

**PRE-CONSTRUCTION
MONITORING REPORT
NIAGARA REGION WIND FARM**

File No. 160950269




Prepared for:
Niagara Region Wind
Corporation
277 Lakeshore Road East,
Suite 211
Oakville, ON L6J 6J3

Prepared by:
Stantec Consulting Ltd.
49 Frederick St.,
Kitchener, ON
N2H 6M7


Revised July 23, 2014

Sign-off Sheet

This document entitled PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM was prepared by Stantec Consulting Ltd. for the account of Niagara Region Wind Corporation. The material in it reflects Stantec's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Prepared by _____

(signature)

Janice Ball
Terrestrial Ecologist

Reviewed by _____

(signature)

Shari Muscat, B.A., B.E.S
Project Manager, Environmental Planner

Table of Contents

1.0	INTRODUCTION	1.1
2.0	METHODS	2.1
2.1	MIGRATORY LANDBIRD STOPOVER AREAS	2.1
2.2	BAT MATERNITY COLONIES	2.2
2.3	TURTLE OVERWINTERING HABITAT	2.4
2.4	SNAKE HIBERNACULUM.....	2.5
2.5	TURTLE NESTING HABITAT	2.6
3.0	RESULTS	3.1
3.1	MIGRATORY LANDBIRD STOPOVER AREAS	3.1
3.2	BAT MATERNITY COLONIES	3.2
3.3	TURTLE OVERWINTERING HABITAT	3.8
3.4	SNAKE HIBERNACULUM.....	3.9
3.5	TURTLE NESTING HABITAT.....	3.10
3.6	SUMMARY	3.13
4.0	CONCLUSION	4.1
5.0	REFERENCES	5.1

LIST OF TABLES

Table 2.1	Spring Migratory Landbird Survey Results
Table 2.2	field Investigation Record for Fall Migratory Landbird Surveys at the Niagara Region Wind Farm
Table 2.3	Field Investigation Record for Bat Maternity Colony Cavity Tree Density Surveys at the Niagara Region Wind Farm
Table 2.4	Field Investigation Record for Turtle Overwintering Habitat Surveys at the Niagara Region Wind Farm
Table 2.5	Field Investigation Record for Snake Hibernaculum Surveys at the Niagara Region Wind Farm
Table 2.6	Field Investigation Record for Turtle Nesting Habitat Surveys at the Niagara Region Wind Farm
Table 3.1	Transect 4 (mlsa3) Fall Migratory Landbird Survey Results for the Niagara Region Wind Farm
Table 3.2	Transect 5 (mlsa4) Fall Migratory Landbird Survey Results for the Niagara Region Wind Farm
Table 3.3	Bat Maternity Colony Tree Density Survey Results for the Niagara Region Wind Farm
Table 3.4	Field Investigation Record for Bat Exit Surveys for the Niagara Region Wind Far
Table 3.5	Bat Exit Survey Candidate Tree Cavity Characteristics

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Table 3.6	Bat Exit Survey Results for the Niagara Region Wind Farm
Table 3.7	Results of Turtle Overwintering Surveys
Table 3.8	Results of Snake Hibernacula Surveys
Table 3.9	Turtle Nesting Habitat Summary
Table 3.10	Pre-Construction Evaluation of Significance Summary

LIST OF APPENDICES

Appendix A	Figures
Appendix B	Tables
Appendix C	Field Notes

LIST OF FIGURES:

APPENDIX A

Figure 1:	Migratory Landbird Stopover Areas
Figure 2:	Candidate Significant Migratory Landbird Stopover Area Transects
Figure 3:	Potential Candidate Significant Bat Maternity Colonies
Figure 4:	Candidate Significant Bat Maternity Colonies
Figure 5:	Candidate Significant Snake Hibernacula
Figure 6:	Potential Candidate Significant Turtle Nesting Habitat and Candidate Significant Turtle Overwintering Habitat

LIST OF TABLES:

APPENDIX B

Table 1:	Migratory Landbird Stopover Area Species List
----------	---

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Introduction

July 23, 2014

1.0 Introduction

The Niagara Region Wind Farm Natural Heritage Assessment and Environmental Impact Study (NHA/EIS) received confirmation from the Ministry of Natural Resources (MNR) April 3, 2013 that the report had been completed in accordance with Section 28(2) and 38(2)(b) of the Ministry of the Environment (MOE) Renewable Energy Approvals (Ontario Regulation 359/09 (O. Reg. 359/09)). The Niagara Region Wind Farm Corporation is proposing to develop, operate and construct the 230 megawatt (MW) Niagara Region Wind Farm within the Townships of West Lincoln and Wainfleet and the Town of Lincoln within the Niagara Region and within Haldimand County in Southern Ontario. The Project includes 77 wind turbine generators, each with a rate capacity of approximately 3 MW, for a maximum installed nameplate capacity of 230 MW. Details regarding the natural heritage assessment are provided in the Niagara Region Wind Farm Natural Heritage Assessment and Environmental Impact Study (Stantec, March 2013). Addendums to the NHA/EIS have also been submitted to the MNR (Stantec, April 8th and June 20th, 2013).

As a condition of confirmation for the Niagara Region Wind Farm, under O. Reg. 359/09, additional pre-construction monitoring surveys were required. Certain natural environment monitoring requirements were established in the supporting REA documentation, namely the NHA/EIS (Stantec, March 2013) and the Environmental Effects Monitoring Plan (EEMP) (Stantec, June 2013). These additional surveys include fall migratory landbird stopover area surveys, bat maternity colony surveys, turtle overwintering area surveys, snake hibernacula surveys and turtle nesting habitat assessments. Surveys were completed to confirm the significance of these features, which were assumed to be significant as part of the NHA/EIS, pending the completion of these surveys.

The purpose of this report is to describe the survey methodologies and summarize results of the pre-construction surveys conducted in 2013, in accordance with the NHA/EIS and EEMP. This report will inform future monitoring requirements and the results will form the basis for comparing post-construction monitoring results of this project.

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Methods
July 23, 2014

2.0 Methods

2.1 MIGRATORY LANDBIRD STOPOVER AREAS

There were four migratory landbird stopover areas identified in Section 6.6.1 of the NHA/EIS as occurring within 120 m of the Project Location (**Figure 1, Appendix A**). In order to determine significance, a candidate migratory landbird stopover area must meet the criteria for significance during transect-based spring and fall migratory surveys, however prior to completion of the NHA/EIS, spring surveys were conducted in two of the features. In accordance with Table 5.3 in Appendix B of the NHA/EIS (**Table 2.1 below**), spring migratory landbird surveys determined that mlsa1 met the criteria for significance, as per the Draft Significant Wildlife Habitat Ecoregion Criterion Schedule (MNR, 2012). Mlsa2 was treated as significant, since evaluation of significance surveys were not possible due to access permission constraints. Insufficient numbers of individuals and a lack of species variety recorded during spring surveys did not qualify mlsa3 and mlsa4 as significant, however, these features were considered to be significant wildlife habitat for migratory landbird stopover areas, pending the results of the fall surveys.

Table 2.1: Spring Migratory Landbird Survey Results					
Feature No.	Transect #	ELC Community Type(s)	Landbird Migratory Stopover Area Criteria		Significant (Yes/No)
			> 200 birds/day*	> 35 species with min 10 species recorded on 5 survey dates*	
mlsa1	1	SWD5-1, SWD4-5/SWD2-1	Y	Y	Y
	2	SWD3-2 and SWD5-1			
	3	SWD5-1			
mlsa2	n/a	SWD2-2 and FOD7-2	n/a	n/a	Y*
mlsa3	4	SWD2-3	N	N	Y**
mlsa4	5	SWD2-2 and FOD 7-2	N	N	Y**
Note: Both criteria must be present for a determination of significance *Assumed significant due to lack of permissions to access the community to conduct passerine surveys **Assumed significant pending fall passerine surveys					

During fall surveys, one (1) transect route for migrating landbirds was conducted within each of the two (2) candidate significant migratory bird stopover areas (mlsa3 and mlsa4), and this was consistent with the transect locations used for the spring surveys. The transect routes were recorded with a GPS to ensure the surveys are replicable. (**Figure 2, Appendix A**).

Surveys began one half hour after sunrise and continued for approximately two hours. The number of individuals of each species observed during the surveys was recorded. Nine (9) surveys were conducted at regular intervals from September 4th to October 17th, 21013.



PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Methods
July 23, 2014

Survey dates, times, weather conditions and survey personnel for these studies are provided in Table 2.2 below.

Table 2.2: Field Investigation Record for Fall Migratory Landbird Surveys at the Niagara Region Wind Farm					
DATE/TIME	WEATHER				SURVEYOR(S)
	Temp. °C	Wind (Beaufort Scale)	Cloud %	PPT / PPT last 24 hours	
Sept. 4, 2013 8:10 – 9:45 am	18-20	1-3	0	None / None	A. Orr
Sept. 9, 2013 7:25 – 9:10 am	10-12	0	50	None / None	A. Orr
Sept. 13, 2013 7:35 – 9:05 am	11-12	1-3	30-60	None / Precipitation in last 24 hours	A. Orr
Sept. 19, 2013 7:45 – 9:07 am	11-13	1-3	30-40	None / None	A. Orr
Sept. 24, 2013 8:30-9:50am	8	0	0	None / None	J. Ball
Sept. 30, 2013 7:32-9:05am	17	2	100	None / Unknown	J. Ball
Oct. 8, 2013 7:50 – 9:30 am	4-6	0	0-10	None / Precipitation in last 24 hours	A. Orr
Oct. 11, 2013 7:48 – 9:10 am	7-8	0-1	10	None / None	A. Orr
Oct. 17, 2013 8:00 – 9:20 am	10	0	50-70	None / Rain in last 24 hours	A. Orr

2.2 BAT MATERNITY COLONIES

There were 48 potential candidate bat maternity colonies identified in Section 6.6.3 of the NHA/EIS as occurring within 120 m of the wind turbines (**Figure 3, Appendix A**). All potential candidate bat maternity colonies were considered to be significant in the NHA/EIS, pending bat maternity colony habitat pre-construction surveys (for which access was permitted) to confirm whether these features met the criteria to be considered as candidate significant wildlife habitat for bat maternity colonies, with subsequent surveys to confirm if the candidate features met the criteria as significant, as per the *Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule* (MNR 2012) and the "*Guidelines for Wind Power Projects Potential Impacts to Bats and Bat Habitats*". These features included; bmc1, bmc6, bmc7, bmc8, bmc9, bmc10, bmc11, bmc13, bmc14, bmc16, bmc17, bmc18, bmc20, bmc23, bmc25, bmc26, bmc27, bmc28, bmc29, bmc30, bmc31, bmc32, bmc33, bmc34, bmc35, bmc37, bmc38, bmc42, bmc47, bmc48, bmc49, bmc50, bmc51, bmc52, bmc53, bmc54 and bmc55. No surveys were undertaken in bmc3, bmc12, bmc15, bmc19, bmc24, bmc36, bmc39, bmc43, bmc44, bmc45 and bmc46 due to access permission constraints. Those features for which permission to access was unavailable

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Methods

July 23, 2014

were considered to be significant wildlife habitat for bat maternity colonies. Potential candidate significant bat maternity colonies and bat maternity colonies that have been assumed significant due to access restraints are shown on **Figure 3, Appendix A**.

Candidate significant bat maternity colony habitat was determined by conducting tree cavity density surveys in each potential candidate feature. This was done by using randomly selected plots, with a 12.6 m radius, as described in Bats and Bat Habitats (MNR 2011b), throughout the applicable habitat. A minimum of 10 plots were established in each forest site ≤ 10 ha. For sites > 10 ha, an extra plot was added for each additional ha in size, to a maximum of 35 plots. Sites that were < 0.5 ha were surveyed in their entirety. Trees with a decay class of 1-3 and a dbh (diameter at breast height) of > 25 cm were surveyed to identify any cavities 10m or higher from the ground. Trees with suitable cavities to support bat maternity colonies (small, narrow openings etc.) were tallied. Suitable cavities were assessed based on the following criteria (NOTE: not all criteria had to be met in order for cavity tree to be tallied):

- Cavity tree is ≥ 25 cm DBH;
- Cavity is ≥ 10 m high in tree;
- Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter;
- Cavity tree is a decay class of 1 – 3 (see decay classification on data form).

Surveys were conducted during leaf off so cavities could be observed clearly. In some cases such as with bmc 14 and bmc16, the features were combined for the purposes of the survey since they were directly adjacent to each other within the same woodlot.

If the cavity tree density was ≥ 10 trees per hectare, then the feature was identified as candidate significant wildlife habitat for bat maternity colony roosts and evaluation of significance bat exit surveys were undertaken. Evaluation methods followed the "Guidelines for Wind Power Projects Potential Impacts to Bats and Bat Habitats".

To determine significance, bat exit surveys were conducted in candidate significant features as follows; 10 candidate trees were selected within woodlots ≤ 10 ha and up to 30 trees for woodlots ≥ 10 ha (an additional tree was added for every hectare above 10 up to a maximum of 30 trees). The tree cavity in each candidate tree was then monitored by one surveyor from sunset (30 minutes before dusk to 60 minutes after dusk) for 1.5 hours to observe whether bats were entering or exiting the cavity. A bat detector was also set up in the area of the candidate tree to record all bats present in the area and bats sighted flying around in the area were tallied by the surveyor.

Survey dates, times, weather conditions and survey personnel for the Bat Maternity Colony Cavity Tree Density Surveys are provided in **Table 2.3** below.

Table 2.3: Field Investigation Record for Bat Maternity Colony Cavity Tree Density Surveys at the Niagara Region Wind Farm					
Date/Time	Temp. °C	Wind (Beaufort Scale)	Cloud %	PPT / PPT last 24 hours	Surveyors

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Methods
July 23, 2014

Table 2.3: Field Investigation Record for Bat Maternity Colony Cavity Tree Density Surveys at the Niagara Region Wind Farm					
Date/Time	Temp. °C	Wind (Beaufort Scale)	Cloud %	PPT / PPT last 24 hours	Surveyors
April 14 2013 10:45 – 17:15	7-9	1-2	50-90	None / Rain	J. Ball
April 18, 2013 9:50-16:40	14-25	2-4	80-100	None / n/a	J. Ball
April 18 2013 8:00 – 17:00	22	3	75	None / Thunderstorms	N. Leava
April 18 2013 11:10-17:00	11-25	1-4	0-80	None / n/a	A. Orr
April 23 2013 8:00 – 17:00	16	1	50	None / Rain	N. Leava M. Cameron

2.3 TURTLE OVERWINTERING HABITAT

According to Section 6.6.4 of the NHA/EIS, a single candidate significant wildlife habitat feature for turtle overwintering habitat was identified within the Project Location where an overhead transmission line is proposed to cross the Welland River (**Figure 6, Appendix A**). This feature was considered to be significant in the NHA/EIS, pending turtle overwintering surveys to confirm whether this feature met the criteria to be considered as significant wildlife habitat.

Habitat use surveys were conducted in the spring to determine whether the reach of the river where the transmission line was proposed, met the criteria to be considered as significant wildlife habitat for overwintering turtles, as per the *Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule* (MNR 2012). The surveyors searched potential basking sites (eg. logs in the water and sunny banks) along the Welland River for turtles, within 120 m on either side of the proposed transmission line. Surveys were conducted on warm, sunny days during the spring; once early in the season (April 15); once in mid-season (May 2), and once later in the season (May 21). Southern Ontario experienced a cooler than normal spring and therefore surveys were postponed until mid-April when daily temperatures became appropriate for basking turtles.

Survey dates, times, weather conditions and survey personnel for these studies are provided in **Table 2.4** below.

Table 2.4: Field Investigation Record for Turtle Overwintering Habitat Surveys at the Niagara Region Wind Farm					
Date/Time	Temp. °C	Wind (Beaufort Scale)	Cloud %	PPT / PPT last 24 hours	Surveyors

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Methods
July 23, 2014

Date/Time	Temp. °C	Wind (Beaufort Scale)	Cloud %	PPT / PPT last 24 hours	Surveyors
April 18 2013 11:00-11:15	25	2	80 (sunny at time of survey)	None / None	J. Ball
May 2 2013 12:50-13:05	21	2	0	None / Unknown	J. Ball
May 21 2013 13:00-13:20	23-26	2-3	60-80	None / Thunderstorms	A. Orr

2.4 SNAKE HIBERNACULUM

According to Section 6.6.5 of the NHA/EIS, there were five candidate significant snake hibernaculum features identified within 120 m of the Project Location (**Figure 5, Appendix A**). These features were considered to be significant in the NHA/EIS, pending snake hibernaculum surveys to confirm whether these features met the criteria to be considered as significant wildlife habitat.

Habitat use surveys were conducted in the spring of 2013 to determine whether candidate significant snake hibernaculum features (sh2, sh3, sh4, sh6 and sh7) met the criteria to be considered as significant wildlife habitat for snake hibernaculum, as per the *Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule* (MNR 2012). Hibernacula emergence/exit surveys were conducted on warm, sunny days during the spring; once early in the season (April 14/15); once in mid-season (May 2), and once later in the season (May 21). Southern Ontario experienced a cooler than normal spring and therefore surveys were postponed until mid-April when daily temperatures became appropriate for snake emergence.

For each survey, the surveyor observed for 20 minutes, recording all snake species and number of individuals observed entering or exiting the candidate hibernacula. The search pattern at each hibernaculum included surveying all potential basking and sheltering habitat within the location (i.e., an area including a 30 m radius around the hibernaculum).

Survey dates, times, weather conditions and survey personnel for these studies are provided in **Table 2.5** below.

Date/Time	Temp. °C	Wind (Beaufort Scale)	Cloud %	PPT / PPT last 24 hours	Surveyors
April 14 2013 14:50-16:15	9	1-2	40-60 (sunny at time of survey)	None / Rain	J. Ball

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Methods
July 23, 2014

Table 2.5: Field Investigation Record for Snake Hibernaculum Surveys at the Niagara Region Wind Farm					
April 15 2013 11:20-16:50	15-20	0	0	None / None	A. Orr
May 2 2013 10:45-15:50	18-23	1-2	0	None / Unknown	J. Ball
May 21 2013 10:20-14:20	23-26	2-3	60-80	None / Thunderstorms	A. Orr

2.5 TURTLE NESTING HABITAT

According to Section 6.6.6 of the NHA/EIS, there were 18 potential candidate significant turtle nesting habitat features identified within 120 m of the Project Location (**Figure 6, Appendix A**). These features were considered to be significant in the NHA/EIS, pending turtle nesting habitat surveys to confirm whether these features met the criteria to be considered as candidate significant wildlife habitat.

Potential candidate significant turtle nesting habitats (th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, and th69) were assessed to determine whether the features met the criteria to be considered as significant wildlife habitat for turtle nesting, as per the *Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule* (MNR 2012). This includes exposed, natural sand and gravel deposits. (**Figure 6, Appendix A**).

Survey dates, times, weather conditions and survey personnel for the turtle nesting habitat assessment is provided in **Table 2.6** below.

Table 2.6: Field Investigation Record for Turtle Nesting Habitat Surveys at the Niagara Region Wind Farm					
Date/Time	Temp. °C	Wind (Beaufort Scale)	Cloud %	PPT / PPT last 24 hours	Surveyors
June 10 2013 10:20-14:18	15-20	1	100	Rain / Unknown	J. Ball
June 11 2013 14:20-18:00	22-24	0-3	20-100	None / Rain	M. Cameron

If candidate habitat was determined to be present, then evaluation of significance surveys would be completed as follows.

- Habitat use surveys will be conducted on three separate dates during the 2013 spring breeding season (June to July) to record direct observations of turtle nesting and/or nesting evidence (e.g. hatched eggs and/or nests that have been dug up by predators).

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Methods

July 23, 2014

- Walking surveys will occur to systematically inspect all areas of exposed mineral (sand or gravel) substrates, spending a minimum of 15 minutes for every 100m² of candidate nesting substrate.
- Surveyors will map and photo-document areas of exposed substrates, and photo-document any observed nesting evidence.

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results

July 23, 2014

3.0 Results

3.1 MIGRATORY LANDBIRD STOPOVER AREAS

In order for the candidate significant migratory landbird stopover features to qualify as significant, they need to meet the criteria of 200 birds/day with 35 different species in either the spring or fall, as per the *Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule* (MNR 2012).

A complete list of all bird species observed is provided in **Table 1, Appendix B**. In total, 34 species of birds were observed during the fall migratory landbird surveys. All species observed are ranked G5 (Very common globally), or G4 (Common globally). Two bird species observed are considered federal species at risk by COSEWIC. The Eastern Wood-Pewee, which is listed as Special Concern was observed in MLSA 4 (Transect 5) on September 9, 2013. Only one individual was heard. One individual was also heard in MLSA 3 (Transect 4) on September 19, 2013. The Wood Thrush, which is listed as Threatened was observed in MLSA 4 (Transect 5) on September 9. Three individuals were seen at this time.

Tables 3.1 – 3.2 below summarize species richness and average abundance for the fall season. Average abundance was determined by dividing total abundance by number of dates (9) surveyed during the fall season. In **Table 3.1**, Transect 4, occurring in mlsa3, showed a daily species richness range from four to 13 species, with a total species richness of 27 for the fall season. Daily abundance ranged from three to 6 to 94 individuals, with an average abundance of 32 for the fall season.

Table 3.1: Transect 4 (mlsa3) Fall Migratory Landbird Survey Results for the Niagara Region Wind Farm		
Date	Species Richness	Abundance
Sept. 4, 2013	7	9
Sept. 9, 2013	4	6
Sept. 13, 2013	8	16
Sept. 19, 2013	7	17
Sept. 24, 2013	11	25
Sept. 30, 2013	4	6
Oct. 8, 2013	13	81
Oct. 11, 2013	12	94
Oct. 17, 2013	9	31
Total species richness and abundance for season	27	285
Abundance average for season	N/A	32

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results

July 23, 2014

In **Table 3.2**, Transect 5, occurring in mlsa4, showed a daily species richness range from three to ten species, with a total species richness of 22 for the fall season. Daily abundance ranged from four to 35 individuals, with an average abundance of 15 for the fall season.

Table 3.2: Transect 5 (mlsa4) Fall Migratory Landbird Survey Results for the Niagara Region Wind Farm		
Date	Species Richness	Abundance
Sept. 4, 2013	5	7
Sept. 9, 2013	9	16
Sept. 13, 2013	6	11
Sept. 19, 2013	3	6
Sept. 24, 2013	6	9
Sept. 30, 2013	3	4
Oct. 8, 2013	10	35
Oct. 11, 2013	9	20
Oct. 17, 2013	9	25
Total species richness and abundance for season	22	133
Abundance average for season	N/A	15

Overall, Transect 4, located in mlsa3, exhibited the highest species richness. A total of 27 species occurred within Transect 4 during the fall season compared to 22 species occurring within Transect 5 (located in mlsa 4). Transect 4 also exhibited the highest average abundance. An average of 32 individuals occurred within Transect 4 during the fall season compared to an average of 15 individuals observed within Transect 5.

As both transects did not meet the criteria of 200 birds/day with 35 different species (MNR 2012) in either the spring or fall, it is concluded that MLSA 3 and MLSA 4 are not significant landbird migratory stopover areas as per the *Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule* (MNR 2012).

3.2 BAT MATERNITY COLONIES

In order for the potential candidate significant bat maternity colony features to qualify as significant, bat maternity colony tree density surveys need to be conducted to determine whether they meet the criteria of ≥ 10 trees per hectare. The candidate significant wildlife habitat for bat maternity colony features then require the presence of bats exiting tree cavities during bat exit surveys in order to confirm significance. Evaluation methods followed the "Guidelines for Wind Power Projects Potential Impacts to Bats and Bat Habitats" as per the *Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule* (MNR 2012).

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results
July 23, 2014

Bat Maternity Colony Tree Density Surveys

Bat maternity colony tree density surveys were undertaken to identify candidate significant wildlife habitat. Results are summarized in **Table 3.7** below.

Table 3.3: Bat Maternity Colony Tree Density Survey Results for the Niagara Region Wind Farm						
Feature ID	Size (ha) (Accessible area in brackets)	Total # plots required	Total # cavity trees	Total # cavity trees / ha	Exit survey required?	Notes
BMC1	1.95	10	0	0	No	Logging occurred in the past as evidenced by several stumps throughout.
BMC6	6.69 (2.84)	10	0	0	No	
BMC7	2.78	10	0	0	No	
BMC8	2.80 (2.38)	10	3	6	No	Very thick understory, young to mid-age FOD/SWD. Lots of decay class 5 and 6.
BMC9	4.40 (1.85)	10	2	4	No	SWT/SWD; very wet and very thick understory. A few decay class 5 and 6.
BMC10	2.46 (0.23)	Searched Entire Accessible Area	0	0	No	
BMC11	2.06 (1.93)	10	0	0	No	
BMC13	0.57	Searched Entire Area	0	0	No	
BMC14/16	4.28	10	0	0	No	BMC14/16 lumped into one survey since they were all directly adjacent to each other but with a different ELC code.
BMC17	0.35	Searched Entire Area	1	2.86	No	
BMC18	0.13	Searched	0	0	No	

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results
July 23, 2014

Table 3.3: Bat Maternity Colony Tree Density Survey Results for the Niagara Region Wind Farm						
Feature ID	Size (ha) (Accessible area in brackets)	Total # plots required	Total # cavity trees	Total # cavity trees / ha	Exit survey required?	Notes
		Entire Area				
BMC20	1.44 (1.12)	10	1	2	No	
BMC23/25/26/27	6.02 (4.72)	10	1	2	No	BMC23/25/26/27 lumped into one survey since they were all directly adjacent to each other but with a different ELC code. Mid-age FOD with few cavity trees having decay class of 5 and 6
BMC28/30/31/32	33.04 (5.05)	33	11	6.6	No	BMC28/30/31/32 lumped into one survey since they were all directly adjacent to each other but with a different ELC code.
BMC29	0.21	Searched Entire Area	0	0	No	Small woodlot, consisting of mid-aged to mature poplar. Downed woody debris throughout with large amounts of brush piles from adjacent clear-cut.
BMC33	4.74 (4.71)	10	1	2	No	
BMC34	3.60 (1.59)	10	0	0	No	Stumps present, indicating forest management.
BMC35	0.68	10	0	0	No	Some overlap of plots may have occurred.
BMC37/38	5.15 (2.38)	10	1	2	No	BMC37/38 lumped into one survey



PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results
July 23, 2014

Table 3.3: Bat Maternity Colony Tree Density Survey Results for the Niagara Region Wind Farm						
Feature ID	Size (ha) (Accessible area in brackets)	Total # plots required	Total # cavity trees	Total # cavity trees / ha	Exit survey required?	Notes
						since they were directly adjacent to each other but with a different ELC code. 2 cavities were found in the same tree with a decay class of 2.
BMC42	2.85	10	4	8	No	Combination of lowland and upland deciduous forest; young in age, with few trees >15m in height and decay class of 1-3.
BMC47	2.35	10	3	6	No	Trees with DBH >25cm scattered throughout forest community; open areas throughout canopy cover
BMC48/49	1.20	10	4	4	No	BMC48/49 lumped into one survey since they were directly adjacent to each other but with a different ELC code. Small isolated forest community; limited clusters of trees with DBH >25cm.
BMC50	1.00 (0.93)	10	2	4	No	Small isolated forest community; young-mature in age, with limited amount of trees >25cm DBH; canopy height ~15m.
BMC51	6.46 (6.43)	10	13	26	Yes	Large portion of

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results
July 23, 2014

Table 3.3: Bat Maternity Colony Tree Density Survey Results for the Niagara Region Wind Farm						
Feature ID	Size (ha) (Accessible area in brackets)	Total # plots required	Total # cavity trees	Total # cavity trees / ha	Exit survey required?	Notes
						trees in FOD community with a DBH >25cm; large amounts of maples and shagbark hickory; canopy height >20m throughout.
BMC52/53/54/55	6.39 (5.07)	10	3	6	No	BMC52/53/54/55 communities combined together: narrow areas of upland deciduous forest surrounded by deciduous swamp. Limited areas of upland deciduous forest in feature.

Based on the plot surveys, a total of one (1) feature was considered as candidate significant wildlife habitat (BMC51). BMC-51 (**Figure 4, Appendix A**) had a total of 13 cavity trees (26 cavity trees / ha) identified during field investigations, meeting the “Guidelines for Wind Power Projects Potential Impacts to Bats and Bat Habitats” requirement of ≥ 10 trees per hectare. Bat exit surveys were therefore required to confirm the significance of this feature.

Bat Exit Surveys

Ten (10) candidate BMC cavity trees were selected within BMC51. The tree cavity in each candidate tree was monitored by one surveyor from sunset (30 minutes before dusk to 60 minutes after dusk) for 1.5 hours to observe whether bats were entering or exiting the cavity. A bat detector was also set up in the area of the candidate tree to record all bats present in the area. Additionally, bats sighted flying around in the area were tallied by the surveyor.

Dates, time, weather conditions and surveyors are provided in **Table 3.4**. Characteristics of each candidate tree cavity are included in **Table 3.5**. Bat observations for each candidate tree cavity are included in **Table 3.6**.

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results

July 23, 2014

Date/Time	Temp. °C	Wind (Beaufort Scale)	Cloud %	PPT / PPT last 24 hours	Surveyors
June 14, 2013 21:00-22:15	17	0-1	5	None / Rain	J. Ball, A.Orr, B. Miller
June 24 2013 20:45 – 22:15	27	0-1	0	None / None	J. Ball, A.Orr, N. Charlton
June 25 2013 20:45 – 22:15	25	3	80	None / None	J. Ball, A.Orr
June 26 2013 21:00 – 22:15	25	1	10	None / Rain	J. Ball, A.Orr

Tree ID	Species ID	# of cavities	DBH (cm)	Cavity Height (m)	Tree Height (m)	Decay Class
1	American Beech	1	30	15	22	1
2	American Beech	2	27	15	20	1
3	Sugar Maple	2	25	10	22	2
4	Sugar Maple	1	25	15	23	2
5	Sugar Maple	1	25	12	21	2
6	Sugar Maple	1	40	13	23	1
7	American Beech	1	26	10	23	1
8	Bitternut Hickory	1	26	12	24	1
9	Sugar Maple	1	25	16	22	2
10	Sugar Maple	3	37	17	23	3

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results

July 23, 2014

Tree ID	Bats observed exiting / entering cavity?	Total # of bats visually observed during survey
1	No	5
2	No	0
3	No	0
4	No	2
5	No	0
6	No	0
7	No	0
8	No	2
9	No	0
10	No	6

No bats were observed exiting tree cavities of candidate trees selected for the bat exit surveys, however bats were observed flying in the area during the surveys. Bat detectors indicate that the species using the habitat provided by the woodlot include Little Brown Myotis (*Myotis lucifugus*) and Big Brown Bat (*Eptesicus fuscus*). Despite the presence of these bats, BMC51 has not been considered as significant wildlife habitat for breeding bats due to the absence of bats observed exiting tree cavities of candidate trees, as per the "Guidelines for Wind Power Projects Potential Impacts to Bats and Bat Habitats".

3.3 TURTLE OVERWINTERING HABITAT

The Draft *Significant Wildlife Habitat Ecoregion 7E Criterion Schedule* (MNR 2012), defines significant wildlife habitat for overwintering turtles to be overwintering habitat used by a minimum of five Midland Painted Turtles or one or more Northern Map Turtle or Snapping Turtle.

Results of the turtle overwintering habitat surveys that were undertaken to identify significant wildlife habitat are summarized in **Table 3.7** below.

Survey Dates	Turtle Observations
April 18 2013	None
May 2 2013	None
May 21 2013	None

No turtles were observed during turtle overwintering surveys which can conclude that the area where the transmission line crosses the Welland River should not be considered to be significant wildlife habitat for overwintering turtles at this location.

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results

July 23, 2014

3.4 SNAKE HIBERNACULUM

In order for a candidate significant snake hibernaculum feature to qualify as significant, it needs to be used by a minimum of five individuals of a snake species or individuals of two or more snake species, as per the *Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule* (MNR 2012).

Results of the snake hibernacula surveys that were undertaken to identify significant wildlife habitat are summarized in **Table 3.8** below.

Feature ID	Survey Dates	Snake Species Observations	Feature Description	Survey Details
SH2	April 15	None	Piles of rocks/concrete in agricultural field.	Searched rocks/concrete for snakes and up to a 30m perimeter around the hibernacula, including adjacent agricultural field, driveway and meadow marsh.
	May 2	None		
	May 21	None		
SH3	April 15	None	Several brush/log piles in FOD.	Searched potential hibernacula, upland forest areas and the edge of agricultural field.
	May 2	Northern Brownsnake observed within 100m of hibernacula.		
	May 21	None		
SH4	April 14	None	Potential hibernacula is a pile of logs/posts and an old bridge foundation.	Searched areas north and south of the watercourse with a focus on potential hibernacula. Searched from the edge of the stream, up the slope and along the edge of the agricultural field/pasture.
	May 2	None		
	May 21	None		
SH6	April 15	None	Pile of sand 3m tall at the edge of agricultural field and FOD.	Searched the hibernacula, dryer areas of the FOD and the edge of the agricultural field.
	May 2	None		
	May	None		

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results

July 23, 2014

Feature ID	Survey Dates	Snake Species Observations	Feature Description	Survey Details
	21			
SH7	April 15	None	Downed logs and an old brick silo within an inaccessible cultural woodland.	Surveyed from the road as we did not have permission to access the property. Observed roadside and the edge of the cultural woodland for snakes.
	May 2	None		
	May 21	None		

One (1) Northern Brownsnake was observed within 100 m of SH3 however this observation does not qualify as significant according to the *Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule* (MNR 2012), which requires a snake hibernacula to be used by a minimum of five individuals of a snake species or individuals of two or more snake species. All five (5) potential snake hibernacula are not considered significant wildlife habitat.

3.5 TURTLE NESTING HABITAT

In order for a potential candidate significant turtle nesting habitat feature to be further assessed for significance, it needs to provide exposed, natural sand and gravel deposits, as per the *Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule* (MNR 2012). Results of the turtle nesting habitat surveys are found in **Table 3.9**.

The majority of sites were disturbed and consisted of drainage ditches with dense canary reed grass, and surrounded by agricultural fields. Nesting habitats were all artificial, consisting of gravel roadway shoulders and agricultural field edges and therefore did not qualify as significant wildlife habitat.

Gravel piles adjacent to TH45 likely provide adequate turtle nesting habitat however, they would not be considered significant as they are artificial. A small gravel pile adjacent to the watercourse in TH21 may also provide turtle nesting habitat however, the gravel pile is artificial and the area is disturbed with agricultural practices.

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results
July 23, 2014

Table 3.9: Turtle Nesting Habitat Summary		
Feature ID	Habitat Description	Candidate SWH? Y/N
TH3	Wetland in red maple, ash and cottonwood thicket with some shallow open water and cattail marsh. Surrounded by gravel roads to the west and north (which provide artificial turtle nesting habitat) and agricultural fields to the south. No exposed mineral soil or gravel besides access road. Heavy, saturated soil along ditch at east end.	N
TH5	Southern Portion: Surrounded by agricultural field to the west and north, forest to the east and south. Exposed clay/silt behind hog barn where tractor created rectangular dug-out beside wetland. Side of ditch on west side of wetland, adjacent to bean field are exposed clay and steep sloped. Smaller Southern Portion: Agriculture and forest on all sides. Northern Portion: Agriculture to the west and east. Forest to the north transitioning to roadside meadow. South is dense deciduous forest. No exposed soil.	N
TH9	Comprised of 2 separate ponds surrounded by dense canary reed grass and agricultural fields. The parking area provides artificial turtle nesting habitat. 3 piles of exposed clay are located by the furthest pond in TH9 however, clay does not provide suitable turtle nesting material.	N
TH10	No longer a wetland. Converted to cropland.	N
TH19	Grassy meadow with meandering stream in center. Agricultural fields to the north and south. Silty clay piles around dugout at SH4 do not provide suitable nesting substrate.	N
TH21	Watercourse (~4m wide) with dense canary reed grass; meanders through agricultural fields. There is a small pile of gravel beside the watercourse at the midpoint of the feature that would likely provide suitable turtle nesting habitat however it is artificial. The shoulders of Rosdene Rd. also provide potential artificial turtle nesting habitat. Exposed clay soils along the bank of the watercourse would not provide suitable nesting habitat due to improper soil texture,	N

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results
July 23, 2014

Table 3.9: Turtle Nesting Habitat Summary		
Feature ID	Habitat Description	Candidate SWH? Y/N
	steep slope and tendency for soils to become saturated.	
TH26	Linear wetland to the south is a grassy channel surrounded by corn fields. Central and northern wetlands have meadow to the north and east, corn fields to the south and west. Shoulders of Canborough Rd. may provide artificial nesting habitat.	N
TH28	Watercourse (~3m wide) with dense canary reed grass and cattails and surrounded by agricultural fields. Comfort Rd. provides artificial turtle nesting habitat along the shoulders. The portion of the watercourse along Comfort Rd. has some exposed clay soils along the bank however soil texture, steep slope and tendency for soils to become saturated does not make it suitable nesting habitat.	N
TH29	Watercourse with dense canary reed grass and cattails and surrounded by agricultural fields. Comfort Rd. provides artificial turtle nesting habitat along the shoulder.	N
TH38	Watercourse (~1m wide) with dense canary reed grass and cattails and surrounded by agricultural fields. Concession 4 provides artificial turtle nesting habitat along the shoulder.	N
TH39	Watercourse (~3m wide) dominated by dense canary reed grass and surrounded by agricultural fields. Gravel shoulders of Vaughan Rd. likely provide artificial turtle nesting habitat. The portion of TH39 that enters the woodland 103 is too shaded for turtle nesting.	N
TH40	Watercourse (~3m wide) dominated by dense canary reed grass and surrounded by agricultural fields. Gravel shoulders of Vaughan Rd. E. likely provide artificial turtle nesting habitat.	N
TH41	Meadow marsh dominated by dense canary reed grass and surrounded by agricultural fields and directly adjacent to an old foundation and manure pile. A gravel/sandy lane provides artificial turtle nesting habitat.	N

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results

July 23, 2014

Table 3.9: Turtle Nesting Habitat Summary		
Feature ID	Habitat Description	Candidate SWH? Y/N
TH42	Wetland is a dense, grassy marsh. Meadow and pine plantation to the north, corn to the east, west and south. No exposed soil beyond cultivated field. Soil is dense, heavy clay and not suitable for nesting.	N
TH45	Pond surrounded by red maple, ash and willow thicket. Piled gravel to the west of pond and gravel substrate between the gravel piles and gravel railway right of way provide artificial nesting habitat. West end of pond is dense cattail marsh and shrub swamp.	N
TH46	Dense, grassy, meadow marsh does not provide very good turtle habitat. No exposed soil. Trees, meadow, agricultural field around entire perimeter.	N
TH62	Watercourse (~0.5m wide) dominated by canary reed grass and surrounded by agricultural fields to the north, south and east. Woods Road to the west provides artificial turtle nesting habitat along the shoulders.	N
TH69	Watercourse (~2m wide) dominated by dense canary reed grass and surrounded by agricultural fields. Exposed soil in the area represents wet, clay depressions within agricultural fields that would not provide suitable turtle nesting habitat. The shoulders of Gee Rd. would provide artificial nesting habitat.	N

No natural, sandy and/or gravelly areas were observed within the eighteen (18) areas that were identified as potential candidate turtle nesting sites. None of these areas are considered to be Candidate significant wildlife habitat for turtle nesting.

3.6 SUMMARY

Apart from the bat maternity colony features for which permission to access the properties was not available (bmc3, bmc12, bmc15, bmc19, bmc24, bmc36, bmc39, bmc43, bmc44, bmc45 and bmc46), none of the potential or candidate features assessed qualified as significant wildlife habitat. **Table 3.10** below summarizes the results of the evaluation of significance surveys.

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results
July 23, 2014

Table 3.10: Pre-Construction Evaluation of Significance Summary			
Feature	Potential Candidate Significant Wildlife Habitat?	Candidate Significant Wildlife Habitat?	Significant Wildlife Habitat?
<i>Migratory Landbird Stopover Areas</i>			
mlsa3	N/A	Yes	No
mlsa4	N/A	Yes	No
<i>Bat Maternity Colonies</i>			
bmc1	Yes	N/A	No
bmc3	N/A	N/A	Yes (assumed)
bmc6	Yes	N/A	No
bmc8	Yes	N/A	No
bmc9	Yes	N/A	No
bmc10	Yes	N/A	No
bmc11	Yes	N/A	No
bmc12	N/A	N/A	Yes (assumed)
bmc15	N/A	N/A	Yes (assumed)
bmc19	N/A	N/A	Yes (assumed)
bmc20	Yes	N/A	No
bmc23	Yes	N/A	No
bmc24	N/A	N/A	Yes (assumed)
bmc25	Yes	N/A	No
bmc26	Yes	N/A	No
bmc27	Yes	N/A	No
bmc28	Yes	N/A	No
bmc29	Yes	N/A	No
bmc30	Yes	N/A	No
bmc31	Yes	N/A	No
bmc33	Yes	N/A	No
bmc34	Yes	N/A	No
bmc35	Yes	N/A	No
bmc36	N/A	N/A	Yes (assumed)
bmc37	Yes	N/A	No
bmc38	Yes	N/A	No
bmc39	N/A	N/A	Yes (assumed)
bmc42	Yes	N/A	No
bmc43	N/A	N/A	Yes (assumed)
bmc44	N/A	N/A	Yes (assumed)



PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results
July 23, 2014

Table 3.10: Pre-Construction Evaluation of Significance Summary			
Feature	Potential Candidate Significant Wildlife Habitat?	Candidate Significant Wildlife Habitat?	Significant Wildlife Habitat?
bmc45	N/A	N/A	Yes (assumed)
bmc46	N/A	N/A	Yes (assumed)
bmc47	Yes	N/A	No
bmc48	Yes	N/A	No
bmc49	Yes	N/A	No
bmc50	Yes	N/A	No
bmc51	Yes	Yes	No
bmc52	Yes	N/A	No
bmc53	Yes	N/A	No
bmc54	Yes	N/A	No
bmc55	Yes	N/A	No
<i>Turtle Overwintering Habitat</i>			
to1	N/A	Yes	No
<i>Snake Hibernacula</i>			
sh2	N/A	Yes	No
sh3	N/A	Yes	No
sh4	N/A	Yes	No
sh6	N/A	Yes	No
sh7	N/A	Yes	No
<i>Turtle Nesting Habitat</i>			
th3	Yes	N/A	No
th5	Yes	N/A	No
th9	Yes	N/A	No
th10	Yes	N/A	No
th19	Yes	N/A	No
th21	Yes	N/A	No
th26	Yes	N/A	No
th28	Yes	N/A	No
th29	Yes	N/A	No
th38	Yes	N/A	No
th39	Yes	N/A	No
th40	Yes	N/A	No
th41	Yes	N/A	No
th42	Yes	N/A	No
th45	Yes	N/A	No

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Results

July 23, 2014

Table 3.10: Pre-Construction Evaluation of Significance Summary			
Feature	Potential Candidate Significant Wildlife Habitat?	Candidate Significant Wildlife Habitat?	Significant Wildlife Habitat?
th46	Yes	N/A	No
th62	Yes	N/A	No
th69	Yes	N/A	No

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Conclusion
July 23, 2014

4.0 Conclusion

This report completes requirements for the pre-construction fall migratory landbird stopover area surveys, bat maternity colony surveys, turtle overwintering habitat surveys, snake hibernacula surveys and turtle nesting habitat assessments under the REA approval as required. Post-construction surveys will follow once the project is constructed to assess potential impacts as outlined in the EIS and EEMP.

Based on these survey results, post-construction surveys as identified in the EEMP and the NHA/EIS will not be undertaken in mlsa 3 and mlsa 4 as these features were not considered to be significant. Additionally, bat maternity colonies and turtle nesting features were not identified as being significant during pre-construction surveys and will not require post-construction surveys, however, all turbines within 120 m of bat maternity colonies that could not be surveyed due to site constraints will be included in the post-construction mortality monitoring for birds and bats. These turbines include: T01, T02, T05, T44, T58, T66, T81, and T96.

Post-construction surveys will still include bird and bat mortality monitoring, spring and fall migratory landbird surveys at mlsa1 and winter raptor and Short-eared Owl surveys for a period of 3 years, and hydrological and amphibian monitoring for a one-year period.

MNR, along with the applicable agencies, will be asked to collectively review the results of the post-construction monitoring to determine if an ecologically significant disturbance/avoidance effect is occurring, and whether such an effect is attributable to the wind turbines and not external factors. These discussions will determine if and when the contingency plan will be implemented and if any additional measures are warranted. The best available science and information will be considered when determining appropriate mitigation.

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

References

July 23, 2014

5.0 References

Ontario Ministry of Natural Resources. 2010. Birds and Bird Habitats: Guidelines for Wind Power Projects. 32pp.

Ontario Ministry of Natural Resources. 2012. Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule.

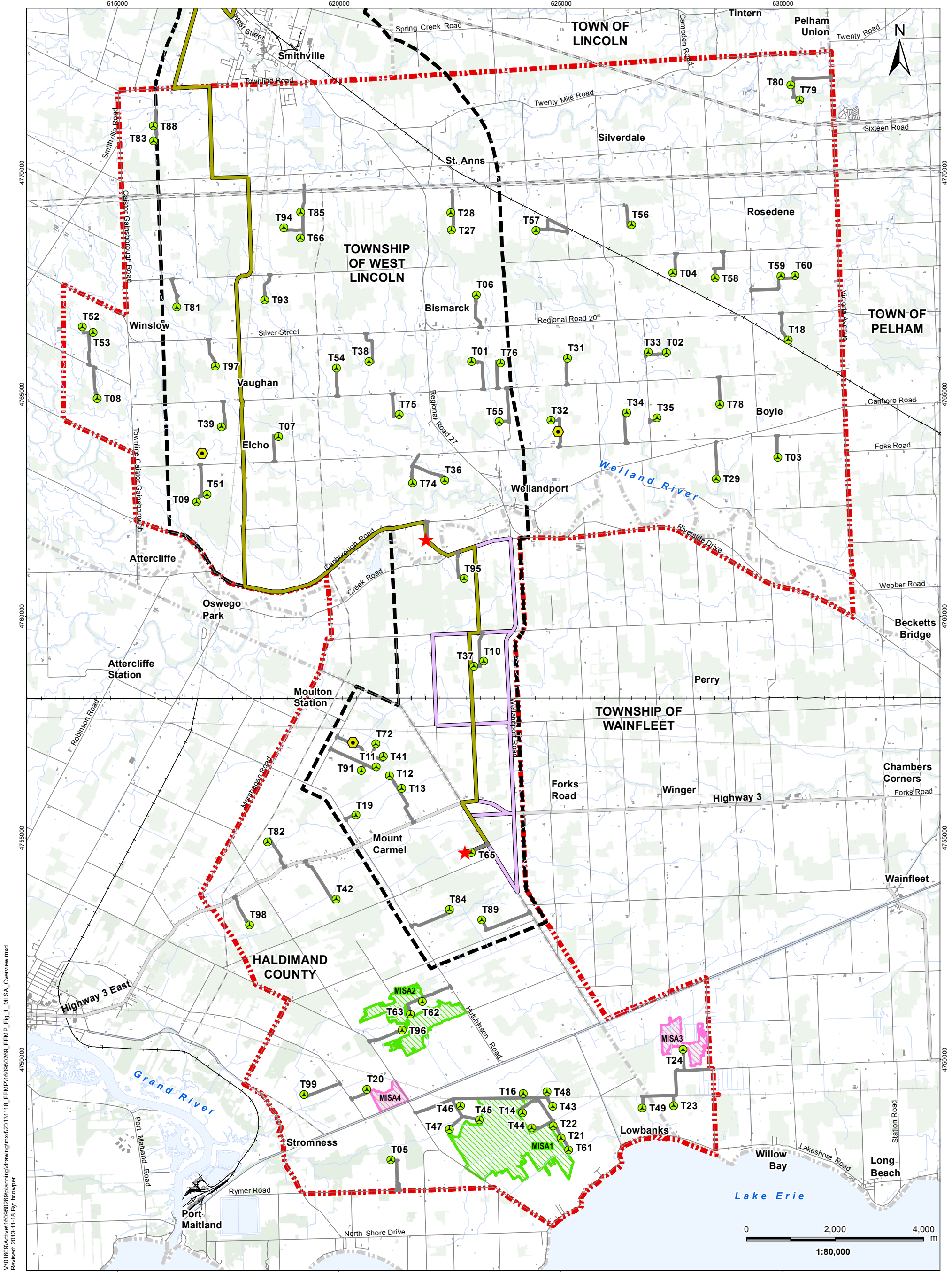
Stantec Consulting Ltd. 2013. Niagara Region Wind Farm: Environmental Effects Monitoring Plan for Wildlife and Wildlife Habitat. Prepared for Niagara Region Wind Corporation.

Stantec Consulting Ltd. 2013. Niagara Region Wind Farm: Natural Heritage Assessment and Environmental Impact Study. Prepared for Niagara Region Wind Corporation.

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Appendix A Figures
July 23, 2014

Appendix A Figures



V:\101609\Active\160950269\planning\drawing\mxd\20131118_EEMP\160950269_EEMP_Fig_1_MLSA_Overview.mxd
 Reviset: 2013-11-18 By: bcbwper



Legend	
	Project Study Area
	Interconnector Study Area
	Proposed Turbine Location
	Potential Access Road
	Transformer Substation
	Tap-in Location
	Existing Met Tower
	Preferred Transmission Line Route
	Alternate Transmission Route
	Road
	Expressway / Highway
	Active Railway
	Abandoned Railway
	Existing Structures
	Existing Transmission Line
	Watercourse
	Waterbody
	Wooded Area
	Municipality Lower Tier
	Significant Migratory Landbird Stopover Area
	Candidate Migratory Landbird Stopover Area

Notes

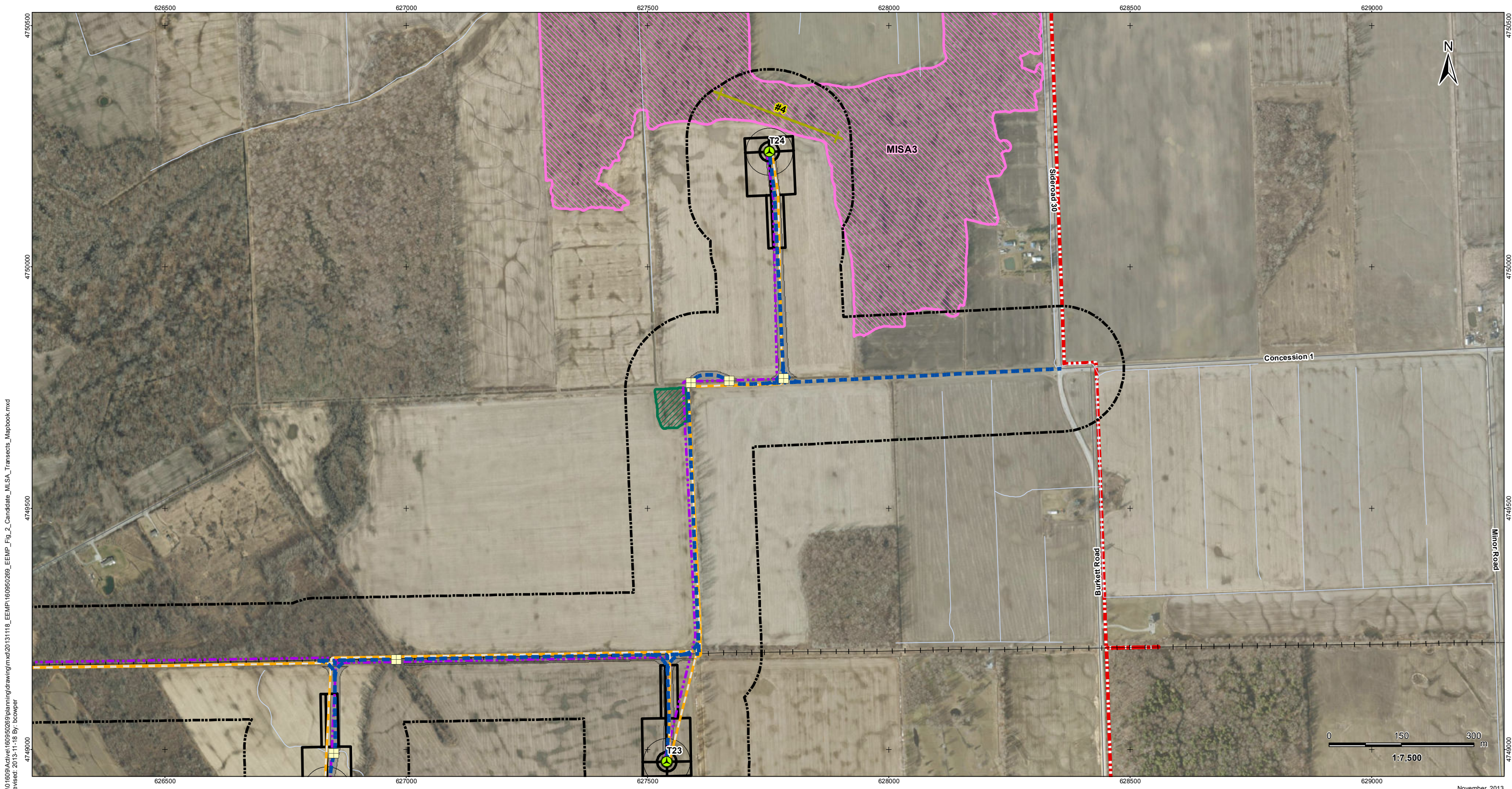
- Coordinate System: NAD 1983 UTM Zone 17N
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Client/Project
 Niagara Region Wind Corporation
 Niagara Region Wind Farm

Figure No.
 1

Title
Migratory Landbird Stopover Area

November 2013
 160950269



V:\01609\Active\160950269\planning\drawing\mxd\20131118_EEMP\160950269_EEMP_Fig_2_Candidate_MLSA_Transsects_Mapbook.mxd
 Revised: 2013-11-18 By: bcomper

November, 2013
160950269



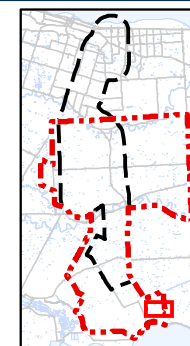
Stantec

Legend

- | | |
|---|-----------------------------------|
| Project Study Area | Potential Access Road |
| 120m Zone of Investigation | Access Road 20m Construction Area |
| Proposed Turbine Location | Migratory Bird Transect |
| Turbine Blade Length | Migratory Landbird Stopover Area |
| Proposed Culvert | |
| Temporary Laydown Area | |
| Collector Lines – Underground or Overhead | |
| Fibre Optic Line | |

Notes

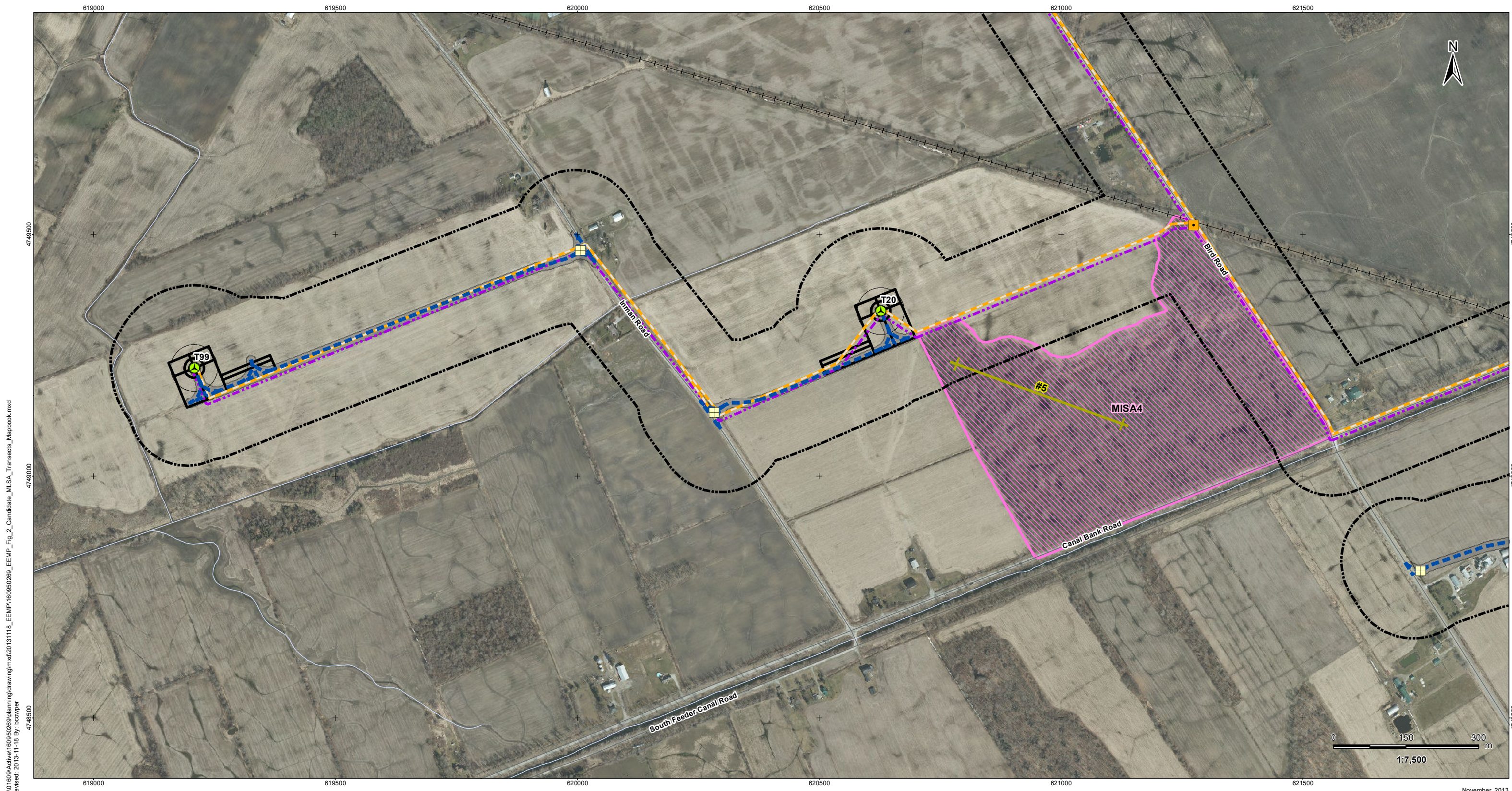
- Coordinate System: NAD 1983 UTM Zone 17N).
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
- Orthoimagery © First Base Solutions, 2010.



Client/Project
 Niagara Region Wind Corporation
 Natural Heritage Assessment Report

Figure No.
 2.1

Title
**Candidate Significant
 Migratory Landbird Stopover
 Area Transects**



V:\01609\Active\160950269\planning\drawing\mxd\20131118_EEMP\160950269_EEMP_Fig_2_Candidate_MLSA_Transsects_Mapbook.mxd
 Revised: 2013-11-18 By: bcompert

November, 2013
160950269

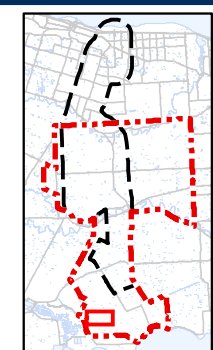


Legend

- | | |
|---|-----------------------------------|
| Project Study Area | Potential Access Road |
| 120m Zone of Investigation | Access Road 20m Construction Area |
| Proposed Turbine Location | Migratory Bird Transect |
| Turbine Blade Length | Migratory Landbird Stopover Area |
| Junction Box | |
| Proposed Culvert | |
| Temporary Laydown Area | |
| Collector Lines – Underground or Overhead | |
| Fibre Optic Line | |

Notes

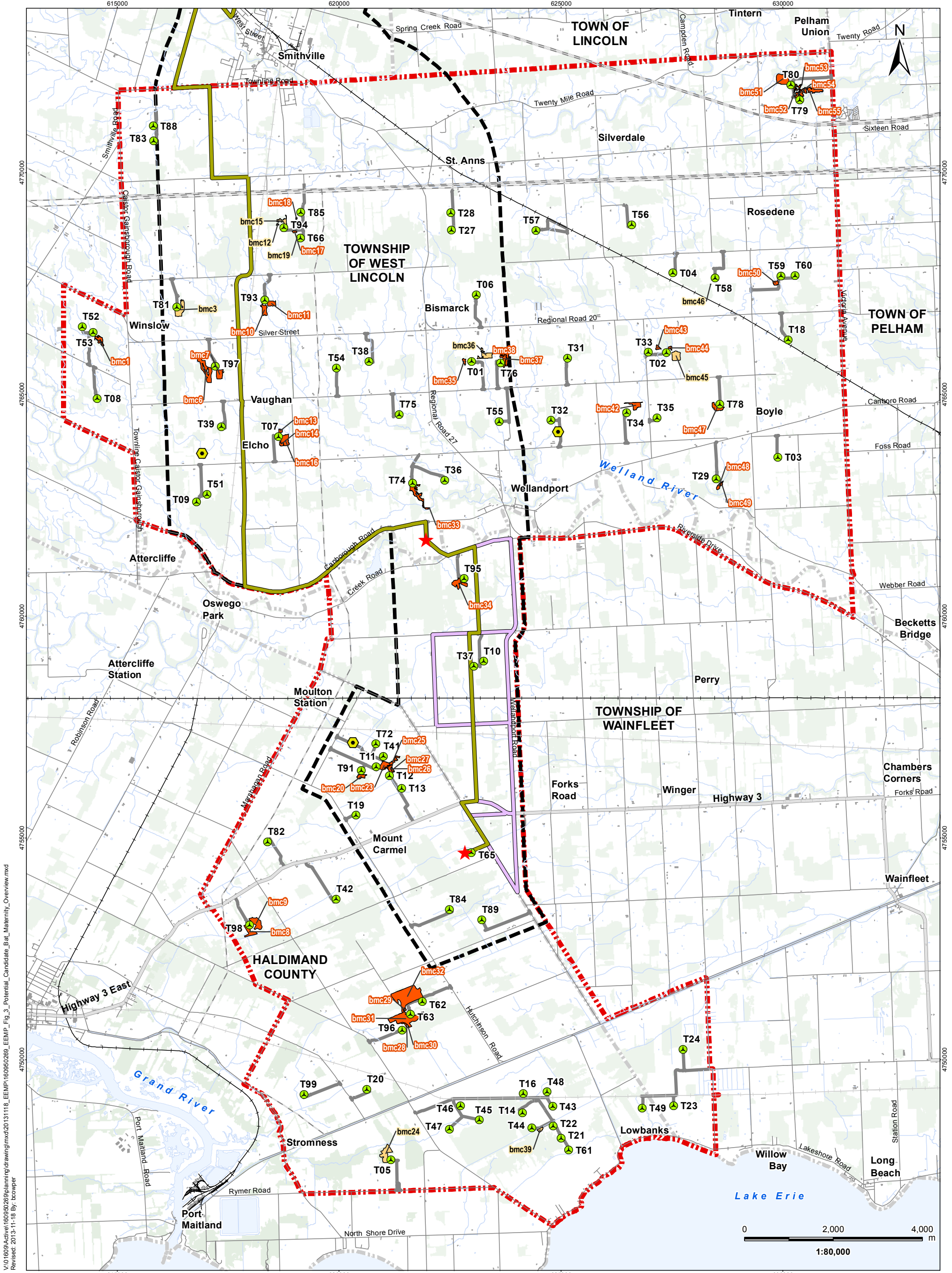
- Coordinate System: NAD 1983 UTM Zone 17N).
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
- Orthoimagery © First Base Solutions, 2010.



Client/Project
 Niagara Region Wind Corporation
 Natural Heritage Assessment Report

Figure No.
 2.2

Title
**Candidate Significant
 Migratory Landbird Stopover
 Area Transects**



V:\1609\Active\16095029\planning\drawing\mxd\20131118_EEMP_16095029_EEMP_Fig_3_Potential_Candidate_Bat_Maternity_Overview.mxd
 Reviset: 2013-11-18 By: bcooper



Legend

- | | | | |
|-----------------------------------|--|----------------------------|-------------------|
| Project Study Area | Interconnector Study Area | Proposed Turbine Location | Active Railway |
| Potential Access Road | Transformer Substation | Tap-in Location | Abandoned Railway |
| Preferred Transmission Line Route | Existing Met Tower | Existing Transmission Line | Watercourse |
| Alternate Transmission Route | Potential Candidate Significant Bat Maternity Colonies | Waterbody | Wooded Area |
| Road | Assumed Significant Bat Maternity Colonies (not surveyed due to access issues) | Municipality Lower Tier | |
| Expressway / Highway | | | |

Notes

- Coordinate System: NAD 1983 UTM Zone 17N
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

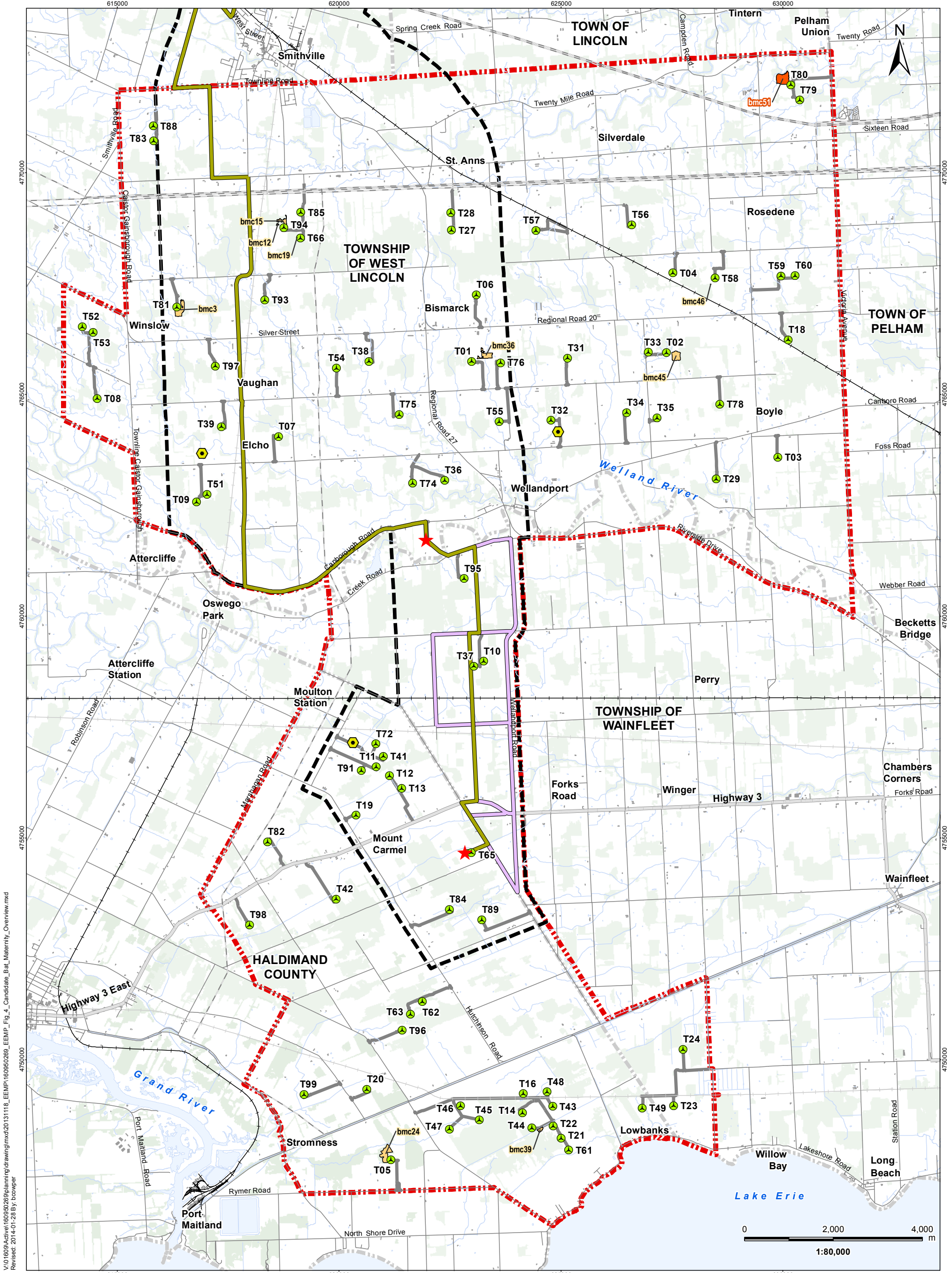
Client/Project
 Niagara Region Wind Corporation
 Niagara Region Wind Farm

November 2013
 160950269

Figure No.
 3

Title

Potential Candidate Significant Bat Maternity Colonies



V:\101609\Active\160950269\planning\drawing\mxd\20131118_EEMP\160950269_EEMP_Fig_4_Candidate_Bat_Maternity_Overview.mxd
 Revised: 2014-01-28 By: bczwper



Legend	
	Project Study Area
	Interconnector Study Area
	Proposed Turbine Location
	Potential Access Road
	Transformer Substation
	Tap-in Location
	Existing Met Tower
	Preferred Transmission Line Route
	Alternate Transmission Route
	Road
	Expressway / Highway
	Active Railway
	Abandoned Railway
	Existing Structures
	Existing Transmission Line
	Watercourse
	Waterbody
	Wooded Area
	Municipality Lower Tier
	Candidate Significant Bat Maternity Colonies
	Assumed Significant Bat Maternity Colonies (not surveyed due to access issues)

Notes

- Coordinate System: NAD 1983 UTM Zone 17N
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

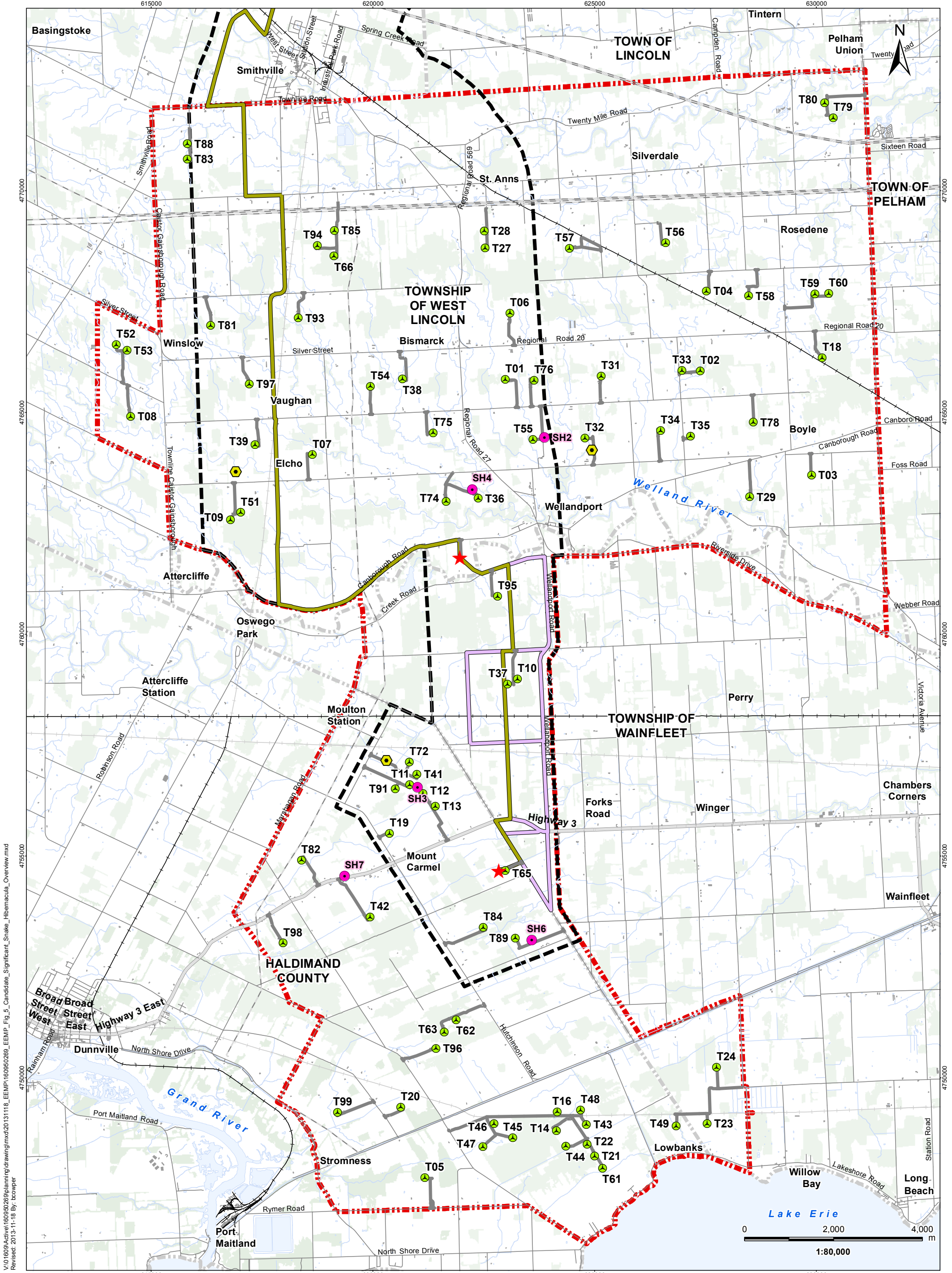
Client/Project
 Niagara Region Wind Corporation
 Niagara Region Wind Farm

Figure No.
 4

Title

Candidate Significant Bat Maternity Colonies

January 2014
 160950269



V:\101609\Active\160950269\planning\drawing\mxd\20131118_EEMP\160950269_EEMP_Fig_5_Candidate_Significant_Snake_Hibernacula_Overview.mxd
 Reviset: 2013-11-18 By: bcooper



Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Potential Access Road
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Preferred Transmission Line Route
- Alternate Transmission Route
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Wooded Area
- Municipality Lower Tier
- Candidate Significant Snake Hibernacula

Client/Project
 Niagara Region Wind Corporation
 Niagara Region Wind Farm

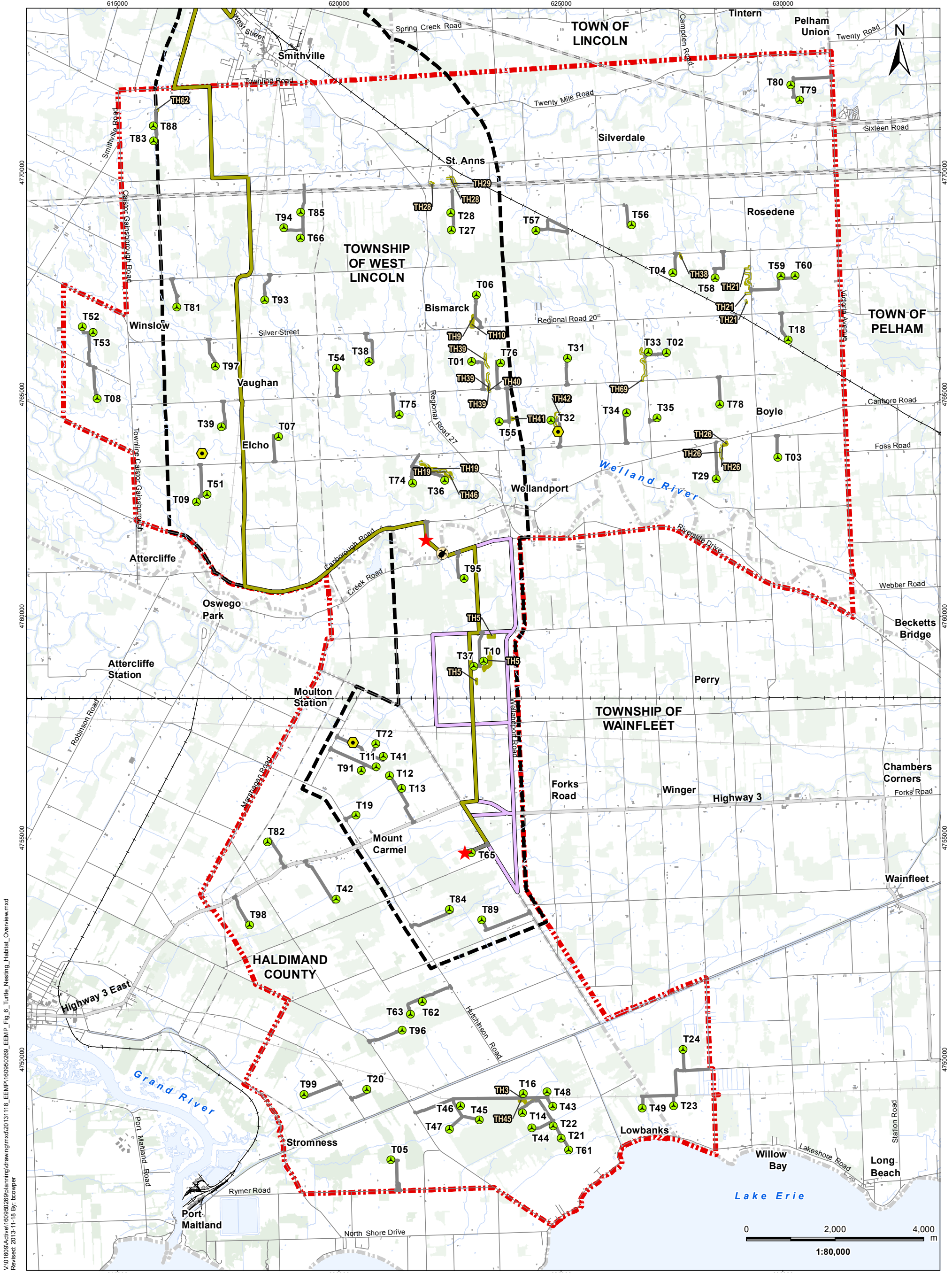
Figure No.
5

Candidate Significant Snake Hibernacula

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

November 2013
 160950269



V:\101609\Active\160950269\planning\drawing\mxd\20131118_EEMP\160950269_EEMP_Fig_6_Turtle_Nesting_Habitat_Overview.mxd
 Reviset: 2013-11-18 By: bcooper



Legend

- Project Study Area
- Interconnector Study Area
- Proposed Turbine Location
- Potential Access Road
- Transformer Substation
- Tap-in Location
- Existing Met Tower
- Preferred Transmission Line Route
- Alternate Transmission Route
- Road
- Expressway / Highway
- Active Railway
- Abandoned Railway
- Existing Structures
- Existing Transmission Line
- Watercourse
- Waterbody
- Wooded Area
- Municipality Lower Tier
- Potential Candidate Significant Turtle Nesting Habitat
- Candidate Significant Turtle Overwintering Habitat

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Client/Project
 Niagara Region Wind Corporation
 Niagara Region Wind Farm

Figure No.
 6

Title
Potential Candidate Significant Turtle Nesting Habitat and Candidate Significant Turtle Overwintering Habitat

November 2013
 160950269

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Appendix B Tables
July 23, 2014

Appendix B Tables

Table 1. Migratory Landbird Stopover Area Species List

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	AREA SENSITIVITY (ha)	Local Status PIF Priority Species (BCR 13)
AMPHIBIANS							
Spring Peeper	<i>Pseudacris crucifer</i>	S5	G5				
Wood Frog	<i>Lithobates sylvatica</i>	S5	G5				
BIRDS							
Canada Goose	<i>Branta canadensis</i>	S5	G5				
Killdeer	<i>Charadrius vociferus</i>	S5B, S5N	G5				
Mourning Dove	<i>Zenaida macroura</i>	S5	G5				
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	S4	G5				
Downy Woodpecker	<i>Picoides pubescens</i>	S5	G5				
Hairy Woodpecker	<i>Picoides villosus</i>	S5	G5			10	
Northern Flicker	<i>Colaptes auratus</i>	S4B	G5				X
Eastern Wood-Pewee	<i>Contopus virens</i>	S4B	G5		SC-NS		X
Least Flycatcher	<i>Empidonax minimus</i>	S4B	G5				
Red-eyed Vireo	<i>Vireo olivaceus</i>	S5B	G5				
Blue Jay	<i>Cyanocitta cristata</i>	S5	G5				
American Crow	<i>Corvus brachyrhynchos</i>	S5B	G5				
Black-capped Chickadee	<i>Poecile atricapillus</i>	S5	G5				
White-breasted Nuthatch	<i>Sitta carolinensis</i>	S5	G5			10	
Brown Creeper	<i>Certhia americana</i>	S5B	G5			30	
House Wren	<i>Troglodytes aedon</i>	S5B	G5				
Golden-crowned Kinglet	<i>Regulus satrapa</i>	S5B	G5			0	
Ruby-crowned Kinglet	<i>Regulus calendula</i>	S4B	G5				
Hermit Thrush	<i>Catharus guttatus</i>	S5B	G5			20-30	
Wood Thrush	<i>Hylocichla mustelina</i>	S4B	G5		THR-NS		X
American Robin	<i>Turdus migratorius</i>	S5B	G5				
Gray Catbird	<i>Dumetella carolinensis</i>	S4B	G5				
Cedar Waxwing	<i>Bombycilla cedrorum</i>	S5B	G5				
Black-and-white Warbler	<i>Mniotilta varia</i>	S5B	G5			100	
American Redstart	<i>Setophaga ruticilla</i>	S5B	G5			20-30	
Blackburnian Warbler	<i>Setophaga fusca</i>	S5B	G5			30-50	
Black-throated Blue Warbler	<i>Setophaga caerulescens</i>	S5B	G5			30-50	
Yellow-rumped Warbler	<i>Setophaga coronata</i>	S5B	G5				
Warbler species							
Song Sparrow	<i>Melospiza melodia</i>	S5B	G5				
White-throated Sparrow	<i>Zonotrichia albicollis</i>	S5B	G5			20	
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	S4B	G5				X
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	S5	G5				
American Goldfinch	<i>Carduelis tristis</i>	S5B	G5				
MAMMALS							
Grey Squirrel	<i>Sciurus carolinensis</i>	S5	G5				
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	S5	G5				
Raccoon	<i>Procyon lotor</i>	S5	G5				
White-tailed Deer	<i>Odocoileus virginianus</i>	S5	G5				

Table 1. Migratory Landbird Stopover Area Species List

SUMMARY

Total Amphibians: 2

Total Birds: 34

Total Mammals: 4

SIGNIFICANT SPECIES

Global: 0

National: 2

Provincial: 0

Explanation of Status and Acronymns

COSSARO: Committee on the Status of Species at Risk in Ontario

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

REGION: Rare in a Site Region

S1: Critically Imperiled—Critically imperiled in the province (often 5 or fewer occurrences)

S2: Imperiled—Imperiled in the province, very few populations (often 20 or fewer),

S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)

S4: Apparently Secure—Uncommon but not rare

S5: Secure—Common, widespread, and abundant in the province

SX: Presumed extirpated

SH: Possibly Extirpated (Historical)

SNR: Unranked

SU: Unrankable—Currently unrankable due to lack of information

SNA: Not applicable—A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

S#S#: Range Rank—A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species

S#B- Breeding status rank

S#N- Non Breeding status rank

?: Indicates uncertainty in the assigned rank

G1: Extremely rare globally; usually fewer than 5 occurrences in the overall range

G1G2: Extremely rare to very rare globally

G2: Very rare globally; usually between 5-10 occurrences in the overall range

G2G3: Very rare to uncommon globally

G3: Rare to uncommon globally; usually between 20-100 occurrences

G3G4: Rare to common globally

G4: Common globally; usually more than 100 occurrences in the overall range

G4G5: Common to very common globally

G5: Very common globally; demonstrably secure

GU: Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.

GNR: Unranked—Global rank not yet assessed.

T: Denotes that the rank applies to a subspecies or variety

Q: Denotes that the taxonomic status of the species, subspecies, or variety is **questionable**.

END: Endangered

THR: Threatened

SC: Special Concern

Table 1. Migratory Landbird Stopover Area Species List

2, 3 or NS after a COSEWIC ranking indicates the species is either on Schedule 2, Schedule 3 or No Schedule of the Species At Risk Act (SARA)

NAR: Not At Risk

IND: Indeterminant, insufficient information to assign status

DD: Data Deficient

Area: Minimum patch size for area-sensitive species (ha)

LATEST STATUS UPDATE

Birds: August 2013

S and G ranks and explanations: December 2011

NOTE

All rankings for birds refer to breeding birds unless the ranking is followed by N

REFERENCES

COSSARO Status

Endangered Species Act, 2007 (Bill 184). Species at Risk in Ontario List.

COSEWIC Status

COSEWIC. 2007. Canadian Species at Risk. Committee on the Status of Endangered Wildlife in Canada. \

Local Status

Ontario Partners in Flight. 2006. Ontario Landbird Conservation Plan: Lower Great Lakes/St. Lawrence Plain (North American Bird Conservation Region 13), Priorities, Objectives and Recommended Actions. Environment Canada and Ontario Ministry of Natural Resources. Draft, February 2006.

Area-sensitive information

Austen, M.J.W., M.D. Cadman, and R.D. James. 1994. Ontario birds at risk: status and conservation needs. Toronto and Port Rowan, ON: Federation of Ontario Naturalists and Long Point Bird Observatory. 165 pp.

Herkert, J.R. 1991. An ecological study of the breeding birds of grassland habitats within Illinois. Ph.D. dissertation. University of Illinois, Urbana, IL. 112 pp.

Robbins, C.S. 1979. Effect of forest fragmentation on bird populations. Pp. 198-212 in DeGraaf, R.M., and K.E. Evans, eds. Management of northcentral and northeastern forests for nongame birds. United States Department of Agriculture, Forest Service General Technical Report NC-51. 268 pp.

Sandilands, A. 2005. Birds of Ontario. Habitat Requirements, Limiting Factors and Status. UBC Press.

PRE-CONSTRUCTION MONITORING REPORT NIAGARA REGION WIND FARM

Appendix C Field Notes
July 23, 2014

Appendix C Field Notes



Stantec Consulting Ltd.
 1 – 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Project Number: 160950269

Project Name: NRWC

April 18, 2013	4:30	5:30	Natalie Leava
DATE	TIME (start)	TIME (end)	Field Personnel

Weather Conditions: <u>26°</u>	<u>2</u>	<u>50%</u>	<input checked="" type="checkbox"/>	<u>7-Storms</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

- Criteria for Cavity Tree Tally Inclusion:**
- Cavity tree is ≥ 25 cm DBH
 - Cavity is ≥ 10 m high in tree
 - Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 - Cavity tree is a Decay Class of 1 - 3 (see decay classification below)
- NOTE: All criteria must be met in order for cavity tree to be tallied*

Feature #: BMC-50 Feature Size (ha): 1ha No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees <i>(based on criteria above)</i>		Plot Center UTM (Zone: _____)	Comments
Plot 01	/	⊙	0629810 / 4767494	
Plot 02	/	⊙	0629832 / 4767525	
Plot 03	/	⊙	0629867 / 4767511	
Plot 04	/	⊙	0629883 / 4767509	
Plot 05	/	⊙	0629861 / 4767501	
Plot 06	•	⊙	0629863 / 4767496	
Plot 07	/	⊙	0629832 / 4767481	
Plot 08	/	⊙	0629837 / 4767494	
Plot 09	•	⊙	0629824 / 4767511	
Plot 10	/	⊙	0629814 / 4767518	
Plot 11			/	
Plot 12			/	
Plot 13			/	
Plot 14			/	
Plot 15			/	
Plot 16			/	
Plot 17			/	
Plot 18			/	
Plot 19			/	
Plot 20			/	
Plot 21			/	

Signature: Natalie Leava
 (Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____
 (Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 2 Density Calculation: (use formula provided²) 4 Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{\text{\# plots} \times 0.05 \text{ ha}}$

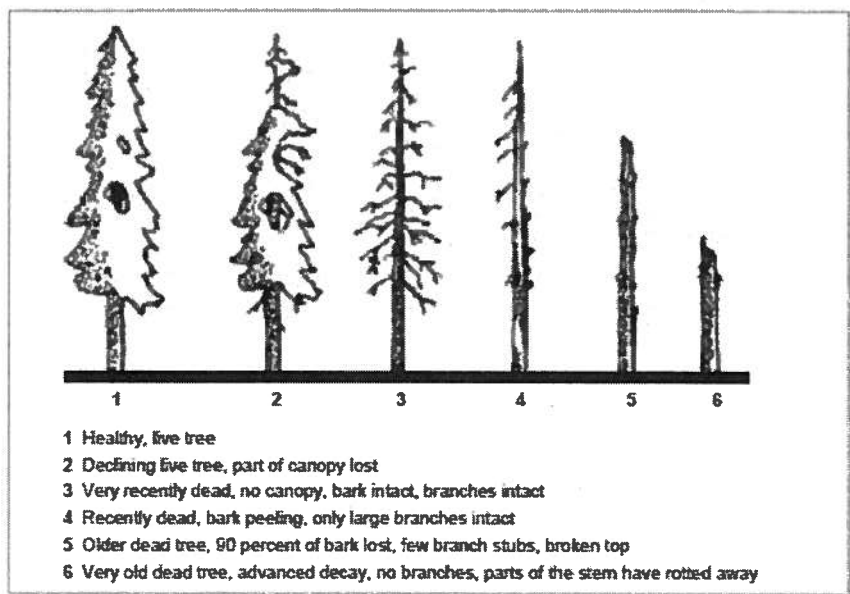


Figure : Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

Page 2 of 2
Signature: Nataheara
(Field Personnel)

Quality Control: This form is complete & legible .
Signature: _____
(Project Manager)



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Stantec

Project Number: 160950269

Project Name: NRWC

April 18, 2013	3:00	4:00	Natalie Leava
DATE	TIME (start)	TIME (end)	Field Personnel

Weather Conditions: <u>26°</u>	<u>2-3</u>	<u>75%</u>	<u>Ø</u>	<u>T-storms</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

Criteria for Cavity Tree Tally Inclusion: Cavity tree is ≥ 25 cm DBH

NOTE: All criteria must be met in Cavity is ≥ 10m high in tree

order for cavity tree to be tallied Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats

Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

Feature #: BMC 48/49 Feature Size (ha): 1.2 ha No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	/ Ø	0628555 / 4762807	
Plot 02	/ Ø	0628586 / 4762827	
Plot 03	/ Ø	0628573 / 4762835	
Plot 04	/ Ø	0628597 / 4762839	
Plot 05	• (1)	0628582 / 4762860	
Plot 06	•• (2)	0628574 / 4762875	
Plot 07	/ Ø	0628593 / 4762918	
Plot 08	• (1)	0628585 / 4762933	
Plot 09	/ Ø	0628605 / 4762932	
Plot 10	/ Ø	0628596 / 4762960	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Signature: _____

Natalie Leava
(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

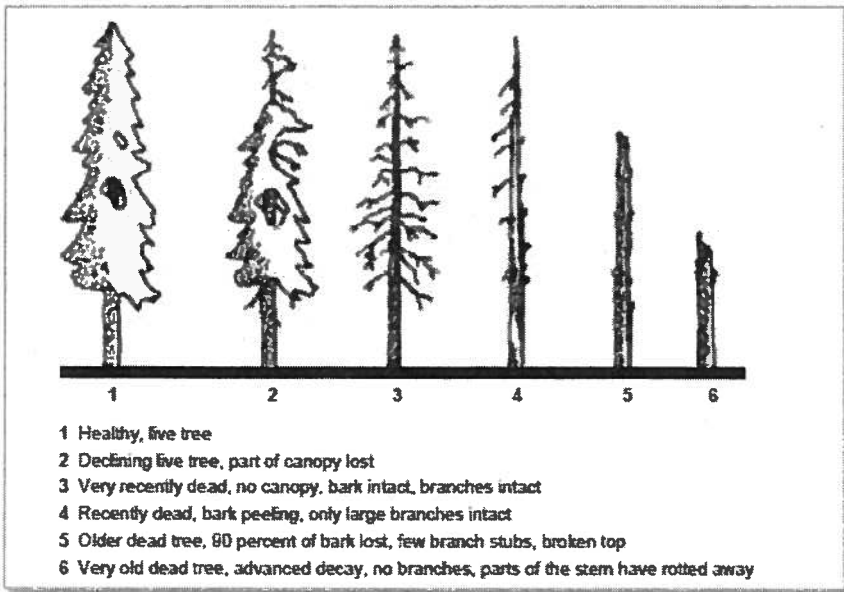
(Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 4 Density Calculation: (use formula provided²) 8 Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$



Note: this feature(s) was extended: FODS extended South, so some plots surveyed occurred in this portion of the feature

Figure : Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

Signature: _____

N. Stehman
(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Stantec

Project Number: 160950269

Project Name: NRWC

April 18, 2013	1:05pm	2:15pm	Natalie Leava
DATE	TIME (start)	TIME (end)	Field Personnel

Weather Conditions:	22°C	3	0%	Ø	T-storms
	TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

Criteria for Cavity Tree Daily Inclusion: Cavity tree is ≥ 25 cm DBH
NOTE: All criteria must be met in order for cavity tree to be tallied Cavity is ≥ 10m high in tree
 Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

Feature #: BMC-47 Feature Size (ha): 2.3 ha No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees <small>(based on criteria above)</small>	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	/ Ø	0628581 / 4764681	} portion of feature very wet w/ vernal pooling throughout
Plot 02	• ①	0628534 / 4764683	
Plot 03	• ①	0628567 / 4764667	
Plot 04	/ Ø	0628503 / 4764673	
Plot 05	• ①	0628476 / 4764673	
Plot 06	/ Ø	0628480 / 4764717	
Plot 07	/ Ø	0628457 / 4764726	
Plot 08	/ Ø	0628452 / 4764731	
Plot 09	/ Ø	0628442 / 4764736	
Plot 10	/ Ø	0628430 / 4764760	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Page 1 of 2
 Signature: Natalie Leava
 (Field Personnel)

Quality Control: This form is complete & legible
 Signature: _____
 (Project Manager)

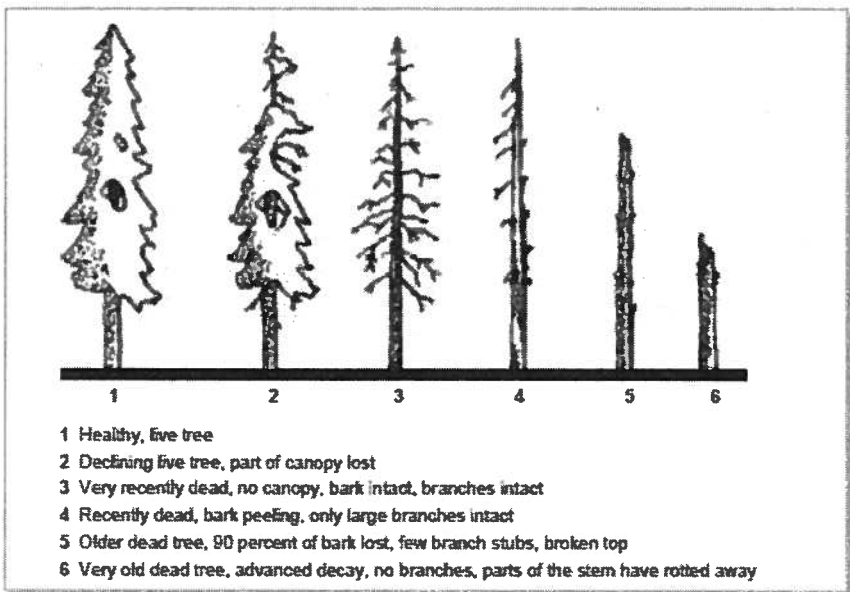
Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31			
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 3

Density Calculation: (use formula provided²) 6 Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots). Plots = 0.05 ha or 12.6m radius. Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$



Sticknest on north edge of woodlot 17T. 0628494, 4764726

Figure : Decay classification system for cavity trees (Watt and Caceres, 1999)
 NOTE: Decay classifications 4-6 should not be tallied in plots.

Signature: Nataheara
 (Field Personnel)

Signature: _____
 (Project Manager)



Stantec Consulting Ltd.
1 - 70 Southgate Drive
Guelph, ON
Canada N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Stantec

Project Number: 160950269

Project Name: NRWC

<u>April 18, 2013</u>	<u>11:40</u>	<u>12:35</u>	<u>Natalie Leaux</u>	
DATE	TIME (start)	TIME (end)	Field Personnel	
<u>22</u>	<u>3</u>	<u>75%</u>	<u>Ø</u>	<u>T-Storms</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

Weather Conditions:

Criteria for Cavity Tree Tally Inclusion: Cavity tree is ≥ 25 cm DBH

NOTE: All criteria must be met in Cavity is ≥ 10 m high in tree

order for cavity tree to be tallied

Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats

Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

Feature #: BMC-42 Feature Size (ha): 2.85ha No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	/	<u>Ø</u> 0626638 1476466	accuracy ~17m.
Plot 02	•	<u>1</u> 0626665 14764680	Forest has large amounts of regeneration in understory
Plot 03	/	<u>Ø</u> 0626697 14764702	accuracy 9m
Plot 04	•	<u>1</u> 0626655 14764676	↓
Plot 05	/	<u>Ø</u> 0626764 14764750	
Plot 06	/	<u>Ø</u> 0626768 14764787	
Plot 07	/	<u>Ø</u> 0626723 14764791	
Plot 08	•	<u>1</u> 0626708 14764774	
Plot 09	•	<u>1</u> 0626686 14764746	
Plot 10	/	<u>Ø</u> 0626648 14764736	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Page 1 of 2

Signature: Natalie Leaux

(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)

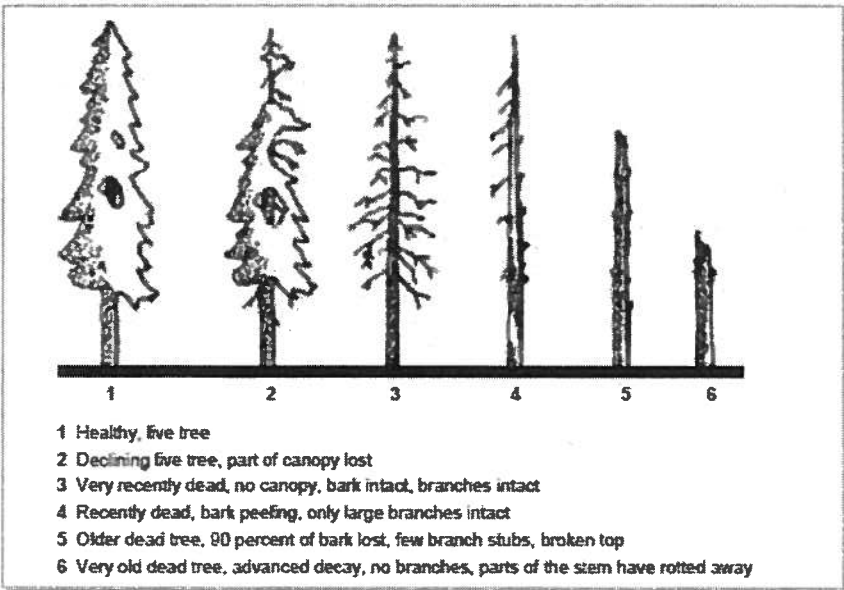
REV: 2013-03-13

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 4 Density Calculation: (use formula provided²) 8 Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$ 0.5



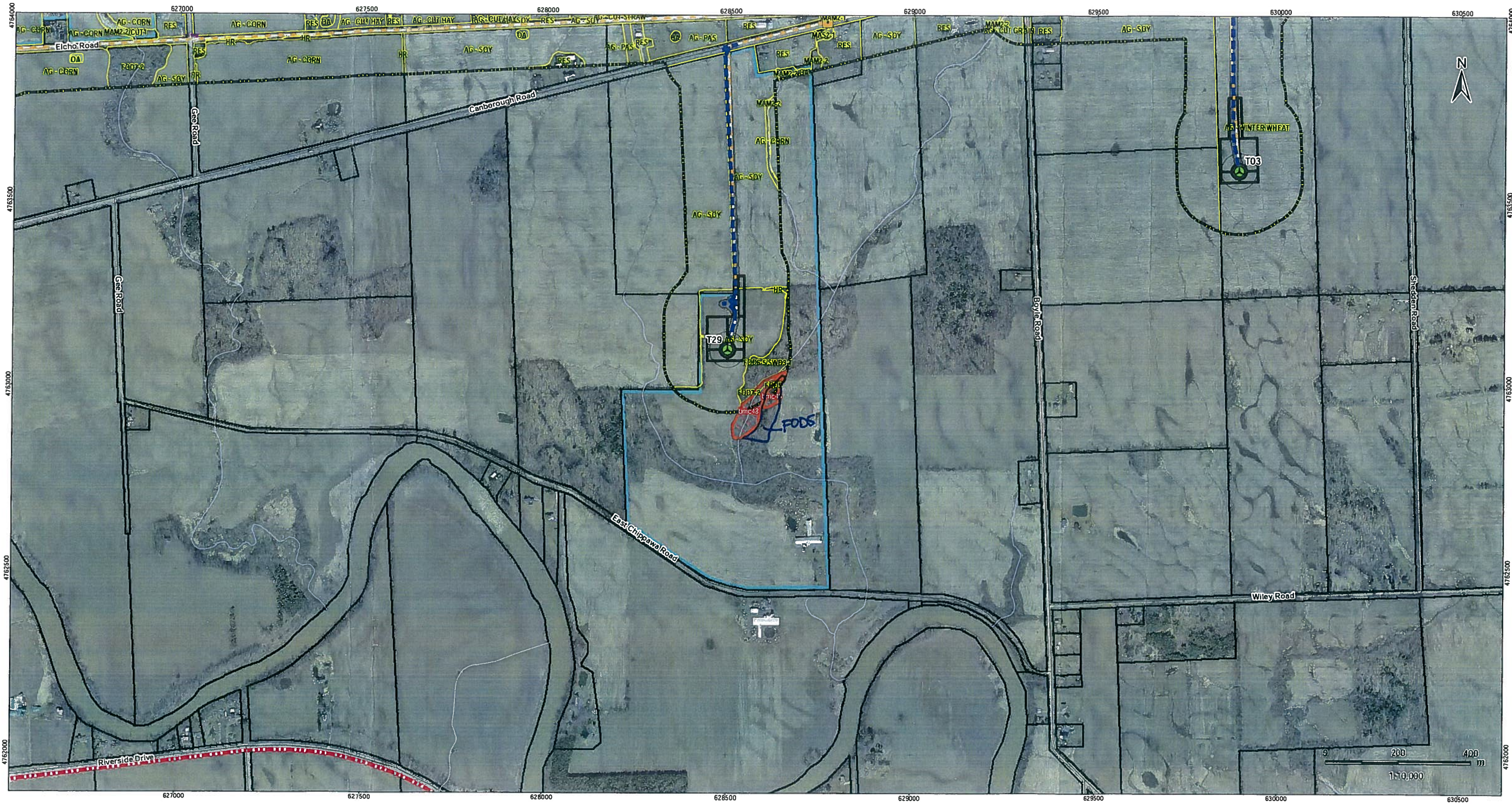
Inc
 -CHFR
 - Woodpecker sp.
 -RTHA
 -SPDE

Figure : Decay classification system for cavity trees (Watt and Caceres, 1999)
 NOTE: Decay classifications 4-6 should not be tallied in plots.

Page 2 of 2
 Signature: Nataheara
 (Field Personnel)

Quality Control: This form is complete & legible .
 Signature: _____
 (Project Manager)

V:\01609\active\160950269\planning\drawing\20130226_Bat_Field_Map\160950269_Figure_1_Bat_Field_Areas_Mapbook_20130319.mxd
 Revised: 2013-03-28 By: bcewper

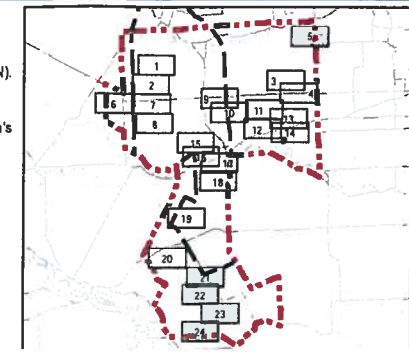


Legend

- | | | |
|----------------------------|---|-------------------------------|
| Project Study Area | Junction Box | Bat Maternity Colonies |
| Interconnector Study Area | Preferred Transmission Line Route | Accessible Bat Survey Areas |
| 120m Zone of Investigation | Alternate Transmission Route | Property Boundary (Survey) |
| ELC Boundary | Collector Lines - Underground or Overhead | Property Boundary (No Survey) |
| Proposed Turbine Location | Temporary Laydown Area | |
| Turbine Blade Length | Fibre Optic Line | |
| Tap-in Location | Potential Access Road | |
| | Potential Construction Laydown Area | |
| | Transformer Substation | |

Notes

- Coordinate System: NAD 1983 UTM Zone 17N).
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
- Orthoimagery source: First Base Solutions, Date Spring 2010.



Client/Project
 Niagara Region Wind Corporation
 Natural Heritage Assessment Report

Figure No.
 1.41

Title
 Bat Surveys
 bmc 48

March, 2013
 160950269



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Stantec

Project Number: 60950269

Project Name: NRW C

<u>23 Apr 13</u>	<u>1:15 pm</u>	<u>2:40 pm</u>	<u>NL/MC</u>
DATE	TIME (start)	TIME (end)	Field Personnel

Weather Conditions: <u>16°C</u>	<u>1</u>	<u>50%</u>	<u>Ø</u>	<u>Ø</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

- Criteria for Cavity Tree Tally Inclusion:**
- Cavity tree is ≥ 25 cm DBH
 - Cavity is ≥ 10m high in tree
 - Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 - Cavity tree is a Decay Class of 1 - 3 (see decay classification below)
- NOTE: All criteria must be met in order for cavity tree to be tallied*
- beautiful forest*

Feature #: BMC51 Feature Size (ha): 6.45 No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17N</u>)	Comments
Plot 01	<u>1</u> <u>Ø</u>	<u>0630000 / 4772154</u>	<u>lots of shagbark hickory in plot</u>
Plot 02	<u>••</u> <u>(2)</u>	<u>0630070 / 4772180</u>	
Plot 03	<u>•</u> <u>(1)</u>	<u>0629973 / 4772225</u>	
Plot 04	<u>•</u> <u>(1)</u>	<u>0629895 / 4772231</u>	
Plot 05	<u>••</u> <u>(4)</u>	<u>0629854 / 4772214</u>	
Plot 06	<u>/</u> <u>Ø</u>	<u>0629910 / 4772121</u>	
Plot 07	<u>•</u> <u>(1)</u>	<u>0629915 / 4772112</u>	
Plot 08	<u>••</u> <u>(3)</u>	<u>0629953 / 4772039</u>	
Plot 09	<u>/</u> <u>Ø</u>	<u>0630002 / 4772069</u>	
Plot 10	<u>•</u> <u>(1)</u>	<u>0630099 / 4772056</u>	
Plot 11		<u>/</u>	
Plot 12		<u>/</u>	
Plot 13		<u>/</u>	
Plot 14		<u>/</u>	
Plot 15		<u>/</u>	
Plot 16		<u>/</u>	
Plot 17		<u>/</u>	
Plot 18		<u>/</u>	
Plot 19		<u>/</u>	
Plot 20		<u>/</u>	
Plot 21		<u>/</u>	

spring beauty

Signature: Nataheara
 (Field Personnel)

Quality Control: This form is complete & legible .
 Signature: _____
 (Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No.
Cavity Trees: 13

Density Calculation:
(use formula provided²)

26

Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$

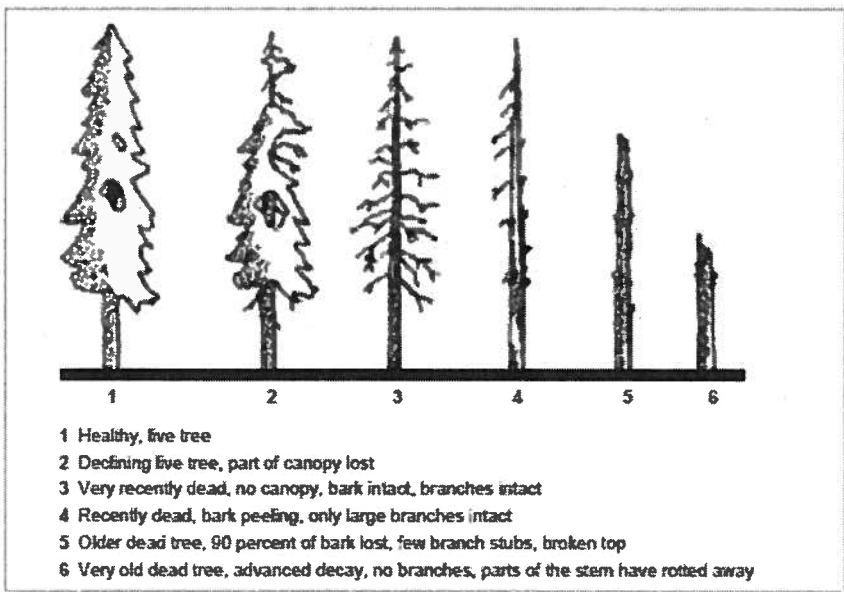


Figure : Decay classification system for cavity trees (Watt and Caceres, 1999)
 NOTE: Decay classifications 4-6 should not be tallied in plots.



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Stantec

Project Number:

160950269

Project Name:

NRWC

<u>Apr 23, 2013</u>	<u>2:45</u>	<u>4:00</u>	<u>N. Leana E.M. Cameron</u>	
DATE	TIME (start)	TIME (end)	Field Personnel	
<u>20°</u>	<u>1</u>	<u>50%</u>	<u>Ø</u>	<u>Ø</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

Weather Conditions:

Criteria for Cavity Tree Tally Inclusion: Cavity tree is ≥ 25 cm DBH

NOTE: All criteria must be met in Cavity is ≥ 10 m high in tree

order for cavity tree to be tallied Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats

Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

Feature #:

BMC52-55

Feature Size (ha):

6.4

No. of Plots to Survey¹:

10

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	/ Ø	0630291 1 4771991	- Accuracy of 8m
Plot 02	/ Ø	0630331 1 4771933	- Combined BMC 52-55;
Plot 03	/ Ø	0630350 1 4771947	upland community
Plot 04	• ①	0630364 1 4771860	worked with SWD community.
Plot 05	• ①	0630416 1 4771827	FOD communities NOT as
Plot 06	/ Ø	0630421 1 4771807	fragmented as depicted on
Plot 07	/ Ø	0630398 1 4771805	map (ELC)
Plot 08	• ①	0630508 1 4771839	
Plot 09	/ Ø	0630556 1 4771853	
Plot 10	/ Ø	0630669 1 4771861	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Nataheera
 (Field Personnel)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31			
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 3

Density Calculation: (use formula provided²) 6 Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots). Plots = 0.05 ha or 12.6m radius. Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{\text{\# plots} \times 0.05 \text{ ha}}$

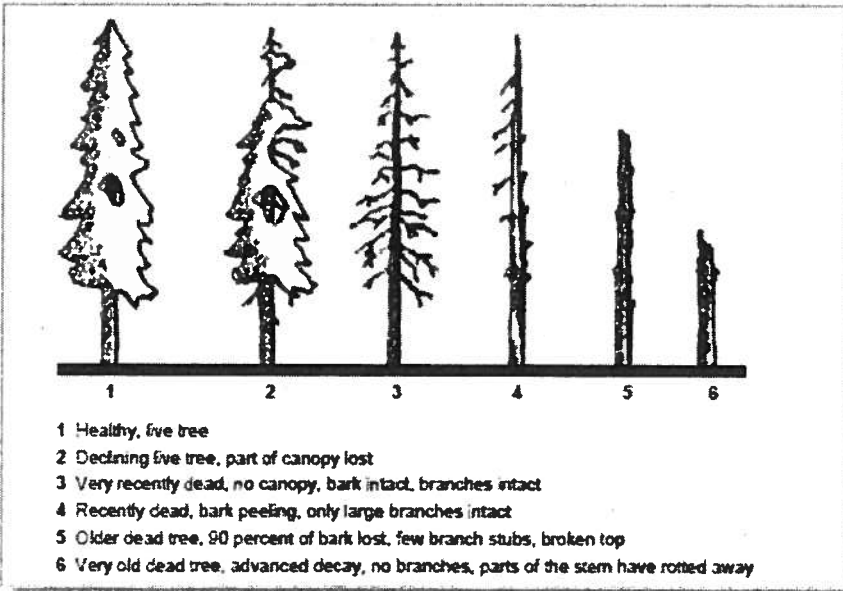
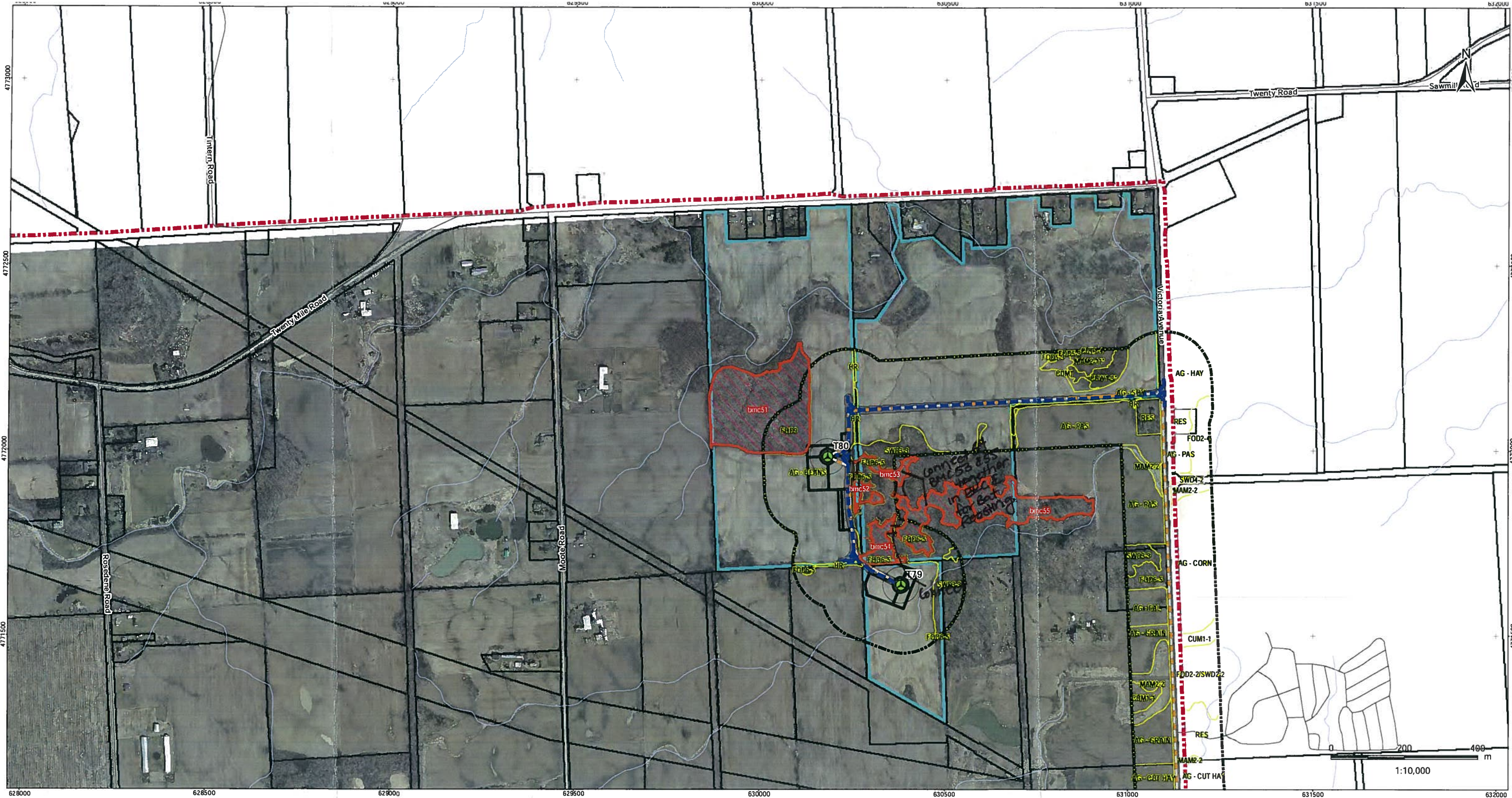


Figure : Decay classification system for cavity trees (Watt and Caceres, 1999)
 NOTE: Decay classifications 4-6 should not be tallied in plots.

V:\160950269\planning\drawing\mxd\20130226_Bat_Field_Map\160950269_Figure_1_Bat_Field_Areas_Mapbook_20130319.mxd
 Revised: 2013-03-28 By: bcowper



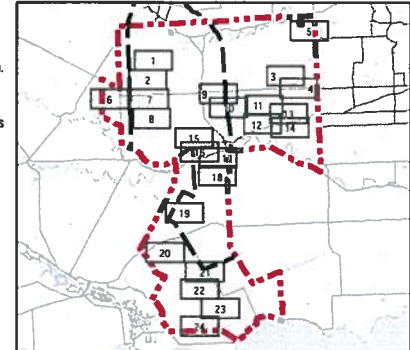
Legend

- | | | |
|----------------------------|---|-------------------------------|
| Project Study Area | Junction Box | Bat Maternity Colonies |
| Interconnector Study Area | Preferred Transmission Line Route | Accessible Bat Survey Areas |
| 120m Zone of Investigation | Alternate Transmission Route | Property Boundary (Survey) |
| ELC Boundary | Collector Lines - Underground or Overhead | Property Boundary (No Survey) |
| Proposed Turbine Location | Temporary Laydown Area | |
| Turbine Blade Length | Fibre Optic Line | |
| Tap-in Location | Potential Access Road | |
| | Potential Construction Laydown Area | |
| | Transformer Substation | |

BUTT? (bmc51)
 17T 0630003, 4772082

Notes

- Coordinate System: NAD 1983 UTM Zone 17N).
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
- Orthimagery source: First Base Solutions, Date Spring 2010.



Client/Project
 Niagara Region Wind Corporation
 Natural Heritage Assessment Report

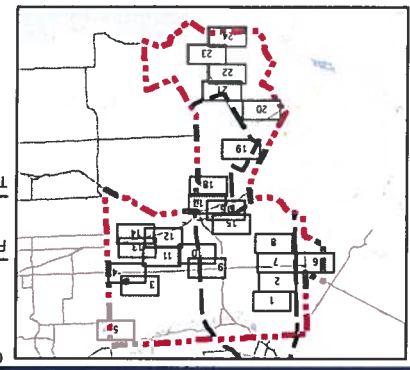
Figure No.
 1.44

Title
 Bat Surveys
 bmc 51

Legend

- Project Study Area
- Interconnector Study Area
- 120m Zone of Investigation
- Proposed Turbine Location
- Turbine Blade Length
- Tap-in Location
- Potential Access Road
- Fibre Optic Line
- Temporary Laydown Area
- Collector Lines - Underground or Overhead
- Alternate Transmission Route
- Preferred Transmission Line Route
- Junction Box
- Bat Maternity Colonies
- Accessible Bat Survey Areas
- Property Boundary (Survey)
- Property Boundary (No Survey)
- Potential Construction Laydown Area
- Transformer Substation

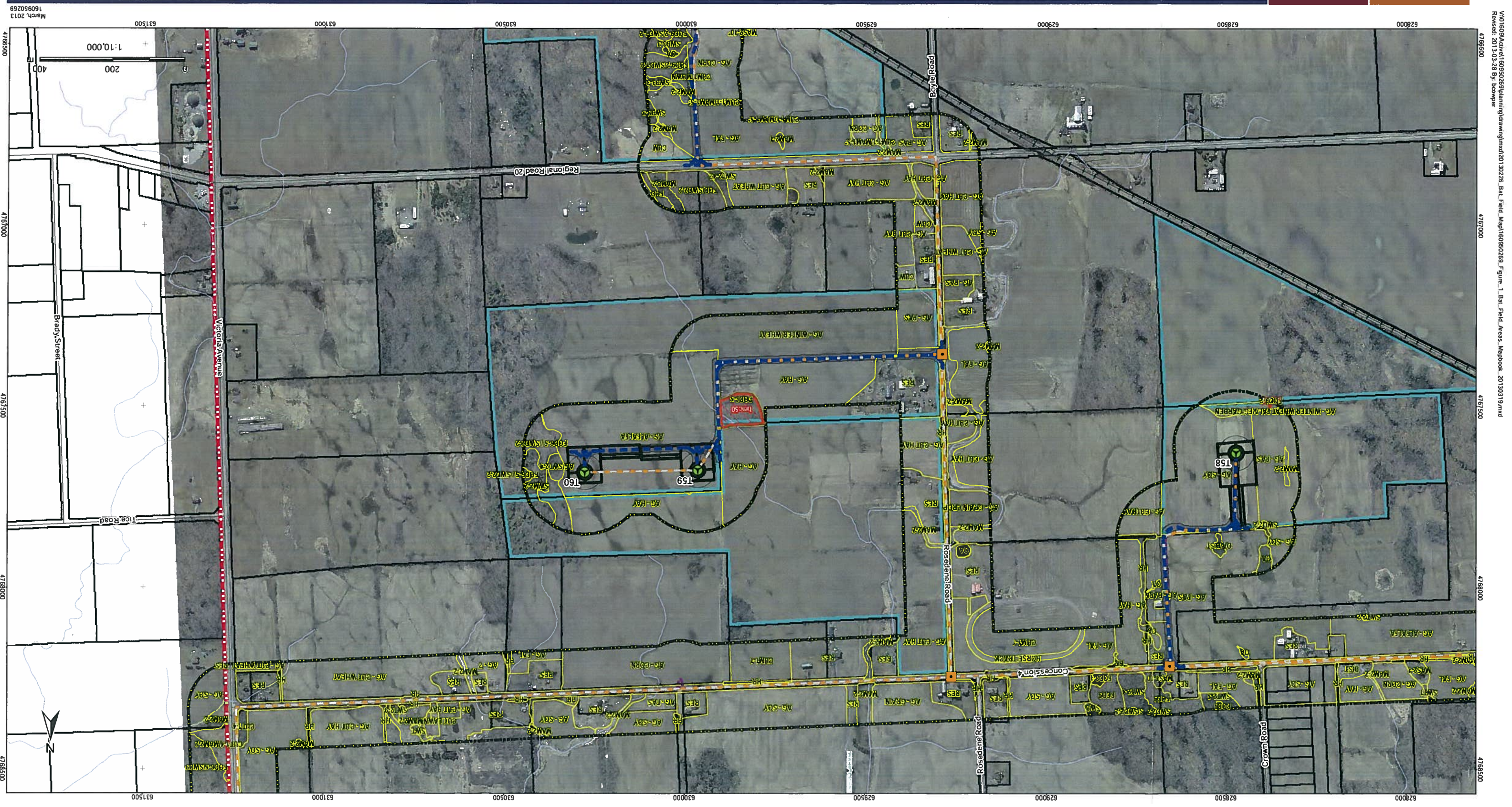
- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N.
 2. Base features produced under license with the Ontario Ministry of Natural Resources @ Queen's Printer for Ontario, 2011.
 3. Orthomography source: First Base Solutions, Date Spring 2010.



Niagara Region Wind Corporation
Natural Heritage Assessment Report

Figure No. 1.43

Bat Surveys
bmc 50



Client/Project
March, 2013
160950269

V:\10160950269\160950269\planning\Drawings\mxd\20130226_Bat_Field_Map\160950269_Figure_1_Bat_Field_Areas_Mapbook_20130319.mxd
Revised: 2013-03-28 By: boomper

4785500



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Stantec

**Bat Maternity Roost -
 Cavity Tree Density Plots
 Data Form**

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Project Number: Niagara Wind Farm ↔ Project Name: 160950269

<u>Apr 14/2013</u>	<u>10:45am</u>	<u>11:45am</u>	<u>J. Ball</u>	
DATE	TIME (start)	TIME (end)	Field Personnel	
<u>7°C</u>	<u>2</u>	<u>50%</u>	<u>NONE</u>	<u>RAIN</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

Weather Conditions:

- Criteria for Cavity Tree Tally Inclusion:** Cavity tree is ≥ 25 cm DBH
 NOTE: All criteria must be met in order for cavity tree to be tallied Cavity is ≥ 10m high in tree
 Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

Feature #: 1 Feature Size (ha): 1.95 No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	0	0614663 ' 4766132	
Plot 02	0	0614708 ' 4766137	
Plot 03	0	0614741 ' 4766195	
Plot 04	0	0614715 ' 4766168	
Plot 05	0	0614667 ' 4766149	
Plot 06	0	0614642 ' 4766188	
Plot 07	0	0614630 ' 4766242	
Plot 08	0	0614638 ' 4766331	
Plot 09	0	0614658 ' 4766406	
Plot 10	0	0614686 ' 4766465	
Plot 11	0	/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Page 1 of 2
 Signature: Jane Ball
 (Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____
 (Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: ____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31			
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 0

Density Calculation: (use formula provided²) 0 Trees/ha

¹No. of Plots: Sites ≤ 10 ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{\text{\# plots} \times 0.05 \text{ ha}}$

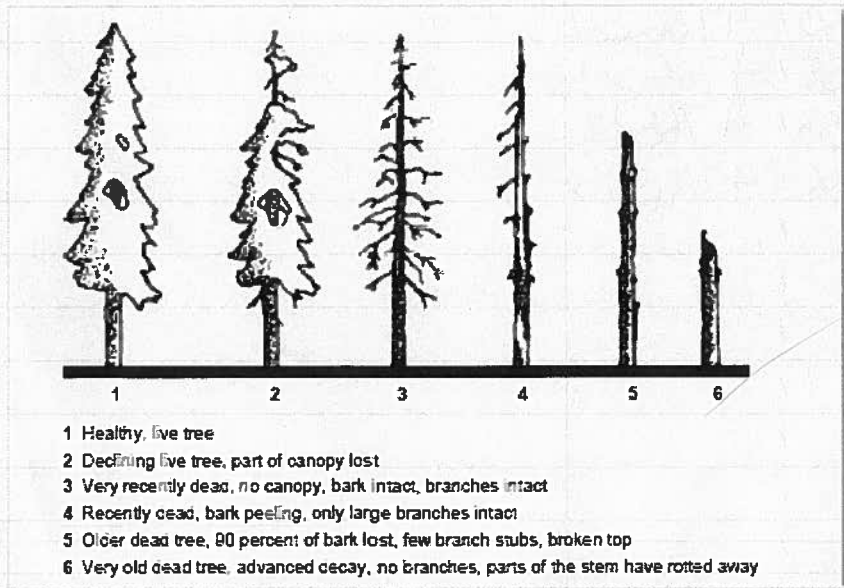


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

Several chorus frogs calling in each waterbody within the woodlot
1 wood frog heard
1 woodcock observed
logging occurred in the past as evidenced by several large stumps throughout



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Stantec

Project Number: 1609 50269

Project Name: Niagara Wind Farm

Apr 14/2013	12:00 pm	12:40 pm	J. Ball
DATE	TIME (start)	TIME (end)	Field Personnel
7°C	1	80%	NONE RAIN
TEMP (°C)	WIND	CLOUD	PPT (in last 24 hrs)

Weather Conditions:

- Criteria for Cavity Tree Tally Inclusion:**
- Cavity tree is ≥ 25 cm DBH
 - Cavity is ≥ 10m high in tree
 - Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 - Cavity tree is a Decay Class of 1 - 3 (see decay classification below)
- NOTE: All criteria must be met in order for cavity tree to be tallied*

Feature #: 6 Feature Size (ha): 6.7 No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	0	0616943' 4765702	
Plot 02	0	0616952' 4765648	
Plot 03	0	0616985' 4765592	
Plot 04	0	0617012' 4765569	
Plot 05	0	0617000' 4765551	
Plot 06	0	0616991' 4765502	
Plot 07	0	0617060' 4765489	
Plot 08	0	0617041' 4765434	
Plot 09	0	0617080' 4765459	
Plot 10	0	0617080' 4765525	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Page 1 of 2
 Signature: Jane Ball
 (Field Personnel)

Quality Control: This form is complete & legible
 Signature: _____
 (Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31			
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

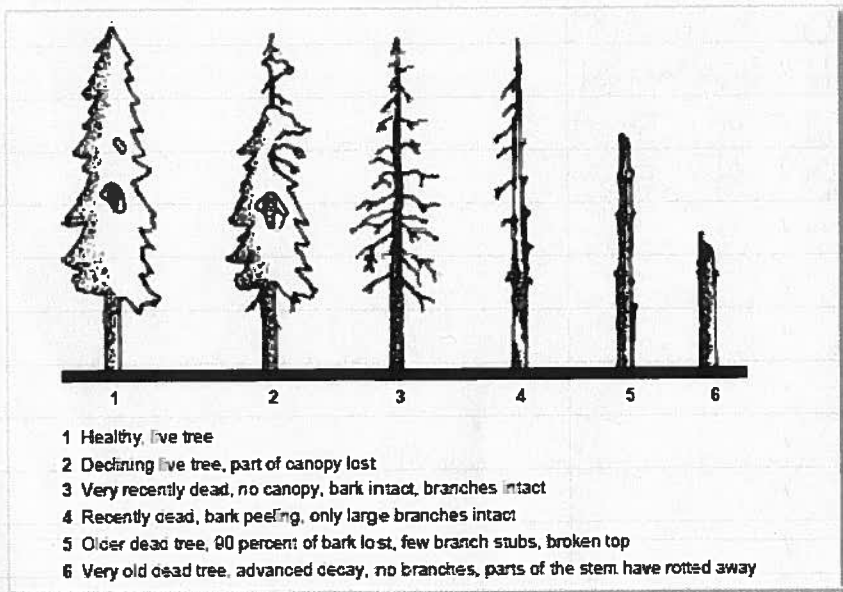
TOTAL No. Cavity Trees: 0

Density Calculation:
(use formula provided²)

Trees/ha

¹No. of Plots: Sites ≤ 10 ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$



1 wood frog,
several chorus frogs
calling

Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

Joe Ball
(Field Personnel)



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Stantec

Project Number: 160950269

Project Name: Niagara Wind Farm

DATE	TIME (start)	TIME (end)	Field Personnel	
<u>Apr 14/2013</u>	<u>12:45</u>	<u>1:30</u>	<u>J. Ball</u>	
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)
<u>7°C</u>	<u>1</u>	<u>80%</u>	<u>NONE</u>	<u>RAIN</u>

Weather Conditions:

- Criteria for Cavity Tree Tally Inclusion:**
- Cavity tree is ≥ 25 cm DBH
 - NOTE: All criteria must be met in order for cavity tree to be tallied* Cavity is ≥ 10m high in tree
 - Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 - Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

Feature #: 7 Feature Size (ha): 2.8 No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees <i>(based on criteria above)</i>	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	0	061725414765522	
Plot 02	0	061725914765472	
Plot 03	0	061726814765443	
Plot 04	0	061726414765388	
Plot 05	0	061729014765377	
Plot 06	0	061734714765410	
Plot 07	0	061734514765466	
Plot 08	0	061735014765502	
Plot 09	0	061737114765538	
Plot 10	0	061733414765539	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Page 1 of 2
 Signature: _____
 (Field Personnel)

James Ball

Quality Control: This form is complete & legible
 Signature: _____
 (Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 0

Density Calculation: (use formula provided²) 0 Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots). Plots = 0.05 ha or 12.6m radius. Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$

Full chorus of chorus frogs in nernal pool (extensive) w red-osier dogwood
2 wood frogs heard
EAPH, HETH observed.
EAME observed singing in AG field.

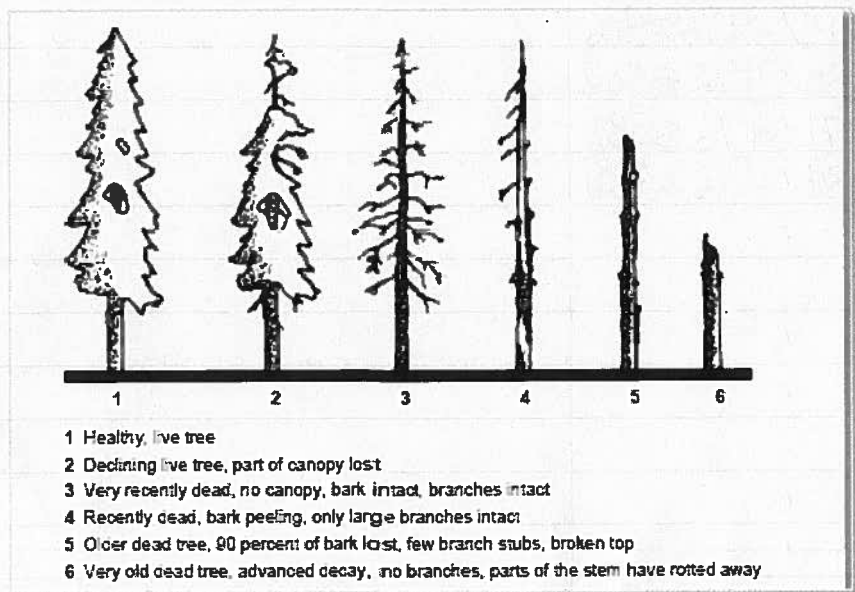


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

Page 2 of 2
Signature: Jaimie Ball
(Field Personnel)

Quality Control: This form is complete & legible
Signature: _____
(Project Manager)
REV: 2013-03-13



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Stantec

Project Number: 160950269

Project Name: Niagara Wind Farm

<u>Apr 14/2013</u>	<u>2:00 PM</u>	<u>2:30 PM</u>	<u>J. Ball</u>
DATE	TIME (start)	TIME (end)	Field Personnel
<u>9</u>	<u>1</u>	<u>90%</u>	<u>NONE</u> <u>RAIN</u>
TEMP (°C)	WIND	CLOUD	PPT PPT (in last 24 hrs)

Weather Conditions:

- Criteria for Cavity Tree Tally Inclusion:**
- Cavity tree is ≥ 25 cm DBH
 - Cavity is ≥ 10 m high in tree
 - Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 - Cavity tree is a Decay Class of 1 - 3 (see decay classification below)
- NOTE: All criteria must be met in order for cavity tree to be tallied*

Feature #: 11 Feature Size (ha): 2.1 No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees <i>(based on criteria above)</i>	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	0	0618498 14767085	
Plot 02	0	0618525 14767062	
Plot 03	0	0618531 14767054	
Plot 04	0	0618512 14767029	
Plot 05	0	0618475 14767024	
Plot 06	0	0618456 14767053	
Plot 07	0	0618425 14767057	
Plot 08	0	0618419 14767043	
Plot 09	0	0618441 14767027	
Plot 10	0	0618478 14767014	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Page 1 of 2
 Signature: James Ball
 (Field Personnel)

Quality Control: This form is complete & legible
 Signature: _____
 (Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: ____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 0

Density Calculation:
(use formula provided²)

0

Trees/ha

¹No. of Plots: Sites ≤ 10 ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$

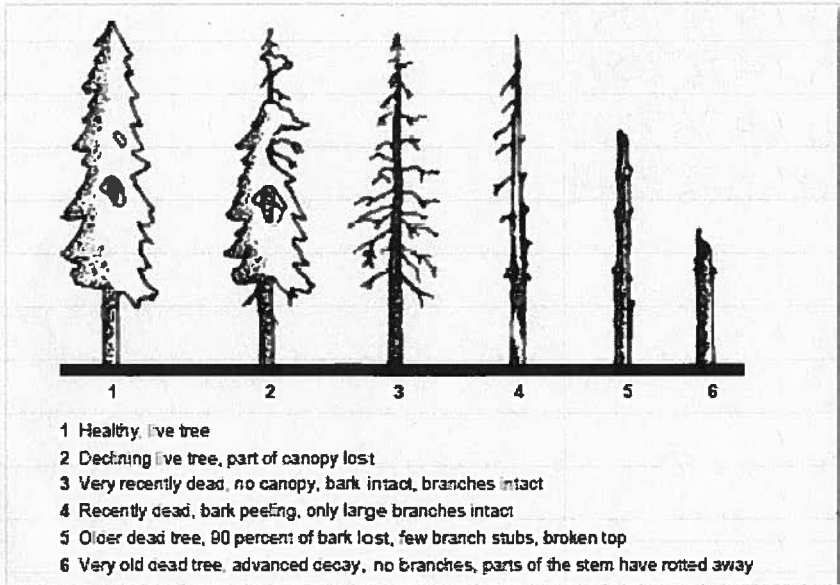


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

2 chorus frogs
chirping from marsh
inclusion
- Large stick nest
- pair of RTNA observed
(possibly using it?)
- male was calling



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Stantec

Project Number: 160950269

Project Name: Niagara Wind Farm

<u>Apr 14/2013</u>	<u>2:40 pm</u>	<u>2:50</u>	<u>J. Ball</u>	
DATE	TIME (start)	TIME (end)	Field Personnel	
<u>9</u>	<u>1</u>	<u>90%</u>	<u>NONE</u>	<u>Rain</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

Weather Conditions:

- Criteria for Cavity Tree Tally Inclusion:**
- Cavity tree is ≥ 25 cm DBH
 - Cavity is ≥ 10 m high in tree
 - Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 - Cavity tree is a Decay Class of 1 - 3 (see decay classification below)
- NOTE: All criteria must be met in order for cavity tree to be tallied*

Feature #: 10 Feature Size (ha): 2.5 No. of Plots to Survey¹: entire area only 0.226 ha accessible

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01		/	no cavities found
Plot 02		/	within the entire
Plot 03		/	area searched
Plot 04		/	
Plot 05		/	
Plot 06		/	
Plot 07		/	
Plot 08		/	
Plot 09		/	
Plot 10		/	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Page 1 of 2

Signature: Jane Ball

(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)

REV: 2013-03-13

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 0 Density Calculation: (use formula provided²) 0 Trees/ha

¹No. of Plots: Sites ≤ 10 ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots). Plots = 0.05 ha or 12.6m radius. Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$

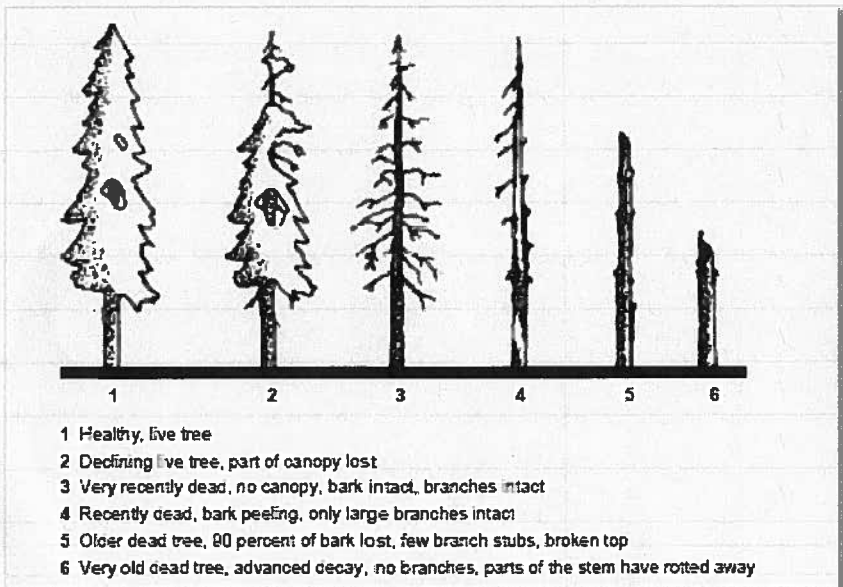


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

chorus frog singing in wetland at the western edge of the feature.

Signature: [Handwritten Signature]
(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____
(Project Manager)



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Stantec

**Bat Maternity Roost -
 Cavity Tree Density Plots
 Data Form**

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Project Number: 160950269

Project Name: Niagara Wind Farm

<u>April 14 / 2013</u>	<u>4:15pm</u>	<u>5:15pm</u>	<u>J. Ball</u>
DATE	TIME (start)	TIME (end)	Field Personnel

<u>9</u>	<u>2</u>	<u>50%</u>	<u>NONE</u>	<u>Rain</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

- Criteria for Cavity Tree Tally Inclusion:**
- Cavity tree is ≥ 25 cm DBH
 - Cavity is ≥ 10m high in tree
 - Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 - Cavity tree is a Decay Class of 1 - 3 (see decay classification below)
- NOTE: All criteria must be met in order for cavity tree to be tallied*

Feature #: 33 Feature Size (ha): 4.7 No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	<u>1</u>	<u>0621810 14762955</u>	
Plot 02	<u>0</u>	<u>0621697 14762936</u>	
Plot 03	<u>0</u>	<u>0621686 14762892</u>	
Plot 04	<u>0</u>	<u>0621679 14762840</u>	
Plot 05	<u>0</u>	<u>0621704 14762812</u>	
Plot 06	<u>0</u>	<u>0621726 14762765</u>	
Plot 07	<u>0</u>	<u>0621771 14762718</u>	
Plot 08	<u>0</u>	<u>0621831 14762658</u>	
Plot 09	<u>0</u>	<u>0621873 14762631</u>	
Plot 10	<u>0</u>	<u>0621889 14762613</u>	
Plot 11	<u>/</u>	<u>/</u>	
Plot 12	<u>/</u>	<u>/</u>	
Plot 13	<u>/</u>	<u>/</u>	
Plot 14	<u>/</u>	<u>/</u>	
Plot 15	<u>/</u>	<u>/</u>	
Plot 16	<u>/</u>	<u>/</u>	
Plot 17	<u>/</u>	<u>/</u>	
Plot 18	<u>/</u>	<u>/</u>	
Plot 19	<u>/</u>	<u>/</u>	
Plot 20	<u>/</u>	<u>/</u>	
Plot 21	<u>/</u>	<u>/</u>	

Page 1 of 2
 Signature: Jane Ball
 (Field Personnel)

Quality Control: This form is complete & legible
 Signature: _____
 (Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: ____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: _____

Density Calculation:
(use formula provided²)

2 Trees/ha

No. of Plots: Sites ≤ 10 ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

$$^2\text{Total Cavity Tree Density} = \frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$$

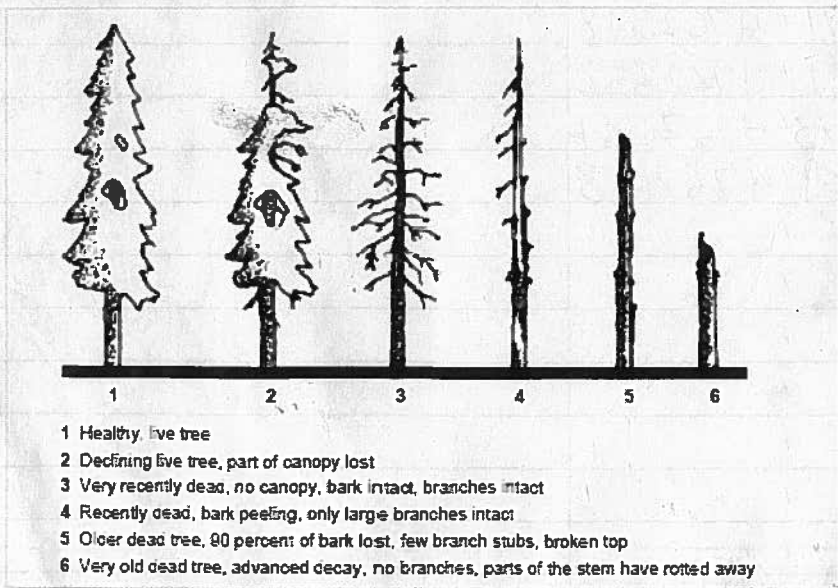


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

snake observed
photos taken
17T 0621693/4762822
no apparent hibernacula
nearby
wood frog calling



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)



Project Number: 160950269

Project Name: Niagara Wind Farm

April 18/2013	9:50	10:50	J. Ball
DATE	TIME (start)	TIME (end)	Field Personnel

Weather Conditions:	14	2	90%	NONE	NONE
	TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

- Criteria for Cavity Tree Tally Inclusion:**
- Cavity tree is ≥ 25 cm DBH
 - NOTE: All criteria must be met in order for cavity tree to be tallied*
 - Cavity is ≥ 10 m high in tree
 - Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 - Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

Feature #: 34 Feature Size (ha): 1.5 No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees <i>(based on criteria above)</i>	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	0	0622863 14760704	
Plot 02	0	0622818 14760696	
Plot 03	0	0622823 14760645	
Plot 04	0	0622825 14760605	
Plot 05	0	0622790 14760615	
Plot 06	0	0622764 14760637	
Plot 07	0	0622754 14760682	garter snake observed
Plot 08	0	0622794 14760715	
Plot 09	0	0622724 14760766	
Plot 10	0	0622707 14760814	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Page 1 of 2
 Signature: Jane Ball
 (Field Personnel)

Quality Control: This form is complete & legible
 Signature: _____
 (Project Manager)

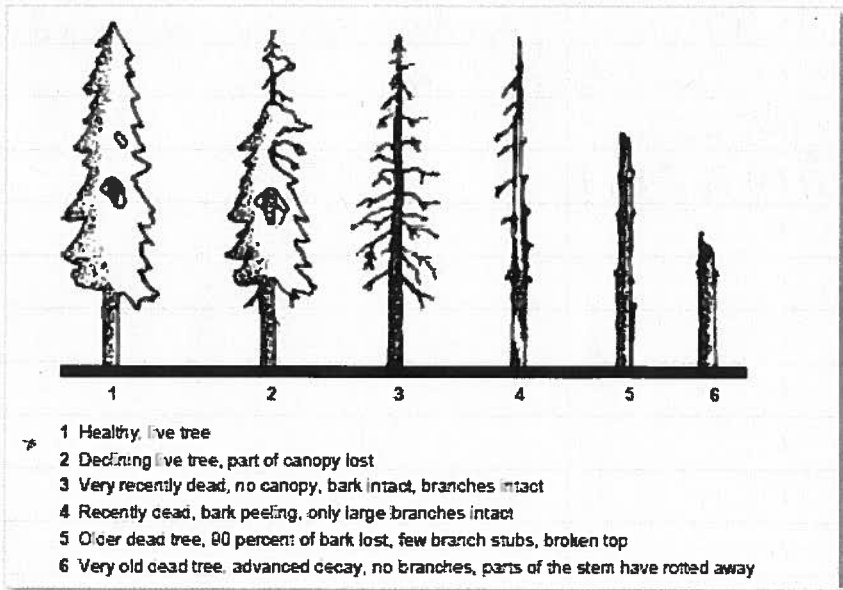
Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 0

Density Calculation: (use formula provided²) 0 Trees/ha

¹No. of Plots: Sites ≤ 10 ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$



- stumps observed indicating forest management
 - chorus frogs abundant

Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
 NOTE: Decay classifications 4-6 should not be tallied in plots.

Page 2 of 2
 Signature: Jane Ball
 (Field Personnel)

Quality Control: This form is complete & legible
 Signature: _____
 (Project Manager)
 REV: 2013-03-13



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Stantec

**Bat Maternity Roost -
 Cavity Tree Density Plots
 Data Form**

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Project Number: 160950269

Project Name: Niagara Wind Farm

<u>April 18/2013</u>	<u>11:45</u>	<u>12:30</u>	<u>J. Ball</u>
DATE	TIME (start)	TIME (end)	Field Personnel

<u>24</u>	<u>3</u>	<u>1.00</u>	<u>NONE</u>	<u>NONE</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

- Criteria for Cavity Tree Tally Inclusion:** Cavity tree is ≥ 25 cm DBH
 NOTE: All criteria must be met in order for cavity tree to be tallied Cavity is ≥ 10 m high in tree
 Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

Feature #: 35 Feature Size (ha): 0.678 No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	0	0622836 14765694	
Plot 02	0	0622829 14765721	
Plot 03	0	0622811 14765751	
Plot 04	0	0622829 14765757	
Plot 05	0	0622806 14765774	
Plot 06	0	0622814 14765768	
Plot 07	0	0622831 14765784	
Plot 08	0	0622836 14765766	
Plot 09	0	0622845 14765737	
Plot 10	0	0622838 14765716	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Signature: J. Ball
 (Field Personnel)

Signature: _____
 (Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: ____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 0 Density Calculation: (use formula provided²) 0 Trees/ha

¹No. of Plots: Sites ≤ 10 ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots). Plots = 0.05 ha or 12.6m radius. Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{\text{\# plots} \times 0.05 \text{ ha}}$

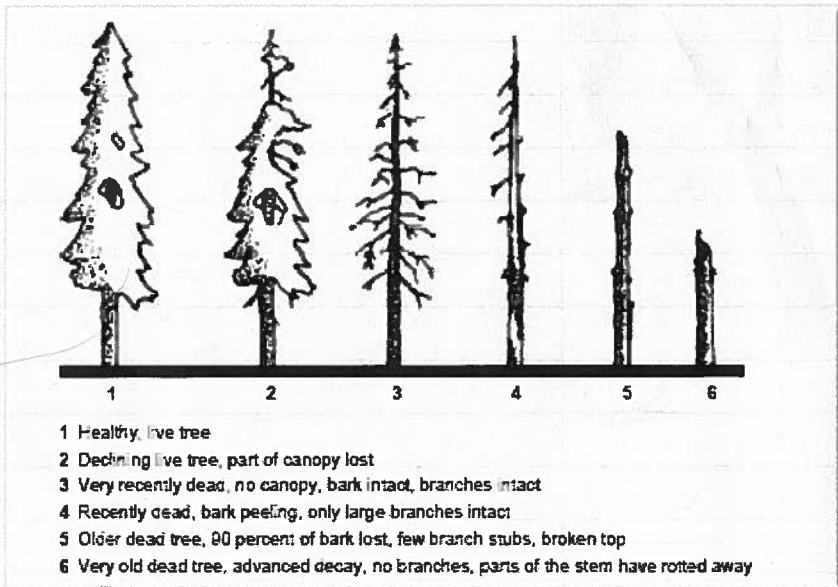


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

- chorus frogs calling in chorus in adjacent wetland
- also 1 wood frog and 1 leopard frog

- some overlap in plots may have occurred
- large stick nest in woodlot - appears unoccupied

Page 2 of 2
Signature: Jane Ball
(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____
(Project Manager)



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Stantec

Project Number: 160950269

Project Name: Niagara Wind Farm

<u>April 18/2013</u>	<u>12:40</u>	<u>1:30</u>	<u>J. Ball</u>
DATE	TIME (start)	TIME (end)	Field Personnel

Weather Conditions: <u>25</u>	<u>4</u>	<u>80% (hazy)</u>	<u>NONE</u>	<u>NONE</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

- Criteria for Cavity Tree Tally Inclusion:**
- Cavity tree is ≥ 25 cm DBH
 - Cavity is ≥ 10m high in tree
 - Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 - Cavity tree is a Decay Class of 1 - 3 (see decay classification below)
- NOTE: All criteria must be met in order for cavity tree to be tallied*

Feature #: 37/38 Feature Size (ha): 5.15 No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	0	0623790 14765663	
Plot 02	0	0623789 14765692	
Plot 03	0	0623812 14765720	
Plot 04	0	0623797 14765774	
Plot 05	2	0623799 14765824	cavities in the same tree - decay class = 2
Plot 06	0	0623767 14765806	
Plot 07	0	0623749 14765761	
Plot 08	0	0623757 14765716	
Plot 09	0	0623759 14765690	
Plot 10	0	0623774 14765670	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Page 1 of 2
 Signature: J. Ball
 (Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____
 (Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31			
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 2

Density Calculation:
(use formula provided²)

2 Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$

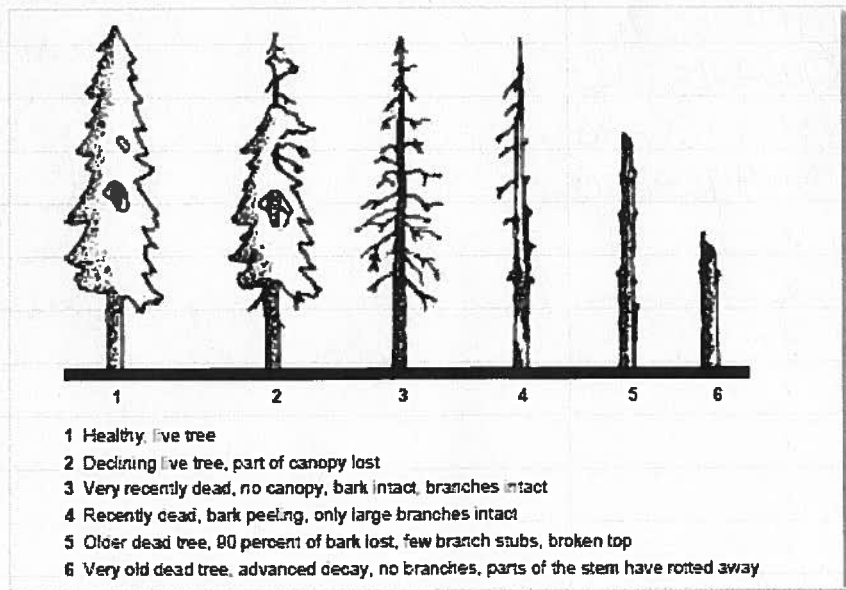


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

-chorus frogs calling in adjacent wetlands

Page 2 of 2
Signature: _____

Jane Ball
(Field Personnel)

Quality Control: This form is complete & legible
Signature: _____

(Project Manager)
REV: 2013-03-13



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Stantec

Project Number: 160950269

Project Name: Niagara Wind Farm

DATE	TIME (start)	TIME (end)	Field Personnel	
<u>April 18/2013</u>	<u>1:45</u>	<u>2:50</u>	<u>J. Ball</u>	
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)
<u>25</u>	<u>4</u>	<u>100%</u>	<u>NONE</u>	<u>NONE</u>

Weather Conditions:

- Criteria for Cavity Tree Tally Inclusion:**
- Cavity tree is ≥ 25 cm DBH
 - Cavity is ≥ 10 m high in tree
 - Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 - Cavity tree is a Decay Class of 1 - 3 (see decay classification below)
- NOTE: All criteria must be met in order for cavity tree to be tallied*

Feature #: 14/16 Feature Size (ha): 4.28 No. of Plots to Survey: 10

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	0	0618818 14763896	
Plot 02	0	0618832 14763983	
Plot 03	0	0618809 14764021	
Plot 04	0	0618829 14764065	
Plot 05	0	0618744 14764018	
Plot 06	0	0618742 14763989	
Plot 07	0	0618716 14763944	
Plot 08	0	0618728 14763907	
Plot 09	0	0618757 14763902	
Plot 10	0	0618688 14763894	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Page 1 of 2

Signature: Jane Ball
(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____
(Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 0

Density Calculation: (use formula provided²) 0

Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$

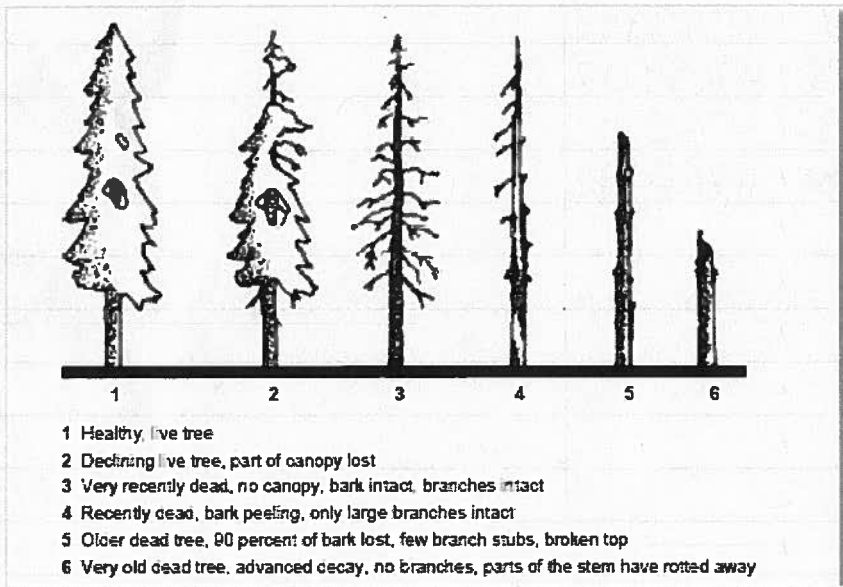


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
 NOTE: Decay classifications 4-6 should not be tallied in plots.

Page 2 of 2
 Signature: [Signature]
 (Field Personnel)

Quality Control: This form is complete & legible
 Signature: _____
 (Project Manager)



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Stantec

**Bat Maternity Roost -
 Cavity Tree Density Plots
 Data Form**

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Project Number: 160950269

Project Name: Niagara Wind Farm

<u>April 18/2013</u>	<u>2:05</u>	<u>2:20</u>	<u>J. Ball</u>	
DATE	TIME (start)	TIME (end)	Field Personnel	
<u>25</u>	<u>4</u>	<u>100%</u>	<u>NONE</u>	<u>NONE</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

Weather Conditions:

- Criteria for Cavity Tree Tally Inclusion:**
- Cavity tree is ≥ 25 cm DBH
 - Cavity is ≥ 10 m high in tree
 - Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 - Cavity tree is a Decay Class of 1 - 3 (see decay classification below)
- NOTE: All criteria must be met in order for cavity tree to be tallied*

Feature #: 13 Feature Size (ha): 0.57 No. of Plots to Survey¹: survey entire area

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01		<u>0618671 14764140</u>	<u>UTM taken from edge</u>
Plot 02		/	<u>of woodlot)</u>
Plot 03		/	<u>No cavities</u>
Plot 04		/	<u>observed</u>
Plot 05		/	
Plot 06		/	
Plot 07		/	
Plot 08		/	
Plot 09		/	
Plot 10		/	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Page 1 of 2
 Signature: _____

Jamie Ball
 (Field Personnel)

Quality Control: This form is complete & legible
 Signature: _____

(Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 0 Density Calculation: (use formula provided²) 0 Trees/ha

¹No. of Plots: Sites ≤ 10 ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$

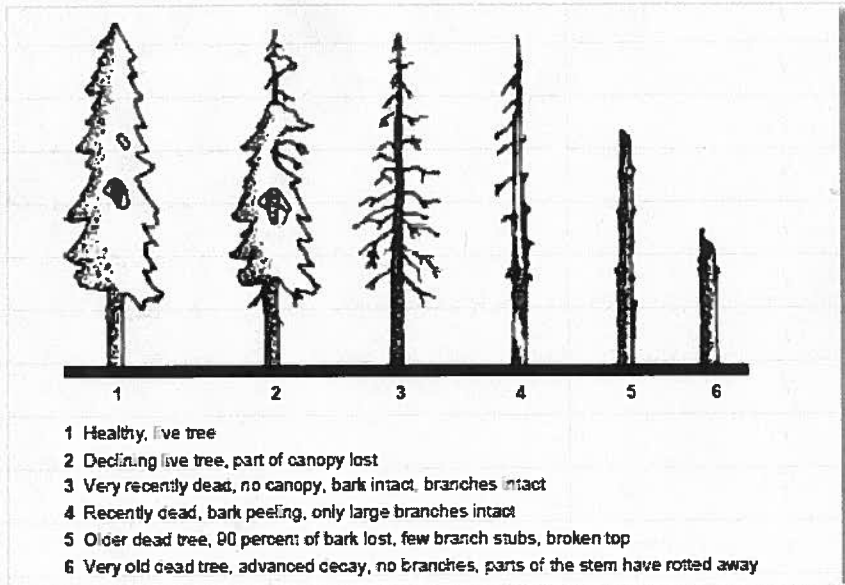


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

- surveyed entire area
- no cavities observed

Page 2 of 2
Signature: Jared Ball
(Field Personnel)

Quality Control: This form is complete & legible
Signature: _____
(Project Manager)



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Stantec

**Bat Maternity Roost -
 Cavity Tree Density Plots
 Data Form**

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Project Number: 160950269

Project Name: Niagara Wind Farm

<u>April 18/2013</u>	<u>4:00</u>	<u>4:30</u>	<u>J. Ball</u>
DATE	TIME (start)	TIME (end)	Field Personnel

<u>25</u>	<u>4</u>	<u>90% hazy</u>	<u>NONE</u>	<u>NONE</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

Criteria for Cavity Tree Tally Inclusion: Cavity tree is ≥ 25 cm DBH

NOTE: All criteria must be met in Cavity is ≥ 10m high in tree

order for cavity tree to be tallied Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats

Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

Feature #: 17 Feature Size (ha): 0.35 No. of Plots to Survey¹: entire area

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	<u>1</u>	<u>0618984 14768569</u>	
Plot 02		/	
Plot 03		/	
Plot 04		/	
Plot 05		/	
Plot 06		/	
Plot 07		/	
Plot 08		/	
Plot 09		/	
Plot 10		/	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Page 1 of 2
 Signature: J. Ball
 (Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____
 (Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31			
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 1

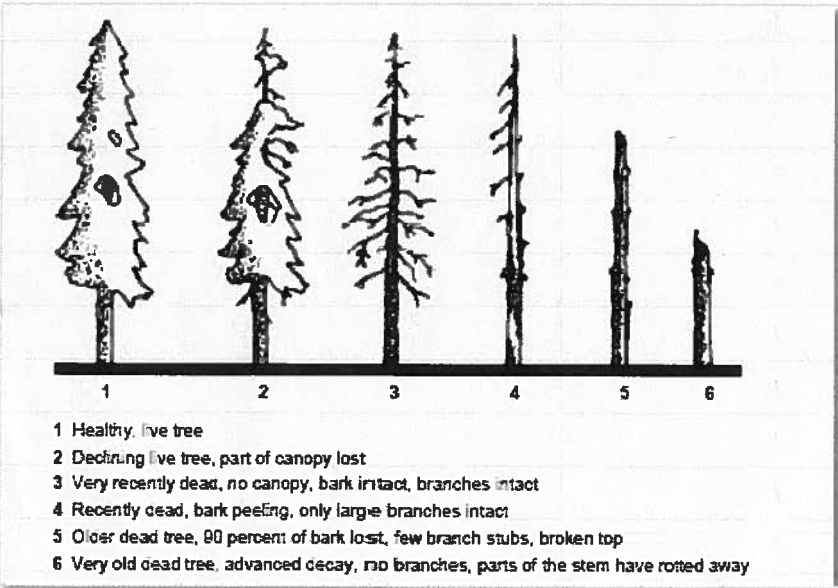
Density Calculation:
(use formula provided²)

N/A

Trees/ha

¹No. of Plots: Sites ≤ 10 ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{\text{\# plots} \times 0.05 \text{ ha}}$



only 1 cavity found in ↑ feature (entire)

Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

Page 2 of 2
 Signature: Jane Ball
 (Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Stantec

Project Number: 160950269

Project Name: Niagara Wind Farm

April 18/2013	4:30	4:40	J. Ball
DATE	TIME (start)	TIME (end)	Field Personnel

Weather Conditions:	25	4	90% hazy	NONE	NONE
	TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

- Criteria for Cavity Tree Tally Inclusion:**
- Cavity tree is ≥ 25 cm DBH
 - Cavity is ≥ 10m high in tree
 - Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 - Cavity tree is a Decay Class of 1 - 3 (see decay classification below)
- NOTE: All criteria must be met in order for cavity tree to be tallied*

Feature #: 18 Feature Size (ha): 0.13 No. of Plots to Survey¹: entire survey

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17T</u>)	Comments
Plot 01	0	0619 001 4768881	no cavities observed
Plot 02		/	in entire feature
Plot 03		/	
Plot 04		/	
Plot 05		/	
Plot 06		/	
Plot 07		/	
Plot 08		/	
Plot 09		/	
Plot 10		/	
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Page 1 of 2
 Signature: Jane Ball
 (Field Personnel)

Quality Control: This form is complete & legible
 Signature: _____
 (Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 0

Density Calculation: (use formula provided²) N/A Trees/ha

¹No. of Plots: Sites ≤ 10 ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots). Plots = 0.05 ha or 12.6m radius. Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$

- searched entire feature
- no cavities found

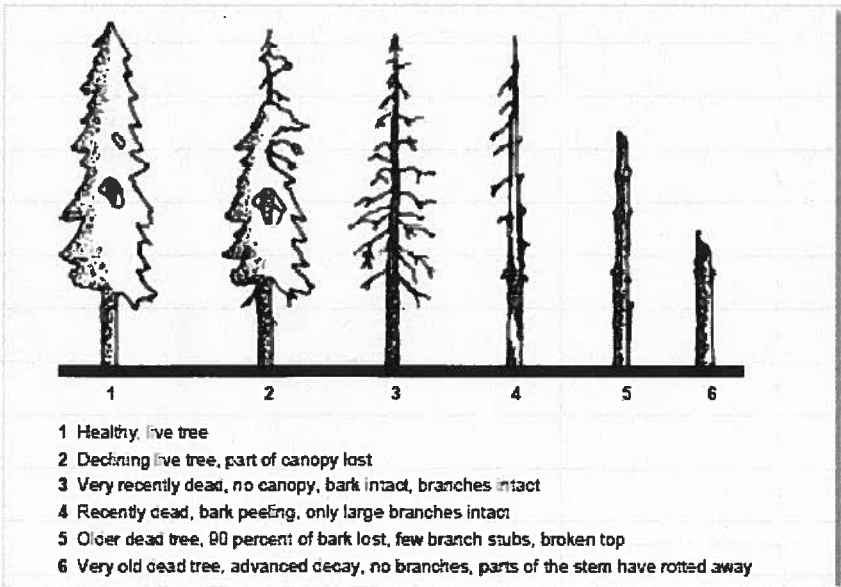


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

Page 2 of 2
Signature: Jan Ball
(Field Personnel)

Quality Control: This form is complete & legible
Signature: _____
(Project Manager)



Stantec Consulting Ltd.
1-70 Southgate Drive
Guelph, ON
Canada N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Stantec

Bat Maternity Colony - Selection of BEST Roost Trees Data Form

Project Number: 1609502109 Project Name: NKWC

DATE: June 13, 2009 TIME (start): 7:00pm TIME (end): 9:30 Field Personnel: BORR, J. BALL, B. Miller

WIND: 0-1 CLOUD: 60% PPT: None

TEMP (°C): 20 PPT (in last 24 hrs): Rain

Weather Conditions

- Criteria for selecting the BEST cavity trees (note: in order of importance; not all criteria must be met):**
- Tallest cavity tree
 - Exhibits cavities or crevices, such as cracks, scars, knot holes, or woodpecker cavities
 - Has the largest DBH (cm)
 - Within highest density of cavity trees (e.g. clusters of cavity trees)
 - Large amount of loose, peeling bark
 - Cavity or crevice is high up in tree (>10 m)
 - Preferred species: white pine, maple, aspen, ash, oak
 - Open canopy
 - Early stages of decay (class 1-3)

- June 14 - 210 - 0-10% - None - Rain (#0, B.M. JB.)
6:00pm - 7:30pm

Tree No.	Species	No. of Cavities	DBH (cm)	Cavity height(s)	Tree height	UTM (Zone:)	Photo Number(s)	Notes
1	FAGGRAN	1	30	15m	22	0630058/4772027	#87 (JB)	Cavity facing East. Decayed class 1
2	FAGGRAN	2	27	15m	20	0629987/4772055		Cavity facing South. Decayed class 1
3	ACESASA	2	25	10m	22	0629926/4772082		Cavity facing West. Decayed class 2
4	ACESASA	1	25	15m	23	0629878/4772210		Cavity facing West. Decayed class 2
5	ACESASA	1	25	12m	21	0629865/4772236		Facing N.W. Decayed class 1
6	ACESASA	1	40	13m	23	0630031/4772096		Facing N. Decayed class 1
7	FAGGRAN	1	26	10m	23	0630031/4772053		Facing S.W. Decayed class 1
8	CARCOR	1	26	12m	24	0629881/4772144	#89 (JB)	Facing S. Decayed class 2
9	ACESASA	1	25	16m	22	0629883/4772265		Facing N. Decayed class 3
10	ACESASA	3	27	17m	23	0629887/4772285		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

Signature: Andrea (Field Personnel)

Signature: _____ (Project Manager)

Quality Control: This form is complete & legible .

Sketch roost trees that have multiple cavities present. Identify the location of the cavities on the tree.

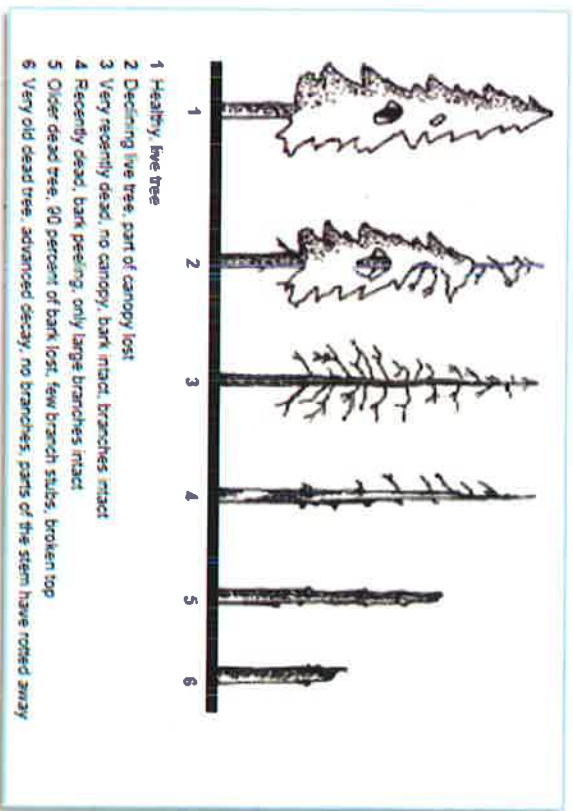


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)

① Bmc 1, 6, 7
② Bmc 2, 3

Signature: _____

(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Stantec

**Bat Maternity Colony -
 Audio & Visual Monitoring
 (Exit Surveys) Data Form**
 (FOR USE IN FOD & FOM COMMUNITIES ONLY)

Project Number: 160950629

Project Name: NRWC

<u>June 14 2013</u>	<u>9:00 pm</u>	<u>10:30 pm</u>	<u>AORR, B. Miller, J. Bail</u>
DATE	TIME (start)	TIME (end)	Field Personnel

<u>17°</u>	<u>0-1</u>	<u>5%</u>	<u>None</u>	<u>Rain</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

June 24 - 9:00pm - 10:30pm - AORR, J. Bail, Vicki Charlton - 27° 0-1 - 0%, None, None

Feature #: BMC 51 Feature Size (ha): _____ No. of Roost Trees: 10

Tree No.	Audio Recorded (Y/N)	File No.	Start Time	End Time	Tally of Bats Observed	Probable Species	UTM (Zone: <u>17</u>)	Notes
01	Y	June 14 - BM Em3-A	9:00 pm	10:15 pm	5		0630058/14772027	Low visibility after 10 pm.
02	Y	June 25 - AO Em3-C	8:45 pm	10:15 pm	—		0629987/14772055	Photo # 47 (AO)
03	Y	June 25 - JB Em3-C	8:45 pm	10:15 pm	—		0629926/14772082	Photo # 95 (JB) Flying squirrel obs.
04	Y	June 26 - JB Sm2-C	8:45 pm	10:15 pm	2		0629872/14772210	Photo # 99 (JB)
05	Y	June 24 - NC Em3-C	9:00 pm	10:20 pm	—		0629865/14772226	Very humid evening.
06	Y	June 14 - JB Em3-B	9:00 pm	10:15 pm	—		0630081/14772016	Low visibility after 10 pm.
07	Y	June 14 - AO Em3-B	9:00 pm	10:15 pm	—		0630031/14772053	Low visibility after 10 pm.
08	Y	June 26 - AO Em3-C	8:45 pm	10:15 pm	2		0629881/14772144	Photo # 48-49
09	Y	June 24 - AO Em3-C	9:00 pm	10:30 pm	—		0629853/14772265	Very humid evening.
10	Y	June 24 - JB Em3-C	9:00 pm	10:20 pm	6		0629887/14772285	Very humid evening.
11							/	
12							/	
13							/	
14							/	
15							/	

Page 1 of 2

Signature: _____

(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)

Tree No.	Audio Recorded (Y/N)	File No.	Start Time	End Time	Tally of Bats Observed	Probable Species	UTM (Zone: _____)	Notes
16							/	
17							/	
18							/	
19							/	
20							/	
21							/	
22							/	
23							/	
24							/	
25							/	
26							/	
27							/	
28							/	
29							/	
30							/	

June 25, 2013 - J. Ball, A. ORR 8:30pm - 11:00pm

25° - 3wind - 80% cloud, None, None.

June 26, 2013 - J. Ball, A. ORR 8:30 - 11:00pm

25° 4wind, 10% cloud, None, Rain

Page 2 of 2

Signature: _____

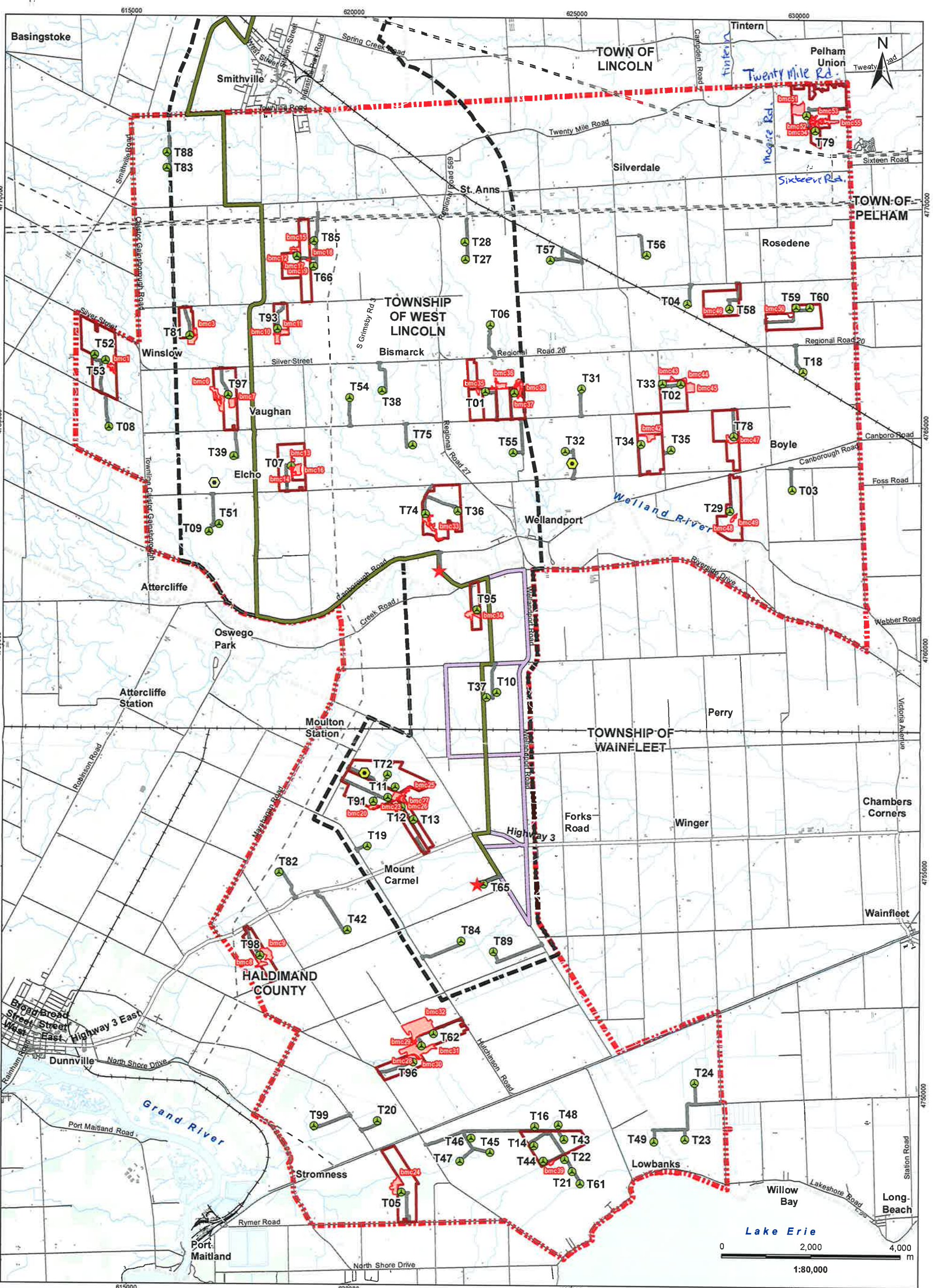
(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)

REV: 2013-06-07



V:\1609\A\dw160950269\planning\drawing\20130226_Bat_Field_Map\160950269_Figure_1_Bat_Field_Areas_Key_Map.mxd
 Revisat: 2013-03-28 By: bowper



Legend

- | | | |
|-----------------------------------|----------------------------|---------------------------|
| Project Study Area | Road | Bat Maternity Colonies |
| Interconnector Study Area | Expressway / Highway | Signed Property |
| Proposed Turbine Location | Active Railway | Potential Signed Property |
| Potential Access Road | Abandoned Railway | |
| Transformer Substation | Existing Structures | |
| Tap-in Location | Existing Transmission Line | |
| Existing Met Tower | Watercourse | |
| Preferred Transmission Line Route | Waterbody | |
| Alternate Transmission Route | Wooded Area | |
| | Municipality Lower Tier | |

Client/Project
 Niagara Region Wind Corporation
 Niagara Region Wind Farm

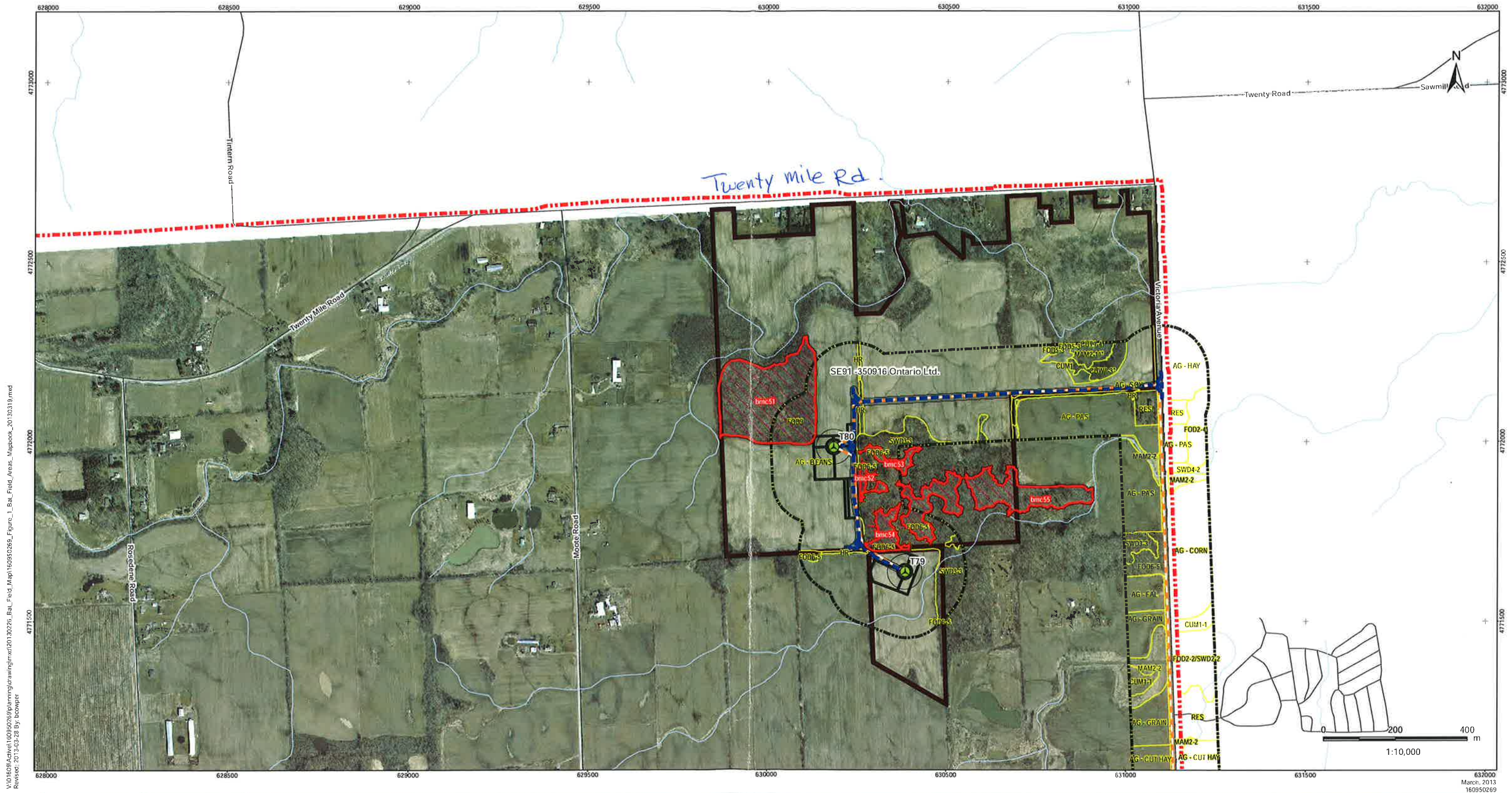
March 2013
 160950269

Figure No.
 1

Draft Site Plan Overview

Notes

- Coordinate System: NAD 1983 UTM Zone 17N
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.



V:\0160950269\planning\drawing\mxd\20130226_Bal_Field_Map\160950269_Figure_1_Bal_Field_Areas_Mapbook_20130319.mxd
 Reviser: 20130326 By: bcowper



Legend

- | | | |
|----------------------------|---|-----------------------------|
| Project Study Area | Junction Box | Bat Maternity Colonies |
| Interconnector Study Area | Preferred Transmission Line Route | Accessible Bat Survey Areas |
| Signed Property | Alternate Transmission Route | |
| Potential Signed Property | Collector Lines – Underground or Overhead | |
| 120m Zone of Investigation | Temporary Laydown Area | |
| ELC Boundary | Fibre Optic Line | |
| Proposed Turbine Location | Potential Access Road | |
| Turbine Blade Length | Potential Construction Laydown Area | |
| Tap-in Location | Transformer Substation | |

Notes

- Coordinate System: NAD 1983 UTM Zone 17N).
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
- Orthimagery source: First Base Solutions, Dale Spring 2010.



Client/Project
 Niagara Region Wind Corporation
 Natural Heritage Assessment Report

Figure No.
 1.44

Title
 Bat Surveys
 bmc 51

632000
 March, 2013
 160950269

NRWC - 160950269

Bat Exit Surveys

June 13, 14, 24, 25, 26
2013



Stantec

Stantec Consulting Ltd.
1 - 70 Southgate Drive
Guelph, ON
Canada N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Project Number: 160950269

Project Name: NRWC

April 18, 2012

11:45

12:45

A. ORR

DATE

TIME (start)

TIME (end)

Field Personnel

Weather Conditions:

21

2-3

80%

None

None.

TEMP (°C)

WIND

CLOUD

PPT

PPT (in last 24 hrs)

Criteria for Cavity Tree Tally Inclusion: Cavity tree is ≥ 25 cm DBH

NOTE: All criteria must be met in Cavity is ≥ 10 m high in tree

order for cavity tree to be tallied Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats

Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

Feature #: bmc 20

Feature Size (ha): 1.4

No. of Plots to Survey: 10

Accessible area = 1.1 ha

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17</u>)	Comments
Plot 01	0	0620493 / 4756404	GPS = 92 - young to middle aged SWD.
Plot 02	0	0620488 / 4756378	very few cavity trees present GPS = 93
Plot 03	0	0620463 / 4756355	GPS = 94
Plot 04	0	0620449 / 4756328	GPS = 95
Plot 05	0	0620440 / 4756365	GPS = 96
Plot 06	0	0620420 / 4756386	GPS = 97
Plot 07	0	0620381 / 4756389	GPS = 98
Plot 08	0	0620353 / 4756359	GPS = 99
Plot 09	0	0620284 / 4756364	GPS = 100
Plot 10	0	0620257 / 4756339	GPS = 101
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Signature: _____

(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 1 **Density Calculation:** (use formula provided²) 2 **Trees/ha**

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$

$\frac{1}{10 \times 0.05}$

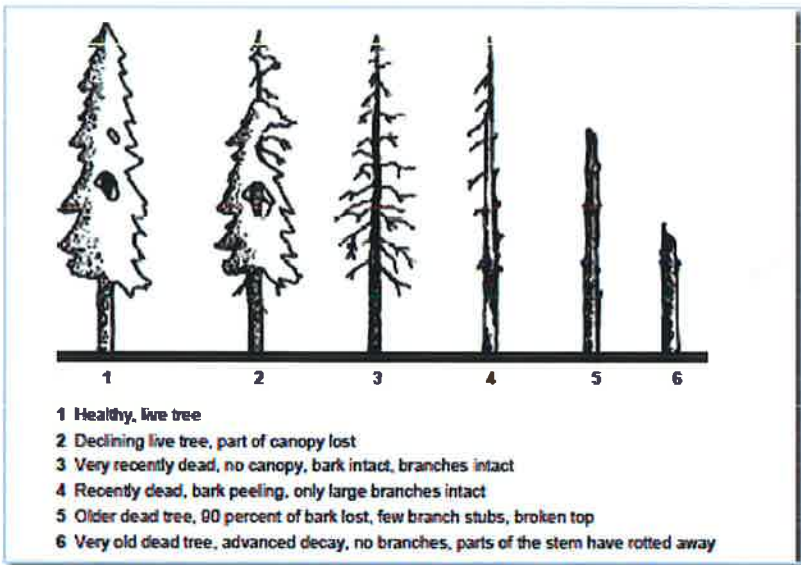


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

Signature: _____

(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Stantec

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Project Number: 1609502109

Project Name: NRWC

April 18 2013	1:15 pm	2:05	A. ORR
DATE	TIME (start)	TIME (end)	Field Personnel

Weather Conditions:

22	3-4	10%	None	None
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

- Criteria for Cavity Tree Tally Inclusion:**
- Cavity tree is ≥ 25 cm DBH
 - NOTE: All criteria must be met in order for cavity tree to be tallied*
 - Cavity is ≥ 10 m high in tree
 - Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
 - Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

Feature #: bmc 23, 25, 27 Feature Size (ha): 6.2 No. of Plots to Survey: 10 → Accessible area = 4.6 ha.
 - all communities lumped to 1.

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17</u>)	Comments
Plot 01	0	0620981 14756633	GPS = 102 → RTM? Vacant - in plot
Plot 02	0	0620998 14756683	GPS = 103 Large stick nest 30m in Tree
Plot 03	0	0621041 14756647	GPS = 104
Plot 04	0	0621076 14756637	GPS = 105
Plot 05	0	0621070 14756701	GPS = 106
Plot 06	0	0621121 14756668	GPS = 107
Plot 07	0	0621135 14756595	GPS = 108
Plot 08	1	0621197 14756574	GPS = 109
Plot 09	0	0621197 14756516	GPS = 110
Plot 10	0	0621219 14756508	GPS = 111
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	Mid-age FOD with few cavity trees having decay
Plot 15		/	class 5-6.
Plot 16		/	
Plot 17		/	
Plot 18		/	
Plot 19		/	
Plot 20		/	
Plot 21		/	

Signature: [Signature]
 (Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____
 (Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 1

Density Calculation: (use formula provided²) 2 Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots). Plots = 0.05 ha or 12.6m radius. Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$

$\frac{1}{10 \times 0.05}$

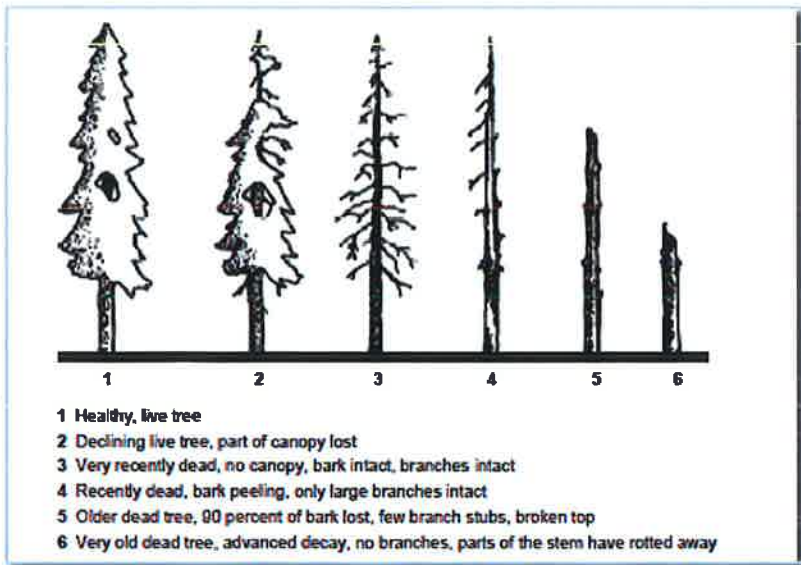


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
 NOTE: Decay classifications 4-6 should not be tallied in plots.

Page 2 of 2
 Signature: [Handwritten Signature]
 (Field Personnel)

Quality Control: This form is complete & legible .
 Signature: _____
 (Project Manager)



Stantec Consulting Ltd.
1 - 70 Southgate Drive
Guelph, ON
Canada N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Stantec

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Project Number: 160950269

Project Name: NRWC

April 18, 2013	3:35pm	4:20pm	A. ORR	
DATE	TIME (start)	TIME (end)	Field Personnel	
25	2-3	0%	None	None
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

Weather Conditions:

Criteria for Cavity Tree Tally Inclusion: Cavity tree is ≥ 25 cm DBH

NOTE: All criteria must be met in Cavity is ≥ 10 m high in tree

order for cavity tree to be tallied Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats

Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

Feature #: bmcX Feature Size (ha): 2.8 No. of Plots to Survey¹: 10

Accessible area = 2.3 ha

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u> </u>)	Comments
Plot 01	0	0617900 14753021	GPS = 112
Plot 02	0	0617930 14752996	GPS = 113
Plot 03	1	0617961 14752967	GPS = 114
Plot 04	0	0617957 14752929	GPS = 115
Plot 05	1	0617990 14752923	GPS = 116
Plot 06	0	0617993 14752875	GPS = 117
Plot 07	1	0618038 14752862	GPS = 118
Plot 08	0	0618054 14752835	GPS = 119
Plot 09	0	0618098 14752839	GPS = 120
Plot 10	0	0618123 14752874	GPS = 121
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	
Plot 16		/	
Plot 17		/	
Plot 18		/	Jeny.
Plot 19		/	Thick understory, young to mid-age FOD/SWD.
Plot 20		/	Lots of decay class 5 & 6.
Plot 21		/	

Page 1 of 2

Signature: [Signature]

(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)

REV: 2013-03-13

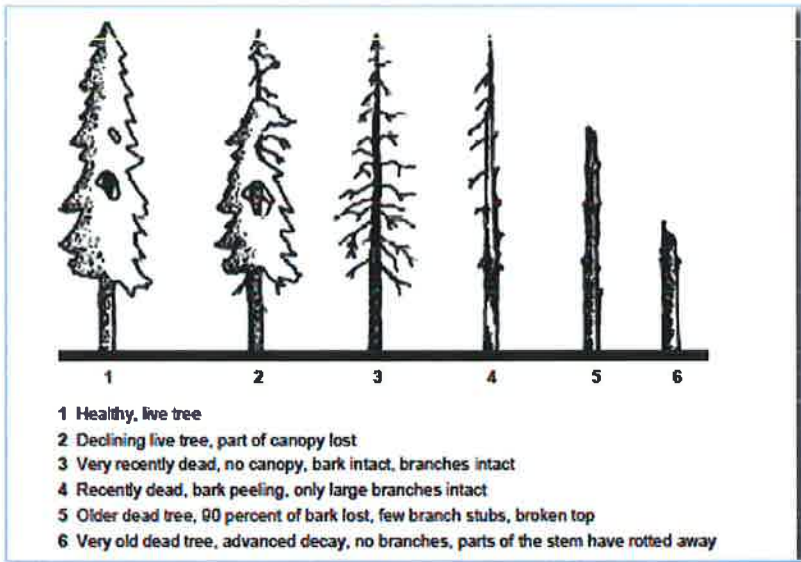
Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 3

Density Calculation: (use formula provided²) 6 Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$



3
10 x 0.05

Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

Signature: _____

(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)



Stantec Consulting Ltd.
1 - 70 Southgate Drive
Guelph, ON
Canada N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Stantec

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Project Number: 1609506029

Project Name: NRWC

<u>April 18, 2013</u>	<u>4:30 pm</u>	<u>5:00 pm</u>	<u>A ORR</u>
DATE	TIME (start)	TIME (end)	Field Personnel

<u>25</u>	<u>2</u>	<u>10%</u>	<u>None</u>	<u>None.</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

Criteria for Cavity Tree Tally Inclusion:

- Cavity tree is ≥ 25 cm DBH
- Cavity is ≥ 10 m high in tree
- Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats
- Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

NOTE: All criteria must be met in order for cavity tree to be tallied

Accessible area = 1.8 ha

Feature #: bmc 9 Feature Size (ha): 4.4 No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17</u>)	Comments
Plot 01	0	061813614753016	GPS = 122
Plot 02	0	061810814753071	GPS = 123
Plot 03	0	061809714753092	GPS = 124
Plot 04	0	061807114753089	GPS = 125
Plot 05	1	061806914753116	= 126
Plot 06	0	061806314753138	= 127
Plot 07	0	061805114753162	= 128
Plot 08	0	061802914753182	= 129
Plot 09	0	061802214753153	= 130
Plot 10	1	061800114753164	= 131
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	Note. In stick part E of bmc 9, on other property; no access.
Plot 16		/	
Plot 17		/	
Plot 18		/	Almost thicket swamp / SWD. Very wet & very thick undergrowth
Plot 19		/	A few decay class 5-6.
Plot 20		/	Hard to walk through.
Plot 21		/	

Page 1 of 2

Signature: _____

(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)

REV: 2013-03-13

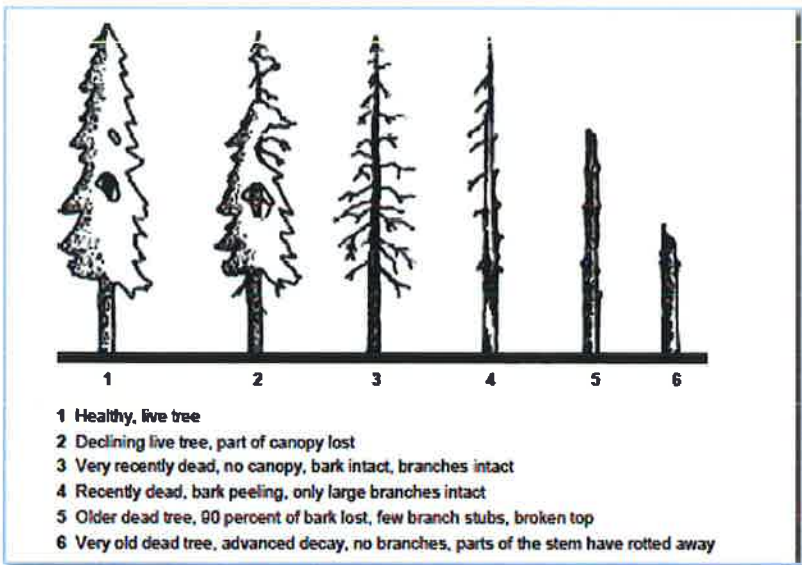
Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: ____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31		/	
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 2

Density Calculation: (use formula provided) 4 Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots). Plots = 0.05 ha or 12.6m radius. Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$



$\frac{2}{10 \times 0.05}$

Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

Page 2 of 2
Signature: [Handwritten Signature]
(Field Personnel)

Quality Control: This form is complete & legible .
Signature: _____
(Project Manager)



Stantec

Stantec Consulting Ltd.
1 - 70 Southgate Drive
Guelph, ON
Canada N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Bat Maternity Roost - Cavity Tree Density Plots Data Form

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Project Number: 160950629

Project Name: NRWC

<u>April 23, 2013</u>	<u>11:35am</u>	<u>12:10pm</u>	<u>A. ORR</u>
DATE	TIME (start)	TIME (end)	Field Personnel

<u>11-18°C</u>	<u>1</u>	<u>0%</u>	<u>None</u>	<u>None</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

Criteria for Cavity Tree Tally Inclusion: Cavity tree is ≥ 25 cm DBH

NOTE: All criteria must be met in Cavity is ≥ 10 m high in tree

order for cavity tree to be tallied Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats

Cavity tree is a Decay Class of 1 - 3 (see decay classification below)

Feature #: 29 Feature Size (ha): 0.2 ha No. of Plots to Survey¹: 10

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: ____)	Comments
Plot 01	0	0621484 14751127	GPS = 144
Plot 02	0	0621481 14751134	GPS = 145
Plot 03	0	0621465 14751131	GPS = 146
Plot 04	0	0621455 14751130	GPS = 147
Plot 05	0	0621468 14751145	GPS = 148
Plot 06	0	0621497 14751145	GPS = 149
Plot 07	0	0621490 14751156	GPS = 150
Plot 08	0	0621475 14751162	GPS = 151
Plot 09	0	0621464 14751150	GPS = 152
Plot 10	0	0621448 14751144	GPS = 153
Plot 11		/	
Plot 12		/	
Plot 13		/	
Plot 14		/	
Plot 15		/	(A few decay class 4-6 Note: BMC 29 - sm. woodlot
Plot 16		/	- DWD in entire area. Large
Plot 17		/	amounts of brush piles from adjacent
Plot 18		/	clear-cut. ∴ difficult to walk thru.
Plot 19		/	Difficult to not overlap plots.
Plot 20		/	- Area was searched as well.
Plot 21		/	- Poplar woodlot. mid-age to mature.

Page 1 of 2

Signature: _____

(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)

REV: 2013-03-13

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: _____)	Comments
Plot 22		/	
Plot 23		/	
Plot 24		/	
Plot 25		/	
Plot 26		/	
Plot 27		/	
Plot 28		/	
Plot 29		/	
Plot 30		/	
Plot 31			
Plot 32		/	
Plot 33		/	
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 0

Density Calculation: (use formula provided)² 0 Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

$$^2\text{Total Cavity Tree Density} = \frac{\text{total \# cavity trees}}{(\# \text{ plots} \times 0.05 \text{ ha})}$$

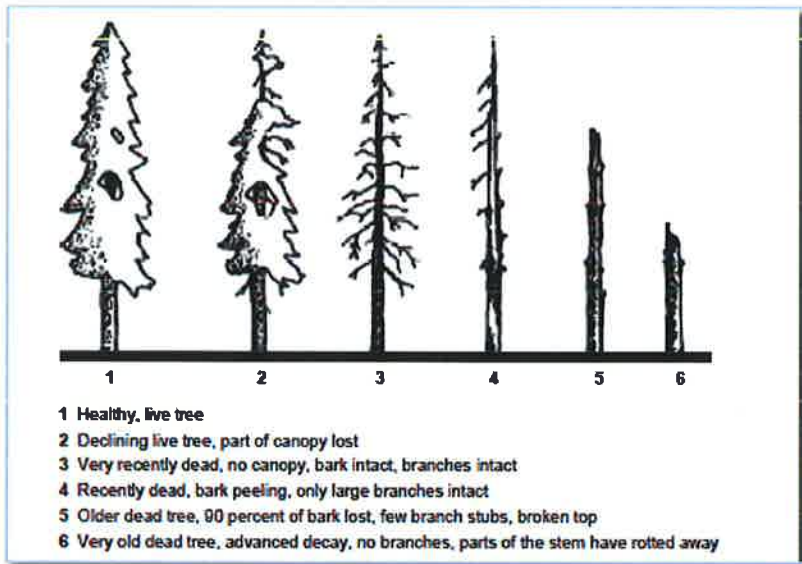


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

Page 2 of 2
Signature: [Handwritten Signature]
(Field Personnel)

Quality Control: This form is complete & legible .
Signature: _____
(Project Manager)



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Stantec

**Bat Maternity Roost -
 Cavity Tree Density Plots
 Data Form**

(FOR USE IN FOD & FOM COMMUNITIES ONLY)

Project Number: 1609502109

Project Name: NRWC

<u>April 23, 2013</u>	<u>11:10</u>	<u>2:50 pm.</u>	<u>A. ORR</u>
DATE	TIME (start)	TIME (end)	Field Personnel

<u>11-18 °C</u>	<u>1-2</u>	<u>0%</u>	<u>None</u>	<u>None.</u>
TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

Criteria for Cavity Tree Tally Inclusion: Cavity tree is ≥ 25 cm DBH

NOTE: All criteria must be met in Cavity is ≥ 10 m high in tree

order for cavity tree to be tallied Size of cavity is small enough so large mammals (i.e. raccoons) cannot enter, but large enough for two bats

Cavity tree is a Decay Class of 1 - 3 (see decay classification below)
 accessible area.

Full area = 33 ha.

Feature #: 28, 30, 31, 32 Feature Size (ha): 4.9 ha No. of Plots to Survey¹: 33

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: <u>17</u>)	Comments
Plot 01	•	0621490 14751248	GPS = 140
Plot 02	••	0621469 14751235	GPS = 141
Plot 03	0	0621427 14751216	GPS = 142.
Plot 04	0.	0621394 14751199	GPS = 143
Plot 05	•	0621409 14751148	GPS = 154
Plot 06	•	0621396 14751139	GPS = 155
Plot 07	0	0621408 14751130	GPS = 156.
Plot 08	0	0621415 14751119	GPS = 167
Plot 09	0	0621453 14751087	GPS = 158
Plot 10	0	0621440 14751060	GPS = 159
Plot 11	0	0621463 14751045	GPS = 160.
Plot 12	0	0621433 14751014	GPS = 161
Plot 13	0	0621446 14750980	GPS = 162
Plot 14	0	0621483 14750990	GPS = 163
Plot 15	0	0621491 14750948	GPS = 164
Plot 16	0	0621578 14750938	GPS = 165
Plot 17	0	0621534 14750897	GPS = 166
Plot 18	0	0621483 14750827	GPS = 167
Plot 19	0	0621516 14750787	GPS = 168
Plot 20	0	0621555 14750752	GPS = 169
Plot 21	0	0621595 14750765	GPS = 170

Page 1 of 2

Signature: _____

(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)

Plot No.	Total No. of Cavity Trees (based on criteria above)	Plot Center UTM (Zone: 17)	Comments
Plot 22	0	0621605 14750797	GPS = 171
Plot 23	0	0621574 14750816	GPS = 172
Plot 24	0	0621563 14750858	GPS = 173
Plot 25	0	0621602 14750951	GPS = 174
Plot 26	0	0621633 14750957	GPS = 175
Plot 27	0	0621659 14750975	GPS = 176
Plot 28	0	0621683 14750980	GPS = 177
Plot 29	0	0621701 14750985	GPS = 178
Plot 30	0	0621727 14751002	GPS = 179
Plot 31	0	0621746 14751008	GPS = 180
Plot 32	0	0621721 14751054	GPS = 181
Plot 33	0	0621897 14751075	GPS = 182
Plot 34		/	
Plot 35		/	

TOTAL No. Cavity Trees: 11

Density Calculation:
(use formula provided²)

6.6 Trees/ha

¹No. of Plots: Sites ≤ 10 ha; 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots).
Plots = 0.05 ha or 12.6m radius.
Select plots randomly.

²Total Cavity Tree Density = $\frac{\text{total \# cavity trees}}{\text{\# plots} \times 0.05 \text{ ha}}$

$$\frac{11}{33 \times 0.05}$$

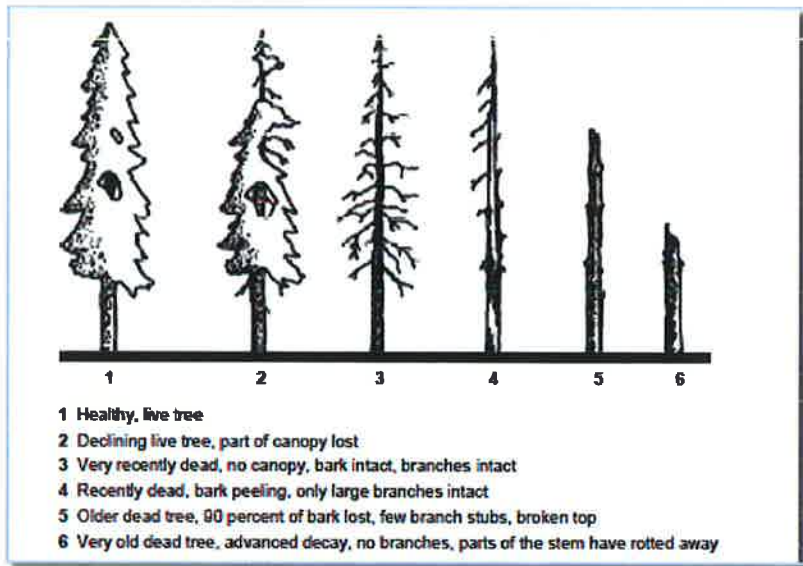


Figure 1: Decay classification system for cavity trees (Watt and Caceres, 1999)
NOTE: Decay classifications 4-6 should not be tallied in plots.

Page 2 of 2

Signature: _____

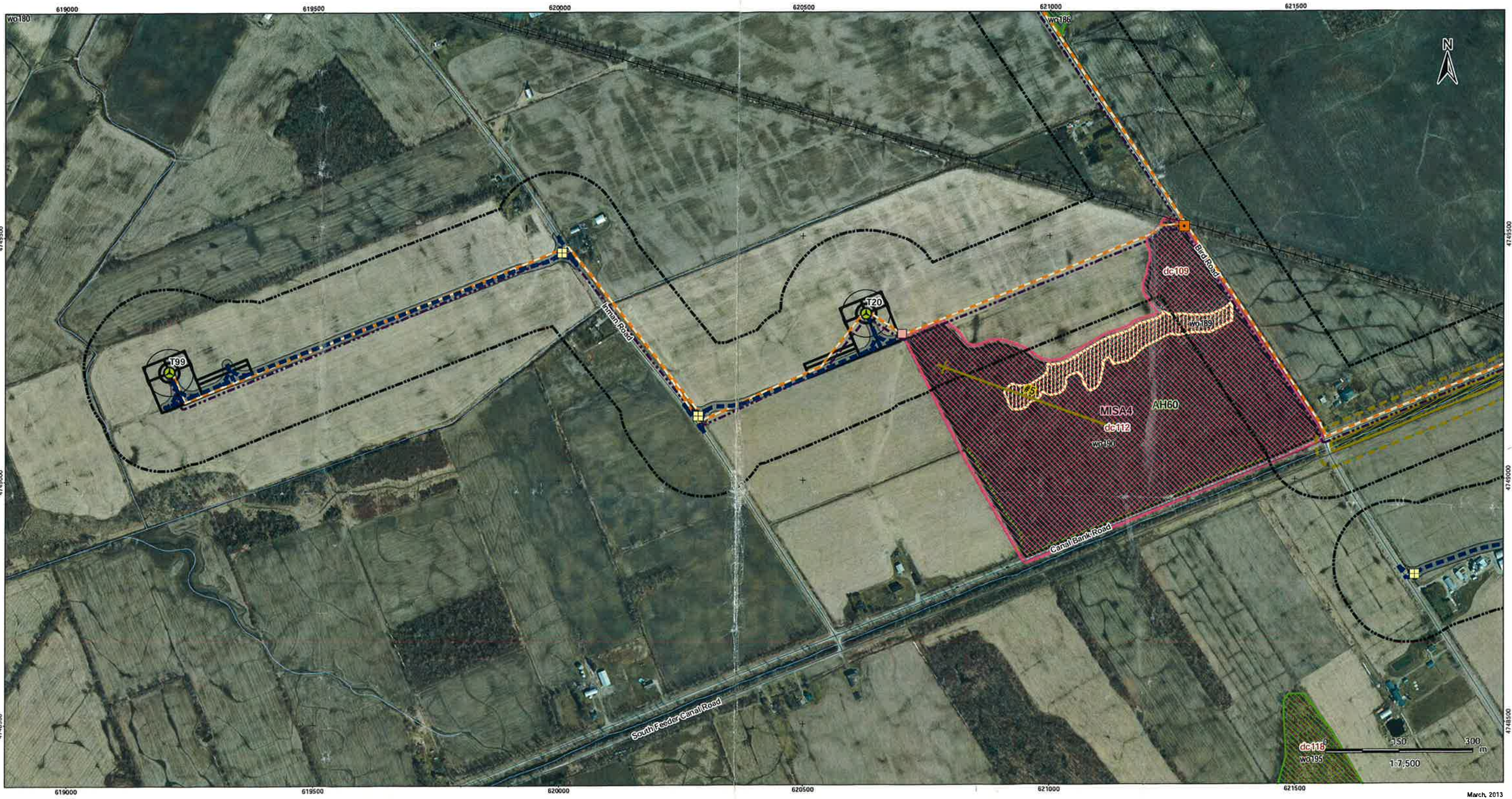
(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)

REV: 2013-03-13



V:\01609\Active\160950269\planning\drawing\mxd\20130212_REA_NHA_Figures\160950269_Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
 Revised: 2013-03-14 By: p.wensell

March, 2013
160950269



Legend	
	Project Study Area
	Interconnector Study Area
	120m Zone of Investigation
	Proposed Turbine Location
	Turbine Blade Length
	Tap-in Location
	Junction Box
	Proposed Culvert
	Preferred Transmission Route
	Alternate Transmission Route
	Temporary Laydown Area
	Collector Lines – Underground or Overhead
	Fibre Optic Line
	Potential Access Road
	Access Road 20m Construction Area
	Potential Construction Laydown Area
	Transformer Substation
	Amphibian Breeding Stations
	Snake Hibernacula
	Snake Hibernacula 30m Buffer
	MBB Point Count Location
	Migratory Bird Transect
	Winter Raptor Transect
	Woodland Communities
	Deer Congregation Areas (MNR)
	Landbird Migratory Stopover
	Other Rare Vegetation Community
	Amphibian Breeding Habitat
	Cliff and Talus Communities
	Raptor Wintering Areas
	Woodland Raptor Nesting Habitat/ Woodland Area Sensitive Bird Breeding Habitat
	Woodland Vole Habitat
	Terrestrial Crayfish Habitat
	Turtle Nesting Habitat/Snapping Turtle Habitat
	Turtle Habitat 30m Buffer
	Turtle Wintering Area
	Bat Maternity Colonies

Notes

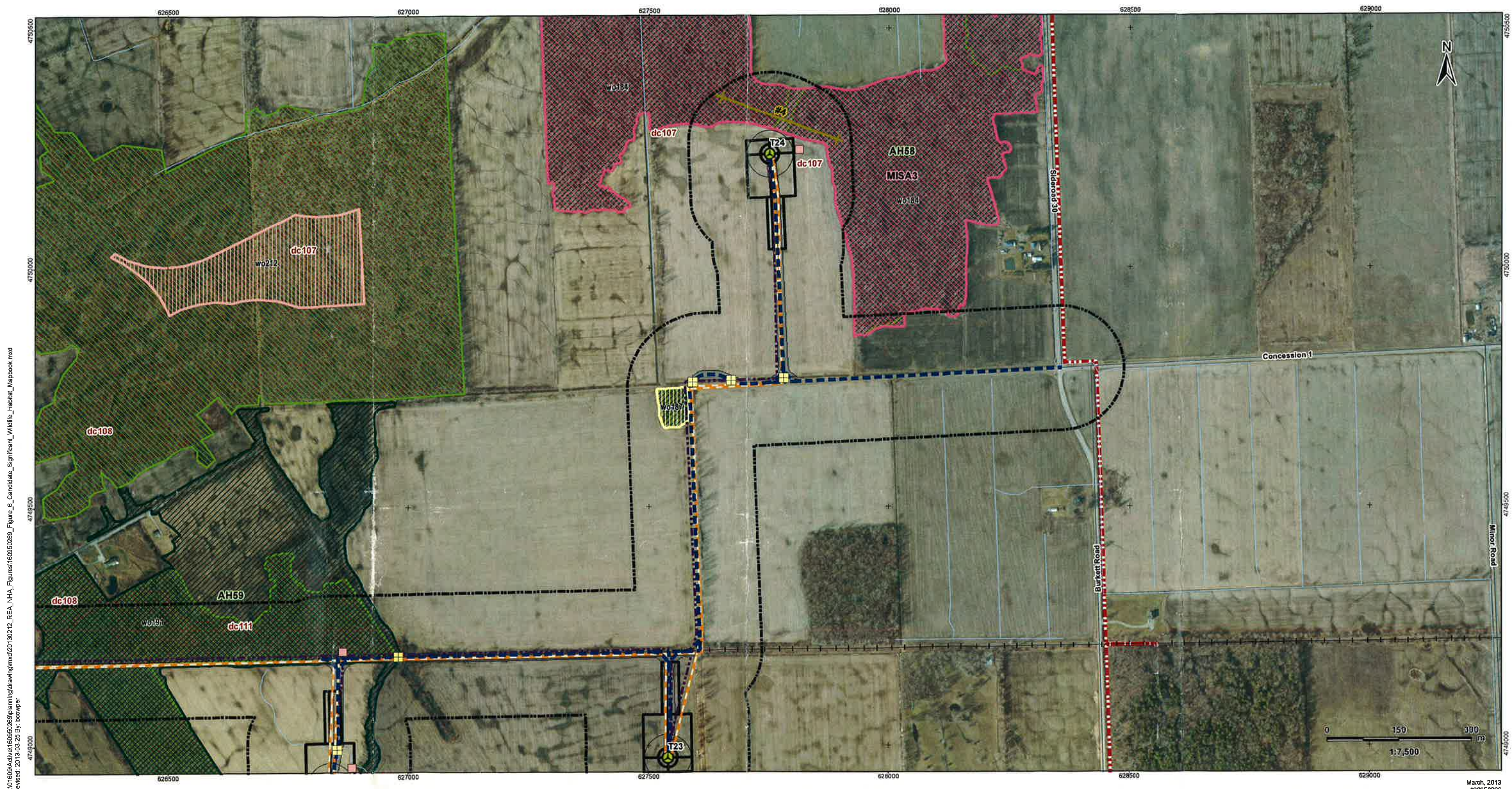
- Coordinate System: NAD 1983 UTM Zone 17N).
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
- Orthoimagery © First Base Solutions, 2010.



Client/Project
**Niagara Region Wind Corporation
 Natural Heritage Assessment Report**

Figure No.
6.54

Title
**Candidate Significant
 Wildlife Habitat
 Figure 6.54**



V:\01609\Active\160950269\claming\drawing\mxd\20130212_REA_NHA_Figures\160950269_Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
 Revised: 2013-03-25 By: bcowpar

March, 2013
160950269



Legend

- | | | | | |
|----------------------------|---|-------------------------------|---|------------------------|
| Project Study Area | Preferred Transmission Route | Amphibian Breeding Stations | Other Rare Vegetation Community | Turtle Wintering Area |
| Interconnector Study Area | Alternate Transmission Route | Snake Hibernacula | Amphibian Breeding Habitat | Bat Maternity Colonies |
| 120m Zone of Investigation | Temporary Laydown Area | Snake Hibernacula 30m Buffer | Cliff and Talus Communities | |
| Proposed Turbine Location | Collector Lines – Underground or Overhead | MBB Point Count Location | Raptor Wintering Areas | |
| Turbine Blade Length | Fibre Optic Line | Migratory Bird Transect | Woodland Raptor Nesting Habitat/
Woodland Area Sensitive Bird Breeding Habitat | |
| Tap-in Location | Potential Access Road | Winter Raptor Transect | Woodland Vole Habitat | |
| Junction Box | Access Road 20m Construction Area | Woodland Communities | Terrestrial Crayfish Habitat | |
| Proposed Culvert | Potential Construction Laydown Area | Deer Congregation Areas (MNR) | Turtle Nesting Habitat/Snapping Turtle Habitat | |
| | Transformer Substation | Landbird Migratory Stopover | Turtle Habitat 30m Buffer | |

Notes

- Coordinate System: NAD 1983 UTM Zone 17N).
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
- Orthoimagery © First Base Solutions, 2010.



Client/Project
**Niagara Region Wind Corporation
Natural Heritage Assessment Report**

Figure No.
6.58

Title
**Candidate Significant
Wildlife Habitat
Figure 6.58**



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Migratory Bird Survey Observation Form

Stantec

Project Number: 1160950269

Project Name: NRWC

Date: Oct. 8, 2013

Field Personnel: H. ORR

Weather Conditions:	TEMP (°C):	WIND:	CLOUD:	PPT:	PPT (in last 24 hrs):
	<u>4°</u>	<u>0</u>	<u>10%</u>	<u>None</u>	<u>Rain</u>

Start Time: 7:50 am

End Time: 8:20 am

Start Point UTM: 627636/4750363

End Point UTM: 627904/4750264

Habitat: FAD

Transect: 4

Feature #: MISA3

Species	Tally
AMBO	+ + +
WTSP	
BTBW	
NOFL	
WBNU	
BWBL	+ +
GRCA	
BCCH	
SOSP	
BRCA	
HOWR	
DOWO	
CAGO	25 - flyover, heading S.
	Incidentals.
	Red squirrel
	WTDC tracks

Pg. 1 of 1

Signature: [Signature]
 (Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____
 (Project Manager)



V:\101609\active\160950269\planning\drawing\mxd\20130212_REA_NHA_Figures\160950269_Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
 Revised: 2013-03-14 By: pworsell

March, 2013
160950269



Legend

Project Study Area	Preferred Transmission Route	Amphibian Breeding Stations	Other Rare Vegetation Community	Turtle Wintering Area
Interconnector Study Area	Alternate Transmission Route	Snake Hibernacula	Amphibian Breeding Habitat	Bat Maternity Colonies
120m Zone of Investigation	Temporary Laydown Area	Snake Hibernacula 30m Buffer	Cliff and Talus Communities	
Proposed Turbine Location	Collector Lines – Underground or Overhead	MBB Point Count Location	Raptor Wintering Areas	
Turbine Blade Length	Fibre Optic Line	Migratory Bird Transect	Woodland Raptor Nesting Habitat/ Woodland Area Sensitive Bird Breeding Habitat	
Tap-in Location	Potential Access Road	Winter Raptor Transect	Woodland Vole Habitat	
Junction Box	Access Road 20m Construction Area	Woodland Communities	Terrestrial Crayfish Habitat	
Proposed Culvert	Potential Construction Laydown Area	Deer Congregation Areas (MNR)	Turtle Nesting Habitat/Snapping Turtle Habitat	
	Transformer Substation	Landbird Migratory Stopover	Turtle Habitat 30m Buffer	

Notes

- Coordinate System: NAD 1983 UTM Zone 17N).
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
- Orthoimagery © First Base Solutions, 2010.

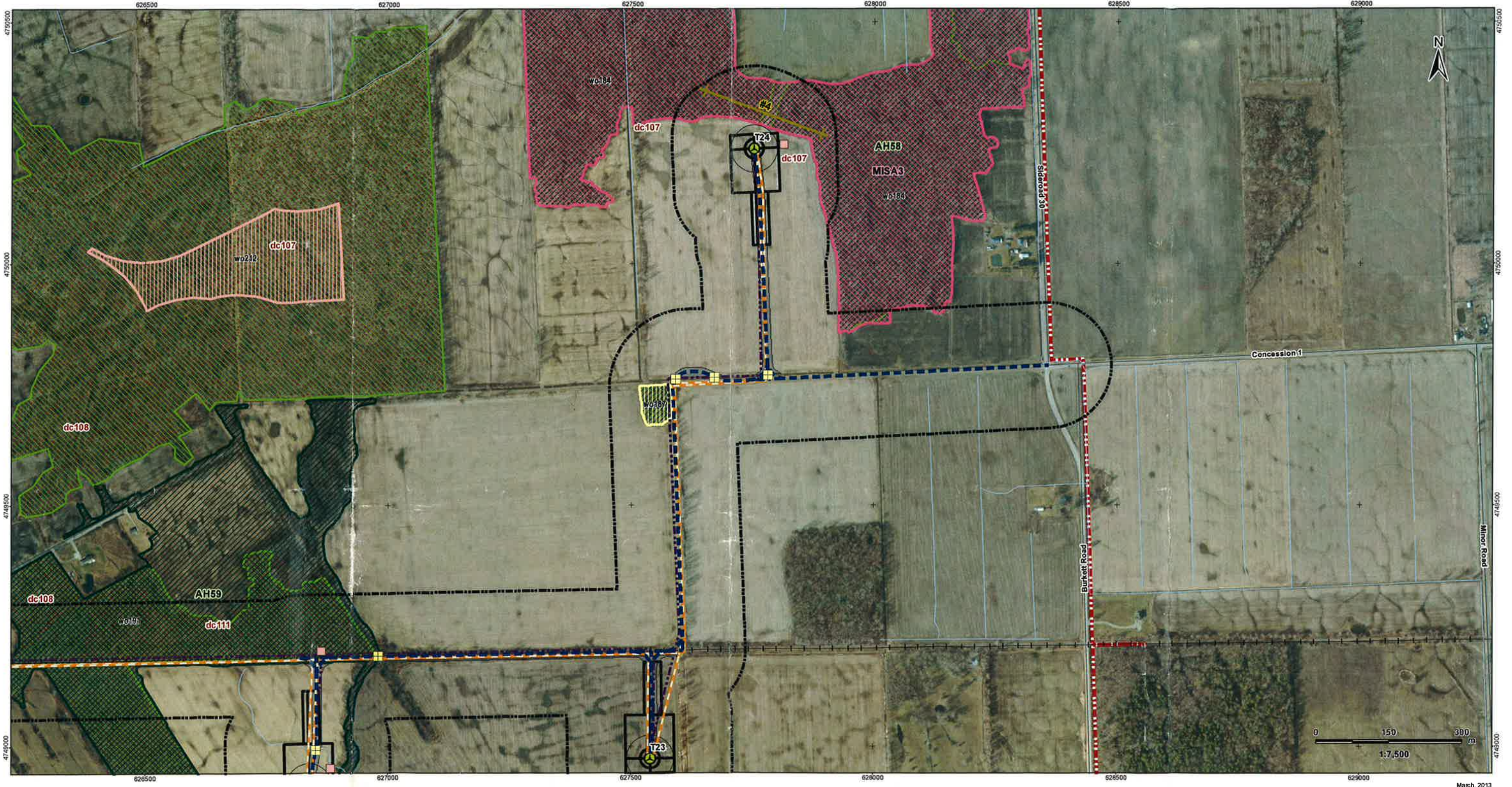


Client/Project
**Niagara Region Wind Corporation
 Natural Heritage Assessment Report**

Figure No.
6.54

Title
**Candidate Significant
 Wildlife Habitat
 Figure 6.54**

V:\01609\Active\160950269\planning\drawing\max\20130212_REA_NHA_Figures\160950269_Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
 Revised: 2013-03-25 By: bcooper



Legend

- | | | | | |
|----------------------------|---|-------------------------------|---|------------------------|
| Project Study Area | Preferred Transmission Route | Amphibian Breeding Stations | Other Rare Vegetation Community | Turtle Wintering Area |
| Interconnector Study Area | Alternate Transmission Route | Snake Hibernacula | Amphibian Breeding Habitat | Bat Maternity Colonies |
| 120m Zone of Investigation | Temporary Laydown Area | Snake Hibernacula 30m Buffer | Cliff and Talus Communities | |
| Proposed Turbine Location | Collector Lines – Underground or Overhead | MBB Point Count Location | Raptor Wintering Areas | |
| Turbine Blade Length | Fibre Optic Line | Migratory Bird Transect | Woodland Raptor Nesting Habitat/
Woodland Area Sensitive Bird Breeding Habitat | |
| Tap-in Location | Potential Access Road | Winter Raptor Transect | Woodland Vole Habitat | |
| Junction Box | Access Road 20m Construction Area | Woodland Communities | Terrestrial Crayfish Habitat | |
| Proposed Culvert | Potential Construction Laydown Area | Deer Congregation Areas (MNR) | Turtle Nesting Habitat/Snapping Turtle Habitat | |
| | Transformer Substation | Landbird Migratory Stopover | Turtle Habitat 30m Buffer | |

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery © First Base Solutions, 2010.



Client/Project
**Niagara Region Wind Corporation
 Natural Heritage Assessment Report**

Figure No.
6.58

Title
**Candidate Significant
 Wildlife Habitat
 Figure 6.58**

V:\01609\active\160950269\shenning\drawing\mxd\20130212_REA_NHA_Figures\160950269_Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
 Revised: 2013.03.14 By: pncrsall



Legend

Project Study Area	Preferred Transmission Route	Amphibian Breeding Stations	Other Rare Vegetation Community	Turtle Wintering Area
Interconnector Study Area	Alternate Transmission Route	Snake Hibernacula	Amphibian Breeding Habitat	Bat Maternity Colonies
120m Zone of Investigation	Temporary Laydown Area	Snake Hibernacula 30m Buffer	Cliff and Talus Communities	
Proposed Turbine Location	Collector Lines – Underground or Overhead	MBB Point Count Location	Raptor Wintering Areas	
Turbine Blade Length	Fibre Optic Line	Migratory Bird Transect	Woodland Raptor Nesting Habitat/ Woodland Area Sensitive Bird Breeding Habitat	
Tap-In Location	Potential Access Road	Winter Raptor Transect	Woodland Vole Habitat	
Junction Box	Access Road 20m Construction Area	Woodland Communities	Terrestrial Crayfish Habitat	
Proposed Culvert	Potential Construction Laydown Area	Deer Congregation Areas (MNR)	Turtle Nesting Habitat/Snapping Turtle Habitat	
	Transformer Substation	Landbird Migratory Stopover	Turtle Habitat 30m Buffer	

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery © First Base Solutions, 2010.

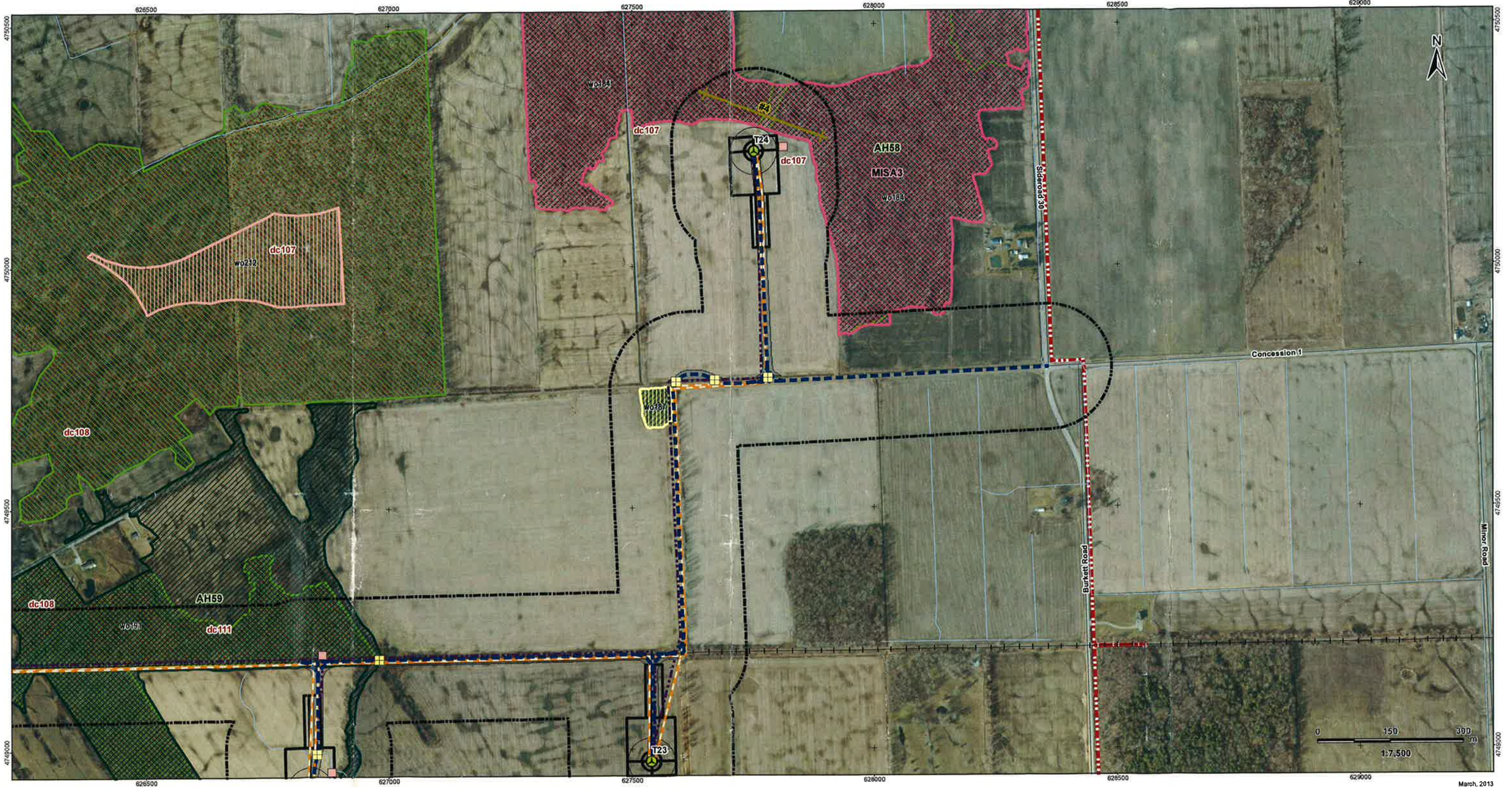


Client/Project
**Niagara Region Wind Corporation
 Natural Heritage Assessment Report**

Figure No.
6.54

Title
**Candidate Significant
 Wildlife Habitat
 Figure 6.54**

V:\01609\Active\16095269\planning\drawing\mxd\20130712_REA_NHA_Figures\16095269\Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
 Revised: 2013-03-25 By: bccwpat



March, 2013
160950269



Legend

- | | | | | |
|----------------------------|---|-------------------------------|---|------------------------|
| Project Study Area | Preferred Transmission Route | Amphibian Breeding Stations | Other Rare Vegetation Community | Turtle Wintering Area |
| Interconnector Study Area | Alternate Transmission Route | Snake Hibernacula | Amphibian Breeding Habitat | Bat Maternity Colonies |
| 120m Zone of Investigation | Temporary Laydown Area | Snake Hibernacula 30m Buffer | Cliff and Talus Communities | |
| Proposed Turbine Location | Collector Lines – Underground or Overhead | MBB Point Count Location | Raptor Wintering Areas | |
| Turbine Blade Length | Fibre Optic Line | Migratory Bird Transect | Woodland Raptor Nesting Habitat/
Woodland Area Sensitive Bird Breeding Habitat | |
| Tap-in Location | Potential Access Road | Winter Raptor Transect | Woodland Vole Habitat | |
| Junction Box | Access Road 20m Construction Area | Woodland Communities | Terrestrial Crayfish Habitat | |
| Proposed Culvert | Potential Construction Laydown Area | Deer Congregation Areas (MNR) | Turtle Nesting Habitat/Snapping Turtle Habitat | |
| | Transformer Substation | Landbird Migratory Stopover | Turtle Habitat 30m Buffer | |

Notes

- Coordinate System: NAD 1983 UTM Zone 17N).
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
- Orthoimagery © First Base Solutions, 2010.



Client/Project
**Niagara Region Wind Corporation
 Natural Heritage Assessment Report**

Figure No.
6.58

Title
**Candidate Significant
 Wildlife Habitat
 Figure 6.58**



V:\01609\Active\160950269\planning\drawing\mxd\20130212_REA_NHA_Figures\160950269_Figure_6_Candidate_Significant_Wildlife_Habitu_Mapbook.mxd
 Revised: 2013-03-14 By: p.worsell

March, 2013
160950269



Legend

- | | | | | |
|----------------------------|---|-------------------------------|---|------------------------|
| Project Study Area | Preferred Transmission Route | Amphibian Breeding Stations | Other Rare Vegetation Community | Turtle Wintering Area |
| Interconnector Study Area | Alternate Transmission Route | Snake Hibernacula | Amphibian Breeding Habitat | Bat Maternity Colonies |
| 120m Zone of Investigation | Temporary Laydown Area | Snake Hibernacula 30m Buffer | Cliff and Talus Communities | |
| Proposed Turbine Location | Collector Lines – Underground or Overhead | MBB Point Count Location | Raptor Wintering Areas | |
| Turbine Blade Length | Fibre Optic Line | Migratory Bird Transect | Woodland Raptor Nesting Habitat/
Woodland Area Sensitive Bird Breeding Habitat | |
| Tap-In Location | Potential Access Road | Winter Raptor Transect | Woodland Vole Habitat | |
| Junction Box | Access Road 20m Construction Area | Woodland Communities | Terrestrial Crayfish Habitat | |
| Proposed Culvert | Potential Construction Laydown Area | Deer Congregation Areas (MNR) | Turtle Nesting Habitat/Snapping Turtle Habitat | |
| | Transformer Substation | Landbird Migratory Stopover | Turtle Habitat 30m Buffer | |

Notes

- Coordinate System: NAD 1983 UTM Zone 17N).
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
- Orthoregistry © First Base Solutions, 2010.

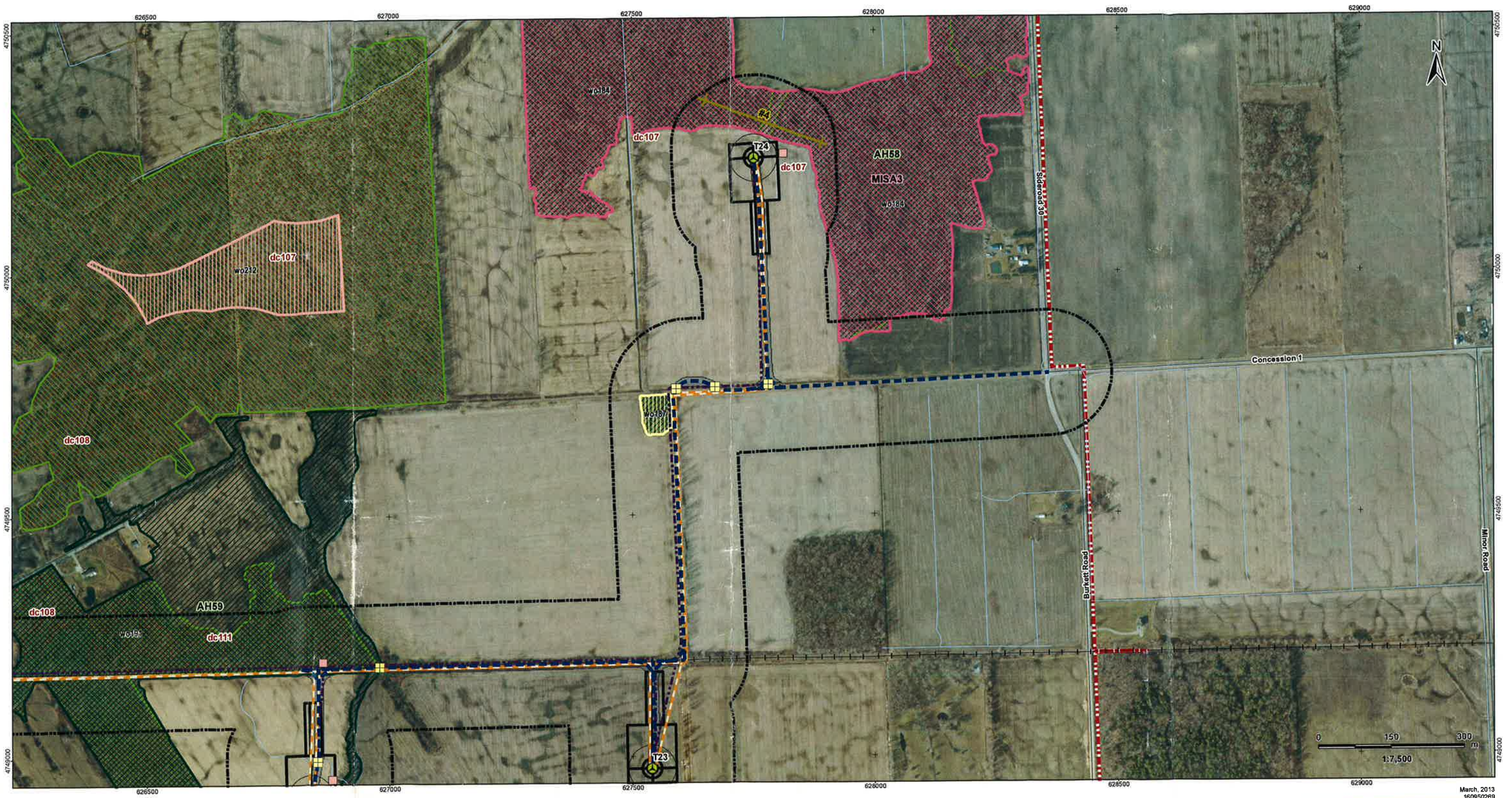


Client/Project
**Niagara Region Wind Corporation
 Natural Heritage Assessment Report**

Figure No.
6.54

Title
**Candidate Significant
 Wildlife Habitat
 Figure 6.54**

V:\16095269\printing\drawing\mxd\20130212_REA_NHA_Figures\16095269_Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
 Revised: 2013-03-25 By: bcooper



Legend

- | | | | | |
|---|---|--|--|---|
| <ul style="list-style-type: none"> Project Study Area Interconnector Study Area 120m Zone of Investigation Proposed Turbine Location Turbine Blade Length Tap-in Location Junction Box Proposed Culvert | <ul style="list-style-type: none"> Preferred Transmission Route Alternate Transmission Route Temporary Laydown Area Collector Lines - Underground or Overhead Fibre Optic Line Potential Access Road Access Road 20m Construction Area Potential Construction Laydown Area Transformer Substation | <ul style="list-style-type: none"> Amphibian Breeding Stations Snake Hibernacula Snake Hibernacula 30m Buffer MBB Point Count Location Migratory Bird Transect Winter Raptor Transect Woodland Communities Deer Congregation Areas (MNR) Landbird Migratory Stopover | <ul style="list-style-type: none"> Other Rare Vegetation Community Amphibian Breeding Habitat Cliff and Talus Communities Raptor Wintering Areas Woodland Raptor Nesting Habitat/ Woodland Area Sensitive Bird Breeding Habitat Woodland Vole Habitat Terrestrial Crayfish Habitat Turtle Nesting Habitat/ Snapping Turtle Habitat Turtle Habitat 30m Buffer | <ul style="list-style-type: none"> Turtle Wintering Area Bat Maternity Colonies |
|---|---|--|--|---|

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery © First Base Solutions, 2010.



Client/Project
**Niagara Region Wind Corporation
 Natural Heritage Assessment Report**

Figure No.
6.58

Title
**Candidate Significant
 Wildlife Habitat
 Figure 6.58**



V:\01609\Active\160950269\planning\drawing\mxd\20130212_REA_NHA_Figures\160950269_Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
 Revised: 2013.03.14 By: pwersell

March, 2013
160950269



Legend

- | | | | | |
|----------------------------|---|-------------------------------|---|------------------------|
| Project Study Area | Preferred Transmission Route | Amphibian Breeding Stations | Other Rare Vegetation Community | Turtle Wintering Area |
| Interconnector Study Area | Alternate Transmission Route | Snake Hibernacula | Amphibian Breeding Habitat | Bat Maternity Colonies |
| 120m Zone of Investigation | Temporary Laydown Area | Snake Hibernacula 30m Buffer | Cliff and Talus Communities | |
| Proposed Turbine Location | Collector Lines - Underground or Overhead | MBB Point Count Location | Raptor Wintering Areas | |
| Turbine Blade Length | Fibre Optic Line | Migratory Bird Transect | Woodland Raptor Nesting Habitat/
Woodland Area Sensitive Bird Breeding Habitat | |
| Tap-in Location | Potential Access Road | Winter Raptor Transect | Woodland Vole Habitat | |
| Junction Box | Access Road 20m Construction Area | Woodland Communities | Terrestrial Crayfish Habitat | |
| Proposed Culvert | Potential Construction Laydown Area | Deer Congregation Areas (MNR) | Turtle Nesting Habitat/Snapping Turtle Habitat | |
| | Transformer Substation | Landbird Migratory Stopover | Turtle Habitat 30m Buffer | |

Notes

- Coordinate System: NAD 1983 UTM Zone 17N).
- Base features produced under license with the Ontario Ministry of Natural Resources @ Queen's Printer for Ontario, 2011.
- Orthoimagery © First Base Solutions, 2010.

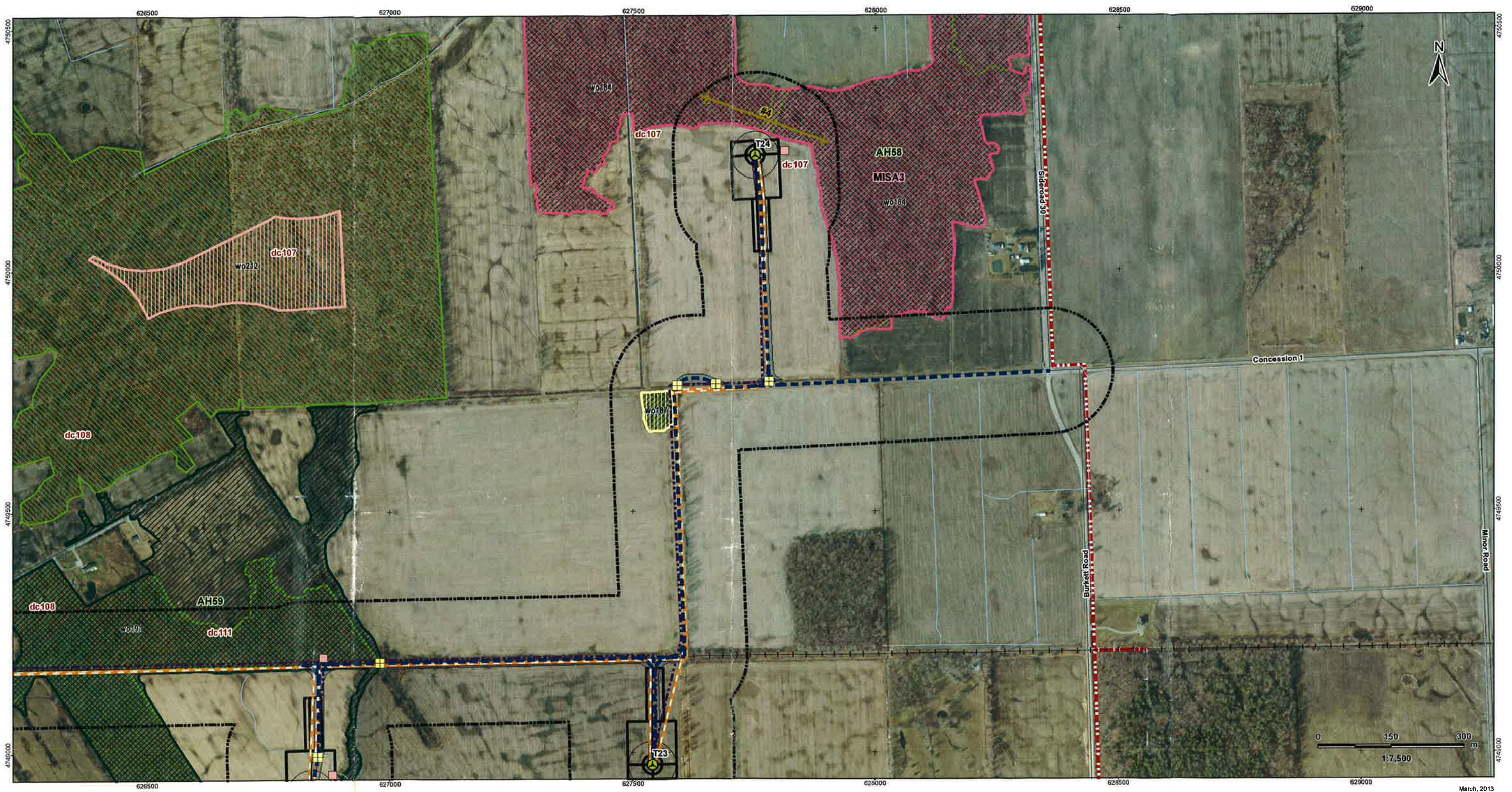


Client/Project
**Niagara Region Wind Corporation
 Natural Heritage Assessment Report**

Figure No.
6.54

Title
**Candidate Significant
 Wildlife Habitat
 Figure 6.54**

V:\0160908\Area\1609028\planning\drawing\mxd\20130212_REA_NHA_Figures\160902089_Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
 Revised: 2013-03-29 By: bcompier



Legend

Project Study Area	Preferred Transmission Route	Amphibian Breeding Stations	Other Rare Vegetation Community	Turtle Wintering Area
Interconnector Study Area	Alternate Transmission Route	Snake Hibernacula	Amphibian Breeding Habitat	Bat Maternity Colonies
120m Zone of Investigation	Temporary Laydown Area	Snake Hibernacula 30m Buffer	Cliff and Talus Communities	
Proposed Turbine Location	Collector Lines - Underground or Overhead	MBB Point Count Location	Raptor Wintering Areas	
Turbine Blade Length	Fibre Optic Line	Migratory Bird Transect	Woodland Raptor Nesting Habitat/ Woodland Area Sensitive Bird Breeding Habitat	
Tap-in Location	Potential Access Road	Winter Raptor Transect	Woodland Vole Habitat	
Junction Box	Access Road 20m Construction Area	Woodland Communities	Terrestrial Crayfish Habitat	
Proposed Culvert	Potential Construction Laydown Area	Deer Congregation Areas (MNR)	Turtle Nesting Habitat/Snapping Turtle Habitat	
	Transformer Substation	Landbird Migratory Stopover	Turtle Habitat 30m Buffer	

Notes

- Coordinate System: NAD 1983 UTM Zone 17N).
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
- Orthoimagery © First Base Solutions, 2010.

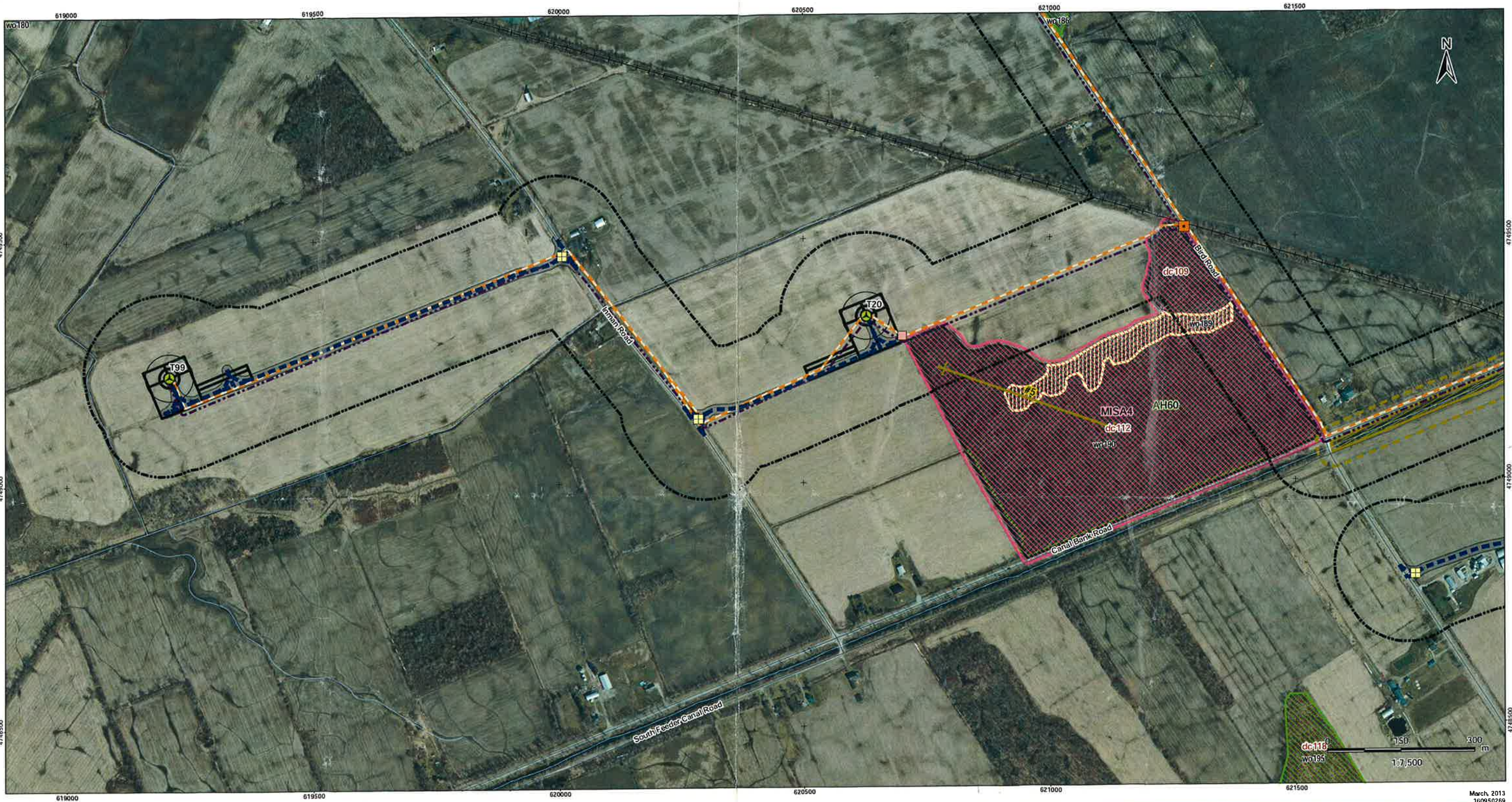


Client/Project
**Niagara Region Wind Corporation
 Natural Heritage Assessment Report**

Figure No.
6.58

Title
**Candidate Significant
 Wildlife Habitat
 Figure 6.58**

March, 2013
 160902089



V:\01609\Active\160950269\planning\drawing\mxd\20130212_REA_NHA_Figures\160950269_Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
 Revised: 2013-03-14 By: pwc/stell

March 2013
160950269



Legend

- | | | | | |
|---|---|--|---|---|
| <ul style="list-style-type: none"> Project Study Area Interconnector Study Area 120m Zone of Investigation Proposed Turbine Location Turbine Blade Length Tap-In Location Junction Box Proposed Culvert | <ul style="list-style-type: none"> Preferred Transmission Route Alternate Transmission Route Temporary Laydown Area Collector Lines - Underground or Overhead Fibre Optic Line Potential Access Road Access Road 20m Construction Area Potential Construction Laydown Area Transformer Substation | <ul style="list-style-type: none"> Amphibian Breeding Stations Snake Hibernacula Snake Hibernacula 30m Buffer MBB Point Count Location Migratory Bird Transect Winter Raptor Transect Woodland Communities Deer Congregation Areas (MNR) Landbird Migratory Stopover | <ul style="list-style-type: none"> Other Rare Vegetation Community Amphibian Breeding Habitat Cliff and Talus Communities Raptor Wintering Areas Woodland Raptor Nesting Habitat/
Woodland Area Sensitive Bird Breeding Habitat Woodland Vole Habitat Terrestrial Crayfish Habitat Turtle Nesting Habitat/Snapping Turtle Habitat Turtle Habitat 30m Buffer | <ul style="list-style-type: none"> Turtle Wintering Area Bat Maternity Colonies |
|---|---|--|---|---|

Notes

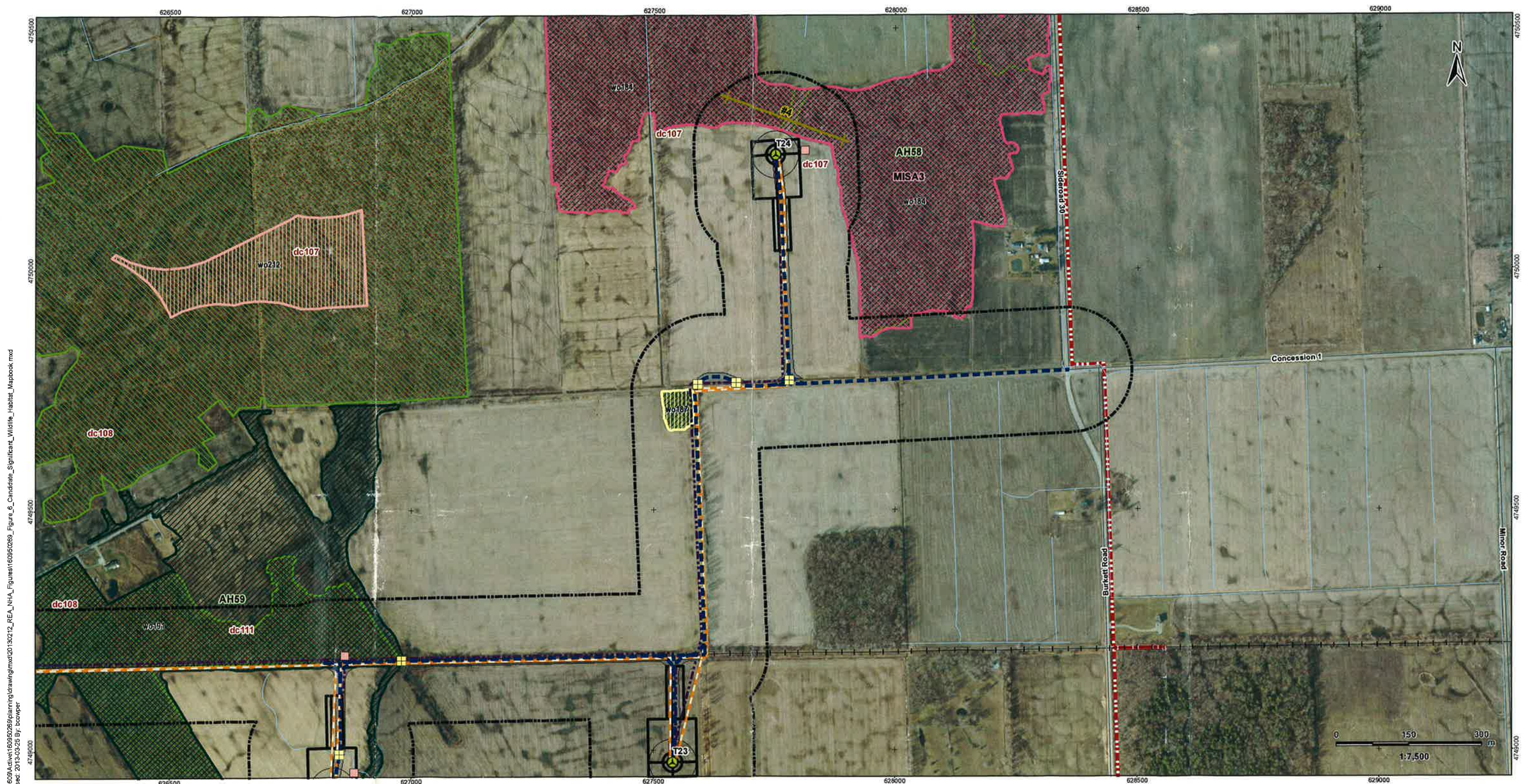
1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery © First Base Solutions, 2010.



Client/Project
**Niagara Region Wind Corporation
 Natural Heritage Assessment Report**

Figure No.
6.54

Title
**Candidate Significant
 Wildlife Habitat
 Figure 6.54**



V:\01609\A\dw\160950269\drawing\drawing\med\20130212_REA_NHA_Figures\160950269_Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
 Reviser: 2013-03-25 By: bawper

March, 2013
160950269



Legend

- | | | | | |
|---|---|--|--|---|
| <ul style="list-style-type: none"> Project Study Area Interconnector Study Area 120m Zone of Investigation Proposed Turbine Location Turbine Blade Length Tap-in Location Junction Box Proposed Culvert | <ul style="list-style-type: none"> Preferred Transmission Route Alternate Transmission Route Temporary Laydown Area Collector Lines – Underground or Overhead Fibre Optic Line Potential Access Road Access Road 20m Construction Area Potential Construction Laydown Area Transformer Substation | <ul style="list-style-type: none"> Amphibian Breeding Stations Snake Hibernacula Snake Hibernacula 30m Buffer MBB Point Count Location Migratory Bird Transect Winter Raptor Transect Woodland Communities Deer Congregation Areas (MNR) Landbird Migratory Stopover | <ul style="list-style-type: none"> Other Rare Vegetation Community Amphibian Breeding Habitat Cliff and Talus Communities Raptor Wintering Areas Woodland Raptor Nesting Habitat/Woodland Area Sensitive Bird Breeding Habitat Woodland Vole Habitat Terrestrial Crayfish Habitat Turtle Nesting Habitat/Snapping Turtle Habitat Turtle Habitat 30m Buffer | <ul style="list-style-type: none"> Turtle Wintering Area Bat Maternity Colonies |
|---|---|--|--|---|

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
3. Orthoimagery © First Base Solutions, 2010.



Client/Project
**Niagara Region Wind Corporation
 Natural Heritage Assessment Report**

Figure No.
6.58

Title
**Candidate Significant
 Wildlife Habitat
 Figure 6.58**



V:\1609\Active\160950269\planning\downing\mxd\20130212_REA_NHA_Figures\160950269_Figure_E_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
 Revised: 2013-03-14 By: p.worsell

March, 2013
160950269



Legend

Project Study Area	Preferred Transmission Route	Amphibian Breeding Stations	Other Rare Vegetation Community	Turtle Wintering Area
Interconnector Study Area	Alternate Transmission Route	Snake Hibernacula	Amphibian Breeding Habitat	Bat Maternity Colonies
120m Zone of Investigation	Temporary Laydown Area	Snake Hibernacula 30m Buffer	Cliff and Talus Communities	
Proposed Turbine Location	Collector Lines – Underground or Overhead	MBB Point Count Location	Raptor Wintering Areas	
Turbine Blade Length	Fibre Optic Line	Migratory Bird Transect	Woodland Raptor Nesting Habitat/ Woodland Area Sensitive Bird Breeding Habitat	
Tap-in Location	Potential Access Road	Winter Raptor Transect	Woodland Vole Habitat	
Junction Box	Access Road 20m Construction Area	Woodland Communities	Terrestrial Crayfish Habitat	
Proposed Culvert	Potential Construction Laydown Area	Deer Congregation Areas (MNR)	Turtle Nesting Habitat/Snapping Turtle Habitat	
	Transformer Substation	Landbird Migratory Stopover	Turtle Habitat 30m Buffer	

Notes

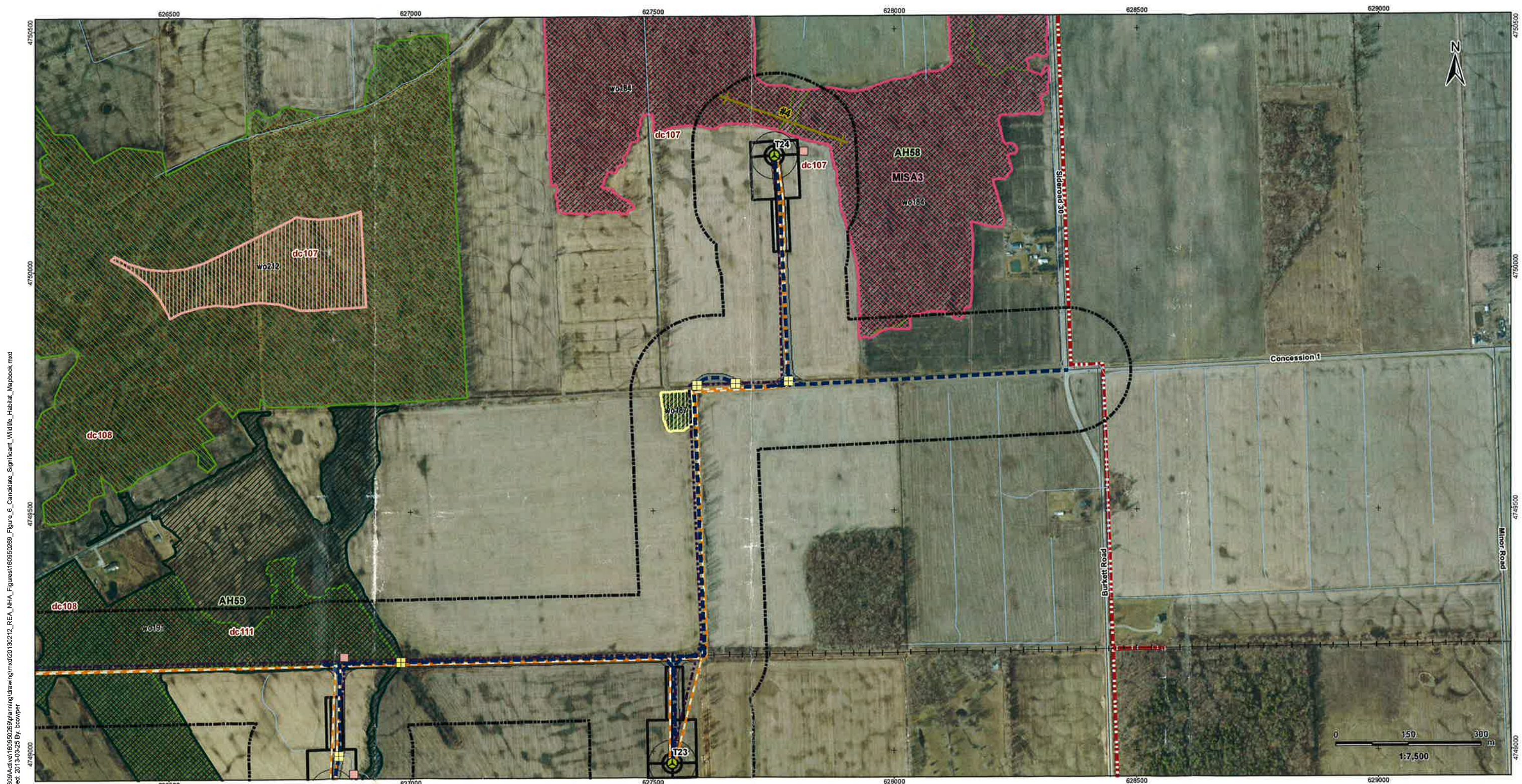
- Coordinate System: NAD 1983 UTM Zone 17N).
- Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
- Orthoimagery © First Base Solutions, 2010.



Client/Project
**Niagara Region Wind Corporation
Natural Heritage Assessment Report**

Figure No.
6.54

Title
**Candidate Significant
Wildlife Habitat
Figure 6.54**



V:\01609\Active\160950269\planning\drawing\med\20130212_REA_NHA_Figures\160950269_Figure_6_Candidate_Significant_Wildlife_Habitat_Mapbook.mxd
 Revised: 2013-03-25 By: bcwper



Legend	
	Project Study Area
	Interconnector Study Area
	120m Zone of Investigation
	Proposed Turbine Location
	Turbine Blade Length
	Tap-in Location
	Junction Box
	Proposed Culvert
	Preferred Transmission Route
	Alternate Transmission Route
	Temporary Laydown Area
	Collector Lines – Underground or Overhead
	Fibre Optic Line
	Potential Access Road
	Access Road 20m Construction Area
	Potential Construction Laydown Area
	Transformer Substation
	Amphibian Breeding Stations
	Snake Hibernacula
	Snake Hibernacula 30m Buffer
	MBB Point Count Location
	Migratory Bird Transect
	Winter Raptor Transect
	Woodland Communities
	Deer Congregation Areas (MNR)
	Landbird Migratory Stopover
	Other Rare Vegetation Community
	Amphibian Breeding Habitat
	Cliff and Talus Communities
	Raptor Wintering Areas
	Woodland Raptor Nesting Habitat/ Woodland Area Sensitive Bird Breeding Habitat
	Woodland Vole Habitat
	Terrestrial Crayfish Habitat
	Turtle Nesting Habitat/Snapping Turtle Habitat
	Turtle Habitat 30m Buffer
	Bat Maternity Colonies

- Notes**
- Coordinate System: NAD 1983 UTM Zone 17N).
 - Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
 - Orthoimagery © First Base Solutions, 2010.



Client/Project
**Niagara Region Wind Corporation
 Natural Heritage Assessment Report**

Figure No.
6.58

Title
**Candidate Significant
 Wildlife Habitat
 Figure 6.58**

March, 2013
 160950269



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Migratory Bird Survey Observation Form

Stantec

Project Number: 160950269

Project Name: NRWC

Date: Sep 24/2013

Field Personnel: J. Ball

Weather Conditions:	TEMP (°C):	WIND:	CLOUD:	PPT:	PPT (in last 24 hrs):
	8	0	0	NONE	NONE

Start Time: 8:30 am

End Time: 8:45 am

Start Point UTM: 0627498/4750338

End Point UTM: 0627750/04750319

Habitat: FOD

Transect: 4

Feature #: MLSA 3

Species	Tally
SOSP	:
AMGO	.
AMCR	:
NOFL	.
BCCH	:
GRCA	:
DOWO	.
unknown	• - sounded like the chattering of a SOSP
CAGO	<input checked="" type="checkbox"/> heard later on during the survey
AMRO	..
MODO	.
BLJA	.
unknown sp	• 'chipping' in canopy

Signature: Jane Ball
 (Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____
 (Project Manager)



Stantec

Stantec Consulting L'c
70-1 Southgate Drive
Guelph, Ontario, Canada
N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

**Reptile Survey
Observation Form**
hibernacula survey

SH1

Project Number 160950269

Project Name: Niagara Wind Farm

Date / Time: 2:50PM - 3:10 PM, April 14/2013

Field Personnel: J. Ball

Weather Conditions:	Temp: <u>9</u>	Wind: <u>1</u>	Cloud: <u>60%</u>	PPT: <u>None</u>	PPT in last 24 hrs: <u>Rain</u>
---------------------	----------------	----------------	-------------------	------------------	---------------------------------

(Sunny at time of survey)

LOCATION	TIME	SPECIES	HABITAT DESCRIPTION	OTHER NOTES
SH1	N/A	None observed	Brush piles of varying sizes at the edge of FOD are the hibernacula. Located just off accessible property. Searched accessible property thoroughly including the edge of the ag field and up to the edge of the wetland. Lifted loose bark and other debris. <u>NO UTRs taken</u>	

Quality Control: This form is completed & legible ✓
Signature: Jane Ball
(Field Personnel)

Signature: _____
(Project Manager)

Page 1 of 1



Stantec

Stantec Consulting L^o
70-1 Southgate Drive
Guelph, Ontario, Canada
N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

**Reptile Survey
Observation Form**

SH4

Project Number 160950269

Project Name: Niagara Wind Farm

Date / Time: April 14 / 2013 3:55-4:15pm

Field Personnel: J. Ball

Weather Conditions:	Temp: <u>9</u>	Wind: <u>2</u>	Cloud: <u>40%</u>	PPT: <u>None</u>	PPT in last 24 hrs: <u>Rain</u>
---------------------	----------------	----------------	-------------------	------------------	---------------------------------

~~SH4~~ ~~DO NOT ATTEMPT TO CROSS THE BRIDGE~~

LOCATION	TIME	SPECIES	HABITAT DESCRIPTION	OTHER NOTES
17T 0622248/7 4763247	N/A	None observed	Hibernacula is a pile of logs (posts). Searched south side of water body from the shore, up the slope and along the edge of the Ag field	
			Photos taken	
			Full sun during entire survey. No debris in the area to check under	

Quality Control: This form is complete & legible

Signature: [Signature]
(Field Personnel)

Signature: _____
(Project Manager)

Page _____ of _____



Stantec

Stantec Consulting Ltd.
70-1 Southgate Drive
Guelph, Ontario, Canada
N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Reptile Survey Observation Form

Project Number 1609502169 Project Name: NRWC - Snake Hibernacula Survey

Date / Time: April 15, 2013 Field Personnel: A O R R

Weather Conditions:	Temp: <u>15-20</u>	Wind: <u>0</u>	Cloud: <u>0%</u>	PPT:	PPT in last 24 hrs:
				<u>None</u>	<u>None</u>

11:00 - 5 pm

LOCATION	TIME	SPECIES	HABITAT DESCRIPTION	OTHER NOTES
SH3	11:20-11:40	N/A	Pile of down woody debris in edge of FOD/Ag field. UTM = 0626997 / 4756547	SPPE / CHFR
SH6	12:50-1:10	N/A	Pile of sand; low high on edge of FOD/Ag field. UTM = 0623697 / 4753108	SPPE
SH7 - Access? Tower?	2:30-2:50	N/A	Old fallen trees? or could be old silo of bricks. UTM = 0619391 / 4754525	Surfaced from road as source of access. Could not go out 30m. Walk up a down edge of road / CUP-3
SH5	3:55-4:15	1EA earler	Pile of down woody debris in SWT & open lawn. UTM = 0624562 / 4763842	SPPE & CHFR Great habitat for "hibernacula"
SH2	4:30-4:50	N/A	Large pile of stones and concrete in middle of Ag field / #1111 UTM = 0623872 / 4764440	TUVU & CHFR Great habitat for "hibernacula"

Quality Control: This form is complete () & legible ()

Signature: [Signature] (Field Personnel)

Signature: _____ (Project Manager)

Page 1 of 1



Stantec Consulting Ltd.
70-1 Southgate Drive
Guelph, Ontario, Canada
N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Stantec

Reptile Survey Observation Form

Basking Turtles

Project Number 160950269 Project Name: NRWC - Basking Turtles.

Date / Time: April 15, 2013 Field Personnel: A. ORR

Weather Conditions:	Temp: <u>15</u>	Wind: <u>2</u>	Cloud: <u>30%</u>	PPT:	PPT in last 24 hrs:
				<u>None</u>	<u>None</u>

LOCATION	TIME	SPECIES	HABITAT DESCRIPTION	OTHER NOTES
TL1	3:35	N/A	Welland River - along Rd. See photos. 0621619 / 4761185.	GBHE, CAGO

Quality Control: This form is complete () & legible ()

Signature: [Signature] (Field Personnel)

Signature: _____ (Project Manager)

Page 1 of 1



Stantec

Stantec Consulting Ltd.
70-1 Southgate Drive
Guelph, Ontario, Canada
N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Reptile Survey Observation Form

Project Number 160950269 Project Name: NRWC.
 Date / Time: May 21, 2013 Field Personnel: A ORR
 Weather Conditions: Temp: 23-26 Wind: 2-3 Cloud: 60-80% PPT: None
 PPT in last 24 hrs: T. Storm

Start 10am - 4pm

LOCATION	TIME	SPECIES	HABITAT DESCRIPTION	OTHER NOTES
SH1	10:20-10:40	—	Pile of sticks/logs in forest edge. (FOD) 0618290 / 4766954	Incidentals: SHH, MALL, CAGO,
SH2	11:05-11:25	—	Pile of rocks/concrete in ag. field.	Incidentals: BOBO, TUNU, RUBL, SOS, KILL,
SH5	11:30-11:50	—	Pile of sticks/logs in OUM / SWT	Sunguy from side of road. NO ORR. YEWB INTC: RUBL, WAVI, SOS, MALL, BOBO, KILL, BOBO, RUBL,
SH4	12:10-12:30	—	Pile of logs adjacent man/cum	BARIS
Basking Turtles/ Millard River	1:00-1:20	—	0622354 / 4766438	Incidentals: TUNU, RUBL, WAVI
SH3	1:35-1:55	—	Pile of sticks/logs in FOD	
SH7	2:00-2:20	—	Down logs, pile of sticks, old foundation.	Sway from road to no orr

Quality Control: This form is complete () & legible ()
 Signature: [Signature] (Field Personnel)
 Signature: _____ (Project Manager)



Turtle Overwintering and
Snake Hibernacula Surveys May 2/2013
160950269 Niagara Wind Farm
J. Ball

Stantec

SH6 10:45-11:00am

Temp = 18°C Wind = 1 Cloud = 0 Precip = 0

Searched 30m on either side of SH6 along the Ag field. Did not enter crops as I did not wish to trample them. Searched 30m into the upland deciduous forest. Did not focus on the wet, lowland forest areas. No snakes observed

SH3 11:35-11:55

Temp = 19°C Wind = 2 Cloud = 0 Precip = 0

17T 0620881/4756520 small brown snake observed within 100m of SH3. Observed on tractor trail within Ag field. Searched the upland forest within 30m of potential hibernacula as well as the edge of the Ag field. There are several brush piles. I focused on brush piles on the south side of the woodlot as piles of the north side were in wet, low-lying areas. Snake observed

SH7 12:25-12:35

Temp 21°C Wind = 2 Cloud = 0 Precip = 0

No direct access. Searched entire shoulder of road along the length of the CUP3. Looked into the edge of CUP3 for snakes. No snakes observed.

Turtle Survey (Transmission Line Across River) (weather condition same as above)
12:50-13:05 17T 0622333/4761361

No turtles observed. Searched 120m of either side of proposed Transmission Line with focus on logs for basking. (and riverbank)

Designed by:

Checked by:



Snake Hibernacula Surveys May 2/2013

160950269 Niagara Wind Farm J. Ball

Weather: Temp 23°C Wind=2 Cloud=0 Precip=0

SH5 13:40-13:45

searched lawn, swamp thicket and meadow marsh (within 30m of hibernacul)
Concentrated on areas closest to hibernacula. No snakes found. Need to confirm whether we have access.

SH2 13:55-14:15

searched area surrounding old foundation including Ag field, manure pile (although I did not climb it), meadow marsh and road. No snakes observed - photos taken.

SH4 14:30-14:50

searched sloped area up to the Ag field. Searched both side of bridge (north side up to the electric fence) since the snake hibernacula identified may have originally included the bridge foundation. No snakes observed.

SH1 15:30-15:50

Searched accessible area and edge of Ag field. No snakes observed. Photo taken.



Stantec Consulting Ltd.
70-1 Southgate Drive
Guelph, Ontario, Canada
N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Stantec

**(COVER-WINTERING
TURTLES) Reptile Survey
Observation Form**

Project Number 160950269 Project Name: Niagara Wind Farm

Date / Time: April 18/2013 11:00-11:15 Field Personnel: J. Ball

Weather Conditions: Temp: 25 Wind: 2 Cloud: 80% PPT: NONE PPT in last 24 hrs: NONE

(Sunny during survey)

LOCATION	TIME	SPECIES	HABITAT DESCRIPTION	OTHER NOTES
120m search on either side of transmission line	11:00-11:15	N/A	some logs for basking in water. At field all the way to river bank on north side	
4761388			thicket to edge of river on north side, checked logs and bank for basking turtles - none found	

Quality Control: This form is complete & legible

Signature: J. Ball (Field Personnel)

Signature: _____ (Project Manager)

Page 1 of 1



Stantec

Stantec Consulting Ltd.
70 Southgate Drive
Guelph, Ontario, Canada
N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Site Visit Record

Project Number: _____

Project Name: NWRC

Date / Time: June 11, 2013

Field Personnel: Melissa Cameron

Weather Conditions:

Temp:

22°C

Wind:

2-3

Cloud:

100%

PPT:

Ø

PPT in last 24 hrs:

>5mm

Time: Description of Activities and Observations

2:20

TH-45

Photos ~~from~~ 168-174

- pond surrounded by red maple, ash, willow thicket
- piled gravel to ~~west~~ west of pond and gravel substrate at northwest between gravel piles and gravel railway ROW
- west end of pond is dense cattail marsh and shrub swamp

TH-3

Photo 165-167

- wetland in red maple, ash, cottonwood thicket with some open water (shallow) and cattail marsh
- surrounded by gravel roads to west and north, and agricultural field to south
- no exposed mineral soil or gravel besides access road
- heavy (saturated) clay soil along ditch at east end

(AI)
* Adjacent landowner noted that Blanding's are observed in this area. - typically in woods during turkey hunting season

Quality Control: This form is complete () & legible ().

Signature: Melissa Cameron
(Field Personnel)

Signature: _____
(Project Manager)

Page 1 of 5

REV: May, 07 Form 028

