

**Aerial Raptor and Great Blue Heron Nest Surveys  
Number Nine Wind Farm  
Aroostook County, Maine**

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**Final Report**

**April 17 – June 7, 2014**



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## INTRODUCTION

Number Nine Wind Farm LLC (EDPR), a subsidiary of EDPR Renewables North America LLC, has proposed a wind energy facility in Aroostook County, Maine, referred to as the Number Nine Wind Farm (Project). EDPR contracted Western EcoSystems Technology, Inc. (WEST) to conduct pre-Project surveys for wildlife resources in the Project area, including aerial surveys for eagle and raptor nests and great blue heron rookeries in the Project and a buffer area surrounding the Project. Nesting density and distribution for all raptors are of interest; however, bald eagles (*Haliaeetus leucocephalus*) and great blue heron (*Ardea herodias*), were a focus of the aerial surveys due to their potential presence in the area.

The principal objectives of the aerial nest surveys were to: 1) identify the species and locations of nesting raptors and great blue heron rookeries in and surrounding the Project area, 2) provide data that could be used in a potential impact assessment for nesting raptors and great blue herons, and 3) provide data on nest and rookery locations that could be useful in Project planning. The following report contains the results of 2014 aerial nest surveys conducted at the Project.

## STUDY AREA

The Project is located in Aroostook County, in northeastern Maine, approximately eight miles (13 kilometers [km]) west of the town of Bridgewater (Figure 1). The Project is located in the Laurentian Plains and Hills Ecoregion in northeastern Maine (USEPA 2007). The Laurentian Plains and Hills are characterized by spruce-fir forests with some patches of deciduous trees interspersed with glacial lakes. Land within the Project area is privately owned and the primary land use is timber harvesting. Elevations in the Project area range from approximately 500 to 1,700 feet (ft) above sea level. The dominant vegetation type is mixed spruce-fir and deciduous forest. Common deciduous trees in the Project area include maple (*Acer* spp.), beech (*Fagus* spp.), and birch (*Betula* spp.).

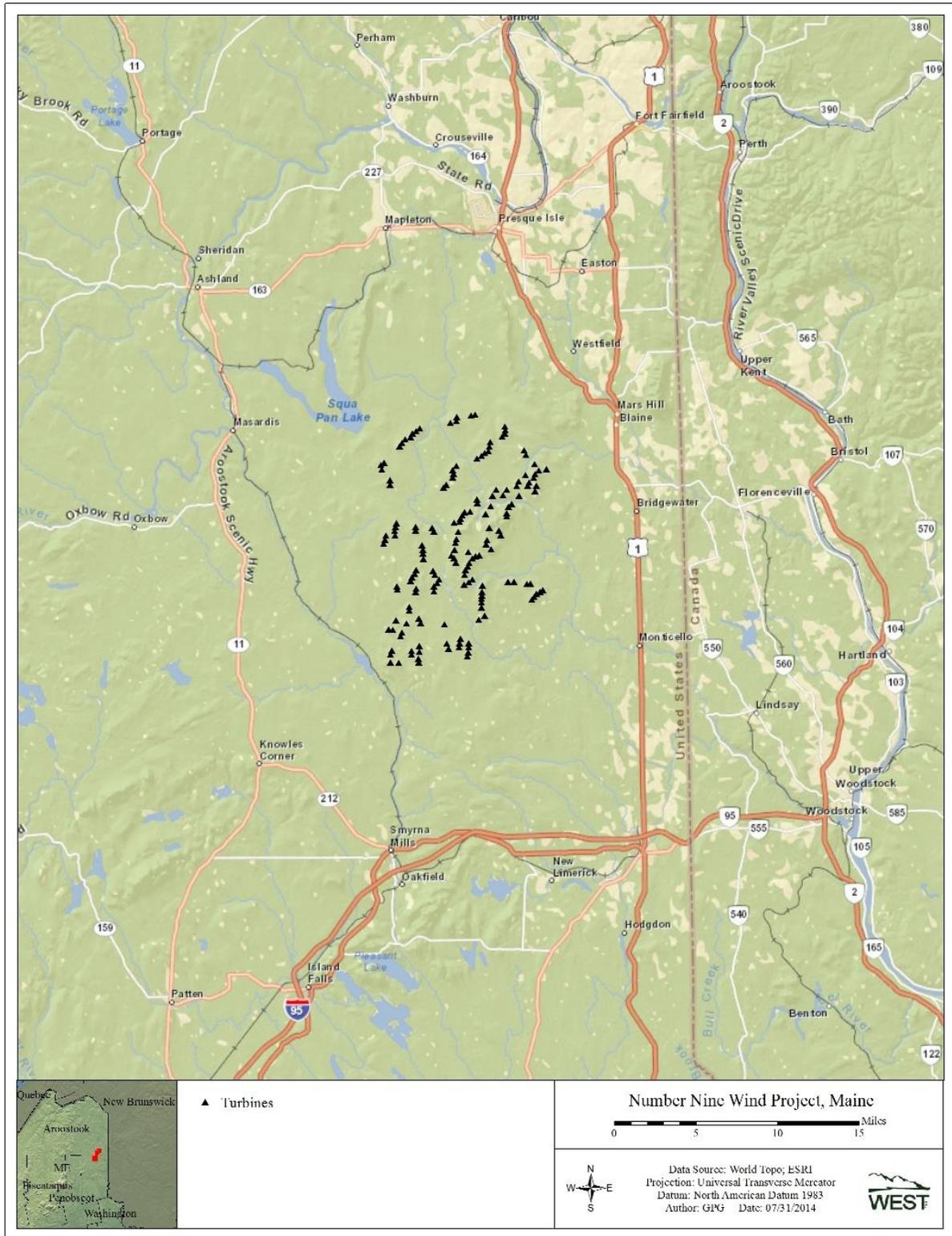


Figure 1. Proposed Number Nine Wind Farm, Aroostook County, Maine.

Approximately 78% of the Project area (defined by the turbine locations) is composed of forest (Table 1). Within the forest types are mixed forest (38.6%), deciduous forest (23.7%) and evergreen forest (15.9%). Shrub/scrub habitat (10.8%) is common throughout the Project area due to logging activity that has removed the forest cover. Woody wetlands (8.5%) also occur throughout the Project area, but other wetland types (emergent wetlands 0.3%, open water 0.8%) are generally uncommon. The area and regional forests are transitional and in various stages of growth (from regenerating stands to mature forest) due to past and ongoing commercial logging activity.

**Table 1. The land cover types, coverage, and percent composition within the Number Nine Wind Farm project area.**

Habitat	Square Miles	Percent Composition
Open Water	0.8	0.88
Developed, Open Space	0.1	0.06
Barren	0.4	0.45
Deciduous Forest	20.8	23.72
Coniferous Forest	14.0	15.98
Mixed Forest	33.9	38.69
Scrub-Shrub	9.5	10.87
Grassland	0.4	0.48
Pasture/Hay	0.1	0.06
Crops	<0.1	<0.01
Woody Wetlands	7.4	8.50
Emergent Wetlands	0.3	0.30
<b>Total</b>	<b>87.6</b>	<b>100</b>

Data from US Geological Survey National Landcover Dataset (USGS NLCD 2009).

## METHODS

The nest surveys followed methods suggested in the USFWS 2013 Eagle Conservation Plan Guidance (ECPG; USFWS 2013). Aerial surveys using a helicopter were conducted to locate raptor nests, particularly bald eagle nests, and heron rookeries within the Project area and an area encompassed by a 10-mile (16-km) buffer around the proposed turbine locations. The total survey area was approximately 553,290.35 acres (864.5 mi<sup>2</sup>; 2239.09 km<sup>2</sup>; Figure 2). The first survey, which occurred over a three day period, was initiated on April 17, 2014, and the second survey was conducted on June 7, 2014. Surveys were conducted during the time period with highest probability of detecting female bald eagles incubating eggs or adults tending young based on recommendations from the Maine Department Inland Fisheries and Wildlife (MDIFW) for survey timing. In addition to the aerial surveys, incidental observations of raptor nests or heron rookeries were recorded while biologists were on site for other surveys and during other grounds based surveys such as wetland delineations. Survey technicians were frequently traveling around the site to conduct other surveys, such as raptor migration and eagle observation surveys, and important or unique observations of wildlife were recorded when observed.

Eagle nest surveys were conducted within a 10-mile (approximately 16.3 km) buffer of the proposed Project turbines; nest surveys for non-eagle raptors and heron rookeries focused on the area within four miles (approximately 6.5 km) of the proposed Project turbines (see Figure 2). Pre-flight planning included a background review of previously recorded nest locations provided by MDIFW, a review of topographic maps and aerial/satellite imagery, and the creation of cartographic figures and Geographic Information Systems (GIS) files.

A Bell Jet Ranger 206 helicopter was used to conduct surveys, with one biologist positioned in the front and a second biologist positioned in the rear of the helicopter on the opposite side to maximize visual detection. A laptop computer connected to a Garmin Global Positioning System (GPS) GPSMAP 76CSx unit and running the program *nRoute* was used to track location and provide visual guidance to the helicopter pilot. A track log was recorded to ensure the survey areas were adequately covered (Figure 2). Flight transects focused on areas of suitable nesting habitat and structure (i.e., large trees, transmission line structures, towers).

Nest locations were recorded using the *nRoute* program, and a unique nest identification number (nest ID) was assigned to each nest. When a nest was detected, attribute data were recorded on datasheets (Appendix B) and were later transcribed into a spreadsheet. Attribute data included raptor species, nest type (e.g., stick, scrape/rock ledge, ground), nest status (see *below*), relative nest condition (i.e., poor, fair, good, excellent), approximate nest height, substrate (e.g., power line, tree, tower, etc), approximate substrate height, nest aspect, and GPS accuracy; these attributes were recorded at each nest location. When a nest could not be identified to species, it was classified as an unknown raptor nest. Nests documented as unknown raptor species were defined as any large stick nest that did not have an occupant associated with it at the time of the survey. Unknown raptor nests were recorded to ensure that subsequent surveys included potentially suitable nest sites. Close-up and landscape photographs of each occupied nest found were taken (Appendix B).

Basic nest use was categorized consistent with definitions in the USFWS *Eagle Conservation Plan Guidance* (April 2013). Nests were classified as occupied if any of the following were observed at the nest structure: (1) an adult in an incubating position; (2) eggs; (3) nestlings or fledglings; (4) occurrence of a pair of adults (or, sometimes sub-adults); (5) a newly constructed or refurbished stick nest in the area where territorial behavior of a raptor was observed or had been observed early in the breeding season; or (6) a recently repaired nest with fresh sticks (clean breaks) or fresh boughs on top, and/or droppings and/or molted feathers on its rim or underneath. Occupied nests were further classified as active if an egg or eggs had been laid or nestlings were observed, or inactive if no eggs or chicks were present. A nest that did not meet the above criteria for “occupied” was classified as “unoccupied”.

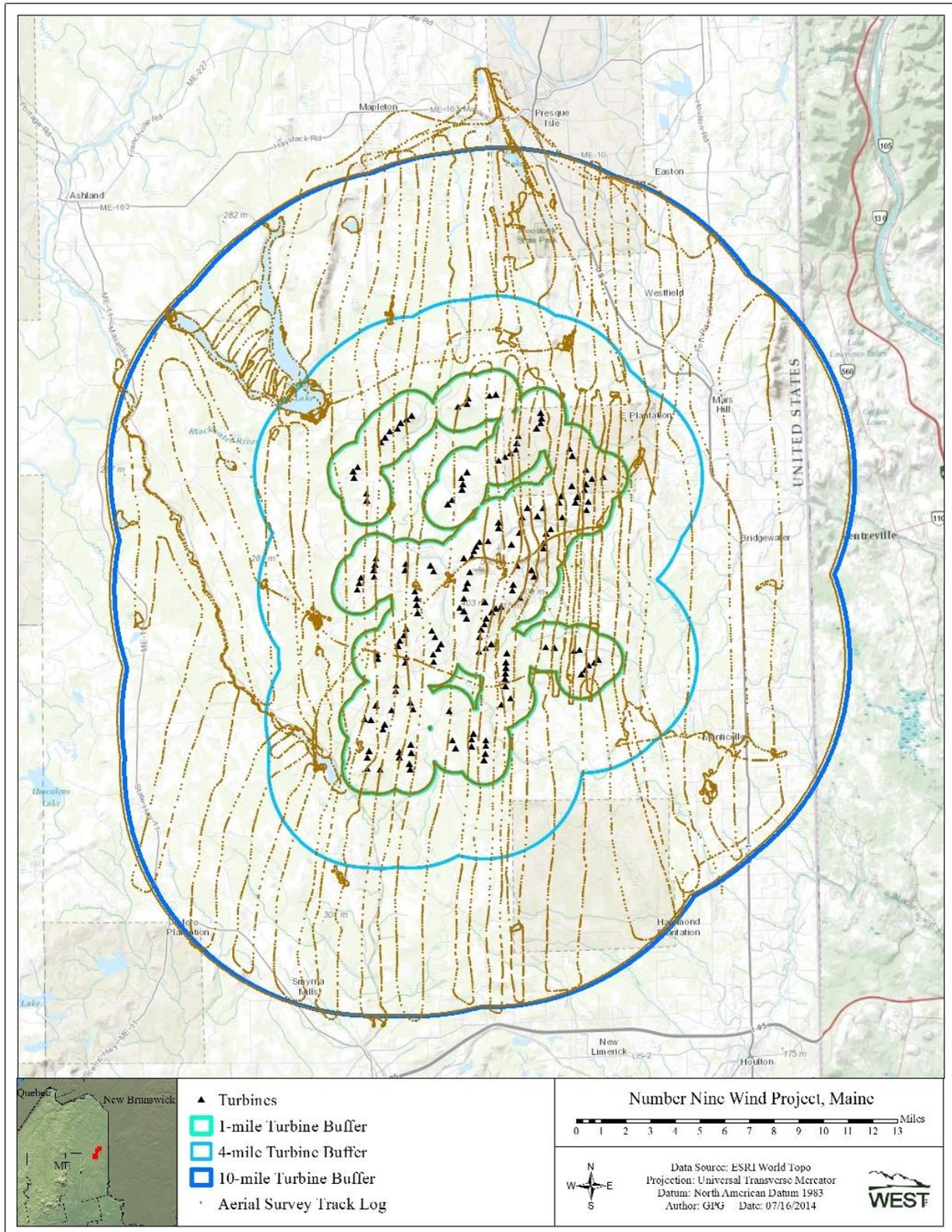


Figure 2. Number Nine Wind Farm aerial survey track log for raptor nest and great blue heron rookery surveys conducted in 2014.

## RESULTS

Three bald eagle nests, two osprey (*Pandion haliaetus*) nests, one great blue heron rookery, two unknown raptor nests, and one common raven (*Corvus corax*) nest were located during the aerial surveys (Table 2; Figure 3). One additional great blue heron rookery was located during ground based wetland surveys. Only one unknown raptor nest was located within approximately one mile of the proposed turbine locations (see Figure 3). The density of occupied raptor nests within a 10-mile buffer of the proposed turbine locations was 0.006 nests/mi<sup>2</sup> (Table 3).

No bald eagle nests were within one mile of the proposed turbine locations. Two of the bald eagle nests were documented as Occupied – Productive having raised one or more chicks to fledgling age (Table 2, Figure 3, Appendix B). One bald eagle nest was documented as Occupied – Visited. An adult was observed at the nest location during the first aerial survey, and there was evidence of nest repairs and fresh greenery added to the nest bowl. During the second aerial survey, no adult, chicks, prey remains, or other evidence indicating a nesting attempt had occurred was observed. The density of occupied bald eagle nests within a 10-mile buffer of the proposed turbine locations was less than 0.01 nests/mi<sup>2</sup> (Table 3).

One of the osprey nests was documented as Occupied – Active, with an adult in the incubating position (Table 1, Figure 3, Appendix B). The other osprey nest (nest 6) was located in the middle of an occupied heron rookery with an adult perched at the nest during the second aerial survey (June 7). No evidence of successful nesting attempt, such as eggs, chicks, or prey remains, was observed; therefore, the nest site was documented as Occupied – Visited. The density of occupied osprey nests within a 10-mile buffer of the proposed turbine locations was less than 0.01 nests/mi<sup>2</sup> (Table 3).

An active great blue heron rookery that included approximately 10 to 15 nests was located during the survey. Only one of these nests was occupied by a great blue heron at the time of the survey; the nest was observed with an adult in the incubating position. Four eggs were observed in this nest when the heron flew off the nest (Table 1, Figure 3, Appendix B). No other great blue herons were observed in the area. One great blue heron rookery at a location provided by the MDIFW (nest ID 5; Table 1, Figure 3) was not found during the surveys. A thorough search of the area around the location provided revealed no indication of a rookery at this location and the rookery was recorded as “did not locate”. A third great blue heron rookery was located during ground based wetland surveys (nest ID 11; Table 1, Figure 3). This rookery appeared to have three nest structures one of which was occupied by a heron. No eggs or hatch-year birds were observed in this rookery.

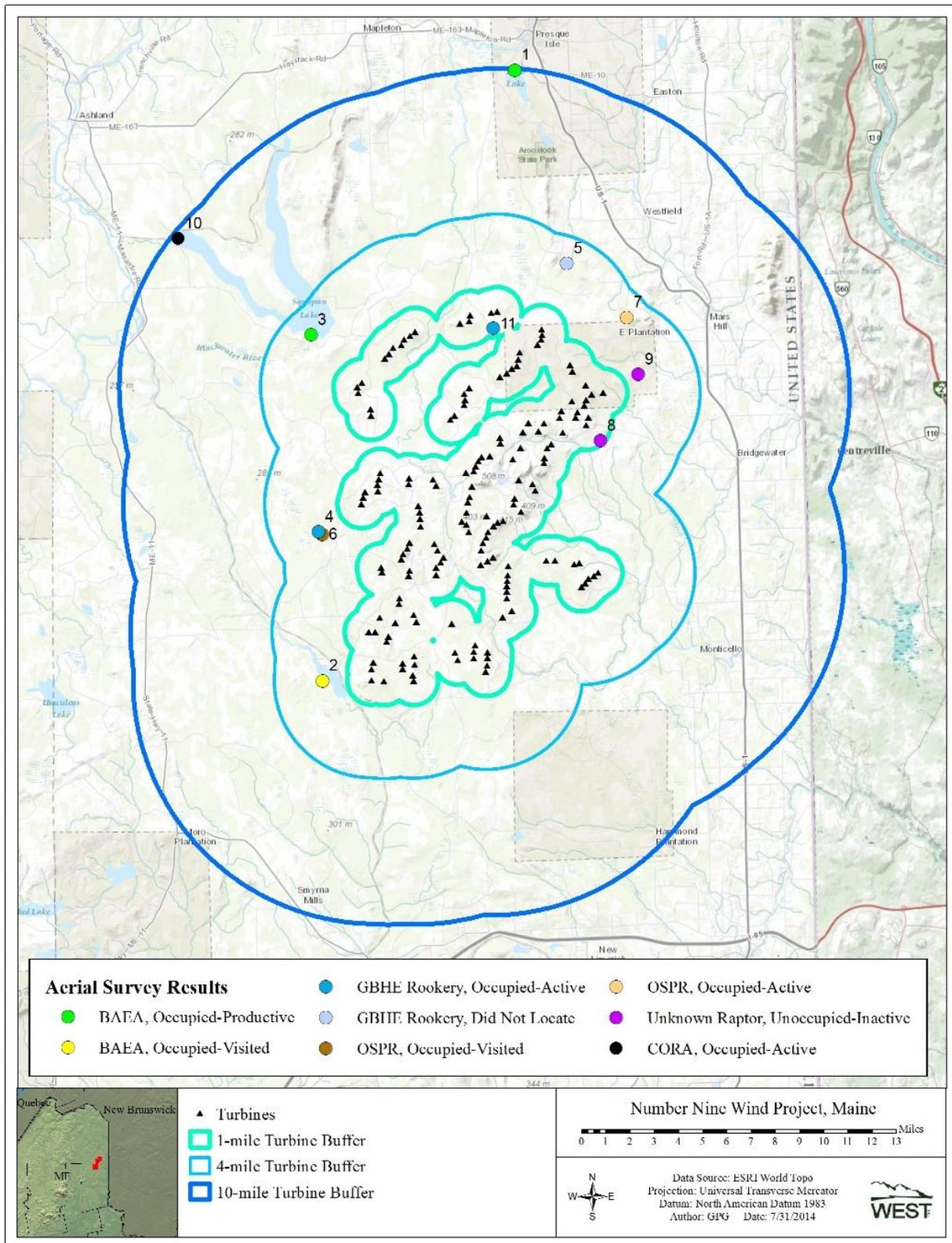


Figure 3. Aerial survey results at the Number Nine Wind Farm study area, showing nest locations.

**Table 2. Summary of the nests located within the Number Nine Wind Farm and a 10-mile buffer of proposed turbine locations during the aerial nest survey.**

NEST ID <sup>1</sup>	Species <sup>2</sup>	Nest Type	Nest Condition	Nest Height (~ft)	Substrate <sup>3</sup>	Substrate Height (~ft)	Nest Aspect	Accuracy	UTM NAD83		Photographs		Nest Status 2014	Territory Occupancy Eagles 2014	Comments
									Easting	Northing	Closeup	Landscape			
1	BAEA	Large Stick	Excellent	60	DTL	60	WNW	GPS Aerial	574065.03	5167706.36	0522, 0730	0524	Occupied-Productive	Yes	2 Fledglings in Nest
2	BAEA	Large Stick	Good	65	DTL	75	N	GPS Aerial	561289.83	5127266.30	0543, 0738	0545	Occupied-Visited	Yes	Greenery added to nest, no sign of nesting
3	BAEA	Large Stick	Excellent	70	CTL	120	ENE	GPS Aerial	560520.90	5150191.83	0546, 0733	0551	Occupied-Productive	Yes	Fledged
4	GBHE	Small Stick	Good	65	CTD CTL	65	n/a	GPS Aerial	561019.11	5137153.79	0736, 0737	0563	Occupied-Active	--	
5	GBHE	DNL	--	--	--	--	--	GPS Aerial	577514.00	5154922.58	--	--	DNL	--	
6	OSPR	Large Stick	Good	70	CTD	75	n/a	GPS Aerial	561245.66	5136981.34	0562	0567	Occupied-Visited	--	
7	OSPR	Large Stick	Good	100	MMS	100	n/a	GPS Aerial	581505.37	5151330.05	0745	0746	Occupied-Active	--	
8	UNK	Medium Stick	Poor	60	CTL	60	NE	GPS Aerial	579750.01	5143176.25	0517	0518	Unoccupied-Inactive	--	
9	UNK	Medium Stick	Poor	40	DTL	50	SW	GPS Aerial	582252.03	5147570.26	0573	0577	Unoccupied-Inactive	--	
10	CORA	Medium Stick	Good	45	CTL	50	NE	GPS Aerial	551673.46	5156580.26	0559	0561	Occupied-Active	--	
11	GBHE	Small Stick	Good	unk	DTL	unk	n/a	GPS Ground	572635.83	5150619.76	none	none	Occupied - Active		Found during wetland surveys

<sup>1</sup> Defined by WEST.

<sup>2</sup> BAEA = bald eagle; CORA = common raven; GBHE = great blue heron; OSPR = osprey; UNK = unknown species

<sup>3</sup> DTL = deciduous tree-live; CTD = coniferous tree-dead; CTL = coniferous tree-live; MMS = man-made structure

**Table 3. Observed occupied raptor nest density for the Number Nine Wind Farm, Aroostook County, Maine, based on the 2014 aerial nest surveys.**

Species	# of Nests within One Mile of Proposed Turbine Locations	# of Nests within 10-mi Buffer of Proposed Turbine Locations	Density (# of nests/mi <sup>2</sup> )	
			1-mile Buffer of Proposed Turbine Locations	10-mi Buffer of Proposed Turbine Locations
bald eagle	0	3	0	<0.01
osprey	0	2	0	<0.01
<b>Occupied Nests</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0.006</b>

## DISCUSSION

The primary purpose of the aerial nest survey was to collect data on nesting eagles, other raptors, and great blue herons in and near the proposed Project that could be useful in assessing potential impacts and in project planning to avoid and minimize potential impacts.

### Raptors and Eagles

Two species of raptor, bald eagle and osprey, were documented nesting in the survey area, but neither were documented nesting within one mile of potential turbine locations. For bald eagle the nearest nest (nest ID 2) was located approximately two miles from potential turbine locations and for osprey the nearest nest (nest ID 6 within the great blue heron rookery) was located approximately 2.1 miles from potential turbine locations (see Figure 3).

Currently, few data concerning the collision risk of bald eagle and osprey nesting near wind energy developments are available. In general, these two species have been rarely documented as casualties at wind energy facilities. As of June 2012, six substantiated bald eagle fatalities or injuries were documented at wind turbines in the US and two were reported in Ontario, Canada (Allison 2012, Pagel et al. 2013). No bald eagle fatalities have been recorded at wind energy facilities in New England; however, one was documented at a 10 kW wind turbine in Maryland. The bald eagle fatality in Maryland was found below a free-spinning, storm damaged turbine much smaller than modern utility-scale turbines at the on the Eastern Neck National Wildlife Refuge (NWR). At the time, the NWR supported about eight nesting bald eagle territories and the nesting density of bald eagles was approximately 2.22 nests/mi<sup>2</sup>, which is more than 220 times greater than the density within 10 miles of the proposed turbine locations for the Project.

The only U.S. or Canadian wind energy facility with documented osprey fatalities is the Jersey-Atlantic wind energy facility in New Jersey. Four osprey fatalities have been documented at the Jersey-Atlantic wind energy facility, located along the New Jersey coast (UDEL CEOE 2009). The coastal waters of New Jersey provide foraging and nesting habitat for relatively high densities of osprey. While some foraging and nesting habitat is present within 10-miles of the proposed turbine locations for the Project, osprey nest density is low (less than 0.01 nests/mi<sup>2</sup>).

Indirect effects caused by disturbance, for example from construction activity near an active nest or primary foraging area, could adversely impact nesting raptors. There are no known

displacement studies concerning the impacts of wind energy development on nesting bald eagles or osprey or other raptors in New England; however, small-scale bald eagle nest displacement has been documented at the Erie Shores facility in Ontario. At this facility, a nesting bald eagle pair left their traditional nest located that was within 400 m of a turbine site during construction, moving to another nest located approximately 600 m away, 900 m away from the nearest turbine (James 2008). The particular nest at the Erie Shores facility was much closer to turbines compared to distances between the bald eagle nest locations and proposed turbine locations at the Project. In addition, the eagle at Erie Shores reestablished a nest approximately 900 m from the nearest turbine indicating that the potential disturbance effects at that facility were temporary. No disturbance related impacts are expected at the Project to nesting eagles or osprey due to the distance of the nests to potential construction areas.

While bald eagle and osprey nest in the area, the nesting density for either species is low. The nearest occupied nests of either species were approximately two miles from proposed turbine locations. There is little foraging opportunity within one mile of the proposed turbine locations, particularly when compared to foraging habitat available in the landscape surrounding the Project. Therefore, the Project is unlikely to attract foraging bald eagle or osprey that may be nesting in the general area. The available evidence suggests that risk of collision and/or displacement of nesting bald eagle and osprey associated with development of the Project are generally low.

### **Great Blue Heron**

Two great blue heron rookeries were documented in the survey area. One rookery was located within one mile of potential turbine locations, and one was approximately 2.1 miles from the nearest proposed turbine location. One occupied nest was observed in each rookery.

Data regarding the impact of wind energy development on great blue heron rookeries are sparse. Great blue herons do not appear to be particularly susceptible to collisions with wind turbines and account for less than 0.1% of fatalities documented during post-construction monitoring at North American wind energy facilities. To date, five great blue heron fatalities have been documented at wind energy facilities, one of which was found in New York State (Erickson et al. 2003, 2004; Gritski et al. 2010; Jain et al. 2010; WEST 2011). Nesting and mortality data are available for one facility in Canada. A great blue heron rookery was located in a valley at the southwest corner of the Castle River wind energy facility in Alberta, Canada (Brown and Hamilton 2006). The herons typically entered and left the rookery through a valley and rarely encountered turbines. A few individuals were observed to alter their flight paths by several hundred meters to fly over or around the rotor-swept area of the turbines. No great blue heron fatalities were documented during a concurrent mortality study at the Castle River wind facility (Brown and Hamilton 2006).

While the information is sparse, great blue herons have rarely been documented as fatalities at wind energy facilities, and available evidence suggests that herons may actively avoid wind turbines due to the generally low number of fatalities recorded and at least one behavioral study (Brown and Hamilton 2008).

## REFERENCES

- Allison, T. D. 2012. Eagles and Wind Energy: Identifying Research Priorities. American Wind Wildlife Institute, Washington, D.C. May 2012. Available online at:  
[http://awwi.org/uploads/files/AWWI\\_White\\_Paper\\_Eagles\\_and\\_Wind\\_Energy\\_May\\_2012.pdf](http://awwi.org/uploads/files/AWWI_White_Paper_Eagles_and_Wind_Energy_May_2012.pdf)
- Brown, W. K. and B. L. Hamilton. 2006. Bird and Bat Interactions with Wind Turbines Castle River Wind Facility, Alberta, 2001-2002. Report for Vision Quest Windelectric, Inc., Calgary, Alberta, Canada.
- Erickson, W. P., J. Jeffrey, K. Kronner, and K. Bay. 2003. Stalene Wind Project Wildlife Monitoring Annual Report, Results for the Period July 2001 - December 2002. Technical report submitted to FPL Energy, the Oregon Office of Energy, and the Stalene Technical Advisory Committee. Western EcoSystems Technology, Inc., Cheyenne, Wyoming. May 2003.
- Erickson, W. P., J. Jeffrey, K. Kronner, and K. Bay. 2004. Stalene Wind Project Wildlife Monitoring Annual Report. July 2001 - December 2003. Technical report peer-reviewed by and submitted to FPL Energy, the Oregon Energy Facility Siting Council, and the Stalene Technical Advisory Committee. Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming, and Northwest Wildlife Consultants, Inc. (NWC), Pendleton, Oregon. December 2004.
- ESRI. 2014. Geographic Information System (GIS) Online Topographic Base Map. ESRI, producers of ArcGIS software. Redlands, California.
- Gritski, R., S. Downes, and K. Kronner. 2010. Klondike III (Phase 1) Wind Power Project Wildlife Monitoring: October 2007-October 2009. Prepared for Iberdrola Renewables, Inc. (IRI), Portland, Oregon, for Klondike Wind Power III LLC. Prepared by Northwest Wildlife Consultants, Inc. (NWC), Pendleton, Oregon. April 21, 2010 (Updated September 2010). Available online at: <http://www.oregon.gov/energy/Siting/docs/KWP/KWPWildlifeReport091210.pdf>
- Jain, A., P. Kerlinger, L. Slobodnik, R. Curry, and K. Russell. 2010. Annual Report for the Noble Clinton Windpark, LLC: Postconstruction Bird and Bat Fatality Study - 2009. Prepared for Noble Environmental Power, LLC. Prepared by Curry and Kerlinger, LLC, Cape May, New Jersey. March 9, 2010.
- James, R. D. 2008. Erie Shores Wind Farm Port Burwell, Ontario: Fieldwork Report for 2006 and 2007 During the First Two Years of Operation. Report to Environment Canada, Ontario Ministry of Natural Resources, Erie Shores Wind Farm LP - McQuarrie North American and AIM PowerGen Corporation. January 2008.
- Manville, A. M. II. 2005. Bird Strikes and Electrocutions at Power Lines, Communication Towers, and Wind Turbines: State of the Art and State of the Science – Next Steps toward Mitigation. C. J. Ralph and T. D. Rich, eds. Bird Conservation Implementation in the Americas: Proceedings of the Third International Partners in Flight Conference 2002. USDA, Forest Service General Technical Report GTR-PSW-191.
- North American Datum (NAD). 1983. NAD83 Geodetic Datum.
- Pagel, J. E., K. J. Kritz, B. A. Millsap, R. K. Murphy, E. L. Kershner, and S. Covington. 2013. Bald Eagle and Golden Eagle Mortalities at Wind Energy Facilities in the Contiguous United States. *Journal of Raptor Research* 47(3): 311-315.
- University of Delaware, College of Earth, Ocean, and Environment. 2009. Post-Construction Wildlife Monitoring at the Atlantic City Utilities Authority- Jersey Atlantic Wind Power Facility Project

Status Report IV. Submitted to: New Jersey Board of Public Utilities, New Jersey Clean Energy Program, Newark, NJ.

[https://www.ceoe.udel.edu/LewesTurbine/documents/acua\\_quarterlyreport\\_fall09.pdf](https://www.ceoe.udel.edu/LewesTurbine/documents/acua_quarterlyreport_fall09.pdf)

US Environmental Protection Agency (USEPA). 2007. Level III Ecoregions of the Continental United States. National Health and Environmental Effects Research Laboratory, USEPA. Available online at: [ftp://ftp.epa.gov/wed/ecoregions/us/Eco\\_Level\\_III\\_US.pdf](ftp://ftp.epa.gov/wed/ecoregions/us/Eco_Level_III_US.pdf)

US Fish and Wildlife Service (USFWS). 2007. National Bald Eagle Management Guidelines. May 2007. Available online at: <http://www.fws.gov/northeast/EcologicalServices/pdf/NationalBaldEagleManagementGuidelines.pdf>

US Fish and Wildlife Service (USFWS). 2012. Final Land-Based Wind Energy Guidelines. March 23, 2012. 82 pp. Available online at: [http://www.fws.gov/windenergy/docs/WEG\\_final.pdf](http://www.fws.gov/windenergy/docs/WEG_final.pdf)

US Fish and Wildlife Service (USFWS). 2013. Eagle Conservation Plan Guidance. Module 1 - Land-Based Wind Energy. Version 2. Division of Migratory Bird Management, USFWS. April 2013. Available online at: [http://www.fws.gov/migratorybirds/Eagle\\_Conservation\\_Plan\\_Guidance-Module%201.pdf](http://www.fws.gov/migratorybirds/Eagle_Conservation_Plan_Guidance-Module%201.pdf)

Western EcoSystems Technology, Inc. (WEST). 2011. Post-Construction Fatality Surveys for the Barton Chapel Wind Project: Iberdrola Renewables. Version: July 2011. Iberdrola Renewables, Portland, Oregon.

**Appendix A.**  
**Aerial Nest Survey Datasheet**

# Raptor Nest Aerial Survey

Pilot \_\_\_\_\_  
 Project Name \_\_\_\_\_  
 Survey: Start Time \_\_\_\_\_

Helicopter Type \_\_\_\_\_  
 Date \_\_\_\_\_  
 Survey: End Time \_\_\_\_\_

**Nest ID** \_\_\_\_\_

**Species**

BAEA	GHOW	<b>Photograph #</b>
GOEA	OSPR	Close-up _____
RTHA	UNK	Landscape _____
RSHA	Other	
CORA	GBHE (Rookery)	

**Nest Status**

Occupied-Active	<b>Female Incubating Position</b>
Unoccupied-Inactive	Eggs Present (Y / N / UNK) #
Occupied-Failed	Young Present (Y / N / UNK) #
Unknown	% Feathered _____

**Nest Condition**

Excellent	Poor
Good	Remnant
Fair	Gone
	DNL

**Nest Height (ft)** \_\_\_\_\_

**Nest Aspect** \_\_\_\_\_

**Substrate**

CLF	TRC	<b>Substrate Height (ft)</b> _____
ROK	GND	
ROC	ANS	
LOW	MMS	
CTL	TRL	
CTD	POW	
DTL	OTH	
DTD		

**Nest substrate codes:** CLF = cliff; ROK = rock outcrop; ROC = rock cavity; LOW = low ridge/hillside; CTL = conifer live; CTD = conifer dead; DTL = deciduous tree live; DTD = deciduous tree dead; TRC = tree cavity; GND = ground; ANS = artificial nesting structure; MMS = man made structure; TRL; POW = power pole; OTH = other (indicate in comments)

**Appendix B.**  
**Photographs of Nests Recorded in the Number Nine Wind Farm Survey Area**  
**April and June 2014**



**Nest 1 Bald Eagle - Photograph 0522 Close up of nest during initial survey.**



**Nest 1 Bald Eagle - Photograph 0730. Close up of nest during follow up survey.**



**Nest 1 Bald Eagle - Photograph 0524. Landscape of nest location.**



**Nest 2 Bald Eagle - Photograph 0543. Close up of nest during initial survey.**



**Nest 2 Bald Eagle - Photograph 0738. Close up of nest during follow up survey.**



**Nest 2 Bald Eagle - Photograph 0545. Landscape of nest location.**



**Nest 3 Bald Eagle - Photograph 0546. Close up of nest during initial survey.**



**Nest 3 Bald Eagle - Photograph 0733. Close up of nest during follow up survey.**



**Nest 3 Bald Eagle - Photograph 0551. Landscape of nest location.**



**Nest 4 Great Blue Heron - Photograph 0736. Close up of one nest in rookery during follow up survey.**



**Nest 4 Great Blue Heron - Photograph 0737. Close up of nest with four eggs present.**



**Nest 4 Great Blue Heron - Photograph 0563. Landscape of rookery location.**



**Nest 6 Osprey - Photograph 0562. Close up of nest.**



**Nest 6 Osprey - Photograph 0567. Landscape of nest location.**



**Nest 7 Osprey - Photograph 0745. Close up of nest.**



**Nest 7 Osprey - Photograph 0746. Landscape of nest location.**



**Nest 8 Unknown Raptor - Photograph 0517. Close up of nest.**



**Nest 8 Unknown Raptor - Photograph 0518. Landscape of nest location.**



**Nest 9 Unknown Raptor - Photograph 0573. Close up of nest.**



**Nest 9 Unknown Raptor - Photograph 0577. Landscape of nest location.**



**Nest 10 Common Raven - Photograph 0559. Close up of nest.**



**Nest 10 Common Raven - Photograph 0561. Landscape of nest location.**