Winter Grassland Raptor Surveys for the Mohawk Solar Project - REDACTED Montgomery County, New York

Winter Report
November 2017 – March 2018

Prepared for:

Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C.

217 Montgomery Street, Suite 1000

Syracuse, New York 13202

Prepared by:

Jason P. Ritzert, Victoria Poulton, and Michelle Ritzert

Western EcoSystems Technology, Inc.
1017 Mumma Road, Suite 103
Lemoyne, Pennsylvania 17043

August 2018

WEST Inc.

NATURAL RESOURCES ◆ SCIENTIFIC SOLUTIONS

STUDY PARTICIPANTS

Western EcoSystems Technology

Jason P. Ritzert	Project Manager/Research Biologist
Carmen Boyd	Data and Report Manager
Zoey Gustafson	Statistician
Jeff Fruhwirth	GIS Technician
Victoria Poulton	Report Compiler
Michelle Ritzert	Technical Editor
Scott Conover	Field Supervisor
Field Technician	Gary Lewandroski

Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services

Field Technician	John Wojcikiewicz
Field Technician	Samouel Beguin
Field Technician	Molly Levy

REPORT REFERENCE

Ritzert J.P. V. Poulton, and M. Ritzert. 2018. Winter Grassland Raptor Surveys for the Mohawk Solar Project, Montgomery County, New York. Draft Winter Report: November 2017 – March 2018. Prepared for Environmental Design & Research, Albany, New York. Prepared by Western EcoSystems Technology, Inc., Lemoyne, Pennsylvania.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

Mohawk Solar LLC, a wholly-owned subsidiary of Avangrid Renewables, LLC, is considering the development of the Mohawk Solar Project (Project or Project area), a 2,761 hectare (ha; 6,600 acre [ac]), 90 megawatt (MW) photovoltaic (PV) solar energy generation project within the towns of Canajoharie and Minden in Montgomery County, New York (Figure 1). Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR) contracted Western EcoSystems Technology, Inc. (WEST) to conduct winter grassland raptor surveys for the state-threatened northern harrier (NOHA; *Circus cyaneus*) and state-endangered short-eared owl (SEOW; *Asio flammeus*). The study plan (EDR 2017) was developed by EDR in coordination with the New York State Department of Environmental Conservation (NYSDEC), and was based on the NYSDEC Survey Protocol for State Listed Winter Grassland Raptor Species (NYSDEC 2014).

The NYSDEC recommended that winter grassland raptor surveys be conducted in areas that could have concentrations of NOHA and SEOW. Objectives of the surveys were to 1) determine species presence or absence, and 2) determine if there are roosting or foraging concentration areas for NOHA or SEOW in the Project area.

STUDY AREA

The Project area lies within the Eastern Great Lakes Lowland Ecoregion, which is characterized by irregular plains bordered by hills (US Environmental Protection Agency 2010). The Project area is located in Montgomery County, approximately one mile south of the Mohawk River, among the rolling hills of the New York State Appalachian Plateau. The Project also falls within the New York State Department of Environmental Conservation (NYSDEC) Mohawk Valley Ecological Zone of New York (Edinger et al. 2014). Land use in the vicinity of the Project is dominated by agricultural uses. The main farming activities include dairy farms and a variety of cultivated crops.

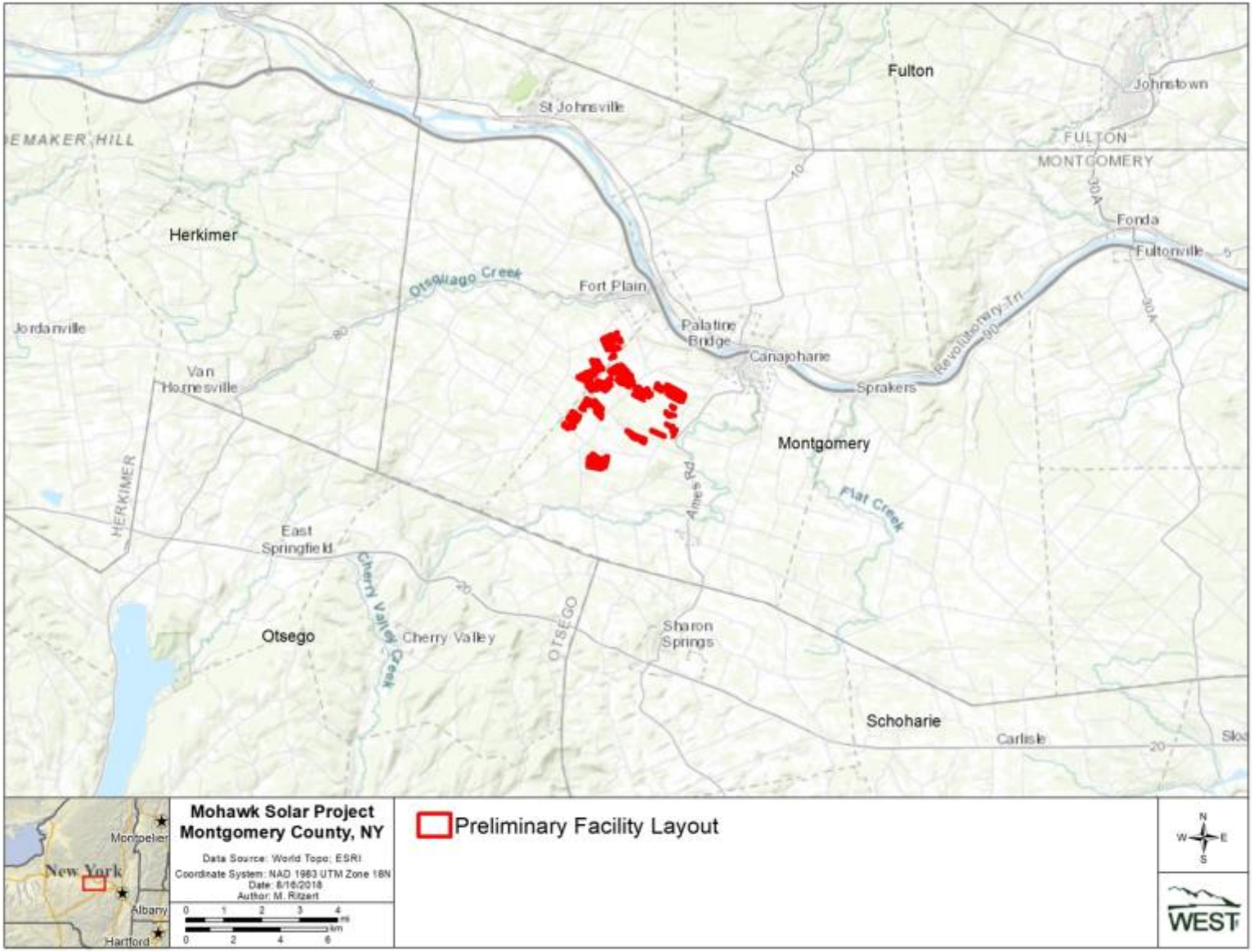


Figure 1. Overview of the Mohawk Solar Preliminary Facility Layout in Montgomery County, New York.

METHODS

Surveys were conducted between November 30, 2017 and March 28, 2018. Surveys consisted of stationary point-counts, driving transects, and driving transect point-counts.

Stationary Point-Count Surveys

Twelve (12) stationary point-count locations were established in the Project area (Figure 2). All point-counts were surveyed every other week (half the points surveyed each week to provide weekly coverage of the Project area). On each survey day, one point-count location was surveyed by a biologist experienced in identifying NOHA and SEOW by sight and sound. The survey began 60 minutes prior to sunset and continued for at least 30 minutes after sunset (or until ambient light was exhausted preventing accurate identification of NOHA and/or SEOW). If NOHA and/or SEOW activity was observed, the survey continued until 1) NOHA/SEOW activity ceased, or 2) weather or visibility conditions prevented accurate identification of NOHA/SEOW.

Surveys were not conducted during inclement weather such as persistent and heavy precipitation, fog, or strong winds (i.e., greater than 19.3 kilometers per hour [kph]; 12 miles per hour [mph]). Data and observations recorded for the stationary point-count surveys, driving transects, and driving transect point-count surveys included:

- Date,
- Observer name,
- Survey location,
- Start/end times,
- Weather information (temperature, wind speed, wind direction, snow depth, and cloud cover),
- Number of NOHA and/or SEOW,
- Behavior,
- Sex (if possible),
- Age (if possible),
- Flight height/direction, and
- Locations (perched and flight paths will be mapped on recent aerial photographs).

All other raptors observed during surveys were recorded in the same fashion as NOHA and SEOW.

Driving Transects

Six driving transects were established in the Project area (Figure 2). The driving surveys were conducted during the afternoon immediately before the stationary point-count surveys. Each driving transect was surveyed once per week, and one or two driving transects were completed

each survey day to maintain four survey days per week. The biologist drove each transect at 24 kph (15 mph; or slower if road conditions dictated) scanning each side of the road and recording all pertinent observations between designated point-count locations.

Driving Transect Point-Count Surveys

Each driving transect had designated point-count locations approximately 0.8 km (0.5 miles) apart, for a total of 18 points (Figure 2). While driving each survey transect the biologist stopped and exited the vehicle at each of the 18 designated point-counts to conduct a five-minute point-count survey.

Incidental Observations

Incidental wildlife observations provide records of wildlife observed outside of the time window or locations of standardized surveys. All incidentally observed raptors, unusual or unique birds and federally or state-listed species were recorded in a similar fashion to standardized surveys. The observation number, date, time, species, number of individuals, sex/age class, distance from observer, activity, height above ground (for bird species) and habitat were recorded. The approximate location of federally or state-listed species was recorded by UTM coordinates using a hand-held GPS unit.

Statistical Analysis

Quality Assurance and Quality Control

Quality assurance and quality control (QA/QC) measures were implemented at all stages of the study, to include in-field, data entry and analysis, and report writing. Biologists were responsible for inspecting data forms for completeness, accuracy, and legibility. A sample of records from a compiled electronic database of survey data and observations was compared to the raw data forms and any errors detected were corrected. Irregular codes or data suspected as questionable were discussed with the observer and/or project manager. Errors, omissions, or problems identified in later stages of analysis were traced back to the raw data forms, and appropriate changes were made in all affected steps.

Data Compilation and Storage

An electronic database was developed to store, organize, and retrieve survey data. Data were keyed into the electronic database using a pre-defined protocol to facilitate subsequent QA/QC and data analysis. All data forms and electronic data files were retained for reference.

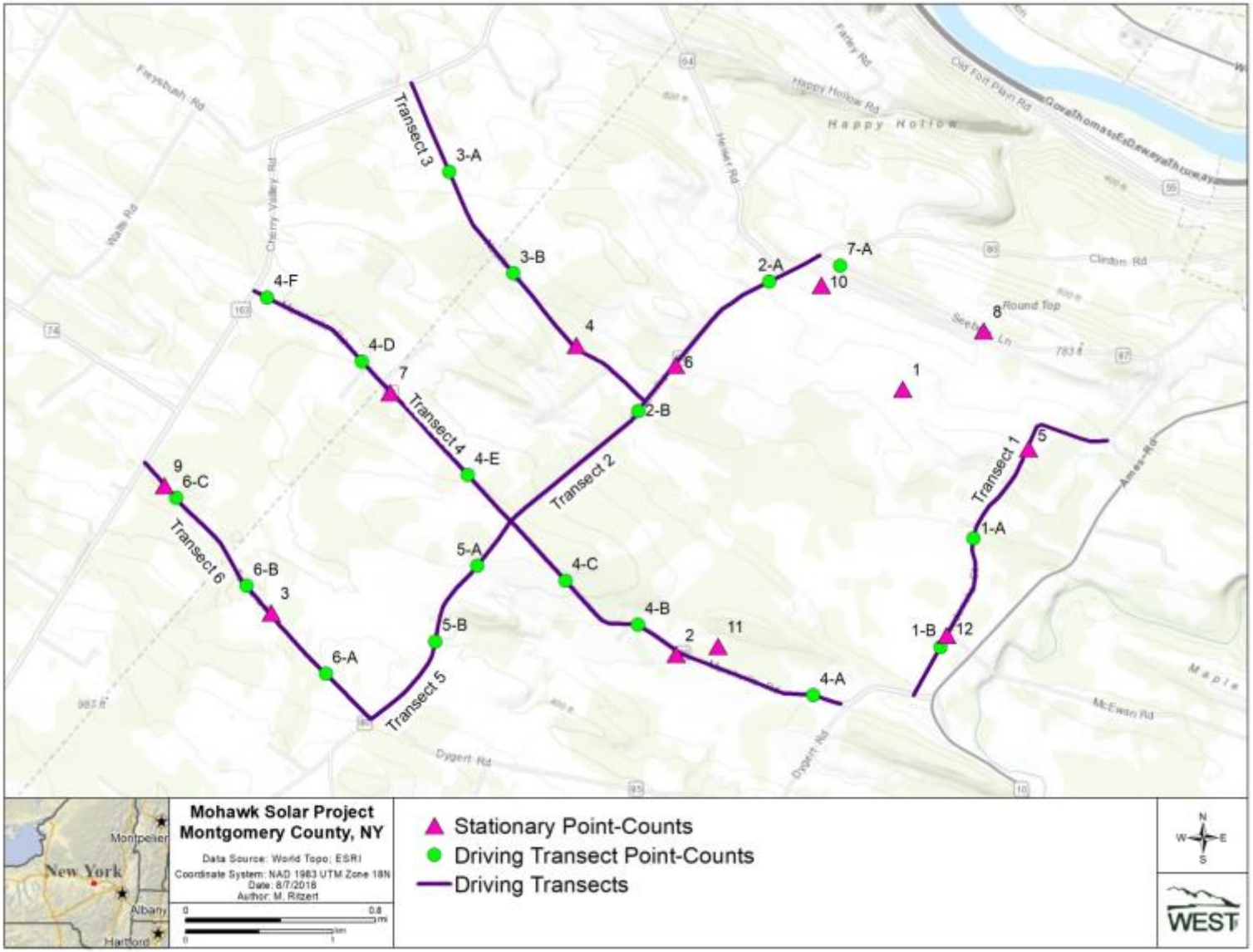


Figure 2. Stationary point-count, driving transects, and driving transect point-count locations at the Mohawk Solar Project.

RESULTS

Ninety (90) stationary point-count surveys were conducted over nine visits, 106 driving transect surveys were conducted during 18 visits, and 288 driving survey point-count surveys were conducted over 16 visits. During all surveys, 24 bird species were identified (Appendix A). Overall, 381 bird observations within 173 separate groups (defined as one or more individuals) were recorded in the Project area (Appendix A). A total of 138 raptor observations were recorded in 131 separate groups. Of the seven (7) unique raptor species recorded the red-tailed hawk was the most common at 99 observations (*Buteo jamaicensis*). A total of 24 owl observations in 24 separate groups and four (4) unique owl species were observed with snowy owl (*Bubo scandiacus*) as the most commonly recorded species at 10 observations (Appendix A).

Northern Harrier Observations

Seven (7) NOHA observations were recorded during all surveys (Appendix B1 [REDACTED]). Observations were reported during December, February, and March at two stationary point-count locations (points [redacted] and [redacted]; Appendix B1 [REDACTED]), during March at driving transect point-count location [redacted], and during December at transect [redacted] and [redacted]. All individuals observed were recorded flying and foraging. No roosting behavior or roost locations were recorded during surveys.

Short-eared Owl Observations

Nine (9) SEOW observations were recorded during stationary point-count surveys (Appendix B1 [REDACTED]). However, the multiple sightings of SEOW (six separate observations) at survey Point [redacted] on March 5, 2018 may be attributed to deteriorating light and weather conditions making it difficult for the biologist to differentiate between individuals after the initial observation and potential for repeated counts of the same individual(s). This would suggest less use of the landscape than indicated by the total number of observations. No SEOWs were observed during driving transect surveys. All observations were reported during December, January, February, and March at two stationary point-count locations (points [redacted] and [redacted]; Appendix B1 [REDACTED]). The observations were primarily in areas of hayfield and pumpkin fields and behaviors observed included flying, foraging, perching, and calling. No roosting behavior or roost locations were recorded during surveys.

Information on the remaining owl species observations is presented in Appendix B2.

Incidental Observations

Incidental observations of seven bird species were recorded totaling 131 observations within 26 separate groups (Table 1). All species were also observed during the surveys. Five (5) NOHAs were observed incidentally during December, February, and March, and their recorded locations can be found in Appendix C [REDACTED].

Table 1. Incidental wildlife observed while conducting all surveys at the Mohawk Solar Project from November 30, 2017 to March 28, 2018.

Species	Scientific Name	# Groups	# Observations
Canada goose	*Branta canadensis*	2	106
American kestrel	*Falco sparverius*	2	2
northern harrier	*Circus cyaneus*	5	5
rough-legged hawk	*Buteo lagopus*	5	5
red-tailed hawk	*Buteo jamaicensis*	9	10
snowy owl	*Bubo scandiacus*	2	2
turkey vulture	*Cathartes aura*	1	1
Total		**26**	**131**

Other Federally or State-Listed Species Observations

In addition to SEOW and NOHA, 10 observations of the state-threatened bald eagle (*Haliaeetus leucocephalus*) were recorded (Table 2). Bald eagles are further protected by the federal Bald and Golden Eagle Protection Act (BGEPA 1940). Five bald eagles observations were recorded during the driving transect point-count surveys (points [redacted], [redacted], [redacted], and [redacted]; Appendix B1 [REDACTED] and C [REDACTED]), four were recorded during stationary point-count surveys (points [redacted], [redacted], [redacted], and [redacted]), and one was recorded along Transect [redacted]. Eagles were observed during all survey months.

Table 2. Summary of federally or state-listed species observed at the Mohawk Solar Project during stationary point-count surveys (SPC), driving transect surveys (T), driving transect point-count (TPC), and as incidental wildlife observations (INC) from November 30, 2017 to March 28, 2018.

			SPC		T		TPC		INC		Total	
Species	Scientific Name	Status*	# of grps	# of obs	# of grps	# of obs	# of grps	# of obs	# of grps	# of obs	# of grps	# of obs
bald eagle	*Haliaeetus leucocephalus*	ST; BGEPA	4	4	1	1	5	5	0	0	10	10
northern harrier	*Circus cyaneus*	ST	4	4	2	2	1	1	5	5	12	12
short-eared owl	*Asio flammeus*	SE	9	9	0	0	0	0	0	0	9	9
Total			**17**	**17**	**3**	**3**	**6**	**6**	**5**	**5**	**31**	**31**

* BGEPA=federal protections under the Bald and Golden Eagle Protection Act (BGEPA 1940); SE= state endangered; ST= state threatened (NYSDEC 2015).

grps=groups; obs=observations.

CONCLUSIONS

NOHA, SEOW, and bald eagle were observed foraging, perching, and flying through the Project area during the winter surveys. However, no direct observations of roosting behavior from NOHA, SEOW, or bald eagle were made within the Project area. NOHA were not observed in high numbers, and did not appear to be concentrating in specific areas of the Project area. SEOW were also observed in low numbers, and observations were restricted to two localized areas within the Project area, which may indicate the presence of preferred habitat at these locations. A closer examination of the landscape where the SEOW were observed may indicate

why the area was being utilized by SEOW and how the changing and rotating agriculture landscape in and near the Project may affect SEOW use locations during the winter.

REFERENCES

Bald and Golden Eagle Protection Act (BGEPA). 1940. 16 United States Code § 668-668d. June 8, 1940.

Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A.M. Olivero (eds.). 2014. Ecological Communities of New York State. Second edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation (NYSDEC), Albany, New York. 160 pp. Available online: https://www.dec.ny.gov/animals/97703.html

Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR). 2017. Mohawk Raptor Survey Work Plan. Mohawk Solar Project, Towns of Canajoharie and Minden – Montgomery County New York. Prepared for Mohawk Solar LLC. December 2017

ESRI. 2011. Geographic Information Services (GIS). Producers of ArcGIS software. ESRI, Redlands, California.

New York State Department of Environmental Conservation (NYSDEC). 2016. Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects. Prepared by NYSDEC Division of Fish and Wildlife. June 2016. Available online at: http://www.dec.ny.gov/docs/wildlife_pdf/winguide16.pdf

US Environmental Protection Agency (USEPA). 2010. Level II and IV Ecoregions. U.S. Geological Survey (USGS), Reston, Virginia. US Environmental Protection Agency (USEPA

Appendix A: All Bird Types and Species Observed at the Mohawk Solar Project during Stationary Point-Count Surveys (SPC), Driving Transect Surveys (T), Driving Transect Point-Count Surveys (TPC), and Incidental Observations.

Appendix A. Summary of individuals and group observations by species and bird group during stationary point-count surveys (SPC), driving transect surveys (T), driving transect point-count surveys (TPC), and incidental observations at the Mohawk Solar Project[a], November 30, 2017, to March 28, 2018.

		SPC		T		TPC		Incidentals		Total	
Type / Species	Scientific Name	# grps	# obs	# grps	# obs	# grps	# obs	# grps	# obs	# grps	# obs
Waterbirds		**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**
great blue heron	*Ardea herodias*	1	2	0	0	0	0	0	0	1	2
Waterfowl		**6**	**118**	**0**	**0**	**0**	**0**	**2**	**106**	**8**	**224**
Canada goose	*Branta canadensis*	4	101	0	0	0	0	2	106	6	207
mallard	*Anas platyrhynchos*	2	17	0	0	0	0	0	0	2	17
Diurnal Raptors		**59**	**60**	**11**	**12**	**61**	**66**	**21**	**22**	**152**	**160**
Accipiters		*5*	*5*	*0*	*0*	*1*	*1*	*0*	*0*	*6*	*6*
Cooper's hawk	*Accipiter cooperii*	4	4	0	0	0	0	0	0	4	4
sharp-shinned hawk	*Accipiter striatus*	0	0	0	0	1	1	0	0	1	1
unidentified accipiter	*Accipiter spp*	1	1	0	0	0	0	0	0	1	1
Buteos		*41*	*42*	*8*	*9*	*49*	*54*	*14*	*15*	*112*	*120*
red-tailed hawk	*Buteo jamaicensis*	38	39	7	8	47	52	9	10	101	109
rough-legged hawk	*Buteo lagopus*	2	2	1	1	2	2	5	5	10	10
unidentified buteo	*Buteo spp*	1	1	0	0	0	0	0	0	1	1
Northern Harrier		*4*	*4*	*2*	*2*	*1*	*1*	*5*	*5*	*12*	*12*
northern harrier	*Circus cyaneus*	4	4	2	2	1	1	5	5	12	12
Eagles		*4*	*4*	*1*	*1*	*5*	*5*	*0*	*0*	*10*	*10*
bald eagle	*Haliaeetus leucocephalus*	4	4	1	1	5	5	0	0	10	10
Falcons		*0*	*0*	*0*	*0*	*3*	*3*	*2*	*2*	*5*	*5*
American kestrel	*Falco sparverius*	0	0	0	0	3	3	2	2	5	5
Other Raptors		*5*	*5*	*0*	*0*	*2*	*2*	*0*	*0*	*7*	*7*
unidentified raptor		5	5	0	0	2	2	0	0	7	7
Owls		**20**	**20**	**2**	**2**	**2**	**2**	**2**	**2**	**26**	**26**
barred owl	*Strix varia*	2	2	0	0	0	0	0	0	2	2
great horned owl	*Bubo virginianus*	3	3	0	0	0	0	0	0	3	3
short-eared owl	*Asio flammeus*	9	9	0	0	0	0	0	0	9	9
snowy owl	*Bubo scandiacus*	6	6	2	2	2	2	2	2	12	12
Vultures		**1**	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**2**
turkey vulture	*Cathartes aura*	1	1	0	0	0	0	1	1	2	2
Doves/Pigeons		**1**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**4**
mourning dove	*Zenaida macroura*	1	4	0	0	0	0	0	0	1	4
Passerines		**8**	**95**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**95**
common grackle	*Quiscalus quiscula*	1	15	0	0	0	0	0	0	1	15
eastern bluebird	*Sialia sialis*	2	7	0	0	0	0	0	0	2	7

Appendix A. Summary of individuals and group observations by species and bird group during stationary point-count surveys (SPC), driving transect surveys (T), driving transect point-count surveys (TPC), and incidental observations at the Mohawk Solar Project[a], November 30, 2017, to March 28, 2018.

		SPC		T		TPC		Incidentals		Total	
Type / Species	**Scientific Name**	**# grps**	**# obs**	**# grps**	**# obs**	**# grps**	**# obs**	**# grps**	**# obs**	**# grps**	**# obs**
European starling	*Sturnus vulgaris*	1	5	0	0	0	0	0	0	1	5
red-winged blackbird	*Agelaius phoeniceus*	1	5	0	0	0	0	0	0	1	5
snow bunting	*Plectrophenax nivalis*	2	59	0	0	0	0	0	0	2	59
unidentified passerine		1	4	0	0	0	0	0	0	1	4
Woodpeckers		**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
unidentified woodpecker		1	1	0	0	0	0	0	0	1	1
Overall		**97**	**301**	**13**	**14**	**63**	**68**	**26**	**131**	**199**	**514**

[a] Regardless of distance from observer.

Appendix B: Northern harrier, short-eared owl, bald eagle [REDACTED], and other raptor and owl species observations recorded while conducting all surveys at the Mohawk Solar Project.

Appendix B1. [REDACTED] Northern harrier, short-eared owl, and bald eagle observations recorded while conducting all surveys at the Mohawk Solar Project from November 30, 2017 to March 28, 2018.

Species	Survey Type*	Location	Date	# Observations
northern harrier	T	[redacted]	12/6/2017	1
northern harrier	T	[redacted]	12/6/2017	1
northern harrier	SPC	[redacted]	12/16/2017	1
northern harrier	SPC	[redacted]	12/19/2017	1
northern harrier	SPC	[redacted]	2/8/2018	1
northern harrier	TPC	[redacted]	3/19/2018	1
northern harrier	SPC	[redacted]	3/21/2018	1
short-eared owl	SPC	[redacted]	12/19/2017	1
short-eared owl	SPC	[redacted]	1/9/2018	1
short-eared owl	SPC	[redacted]	2/6/2018	1
short-eared owl	SPC	[redacted]	3/5/2018	6**
bald eagle	SPC	[redacted]	12/14/2017	1
bald eagle	SPC	[redacted]	12/14/2017	1
bald eagle	TPC	[redacted]	12/27/2017	1
bald eagle	TPC	[redacted]	12/28/2017	1
bald eagle	SPC	[redacted]	1/10/2018	1
bald eagle	SPC	[redacted]	1/11/2018	1
bald eagle	TPC	[redacted]	2/14/2018	1
bald eagle	TPC	[redacted]	2/18/2018	1
bald eagle	T	[redacted]	2/26/2018	1
bald eagle	TPC	[redacted]	3/15/2018	1

*SPC=stationary point-count; TPC=driving transect point-count; T=driving transect survey

**Observations likely of same individuals flying into and out of view

Appendix B2. Other raptor species observations recorded while conducting all surveys at the Mohawk Solar Project from November 30, 2017 to March 28, 2018.

Species	Survey Type*	Location	Date	# Observations
red-tailed hawk	SPC	5	12/6/2017	1
Cooper's hawk	SPC	8	12/11/2017	2
red-tailed hawk	SPC	12	12/14/2017	1
unknown buteo	SPC	12	12/14/2017	1
barred owl	SPC	2	12/15/2017	2
red-tailed hawk	TPC	2-B	12/15/2017	1
red-tailed hawk	TPC	6-C	12/15/2017	2
Cooper's hawk	SPC	1	12/17/2017	1
great horned owl	SPC	1	12/17/2017	1
red-tailed hawk	TPC	3-A	12/18/2017	2
red-tailed hawk	TPC	3-B	12/18/2017	1
red-tailed hawk	SPC	9	12/19/2017	3
unknown raptor	SPC	6	12/20/2017	1
red-tailed hawk	T	Transect 4	12/21/2017	1
red-tailed hawk	T	Transect 4	12/21/2017	1
red-tailed hawk	SPC	3	12/21/2017	2
unknown raptor	SPC	3	12/21/2017	1
rough-legged hawk	TPC	4-A	12/21/2017	1
red-tailed hawk	TPC	5-A	12/26/2017	1
red-tailed hawk	T	Transect 6	12/27/2017	1
red-tailed hawk	TPC	6-A	12/27/2017	1
red-tailed hawk	TPC	6-C	12/27/2017	1

Appendix B2. Other raptor species observations recorded while conducting all surveys at the Mohawk Solar Project from November 30, 2017 to March 28, 2018.

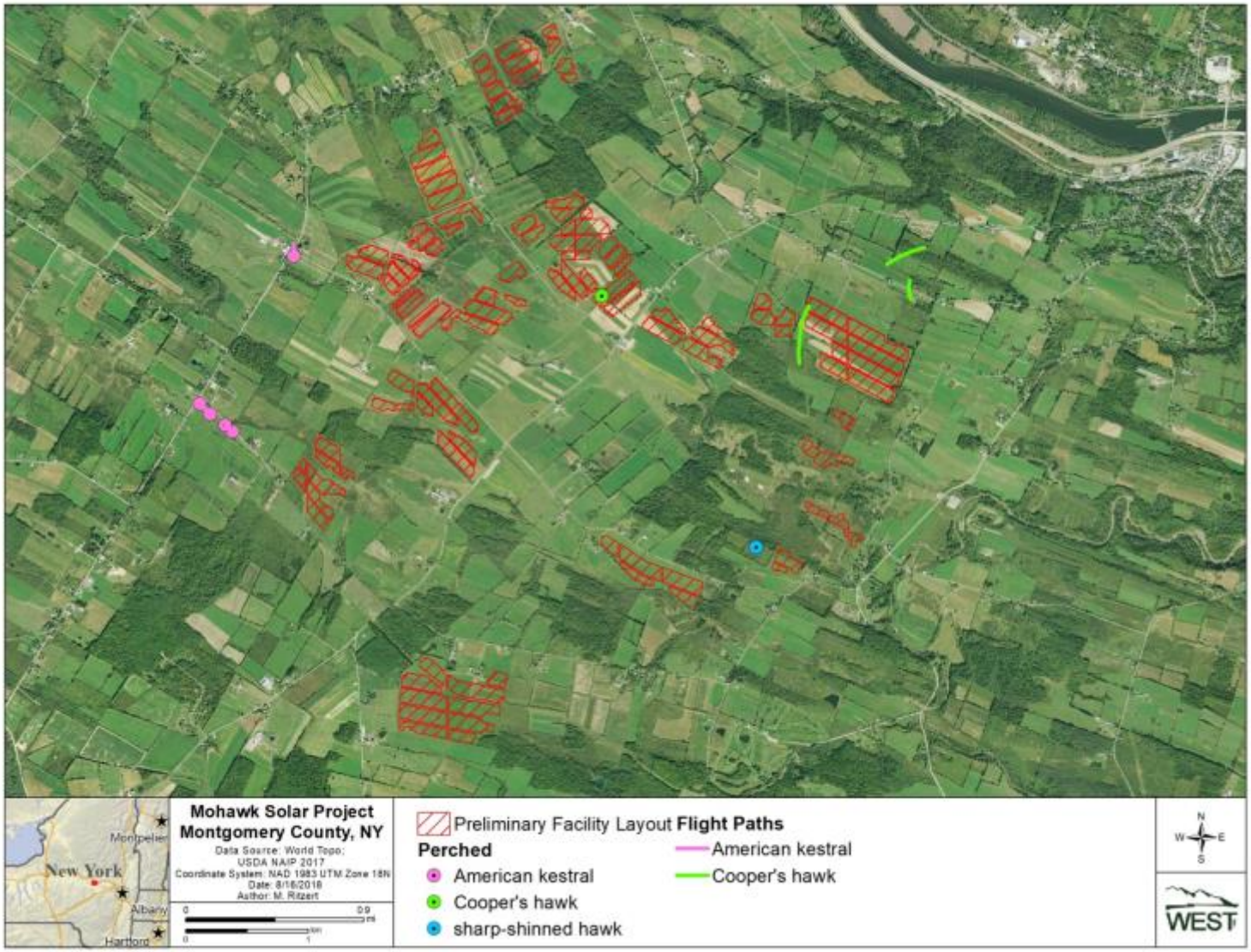
Species	Survey Type*	Location	Date	# Observations
red-tailed hawk	TPC	1-B	12/28/2017	1
red-tailed hawk	TPC	4-B	12/29/2017	1
red-tailed hawk	TPC	5-A	1/1/2018	1
red-tailed hawk	T	Transect 4	1/4/2018	1
red-tailed hawk	TPC	4-F	1/4/2018	1
red-tailed hawk	SPC	8	1/8/2018	3
red-tailed hawk	TPC	5-A	1/8/2018	1
great horned owl	SPC	2	1/9/2018	1
red-tailed hawk	SPC	4	1/10/2018	1
snowy owl	SPC	4	1/10/2018	2
red-tailed hawk	SPC	12	1/10/2018	1
unknown raptor	SPC	7	1/11/2018	1
sharp-shinned hawk	TPC	4-A	1/11/2018	1
red-tailed hawk	TPC	4-B	1/11/2018	1
red-tailed hawk	SPC	6	1/15/2018	2
red-tailed hawk	T	Transect 6	1/16/2018	1
red-tailed hawk	SPC	1	1/16/2018	2
red-tailed hawk	TPC	2-B	1/16/2018	1
red-tailed hawk	TPC	7-A	1/16/2018	1
red-tailed hawk	SPC	3	1/17/2018	1
red-tailed hawk	TPC	4-A	1/18/2018	1
red-tailed hawk	TPC	4-C	1/18/2018	1
red-tailed hawk	TPC	4-D	1/18/2018	1
red-tailed hawk	SPC	2	1/21/2018	1
red-tailed hawk	TPC	3-B	1/21/2018	1
red-tailed hawk	TPC	5-A	1/21/2018	1
red-tailed hawk	SPC	9	1/24/2018	1
red-tailed hawk	TPC	6-C	1/24/2018	1
red-tailed hawk	T	Transect 4	1/25/2018	1
red-tailed hawk	TPC	4-A	1/25/2018	1
rough-legged hawk	SPC	6	1/28/2018	1
red-tailed hawk	TPC	5-B	1/28/2018	1
rough-legged hawk	T	Transect 2	1/29/2018	1
red-tailed hawk	SPC	1	1/29/2018	1
red-tailed hawk	TPC	2-B	1/29/2018	1
red-tailed hawk	TPC	7-A	1/29/2018	1
red-tailed hawk	SPC	12	1/31/2018	1
red-tailed hawk	TPC	2-A	2/6/2018	1
unknown raptor	TPC	6-A	2/6/2018	1
red-tailed hawk	TPC	6-B	2/6/2018	1
rough-legged hawk	SPC	4	2/8/2018	1
red-tailed hawk	SPC	7	2/9/2018	1
snowy owl	TPC	4-E	2/9/2018	1
red-tailed hawk	SPC	5	2/12/2018	2
Cooper's hawk	SPC	6	2/13/2018	1
great horned owl	SPC	6	2/13/2018	1
red-tailed hawk	SPC	6	2/13/2018	1
red-tailed hawk	TPC	6-B	2/13/2018	2
red-tailed hawk	TPC	6-C	2/13/2018	1
red-tailed hawk	TPC	7-A	2/13/2018	2
red-tailed hawk	SPC	1	2/14/2018	2
red-tailed hawk	SPC	3	2/15/2018	2

Appendix B2. Other raptor species observations recorded while conducting all surveys at the Mohawk Solar Project from November 30, 2017 to March 28, 2018.

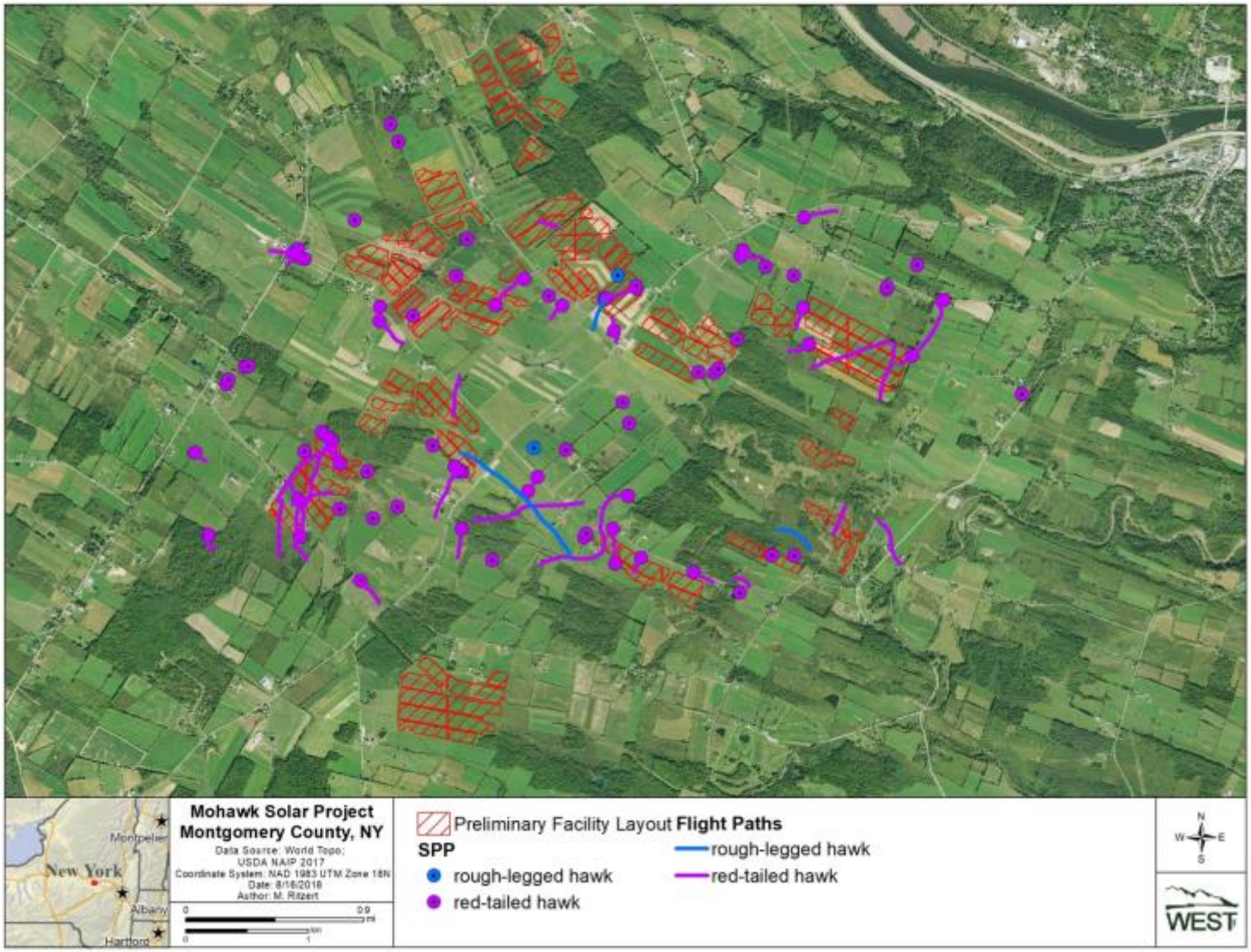
Species	Survey Type*	Location	Date	# Observations
red-tailed hawk	TPC	4-E	2/15/2018	1
snowy owl	TPC	4-F	2/15/2018	1
red-tailed hawk	SPC	7	2/18/2018	1
rough-legged hawk	TPC	5-A	2/18/2018	1
red-tailed hawk	TPC	5-A	2/18/2018	1
unknown raptor	SPC	4	2/20/2018	1
red-tailed hawk	TPC	4-C	2/24/2018	1
red-tailed hawk	TPC	4-E	2/24/2018	1
American kestrel	TPC	4-F	2/24/2018	1
unknown accipiter	SPC	12	2/26/2018	1
red-tailed hawk	SPC	1	2/27/2018	1
red-tailed hawk	SPC	9	2/27/2018	1
American kestrel	TPC	6-C	2/27/2018	1
red-tailed hawk	TPC	7-A	2/27/2018	1
red-tailed hawk	SPC	6	2/28/2018	1
red-tailed hawk	T	Transect 4	3/1/2018	2
red-tailed hawk	TPC	3-A	3/4/2018	1
red-tailed hawk	TPC	5-A	3/4/2018	1
snowy owl	SPC	7	3/5/2018	3
snowy owl	T	Transect 2	3/8/2018	1
red-tailed hawk	TPC	6-B	3/8/2018	1
red-tailed hawk	TPC	1-B	3/9/2018	1
red-tailed hawk	TPC	4-A	3/9/2018	1
red-tailed hawk	SPC	6	3/11/2018	3
red-tailed hawk	TPC	5-A	3/11/2018	1
snowy owl	T	Transect 2	3/12/2018	1
red-tailed hawk	SPC	3	3/12/2018	3
unknown raptor	TPC	3-B	3/18/2018	1
snowy owl	SPC	4	3/19/2018	1
unknown raptor	SPC	2	3/21/2018	1
red-tailed hawk	TPC	4-C	3/21/2018	1
red-tailed hawk	TPC	4-E	3/21/2018	1
red-tailed hawk	TPC	3-B	3/25/2018	1
red-tailed hawk	TPC	5-B	3/25/2018	2
red-tailed hawk	TPC	2-B	3/26/2018	1
American kestrel	TPC	6-C	3/26/2018	1
red-tailed hawk	TPC	6-C	3/26/2018	1

*SPC=stationary point-count; TPC=driving transect point-count; T=driving transect survey

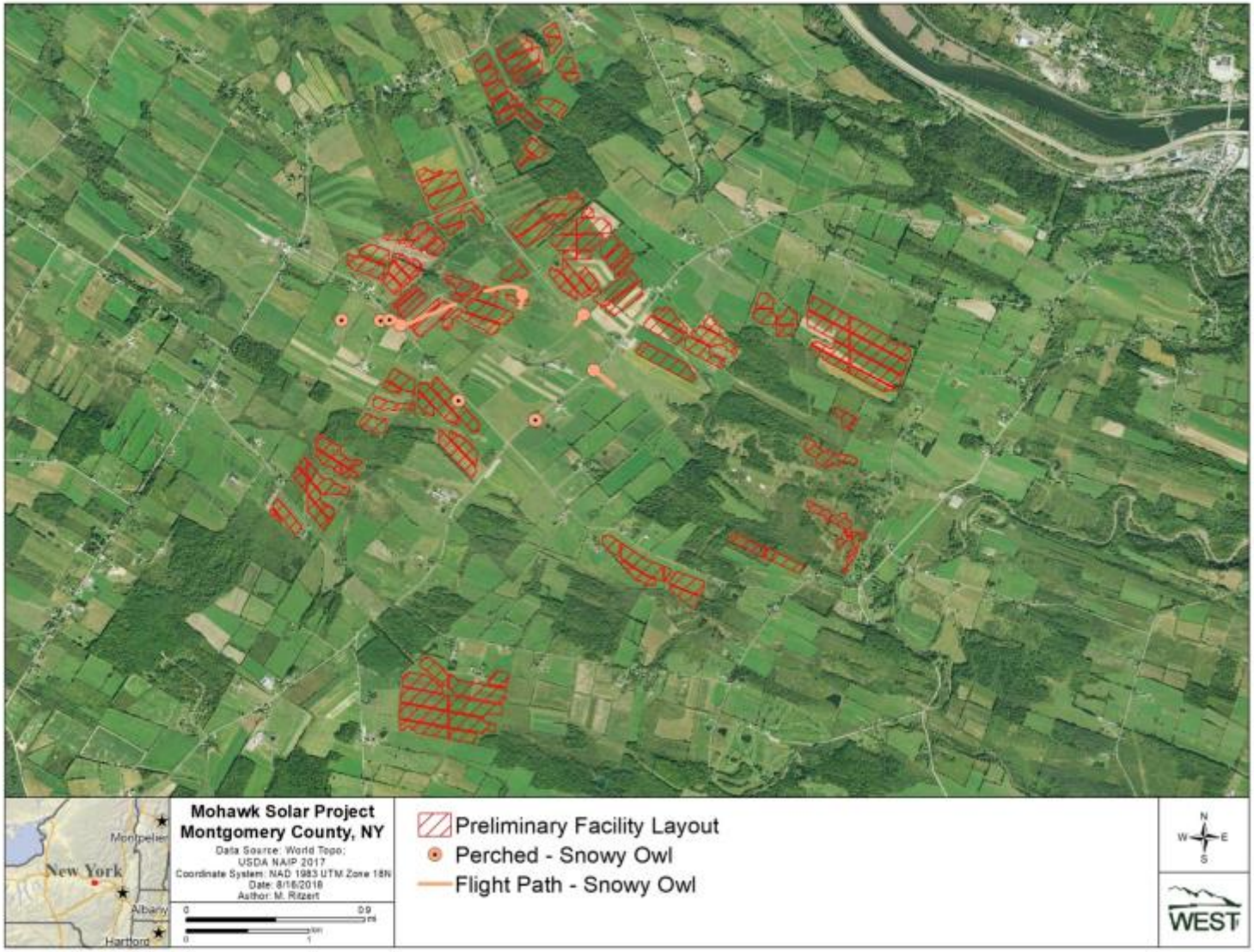
Appendix C: Northern harrier, short-eared owl, bald eagle [REDACTED], and other raptor and owl species flight paths recorded while conducting all surveys at the Mohawk Solar Project.



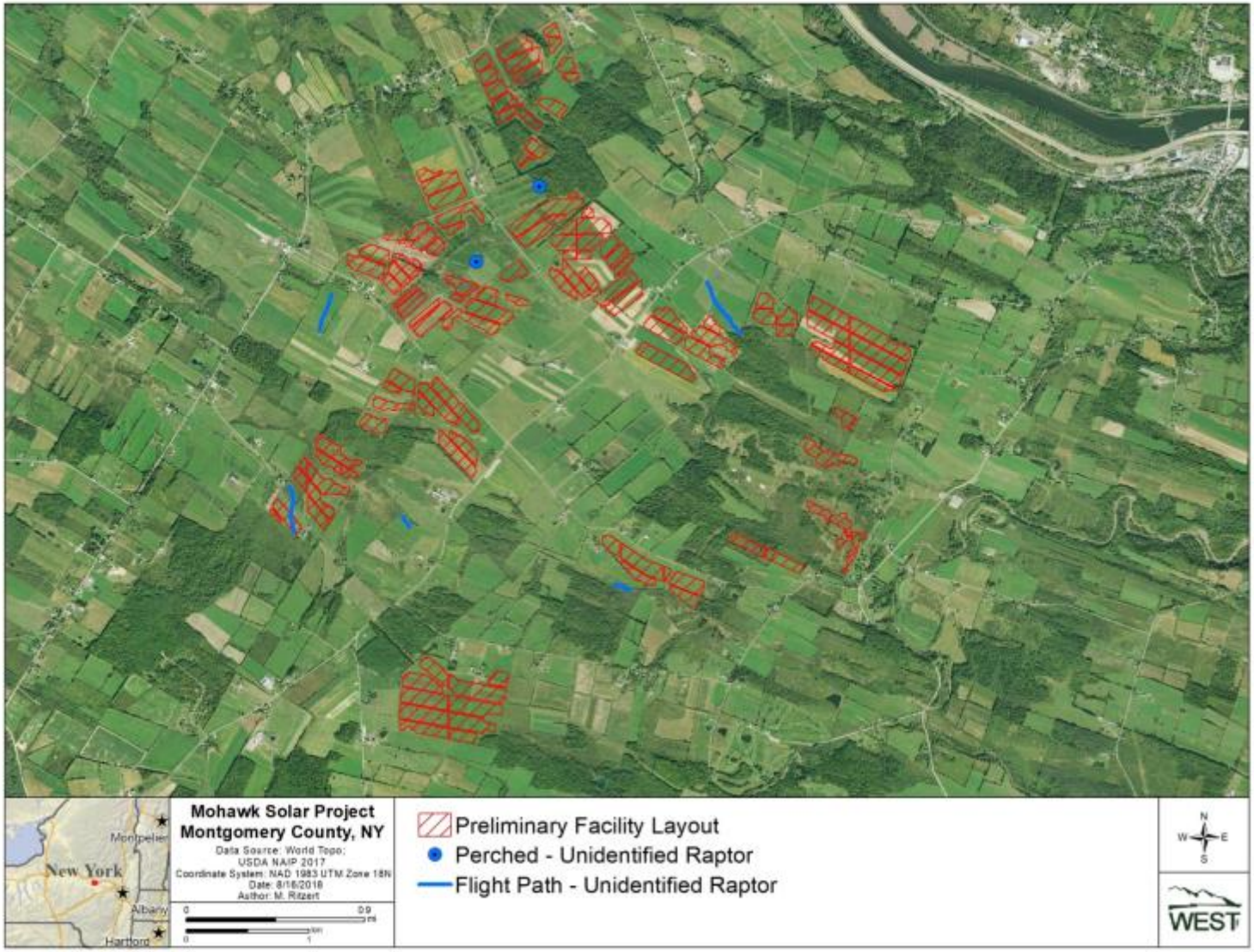
Appendix C *(continued).* Locations of accipiters observed during all surveys within the Mohawk Solar Project.



Appendix C *(continued).* Locations of buteos observed during all surveys within the Mohawk Solar Project.



Appendix C *(continued).* Locations of snowy owls observed during all surveys within the Mohawk Solar Project.



Appendix C *(continued).* Locations of unidentified raptors observed during all surveys within the Mohawk Solar Project.