

**2016-2017 Eagle Surveys at the  
Proposed  
Ball Hill Wind Energy Project  
Chautauqua County, New York**

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**Prepared for:**

**Ball Hill Wind Energy, LLC  
11101 W. 120<sup>th</sup> Avenue, Suite 400  
Broomfield, Colorado 80021**

**Prepared by:**

**ECOLOGY AND ENVIRONMENT, INC.  
368 Pleasant View Drive  
Lancaster, New York 14086**

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# List of Abbreviations and Acronyms

agl	above ground level
Ball Hill	Ball Hill Wind Energy, LLC
BBCS	Bird and Bat Conservation Strategy
ECPG	<i>Eagle Conservation Plan Guidance, Module 1 – Land Based Wind Energy, version 2</i>
E & E	Ecology and Environment, Inc.
ECL	Environmental Conservation Law
FEIS	Final Environmental Impact Statement
MW	megawatt
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
O&M	operations and maintenance
Project	Ball Hill Wind Project
RSZ	rotor-swept zone
SEQRA	(New York) State Environmental Quality Review Act
T/E	threatened and endangered
USFWS	United States Fish and Wildlife Service

# 1

## Background and Study Area

An interim version of this report, an appendix in the Final Environmental Impact Statement (FEIS), included survey results from March 2016 through September 2016 (Ecology and Environment, Inc. [E & E] 2016). This final report is an update of the interim report and includes additional data collected through the completion of surveys in February 2017.

### 1.1 Wind Project Description

Ball Hill Wind Energy, LLC (Ball Hill) is proposing to construct and operate a wind energy project in the Chautauqua County towns of Villenova and Hanover, located in Western New York State (the Project). The proposed Project area encompasses approximately 9,700 acres and comprises forest stands, pastures, hayfields, and agricultural fields. The Project would include installing and operating up to 29 wind turbines, with a total capacity of approximately 100 megawatts (MW). Each turbine would be a three-bladed, upwind, horizontal-axis wind turbine. The Project would also include the construction and use of access roads, an underground electrical collection system, a substation and switchyard in the town of Hanover, an overhead 115-kilovolt transmission line in the town of Hanover, and an operations and maintenance (O&M) facility within the Project area. Construction of the Project is expected to begin in 2017 and finish in 2018.

E & E conducted eagle use point-count surveys from March 2012 through February 2013 at the proposed Project area as part of the pre-construction avian studies, and initiated another year of eagle use point-count surveys for Ball Hill in March 2016 that was completed in February 2017.

### 1.2 Project Permitting

The Project is subject to the New York State Environmental Quality Review Act (SEQRA) (Environmental Conservation Law [ECL] Article 8) and its implementing regulations (6 New York Codes, Rules, and Regulations [NYCRR] Part 617). Following the lead agency's (town of Villenova) acceptance of the FEIS, Ball Hill is submitting this report as part of continued coordination with the lead agency, the United States Fish and Wildlife Service (USFWS), and the New York State Department of Environmental Conservation (NYSDEC) regarding Bald Eagle In-sert (*Haliaeetus leucocephalus*) issues.

### **1.3 Eagle Surveys Overview**

The pre-construction surveys were based on the USFWS's *Eagle Conservation Plan Guidance, Module 1 – Land Based Wind Energy, version 2* (USFWS 2013), referred to as ECPG in this report. This study was designed to document the movements of eagles in accordance with the recommended methods and metrics outlined in the ECPG. The Ball Hill site eagle population has been studied for two years (24 months of survey effort), including the 2012 to 2013 season as well as the 2016-2017 season, which is the basis for this report. Ball Hill continues to meet and coordinate with the USFWS and NYSDEC regarding this Project.

# 2

## Methodology

### 2.1 Eagle Surveys

E & E conducted eagle use point-count surveys for a 12-month period. During each round of surveys, 13 points were visited for 1 hour once per month, requiring a total of two field days per month (see Figure 2-1). Point locations were concentrated in the areas of proposed turbines (points 1 through 10), and three points were surveyed along the proposed transmission line (points 11 through 13). The completed survey effort included 156 total survey hours and supplements the 312 survey hours previously completed at the site in 2012 and 2013, for a total of 468 standardized survey hours from the Project site.

Surveys generally began at 8:00 a.m. and ended at approximately 5:00 p.m., with alternating start and end points. Surveys were conducted during all weather conditions, with the exception of conditions that limit visibility to below 200 meters vertically and 800 meters horizontally. In order to provide an efficient and standardized account of eagle exposure, eagles were recorded in flight within 1-minute intervals. One exposure minute was recorded for any eagle observed perching throughout the survey window. The time, direction, behavior, age, number of individuals, and approximate flight height for eagle flights were documented on field survey forms, as recommended in the ECPG. The observer also recorded weather data, including wind direction and speed, temperature, precipitation, and cloud cover.

### 2.2 Characterization of the Local Nesting Population

E & E obtained status information from NYSDEC's 2015 and 2016 monitoring of the local Bald Eagle nests. In addition to the eagle use point-count surveys, the E & E avian surveyor visited the two Bald Eagle nests that are closest to the Project area during each survey day from March 2016 through February 2017 and documented eagle observations and nest status to the extent possible from nearby roadside locations. E & E provided information to NYSDEC regarding Bald Eagle activity and nesting from these two nests.







# 3

## Results

### 3.1 2016-2017 Eagle Survey Results

Fifty Bald Eagle sightings and no Golden Eagle (*Aquila chrysaetos*) sightings were recorded within the 800-meter-radius survey plots during the point-count surveys conducted from March 2016 through February 2017 (see Tables 3-1 and 3-2 and Appendix A, Table A-1). The eagle survey effort in 2016 and 2017 amounted to a total of 156 hours (9,360 minutes) of survey time. Bald Eagles were identified in the Project area during 11 of the 12 monthly survey rounds conducted. No eagles were detected during December 2016 surveys, although there was one incidental Bald Eagle sighting outside the plot radius during that month. No Golden Eagles were identified during the 12 survey rounds. Figure 3-1 depicts all of the eagle flight paths within each survey point. The mean sighting rates in the Project area (not including incidental sightings) were 0.32 Bald Eagles per hour (see Table 3-1) and 0.00 Golden Eagles per hour.

The greatest number of eagle observations (18) were made at point 12, followed by point 11 (six observations), points 4 and 13 (five observations each), point 10 (four observations), points 7, 8, and 9 (three observations each), and points 1, 3, and 6 (one observation each) (see Table 3-1). Sighting rates by point ranged from 0.00 to 1.50 eagles per hour (see Figures 3-2 and 3-3). Eight incidental Bald Eagle sightings were made. Five incidental Bald Eagles and one unidentified eagle were observed outside of the 800-meter survey radius of point 13 on September 1, 2016, point 10 on December 5, 2016, point 11 on January 9, 2017, and points 8 and 11 on February 14, 2017. Two Bald Eagles were incidentally observed within the survey radius, following the completion of surveys at point 2 on April 25, 2016, and at point 8 on October 7, 2016.

Bald Eagle sightings within the Project area ranged from zero to 18 sightings per survey round (see Table 3-1). Table 3-1 and Figure 3-4 present eagle detection rates based on survey effort per month. Detection rates of Bald Eagles were highest during September, with 1.38 eagles per survey hour. February had the next highest detection rate, with 0.77 eagle/hour; followed by April and May with detection rates ranging from 0.38 to 0.46 eagles/hour during this period. Lower Bald Eagle detection rates were documented in the other months (0.00 to 0.23 eagles/hour). Golden Eagles were not recorded during the survey period (0.00 eagles/hour).

**Table 3-1 Eagle Sightings at Survey Points within the Project Area, March 2016 through February 2017**

Survey Point	3/14/16 and 3/22/16	4/6/16 and 4/25/16	5/7/16 and 5/25/16	6/8/16 and 6/27/16	7/3/16 and 7/15/16	8/14/16 and 8/23/16	9/1/16 and 9/23/16	10/7/16 and 10/23/16	11/4/16 and 11/18/16	12/5/16 and 12/20/16	1/9/17 and 1/22/17	2/14/17 and 2/27/17	Sightings per Point
<b>Bald Eagles</b>													
1	0	1	0	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	1	0	0	0	0	0	0	1
4	1	0	1	0	0	0	1	0	0	0	0	2	5
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	1	1
7	0	3	0	0	0	0	0	0	0	0	0	0	3
8	0	0	1	0	0	0	0	0	0	0	0	2	3
9	0	1	0	0	1	0	0	1	0	0	0	0	3
10	0	0	0	0	0	0	1	0	0	0	0	3	4
11	0	0	3	0	0	1	1	0	1	0	0	0	6
12	0	0	0	1	2	0	11	0	1	0	1	2	18
13	0	1	0	0	0	0	4	0	0	0	0	0	5
<b>Total Bald Eagles</b>	<b>1</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>18</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>10</b>	<b>50</b>
<b>Golden Eagles</b>													
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Golden Eagles</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Table 3-1 Eagle Sightings at Survey Points within the Project Area, March 2016 through February 2017**

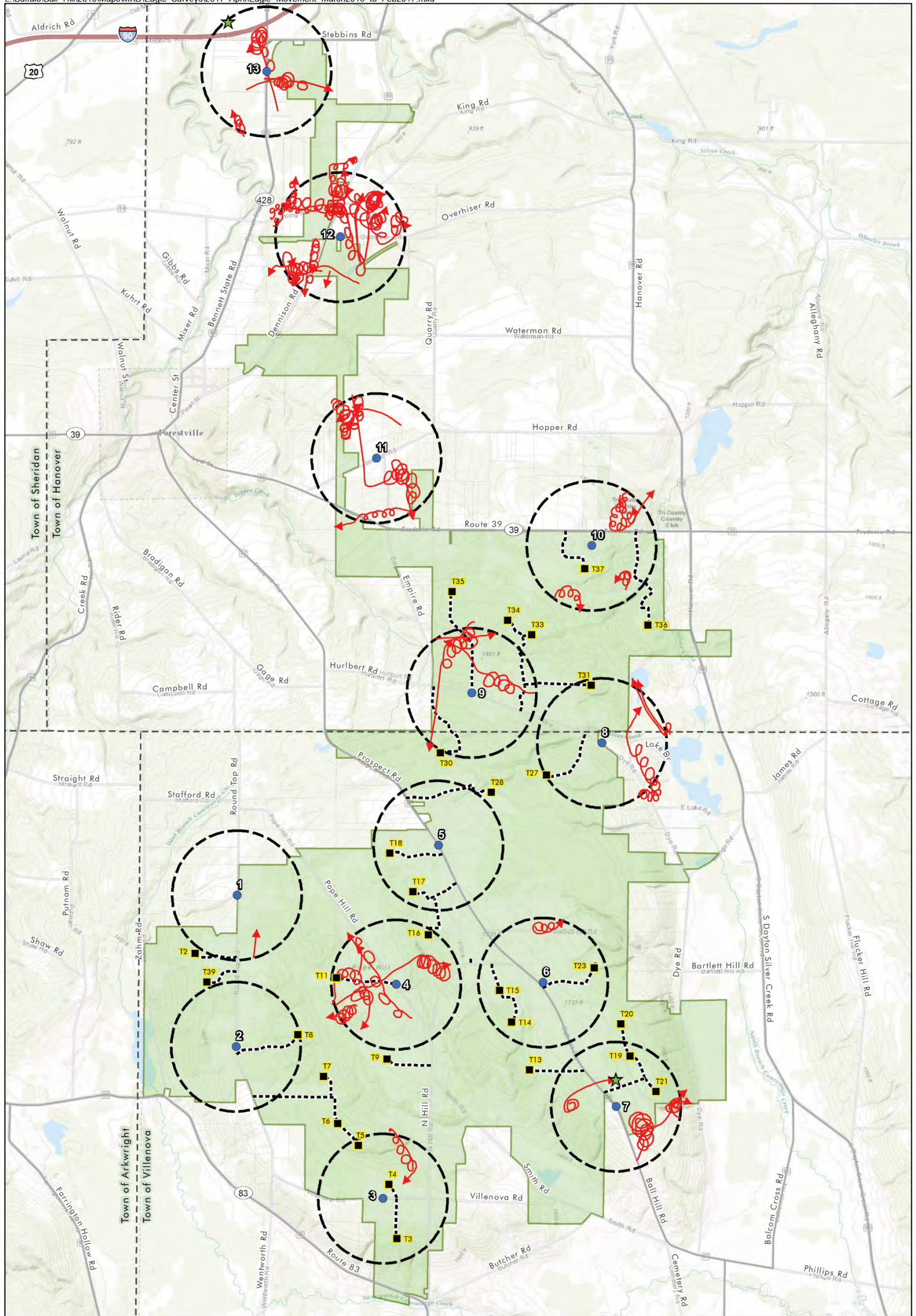
Survey Point	3/14/16 and 3/22/16	4/6/16 and 4/25/16	5/7/16 and 5/25/16	6/8/16 and 6/27/16	7/3/16 and 7/15/16	8/14/16 and 8/23/16	9/1/16 and 9/23/16	10/7/16 and 10/23/16	11/4/16 and 11/18/16	12/5/16 and 12/20/16	1/9/17 and 1/22/17	2/14/17 and 2/27/17	Sightings per Point
Total Survey Time (mins.)	780	780	780	780	780	780	780	780	780	780	780	780	9,360
Total Survey Time (hrs.)	13	13	13	13	13	13	13	13	13	13	13	13	156
Bald Eagle Sightings/ Survey Period (in hrs.)	0.08	0.46	0.38	0.08	0.23	0.15	1.38	0.08	0.15	0.00	0.08	0.77	0.32
Golden Eagle Sightings/ Survey Period (in hrs.)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**Table 3-2 Eagles Sighted Below 200 Meters AGL**

Species	Number of Eagle Sightings	Number of Eagle Sightings below 200 meters agl	Percentage
Bald Eagle	50	35	70%
Golden Eagle	0	0	0%

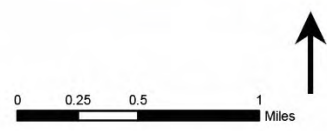
Key:  
agl = above ground level



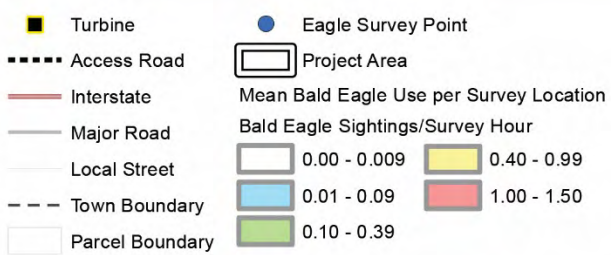
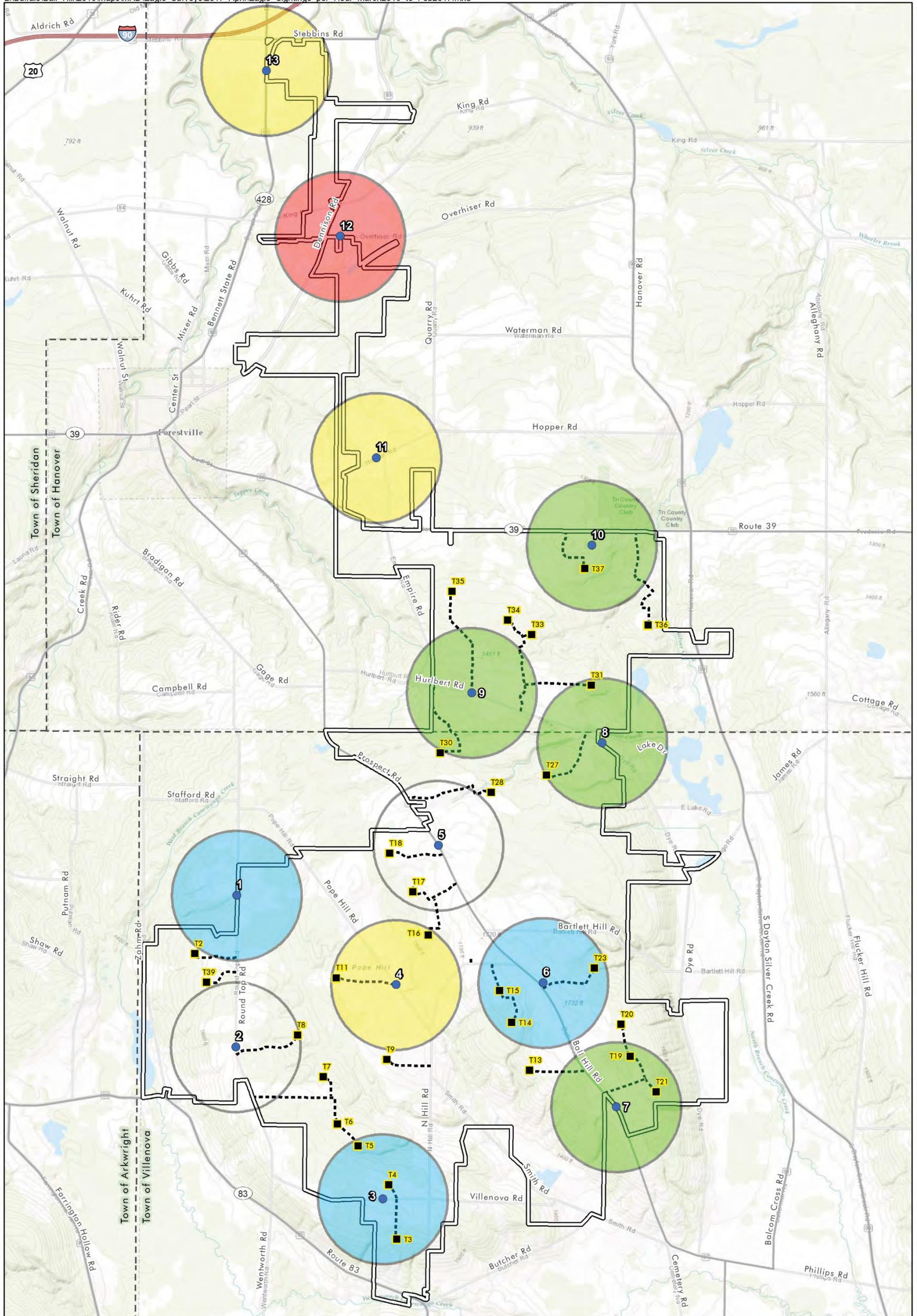


- Turbine
- Eagle Survey Point
- Access Road
- ★ Perch Location
- Interstate
- Bald Eagle Flight Path
- Major Road
- ⊞ Survey Site 800m Buffer
- Local Street
- Project Area
- - - Town Boundary
- Parcel Boundary

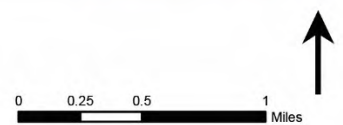
**Figure 3-1**  
**Eagle Movements, March 2016 – February 2017**  
**Ball Hill Wind Project**  
 Chautauque County, New York  
 Ball Hill Wind Energy, LLC



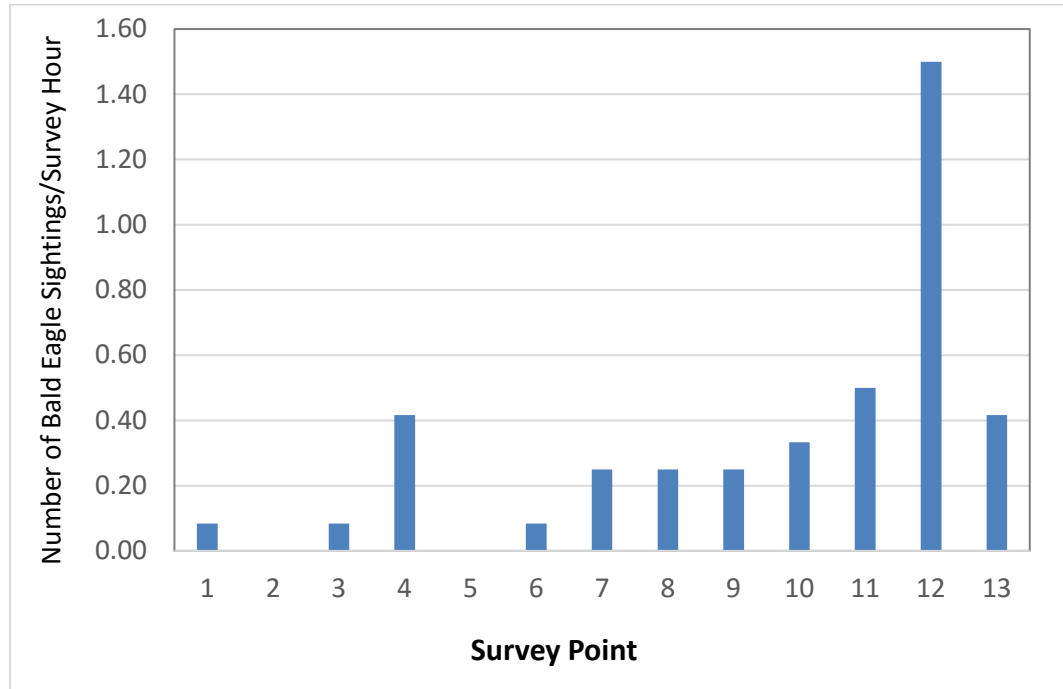




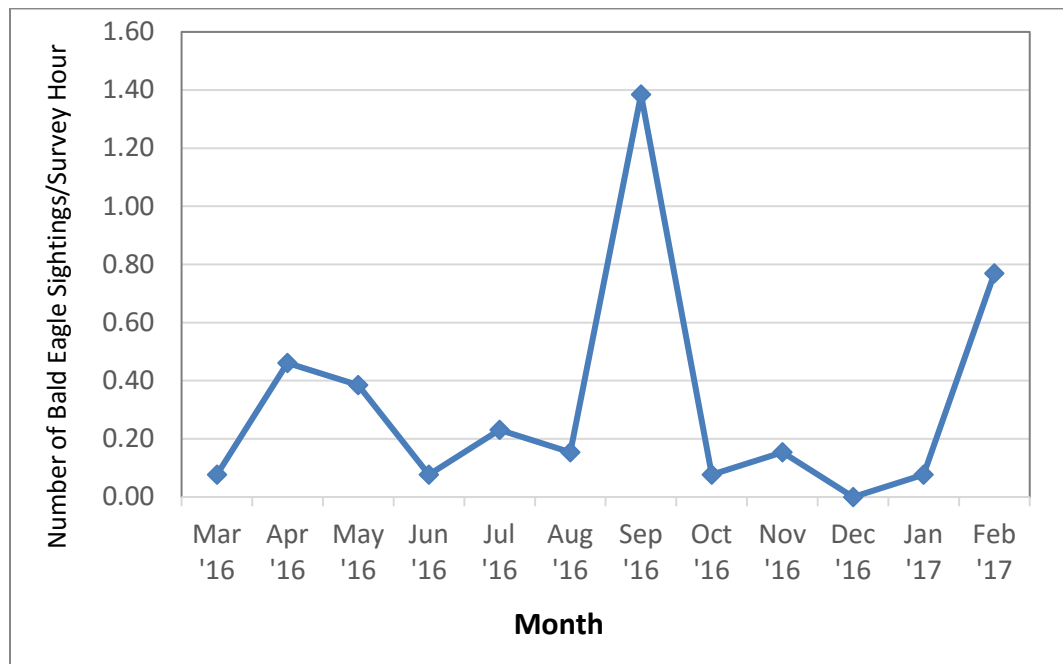
**Figure 3-2**  
**Bald Eagle Sightings per Hour**  
**March 2016 - February 2017**  
**Ball Hill Wind Project**  
 Chautauque County, New York  
 Ball Hill Wind Energy, LLC







**Figure 3-3 Eagle Mean Use (Number of Bald Eagle Sightings/Survey Hour) by Survey Point (March 2016 through February 2017)**



**Figure 3-4 Eagle Mean Use (Number of Bald Eagle Sightings/Survey Hour) by Month (March 2016 through February 2017)**

Of the 50 eagle sightings observed during the point-count surveys to date, 70% (35 sightings) were observed flying below 200 meters above ground level (agl) for at least a portion of the viewing time. Approximately 64% (32 sightings) of the eagles observed were recorded flying in the rotor-swept zone (RSZ).

Of the 50 Bald Eagle sightings recorded during the surveys, 25 were adult eagles and 25 were immature. In general, adult Bald Eagles were observed throughout the survey period except for August and December. Immature Bald Eagles were observed during the April, May, August, September, November, and February surveys. Most of the sightings of immature Bald Eagles were likely transient eagles.

Weather conditions were conducive to Bald Eagle sightings during all survey dates (see Appendix B, Table B-1). Precipitation was limited to approximately 15 minutes of light rain on August 14, 2016, and approximately 1.5 hours of light rain on January 22, 2017 (see Appendix B). On most survey dates, temperature rose slowly throughout the day; the coolest temperatures were recorded during the March surveys, while the warmest were recorded during the July surveys. The lowest maximum recorded temperature was 24°F on January 9, 2017, and the highest maximum recorded temperature was 82°F on June 27, 2016. Winds and cloud cover were variable during most survey periods and across all survey dates (see Appendix B).

### **3.2 Bald Eagle Nests**

In 2016, there were two known Bald Eagle nests in the close vicinity of the Project area, plus several other Bald Eagle nests within 10 miles of the Project area. Bald Eagle nest locations are considered sensitive information; therefore, no figures in this report identify these nest locations. The descriptions below of nests in the vicinity (i.e., within approximately 10 miles) of the Project area include the “Thruway nest” and the “Hanover nest,” which were monitored during the March 2016 to February 2017 field season.

- The “Thruway nest,” located in the vicinity of the New York State Thruway, is approximately 4,000 feet northwest of the proposed transmission line and approximately 5 miles north of the nearest proposed turbine. This nest site has been active for several years, and E & E confirmed it was active again in 2016 and suspect it will be active in 2017 based on Bald Eagle behavior (see Appendix C, Tables C-1 and C-2). E & E observed this nest from a distance for a total of 207 minutes during 21 visits between March 2016 and February 2017. An incubating adult Bald Eagle was observed on March 14, 2016, and adults were observed incubating or in the vicinity of the nest in March, April, and May. By late May leaves had obscured the nest from view. This nest probably fledged two young, as two juvenile Bald Eagles were seen in the vicinity of the nest tree on July 15, 2016. There was no eagle activity observed near the nest from August 2016 through January 2017. However, on both visits in February 2017 two adult Bald Eagles were observed perched on the nest



edge, inside the nest, and in the vicinity of the nest. Although incubation was not confirmed, it is likely this nest will be used again during the 2017 season.

- The “Hanover nest” was discovered by E & E in early April 2012. The nest is located in the vicinity of the Silver Creek Reservoir, approximately 0.7 miles northeast of the nearest Project component (an access road). The closest turbine is located just over 1 mile (6,000 feet) to the southwest of the nest. E & E confirmed the nest was active in 2016 and 2017 (see Appendix C, Tables C-1 and C-2). E & E observed this nest from three varying distances for a total of 544 minutes during 24 visits between March 2016 and February 2017. An incubating adult Bald Eagle was observed on March 14, 2016, and adults were observed perched on or near the nest in subsequent visits in March, April, and May. The nest apparently failed by May 25, 2016, as indicated by a flycatcher perched on the nest edge. No Bald Eagle activity was recorded at or near the nest during observations between June 2016 and January 2017. However, on February 14 and 27, 2017, an incubating adult Bald Eagle was observed on the nest with a second adult Bald Eagle perched nearby.
- There are an unspecified number of active nests along Cattaraugus Creek in the vicinity of the Cattaraugus Indian Reservation. The distance from the closest turbine to the area with nests along Cattaraugus Creek is approximately 6.3 miles.
- The “Dayton nest” is located approximately 5.5 miles southeast of the Project area and has been active in recent years according to NYSDEC.
- The “Pomfret nest” is located approximately 7.0 miles west of the Project area, in the vicinity of the Fredonia reservoir. NYSDEC discovered nesting activity in this location in 2012 and it has been active since that time.
- The “Dunkirk nest” is located approximately 9.5 miles west of the Project area. This is a more recent nest location according to NYSDEC.
- The “Sheridan nest” is located approximately 3.0 miles northwest of the Project area. This is a more recent nest location according to NYSDEC.

# 4

## Discussion

### 4.1 2016-2017 Eagle Surveys

Bald Eagles were periodically observed in the Project area during surveys between March 2016 and February 2017, with most sightings occurring in September. Golden Eagles were not observed in the Project area during the 2016 and 2017 surveys. The 17 Bald Eagle sightings on September 1 likely involved multiple sightings of the same individuals. The Bald Eagles were likely a mix of migrants, locals, and transients and included adult and immature birds. The relatively high sightings per hour at the three most northern survey points is influenced by the large number of sightings on September 1, 2016, which involved surveying only the northern half of the site. Aside from the number of sightings on September 1, the results of the 2016 and 2017 surveys are generally consistent with the results reported in previous studies conducted by E & E in the Project area, suggesting Bald Eagle activity within the Project area during spring and fall migration seasons and more occasional activity during summer months.

The Project area is situated east and south of the Portage Escarpment and Lake Erie plain, where Bald Eagles and other raptor migrants are concentrated during spring migration. It is likely that some of the eagles observed in April, May, and possibly September and February were migrants. Surveys on September 1, 2016, yielded the highest number of Bald Eagle sightings for any single day in 2016 and 2017 (17 sightings). The winds on this day were moderate and from the north, providing good conditions for raptor migration; however, the time period was too early in the fall for migration activity and there is minimal fall raptor migration along the southern shores of the Great Lakes. Therefore, these sightings were likely a combination of local birds, transient immature eagles, and multiple sightings of the same individuals. The local flights in the Project area may have been between possible foraging areas (i.e., East Mud Lake, West Mud Lake, Lake Erie, Silver Creek Reservoir, Fredonia Reservoir, and Dayton gravel ponds).

There are several hawk watch sites in New York State monitored each year during the peak spring raptor migration (daily surveys conducted from mid-March through mid-May). The two closest sites are the Hamburg Hawk Watch site, located approximately 27.5 miles northeast of the Project area, and the Ripley Hawk Watch site, located approximately 28 miles south-southwest of the Project area. These sites have data for five of the same survey dates as the Project area during the 2016 spring migration (Hawk Migration Association of North America 2017a;

2017b). Table 4-1 presents a comparison of migrant eagle mean use between the Project area, Hamburg Hawk Watch, and Ripley Hawk Watch for these dates.

Over the five concurrent survey days, there were a total of 10 Bald Eagle sightings over 33 survey hours in the Project area (0.30 sightings per hour), compared with 0.64 Bald Eagle sightings per survey hour at the Hamburg Hawk Watch (18 Bald Eagles over 28.25 hours) and 0.85 Bald Eagle sightings per survey hour at the Ripley Hawk Watch (25 Bald Eagles over 29.5 hours). There were 0.03 Golden Eagle sightings per survey hour at Ripley Hawk Watch (one sighting); no Golden Eagles were detected over the five survey days at the Project area or the Hamburg Hawk Watch. Observations at the Project area were similar to the Hamburg Hawk Watch, with relatively few Bald Eagle sightings in March and early April and more Eagles seen in late April and May. Both the Hamburg and Ripley Hawk Watch sites are situated closer to the Lake Erie shoreline compared to the Project area, and thus would be expected to have higher concentrations of raptors during spring migration as raptors move along the lake looking for a flight path northward without crossing the open water.

**Table 4-1 Migrant Eagle Sightings and Mean Use (Number of Migrant Eagle Sightings/Survey Hour) at Project Area Compared to Eagle Sightings at Local Hawk Watch Sites (Spring 2016)**

Date	Ball Hill Project Area		Hamburg Hawk Watch, Hamburg, NY		Ripley Hawk Watch, Ripley, NY	
	No. Eagles	Eagles/Hour	No. Eagles	Eagles/Hour	No. Eagles	Eagles/Hour
<b>Bald Eagle</b>						
3/14/2016	1	0.14	1	0.18	0	0.00
3/22/2016	0	0.00	0	0.00	4	0.53
4/6/2016	1	0.14	0	0.00	4	0.67
4/25/2016	4	0.67	12	1.60	3	0.46
5/7/2016	4	0.57	5	1.11	14	2.80
<b>Total</b>	<b>10</b>	<b>0.30</b>	<b>18</b>	<b>0.64</b>	<b>25</b>	<b>0.85</b>
<b>Golden Eagle</b>						
3/14/2016	0	0.00	0	0.00	0	0.00
3/22/2016	0	0.00	0	0.00	0	0.00
4/6/2016	0	0.00	0	0.00	0	0.00
4/25/2016	0	0.00	0	0.00	0	0.00
5/7/2016	0	0.00	0	0.00	1	0.20
<b>Total</b>	<b>0</b>	<b>0.00</b>	<b>0</b>	<b>0.00</b>	<b>0</b>	<b>0.03</b>

Source: Hawk Migration Association of North America 2017a; 2017b

A few of the Bald Eagle sightings during surveys appeared to be associated with occupied nests in the vicinity of the Project area. Five Bald Eagles were sighted at survey point 13, which is the survey point closest to the “Thruway nest.” One of these was a perched adult that was likely associated with this nest. The other four Bald Eagle sightings were two adults and two immatures seen during the fall

migration season. With the proximity of the “Thruway nest” to Lake Erie (approximately 2.5 miles), it is likely that most foraging flights go toward the lake. Three Bald Eagle sightings were made at survey point 10, which is the survey point closest to the “Hanover nest.” One of these was a soaring adult seen in February 2017 that was likely associated with the “Hanover nest,” as it displayed territorial behavior toward an immature Bald Eagle. The other two Bald Eagle sightings were immatures—one in September 2016 and one in February 2017—which would not be associated with the nest.

## **4.2 Golden Eagles**

Golden Eagles are uncommon migrants over Western New York. No Golden Eagles were observed during the March 2016 through February 2017 surveys. Migrant Golden Eagles would be expected to fly over the Project area during the usual periods of migration, specifically spring migration. Because the period of time when Golden Eagles would be expected to fly over the Project area is brief, and because the occurrence of the Golden Eagle is generally uncommon, it is expected that the Golden Eagle is unlikely to be adversely affected by the Project.

## **4.3 Bald Eagles**

### **4.3.1 Nest Monitoring**

Bald Eagles continue to increase their presence and expand their distribution in Chautauqua County as well as in western New York State, adjacent states, and the Great Lakes region. Two Bald Eagle nest locations in the vicinity of the Project area were monitored in 2016 and early 2017. Both nests were confirmed to be occupied by incubating Bald Eagles in 2016. The “Hanover nest” apparently failed later in the season while the “Thruway nest” possibly fledged two young (see Section 3.2). In early 2017 the “Hanover nest” was confirmed to be occupied with an incubating Bald Eagle while the “Thruway nest” had an adult pair perched on the nest.

Nesting typically takes place in forested areas relatively close (usually less than 1.2 miles) to suitable foraging areas, typically large bodies of water (Buehler 2000). Undisturbed forested habitats near lakes, rivers, or wetlands are preferred (Nye 2008). Large nests of sticks and finer materials are typically built in the tops of the largest trees in the area and are reused for many years. Bald Eagles may build one or more alternate nest(s) within their territory and may switch to an alternate nest in successive years, particularly after a nesting failure (Buehler 2000). As Bald Eagle populations continue to increase, greater nest densities may occur in preferred habitats, and eagles may also begin to nest in less ideal habitats further from foraging areas.

The USFWS recommends measures to avoid nest site disturbances, such as 1) maintaining a distance buffer between the activity and the nest; 2) maintaining a landscape buffer (forested or natural areas) between the activity and nest trees; and 3) avoiding disruptive activities during the breeding season (USFWS 2007).

Based on the existing locations of the Bald Eagle nests in the vicinity of the Project Area, construction activity is not anticipated to be directly visible from any of the nest sites because of forest cover and topography. Therefore, the recommended minimum distance buffer is 660 feet, or 1/8 mile (USFWS 2007), which is outside the Project Area boundary and would be maintained during Project construction.

Since the nearest Bald Eagle nest is outside the limits of the Project Area and beyond the minimum USFWS guidance (2007) for construction, no significant adverse impacts from construction activities on Bald Eagles are anticipated. Ball Hill will continue to coordinate with the USFWS and NYSDEC regarding the potential risk from the Project for eagles. It is anticipated that there will be permit conditions from NYSDEC regarding monitoring for Bald Eagles and other listed species during construction, and such measures will help avoid and minimize any potential impacts from construction.

#### **4.3.2 Operations**

Bald Eagles may occur in the Project Area throughout the year. As such, there is potential for direct mortality or injury to Bald Eagles resulting from collision with wind turbines and the potential for harassment, displacement, or habitat impacts; however, these risks appear to be minimal. Impacts on Bald Eagles as a result of wind power development have been low, but there has been a slight increase in fatalities reported in recent years, likely due to an increasing eagle population and more wind projects being constructed in areas with Bald Eagles. At least 18 Bald Eagles have been documented killed or injured at wind facilities through November 2016 (Rheude et al. 2016).

Ball Hill will continue to coordinate with the USFWS and NYSDEC regarding potential risks for eagles from the Project. While the potential for unavoidable Bald Eagle-related impacts exists, it is anticipated that the Project would not significantly impact local or migrating Bald Eagles. Ball Hill will include avoidance and minimization measures in a project-specific Bird and Bat Conservation Strategy (BBCS). Post-construction wildlife monitoring inspections will be conducted and operation and maintenance staff will be trained to identify eagles and other threatened and endangered (T/E) species. Any occurrences of eagles or other T/E species will be reported as required.

# 5

## References

- Buehler, D.A. 2000. Bald Eagle, *Haliaeetus leucocephalus*. In *The Birds of North America*. Vol. 506, (A. Poole and F. Gill, eds.), pp. 1-39. The Birds of North America, Inc.: Philadelphia, Pennsylvania, USA.
- Hawk Migration Association of North America. 2017a. Hamburg Hawk Watch Site Profile: Data Inventory. <http://www.hawkcoun.org> on March 28, 2017.
- \_\_\_\_\_. 2017b. Ripley Hawk Watch Site Profile: Data Inventory. <http://www.hawkcoun.org> on March 28, 2017.
- Nye, P. 2008. Bald Eagle, *Haliaeetus leucocephalus*. In *The Second Atlas of Breeding Birds in New York State* (K.J McGowan and K.J. Corwin, eds.). Ithaca, New York: Cornell University Press.
- Rheude, M., L. New, and K. Kritz. 2016. Using Incidental Finds to Update Collision Risk Models at Wind Farms. Poster presentation at National Wind Coordinating Collaborative Wind Wildlife Research Meeting XI, November 29-December 2, 2016, Broomfield, Colorado. <https://www.national-wind.org/research/meetings/wind-wildlife-research-meeting-xi/>. Poster file viewed on June 6, 2017 at <http://programme.exordo.com/worm2016/delegates/presentation/111/>
- U.S. Fish and Wildlife Service (USFWS). 2007. National Bald Eagle Management Guidelines. U. S. Fish and Wildlife Service. May 2007.
- \_\_\_\_\_. 2013. *Eagle Conservation Plan Guidance, Module 1 – Land Based Wind Energy, Version 2*. Washington D.C.:U.S. Fish and Wildlife Service, Division of Migratory Bird Management. [http://www.fws.gov/windenergy/eagle\\_guidance.html](http://www.fws.gov/windenergy/eagle_guidance.html).

**A**

**Eagle Surveys Sightings Data**

**Table A-1 Eagle Survey Sightings (March 2016 through February 2017), Ball Hill Wind Energy Project Area.**

Species	Date	Time	Number	Survey Point	Flight Height	Flight Direction	Resight	Behavior	Age Class	Notes
<b>2016</b>										
Bald Eagle	3/14	1242	1	4	L	NW	No	S	A	Soaring NW through plot
Bald Eagle	4/6	925	1	13			No	P	A	Perched in riparian strip to NW. Likely one of breeding pair of I-90 nest
Bald Eagle	4/6	1251	1	9	RSZ	E	No	FG	Im	Flew east through plot
Bald Eagle	4/25	1001	1	7	L/RSZ/H	NE	No	S/G	Im	Initially soaring NE with Broad-winged Hawks then with second immature Bald Eagle
Bald Eagle	4/25	1008	1	7	L/RSZ	W/E	No	S/FG	Im	Soaring with first immature Bald Eagle
Bald Eagle	4/25	1021	1	7	L	NE	No	FG/P	A	Soaring low then perched in tree to north
Bald Eagle	4/25	1535	1	1	RSZ	N	No	G	A	Gliding north; kettle of Broad-winged Hawks flying above
Bald Eagle	5/7	1111	1	8	RSZ/H	NNW	No	S/G	A	Soaring east then NW, net movement NNW
Bald Eagle	5/7	1323	1	11	H	SE	No	S	A	Soaring with two immature Bald Eagles; net movement SE
Bald Eagle	5/7	1325	1	11	H	S	No	S	Im	One of two immatures soaring higher than adult Bald Eagle; soaring south
Bald Eagle	5/7	1325	1	11	H	SE/NE	No	S	Im	One of two immatures soaring higher than adult Bald Eagle; soaring SE then NE, net movement east
Bald Eagle	5/25	1243	1	4	RSZ/H	ENE	No	FG/S	A	Flap-gliding NE through plot then soaring SE
Bald Eagle	6/8	1053	1	12	RSZ/H	ESE	No	S	A	Soaring ESE through plot
Bald Eagle	7/3	1129	1	9	H	NW	No	G/S	A	Gliding and soaring NW through plot
Bald Eagle	7/3	1429	1	12	H	W	No	FG	A	Adult flap-gliding west over woods to south
Bald Eagle	7/3	1435	1	12	H	E	Yes	S	A	Resight of adult soaring off to SW
Bald Eagle	8/14	1125	1	11	RSZ/H	S	No	S/FG	Im	Soaring/gliding south, then east, then south
Bald Eagle	8/23	1402	1	3	H	SE	No	S	Im	Soaring SE and joins a flock of Turkey Vultures
Bald Eagle	9/1	1032	1	10	RSZ	NE/S	No	S	Im	Soaring off to SSW
Bald Eagle	9/1	1249	1	11	H	W	No	G	A	Gliding west; flies past a soaring Osprey
Bald Eagle	9/1	1306	2	12	RSZ/H	S	No	S	Im	Two immatures soaring and talon grabbing (Im, 1 & 2)
Bald Eagle	9/1	1309	2	12	RSZ	N	Yes	S	Im	Likely immature Bald Eagles from 1306 (Im, 1 and 2)
Bald Eagle	9/1	1319	1	12	RSZ/H	S/NE	Yes	S/G	Im	Im. 1 gliding south then soaring NE
Bald Eagle	9/1	1319	1	12	RSZ/H	S/NE	Yes	S/G	Im	Im. 2 gliding south then soaring NE, separates from Im. 1 flight path

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**Table A-1 Eagle Survey Sightings (March 2016 through February 2017), Ball Hill Wind Energy Project Area.**

Species	Date	Time	Number	Survey Point	Flight Height	Flight Direction	Resight	Behavior	Age Class	Notes
Bald Eagle	9/1	1335	1	12	RSZ	S	Unknown	S	Im	Soaring off to south; could be a resight or new
Bald Eagle	9/1	1324	1	12	H	N	No	G/S	A	Adult gliding north overhead with immature (Im. 3) as Im. 1 and 2 glide south
Bald Eagle	9/1	1324	1	12	RSZ/H	NNE	No	G/S	Im	Im. 3 gliding north overhead with adult Bald Eagle, then soaring with Im. 1, then soaring NW
Bald Eagle	9/1	1332	1	12	H	NE	No	G/S	Im	Im. 4 soaring with adult; five Bald Eagles visible
Bald Eagle	9/1	1332	1	12	H	NE	Yes	G/S	A	Resighted adult soaring with Im. 4
Bald Eagle	9/1	1448	1	13	RSZ/H	N	No	G/S	Im	Immature soaring NNW then south until too high to see; net movement north
Bald Eagle	9/1	1504	1	13	RSZ/H	E	No	G/S	A	Adult soaring then gliding east with second adult Bald Eagle
Bald Eagle	9/1	1505	1	13	RSZ/H	E	No	G/S	A	Adult soaring then gliding east with first adult Bald Eagle
Bald Eagle	9/1	1524	1	13	H	N	No	S/G	Im	Second immature soaring north; joined by another immature Bald Eagle after end of survey
Bald Eagle	9/23	1116	1	4	L/RSZ	NE/S	No	S/G	A	Soaring NE then gliding south; net movement SE
Bald Eagle	10/7	1354	1	9	H	S	No	S/FG	A	Adult soaring off to north, gliding SSW through plot, staying high. 4 TUVU and a RTHA follow a similar path.
Bald Eagle	11/4	1248	1	11	RSZ/H	W	No	S/FG	A	First see >800 m at 1247
Bald Eagle	11/4	1445	1	12	RSZ	W	No	S/G	Im	Immature flying off to SE
<b>2017</b>										
Bald Eagle	1/9	1513	1	12	L/RSZ	NE	No	S/G	A	<800 m from 1513-1518, then visible >800 m off to north 1519-1521.
Bald Eagle	2/14	951	1	12	RSZ	NE	No	S	A	First see >800 m at 0951; could be pair seen at I-90 nest earlier this morning.
Bald Eagle	2/14	952	1	12	RSZ	N	No	S	A	First see >800 m at 0951; could be pair seen at I-90 nest earlier this morning.
Bald Eagle	2/14	1235	1	10	RSZ	N/SW	No	S	Im	Immature soaring over woods to SE then out of view behind trees and hill
Bald Eagle	2/14	1249	1	10	RSZ	SW/NE	No	S/FG	A	Adult soaring over golf course to NE then glides NE toward reservoir; likely one of Hanover pair seen this morning

**Table A-1 Eagle Survey Sightings (March 2016 through February 2017), Ball Hill Wind Energy Project Area.**

Species	Date	Time	Number	Survey Point	Flight Height	Flight Direction	Resight	Behavior	Age Class	Notes
Bald Eagle	2/14	1320	1	10	RSZ	N	Yes	S	Im	Immature soaring over golf course to NE at survey end. Likely 1235 immature. After end of survey an Adult BAEA aggressively dives the immature - likely territorial defense.
Bald Eagle	2/14	1539	1	8	RSZ	NW	No	G	A	Adult first seen >800 m at 1538 gliding toward plot
Bald Eagle	2/14	1539	1	8	H	NW	No	G	Im	Immature gliding high above adult BAEA flying in same direction
Bald Eagle	2/27	1151	1	6	RSZ	E	No	S	Im	Immature soaring east off to north at end of survey; white triangle on its back
Bald Eagle	2/27	1209	1	4	RSZ/H	SW	No	S	Im	Immature visible soaring at start of survey, then glided west off the plot
Bald Eagle	2/27	1247	1	4	L	NW	No	FG	A	Adult flying low to ground past rise to NW then out of view
<b>Total</b>			<b>50</b>							

Key:

agl = above ground level  
 RSZ = rotor-swept zone

**Height:**

L = < 50 m agl  
 RSZ = 50 – 200 m agl  
 H = > 200 m agl

**Behavior:**

S = Soaring  
 G = Gliding  
 FG = Flapping - Gliding  
 P = Perching

**Age:**

A = Adult  
 Im = Immature

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# B

## Weather Data

**Table B-1 Weather Conditions by Survey Date for Eagle Surveys - March 2016 through February 2017**

Date	Survey Mean Temperature (°F)	Survey Max Temperature (°F)	Survey Min Temperature (°F)	Survey Wind Direction	Survey Avg. Wind Speed (mph)	Survey Max. Wind Speed (mph)	Average Cloud Cover	Comments
3/14/2016	49	56	44	S	17	23	Overcast	
3/22/2016	45	55	34	S	9	15	Overcast	
4/6/2016	41	46	36	S	15	26	Overcast	
4/25/2016	60	65	52	SE	6	8	Partly Cloudy	
5/7/2016	63	70	54	S	7	13	Partly Cloudy	
5/25/2016	77	82	70	W	13	18	Sunny	
6/8/2016	53	57	48	WNW	18	22	Overcast	
6/27/2016	78	82	70	W	10	15	Partly Sunny	
7/3/2016	73	77	64	WNW	7	11	Partly Cloudy	
7/15/2016	77	79	72	WSW	16	25	Partly Sunny	
8/14/2016	74	77	72	W	5	8	Overcast	Light rain - 0.25 hour
8/23/2016	73	79	64	SSW	6	9	Sunny	
9/1/2016	72	77	64	N	8	12	Partly Sunny	
9/23/2016	74	77	66	NW	8	10	Partly Cloudy	
10/7/2016	68	75	30	SSE	7	11	Clear	
10/23/2016	52	54	48	W	20	25	Mostly cloudy	
11/4/2016	47	50	45	NW	7	10	Mostly cloudy	
11/18/2016	61	68	43	SSE	7	12	Clear	
12/5/2016	38	39	36	W	16	24	Overcast	
12/20/2016	25	30	16	S	13	19	Mostly cloudy	
1/9/2017	16	24	10	S	12	20	Overcast	
1/22/2017	50	52	48	S	3	7	Overcast	Light rain - 1.5 hours
2/14/2017	40	43	33	SW	10	13	Clear	
2/27/2017	43	46	37	SW	11	17	Clear	

Key:

Cloud Cover:

Sunny = 0%-20%

Partly Sunny = 21%-50%

Partly Cloudy = 51%-80%

Overcast = 81%-100%

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# C

## Bald Eagle Nest Observation Data

**C Bald Eagle Nest Observation Data**
**Table C-1 E & E Bald Eagle Nest Observations - March 2016 through September 2016**

Date	Hanover Nest		Thruway Nest	
	Bald Eagle Activity at or Near the Nest	Observation Time (min.)	Bald Eagle Activity at or Near the Nest	Observation Time (min.)
3/14/2016	1 adult BAEA incubating nest.	20	1 adult BAEA incubating nest.	10
3/22/2016	1 adult BAEA perched 5 m from nest and 2nd adult perched nearby.	6	1 adult BAEA incubating nest.	12
4/6/2016	1 adult BAEA flew south in the vicinity of the nest tree.	40	None	5
4/25/2016	1 adult BAEA perched below the nest for 4 minutes.	65	1 adult BAEA perched on nest edge and 2nd adult perched nearby.	5
5/7/2016	1 adult BAEA perched on nest edge for 4 minutes and perched below the nest for 47 minutes.	65	1 adult BAEA perched on nest edge.	5
5/25/2016	1 adult BAEA perched 210 m north of nest. A flycatcher perched on the edge of the eagle nest.	68	None; nest not visible.	10
6/7/2016	No activity	10	N/A	0
6/8/2016	No activity	65	No activity; nest not visible.	8
6/13/2016	No activity	25	N/A	0
6/22/2016	N/A	0	No activity; nest not visible.	10
6/24/2016	No activity	30	No activity; nest not visible.	5
7/3/2016	No activity	9	1 adult BAEA perched south of nest tree.	6
7/15/2016	No activity	10	2 juvenile BAEA flying in vicinity of nest tree.	30
8/14/2016	No activity	5	N/A	0
8/23/2016	N/A	0	No activity; nest not visible.	5
9/1/2016	No activity	2	N/A	0
9/23/2016	N/A	0	N/A	0
<b>2016 Status</b>	<b>Apparently failed</b>	<b>420</b>	<b>Possibly fledged 2 young</b>	<b>111</b>

**Table C-2 E & E Bald Eagle Nest Observations – October 2016 through February 2017**

Date	Hanover Nest		Thruway Nest	
	Bald Eagle Activity at or Near the Nest	Observation Time (min.)	Bald Eagle Activity at or Near the Nest	Observation Time (min.)
10/7/2016	No activity	5	No activity; nest not visible.	5
10/23/2016	No activity	7	N/A	0
11/4/2016	No activity	5	No activity; nest not visible.	5
11/18/2016	No activity	9	No activity	8
12/5/2016	No activity	15	No activity	5
12/20/2016	No activity	9	No activity	5
1/9/2017	No activity	7	No activity	5
1/22/2017	No activity	10	No activity; fog obstructing view of nest.	5
2/14/2017	1 adult BAEA incubating nest and 2nd adult perched nearby.	32	1 adult BAEA perched on nest edge and 2nd adult perched nearby.	28
2/27/2017	1 adult BAEA incubating nest and 2nd adult perched nearby.	25	2 adult BAEA perched on nest edge.	30
<b>2017 Status</b>	<b>Confirmed Occupied</b>	<b>124</b>	<b>Pair Attending Nest</b>	<b>96</b>