Ernestown Wind Park

Bat Maternity Roosting Area Habitat-use Surveys Report

Prepared by: *M.K. Ince and Associates Ltd.*

Prepared for: *Ernestown Windpark LP*

July 18, 2013

M.K. INCE AND ASSOCIATES LTD.
Renewable Energy & Environmental Consulting

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1 INTRODUCTION

Site investigations of the Ernestown Wind Park for the presence of bat maternity roosting candidate habitat was conducted by AET in 2010 and followed the *Draft Bat and Bat Habitats: Guidelines for Wind Power Projects* (MNR, 2010). During 2010, surveys of all woodlands within 120 m of the project location were searched for potential roosting sites. The presence of four candidate bat maternity roosting habitats were identified (BMR01, BMR02, BMR03 and BMR04; see **Figure 1-1**). These candidate habitats were identified in tree cavities and vegetation within all ecosites of deciduous and mixed forest habitats. **Table 1-1** below presents additional information on the candidate habitats identified during the site investigation.

Table 1-1: Description of Candidate Bat Maternity Roosting Areas

Feature ID	Project Components within 120 m	Attributes and Composition	Function	Associated Natural Features
		ELC Community		
BMR01	Access Road (35m) Collector (40m)	Associated with FODM6-1 (ELC ID: 37); cavity identified in White Ash tree in WO04	Individual tree cavities may provide suitable maternity roosts. Tree cavities identified during area searches will be used to determine if maternity roosting sites exist in the *Evaluation of Significance Report.*	Woodland (WO04)
BMR02	N/A	Associated with FODM6-1 (ELC ID: 35); cavity identified in White Ash tree in WO04		Woodland (WO04)
BMR03	Access Road (93m) Collector (91m)	Associated with SWDM2-1 (ELC ID: 36); cavity identified in White Oak tree in WO04		Woodland (WO04)
BMR04	N/A	Associated with FODM9-4 (ELC ID: 57); cavity identified in Trembling Aspen tree in WO04		Woodland (WO06)

The *Natural Heritage Evaluation of Significance Report* (MKI, 2012) did not report on the outcomes of the evaluation of significance for BMR01, BMR02, BMR03 and BMR04, due to seasonality constraints and surveys unable to be conducted prior to the submission of the Natural Heritage Assessment. Consequently, the listed candidate habitats were treated as significant and subject to additional habitat-use surveys to determine significance. This process of treating a habitat as significant and committing to

undertake studies prior to construction is outlined in Appendix D of the Natural Heritage Assessment Guide (MNR, 2011).

This report presents the results from the pre-construction habitat-use surveys for BMR01, BMR02, BMR03 and BMR04.

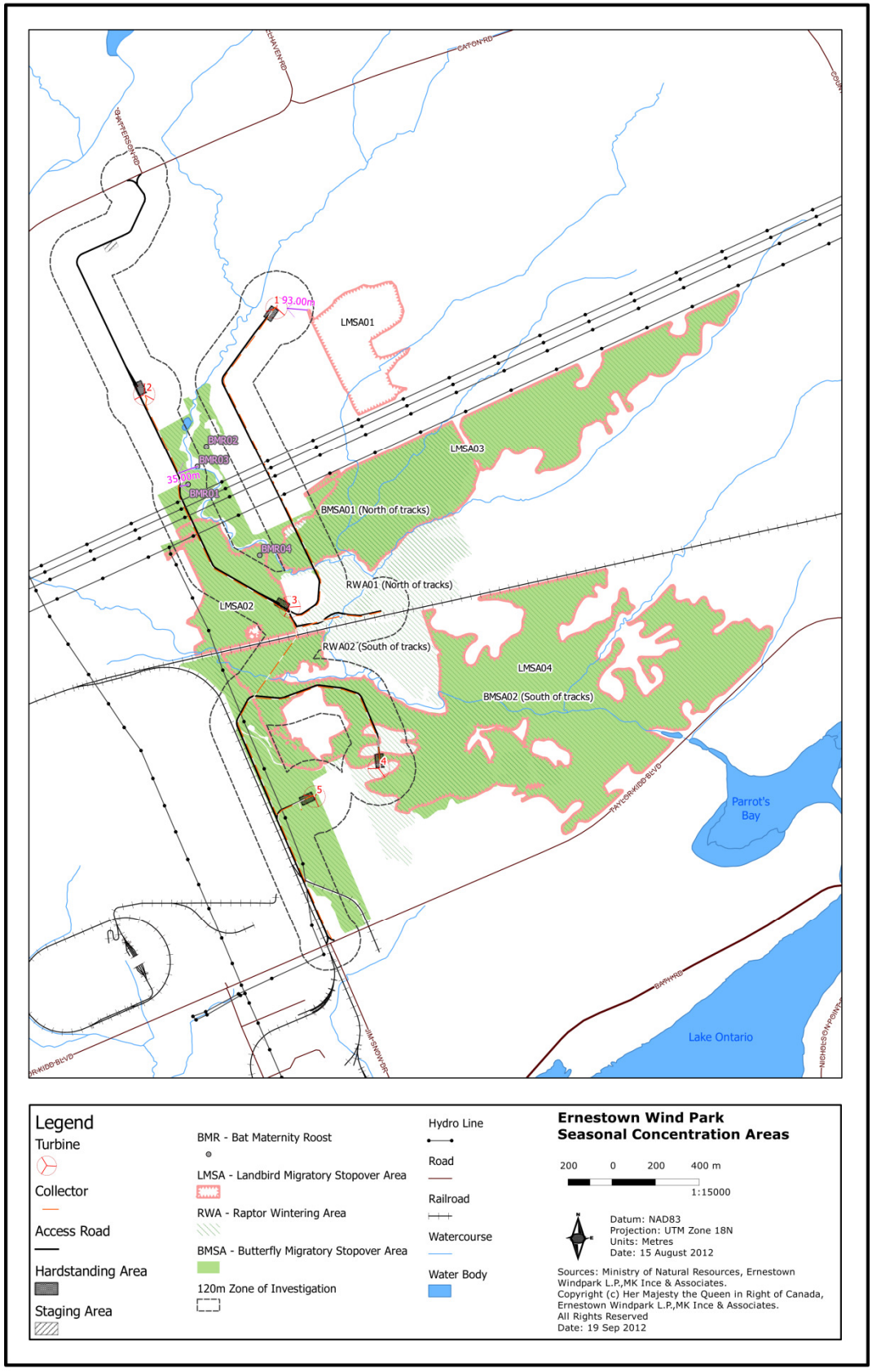

Figure 1-1: Map indicating location of candidate Bat Maternity Roosting Areas at Ernestown Wind Park

2 METHODOLOGY

Detailed methodology for pre-construction surveys to evaluate the significance of BMR01, BMR02, BMR03 and BMR04 was provided within the *Natural Heritage Environmental Impact Study Report* (MKI, 2012). To summarize, the methodology used to observe for the presence of roosting bats followed the 2010 *Draft Bats and Bat Habitats: Guidelines for Wind Power Projects* (MNR, 2010). Candidate roost trees were monitored by a field crew on warm or mild nights (>10°C) with low winds and no precipitation. Although the methodology established by the MNR indicated that surveying should take place between June 1 and June 30, weather constraints through the presence of heavy rainfall and site flooding resulted in two days of monitoring in July for BMR02, BMR03 and BMR04, and one day of surveying in July for BMR01. The extension in the established surveying period was discussed and approved by a Renewable Energy Planning Ecologist at Ontario Ministry of Natural Resources, Eric Prevost (see **Appendix A**).

Visual monitoring of the candidate bat roosting habitats was conducted between dusk and up to 5 hours post-dusk. As there was no activity observed during the initial visit, 10 subsequent visits took place to confirm that the sites were not bat maternity roosting sites. Acoustic stations were positioned within 10 m of the potential roosts at BMR01, BMR02 and BMR04 with monitoring commencing at dusk to accompany visual monitoring. Due to inclement weather conditions, candidate roost site BMR03 was flooded and acoustical monitoring equipment was not able to be used for the first 5 visits, resulting in the use of only visual monitoring; acoustical monitoring equipment was used once the water levels reduced to a safe depth.

The acoustic monitoring equipment used was Avisoft UltraSoundGate 116H which used a modern broadband bat detector with a condenser microphone. Sonobat software was used to analyze recordings and identify bat calls. Data analysis was performed by Erin Jaggard (see CV in **Appendix C**).

3 RESULTS

A summary of the pre-construction habitat-use surveys for BMR01, BMR02, BMR03 and BMR04 at the Ernestown Wind Park Project is provided in **Table 3-1** below. Details on the dates, time, weather conditions during each site visit, as well as the names of each of the investigators is provided. All site investigations were overseen by Erin Jaggard (see CV in **Appendix C**).

Table 3-1: Summary of Site Visits

Date	Habitat Surveyed	Start/ End Time	Weather Conditions	Site Investigators
2013-06-11	BMR01	20:37-21:54	Temp: 16°C Cloud Cover: 1/10 Wind (Beaufort): 3 Precipitation: none	Ryan Benvenuti
2013-06-12	BMR01	20:20-21:50	Temp: 18°C Cloud Cover: 0/10 Wind (Beaufort): 0 Precipitation: none	Jean Blair
	BMR02			Connor Edington
	BMR03			Heather Hodgson

Date	Habitat Surveyed	Start/ End Time	Weather Conditions	Site Investigators
	BMR04			Ryan Benvenuti
2013-06-13	BMR01	20:20-21:50	Temp: 18°C Cloud Cover: 10/10 Wind (Beaufort): 0 Precipitation: light to moderate	Jean Blair
	BMR02			Connor Edington
	BMR03			Heather Hodgson
	BMR04			Ryan Benvenuti
2013-06-18	BMR01	20:25-21:55	Temp: 16°C-20°C Cloud Cover: 0/10-2/10 Wind (Beaufort): 1 Precipitation: none	Jean Blair
	BMR02			Connor Edington
	BMR03			Heather Hodgson
	BMR04			Ryan Benvenuti
2013-06-19	BMR01	20:27-21:57	Temp: 15°C-20°C Cloud Cover: 0/10-1/10 Wind (Beaufort): 0 Precipitation: none	Jean Blair
	BMR02			Connor Edington
	BMR03			Heather Hodgson
	BMR04			Ryan Benvenuti
2013-06-20	BMR01	20:25-21:55	Temp: 18°C Cloud Cover: 0/10 Wind (Beaufort): 0 Precipitation: none	Jean Blair
	BMR02			Connor Edington
	BMR03			Heather Hodgson
	BMR04			Ryan Benvenuti
2013-06-24	BMR01	20:25-21:55	Temp: 27°C-30°C Cloud Cover: 1/10 Wind (Beaufort): 1 Precipitation: none	Ryan Benvenuti
	BMR02			Connor Edington
	BMR03			Heather Hodgson
	BMR04			Jean Blair
2013-06-26	BMR01	20:25-21:55	Temp: 26°C-30°C Cloud Cover: 1/10-2/10 Wind (Beaufort): 1 Precipitation: none	Ryan Benvenuti
	BMR02			Connor Edington
	BMR03			Heather Hodgson
	BMR04			Jean Blair

Date	Habitat Surveyed	Start/ End Time	Weather Conditions	Site Investigators
2013-06-27	BMR01	20:25-21:55	Temp: 25°C-30°C Cloud Cover: 3/10 Wind (Beaufort): 0 Precipitation: none	Ryan Benvenuti
	BMR02			Connor Edington
	BMR03			Heather Hodgson
	BMR04			Jean Blair
2013-07-03	BMR01	20:25-21:55	Temp: 27°C-29°C Cloud Cover: 5/10-9/10 Wind (Beaufort): 0-1 Precipitation: none	Rob Tymstra
	BMR02			Connor Edington
	BMR03			Heather Hodgson
	BMR04			Jean Blair
2013-07-04	BMR02	20:20-21:50	Temp: 28°C-30°C Cloud Cover: 0/10 Wind (Beaufort): 1-2 Precipitation: none	Connor Edington
	BMR03			Heather Hodgson
	BMR04			Jean Blair

All observations made during the three site visits can be seen in **Table 3-2** below. Please see **Appendix B** for a copy of all field notes as well as field maps indicating the location of each of the observations.

Table 3-2: All Bat Roost Observations during Pre-Construction Habitat-Use Surveys of BMR01, BMR02, BMR03 and BMR04.

Date	Habitat Surveyed	Visual Observations	Acoustical Recording Observations	Notes
2013-06-11	BMR01	No bats observed in cavity	No bats recorded on audio detector	
2013-06-12	BMR01	No bats observed in cavity	Bats recorded on audio detector 27 instances of bat passes recorded on detector	
	BMR02	No bats observed in cavity	No bats recorded on audio detector	
	BMR03	No bats observed in cavity	No audio equipment used due to inclement weather conditions	
	BMR04	No bats observed in cavity Bats seen in flythrough at 21:10	No bats recorded on audio detector	
2013-06-13	BMR01	No bats observed in cavity	Bats recorded on audio detector	

Date	Habitat Surveyed	Visual Observations	Acoustical Recording Observations	Notes
			4 instances of bat passes recorded on detector	
	BMR02	No bats observed in cavity	No bats recorded on audio detector	
	BMR03	No bats observed in cavity	No audio equipment used due to inclement weather conditions	
	BMR04	No bats observed in cavity	No bats recorded on audio detector	
2013-06-18	BMR01	No bats observed in cavity	No bats recorded on audio detector	- Numerous small birds
	BMR02	No bats observed in cavity	No bats recorded on audio detector	
	BMR03	No bats observed in cavity	No audio equipment used due to inclement weather conditions	
	BMR04	No bats observed in cavity	No bats recorded on audio detector	
2013-06-19	BMR01	No bats observed in cavity	Bats recorded on audio detector 4 instances of bat passes recorded on detector	
	BMR02	No bats observed in cavity	No bats recorded on audio detector	- Chipmunk seen in cavity
	BMR03	No bats observed in cavity	No audio equipment used due to inclement weather conditions	- Saw small flying animal pass tree
	BMR04	No bats observed in cavity	No bats recorded on audio detector	
2013-06-20	BMR01	No bats observed in cavity	Bats recorded on audio detector 31 instances of bat passes recorded on detector	
	BMR02	No bats observed in cavity	No bats recorded on audio detector	
	BMR03	No bats observed in cavity	No audio equipment used due to inclement weather conditions	
	BMR04	No bats observed in cavity	No bats recorded on audio detector	
2013-06-24	BMR01	No bats observed in cavity	Bats recorded on audio detector 87 instances of bat passes recorded on detector	- Chickadee seen in cavity 2 m high
	BMR02	No bats observed in cavity	No bats recorded on audio detector	

Date	Habitat Surveyed	Visual Observations	Acoustical Recording Observations	Notes
	BMR03	No bats observed in cavity	No bats recorded on audio detector	
	BMR04	No bats observed in cavity	No bats recorded on audio detector	
2013-06-26	BMR01	No bats observed in cavity Observed a bat flying past tree line at 21:41	Bats recorded on audio detector 102 instances of bat passes recorded on detector	
	BMR02	No bats observed in cavity	No bats recorded on audio detector	
	BMR03	No bats observed in cavity	No bats recorded on audio detector	
	BMR04	No bats observed in cavity	No bats recorded on audio detector	
2013-06-27	BMR01	No bats observed in cavity	Bats recorded on audio detector 36 instances of bat passes recorded on detectors	
	BMR02	No bats observed in cavity	No bats recorded on audio detector	
	BMR03	No bats observed in cavity	No bats recorded on audio detector	
	BMR04	No bats observed in cavity	No bats recorded on audio detector	
2013-07-03	BMR01	No bats observed in cavity One small bat flyover at 20:55 One pair of large bats flyover at 21:25	Bats recorded on audio detector 29 instances of bat passes recorded on detectors	
	BMR02	No bats observed in cavity	No bats recorded on audio detector	
	BMR03	No bats observed in cavity	No bats recorded on audio detector	
	BMR04	No bats observed in cavity	No bats recorded on audio detector	
2013-07-04	BMR02	No bats observed in cavity	No bats recorded on audio detector	
	BMR03	No bats observed in cavity	No bats recorded on audio detector	
	BMR04	No bats observed in cavity	No bats recorded on audio detector	

To evaluate each habitat, the *Significant Wildlife Habitat Ecoregion 6E Criterion Schedule* (MNR, 2012) was used. This document states that a habitat is considered significant with the presence of twenty or

more Eastern Pipistrelle (Tri-coloured Bats) or Northern Long-eared Myotis, thirty or more Big Brown Bats, 50 or more Little Brown Myotis or more than ten adult female Silver-haired Bats.

There were no bats observed in cavities. Therefore the criteria for significance were not met for any of the candidate bat maternal roost habitats. See **Table 3-3** below for totals.

Table 3-3: Total and mean observations and recorded passes

Candidate Habitat	Total observations in cavity	Total recorded passes	Mean passes/night	Mean passes/hour
BMR01	0	320	32	21.3
BMR02	0	0	0	0
BMR03	0	0	0	0
BMR04	0	0	0	0

4 CONCLUSION

There were eleven site visits made to Ernestown Wind Park to evaluate four candidate habitats treated as significant in the *Natural Heritage Evaluation of Significance Report* (MKI, 2012). Pre-construction habitat-use surveys were conducted in June and July 2013. Although some bats were observed flying past the candidate habitats and detected through the audio equipment, these bats were not observed in roosts. The candidate habitats therefore did not meet criteria for significance. Consequently, the potential negative environmental effects and mitigation measures as well as the environmental effects monitoring plan for BMR01, BMR02, BMR03 and BMR04 presented in the *Natural Heritage Environmental Impact Study Report* (MKI, 2012) are not applicable to the Ernestown Wind Park Project, as the habitats have not been determined to be significant.

5 REFERENCES

M.K. Ince and Associates. 2012. *Natural Heritage Evaluation of Significance Report.* 133p.

M.K. Ince and Associates. 2012. *Natural Heritage Environmental Impact Study Report.* 78p.

Ministry of Natural Resources. 2010. *Draft Bat and Bat Habitats: Guidelines for Wind Power Projects.* Queen's Printer for Ontario. 24 p

Ministry of Natural Resources. 2012. *Significant Wildlife Habitat Ecoregion 6E Criterion Schedule*. 42p.

Ministry of Natural Resources. 2011. *Natural Heritage Assessment Guide for Renewable Energy Projects.* 99p.

6 QUALIFICATIONS AND LIMITATIONS

M. K. Ince & Associates Ltd. (MKI) has prepared this report in accordance with its proposal and information provided by its Client. The information and analysis contained herein is for the sole benefit of the Client and save for regulatory review purposes may not be relied upon by any other person.

MKI's assessment was made in accordance with guidelines, regulations and procedures believed to be current at this time. Changes in guidelines, regulations and enforcement policies can occur at any time and such changes could affect the conclusions and recommendations of this report.

The reports, maps and related documents may rely on information provided to MKI by the Client. This information may include but is not limited to manufacturer and construction specifications and other related information. Maps are created using a Geographic Information System (GIS) that compiles records, information, and data from various sources which may contain errors. While we have referred to and made use of reports, maps and geospatial data and specifications prepared by others, we assume no liability for the accuracy of the information contained within.

Maps and documents made available by MKI are not legal surveys and are not intended to be used as such. No original surveying is included as part of these maps. If any contradictions exist between this document and relevant municipal, provincial or federal laws, regulations, codes, or policies, the text of the laws, regulations, codes or policies will be the legal authority.

APPENDIX A – PROTOCOL AND CORRESPONDENCE

- Survey protocol, extracted from Natural Heritage Environmental Impact Study Report, September 28, 2012 (two pages)
- Email correspondence, June 12, 2013 through June 25, 2013 (3 pages)

RAPTOR WINTERING AREA (RWA01 & RWA02)

Field staff will visit identified candidate raptor wintering areas to observe for the presence of wintering raptors and will evaluate habitat according to methodology outlined in the *Bird and Bird Habitats: Guidelines for Wind Power Projects* (OMNR, 2011) for "standardized area searches". Preselected transect routes will be selected within the candidate habitat. Prior to conducting surveys the MNR district office will be contacted to approve transect routes. Transects will be walked in field and GPS tracks will be recorded.

Surveys will be conducted by an individual experienced in identifying the birds of eastern North America both aurally and visually. Transects will be walked six times throughout January-early March. All surveys will be conducted during late morning or early afternoon. No surveys will be conducted during severe weather events such as heavy precipitation, as this can bias results. All birds heard or seen will be recorded and flyovers will be clearly indicated. Surveyors will record the following data at each visit on standardized data forms (see **Appendix A1**):

- Date
- Names of people conducting the work
- Time (start and end time of transect; duration of time it took to walk the transect)
- Weather conditions (temperature, %cloud cover, Beaufort wind scale, visibility)
- GPS track of each transect
- Species observed and total number of individuals of each species detected along the transect
- Behaviour recorded as : foraging, flying , perching, perched on ground
- Height category (0=0-9m; 1=10-19m; 2=20-29m; 3=30-39m, etc.)
- Flight direction
- Direction and distance from observer

Species of particular interest (focal species) include: Rough-legged Hawk, Red-tailed Hawk, Northern Harrier, American Kestrel, Snowy Owl, and Short-eared Owl (COSSARO: Special Concern).

The *Draft Ecoregion 6E Criterion Schedule* (OMNR, 2012) will be used to evaluate candidate habitat for significance. This document states that a habitat is considered significant if the area is used by one or more Short-eared Owls, or ten individuals of the two focal species. The site must be used for a minimum of 20 days to be considered significant. The presence of Short-eared Owls would also classify the area as habitat for special concern and rare wildlife species, as these species are currently listed as Special Concern by COSSARO.

BAT MATERNITY ROOST (BMR01, BMR02, BMR03 & BMR04)

Field staff will visit identified candidate bat maternity roosts to observe for the presence of roosting bats and will evaluate habitat according to methodology from the 2010 *Draft Bats and Bat Habitats: Guidelines for Wind Power Projects* (OMNR, 2010). Candidate roost trees will be monitored, by biologists experienced in bat identification and monitoring, during warm or mild nights (>10°C) with low winds and no precipitation between June 1 and June 30. Visual monitoring of the potential roost will be conducted between dusk and up to 5 hours post-dusk. If no activity is observed on the initial visit, a

minimum of 10 subsequent visits will take place to confirm that the site is not a roost. Acoustic stations will be positioned within 10 m of the potential roost with monitoring commencing at dusk.

Acoustic monitoring will be done using modern broadband bat detectors with condenser microphones. The system will allow the surveyor to determine the signal to noise ratio of the recorded signals (i.e. from oscillograms or time-amplitude displays). Microphones will be positioned to maximize bat detection (i.e. situated away from nearby obstacles to allow for maximum range of detection, microphones angled slightly away from the prevailing wind to minimize wind noise). The same acoustic monitoring system will be used throughout the survey. All relevant information on the acoustic equipment will be recorded, including information on all adjustable settings (i.e. gain level), the position of the microphones, dates and times by station when recorded was conducted. Additionally, at each visit field staff will record: date, start time, end time, weather, species observed, number of individuals and behavior in field notes.

Data attained from acoustic surveys will be analyzed to identify species whenever possible. Any unidentified species will be included in analysis and reporting. Collected information will include the total and mean bat passes (i.e. sequence of two or more echolocation calls) per detector hour and per night as a function of bat activity at the survey station.

Species of particular interest (focal species) include: Big Brown Bat, Little Brown Myotis, Eastern Pipistrelle (Tri-coloured Bat), Northern Long-eared Myotis, Eastern Small-footed Myotis, and Silver-haired Bat.

The 2009 *Draft SWH Ecoregion 6E Criteria Schedules* (OMNR, 2009) will be used to evaluate candidate habitat for significance. This document states that a habitat is considered significant with the presence of twenty or more Eastern Pipistrelle (Tri-coloured Bats) or Northern Long-eared Myotis, ≥30 Big Brown Bats, ≥50 Little Brown Myotis or >10 Adult Female Silver-haired Bats.

MIGRATORY BUTTERFLY STOPOVER AREA (BMSA01 & BMSA02)

Field staff will visit identified candidate migratory butterfly stopover areas to observe for the presence of migrating butterflies and will evaluate habitat according to methodology outlined in the *Significant Wildlife Habitat Technical Guide* (OMNR, 2000) and *Draft SWH Ecoregion 6E Criterion Schedule* (OMNR, 2012). Preselected transect routes will be selected within the candidate habitat. Prior to conducting surveys the MNR district office will be contacted to approve transect routes.

During the initial visit, transects will be walked in field and GPS tracks will be recorded. The route will also be flagged where possible with fluorescent tags, so that the route can be followed on subsequent visits.

Surveys will be conducted by an individual experienced in identifying the butterflies of eastern North America, especially focal species (see below). Transects will be walked twice weekly in the fall, from August to late October. In total, 20 visits will be made during fall. No surveys will be conducted during severe weather events such as high winds and/or heavy precipitation, as this can bias results. Surveys will be conducted on calm days, as these are less optimal for migration and provide conditions better for observing butterflies during stopover. All butterflies seen will be recorded and flyovers will be clearly indicated. Surveyors will record the following data at each visit on standardized data forms (see **Appendix A2**):

- Date

bat survey question

5 messages

Erin Jaggard <erin.jaggard@mkince.ca> Wed, Jun 12, 2013 at 10:01 AM
To: "Prevost, Eric (MNR)" <eric.prevost@ontario.ca>

Hi Eric

We have started bat surveys at the Ernestown project. Things have not been going as smoothly as we had wished given the extremely wet conditions this spring. In fact, one of our identified snags still sits in two feet of water as of last night (please see attached pic) and no surveys have yet been completed.

I am anticipating some challenges with getting our ten evenings of surveys completed by the end of June. If we roll into the first week of July, is that okay? At the bat training session last fall, Lesley indicated that surveys done early in July would be okay. Given the cool and wet June we have had this year, I am hoping this options still stands.

My cell number is 905.537.1051

Talk to you soon,
Erin

--

Erin Jaggard, MSc
Environmental Project Coordinator
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Web: www.mkince.ca

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2008K

Prevost, Eric (MNR) <eric.prevost@ontario.ca> Fri, Jun 21, 2013 at 10:48 AM
To: Erin Jaggard <erin.jaggard@mkince.ca>

Hi Erin,

My apologies for not responding. I will be working with our Bat experts today to provide you some more specific technical advice.

Thanks

Eric R. Prevost

Renewable Energy

Planning Ecologist

Ontario Ministry of Natural Resources

Peterborough District

300 Water Street

Peterborough ON

K9J 7M7

Phone - (705) 755-3134

From: Erin Jaggard [mailto:erin.jaggard@mkince.ca]
Sent: June-12-13 10:01 AM
To: Prevost, Eric (MNR)
Subject: bat survey question

[Quoted text hidden]

Erin Jaggard <erin.jaggard@mkince.ca> Fri, Jun 21, 2013 at 10:58 AM
To: "Prevost, Eric (MNR)" <eric.prevost@ontario.ca>

Hi Eric

To update you on the status of the bat surveys at Ernestown. We have completed 5 full nights of surveys with four more hopefully happening next week and one, weather dependent on the success of next week's surveys, for the first week of July. The weather continues to be terrible - wet, windy and shockingly cool for the month of June. The snag that I have been speaking of regarding the presence of water, continues to be submerged. The water levels have dropped however, and we hoping that we can get acoustical monitoring equipment set up next week.

No bats seen to date.

Looking forward to speaking with you later.

-Erin
[Quoted text hidden]

Prevost, Eric (MNR) <eric.prevost@ontario.ca> Tue, Jun 25, 2013 at 11:10 AM
To: Erin Jaggard <erin.jaggard@mkince.ca>

Hi Erin,

I have spoke with our bat expert and they are supportive of the approach you have taken thus far.

Best wishes

Eric R. Prevost

Renewable Energy

Planning Ecologist

Ontario Ministry of Natural Resources

Peterborough District

300 Water Street

Peterborough ON

K9J 7M7

Phone - (705) 755-3134

From: Erin Jaggard [mailto:erin.jaggard@mkince.ca]
Sent: June-21-13 10:58 AM
To: Prevost, Eric (MNR)
Subject: Re: bat survey question

[Quoted text hidden]

Erin Jaggard <erin.jaggard@mkince.ca> Tue, Jun 25, 2013 at 8:25 PM
To: Thomas Bernacki <tom.bernacki@mkince.ca>

Hi Tom

It appears as though the MNR is okay with the approach that we have taken at ERN re: BMR surveys to date. I would also assume, based on Eric's comment below, that he is okay with us completing the surveys the first week of July.

-Erin
[Quoted text hidden]

APPENDIX B – FIELD FORMS

- Field Forms, June 11, 2013 through July 4, 2013 (40 pages)

SITE 01 Ryan B.

June 11/13 *only one bats using my trees*

start time - 8:37 (20:37)
end time - 9:54 (21:54)
weather 16°C ↓ 10°C mixed overcast 2/10

weather
temperature - 16°C
cloud cover -
precipitation N/A
beaufort - (1-4) ↓ 3 - 0: nothing 1: light breeze 2:

observations (record time bats observed at ring)
No sightings

R.B.

Site: #1

Jean Blair

Date: 2013-06-12

Start time: 8:20 pm

Weather

Temp: 18

cc: 0

wind: 0

precip: 0

end time: 9:50 pm

Site: 7 Jean Blair

Date: 2013-06-13

start time: 8:20pm

Weather (start)

Temp: 17°

CC: 10%

precipitation: light to moderate

wind: 0

Weather (as of approx. 8:45pm)

temp: 16°

CC: 1

precip: 0

wind: 0

end time: 9:50pm

Site #1

Jean Blair

Date: 2013-06-18

start: 8:25
end: 9:55

Weather

	start	(end)
Temp:	20°	(16°)
cc:	0	"
precip:	0	"
wind:	1	(0)

Observations: no bats, lots of little birds.

Notes: Computer clock is 2mn fast.

Site: 1
Date: 2013-06-19 Jean S

Start time: 8:27
End time: 9:57

Weather
Temp 15° (end)
(14° but feels much cooler)
CC 0
Wind 0
Precip 0

Observations: None.

Site 1

Jean Blaw

Date: 2013-06-20
Start time: 8:25
End time: 9:55

Weather

Temp: 18° (16°) end
CC: 0
Wind: 0
Precip: none

Observations: No Observations

June 24 2013 Ryan B

* site 01 *

start - 8:25

end - 9:55

Weather

precipitation - N/A

cloud - 1

wind - 1

temp - 27°C + humid.

observations

red squirrel observed in and around gear 9:30

small (songbird?) bird stopped at tree, did not enter any cavities.

* bird entered cavity. dm high 9:36

↓ chickadee seen in cavity possible nest + young

June 26/2013 Ryan B.

* site 01 *

start - 8:25

end - 9:55

weather

cloud - 1-2

wind - 1

precipitation - N/A

temp - 24°C

observations

northern flicker spotted top of tree. Snap @ 8:38

obscured bat flying past tree line @ 9:41

June 27 2013 Ryan B.

*site 01

start - 8:25
end - 9:55

weather
cloud - 3
wind - 0
precipitation - N/A
temp - 25°C - very humid

observations
No observations

Rob Tymstra
Project - ERN
Date 2013-07-03
Site # 01
Weather
Temp 27-29°C
CC = 1
Precip - None
Wind - 0-1
Start 8 20 PM Sunset 8 56 PM
Fini 9 56 PM

one small bat flyover @ 8 55 PM
one pair of large bats flyover @ 9 25 PM (slow wingbeats)
several recordings on USB stick

Connor Edington

2013-06-12 SITE: 02 PROJECT: ERN

START TIME: 8:20 P.M.

END TIME: 9:50 P.M.

WEATHER:

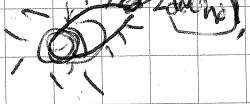
- TEMP RANGE: 15°C – 18°C
- CC: 0
- PRECIPITATON: NONE
- WIND: Ø

OBSERVATIONS

8:37 - Turned rain down @ 8:37 P.M. a little

8:51 P.M.: 360° Visual inspection of tree.

9:39 P.M. Lightning Bugs!



MOSQUITO DEATH COUNT

||||

9:51 P.M END

CONNOR Edington

ERN-02 Project: ERN

Site: 02

Date: 2013.06.13

Start time: 8:20

End time: 9:50

Weather

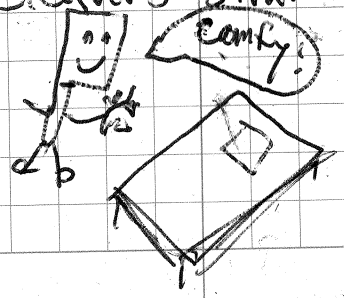
- CC: 9
- Precipitation: Large droplets, light-med.
- Wind: 0
- temp Range: 16-20

Observations

8:30 - Rain

End time: 9:50pm

Cleaver's Strawbedding



Connor Edington
Date: June, 18 2013
Project: ERN
Site #: 02
Weather
- Temp.: 20°C - 21°C
- CC: 1
- Precipitation: No precipitation
- Wind: 1

START TIME: 8:25 PM
END TIME: 9:55 PM

Observations

8:20 P.M.: ↓
* -Trouble with computer recognizing MSB ports. Data saved to desktop.
- Mic gain wayyy too high, Mic attachment needed to be tightened.
Problem resolved
8:53: Computer suits working on moisture strip on tree -- possible guano...
8:56: Explored around tree to get better view 

9:17: Looked like 2 chipmunks climbing the tree just above possible roosting hole...

back ↑

Connor Edinglan
Date: 2013.06.19
Project: ERN
Site #: 02
Weather
- Temp: 18-20°C
- CC: 1
- Precipitation: No precipitation
- Wind: 0, no leaves moving
START TIME: 8:25 PM
END TIME: 9:57 PM

Observations
8:30 - Wood thrush is hanging out with me.
9:12 - Chipmunk ran up tree same route as last night. Roost hole in tree may be a chipmunk abode.
9:30 - 9:40 Temp drop ~2°C - 4°C
Temp. drop ~ 2° - 4°C.
Data recorded to desktop. SD card not reading
End time: 9:57pm

Connor Edington
Date: June, 20, 2013
Project: ERN
Site #: 07
Weather
- Temp: 16°-18°C
- CC: 0
- Precip: No precipitation
- Wind: 1
START TIME: 8:25
END TIME: 9:55
Observations
* Data saved to desktop
8:38: Chipmunks chirping hard @ me, from surrounding area of the tree
9:08: Small creature crawled up tree. Probably a chimpmunk.
9:14: Checked NW side of canopy. Nothing but chipmunks.

Conner Edington

Date: 24-06-2013

Project: ERN

Site #: 02

Weather:

- Temp. 29-31
- CC: 1
- Precip: No precipitation
- Wind: 1

START TIME: 8:25 PM

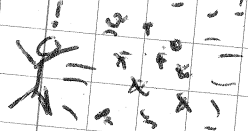
END TIME: 9:55 PM

Observations:

* Data saved to desktop *

8:14 PM: Chipmunks ~~[illegible]~~ calling @ my arrival

8:45-8:55 ATTACK OF THE MOSQUITOS!!!



Connor Edmington

Date: 2013-06-26

Project: ERN

Site #: 02

Weather:

- Temp: 28-30°C
- CC: 0
- Precip: No Precipitation
- Wind: 1

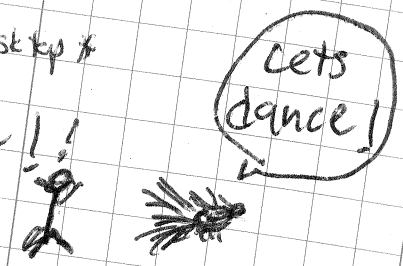
START TIME: 8:25 PM

END TIME: 9:55 PM

Observations

* Data saved to desktop *

9:45: Porcupine!!



Connor Edington

Date: 2013-06-27

Project ERN

Site #: 02

Weather:

- Temp: 27-30°C
- CC: ~8-9 (overcast)
- Precip: No precipitation
- Wind: 0

START TIME: 8:25 PM

END TIME: 9:55 PM

Observations

9:22: Wind upgraded to 2.

Connor Edington
Project: ERN
Date: 2013-07-03
Site #02
Weather:
- Temp: 27-29°C
- CC: 1
- Precip: No precipitation
- Wind: 1
START TIME: 8:20 PM
END TIME: 9:50 PM
Observations

* Data saved to desktop

Connor Edington

*Data on desktop

Date: 04-07-2013

Project: ERN

Site: 02

Weather

- Temp: 28-30°C
- CC: 0
- Precipitation: None
- Wind: 1-2

Start time: 8:20 p.m.

End time: 9:50 p.m.

Observations

8:40 p.m: Lone turkey walked on through.

EB3

Name: Heather Hodgson
Date: June 12, 2013
Start: 8:20pm
End: 9:50pm.
Weather: temp - 18°C
cloud cover - ∅
precipitation - none
wind - ∅ not found

Observations: No bat activity observed

EB3

Name: Heather Hodgson
Date: June 13, 2013
Start: 8:20pm
End: 9:50pm
Weather → temp 16°C - 18°C
cloud cover → 10 @ 8:20-8:45
~~precipitation~~ → 2 @ 8:45-9:50
~~wind~~ → 1

~~Observations~~ Percipitation
↳ full Rain from 8:20pm - 8:45pm
↳ none to light percipitation 8:45pm - 9:50pm
Wind → 1

OBSERVATIONS
No bat activity observed

Heather Hodgson
July 18, 2013
Start: 8:25pm
End: 9:55pm 18-
Weather: temp ~ 20°C
cloud cover ~ 2
no precipitation
wind - 1

Observations:
No bat activity observed.

Name: Heather Hodgson.
Date: July 19, 2013
Start time: 8:27 pm.
End time: 9:55 pm
Weather: temp [redacted] 13–15°C
cc → 0
precipitation - none.
wind - 0

Observations:
[redacted]
9:44pm Saw a very small flying animal pass tree

Name: Heather Hodgson
Date: July 20, 2013
Start: 8:25 pm
End: 9:55 pm
Weather → temp - 17°C - 18°C
CC → 0
percipitation - none
wind - 0

Observations:
No bat activity observed.

Name: Heather Hodgson (ne
Location: EB3
Date: June 24, 2013
Time: 8:25 - 9:55pm
Weather: temp - ~25-27°C
cc - 0-2
precipitation - none
wind - 1-2

Observations
No bat activity observed

Name: Heather Hodgson
Date: June 26, 2013
Start: 8:25 Site #3
End: 9:55
Weather - temp - 20-25°C
cc - 2
percipitation - none
wind → 0

Observations:
No bat activity observed.

Site #3
Name Heather Hodgson
Date June 27, 2013
Start 8:25 pm
End 9:55 pm
Weather - temp 23-26°C
- cc (0-10) 5
- precipitation none
- wind (0-4) 0

Observations:
No bat activity observed

Name Heather Hodgson
Date July 3, 2013
Start 8:20pm
End 9:50pm
Weather → temp 18-22°C
cc (0-10) 2
precipitation none
wind (0-4) (1)

Observations.
No bat activity observed.

Recording saved under
my documents
ERN_hh_EB3_July 3, 2013.

Name Heather Hodgson
Date July 4, 2013
Start 8:20pm
End 9:50pm
Weather - temp 18-22°C
CC (0-10) 1
precipitation none
wind (0-4) 1-2

Observations:

No bat activity observed.

June 12/13 Ryan B. site 04

Start time - 8:20 pm (20:20)
End time - 9:50 pm

Weather
temp - 18°C
cloud cover - 1
precipitation - N/A
wind - 0 (beaufort)

Observations -

Bats in area, but not in face 4/pax 9:10

June 13 2013 Site 04
Ryan B.

start 8:20
end: 9:50

Weather
overcast 9
light rain
wind 0-1 beaufort
temp - 17°C

Observations

- I see a reflective glare 6m up N tree. - 9:48-9:50.

June 18th

Ryan Benvegati
Site 04

start - 8:25
end - 9:55

Weather
Temp - 20°C
Precipitation - N/A
wind - 0-1
cloud - 1

Observations

at least 2 white tail deer 30-40 meter away. 8:50pm
turkey observed 8:05pm

No bats observed.

June 19 Ryan B.

site 04

start - 8:27 pm

end - 9:57 pm

wind - 0

precipitation - N/A

cloud cover - 0-1

temp - 15°C

Observations

No observations

June 20 2013 Ryan B.

Site 04

start - 8:25
end - 9:55

weather

wind - 1
cc - 1
temp - ~~2~~ 18°C
precipitation - N/A

observations

No observations.

Site # 4

Jean Blair

Date: 2013-06-24
Start time: 8:25
End time: 9:55

Weather

Temp: 22 (end) (21° but feels much cooler than start temp)
CC: 0 but hazy
Precip: 0 humid
Wind: 1

Notes:

8:05 - saw woodpecker
8:31 - heard woodpecker, he sounds distraught
8:36 - woodpecker landed on my tree near vertical crack

Site # 4

Jean R

Date: 2013-06-26

Start time: 8:25 pm

End time: 9:55 pm

Weather

Temp: 25° (end) (24°)

CC: 1

Wind: 2

Precip: 0

Notes

Site 4

Jean

Date: 2013-06-27

Start time: 8:25
End time: 9:55

Weather

Temp: 25°
Wind: 0
CC : 10
Precip: 0

(end)
wind picked up to 2 w gusts to 3

Notes

No obs

Site 4

Jean Blair

Date: 2013-07-03

Start time: 8:20

End time: 9:52

Weather

Temp 24°
CC 2
Wind 0
Precip 0

Obs: None

Site 04

Jean Blair

Date: 2013-07-04

Start time: 8:20

End time: 9:50

Weather

Temp: 25°
CC: 0
Wind: 2
Precip: none

Notes

No Obs.

APPENDIX C – CURRICULUM VITAE

- CV for Erin Jaggard

Erin Jaggard, M.Sc.

M.K. Ince and Associates Ltd.

M.K. INCE AND ASSOCIATES LTD.
Renewable Energy & Environmental Consulting

BIOGRAPHY

Erin Jaggard has been working and studying in the natural resources sector for nearly a decade. In her current role as an Environmental Project Coordinator and Biologist for M.K. Ince and Associates Ltd. (MKI), Erin is involved with Natural Heritage and Environmental Assessments including ecological land classification, water body surveys, wildlife habitat identification/evaluation and species at risk surveys. She has a large role in project planning, execution, and reporting including environmental impact statements and permitting.

Erin completed her Master of Science in Physical Geography at Queen's University in 2011. Her research focused on land-use change following the establishment of switchgrass as a bioenergy feedstock in southeastern Ontario. During Erin's studies she was concurrently involved with local energy initiatives in the Kingston area. She worked with Lafarge, Bath Plant on their Cement 2020 alternative energy project to assess renewable energy sources for industrial use. She established field trials for bioenergy crops and evaluated them utilizing geospatial analysis and life cycle assessment protocols. With the FABRECC laboratory she conducted greenhouse gas emission studies in partnership with OMAFRA for bioenergy crops.

Prior to returning to school Erin spent many years working in the forestry sector. Over the years, she has managed field operation amounting to the planting of over fifteen million trees in northern Ontario. She has also provided additional silviculture services to a variety of stakeholders.

Erin's work in numerous terrestrial systems in conjunction with her excellence in project management and dedication towards alternative energy initiatives has given her the skills to provide services in the environmental assessment and renewable energy approvals process. Her past experiences make her an asset to MKI in both field and office settings.

When Erin is not working she can be found walking her dog in the great outdoors and taking deep yogi breaths.

EXPERIENCE

- Field experience in a variety of terrestrial systems including agricultural and forestry settings; ELC certified; trained in the MNR's Bat and Bat Habitats: Guidelines for Wind Power Projects
- Experience with the public consultation process and community energy conferences
- Experience with data management and analysis, systems modelling, report writing
- Over five years of experience working in natural resource management with extensive integration of provincial land-use legislation and ISO 14000 series standards
- Awards for academic excellence, written reports and presentations

EDUCATION

- Master of Science, Physical Geography, Queen's University, 2011
- Bachelor of Science, Environmental Science, Queen's University, 2006

AFFILIATIONS

- Member of SWITCH – sustainable energy network for eastern Ontario
- Pursuing P. Ag. Designation
- Hamilton and Kingston Field Naturalists' Club

PROJECT EXPERIENCE

- Skyway 126 Wind Energy, ZEP Wind Farm Ganaraska, Wind Farm Collie Hill, Grey Highlands ZEP Wind Park, Grey Highlands Clean Energy, Clean Breeze Wind Park, Clean Breeze Wind Park Grafton, Snowy Ridge Wind Park, Settler's Landing Wind Park, and UDI Port Ryerse Wind Farm, Ernestown Wind Park– REA Process
- Post-Construction Monitoring - Proofline
- Organization and management of biological field studies for projects listed above

PRIOR WORK / VOLUNTEER EXPERIENCE

- Queen's Institute for Energy and Environmental Policy Research Assistant
- Lafarge, Bath Plant, Cement 2020 Alternative Energy Project, Researcher
- FABRECC laboratory, Research Assistant - emphasis on pedology, forestry, and agricultural projects
- A&M Reforestation, Project Manager - silviculture projects for Domtar, Tembec, Buchanan, and Green Forest
- Volunteer Instructor for Kingston Field Naturalist Junior Program