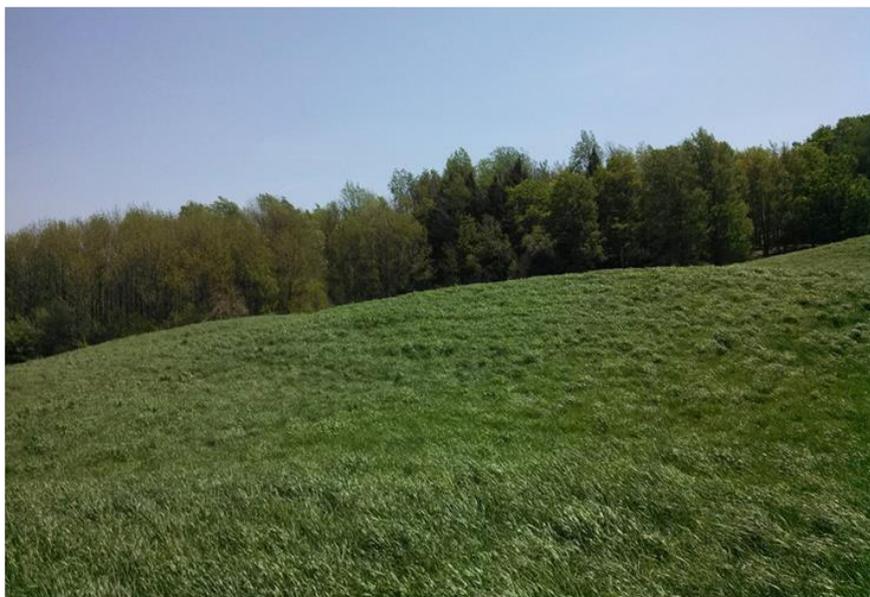


**Eagle Observation Surveys
Arkwright Summit Wind Project
Chautauqua County, New York**

**Final Report
May – August 2013**



Prepared for:

EDP Renewables

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October 1, 2013



EXECUTIVE SUMMARY

EDP Renewables (EDPR) has proposed to develop the Arkwright Summit Wind Project (Project) in Chautauqua County, New York. EDPR contracted Western EcoSystems Technology, Inc. (WEST) to conduct surveys for eagles within the proposed Project Area to - evaluate the potential impacts and risks that the development of a wind energy facility, associated construction, and operations might have on eagles in the area. The following document contains results of the eagle observation surveys.

The principal objectives of the study were to: 1) provide site-specific eagle use data that would be useful in evaluating potential impacts from the proposed wind energy facility; 2) provide information that could be used in project planning and design of the facility to minimize impacts to eagles; and 3) recommend further studies or potential mitigation measures, if warranted.

Eagle observation surveys were conducted at the Project 14 times during the summer. A total of 82 60-minute (min) surveys were conducted within the project area from May 25, to August 30, 2013, during which one bald eagle was observed. This eagle was observed at point AR2 on May 25, 2013, about 800 meters (m; 2,625 feet [ft]) from the observer, resulting in an eagle use value of 0.01 eagles per plot per survey.

Eight different bird species were observed during the eagle surveys in the study area, totaling 239 bird observations within 142 separate groups. The most abundant species seen were turkey vulture (92 observations), American crow (50 observations), red-tailed hawk (42 observations), and American kestrel (36 observations). Other species seen included Canada goose (14 observations), sharp-shinned hawk (three observations; a state species of concern), common raven (one), and great blue heron (one).

STUDY PARTICIPANTS

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REPORT REFERENCE

Lukins, W., D.P. Young, and K. Bay. 2013. Eagle Observation Surveys, Arkwright Summit Wind Project, Chautauqua County, New York. Final Report: May – August 2013. Prepared for EDP Renewables (EDPR), Albany, New York. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming.

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INTRODUCTION

In 2013, EDPR contracted Western EcoSystems Technology, Inc. (WEST) to conduct eagle observation surveys (EOS) at the Arkwright Summit Wind Project Area (Project). Surveys were conducted to evaluate the potential impacts and risks that the development of a wind energy facility, associated construction, and operations might have on eagles (and other raptors) in the area. The following document contains results of the EOS surveys.

The principal objectives of the study were to: 1) provide site-specific bird resource and use data that would be useful in evaluating potential impacts from the proposed wind energy facility; 2) provide information that could be used in project planning and design of the facility to minimize impacts to birds; and 3) recommend further studies or potential mitigation measures, if warranted.

Eagle observation surveys conducted at the Project area provide baseline data of avian use that can be compared to the results of other regional studies and post-construction studies, as appropriate. A study designed to estimate bird fatality rates at the Project area will help to better predict potential impacts of future development in New York State and the region.

PROJECT AREA

The Project is located in the northwest corner of Chautauqua County, New York. The Project study area is about two miles (three kilometers [km]) west of Fredonia and approximately three miles (five km) south of Lake Erie (Figure 1). The Project is located on relatively broad hilltops with an elevation range of 750 to 1,900 feet (ft; 229 to 579 meters [m]), generally increasing from north to south. The Project intersects with Canadaway Creek Wildlife Management Area and abuts the Boutwell Hill State Forest. Primary roads through the Project area include Route 39 to the north, Straight Road near the center, and Route 83 towards the south. An existing 115-kilovolt (kV) transmission line runs along the western boundary and an existing 230-kV transmission line runs along the northern boundary. The Project vicinity is composed mainly of deciduous and mixed forests, as well as agricultural lands.

Approximately 68% of the Project area is in forested upland (deciduous and mixed forests), and 20% is composed of agricultural land (pastureland). The primary cover types are distributed fairly evenly throughout the Project area, with some concentration of mixed forests and urban, in the northern portion of the area, and a concentration of deciduous forests in the southern portion.

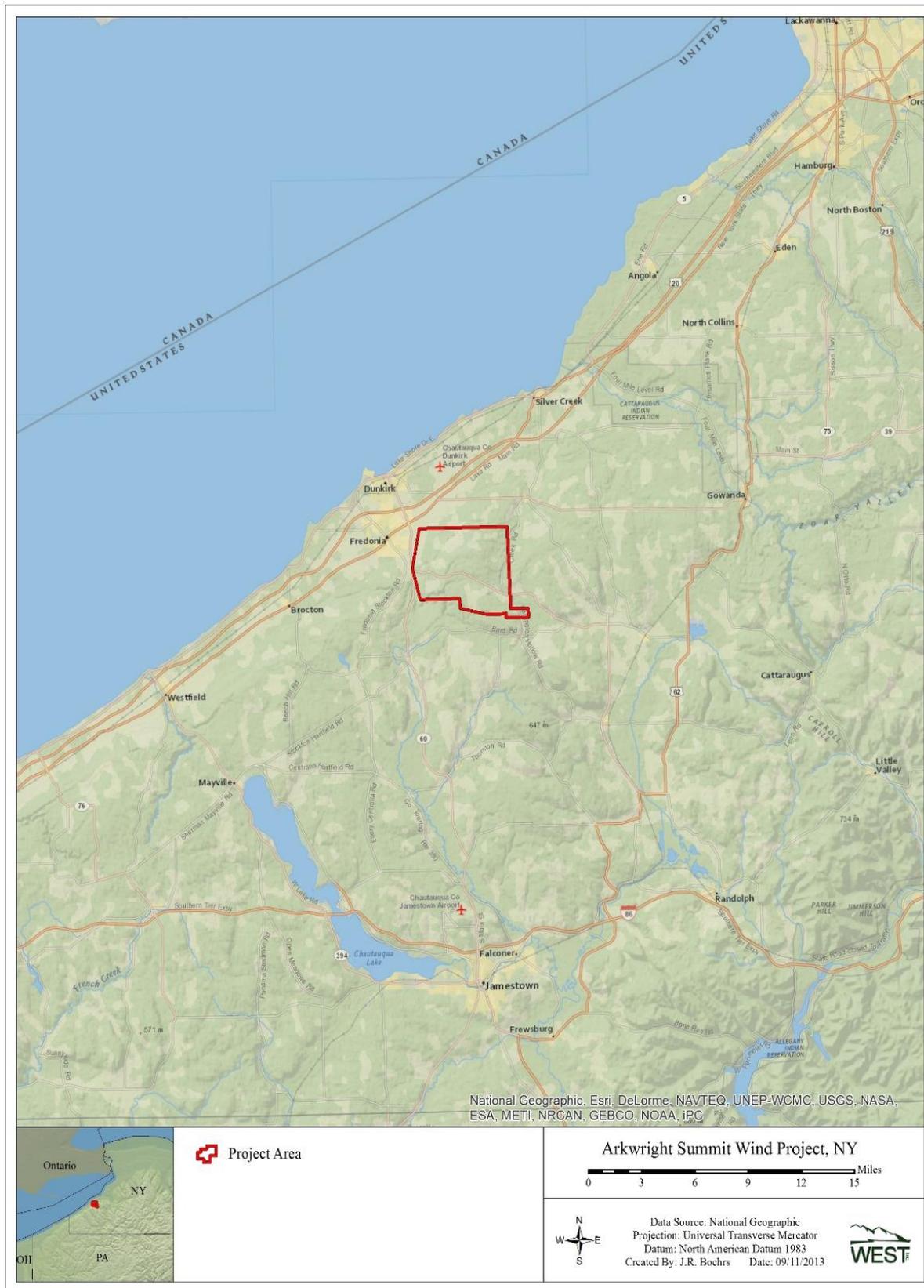


Figure 1. Location of the Arkwright Summit Wind Resource Area.

METHODS

Eagle Observation Surveys

The objective of these surveys was to estimate the seasonal, spatial, and temporal use of the study area by bald eagles (*Haliaeetus leucocephalus*) during the late-spring and summer of 2013. Surveys were conducted using methods described by Reynolds et al. (1980) and used at a large number of comparable projects throughout the US (Strickland et al. 2011). Such observational surveys are currently recommended for characterizing levels of eagle use and for calculating risk of a proposed wind energy project to eagles in the US Fish and Wildlife Service (USFWS) Eagle Conservation Plan (ECP) Guidance (USFWS 2013).

Survey Schedule

Surveys were scheduled to be conducted during the period of greatest raptor flight activity (approximately 09:00 – 15:00 hours Eastern Standard Time [EST]). Each survey round consisted of the completion of 60-minute (min) observations at each of six survey points arrayed within the Project (Figure 2). To the extent practicable, the order in which survey points were visited was rotated to vary the time of day in which each point was surveyed. The schedule remained flexible to respond to adverse weather conditions. Surveys were generally conducted on days when the forecast did not include precipitation.

Survey Points

Six survey points were established within the Project in areas providing good viewshed of proposed turbine locations while providing relatively even coverage of the site with no overlap between points (Figure 2). A minimum of 30% of turbines proposed for the Project were targeted to be included within 800-m (2,625-ft) viewsheds of survey points. The six survey points (AR1 - AR6), provided coverage of approximately 40% (17) of proposed turbines. Visibility was a primary concern when selecting sampling points, as maximizing visibility increases detection rates of eagles and other raptors. Because dense forest cover is a limiting factor for a good viewsheds, a free-standing, tripod-mounted deer stand was used to enhance visibility of the surrounding area at survey point AR1.

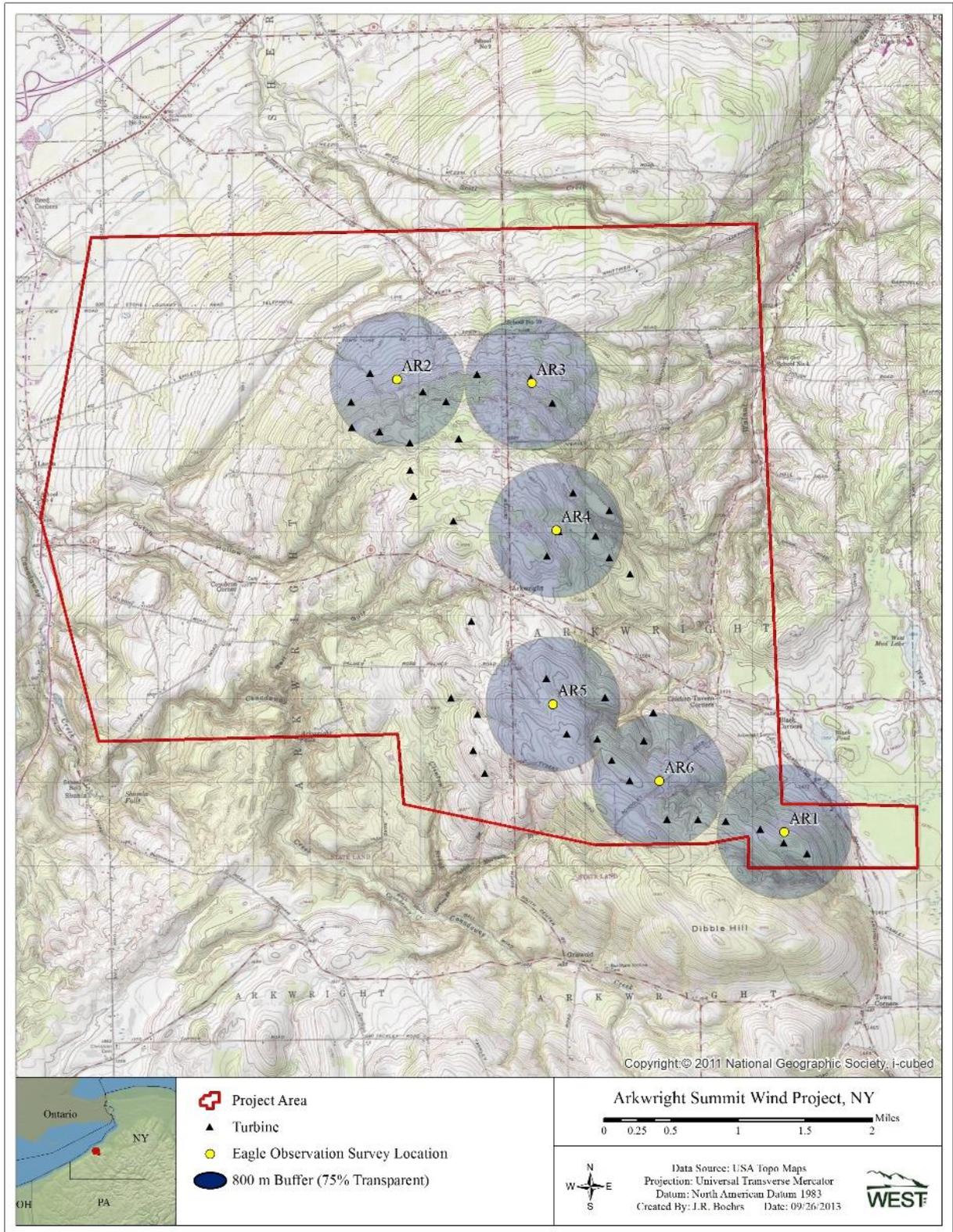


Figure 2. Eagle observation survey points within the Arkwright Summit Wind Resource Area.

Field Methods

Survey plots consisted of an 800-m radius circle centered on the survey point. Surveys were conducted for 60 min intervals at each point. All raptor and other large bird species observed during the survey period were recorded. All eagle observations were recorded within an unlimited viewshed; however, data analysis only included eagle observations within 800 m.

All other bird observations were recorded as incidental wildlife observations. For all eagle observations, the number of eagle observation minutes was calculated. Eagle observations included minute by minute data collection for: number of individuals, behavior, habitat, and flight height. Eagle flight paths were recorded on field maps by observation number.

The following information was recorded for each eagle observation: the date, start and end time of the survey period, and weather information such as temperature, wind speed, wind direction, and cloud cover. A unique observation number was assigned to each observation. Species or best possible identification, number of observations, sex and age class (when possible), distance from plot center when first recorded, closest distance, altitude above the ground, behavior, and habitat(s) in which or over which the bird occurred was recorded for each observation. Behavior and habitat type was recorded based on the point of first observation. Behavior categories include perched, soaring, flapping, flushed, circle soaring, hunting, gliding, and/or other (noted in comments). Approximate flight height and flight direction at first observation was recorded to the nearest 5-m (16-ft) interval. In addition, whether the observation is auditory only, and the 10-min interval of the 60-min survey in which it was first recorded, as well as any other comments or unusual observations, was recorded.

Statistical Analysis

Mean Use and Frequency of Occurrence

Estimates of mean eagle use was calculated as the number of eagle observations recorded per plot per 60-min survey (number per observer-hour). The frequency of occurrence for eagles was calculated as the percent of surveys in which an eagle was recorded.

RESULTS

Eagle Observation Surveys

Surveys were conducted four to five times per month at each survey point, with the exception of point AR5, where landowner restricted access resulted in two fewer surveys conducted at this point during the survey period (beginning May 25, ending August 30, 2013). A total of 82 60-min surveys were conducted within the project area, during which one bald eagle was observed. This individual eagle observation was made at point AR2 on May 25, 2013, approximately 800 m from the observer. This resulted in an eagle use value of 0.01 (Table 1). The frequency of occurrence was also 0.01 (one observation per 82 60-min surveys [observer-hours]).

Table 1. Summary of the survey effort during eagle observation surveys at the Arkwright Summit Wind Project from May 25 to August 30, 2013.

Season	Number of Stations	Number of Visits *	Number of Surveys Conducted	Number of Eagle Species	Number of Observer-Hours	Mean Use	Frequency of occurrence
Summer	6	14	82	1	82	0.01	0.01

* = station AR5 was only surveyed 12 times due to restricted access

Incidental Observations

Eight other bird species were observed during the EOS, totaling 239 bird observations within 142 separate groups during the study (Table 2). The most abundant species seen were turkey vulture (*Cathartes aura*; 92 observations), American crow (*Corvus brachyrhynchos*; 50), red-tailed hawk (*Buteo jamaicensis*; 42), and American kestrel (*Falco sparverius*; 36). Other species seen included Canada goose (*Branta canadensis*; 14 observations), sharp-shinned hawk (*Accipiter striatus*; three; a state species of special concern), common raven (*Corvus corax*; one), and great blue heron (*Ardea herodias*; one).

Table 2. Incidental wildlife observed while conducting eagle observation surveys at the Arkwright Summit Wind Project from May 25 to August 30, 2013.

Species	Scientific Name	# grps	# obs
turkey vulture	<i>Cathartes aura</i>	52	92
American crow	<i>Corvus brachyrhynchos</i>	24	50
red-tailed hawk	<i>Buteo jamaicensis</i>	36	42
American kestrel	<i>Falco sparverius</i>	23	36
Canada goose	<i>Branta canadensis</i>	2	14
sharp-shinned hawk *	<i>Accipiter striatus</i>	3	3
common raven	<i>Corvus corax</i>	1	1
great blue heron	<i>Ardea herodias</i>	1	1
Total	8 species	145	239

* state species of concern (NYSDEC 2013).

DISCUSSION AND IMPACT ASSESSMENT

The intent of the eagle observation surveys was to investigate potential temporal and spatial use patterns by eagles within the Project area. However, eagle observations were so rare (when examining the minute by minute data the single bald eagle was seen for a total of five minutes over the course of 82 survey hours [4,920 survey minutes]) during the surveys that no patterns were seen. The risk of collision during the survey period is considered low because of such low eagle use and frequency of occurrence. Based on the results, the Project would fall in the Category 3 designation, minimal risk to eagles, of the USFWS ECPG (USFWS 2013), if potential fatalities were equivalent to use, which was 0.01 eagle per observer-hour. However, because of the temporally limited survey effort, this conclusion is only relevant to the summer season and an annual estimate could be different based on additional data collected over additional seasons.

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