

North Middlesex Bald Eagle Report

Project No. 1231

Date: November 2013



North Middlesex Bald Eagle Report

Project Team:

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Christina Carter	Terrestrial and Wetland Biologist
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Report submitted on November 28, 2013



Andrew G. Ryckman

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Appendix I: Photo of Nest Location and Woodland/Tributary West of Nest

1.0 Introduction

This report has been prepared to discuss the bald eagle (*Haliaeetus leucocephalus*) nest that is located in North Middlesex, Middlesex County, Ontario. The nest is located in the northwestern edge of a woodlot south of Elginfield Road and west of Kerwood Road. See Figure 1 for a map of the nest location and preliminary habitat boundaries, as defined in the *Bald Eagle Management Guidelines* released by the Ministry of Natural Resources (MNR) (OMNR 1987).

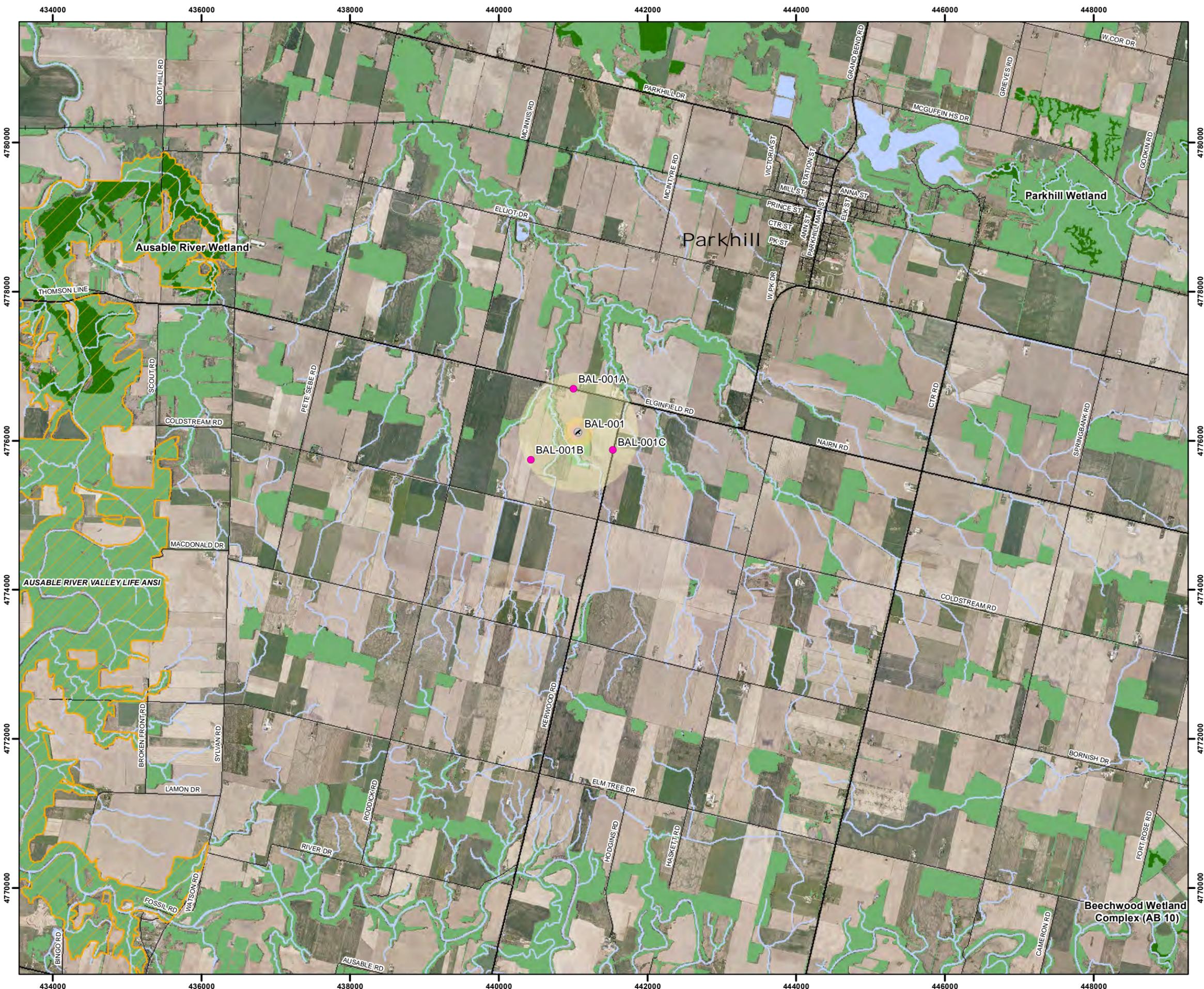
Surveys were completed by Natural Resource Solutions Inc. (NRSI) in order to confirm the presence of an active nest and study the behaviour of any bald eagles using the nest. The behaviour surveys focused on identifying habitats and areas that were used during the various life-cycle stages of the eagles, including the identification of perching and foraging areas, sight lines and flight paths to and from the nest. The purpose of completing these surveys was to refine the tertiary zone for this nesting pair of eagles, once the habitat use had been confirmed through site-specific surveys.

Figure 1

Bald Eagle Report Bald Eagle Nesting, Foraging, and Perching Habitat

Legend

- Bald Eagle Nest
- Bald Eagle Survey Location
- Primary Zone (0-100m)
- Secondary Zone (100-200m)
- Tertiary Zone (200-800m)
- Primary Road
- Secondary Road
- Intermittent Watercourse
- Permanent Watercourse
- Open Aquatic
- ANSI, Life Science
- Provincially Significant Wetland (PSW)
- Other Wetland
- Wooded



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2.0 Staff Roles

The requirements of the REA process indicate that the names and qualifications of all staff participating in the NHA should be included. As a result, the qualifications and roles of key staff participating in bald eagle surveys have been outlined below.

Andrew Ryckman, B.Sc.

Andrew is a Terrestrial and Wetland Biologist with 8 years of environmental experience. He routinely manages the natural heritage aspects of renewable energy projects, with specific expertise relating to bats and herpetofauna. Andrew is certified in the Ecological Land Classification (ELC) system (2010), and has successfully completed a Bat Conservation International (BCI) Acoustic Monitoring Workshop (2008).

Andrew's role was to act as the project manager, overseeing all aspects of the Natural Heritage Assessment, including all associated field work and reporting. He was the main contact point for agency staff and assisted with the preparation of all corresponding reports including this addendum.

Charlotte Moore, M.E.S. Candidate

Charlotte is a Terrestrial and Wetland Biologist with 3 years of experience in butterfly ecology and various other environmental projects. Charlotte has completed her Bachelor of Environmental Studies and is a candidate for a Master of Environmental Studies (2013) at the University of Waterloo. Other environmental projects Charlotte has worked on include the use of Ecological Land Classification (ELC), bat habitat assessments, breeding bird surveys and reptile studies. Charlotte is certified in the Ontario Wetland Evaluation System (2012) and the southern Ontario ELC system (2013).

Charlotte coordinated the field work and data analysis for these surveys and prepared this report.

Christina Carter, M.E.S.

Christina is a Terrestrial and Wetland Biologist with over 4 years of experience working on a variety of environmental projects. She is a project manager specializing in bird ecology, but has experience conducting natural area inventories for vegetation, bats, reptiles, amphibians, and mammals. Christina has worked on multiple stages for a variety of renewable energy projects, including both wind and solar power projects. She is also certified in the southern Ontario ELC system (2013).

Christina was a crew lead for bald eagle surveys.

Jessica Walker, M.E.S.

Jessica is a Terrestrial and Wetland Biologist who has over 2 years of experience working on a variety of environment projects. She graduated from the University of Waterloo with a M.E.S. in Environmental Studies. Jessica has a wide range of field skills including birds, amphibians, reptiles, bats, and plants, and she is certified in the Ecological Land Classification System for Southern Ontario (2012).

Jessica has participated in numerous wind-related projects throughout Ontario and has conducted a multitude of related surveys including avian and bat mortality surveys, and waterfowl and shorebird surveys.

Jessica was a crew lead for bald eagle surveys.

Ken Burrell, B.E.S.

Ken is a terrestrial and wetland biologist who has 6 years of experience working on a variety of environmental projects. He specializes in bird ecology but has over 4 years of experience conducting floral inventories and wildlife studies focused on amphibians, reptiles, bats, and mammals. Ken has worked on multiple stages for a variety of renewable energy projects, primarily focusing on wind power. He is trained by the MNR to conduct the provincial ELC system for northeastern Ontario (2011). Ken has completed his Bachelor of Environmental Studies and is a candidate for a Master of Environmental Studies (2013) at the University of Waterloo.

Ken was a crew lead for bald eagle surveys.

Nathan Miller, M.Sc.

Nathan graduated from the University of Guelph with a B.Sc. in Wildlife Biology and a M.Sc. in Integrative Biology. Research for Nathan's M.Sc. focused on the migration and conservation of the monarch butterfly throughout Canada and the United States. Nathan also has extensive experience conducting research on a wide range of wildlife species including birds, mammals, herptofauna, insects and plants. Nathan is also certified in the ELC system for northeastern Ontario (2011).

Nathan was a crew lead for bald eagle surveys.

3.0 Methods

This section summarizes the survey dates, evaluation criteria and survey methods used to evaluate the significance of the bald eagle nesting, foraging and perching habitat.

3.1 Survey Dates

In accordance with the REA Regulation, NRSI recorded dates, times, duration, and weather conditions during each bald eagle survey. This information has been summarized in Table 1 below. Detailed descriptions of staff roles and qualifications can be found in Section 2.0 of this report.

Table 1. Bald Eagle Activity Assessment and Behavioural Survey Details

Staff Name(s)	Purpose	Date (2013)	Start Time (hrs)	Duration (hrs)	Weather Conditions		
					Temp. (°C)	Beaufort Wind	Cloud Cover (%)
Nathan Miller	Bald Eagle Activity Assessment	February 15	10:31	1	-3	5	70
Ken Burrell, Charlotte Moore	Bald Eagle Behavioural Survey	February 22	9:18	4	-4	3-5	100
Nathan Miller, Ken Burrell	Bald Eagle Behavioural Survey	February 26	9:08	4	-1	2	100
Nathan Miller, Jessica Walker	Bald Eagle Behavioural Survey	March 1	9:30	4	-3	4	100
Nathan Miller, Christina Carter	Bald Eagle Behavioural Survey	March 5	9:18	4	-3	2	0
Jessica Walker, Christina Carter	Bald Eagle Behavioural Survey	March 7	9:38	4	0	2	100
Ken Burrell, Kaitlin Powers	Bald Eagle Behavioural Survey	March 12	9:37	4	2	3	100
Jessica Walker, Charlotte Moore	Bald Eagle Behavioural Survey	March 15	9:48	4	0	3	100
Ken Burrell, Andrew Dean	Bald Eagle Behavioural Survey	March 19	9:16	4	-1	3	100
Christina Carter, Heather Fotherby	Bald Eagle Behavioural Survey	March 22	10:01	4	-3	3	100
Jessica Walker, Charlotte Moore	Bald Eagle Behavioural Survey	March 26	9:38	4	2	2	95
Jessica Walker, Ashley Favaro	Bald Eagle Behavioural Survey	March 28	9:35	4	1.5	3	100
Nathan Miller, Gina MacVeigh	Bald Eagle Behavioural Survey	April 2	9:37	4	-2	4	15
Christina Carter, Charlotte Moore	Bald Eagle Behavioural Survey	April 5	9:36	4	3	3	70
Jessica Walker, Steve Burgin	Bald Eagle Behavioural Survey	April 9	9:32	4	3	2	100
Ken Burrell, Nyssa Clubine	Bald Eagle Behavioural Survey	April 12	10:45	4	2	0	100
Nathan Miller, Jeremy Bannon	Bald Eagle Behavioural Survey	April 16	9:20	4	10	4	100

Staff Name(s)	Purpose	Date (2013)	Start Time (hrs)	Duration (hrs)	Weather Conditions		
					Temp. (°C)	Beaufort Wind	Cloud Cover (%)
Christina Carter, Jeremy Bannon	Bald Eagle Behavioural Survey	April 19	9:30	4	9	5	100
Ken Burrell, Christy Humphrey	Bald Eagle Behavioural Survey	April 23	10:01	4	11	4-5	50
Jessica Walker, Charlotte Moore	Bald Eagle Behavioural Survey	April 26	9:38	4	8	2	2
Ken Burrell, Kaitlin Boddaert	Bald Eagle Behavioural Survey	April 30	10:17	4	17	3-4	80
Jessica Walker, Heather Fotherby	Bald Eagle Behavioural Survey	May 3	10:18	4	17	4-6	15
Jessica Walker, Steve Burgin	Bald Eagle Behavioural Survey	May 7	10:25	4	21	1	15
Nathan Miller, Jeremy Bannon	Bald Eagle Behavioural Survey	May 10	9:00	4	12	3	100
Jessica Walker, Charlotte Moore	Bald Eagle Behavioural Survey	May 14	9:36	4	8	3	100
Jessica Walker, Kaitlin Powers	Bald Eagle Behavioural Survey	May 17	9:46	4	18	2	85
Nathan Miller, Charlotte Moore	Bald Eagle Behavioural Survey	May 21	9:30	4	23	4	20-100
Christina Carter, Nyssa Clubine	Bald Eagle Behavioural Survey	May 24	10:20	4	5	4	95
Jessica Walker, Ashley Favaro	Bald Eagle Behavioural Survey	May 28	10:10	4	15	2	100
Nathan Miller, Blair Baldwin	Bald Eagle Behavioural Survey	May 31	9:08	4	25	4	10
Jessica Walker, Katharina Walton	Bald Eagle Behavioural Survey	June 4	9:43	4	13	3-4	5
Christina Carter, Erin Thompson	Bald Eagle Behavioural Survey	June 7	10:05	4	14	1	95
Nathan Miller, Heather Fotherby	Bald Eagle Behavioural Survey	June 11	9:17	4	16	3	100
Jessica Walker, Jeremy Bannon	Bald Eagle Behavioural Survey	June 14	9:29	4	17	2	2
Ken Burrell, Nyssa Clubine	Bald Eagle Behavioural Survey	June 18	8:55	4	17	2-3	30

Staff Name(s)	Purpose	Date (2013)	Start Time (hrs)	Duration (hrs)	Weather Conditions		
					Temp. (°C)	Beaufort Wind	Cloud Cover (%)
Jessica Walker, Gina MacVeigh	Bald Eagle Behavioural Survey	June 21	9:38	4	23	2-4	0
Christina Carter, Tara Lessard	Bald Eagle Behavioural Survey	June 25	10:05	4	23	1-2	90
Jessica Walker, Ashley Favaro	Bald Eagle Behavioural Survey	June 28	9:48	4	19	5	100
Christina Carter, Rachele Young	Bald Eagle Behavioural Survey	July 2	9:32	4	23	1	80-95
Christina Carter, Christy Humphrey	Bald Eagle Behavioural Survey	July 5	10:02	4	22	0	100
Jessica Walker, Nyssa Clubine	Bald Eagle Behavioural Survey	July 9	10:05	4	23	0	80
Jessica Walker, Pat Deacon	Bald Eagle Behavioural Survey	July 12	9:34	4	20	0	0
Nathan Miller, Erin Thompson	Bald Eagle Behavioural Survey	July 16	9:45	4	3	1	0
Jessica Walker, Christy Humphrey	Bald Eagle Behavioural Survey	July 19	9:40	4	29	5	0
Nathan Miller, Rachele Young	Bald Eagle Behavioural Survey	July 23	9:30	4	20	3	85
Ken Burrell, Erin Thompson	Bald Eagle Behavioural Survey	July 26	9:03	4	19	2	20
Ken Burrell, Andrew Dean	Bald Eagle Behavioural Survey	July 30	9:07	4	22	1	65
Jessica Walker, Brianne Kelly	Bald Eagle Behavioural Survey	August 2	8:50	4	20	2	10
Ken Burrell, Andrew Dean	Bald Eagle Behavioural Survey	August 6	9:04	4	23	3	90
Christina Carter, Colin Oaks	Bald Eagle Behavioural Survey	August 9	9:25	4	20	1	10
Nathan Miller, Nyssa Clubine	Bald Eagle Behavioural Survey	August 13	9:33	4	17	5	70
Nathan Miller, Erin Thompson	Bald Eagle Behavioural Survey	August 16	9:15	4	17	2	10

3.2 Survey Methods

In accordance with the REA Regulation, a bald eagle activity assessment was used to confirm the use of this nest by bald eagles. If the nest is deemed active through the activity assessment, a bald eagle behavioural study can be conducted to confirm the extent of use by the bald eagle with regards to flight patterns, sight lines, perching habitat, and foraging habitat in order to refine the habitat zones around the nest. The methods used for each survey type have been summarized in Table 2.

Table 2. Bald Eagle Survey Methods

Feature ID	Survey Type	Methods
<p>BAL-001</p> <p>Bald Eagle Nesting, Foraging and Perching Habitat</p>	<p>Bald Eagle Activity Assessment</p>	<p>This survey was designed to confirm the presence of an active bald eagle nest.</p> <p>This survey was conducted on February 15 to document any eagle activity (courtship, nesting building or incubation) around the nest. The survey was completed during daylight hours at a suitable vantage point, BAL-001A (see Figure 1), which is located further than 500m from the nest to avoid disturbance, and occurred for 60 minutes.</p> <p>The Activity Assessment confirmed the nest was active, so this survey ceased and the Behavioural Study began.</p>
<p>BAL-001</p> <p>Bald Eagle Nesting, Foraging and Perching Habitat</p>	<p>Bald Eagle Behavioural Study</p>	<p>The Behavioural Study focused on the flight patterns, sight lines, perching habitat, and foraging habitat of the nesting eagles in order to refine the habitat zones around the nest.</p> <p>These surveys occurred twice a week from the date when the Activity Assessment confirmed the nest was active (February 15). The surveys began on February 22 and lasted until August 16 when it was confirmed that the juvenile had left the nest. Surveys were conducted from vantage points, BAL-001A, BAL-001B and BAL-001C. A two hour point count occurred at BAL001A, while one hour point counts were conducted at each of BAL-001B and BAL-001C, totaling 4 hours of behavioural observations per visit.</p> <p>On each survey date, a biologist, using binoculars and a spotting scope, documented and mapped all activity of the eagle(s) for at least 4 hours. All bald eagle behaviour was recorded during the survey, with the approximate location, age, and behaviour (e.g. courtship, nest building, incubation), including mapping all flight corridors and habitats used. All bald eagle movements within the 800m radius were recorded.</p> <p>Surveys were completed during calm, clear weather conditions, when possible. Weather conditions (wind speed and direction, cloud cover, temperature, and precipitation), start time and end time were recorded during each survey. The timing of the visits varied only slightly throughout the survey period and surveys during the fledging period were conducted in the morning, as this is the most active time and is particularly important during the fledging period.</p> <p>The GPS co-ordinates of the vantage points were collected on the first visit to ensure all surveys were conducted from the same locations.</p> <p>Data collected was analyzed to identify important life cycle (i.e. perching, foraging, etc.) habitats for the eagles, and will be used to refine the habitat zones around the nest accordingly.</p>

4.0 Results

During the detailed site investigation process, NRSI biologists examined natural features for the presence of wildlife habitats and identified a candidate Bald Eagle Nesting, Foraging and Perching habitat. This wildlife habitat has been examined and compared with the standards of significance provided in the Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule (OMNR 2012) and the nest was determined to be active and therefore is significant wildlife habitat.

Once the significance of the habitat was confirmed, comprehensive behavioural surveys were initiated to refine the habitat zones used by the bald eagles. During these surveys, all behaviour of the eagles was recorded and the nest was closely observed to determine if any young were present. It was noted that the adults were incubating egg(s) and the pair successfully raised one juvenile bald eagle at this location.

The general results of each survey date have been summarized below in Table 3, with a more specific discussion of the results in the following subsections.

Table 3. Summary of Activity Assessment and Behavioural Survey Results

Date (2013)	Number of Individual(s)	Age of Individual(s)	Summary of Observed Behaviour	Height Category ¹
February 15	2	Adults	Perching	1
February 22	2	Adults	Perching, flying, arranging nest material	2-5
February 26	2	Adults	Perching, flying, courtship displays	1-2
March 1	2	Adults	Perching, arranging nest material, flying	0-9
March 5	2	Adults	Perching, flying	2
March 7	2	Adults	Perching, flying	2
March 12	1	Adult	Perching, incubating	2
March 15	2	Adults	Perching, flying, incubating,	1-3
March 19	1	Adult	Perching, incubating	2
March 22	2	Adults	Perching, flying	2
March 26	1	Adult	Perching	2
March 28	2	Adults	Perching, flying	2-3
April 2	1	Adult	Perching, flying with fish in talons	1-2
April 5	1	Adult	Perching, flying	2
April 9	1	Adult	Perching, flying, foraging	0-2
April 12	2	Adults	Perching, flying	2-4
April 16	2	Adults	Perching, flying, feeding juvenile in nest	1-3
April 19	2	Adults	Perching, flying	1-2
April 23	2	Adults	Perching, flying with food in talons	1-2
April 26	2	Adults	Perching, flying	2-4

Date (2013)	Number of Individual(s)	Age of Individual(s)	Summary of Observed Behaviour	Height Category ¹
April 30	1	Adult	Perching, flying	2-5
May 3	2	Adults	Perching, flying	2-4
May 7	2	1 Adult, 1 Juvenile	Perching, feeding juvenile in nest	2
May 10	3	2 Adults, 1 Juvenile	Perching, flying	2
May 14	2	Adults	Perching, flying	2-3
May 17	2	1 Adult, 1 Juvenile	Perching, flying	1-2
May 21	2	Adults	Perching, flying	1-6
May 24	2	Adults	Perching, flying	1-30
May 28	2	1 Adult, 1 Juvenile	Perching, flying	1-2
May 31	2	Adults	Perching, flying	1-5
June 4	2	1 Adult, 1 Juvenile	Perching, flying	2-7
June 7	2	1 Adult, 1 Juvenile	Flying, perching, juvenile hopping on nest and flapping wings	2-25
June 11	2	1 Adult, 1 Juvenile	Perching, feeding juvenile in nest, flying	2
June 14	2	1 Adult, 1 Juvenile	Flying with fish in talons	2-8
June 18	2	1 Adult, 1 Juvenile	Flying, feeding juvenile in nest	1-10
June 21	2	1 Adult, 1 Juvenile	Flying, feeding juvenile in nest	1-2
June 25	0	---	---	---
June 28	1	Adult	Perching	2
July 2	1	Juvenile	Perching, flying	1-2
July 5	1	Juvenile	Perching	1-2
July 9	2	1 Adult, 1 Juvenile	Perching, calling	1
July 12	1	Adult	Flying	3-7
July 16	0	---	---	---
July 19	0	---	---	---
July 23	1	Juvenile	Flying	2-7
July 26	0	---	---	---
July 30	1	Adult	Flying	6
August 2	0	---	---	---
August 6	0	---	---	---
August 9	0	---	---	---
August 13	0	---	---	---
August 16	0	---	---	---

¹ Height Category: 0=0-9m; 1=10-19m; 2=20-29m; 3=30-39m; 4=40-49m; 5=50-59m; etc.

4.1 Adult Eagle Behaviour

Specific observations of the habitat use by the adult bald eagles, with focus on perching areas and flight paths, have been discussed in the section below. An analysis of the height of flight paths can also be found below, with an illustration of the heights in

relation to turbine sweep area on Figure 2. The locations of adult bald eagle perching habitat and flight paths have been shown on Figure 3.

4.1.1 Perching Areas

All perching areas used by the adult bald eagles have been shown on Figure 3. The primary area used for perching by the adult bald eagles is located immediately north of the nest site, along the western edge of the wooded habitat. The primary perching area is entirely within 100m of the nest location.

Other regular perching locations were also noted along the northern and eastern edges of the woodland, and along the watercourse located to the west of the nest, across the agricultural field. As shown on Figure 3, almost all of the observed perching locations were within 400m of the location of the nest.

4.1.2 Flight Paths

As seen on Figure 3, the majority of adult bald eagle flights occurred within 200m of the nest. In addition to this very localized flight activity, NRSI biologists noted several other flight paths that the eagles regularly followed. These primary flight paths typically either began or ended in close proximity of the nest. One such primary flight path was documented in the area extending west of the nest. The adults were regularly observed flying west from the nest and out of sight into the distance. Based on the landscape and natural features, it is likely that the eagles were flying west to forage in the Ausable River, which is located approximately 6.5km west of the nest (see Section 4.3 for more detail on foraging areas). Another primary flight path extended northwest of the nest, and was likely used by the adult eagles to access other foraging areas along tributaries that lead to the Ausable River, as well as to forage on a more northern section of the Ausable River located approximately 8km from the nest. A third primary flight path was located northeast of the nest. This path may have been used by the bald eagles to forage in an open water body north of Parkhill, which is located approximately 5.5km from the nest site.

Other flight paths can be seen on Figure 3, however these paths were only occasionally, or even rarely, used and did not appear to contribute to critical life cycle functions of the adult bald eagles.

4.1.3 Flight Height

The height of each adult flight was recorded during the behaviour surveys. Figure 2 illustrates the total number of observations within each particular 10m height category. Flight activity was most commonly observed in the 20-29m height category, accounting for approximately 46% of all flight observations. In general, the adult eagles were flying relatively close the ground, with most activity (67%) occurring below 40m. Some moderate activity was observed between 40-70m in elevation, and some soaring activity was observed above 200m.

As demonstrated in the figure, the majority of flight activity occurred below 40m, with most of this activity expected to be following flight paths for the purpose of foraging nearby or flying between perching locations. It is expected that the flight height increases as the eagle travels further from the nest to feed in other foraging locations (see Section 4.3 and Figure 5).

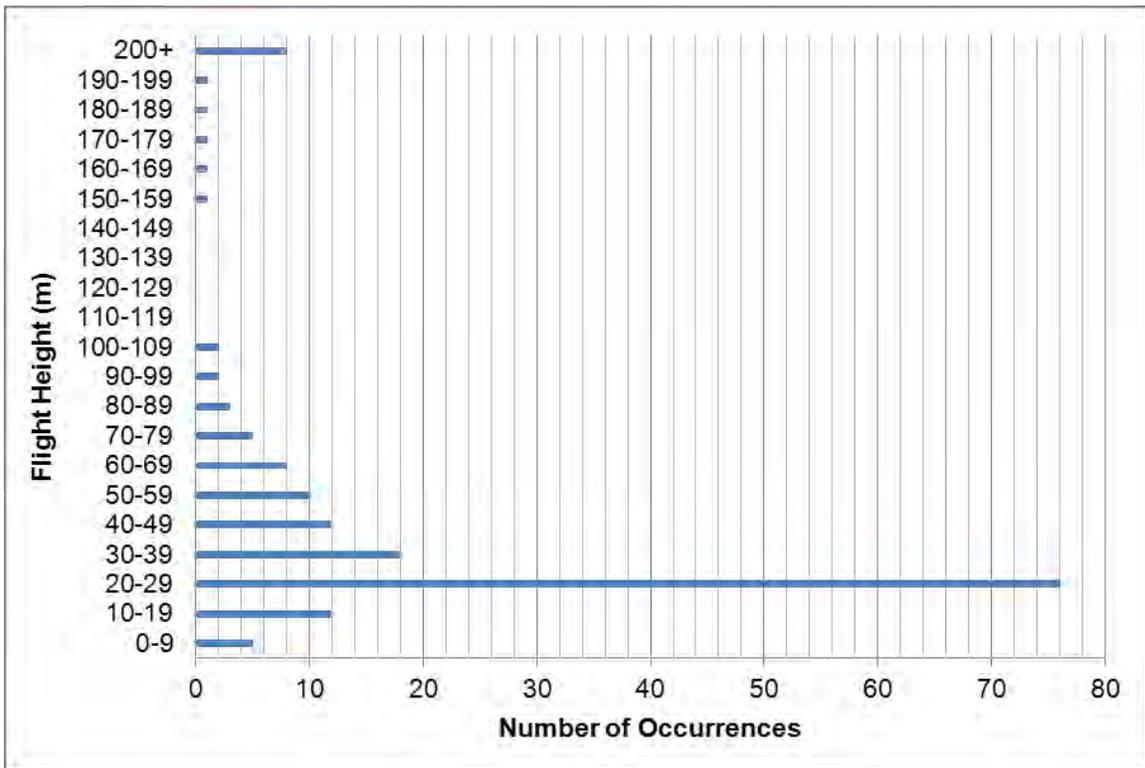


Figure 2. Height of Adult Bald Eagle Flight Paths

Figure 3

Bald Eagle Report Adult Behaviour

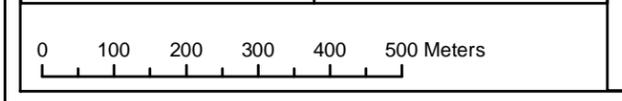
Legend

-  Bald Eagle Nest
-  Bald Eagle Survey Location
-  Perching Location
-  Flight Path
-  Primary Road
-  Secondary Road
-  Permanent Watercourse
-  Open Aquatic
-  Wooded



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4.2 Juvenile Eagle Behaviour

Specific observations of the habitat use by the juvenile bald eagle, with focus on perching areas and flight paths, have been discussed in the section below. The locations of juvenile bald eagle perching habitat and flight paths have been shown on Figure 4.

4.2.1 Perching Areas

All of the perching areas used by the juvenile can be seen on Figure 4. Throughout the survey period, the single juvenile bald eagle spent most of its time within the nest itself. After fledging, there were very few locations where the juvenile was observed perching, and they were all located within 200m of the nest.

4.2.2 Flight Paths

All of the flight paths used by the juvenile bald eagle are shown on Figure 4. After the time of first observation of the juvenile eagle flying, it was only occasionally seen on subsequent survey visits, and only a limited number of flight paths were documented for the juvenile. As a result, primary flight paths could not be determined.

Of the three flight paths document, two occurred entirely within 200m of the nest. The third flight path extended northeast of the nest location.

4.2.3 Flight Height

As noted above, observations of the juvenile bald eagle flying were relatively limited, and after the fledgling period, the juvenile was rarely seen on subsequent visits. All of the juvenile eagle flight activity was observed below 40m in elevation. This is consistent with localized foraging activity, travel between perches, and other early fledging activity.

Figure 4

Bald Eagle Report Juvenile Behaviour

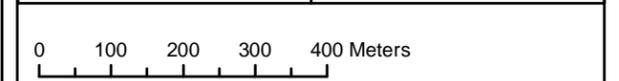
Legend

-  Bald Eagle Nest
-  Bald Eagle Survey Location
-  Perching Locations
-  Flight Path
-  Primary Road
-  Secondary Road
-  Permanent Watercourse
-  Open Aquatic
-  Wooded



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4.3 Foraging Areas

Any observed foraging evidence of the juvenile or adult bald eagles was recorded on each visit, however it is expected that most foraging activity occurred well away from the nest location and may be difficult to specifically identify. The flight lines shown on Figures 3 and 4, in combination with the surrounding landscape and natural features, were used to suggest possible foraging locations where the eagles may be regularly travelling. Figure 5 shows the locations of expected foraging areas of the eagles, including distances from the nest itself.

On 6 occasions, the adults or juvenile were exhibiting activity consistent of foraging behaviour. In 4 instances, the adults were observed flying towards the nest already carrying food. The food being carried by the eagles included fish, small mammals (i.e. muskrat), and what appeared to be another bird. In each of these 4 instances, the eagles were foraging beyond 800m from the nest, and returning to the nest with their food. Twice, the eagles appeared to be foraging (or attempting to forage) within 800m of the nest, including along the creek found west of the nest location and in the field immediately west of the nest. Both of these observations are also consistent with the other regular perching locations used by the adult eagles along the creek and generally surrounding the field west of the nest.

Based on the flight lines of the eagles and preferred foraging habitats, it is likely that the eagles are flying to the Ausable River, tributaries of the Ausable River, or an open body of water near the Town of Parkhill to forage. The location of these 3 features, including distances from the nest, are shown on Figure 5.

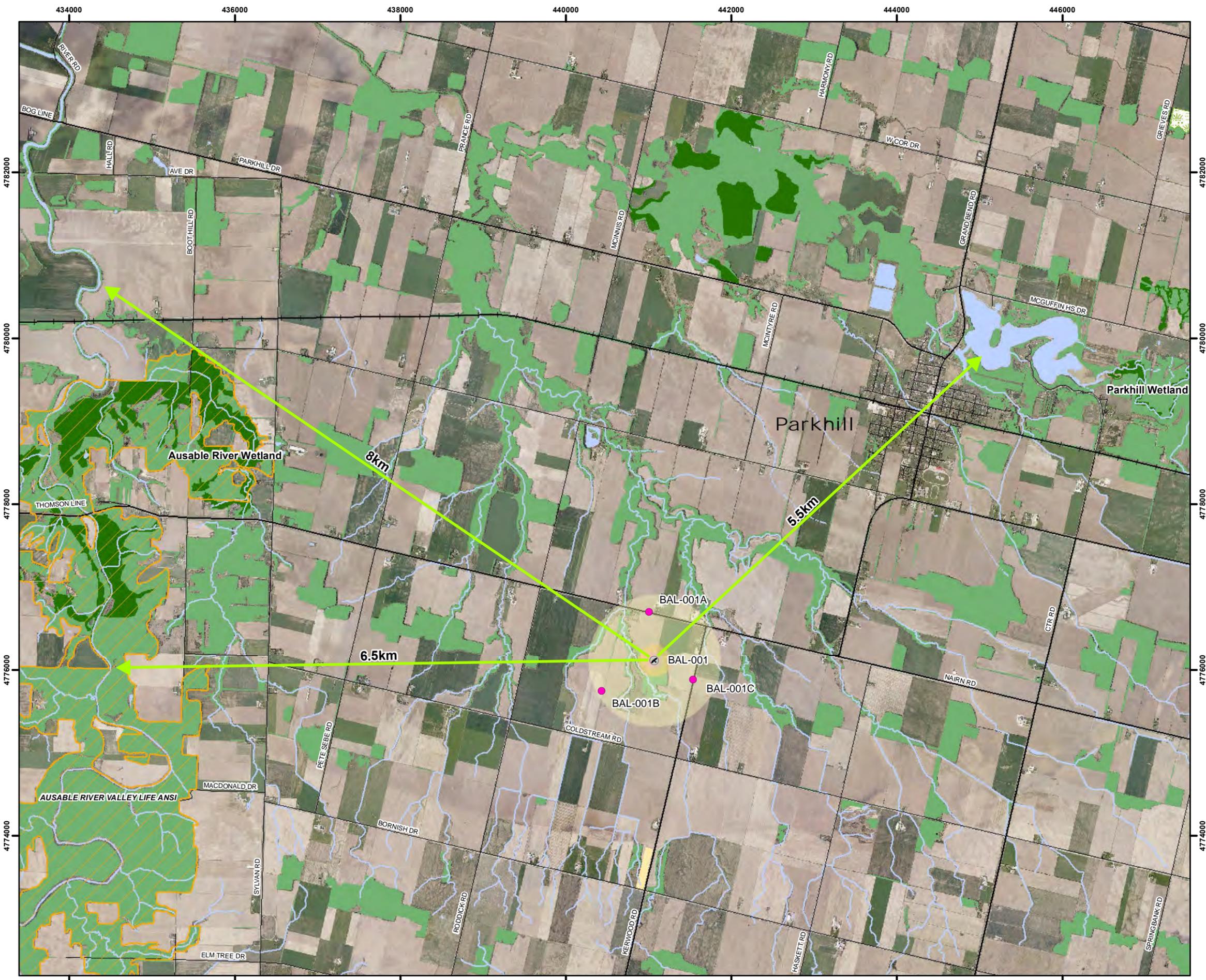
Figure 5

Bald Eagle Report

Distance to Potential Bald Eagle Foraging Habitats

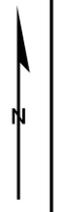
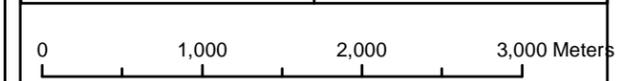
Legend

- Bald Eagle Nest
- Bald Eagle Survey Location
- Primary Zone (0-100m)
- Secondary Zone (100-200m)
- Tertiary Zone (200-800m)
- Primary Road
- Secondary Road
- Intermittent Watercourse
- Permanent Watercourse
- Open Aquatic
- ANSI, Life Science
- Provincially Significant Wetland (PSW)
- Other Wetland
- Wooded



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4.4 Sight Lines

The nest is located approximately 5m below the top of a tall tree (see Appendix I) within a woodland. The woodland in which the nest is located provides a natural barrier limiting site to the east and south of the nest at any time of year. Portions of this treed habitat are also found west of the nest (see Appendix I), across an agricultural field. These trees, approximately 200m from the nest, also provide some barrier to natural site lines from within the nest or other perching locations in the immediate surrounding area.

The general natural features and topography that is typical of the landscape surrounding the nest provide very little barrier to the direct sight lines of the eagles, especially once they are in flight. Topography of the landscape is relatively level, with local elevation changes of generally less than 15m.

5.0 Discussion

A thorough analysis of the activity assessment and behavioural survey results has been conducted in order to determine core habitat zones used by the bald eagles. This detailed review has included an assessment of perching areas, primary flight paths, foraging areas and sight lines. The results of the behaviour study, described above, have been used to assess the potential significant habitat surrounding the eagle nest.

The majority of the eagle activity, including both perching and flying, occurs within 200m of the nest, which is consistent with the primary and secondary habitat zones, as described in the Bald Eagle Habitat Management Guidelines (MNR 1987). A total of 3 primary flight paths were also identified by these studies, occurring to the west, northwest, and northeast. Other flight paths were used, on occasion, by the eagles, but did not appear to be regularly used and were not documented as contributing to any important life function of the eagle. As a result, individual or occasionally used flight paths have not been included in the final delineation of tertiary habitat.

Generally, the habitat within 800m of the nest does not contain preferred foraging habitat for bald eagles, which typically consists of large lakes, rivers or other large water bodies (OMNR 2000; 2012). However, indications of foraging (or potential foraging) was noted along the creek corridor west of the nest and within the agricultural field immediately west of the nest. Both of these habitats are found within 400m of the nest, and have been included in the final delineation of the tertiary habitat. In addition, the flight paths (discussed above) that were expected to be used for regular foraging activity have also been included in the final delineation of tertiary habitat given their expected importance and regular use by the eagles.

Eagles will typically nest with a clear view of the area where they forage, which is often a large body of water (U.S. Fish & Wildlife Service 2007). In this case, the eagles appear to have nested in a location with a view of their regular flight paths to their expected foraging areas. Given that some limited foraging may occur within the immediate vicinity of the nest, in the agricultural field and watercourse, and that the regular flight paths and existing lines of sight occur to the west, northwest, and northeast, NRSI recommends that the tertiary habitat be extended to the full 800m from the nest in these directions.

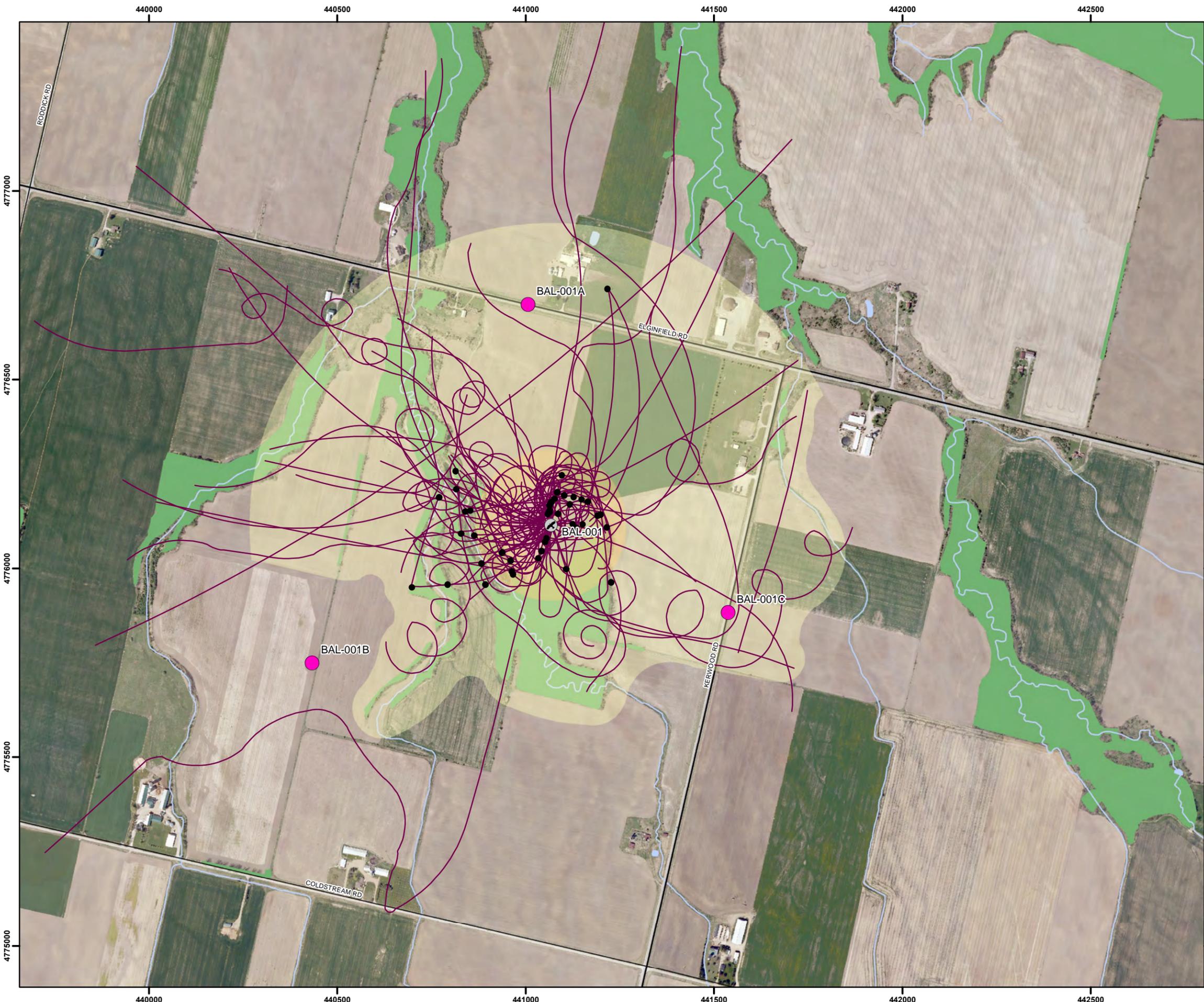
Based on the results of the site-specific behaviour surveys, including a detailed review of perching areas, flight paths, foraging habitat, and potential site lines, NRSI has prepared a refined tertiary zone that reflects the specific eagle behaviour observed surrounding this nest (Figure 6). In the proposed delineation of tertiary habitat, NRSI proposed to include all perching habitat, regularly flight paths, local foraging areas, and important lines of sight.

Figure 6

Bald Eagle Report Refined Habitat Zones

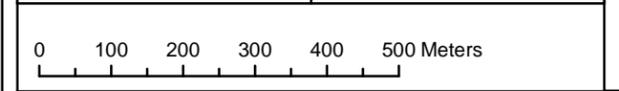
Legend

-  Bald Eagle Nest
-  Bald Eagle Survey Location
-  Primary Zone (0-100m)
-  Secondary Zone (100-200m)
-  Tertiary Zone (200-800m)
-  Perching Locations
-  Flight Path
-  Primary Road
-  Secondary Road
-  Permanent Watercourse
-  Open Aquatic
-  Wooded



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6.0 Summary

This report has been prepared to discuss the bald eagle nest that is located in North Middlesex, Middlesex County, Ontario. The nest is located in the northwestern edge of a woodlot south of Elginfield Road and west of Kerwood Road.

NRSI biologists have completed a bald eagle activity assessment and comprehensive behavioural surveys to determine the significance of the nest and refine the habitat boundaries.

The activity assessment confirmed the nest to be active and the behavioural surveys were initiated in order to document the habitat used by the eagles. The behavioural surveys documented perching habitats, flight paths, foraging areas and sight lines of the eagles, which were used to draw the boundaries of the tertiary habitat.

Completion of the behavioural surveys provided NRSI with the necessary information to refine the tertiary habitat for this specific pair of eagles and their young. The refinement of this habitat can be found on Figure 6.

7.0 References

Publications

- Ontario Ministry of Natural Resources (OMNR). 2012. Significant Wildlife Habitat Ecoregion 7E Criterion Schedule. Addendum to Significant Wildlife Habitat Technical Guide. February 2012.
- Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat: Technical Guide. October 2000.
- Ontario Ministry of Natural Resources (OMNR). 1987. Bald Eagle Habitat Management Guidelines. June 1987.
- U.S. Fish and Wildlife Service. 2007. National Bald Eagle Management Guidelines May 2007.

Appendix I
Photo of Nest Location and Woodland/Tributary West of Nest

APPENDIX I

Nest Location within Woodland



Tributary and Woodland West of the Nest

