treaty, the SON have Aboriginal title to those lands. Those reserves sustain the SON's future in various ways. They are our residential communities, include places of cultural and spiritual significance, and are the base for our fisheries and other economic opportunities, including valuable recreational properties. Those proprietary rights and interests depend on a safe and stable, toxic-free environment, including clean water from Lake Huron or Georgian Bay.

b) The SON have subsistence fisheries and land-based harvesting practices and rights throughout our territory. These provide vital support for our Aboriginal culture and way of life, as well as the economy, health and social relationships in the SON communities.

c) The SON also have commercial fishing rights in Lake Huron and Georgian Bay. These Aboriginal and Treaty rights were confirmed in *R v Jones and Nadjiwan*, [1993] 3 CNLR 178, and are an interest of growing economic importance, in light of the large scale settlement and development in the territory.

d) The SON also have two major land claims before the courts. One is an aboriginal title claim to the lakebeds of our traditional waters. The other affects the whole of Bruce Peninsula, including the land under navigable rivers and lakes.

2. Consultation

The Supreme Court of Canada has recently explained the Crown's legal obligations to consult aboriginal peoples, in three decisions: *Taku River Tlingit v British Columbia* [2005] 1 CNLR 366, *Haida Nation v British Columbia* [2005] 1 CNLR 72, and *Mikisew Cree v Canada* [2006] 1 CNLR 78. In subsequent decisions by courts in British Columbia and Ontario, further details have been clarified – see e.g., *Musqueam Indian Band v Canada* [2005] 2 CNLR 212 (B.C.C.A.), *Platinex Inc. v Kitchemuhmaykoosib Inninuwig First Nation* (Ont. SCJ, July 28, 2006).

It is now settled that a government must engage in consultations with an Aboriginal people when considering a decision that might adversely affect their Aboriginal or Treaty rights or interests intended for protection by section 35 of the *Constitution Act, 1982*. If there is a potential for substantial adverse impacts or infringement, there is a corresponding obligation to protect and accommodate the affected rights or interests.

These consultation and accommodation obligations are based on the honour of the Crown. They reflect the ongoing requirement to pursue the reconciliation of pre-existing Aboriginal rights and interests with Crown sovereignty. These are continuing obligations that emerge from the Crown-Aboriginal relationship, and which arise whenever there is a reasonable likelihood that Aboriginal interests could be at risk. If governments do not fulfill these obligations, the courts may disallow authorizations for proposals that triggered the duty.

Therefore, in the context of the SON:

a) The process must focus on the impacts/infringement. The Crown must genuinely seek to inform itself about and substantially address the First Nation's concerns.

b) The focus must be on the outcome and not just the process. The appearance must not triumph over content.

c) The key is to focus the consultation process on the constitutionally protected aboriginal rights in question. This is not just a chat. This is not a discussion about "interests". This is a process required because the Crown is proposing to allow something to take place that could infringe a right or rights protected by s.35 of the Canadian Constitution. The scope and nature of the consultation and accommodation are inextricably linked to the rights at stake.

d) The substantive requirement is that the Crown "demonstrably integrate" the rights and title claims raised by the First Nation into the decision making process.

e) The Crown's legal duty to consult with the Saugeen Ojibway Nations cannot be delegated to third parties.

f) Consultation cannot proceed in the absence of the Crown.

g) The SON, after the Environmental Assessment process, will be consulted about any subsequent permitting, approval and licensing processes that are a part of the overall project.

3. Protection of the Environment

The Saugeen Ojibway Nations' traditional territories have been their home long before contact and will continue to be their home for generations to come. The full expression of Saugeen Ojibway Nations' rights depends on healthy, biologically diverse ecosystems. Therefore:

a) The SON must have full participation in any environmental screening or assessment process.

b) The SON are entitled to share and have access to all necessary information relating to environmental screening or assessment reports and processes, especially those that might reveal potential impacts on Saugeen Ojibway Nations' rights, claims and way of life.

c) The SON must have full participation in the ongoing monitoring of the project.

d) A separate Environmental Agreement will be required. Components of the Environmental Agreement would include (but would not be limited to):

i. terms and conditions that are necessary as identified by the SON's environmental review of the project;
ii. a determination of the level of engagement of the SON in the ongoing environmental management of the project, including decommissioning of the project;
iii. delivery of environmental monitoring data, studies and other information to the SON for periodic evaluation;
iv. periodic independent evaluation of the proponent's environmental performance;
v. the collection of baseline data for use as environmental health indicators.
vi. environmental reporting to the SON on a regular basis;
vii. review and approval authority by SON of environmental management plans (especially closure/decommissioning plans);
viii. an endorsement of the precautionary principle;
ix. agreement on the preservation of sensitive naturally occurring ecologies, including species of particular cultural interest to the SON;
x. restoration, where practical and appropriate, of indigenous species;
xi. compliance with regulations, standards and best practices of the day.

4. Sustainability of the First Nations

In the past, many projects, legislation, policies and practices have proven incompatible with the Saugeen Ojibway Nations' rights, interests and way of life. Therefore:

a) The proponent must accommodate the rights and interests of the SON such that the project contributes to the SON's well-being and does not undermine it.

b) Any adverse impact or infringement upon the SON's rights and way of life and the sustainability of these interests within their traditional territories must be fully addressed and mitigated by the proponent. This would include impacts on harvesting rights, particularly SON rights to a commercial fishery.

c) The proposed project must be consistent with the SON's vision for the land and waters of their traditional territories, respectful of their rights and interests and it must contribute to the cultural, economic and social vitality of their people.

5. Protection of Culturally Specific Sites (burial grounds, ancient habitation sites etc.)

Areas within the traditional territories of the Saugeen Ojibway Nations are sacred and are of significant cultural value. It is imperative that these sites are properly identified and protected. Therefore:

a) The proponent must, with SON participation, determine whether the site for the proposed project is of any cultural significance to the SON.

b) The proponent and the SON must assess whether the project will have an adverse impact on any existing culturally specific site(s).

c) If the heritage resource potential of any site(s) proposed for surface disturbance has not yet been assessed for archaeological potential, then, prior to any disturbance, the proponent must conduct a site archaeological survey according to terms agreed to by the SON.

d) If artefacts or remains are found, all work at the site must cease and the SON notified immediately. The proponent and First Nation representatives will then enter into negotiations regarding the disposition of artefacts and the protection of remains.

e) Socio-cultural impact assessment studies may need to be conducted at the proponent's expense.

6. Experts and Assessments

a) The proponent must seek the approval of the SON for the appointment of experts who will conduct traditional land use studies, archaeological studies and ethnographic studies that assess the impacts of the project.

b) The SON must play a meaningful role in any assessments or studies regarding the project and its impact on their rights and way of life and the sustainability of these

interests within their traditional territories. This role might include the setting of terms of reference and the peer review of such studies.

7. Mitigation Strategies

Accommodation is an integral part of consultation. Therefore:

a) The proponent and the SON must jointly develop mitigation strategies that fully address the SON's concerns.

8. Information Sharing

An open and transparent process, conducted in good faith is at the heart of proper consultation. The Saugeen Ojibway Nations must be able to make informed decisions, understand fully the effects that a decision may have, and ensure their decisions are consistent with the needs, aspirations and concerns expressed by their communities. Therefore:

a) The proponent must provide the necessary vital and detailed information pertinent to the project and its impacts on the SON's rights and interests and the sustainability of these interests within their traditional territories.

b) The SON must share all information with the proponent that addresses their concerns regarding potential impacts of the project and any other information that is necessary in terms of assessing and or monitoring the project as well as designing and implementing any required mitigation measures.

c) All information must be provided in a timely manner.

9. Capacity

a) The proponent must provide the Saugeen Ojibway Nations with sufficient funding to ensure that the SON can participate fully in the negotiation of a Protocol Agreement and in the consultation process itself, which includes the various studies, and stages of the assessment process.

10. Benefits

The SON is generally excluded from the educational, employment and business opportunities that industry brings to others in their traditional territories. Therefore:

a) The proponent and SON will negotiate an agreement that will include, but is not limited to, compensation, employment, training and business opportunities.

APPENDIX D ENVIRONMENTAL POLICY

WETLAND POLICY

4.3.2.4 ***Locally Significant Wetlands***

.1 County Council shall encourage the protection of locally significant wetlands.

.2 Development, which may have a significant impact on lands, located within locally significant wetlands, may require the preparation of an Environmental Impact Study, by the proponent, to ensure that the ecological function of the lands, and the ecological function of the lands, are not negatively impacted by the proposed development. An EIS shall be prepared in accordance with the policies of Section 4.3.3 [Environmental Impact Studies].

4.3.2.5 ***Provincially Significant Wetlands***

.1 Schedule C to this Plan identifies Provincially Significant Wetlands. The following policies apply to those wetlands.

.2 It is the policy of County Council that development except for infrastructure permitted by the Provincial Policy Statement shall not be permitted within Provincially Significant Wetlands.

.3 It is the policy of County Council that development may be permitted on adjacent lands only if it does not result in any of the following:

i) A loss of wetland function;

ii) Subsequent demand for future development, which will negatively impact on existing wetland functions;

i) Conflict with existing site specific wetland management practices; and

ii) Loss of contiguous wetland areas.

.4 Wetland Area is a single continuous wetland, which may be composed of one or more wetland types.

.5 Adjacent lands are those lands within 120 metres of an individual wetland area.

.6 It is the policy of County Council that the policies of Section 4.3.2.5.3 i), ii), iii) and iv) shall be addressed by an Environmental Impact Study (EIS), prepared in accordance with established procedures and carried out by the proponent. The EIS shall be subject to review and comment by the appropriate Provincial authority, the Conservation Authority, where one exists, and other public authorities having jurisdiction.

.7 Development proposals may be considered on adjacent lands without an Amendment to this Plan, in accordance with the abutting land use designation if supported by a site specific EIS indicating how the above policy has been met.

.8 It is the policy of County Council that wetlands shall be designated in local Official Plans where they exist, and that policies be included to preclude new development within Provincially Significant Wetlands.

i) .9 It is the policy of County Council that Provincially Significant Wetlands shall be zoned in the local Municipal Zoning By-Law to preclude new development within Provincially Significant Wetlands.

HABITAT OF THREATENED AND ENDANGERED SPECIES POLICY

4.3.2.7 ***Threatened and Endangered Species***

.1 Detailed mapping showing the significant portions of the habitat for threatened and endangered species in the county is not included on Schedule C to this Plan. Until such mapping becomes available and is incorporated in the Plan, these heritage resources shall require protection in accordance with the following policies where they are identified by the proponent and/or review agencies as being on or adjacent to a development proposal through individual review. The following policies apply to significant habitat of threatened and endangered species.

.2 When mapping does become available, it is the policy of County Council to designate such areas in the County Plan. It may be difficult to maintain up-to-date mapping showing significant habitat of endangered species and threatened species given that the listing of the species and their respective rankings change often. Reference should be made to the Ministry of Natural Resources official species at risk list, as updated and amended from time to time.

.3 It is the policy of County Council that development except for infrastructure permitted by the Provincial Policy Statement shall not be permitted within significant portions of the habitat of threatened and endangered species.

.4 It is the policy of County Council that development and site alteration may be permitted on adjacent lands only if it has been demonstrated through an EIS, carried out by the proponent, that there will be no negative impacts on the natural features or on the ecological functions for which the area is identified. Impact is deemed significant as guided by the PPS glossary

.5 Adjacent lands are those lands within 50 metres of an identified area.

.6 Development proposals may be considered on adjacent lands without amendment to this Plan, in accordance with the abutting land use designation if supported by a site specific EIS indicating how the above policies have been met.

.7 It is the policy of County Council that significant habitat of threatened and endangered species be designated in local Official Plans where they exist, and that policies be included to preclude new development within such areas.

.8 It is the policy of County Council that significant portions of habitat of threatened and endangered species shall be zoned in the local Municipal Zoning By-law to preclude new development within such areas.

SIGNIFICANT WOODLAND POLICY

The County of Bruce Official Plan speaks to significant woodlands and this report complies with the intent of these policies:

4.3.2.6 ***Significant Woodlands***

.1 It is the intent of County Council to protect significant woodlands as they are one of the key components of our natural heritage areas. Wood lands provide significant economic value as well as habitat for wildlife, erosion control and maintenance of the 'cold water' for fish habitat.

.2 Although significant wood lands have not been mapped in this Plan, the following policies shall apply to the protection of wood lands:

i) For Townships with less than 30% forest cover, wood lots of 40 hectares or greater are considered significant. Prior to development being permitted in these areas the proponent of the development shall be required to undertake an Environmental Impact Study.

ii) For municipalities with greater than 30% forest cover, an Environmental Impact Study shall only be required for developments that propose four or more lots in one development, or that involve the removal of more than 1.0 ha of forest cover in a single proposal. In certain instances, where the County may be concerned about cumulative losses to a significant wood lot, an EIS may also be required.

.3 Where it cannot be demonstrated through the preparations of an Environmental Impact Study that the proposed development will not impact on the habitat/resource function of the wood lot, the development shall be refused.

.4 The County recognizes that the evaluation of significant woodlots on a case-by-case basis may no longer be adequate. In this regard, the County shall endeavour to undertake a countywide evaluation of woodlands, provide required mapping, and update this section as required.

VALLEYLAND POLICY

4.3.2.8 ***Significant Valleylands***

.1 Detailed mapping showing significant valleylands is not included on Schedule C to this Plan. Until such mapping becomes available and is incorporated in the Plan, significant valleylands are identified on a case-by-case basis.

.2 When mapping does become available, it is the policy of County Council to designate such areas in the County Official Plan.

.3 It is the policy of County Council that no development or site alteration may be permitted within or adjacent (50 metres) to a significant valleyland unless it has been demonstrated through an EIS, carried out by the proponent, that there will be no negative impacts on the natural features or the ecological function of the significant valleylands. Impact refers to significant negative impact using the PPS glossary.

SIGNIFICANT AREAS OF NATURAL AND SCIENTIFIC INTEREST POLICY

4.3.2.10 ***Significant Wildlife Habitat***

.1 Detailed mapping showing the significant wildlife habitat in the County is not included on Schedule C to this Plan. Until such mapping becomes available and is incorporated in the Plan, these heritage resources are identified on a case-by-case basis.

.2 It is the policy of County Council that no development except for essential municipally owned infrastructure shall be permitted within areas of significant wildlife habitat provided no adverse environmental impact will result.

.3 It is the policy of County Council that no development or site alteration may be permitted within 120 metres to significant wildlife habitat unless it has been demonstrated through an EIS, carried out by the proponent, that there will be no negative impacts on the natural features or on the ecological functions for which the area is identified. Impact is deemed significant negative impact as guided by the PPS glossary.

4.3.2.3 ***Areas of Natural or Scientific Interest (ANSI)***

.1 County Council recognizes that most ANSI are held in private ownership. The objective of the policies of this section will therefore be to provide for the continued private use while encouraging landowners to voluntarily protect and manage the unique environmental resources of their land. This encouragement can be achieved by demonstrating wise environmental management of public land, the distribution of information concerning the establishment of new ANSI and the management of environmental features found within the ANSI.

.2 County Council is in a position to influence the nature of development occurring within and contiguous to ANSI. The policies of this Plan seek to protect and improve the natural environment of ANSI affected by the development of land in recognition of the fact that:

i) The protection, management and renewal of ANSI is essential if the County's natural heritage is to survive;

ii) Some forms of development may be accommodated within and contiguous to ANSI;

iii) When development and environmental objectives cannot be reconciled, the County shall attempt to protect the affected area by requesting a public agency or non-profit Corporation or the Conservation Authority to acquire the land, or to permit re-evaluation of the ANSI designation, or refuse to approve the development;

iv) The policies and objectives of this Section can complement the actions of other agencies in the protection and wise management of the natural environment; and

v) The distribution of information on the state of environmental conditions is essential to ensure the survival of the County's natural heritage.

.3 County Council has designated on Schedule C those areas identified and judged by the Province of Ontario as Areas of Natural or Scientific Interest (ANSI) of Provincial significance.

.4 County Council is prepared to consider mapping of ANSI at an improved scale to more accurately represent or determine the lands designated ANSI on Schedule C. Such mapping shall be used in the application of policies associated with this Plan and shall be revised as improved information and Environmental Impact Statements indicate more precise boundaries. Where more accurate mapping becomes available, this mapping will be incorporated by Amendment to this Plan.

.5 It is the policy of County Council to consider the use of land within an ANSI identified on Schedule C in accordance with the underlying land use designation on Schedule A, provided it can be shown that the development would not adversely impact upon the ANSI. In order to further clarify the intent of this policy, the following use of land and buildings as they existed on the date of adoption of this Plan may continue:

i) Farming operations and the expansion of the same in accordance with the Minimum Distance Separation Formula;

ii) Management and harvesting of timber in accordance with sound forest management practices;

iii) Construction or expansion of a residence on a legally separated parcel of land existing on the date of the adoption of this Plan, provided that measures are taken to minimize negative impacts on the ANSI and subject to other policies of this Plan, the local Municipal Zoning By-Law and the applicable policies and regulations of other agencies or Government ministries; and, iv) The existing use of the area for public recreational uses.

.6 It is the policy of County Council that when a change in the use of land not in conformity with the above policy is proposed for lands within the ANSI such that adverse effects on the ANSI are likely to occur, a full, scoped or check list, Environmental Impact Studies (EIS) in regard to the merits of the proposal as determined by the appropriate Council, shall be prepared prior to the consideration of approval of the proposal according to the policies of Section 4.3.3 [Requirements for Environmental Impact Studies]. Where it cannot be shown that the development proposal will have minimal impacts on the ANSI, such proposal shall be refused.

.7 ANSI are identified by the Province of Ontario. It is the policy of County Council to ensure that an EIS is reviewed with respect to the merits of the proposal. A recommendation will then be submitted to the County and/or local municipality for consideration of the proposed change in the use of the land.

.8 It is the policy of County Council that the lands identified as ANSI, which are privately owned, are not free and open for the public to use. Public access to ANSI on privately owned lands may occur by permission of the land owner, and the use of other mechanisms such as Land Trusts or Conservation Easements.

.9 County Council recognizes that the existing statutory powers of the County to fully achieve the objectives of environmental protection are inadequate.

.10 In order to supplement the provisions of the above policies, County Council may from time to time consider:

i) The acquisition (by donation) of ANSI that may be suitable for the extension of existing County forests or for the establishment of new County forests;

ii) Negotiating with the owners of an ANSI to have all or part of it privately preserved or managed in accordance with sound environmental practices, or conveyed by the owner to a public authority;

iii) The use of conservation measures such as Land Trusts or Conservation Easements; and,

iv) Requesting the public agency or non-profit Corporation, or the Conservation Authority, having jurisdiction to acquire such ANSI.

SEASONAL CONCENTRATION AREAS

4.3.2.9 ***Deer Wintering Areas***

.1 Detailed mapping showing deer wintering areas in the County is not included on Schedule C to this Plan. The deer wintering areas are identified on a case-by-case basis.

.2 In the interim, it is the policy of County Council that development or site alteration may be permitted within or adjacent (120 metres) to deer wintering areas only if it has been demonstrated through an EIS, carried out by the proponent that there will be no negative impacts on the deer wintering area. Impact is deemed significant negative impact as guided by the PPS glossary.