According to NHP, a Great Blue Heron rookery with more than 50 nests per year has been observed at Dibble Hill/Farrington Hollow in the Town of Arkwright, Chautauqua County, approximately 2 miles west of the Project Area. Bald Eagle nests have been located on the Cattaraugus Indian Reservation in Cattaraugus and Chautauqua counties approximately 8 miles north of the Project Area and at Conewango Swamp in the Town of Dayton, Cattaraugus County approximately 4.5 miles east of the Project Area. Northern Harrier has been observed in the towns of Dayton, Cattaraugus County approximately 4 miles east of the Project Area, and Leon, Cattaraugus County approximately 6 miles southeast of the Project Area. Short-eared Owls have been observed in fields by the Dunkirk Airport, likely during winter months, in the Town of Sheridan, Chautauqua County, approximately 8 miles northwest of the Project Area. Sedge Wren have been observed in the Towns of Sheridan and Pomfret, Chautauqua County, approximately eight 8 northwest and 10 miles west of the Project Area, respectively. Henslow's Sparrow have been observed in the Town of Arkwright, Chautauqua County, approximately 6 miles west of the Project Area.

Dates and seasonal occurrence of the identified bird species were not provided in the 2008 NHP letter. No bat colonies or species were identified within a 40-mile radius of the Project Area.

3.2.3.2 USFWS

The USFWS has expressed concern pertaining to the potential for wind projects, in general, to impact migratory birds and threatened or endangered bat species (such as the Indiana Bat). The USFWS maintains a database of federally listed endangered and threatened and candidate species regarding known or likely occurrences by county. The database is available online at http://www.fws.gov/northeast/nyfo/es/esdesc.htm. The county-level list of federally listed animal species was reviewed for this project for updated threatened and endangered bird and bat species information. Although the Bald Eagle been observed in Chautauqua County (USFWS 2007a), it has been de-listed and is no longer protected by the Endangered Species Act (USFWS 2007c). While they are no longer protected by the Endangered Species Act, the Bald Eagle is still protected federally under the Bald and Golden Eagle Protection Act (USFWS 2008b). No federally designated or proposed "critical habitat" exists within the Project Area.

3.3 Field Studies

3.3.1 Nocturnal Radar Study

Woodlot conducted a nocturnal radar study between September 1 and October 15, 2006, and between April 15 and May 31, 2007, to analyze the nocturnal migration of birds and bats over the Project Area. The results of the study, including nocturnal radar passage rates, flight altitude, flight direction, and visual findings, are summarized in this section. Refer to Woodlot's reports in Appendices A and B for full details.

Passage Rates

Nocturnal radar observations indicate that passage rates in fall 2006 were 189 ± 21 targets/km/hour (hr), and the median passage rate was 170 targets/km/hr. Nocturnal passage rates were highly variable from night to night, ranging from 16 ± 3 to 604 ± 77 targets/km/hr (see Figure 4 in Appendix A). Passage rates had some variation throughout the night and the lowest rates occurred during the first hour of sampling (between crepuscular and nocturnal hours) and near sunrise; whereas the highest rates occurred near the third, fourth, or fifth hour of sampling (see Figure 5 in Appendix A).

Nocturnal radar observations indicate that passage rates in spring 2007 were 419 ± 40 targets/km/hr with a median passage rate of 391 targets/km/hr. The mean nocturnal passage rates were variable from night to night, ranging from 22 ± 7 targets/km/hr to 1,190 ± 94 targets/km/hr (see Figure 2-3 in Appendix B). Passage rates had some variation throughout the night and the lowest rates occurred during the first hour of sampling (between crepuscular and nocturnal hours) and near sunrise; whereas the highest rates occurred from the third through the seventh hour of sampling (see Figure 2-4 in Appendix B). Nights with the highest passage rates also had calm to moderate winds.

The overall mean passage rate in fall was low to average; whereas the spring passage rate was higher than average but well within the range of historical results from similar radar studies in the northeast (see Tables 3-6 and 3-7).

Flight Altitude

The mean nocturnal flight altitude for the fall 2006 season based on vertical radar sampling less than 1,500 meters (4,921 feet) agl was 1,157 ± 39 feet (353 ± 12 meters) agl, with a range among nights of 748 to 1,674 feet (228 to 510 meters) agl. The mean nocturnal flight altitude based on vertical radar sampling less than 4,921 feet (1,500 meters) agl in spring 2007 was 1,617 ± 92 feet (493 ± 28 meters) agl, with a range among nights of 581 to 3,009 feet (177 to 917 meters) agl. The spring and fall results are similar, and they are consistent with similar radar studies conducted in the northeast (see Tables 3-6 and 3-7) and existing literature regarding the flight of nocturnal migrants (Kerlinger 1989; Mabee et al. 2006a, b; Smithsonian Migratory Bird Center 2006). Mean flight altitudes were variable throughout the study periods (see Figure 7 in Appendix A and Figure 2-6 in Appendix B). There was no significant pattern as to the timing of the lowest altitudes. Approximately 9% of all nocturnal targets in fall 2006 and approximately 3% of all nocturnal targets in spring 2007 flew below 120 meters (394 feet) agl, a close approximation to the maximum turbine height. These percentages are consistent with similar radar studies conducted in the northeast United States.

Table 3-6 Comparison of Fall Mean Passage Rates, Mean Flight Altitudes, Average Flight Directions, and Percentage of Targets at Altitudes Less than 410 Feet (125 Meters) at Sites in New York State

Location	Year	Mean Passage Rate[1] (Targets/ km/hr)	Mean Flight Altitude (Meters [Feet] agl)	Average Flight Direction (Degrees)	Percentage of Targets at Altitudes <125 Meters	Reference
Perry (Dairy Hills), Wyoming Co.	2005	64 ± 3 (hor), 170 (ver)	466 ± 2 (1,529 ± 7)	180	10	Young et al. 2006
Alabama (Horizon), Genesee Co.	2005	67 (hor), 165 (ver)	489 (1,604)	219	11	Gary 2007
Arkwright (New Grange), Chautauqua Co.	2007	112 ± 6 (hor) 178 ± 7 (ver)	458 ± 2[4] (1,502 ± 7)	208	10	Kerns et al. 2008
Harrisburg, Jefferson Co.	1998	122	-[2]	181	-[2]	Cooper and Mabee 2000
Clinton (Marble River), Clinton Co.	2005	152 ± 16	438 ± 15 (1,437 ± 49)	193	5[3]	Woodlot 2006i
Tug Hill (Maple Ridge), Lewis Co.	2004	166	430 (1,411)	195	7	Mabee et al. 2005a
Wethersfield, Wyoming Co.	1998	168	-[2]	179	-[2]	Cooper and Mabee 2000
Villenova (Noble Ball Hill), Chautauqua Co.	**2006**	**189 ± 21**	**353 ± 12 (1,157 ± 39)**	**216**	**9[3]**	**Woodlot 2008a**
Prattsburgh (UPC), Steuben Co.	2004	193 ± 21	516 ± 17 (1,692 ± 148)	188	2.6	Woodlot 2004
Sheldon (High Sheldon), Wyoming Co.	2005	197 ± 24	422 ± 12 (1,385 ± 39)	213	3[3]	Woodlot 2006c
Ellenburg (Noble), Clinton Co.	2005	197 ± 37	333 ± 1 (1,093 ± 3)	162	12	Mabee et al. 2006c
Prattsburgh-Italy (Ecogen), Steuben Co.	2004	200 ± 12	365 ± 3 (1,198 ± 10)	177	9	Mabee et al. 2005b
Carthage, Jefferson Co.	1995	225	-[2]	NA	-[2]	Cooper et al. 1995 in Cooper et al. 2004c
Westfield, Chautauqua Co.	2003	238 ± 48	532 ± 3 (1,745 ± 10)	199	4	Cooper et al. 2004c
Wethersfield (Noble), Wyoming Co.	2006	256 ± 20	344 ± 1 (1,129 ± 3)	203	11	Mabee et al. 2006b

Table 3-6 Comparison of Fall Mean Passage Rates, Mean Flight Altitudes, Average Flight Directions, and Percentage of Targets at Altitudes Less than 410 Feet (125 Meters) at Sites in New York State

Location	Year	Mean Passage Rate[1] (Targets/ km/hr)	Mean Flight Altitude (Meters [Feet] agl)	Average Flight Direction (Degrees)	Percentage of Targets at Altitudes <125 Meters	Reference
Centerville (Noble), Allegany Co.	2006	259 ± 27	350 ± 2 (1,148 ± 7)	208	12	Mabee et al. 2006b
Moresville (Invenergy), Delaware Co.	2005	315	494 (1,621)	251	3	Woodlot 2007
Cape Vincent, Jefferson Co. (horizontal and vertical modes)	2006	346	490 (1,608)	209	8	Kerns et al. 2007
Jordanville, Herkimer Co.	2005	380	440 (1,444)	208	6	Woodlot 2005d in Woodlot 2006f
Clayton (Horse Creek), Jefferson Co.	2005	418	475 (1,558)	168	10[6]	Woodlot 2005i
Bliss (Noble), Allegany Co.	2005	444	411 (1,348)	Southwest	13	Yonker and Landon 2005
Howard, Steuben Co.	2005	481 ± 52	491 ± 14 (1,611 ± 46)	185	5[7]	Woodlot 2005a
Dutch Hill, Steuben Co.	2006	535	358 (1,175)	215	11	Roy 2006
Chateaugay, Franklin Co.	2006	643 ± 63	431 ± 17 (1,414 ± 56)	212	8[3]	Woodlot 2006f
Fairfield (Top Notch), Herkimer Co.	2005	691	516 (1,693)	198	4	Woodlot 2005c in Woodlot 2006f
West Hill, Madison Co.	2005	732	664 (2,179)	223	2[5]	Gary 2007

Note:

[1] There are a number of factors that can influence the mean passage rate including: weather, sampling methodology, equipment, study duration, site location, experience of firm/staff, etc. Therefore, this summary is intended to show a general comparison of passage rates of radar studies conducted in New York State and it should not be used as a direct comparison between listed sites without additional evaluation.

[2] ABR does not believe it is appropriate to compare flight altitudes with studies conducted before 2001 because of different equipment that probably resulted in a low altitude bias (Mabee et al. 2006a).

[3] <120 meters (394 feet).

[4] Mean Flight Altitude is presented as (Meters [feet] arl [above radar level]).

[5] <118 meters (387 feet).

[6] <150 meters (492 feet).

[7] <91 meters (299 feet).

Key:
NA = Not available.

Table 3-7 Comparison of Spring Mean Passage Rates, Mean Flight Altitudes, Average Flight Directions, and Percentage of Targets at Altitudes Less than 410 Feet (125 Meters) at Sites in New York State

Location	Year	Mean Passage Rate[1] (Targets/ km/hr)	Mean Flight Altitude (Meters agl [feet])	Average Flight Direction (Degrees)	Percentage of Targets at Altitudes <125 Meters	Reference
Wethersfield, Wyoming Co.	1999	41	-[2]	21	-[2]	Cooper and Mabee 2000
Ellenburg (Noble), Clinton Co.	2005	110 ± 19	338 ± 3 (1,109 ± 10)	30	20	Mabee et al. 2006c
Alabama (Horizon), Genesee Co.	2005	111 (hor), 200 (ver)	413	35	14	Gary 2007
Sheldon (High Sheldon), Wyoming Co.	2005	112	418 (1,371)	25	6[3]	Woodlot 2006l
Perry (Dairy Hills), Wyoming Co.	2005	117 ± 9	397 ± 2 (1,302 ± 7)	14	15	Young et al. 2006
Carthage, Jefferson Co.	1994	159	-[2]	NA	-[2]	Cooper et al. 1995 in Cooper et al. 2004a
West Hill, Madison Co.	2005	160	291	31	25[6]	Gary 2007
Cape Vincent, Jefferson Co.	2007	166 (hor), 191 (ver)	441	34	14	Kerns et al. 2007
Prattsburgh-Italy (Ecogen), Steuben Co.	2005	170 ± 35	319 ± 2 (1,047 ± 7)	18	18	Mabee et al. 2005c
Arkwright (New Grange), Chautauqua Co.	2007	175 (hor), 635 (ver)	450 ± 2[5] (1,476 ± 7)	18	13	Kerns et al. 2008
Moresville (Invenergy), Delaware Co.	2005	210	431 (1,414)	46	8	Woodlot 2007
Clinton (Marble River), Clinton Co.	2005	254 ± 45	422 ± 54 (1,385 ± 177)	40	11[3]	Woodlot 2006h
Prattsburgh (First Wind), Steuben Co.	2006	277 ± 52	370±41 (1,214±135)	22	16	Woodlot 2005f
Centerville (Noble Allegany), Allegany Co.	2006	290 ± 35	351 ± 2 (1,152 ± 7)	22	16	Mabee et al. 2006a
Wethersfield (Noble), Wyoming Co.	2006	324 ± 27	355 ± 2 (1,165 ± 7)	12	19	Mabee et al. 2006a

Table 3-7 Comparison of Spring Mean Passage Rates, Mean Flight Altitudes, Average Flight Directions, and Percentage of Targets at Altitudes Less than 410 Feet (125 Meters) at Sites in New York State

Location	Year	Mean Passage Rate[1] (Targets/ km/hr)	Mean Flight Altitude (Meters agl [feet])	Average Flight Direction (Degrees)	Percentage of Targets at Altitudes <125 Meters	Reference
Chateaugay, Franklin Co.	2006	360 ± 37	409 ± 26 (1,342 ± 85)	48	18[3]	Woodlot 2006d
Cohocton, Steuben Co.	2005	371	609 (1,198)	28	12	Woodlot 2006k in Woodlot 2006d
Westfield, Chautauqua Co.	2003	395 ± 69	528 ± 3 (1,732 ± 10)	29	4	Cooper et al. 2004a
Jordanville, Herkimer Co.	2005	409	371 (1,217)	40	21	Woodlot 2005g in Woodlot 2006d
Villenova (Noble Ball Hill), Chautauqua Co.	**2007**	**419 ± 40**	**493 ± 28 (1,617 ± 92)**	**10**	**3[3]**	**Woodlot 2008b**
Howard, Steuben Co.	2006	440 ± 68	426 ± 24 (1,398 ± 79)	27	13[4]	Woodlot 2006e
Clayton (Horse Creek), Jefferson Co.	2005	450	443	30	14[7]	Woodlot 2005h
Cape Vincent, Jefferson Co.	1995	473	-[2]	18	-[2]	Cooper et al. 1995 in Kerlinger and Guarnaccia 2006
Fairfield (Top Notch), Herkimer Co.	2005	509	419 (1,375)	44	20	Woodlot 2006d

Notes:

[1] There are a number of factors that can influence the mean passage rate including: weather, sampling methodology, equipment, study duration, site location, experience of firm/staff, etc. Therefore, this summary is intended to show a general comparison of passage rates of radar studies conducted in New York State and it should not be used as a direct comparison between listed sites without additional evaluation.

[2] ABR does not believe it is appropriate to compare flight altitudes with studies conducted before 2001 because of different equipment that probably resulted in a low altitude bias (Mabee et al. 2006a).

[3] <120 meters (394 feet).

[4] <91 meters (299 feet).

[5] Mean Flight Altitude is presented as (Meters [feet] arl [above radar level]).

[6] <118 meters (387 feet).

[7] <150 meters (492 feet).

Key:
NA = Not available.

In the fall, the mean flight altitude was 768.2 feet (234.5 meters) higher than the maximum turbine height (388.8 feet [118.5 meters]) but slightly lower than at the other locations in the east where similar studies have been conducted (see Table 3-6). The mean flight altitude in the spring was 1,230.2 feet (374.5 meters) higher than the maximum turbine height but in general, was in the middle of the range of mean flight altitudes from other studies (see Table 3-7). In both spring and fall, the majority of migration occurred well above the height of the proposed turbines.

Flight Direction

The mean flight direction of targets observed on radar was 216º in fall and 10º in spring. This indicates that the predominant flight direction was southwesterly in fall and northerly in spring, which is consistent with the expected seasonal migration flight directions. See Figure 6 in Appendix A and Figure 2-5 in Appendix B for compass rose figures showing the flight directions of targets.

Nighttime Visual Study

Based on visual sampling to an approximate altitude of 120 meters (394 feet) agl, a total of 31 birds and 12 bats were observed in fall 2006 during 313 five-minute observations and four birds and 13 bats in spring 2007 during 157 five-minute observations.

Woodlot also calculated the percentage of birds and bats detected with the radar based on flight behavior. To distinguish birds from bats, flight behavior across the radar screen was noted where erratic flight behavior indicated bats and linear movement indicated either birds or bats. From this coarse level analysis, 95% of targets were birds, 3% were bats, and 2% were insects in the fall. In the spring, 96% of targets were birds, 2% were bats, and 2% were insects (see Appendices A and B for more information).

3.3.2 Migratory Raptor Surveys

3.3.2.1 Fall Raptor Surveys

Fall migratory raptor surveys were conducted by E & E on September 15, October 5, and November 1, 2006, for a total of 21 survey hours. Migrants were determined as those raptors with a non-northerly flight path. Locally foraging raptors were also counted but not included in the migrant totals. Weather conditions on the survey days were generally favorable for fall raptor migration with northerly, northeasterly or northwesterly winds; light drizzle on the morning of September 15, 2006, but otherwise no precipitation; and average temperatures.

During Project surveys in fall 2006, E & E observed a total of 94 raptors including 59 migrants and 35 local raptors of eight species (see Table 3-8 and Appendix E, Table E-1). The migratory passage rate was 2.8 raptors per observer hour. The nearest local hawk watch is in Hamburg, New York, but a hawk watch is not conducted at the Hamburg site or other regional hawk watches in the fall because of the very sparse raptor migration; therefore, no comparison could be made for the fall. Turkey Vultures were the most prevalent raptor species seen. Many of the

Turkey Vultures identified were likely local birds exhibiting back and forth foraging flights; however, all birds observing flying in a non-northerly direction were considered potential migrants. Approximately 42% of the migratory raptors flew below 400 feet agl at some point during observation. The primary flight direction of migratory raptors was southeast and no concentrated flight paths were identified. General flight paths observed from the raptor survey location are shown on Figure 3-5.

Table 3-8 Fall Raptor Survey Results

	Common Name	9/15/06	10/5/06	11/1/06	Grand Total
Local	Turkey Vulture	5	3	0	8
	Northern Harrier	2	2	2	6
	Cooper's Hawk	0	1	1	2
	Red-tailed Hawk	4	2	6	12
	Unidentified Buteo	0	0	3	3
	American Kestrel	2	1	1	4
Total Locals		**13**	**9**	**13**	**35**
Migrant	Turkey Vulture	17	28	0	45
	Northern Harrier	0	2	0	2
	Sharp-shinned Hawk	0	1	0	1
	Cooper's Hawk	0	1	0	1
	Red-shouldered Hawk	0	6	0	6
	Red-tailed Hawk	0	0	1	1
	Merlin	1	1	0	2
	Unidentified Raptor	0	0	1	1
Total Migrants		**18**	**39**	**2**	**59**
	Grand Total	**31**	**48**	**15**	**94**

The findings are consistent with the knowledge of fall raptor migration in the region and the nearby studies conducted at the New Grange Wind Farm Project Area, which had an overall passage rate of six raptors/hour (Kerns et al. 2008), as raptors do not concentrate in large numbers in this area and movements are relatively diffuse. There is no evidence of a pronounced fall migratory raptor corridor in the Project Area.

3.3.2.2 Spring Raptor Surveys

Spring migratory raptor surveys were conducted on April 22, 23, and 30, 2007, for a total of 21 survey hours in 2007; and March 30, April 7, 15, and 24, and May 6 and 13, 2008 for a total of 42 survey hours in 2008. Migrants were determined as those raptors with a non-southerly flight path. Locally foraging raptors were also counted but not included in the migrant totals. Weather conditions on the survey days were generally favorable for raptor migration with westerly or south-westerly winds; average to above average temperatures; and no precipitation except for a 10-minute shower on April 23, 2007.

Over the course of nine raptor surveys conducted during the spring of 2007 and 2008, a total of 671 raptors of 12 species were identified, 332 of which were considered to be migrants (see Table 3-9 and Table E-1). The migratory passage rate was 5.3 raptors per observer hour. For comparison, at the Hamburg Hawk Watch in Hamburg, New York over the same nine survey days, 4,083 raptors were tallied with a passage rate of 65.6 raptors/hour (HawkCount 2007, 2008). At the Ripley Hawk Watch in Ripley, New York over the same nine survey days, 7,947 raptors were tallied with a passage rate of 135.9 raptors/hour (HawkCount 2007, 2008).

The findings from the 2007 and 2008 spring migratory raptor surveys are consistent with the knowledge of spring raptor migration in New York State and the nearby studies conducted at the New Grange Wind Farm Project Area, which had an overall passage rate of three raptors/hour (Kerns et al. 2008), as the birds concentrate in higher numbers along the Great Lakes and are relatively diffuse elsewhere. General flight paths observed from the raptor survey location are shown on Figure 3-6. There is no evidence of a pronounced spring migratory raptor corridor in the Project Area.

3.3.3 Spring Migratory Surveys

In 2007, a total of 1,624 birds of 90 species was recorded during migratory bird surveys conducted at 28 points (A through ZC) on May 11 and 22, 2007 (see Appendix E, Table E-2 for totals and Tables E-3 and E-4 for survey results by date). In 2008, 1,603 birds of 75 species was recorded at 33 points (A through ZH) on May 6 and 16, 2008 (see Appendix E, Table E-5 for totals and Tables E-6 and E-7 for survey results by date).

Flyovers in 2007 made up 111 of the 1,624 birds and were observed at 23 of the 28 survey locations; species observed flying over the Project Area included Mallard (five birds), Turkey Vulture (11 birds), Red-tailed Hawk (one bird), Blue Jay (four birds), American Crow (12 birds), Common Raven (two birds), Tree Swallow (six birds), Barn Swallow (three birds), Northern Mockingbird (one bird), Yellow Warbler (two birds), Red-winged Blackbird (seven birds), Common Grackle (three birds), Brown-headed Cowbird (one bird), Baltimore Oriole (three birds), Purple Finch (five birds), and American Goldfinch (45 birds). Flyovers in 2008 made up 208 of the 1,603 birds and were observed at 30 of the 33 survey locations; species observed flying over the Project Area included Great Blue Heron (one bird), Canada Goose (five birds), Red-tailed Hawk (one bird), American Kestrel (one bird), Killdeer (two birds), Mourning Dove (nine birds), Northern Flicker (two birds), Great Crested Flycatcher (one bird), Eastern Kingbird (one bird), Blue Jay (29 birds), American Crow (21 birds), Tree Swallow (three birds), Barn Swallow (eight birds), Eastern Bluebird (one bird), American Robin (two birds), Bobolink (five birds), Red-winged Blackbird (21 birds), Common Grackle (13 birds), Brown-headed Cowbird (32 birds), House Finch (one bird), and American Goldfinch (49 birds). All of these species are known to breed in or within proximity to the Project Area and the number of flyovers is relatively low

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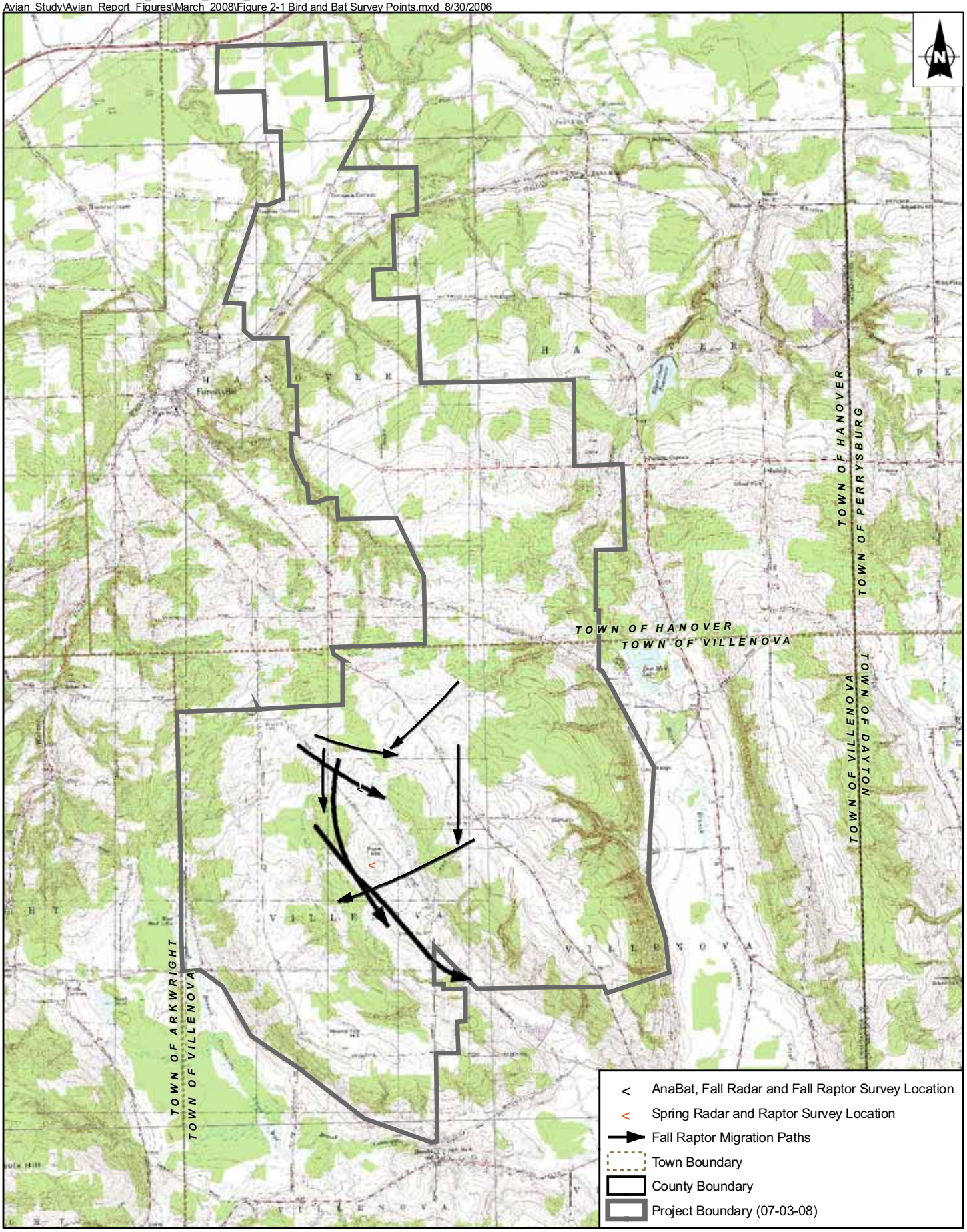
\\BUFSDL4\GIS\Buffalo\Noble_Wind\2008_NOBLE_SITES\Maps\Villenova\MXDs\
Avian_Study\Avian_Report_Figures\March_2008\Figure 2-1 Bird and Bat Survey Points.mxd 8/30/2006



Source: USGS Cherry Creek Quad, 1990; USGS Forestville Quad, 1990; USGS Perrysburg Quad, 1990; USGS Hamlet Quad, 1990.

Figure 3-5 Fall Raptor Migration Paths
Ball Hill Project Area

0 0.5 1 2
Miles

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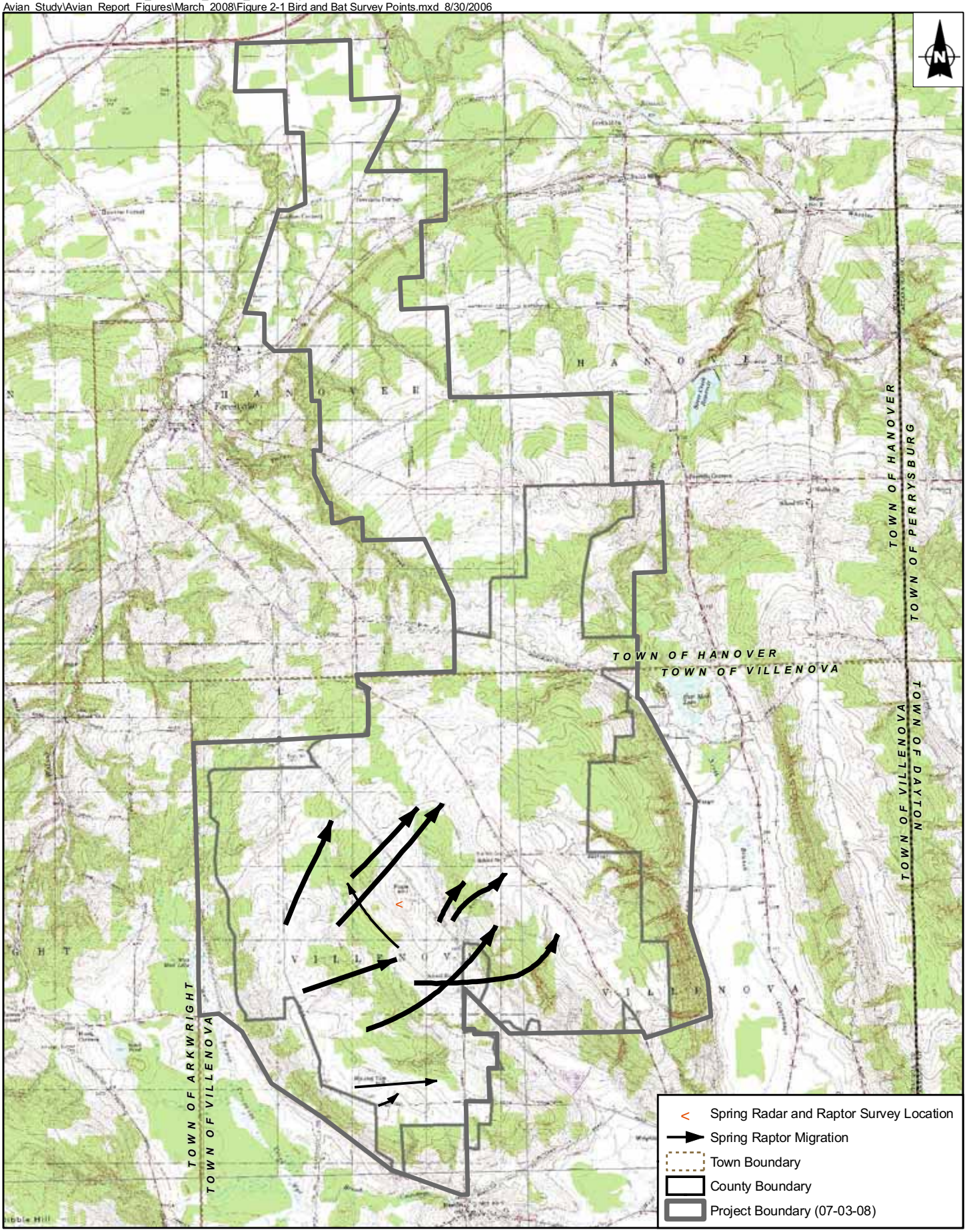
\\BUFSDL4\GIS\Buffalo\Noble_Wind\2008_NOBLE_SITES\Maps\Villenova\MXDs\
Avian_Study\Avian_Report_Figures\March_2008\Figure 2-1 Bird and Bat Survey Points.mxd 8/30/2006



Source: USGS Cherry Creek Quad, 1990; USGS Forestville Quad, 1990; USGS Perrysburg Quad, 1990; USGS Hamlet Quad, 1990.

Figure 3-6 Spring Raptor Migration Paths
Ball Hill Project Area

0 0.5 1 2
Miles

Table 3-9 Spring Raptor Survey Results

	Common Name	4/22/07	4/23/07	4/30/07	3/30/08	4/07/08	4/15/08	4/24/08	5/06/08	5/13/08	2007 Total	2008 Total	Grand Total
Local	Turkey Vulture	11	0	22	5	19	2	57	59	81	33	223	256
	Osprey	0	0	1	0	0	0	0	0	0	1	0	1
	Bald Eagle	0	0	1	0	1	0	0	0	0	1	1	2
	Northern Harrier	1	0	0	1	0	2	0	0	2	1	5	6
	Cooper's Hawk	1	2	0	0	0	0	0	0	0	3	0	3
	Red-shouldered Hawk	0	1	0	0	0	0	0	0	0	1	0	1
	Broad-winged Hawk	0	1	1	0	0	0	0	0	0	2	0	2
	Red-tailed Hawk	2	2	5	4	7	3	11	10	9	9	44	53
	Rough-legged Hawk	1	0	0	1	0	0	0	0	0	1	1	2
	American Kestrel	2	1	0	2	1	2	0	2	2	3	9	12
	Unidentified Raptor	0	0	1	0	0	0	0	0	0	1	0	1
Total Locals		**18**	**7**	**31**	**13**	**28**	**9**	**68**	**71**	**94**	**56**	**283**	**339**
Migrant	Turkey Vulture	7	18	46	43	71	21	33	4	3	71	175	192
	Osprey	1	0	0	0	0	0	0	0	2	1	2	3
	Bald Eagle	0	1	0	0	1	0	0	0	0	1	1	2
	Northern Harrier	0	0	2	2	0	0	0	1	0	2	3	5
	Sharp-shinned Hawk	0	7	0	0	0	0	0	1	0	7	1	8
	Cooper's Hawk	0	1	0	0	0	0	0	0	0	1	0	1
	Broad-winged Hawk	1	19	0	0	0	0	0	0	0	20	0	20
	Red-tailed Hawk	3	1	2	8	3	6	10	3	0	6	30	36
	Rough-legged Hawk	2	0	0	1	0	0	0	0	0	2	1	3
	Golden Eagle	0	0	0	1	1	0	0	0	0	0	2	2
	American Kestrel	0	0	0	0	0	0	0	1	0	0	1	1
	Unidentified Buteo	2	0	0	0	1	0	0	0	0	2	1	3
	Unidentified Raptor	0	0	1	1	0	0	0	0	0	1	1	2
Total Migrants		**16**	**47**	**51**	**56**	**77**	**27**	**43**	**10**	**5**	**114**	**218**	**332**
	Grand Total	**34**	**54**	**82**	**69**	**105**	**36**	**111**	**81**	**99**	**170**	**501**	**671**

in comparison to total birds identified. Thus, these birds were included in the results that follow.

On May 11, 2007, 787 birds of 76 species were identified, and on May 22, 2007, 837 birds of 66 species were identified. The most numerous species recorded in 2007 were Red-winged Blackbird (261 birds), American Crow (125 birds), and Bobolink (99 birds). On May 6, 2008, 718 birds of 61 species were identified, and on May 16, 2008, 885 birds of 72 species were identified. Similarly to 2007, Red-winged Blackbird (239 birds) and American Crow (139 birds) were the two most numerous species recorded in 2008. In 2008, American Robin was the third most common species recorded with 135 birds observed. Overall, the species observed were generally expected based on the habitat, location, and time of year. The averages for total birds and species per survey location are indicated in Table 3-10.

Table 3-10 Spring Migratory Survey Results

	May 11, 2007	May 22, 2007	May 6, 2008	May 16, 2008
Total Species on Survey	76	66	61	72
Average Total Birds per Location	28.1	29.9	21.8	26.8
Average Number of Species per Location	13.8	15.8	10.7	14.3

In 2007, the total number of birds per point across both surveys ranged between 12 and 73 birds, with an overall average of 29.0 birds per point. Points Y, P, and H had the highest number of birds with averages of 39 or more birds and points T, ZB, and U held the lowest number of total birds with averages under 20 birds. In 2008, the total number of birds per point across both surveys ranged between 2 and 45 birds, with an overall average of 24.3 birds per point. Points E, B, C, and J had the highest number of birds with averages of 34 or more birds and points ZH, T, and ZB had the lowest number of birds with averages under 10 birds.

In 2007, the species richness per point across both surveys ranged between six and 26 species, with an overall average of 14.8 species per point. Survey points P, H, and A averaged more than 19 species, while survey points S, ZB, D, and K averaged fewer than 11 species. In 2008, the species richness per point across both surveys ranged between one and 22 species, with an overall average of 12.5 species per point. Survey points E, K, ZG, and M averaged more than 17 species, while survey points ZH, ZA, and ZD averaged fewer than seven species.

The survey points with the highest number of birds and species richness, generally, have a mix of habitats. The survey points with the lowest number of birds and species richness, generally, were without a mix of habitats and/or had poor lines-of-sight.

Most of the birds tallied during the spring migratory survey were likely local breeders rather than migrants, as most species identified were within their population breeding range. However, surveys were conducted during the migratory sea-

son, as evidenced by sightings of several species that do not breed in the area, including Palm Warbler and White-crowned Sparrow. There was no evidence from the surveys or other time spent in the Project Area during the spring season that the Project Area serves as an increased migratory corridor or stopover point for passerines or other bird species.

3.3.4 Breeding Bird Surveys

A three-minute breeding bird survey was conducted at 13 points (points A through M) on June 11, 2007 and was repeated on June 26, 2007 (see Figure 2-1). In 2008, a 5-minute breeding bird survey was conducted at 26 points over two consecutive days (June 11 and June 12, 2008). Six points (points B, E, F, G, H, and L) surveyed in 2008 were also surveyed in 2007. In 2007, a combined total of 609 birds of 68 species were identified during the two surveys (see Appendix E, Table E-8 for totals and Tables E-9 and E-10 for survey results by date). Fifty-six species were identified during the June 11, 2007, survey for a total of 250 birds. Sixty species and a total of 359 birds were identified during the June 26, 2007 survey. The most numerous species recorded in 2007 were American Goldfinch (57 birds), Bobolink (49 birds), Red-winged Blackbird (41 birds), and American Crow (41 birds). Although the 2008 survey was conducted across two days all points were visited only once and therefore the results are presented as one survey. In 2008, 653 birds of 72 species were identified across the 26 survey points (see Appendix E, Table E-11 for totals). The most numerous species recorded in 2008 were Bobolink (60 birds), American Crow (59 birds), Red-winged Blackbird (49 birds), and Song Sparrow (44 birds).

Total birds per point in 2007 ranged from seven to 40 birds, with averages of 19.2 birds on June 5 and 27.6 birds on June 22. Total birds per point in 2008 ranged from nine to 36, with an average of 25.1 birds. Total species per point in 2007 ranged from six to 18 species, with averages of 11.2 species on June 5 and 15.2 species on June 22. Survey points A, J, and L averaged (for the two survey days) less than 16 birds per location and low species diversity (12 or fewer species per location); whereas points H, M, and K averaged 27 or more birds and relatively higher species diversity (15 or more species per location). Total species per point in 2008 ranged from seven to 20, with an average of 14.1 species. In 2008, only two survey points (T3 and T35) had 16 or fewer birds and 12 or fewer species. In contrast, eight points (F, H, L, T3, T17, T25, T58, and T64) had 27 or more birds and 15 or more species.

The species composition was generally consistent with what was anticipated for the habitat and location and was generally consistent with those species regularly found in or near Chautauqua County during the New York State Breeding Bird Atlas (2000 through 2005) and USGS breeding bird surveys. No threatened or endangered species were identified during E & E breeding bird surveys; only one state species of special concern, Grasshopper Sparrow, was detected.

To provide a more standardized view of habitat, percent cover within a 0.25-mile radius of the 2008 survey locations was determined from a geographic information system (GIS) aerial photograph layer. A 0.25-mile-radius circle was centered over the survey point and the habitat type (agricultural, grassland, reverting field, and forest) within the circle was approximated to the nearest 25% (see Tables E-12 and E-13). Acknowledging that habitat could have changed since the aerial photograph was taken in 2004, percent cover was compared to notes taken in the field and adjusted as necessary. The survey points were in a variety of habitat types, but most had at least some forested habitat nearby (see Tables 3-11, E-12, and E-13) and were consistent with the overall habitat at the proposed turbines. In general, more birds and species were found at survey points with a mix of habitats. Bird species observed during surveys were typical of the habitats examined. GPS coordinates of the 2008 survey locations are included on Table E-12.

Table 3-11 Summary of Habitat Types Based on Aerial Photograph Interpretation, Ball Hill 2008 Breeding Bird Surveys

Habitat Type	Number of Points with			
	100% Cover	75% Cover	50% Cover	25% Cover
Forest	1	6	7	9
Row Crop	0	5	6	7
Grassland	0	0	2	9
Reverting Field	0	0	0	12

3.3.5 Bat Habitat Surveys

Habitat surveys of the Project Area were conducted during various field efforts in fall 2006, spring 2007, and spring 2008. Surveys identified no major rock outcroppings, cave dwellings, or hibernacula where bats may roost within the Project Area. Based on the mosaic of habitat types found throughout the Project Area, suitable habitat was identified for the most common bat species that would be expected to occur in the Project Area. The acoustical monitoring surveys (see Section 3.3.6) confirmed their presence in the Project Area.

In order to determine the potential for state- and federally endangered Indiana Bats to occur in the Project Area, the suitability of the Project Area to support the Indiana Bat was evaluated. Preferred habitats and geographic location can vary between males and females and time of year. These bats may react positively or negatively to habitat disturbances (i.e., forest management practices) and are known to typically forage in semi-open forested habitats, in riparian areas, and along forested edges (USFWS 2007c). Roost trees can vary in size and species. As these environments are common in the Project Area as well as most of New York State, there is suitable habitat for them to occur in the Project Area. However, the range of the Indiana Bat in New York State is primarily in the eastern part of the state. No known Indiana Bat hibernacula were documented by NYSDEC or USFWS within 40 miles of the Project Area (Seoane 2006, 2008).

As of November 2006, the USFWS has records of winter populations (i.e., positive winter occurrence since 1995) of the Indiana Bat at approximately 281 different hibernacula located in 19 states (Alabama, Arkansas, Connecticut, Illinois, Indiana, Kentucky, Maryland, Michigan, Missouri, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Vermont, Virginia, and West Virginia) (USFWS 2007c). New York has two of the 13 rangewide Priority 1 hibernacula, four of the 45 Priority 2 hibernacula, three of the 125 Priority 3 hibernacula, and two of the 85 Priority 4 hibernacula that have positive winter occurrence since 1995. Winter surveys were conducted in 2005, and New York had 9.1% of the hibernating Indiana Bats (USFWS 2007c). The two Priority 1 hibernacula located in New York are in Ulster County: Walter William Preserve Mine and the Williams Hotel Mine. The current (2005) population estimate for Walter William Preserve Mine is 11,394 bats and for the Williams Hotel Mine is 15,438 bats (USFWS 2007c). No Indiana Bat hibernacula were identified in western New York (USFWS 2007c).

As of October 2006, there are records of 269 maternity colonies in 16 states that are considered to be locally extant (Arkansas, Illinois, Indiana, Iowa, Kentucky, Maryland, Michigan, Missouri, New Jersey, New York, Ohio, Pennsylvania, Tennessee, Vermont, Virginia, and West Virginia) (USFWS 2007c). Of the 269 colonies, 54% (146 colonies) have been found, mostly during mist-netting surveys, since 1997 (USFWS 2007c). Because maternity colonies are widely dispersed during the summer and difficult to locate, it is believe that only a fraction of existing maternity colonies have been identified based on the rangewide population estimates derived from winter hibernacula surveys. For example, based on the 2005 rangewide population estimate of 457,400 bats, and assuming a 50:50 sex ratio, and an average maternity colony size of 50 to 80 adult females (Whitaker and Brack 2002), then the 269 maternity colonies may only represent 6 to 9% of the 2,859 to 4,574 maternity colonies assumed to exist (USFWS 2007c). Although there may be disagreements regarding the average colony size, the geographic locations of the majority of Indiana Bat maternity colonies remain unknown. Most capture records of reproductively active female and juvenile Indiana Bats (i.e., evidence of a nearby maternity colony) have occurred in glaciated portions of the upper Midwest; however, a growing number of maternity records have been documented in New York, New Jersey, and Vermont in recent years as a result of spring emergence studies and mist netting efforts (Gardner and Cook 2002 in USFWS 2007c). To date, New York has 31 documented maternity colonies with locations spread among the following counties: Cayuga (1), Dutchess (5), Essex (1), Jefferson (9), Onondaga (4), Orange (8), and Oswego (3) (USFWS 2007c).

Male Indiana Bats are found throughout the range of the species, but in summer they are most common in areas near hibernacula (Hall 1962 in USFWS 2007c; Gardner and Cook 2002 in USFWS 2007c).

By compiling individual population estimates from bat surveys conducted within 214 hibernacula during the winters of 2003-2004 and 2004-2005, the USFWS has estimated that the 2005 rangewide population of Indiana Bats was approximately 457,000 bats (USFWS 2007c). The population estimates are considered conservative (i.e., underestimations), because some hibernacula may be physically inaccessible (e.g., areas ranging in size from small cracks and crevices to large rooms where Indiana Bats are known or believed to roost). In most winters, a few new hibernacula are discovered somewhere across the range, but discovery of previously unknown hibernacula with greater than 1,000 Indiana Bats is uncommon. Of hibernacula first documented during the past 10 years, only three have held more than 5,000 Indiana Bats when initially discovered: Magazine Mine in Illinois, Lewisburg Limestone Mine in Ohio, and Williams Hotel Mine in New York. Survey results indicate that numbers of Indiana Bats in New York have been increasing since 1990; however, the recent outbreak of White Nose Syndrome may ultimately change that trend.

Summer maternity habitats for Indiana Bats require dead/dying, large diameter trees, with exfoliating bark or cavities, located in upland forests, exposed to direct sunlight. Generally, Indiana Bat habitat requires streams/riparian areas (or some water source) harboring forage material. Dominant preferred tree species that provide suitable habitat for the Indiana Bat include Hickory (*Carya* spp.), Elm (*Ulmus* spp.), Oaks (*Quercus* spp.), and Cottonwood (*Populus deltoides*). Other tree species have been documented as "acceptable" tree habitat; however, these trees require very specific conditions to attract Indiana Bats. These secondary "acceptable" choices of tree species often include common trees where size, the presence of cavities, exfoliating bark, or dead "snag" portions occurs. This flexibility in tree use suggests that preference may not be determined by tree species; so much as it may be the condition of the potential roost site (Menzel et al. 2001).

Female Indiana Bats spend a majority of the summer in breeding nurseries, generally located around water resources (i.e., streams, ponds, and wetlands). Male Indiana Bats spend most of their time foraging in close proximity to hibernacula and along watercourses, locating preferred food sources of flying insects. In late summer and early fall (late May through November), these bats begin to move back to wintering hibernacula. The closest known Indiana Bat hibernacula to the Project Area are located in Onondaga County approximately 90 miles east and Jefferson County approximately 120 miles northeast (see Figure 3-7). Outside of New York, there are also known Indiana Bat hibernacula that are located in central and southern Pennsylvania, which are a similar distance away as Onondaga County, New York.

No hibernacula or roosts were identified within the Project Area. Based on the known locations of Indiana Bat hibernacula and the distance that separates these hibernacula from the Project Area, migration through the Project Area is unlikely.

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P1: Priority 1- Essential to recovery and long-term conservation. Priority 1 hibernacula typically have (1) a current and/or historically observed winter population = 10,000 Indiana bats and (2) currently have suitable and stable microclimates.

P2: Priority 2- Contributes to recovery and long-term conservation. Priority 2 hibernacula have a current or observed historic population of 1,000 or greater but fewer than 10,000 and an appropriate microclimate.

P3: Priority 3- Contribute less to recovery and long-term conservation. Priority 3 hibernacula have current or observed historic populations of 50-1,000 bats.

P4: Priority 4- Least important to recovery and long-term conservation. Priority 4 hibernacula typically have current or observed historic populations of fewer than 50 bats.

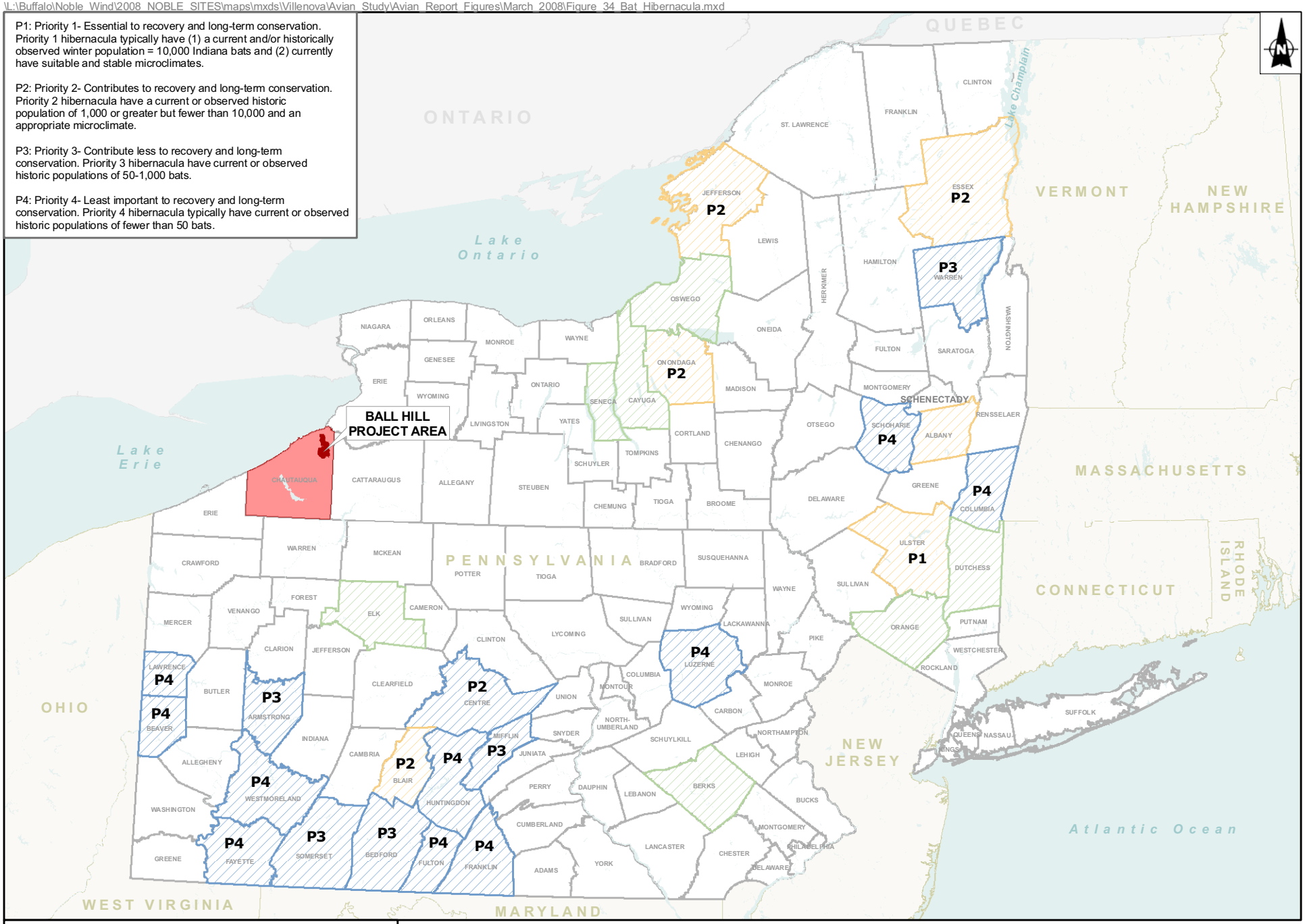

Figure 3-7 Distribution of Indiana Bats in New York and Pennsylvania

Source: USFWS 2007b.

3.3.6 Acoustical Monitoring for Bats

Woodlot conducted an acoustical monitoring study in the spring and fall of 2007. The results of their study, including mean detection rate, species composition, and the relationship of the number of call sequences to weather variables, are summarized in this section. The reports prepared by Woodlot are in Appendix B and Appendix C.

3.3.6.1 Spring 2007 Study

Two detectors were deployed at different heights in a met tower in the Project Area from the night of March 28 to the night of May 30, 2007, yielding a total of 86 detector-nights of recordings (32 nights from the high detector and 54 nights from the low detector) (some nights of data were lost as a result of detector failure, which is common during remote studies). The met tower was located in an open agricultural field with some nearby woodlands (see Figure 2-1). A total of 78 bat call sequences were recorded during the spring sampling. The mean detection rate of both detectors was 0.9 call sequences per detector-night. Many more call sequences were recorded by the lower detector (74 call sequences), which was 20 meters (66 feet) above the ground, than by the upper detector (four call sequences), which was 40 meters (132 feet) above the ground. The lower detector was operational for more nights than the higher detector (54 vs. 32 nights of data, respectively), but even on nights when both detectors were functioning, the low detector recorded more call sequences than the high detector. The number of call sequences varied considerably from night to night. In general, the most calls were recorded over a few nights in late April and early May (see Figure 3-2 in Appendix B). At the low detector, the maximum number of call sequences occurred on May 8 and 9, 2007, when 13 call sequences were recorded on each night, and at the high detector, the maximum number of call sequences occurred on May 15, 2007, when two call sequences were recorded.

A large proportion (45% or 35 calls) of the call sequences were identified simply as “unknown” due to poor call quality or too few call pulses on which to base identification. Most of the call sequences, that could not be identified (91% [32 calls]) were high frequency calls, indicating that they may have been myotids or bats in the Eastern Red Bat/Eastern Pipistrelle guild. Of the call sequences that could not be identified (55% or 43 calls) based on good call quality and a sufficient number of call pulses, approximately 33% were myotids and 22% belonged to the “Big Brown” guild, which includes the Big Brown Bat, Silver-haired Bat, and Hoary Bat. Several of the recorded call sequences were distinct enough to identify to species, rather than just to guild. Two bat species were identified in this manner during the spring surveys, including the Big Brown Bat (two calls) and the Silver-haired Bat (one call). The call sequences in the myotid group could not be identified to species because the call sequences were too indistinct, and the other calls in the Big Brown guild were either that of the Big Brown Bat or Silver-haired Bat, but definitely not from the Hoary Bat. Both species identified are found throughout New York State.

The survey results (detections and species) were generally consistent, although slightly higher, than similar studies conducted in the spring in agricultural habitat in the northeast (see Table 5 in Appendix C). Comparison of results between sites has numerous caveats, especially for the mean detection rate (call sequences per night) because the detection rates can be easily skewed by one or several bats repeatedly circling the met tower and producing many calls on one or several nights during the study period. Site selection is also a key component for comparison, as most studies are conducted at met towers, which are often placed in wide open fields that are not near wooded areas where there is often more local bat activity. Therefore, sites located near wooded areas and/or wetlands may have higher detection rates compared to other sites because of the surrounding habitat. Other factors include, but are not limited to, duration of season, number of detectors, type of detectors, setup, and amount of operational time for the detectors as malfunctions are common for remote-based acoustical monitoring equipment.

For more complete results and discussion on the AnaBat surveys conducted in the spring, see the Woodlot report in Appendix B.

3.3.6.2 Fall 2007 Study

Detectors were deployed at the same heights and on the same met tower used during the spring 2007 study. Surveys were conducted from the night of July 30 to the night of October 14, 2007, yielding a total of 154 detector-nights of recordings (77 detector-nights at the low detector and 77 detector-nights at the high detector). A total of 541 bat call sequences were recorded during the fall sampling. The mean detection rate for both detectors was 3.5 call sequences per detector-night. Both detectors recorded a similar number of call sequences, with the low detector (295 calls) recording a few more calls than the high detector (246 calls). The number of call sequences varied and no calls were detected on a number of nights toward the end of the sampling period; consequently, no seasonal trends were observed (see Figure 2 in Appendix C). At the high detector, the maximum number of call sequences occurred on August 29, 2007, when 22 call sequences were recorded, and at the low detector, the maximum number of call sequences occurred on September 21, 2007, when 20 call sequences were recorded.

The highest proportion (54% or 291 calls) of the recorded call sequences were labeled as unknown due to short call sequences, poor call signature formation, or static interference. More low frequency calls (62% or 85 calls) were recorded than high frequency calls (38% or 52 calls); the low frequency calls are characteristic of the Big Brown guild. The composition of bat call sequences were 197 (36%) in the Big Brown guild, 27 (5%) in the Eastern Red Bat/Eastern Pipistrelle guild, and 26 (5%) in the Myotis guild. Several of the recorded call sequences were distinct enough to identify to species, rather than just to guild. Five bat species were identified in this manner during the spring surveys, including the Silver-haired Bat (52 calls), Hoary Bat (30 calls), Eastern Red Bat (19 calls), Big Brown Bat (one call), and Eastern Pipistrelle (one call). The call sequences in the myotid group could not be identified to species, because the call sequences were too in-

distinct. All of the species identified are found throughout New York State. The survey results (detections and species) were generally consistent with similar studies conducted in the fall in agricultural habitat in the northeast, although a wide range of detection rates have been reported for agricultural land (see Table A-3 in Appendix C).

The detection rates in spring 2007 were lower than in fall 2007 at this site, which was anticipated as bat activity is often greater in the late-summer and fall, based on previous studies conducted in the northeast due to recruitment to the population (e.g., young born in the spring). Please see the discussion on the caveats of detection rates and comparison between sites in Section 3.3.6.1.

For more complete results and discussion on the AnaBat surveys conducted in the fall, see the Woodlot report in Appendix C.

3.3.7 Bird Species List and Threatened/Endangered Species

During the bird surveys and other activities in the Project Area, E & E identified a total of 125 bird species in the Project Area (see Table 3-12).

Table 3-12 Bird Species Identified during E & E Surveys and Site Work in the Ball Hill Project Area

Common Name[1]		
Canada Goose	Acadian Flycatcher	Blue-winged Warbler
Wood Duck	Alder Flycatcher	Nashville Warbler
Mallard	Willow Flycatcher	Yellow Warbler
Ring-necked Duck	Least Flycatcher	Chestnut-sided Warbler
Bufflehead	Eastern Phoebe	Magnolia Warbler
Ring-necked Pheasant	Great Crested Flycatcher	Black-throated Blue Warbler
Ruffed Grouse	Eastern Kingbird	Yellow-rumped Warbler
Wild Turkey	Northern Shrike	Black-throated Green Warbler
Common Loon (SC)	Blue-headed Vireo	Blackburnian Warbler
Great Blue Heron	Warbling Vireo	Pine Warbler
Turkey Vulture	Red-eyed Vireo	Palm Warbler
Osprey (SC)	Blue Jay	Bay-breasted Warbler
Bald Eagle (T)	American Crow	Black-and-white Warbler
Northern Harrier (T)	Common Raven	American Redstart
Sharp-shinned Hawk (SC)	Horned Lark (SC)	Ovenbird
Cooper's Hawk (SC)	Purple Martin	Mourning Warbler
Red-shouldered Hawk (SC)	Tree Swallow	Common Yellowthroat
Broad-winged Hawk	Northern Rough-winged Swallow	Hooded Warbler
Red-tailed Hawk	Barn Swallow	Scarlet Tanager
Rough-legged Hawk	Black-capped Chickadee	Eastern Towhee
Golden Eagle (E)	Tufted Titmouse	Chipping Sparrow

Table 3-12 Bird Species Identified during E & E Surveys and Site Work in the Ball Hill Project Area

Common Name[1]		
American Kestrel	Red-breasted Nuthatch	Field Sparrow
Merlin	White-breasted Nuthatch	Savannah Sparrow
Killdeer	Brown Creeper	Grasshopper Sparrow (SC)
Solitary Sandpiper	House Wren	Song Sparrow
Spotted Sandpiper	Winter Wren	Swamp Sparrow
American Woodcock	Golden-crowned Kinglet	White-crowned Sparrow
Ring-billed Gull	Ruby-crowned Kinglet	Dark-eyed Junco
Rock Pigeon	Blue-gray Gnatcatcher	Snow Bunting
Mourning Dove	Eastern Bluebird	Northern Cardinal
Black-billed Cuckoo	Veery	Rose-breasted Grosbeak
Yellow-billed Cuckoo	Swainson's Thrush	Indigo Bunting
Barred Owl	Hermit Thrush	Bobolink
Ruby-throated Hummingbird	Wood Thrush	Red-winged Blackbird
Belted Kingfisher	American Robin	Eastern Meadowlark
Red-bellied Woodpecker	Gray Catbird	Common Grackle
Yellow-bellied Sapsucker	Northern Mockingbird	Brown-headed Cowbird
Downy Woodpecker	Brown Thrasher	Baltimore Oriole
Hairy Woodpecker	European Starling	Purple Finch
Northern Flicker	American Pipit	House Finch
Pileated Woodpecker	Cedar Waxwing	American Goldfinch
Eastern Wood-Pewee		House Sparrow

Note:
[1] Endangered (E) and threatened (T) species and species of special concern (SC) are noted with parenthesis after the common name.

NYSDEC maintains a list of bird species that are considered endangered (nine species), threatened (10 species), or of special concern (19 species) within the state of New York, inclusive of several federally listed species. Information was obtained from various sources, including E & E field surveys, Breeding Bird Atlas projects, and the BOS database of avian records to determine the potential occurrence of endangered, threatened, or special concern species in the Project Area. Table 3-13 lists these species along with notes of possible or confirmed occurrence within the Project Area.

Table 3-13 Potential Occurrence of Avian Endangered, Threatened, or Species of Special Concern within New York State at the Ball Hill Project Area

Listed Species[1,2]	Notes
Endangered Species	
Golden Eagle	It is considered extirpated as a breeder in New York State. It is a rare migrant over the Project Area. Two migrants were observed during E & E raptor surveys in Spring 2008. One adult was observed flying in March of 1993 in Hanover (BOS 2006).
Peregrine Falcon	No nests are known to occur in or near the Project Area. It is likely an uncommon migrant over the Project Area. One was observed in Hanover in October of 1999 (BOS 2006).
Spruce Grouse	Its New York State range is limited to the Adirondacks, where rare. Location/habitat is not suitable in Project Area.
Black Rail	It is extremely rare in New York. There are no records of occurrence in Chautauqua County. Location/habitat is not suitable in Project Area.
Piping Plover	It is federally endangered in the Great Lakes region. It is very rare in western New York. Location/habitat is not suitable in the Project Area. There are no records of occurrence in Chautauqua County.
Roseate Tern	It is federally endangered. Its New York State range is limited to coastal Long Island. Location/habitat is not suitable in the Project Area.
Black Tern	Location/habitat in the Project Area is not suitable for breeding or foraging. There are no records of occurrence in the Project Area.
Short-eared Owl	It is a very rare breeder in western New York. There are no records of breeding in Chautauqua County. As evidenced by Fredonia-Dunkirk and Jamestown CBC data, it occasionally winters in the county and may occur in the Project Area. As reported by the NHP, this species was observed in the Town of Sheridan in Chautauqua County near the Dunkirk Airport (Seoane 2006, 2008). Two were observed in December of 1991 in Hanover (BOS 2006).
Loggerhead Shrike	It is very rare in New York State and declining. There are no records of occurrence in the Project Area.
Threatened Species	
Pied-billed Grebe	It is an uncommon breeder in Chautauqua County. As evidenced by Fredonia-Dunkirk and Jamestown CBC data, it regularly winters in the county. There are no records of occurrence in the Project Area.
Least Bittern	Location/habitat within Project Area is not suitable for breeding. There are no records of occurrence in the Project Area.
Bald Eagle	This increasing species occurs as a migrant and transient over the Project Area. Location/habitat within Project Area is not ideal for breeding; however, there are several known nesting areas within 10 miles of the Project Area. E & E observed four individuals during spring raptor surveys in 2007 and 2008, and there have been a number of sightings of adults and immature birds near Lake Erie in the Town of Hanover (BOS 2006).

Table 3-13 Potential Occurrence of Avian Endangered, Threatened, or Species of Special Concern within New York State at the Ball Hill Project Area

Listed Species[1,2]	Notes
Northern Harrier	It has bred in a number of locations in Chautauqua County. It was listed as a possible breeder in BBA block 1569A in or near the Project Area. E & E staff observed this species on several occasions during E & E spring and fall raptor surveys and during spring migratory surveys within the Project Area.
King Rail	It is extremely rare in upstate New York. There is only one record of occurrence in Chautauqua County in the Town of Kiantone, approximately 20 miles south of the Project Area. Location/habitat in the Project Area is unsuitable for breeding.
Upland Sandpiper	This species has decreased over the last few decades. Although they were not detected during the 2000-2005 BBA, they were listed as confirmed, possible, and probable breeders in a number of blocks in Chautauqua County during the 1980-1985 BBA. There is some habitat (pasturelands) suitable for breeding in the Project Area. Six were observed in Hanover in April 1974, three were observed in Hanover in April 1975, two were observed in Villenova in 1987, and one was observed in Villenova in 1989 (BOS 2006). E & E conducted targeted searches in the Project Area but did not find this species in May or June 2007 or 2008.
Common Tern	It is rare in Chautauqua County away from large waterbodies. Location/habitat in the Project Area is unsuitable for breeding or foraging.
Least Tern	Its New York State range is limited to coastal Long Island. Location/habitat is not suitable in the Project Area. One of the few regional reports was at Sunset Bay on Lake Erie in the Town of Hanover in May 1993 (BOS 2006).
Sedge Wren	There are no records of occurrence in the Project Area. There is some potentially suitable habitat in the Project Area. The NHP reported that this species was observed in the Town of Sheridan and in the Town of Pomfret, both in Chautauqua County (Seoane 2006, 2008).
Henslow's Sparrow	The NHP reported that this species was observed in the Town of Arkwright, Chautauqua County (Seoane 2006, 2008). Although they were not detected during the 2000-2005 BBA, they were listed as probable breeders in block 1570C and possible breeders in blocks 1569A and 1570D during the 1980-1985 BBA. There is some potentially suitable habitat in the Project Area. Two were observed in Hanover in April 1972 and two were observed in Hanover in July 1987. E & E conducted targeted searches in the Project Area but did not find this species in May or June 2007 or 2008.
Species of Special Concern	
Common Loon	Location/habitat in the Project Area is not suitable for breeding. It is likely an uncommon migrant over the Project Area. One was observed during E & E raptor surveys on April 23, 2007.

Table 3-13 Potential Occurrence of Avian Endangered, Threatened, or Species of Special Concern within New York State at the Ball Hill Project Area

Listed Species[1,2]	Notes
American Bittern	Location/habitat within the Project Area is not suitable for breeding. One was observed in Villenova in 1987, and one was observed in Hanover in 1991 (BOS 2006).
Osprey	It is a migrant and transient over the Project Area. E & E observed this species during the April 22 and 30, 2007, and May 13, 2008 spring raptor surveys. Location/habitat within the Project Area is not suitable for breeding.
Sharp-shinned Hawk	It is considered fairly common in Chautauqua County. Location/habitat in the Project Area is suitable for breeding. One was observed in the Project Area on October 5, 2006, during fall raptor surveys and was though to be a migrant; seven were observed on April 23, 2007 and one on May 6, 2008, during spring raptor surveys and were thought to be migrants.
Cooper's Hawk	It is considered fairly common in Chautauqua County. Location/ habitat in the Project Area is suitable for breeding. It was considered a possible breeder in BBA block 1569A. Three were observed during 2006 fall raptor surveys, and four were observed during 2007 spring raptor surveys.
Northern Goshawk	It is considered a rare breeder in western New York. Location/habitat in the Project Area is suitable for breeding. It was not observed during E & E surveys or field work. It was considered a possible breeder in BBA block 1570B. One was observed in Hanover in March 1978 and one in Hanover in March 1993 (BOS 2006).
Red-shouldered Hawk	It is considered fairly common in Chautauqua County. It was considered a possible breeder in BBA block 1570A. E & E observed six on October 5, 2006, during fall raptor surveys in the Project Area, and one on April 23, 2007, during spring raptor surveys.
Black Skimmer	Its New York State range is restricted to coastal Long Island. Location/habitat is not suitable in the Project Area.
Common Nighthawk	It is a rare and declining breeder in western New York. Site location/habitat is likely unsuitable for breeding. It is likely an occasional spring and late summer migrant over the Project Area. There are no records of occurrence in the Project Area. Three were observed in August 1983 and three were observed in May 1987 in the Town of Hanover (BOS 2006).
Whip-poor-will	It is a very rare breeder and migrant in western New York. Location/habitat in the Project Area is likely unsuitable for breeding. There are no records of occurrence in the Project Area. One was observed in May 1999 in Hanover (BOS 2006).

Table 3-13 Potential Occurrence of Avian Endangered, Threatened, or Species of Special Concern within New York State at the Ball Hill Project Area

Listed Species[1,2]	Notes
Red-headed Woodpecker	It is an uncommon and declining breeder in western New York. Location/habitat in the Project Area is possibly suitable for breeding. There are no records of occurrence in the Project Area. In the Town of Hanover, one was observed in November 1982 and two were observed at a nest in July 1997 (BOS 2006).
Horned Lark	It is a regular, often common, species in winter throughout New York State. It likely breeds in low numbers in plowed fields within and near the Project Area. It was listed as a probable breeder in BBA block 1569A. E & E observed several of them as flyovers during spring 2008 raptor surveys. In November 2005, 115 were observed in Villenova (BOS 2006).
Bicknell's Thrush	Its New York State range is restricted to the Adirondacks and Catskills, where it breeds in stunted fir forests above 3,000 feet. Location/habitat in the Project Area is unsuitable for breeding.
Golden-winged Warbler	Location/habitat in the Project Area is possibly suitable for breeding. One was observed in Hanover in May of 1974, and two were observed in Hanover in May of 1999 (BOS 2006).
Cerulean Warbler	Location/habitat in the Project Area is possibly suitable for breeding. None were observed during E & E surveys or site work. There are no records of occurrence in the Project Area.
Yellow-breasted Chat	It is an uncommon breeder in western New York. Location/habitat in the Project Area is suitable for breeding. None were observed during E & E surveys or site work. One was observed in Hanover in May 1976 (BOS 2006).
Vesper Sparrow	Location/habitat in the Project Area is suitable for breeding. Two were observed in April 2003 in Hanover (BOS 2006). None were observed during E & E surveys or site work.
Grasshopper Sparrow	Location/habitat in the Project Area is suitable for breeding. One was detected during E & E breeding bird surveys on June 11, 2007 and one was detected during E & E breeding bird surveys in June 2008.
Seaside Sparrow	Its New York State range is restricted to coastal Long Island. Location/habitat in the Project Area is unsuitable for occurrence.

Notes:
1 All species are state-listed. Federally listed species are indicated in the notes column.
2 Special concern species are not afforded protection under state and/or federal endangered species acts.

3.3.8 Bat Species List and Threatened/Endangered Species

During the acoustical monitoring, a total of five bat species in the Project Area were conclusively identified as well as at least one species from the Myotid group of bats (see Table 3-14).

There are two bat species that occur in New York State that are either state- and/or federally listed. The Indiana Bat, which is state and federally protected, and the

Eastern Small-footed Myotis, a state species of concern, have not been identified in the Project Area and are not expected to be present. See Section 3.3.5 for more information on the Indiana Bat. Table 3-15 lists these species along with notes of possible occurrence within the Project Area.

Table 3-14 Bat Species Identified during Acoustical Monitoring in the Ball Hill Project Area

Common Name[1]	Scientific Name
Big Brown Bat	*Eptesicus fuscus*
Silver-haired Bat	*Lasionycteris noctivagans*
Eastern Red Bat	*Lasiurus borealis*
Hoary Bat	*Lasiurus cinereus*
Eastern Pipistrelle	*Pipistrellus subflavus*
Myotid species[1]	

Note:
[1] Myotid bat species call sequences were identified during acoustical monitoring; however, the call sequence identifications could not be distinguished to species. There are four Myotid bat species that occur in New York State including the Little Brown Bat (most common), Eastern Small-footed Myotis (uncommon; State species of special concern); Indiana Bat (uncommon; Federally- and State-endangered); and Northern Myotis (uncommon to common).

Table 3-15 Potential Occurrence of Bat Endangered, Threatened, or Species of Special Concern within New York State at the Ball Hill Project Area

Listed Species[1,]	Notes
Endangered Species (State and Federal)	
Indiana Bat	There are no records of occurrence in or near the Project Area. Based on the known locations of Indiana Bat hibernacula and the distance that separates these hibernacula from the Project Area, migration through the Project Area is unlikely. See Section 3.3.5.
State Species of Special Concern	
Eastern Small-footed Myotis	There are no records of occurrence in or near the Project Area. Location/habitat in the Project Area is suitable for occurrence.

Note:
[1] Special concern species are not afforded protection under state and/or federal endangered species acts.