Breeding Bird Survey Report

Hoffman Falls Wind Project

Towns of Fenner, Nelson, and Smithfield
Madison County, New York

Prepared for:

Liberty Renewables Inc.
90 State Street, Suite 700
Albany, NY 12207

Prepared by:

Environmental Design & Research, D.P.C.
217 Montgomery Street, Suite 1100
Syracuse, New York 13202
www.edrdpc.com

September 2021

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

1.1 Purpose of the Investigation

On behalf of Liberty Renewables Inc. (the Applicant), Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR) has prepared this Breeding Bird Survey Report for a proposed wind energy generation facility and associated infrastructure (the Facility) located in Madison County, New York. This report supports an Application for a siting permit under New York's Accelerated Renewable Energy Growth and Community Benefit Act, Executive Law § 94-c (Section 94-c) regulations.[1] The information included in this report is intended to help the Applicant design the Facility in a manner that minimizes adverse environmental impacts, and assist the New York State Office of Renewable Energy Siting (ORES) and the New York State Department of Environmental Conservation (NYSDEC) in their determination of whether or not occupied habitat for one or more state-listed threatened or endangered wildlife species exists within the area being considered to host Facility components (the Facility Area) in accordance with the requirements of Section 94-c.

Breeding bird surveys were conducted between May and July 2021 to document the presence and use patterns of avian species (including grassland bird species) within the Facility Area during the breeding season, and to identify specific habitat areas used by state-listed bird species. The 2021 breeding bird surveys were designed based on the 2016 NYSDEC *Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects* (NYSDEC Survey Protocol), with some modifications in consideration of comments provided by ORES and NYSDEC staff, and the 2021 ORES *Draft Field Survey Protocol for State-listed Breeding Grassland Bird Species* (2021 Survey Protocol), which was made available to the Applicant after the 2021 survey period had already begun. The scope of these surveys is defined in a Breeding Bird Survey Work Plan that was submitted to ORES and NYSDEC for review and comment (see Appendix A).

1.2 Facility Location and Description

The Applicant is proposing to construct an up to 72-megawatt (MW) wind-powered electric generating facility within the Towns of Fenner, Nelson, and Smithfield in Madison County, New York (see Figure 1). The proposed Facility will consist of wind turbines, a point of interconnection (POI) substation, access roads, and collection lines. The Facility Area is an approximately 8,300-acre area (see Figure 2). Facility components will ultimately be constructed within more limited areas within the Facility Area, and largely in areas where disturbance has already occurred (e.g., agricultural fields that are used for hay and/or row crop production) in order to minimize the need for vegetation removal within undisturbed natural communities (e.g., forestland).

[1] Chapter XVIII, Title 19 of the New York Codes, Rules and Regulations (NYCRR) Part 900. Available at: https://ores.ny.gov/regulations

2.0 BACKGROUND INFORMATION

2.1 Existing Conditions

The Applicant has gathered a substantial amount of information on the existing ecological conditions within the Facility Area. These investigations have included a Wildlife Site Characterization (submitted to ORES and the NYSDEC on May 3, 2021) plus additional desktop analyses and on-site field assessments. Based on these assessments, the Facility Area is primarily composed of deciduous forestland, pastureland, hayfields, and cultivated cropland. In addition, the Facility Area includes some areas of evergreen forest, mixed forest, woody wetlands, shrub/scrub, grassland/herbaceous, open water, emergent herbaceous wetlands, and developed land (primarily rural single-family houses, farms, and associated yards). On-site crop cover types for the past five years (2016-2020) are presented in Appendix B. Spring raptor migration surveys were recently completed for the Facility in May 2021, and a Spring Raptor Migration Survey Report was submitted to ORES and NYSDEC staff on July 19, 2021. **BEGIN CONFIDENTIAL INFORMATION<** [redacted] **END CONFIDENTIAL INFORMATION** (though this feature is located away from areas currently under consideration for Facility development).

2.2 Agency Database Review and Consultation

As part of the Wildlife Site Characterization, EDR consulted with federal and state agencies regarding the potential presence of threatened and endangered species within the Facility Area. This has included database review via the U.S. Fish and Wildlife Service (USFWS) online Information for Planning and Consultation (IPaC) system, correspondence with the New York Natural Heritage Program (NYNHP), and a pre-application consultation meeting with ORES and NYSDEC. A shapefile of the Facility Area was uploaded to IPaC on April 6, 2021. **BEGIN CONFIDENTIAL INFORMATION<** [redacted] **>END CONFIDENTIAL INFORMATION**

In a pre-application consultation letter provided in June 2021, ORES noted that the Facility Area "is not sited in areas of mapped occupied habitat for State-listed species", but recommended conducting winter raptor surveys and breeding bird surveys. In a pre-application consultation meeting held on June 11, 2021, ORES and NYSDEC staff recommended focusing the breeding bird survey effort on open field portions of the Facility Area where Facility components may be constructed. The Applicant will continue to consult with the appropriate agencies to ensure that the most current state-listed species information is being considered throughout the Facility design and development process.

3.0 BREEDING BIRD SURVEYS

3.1 Survey Period and Frequency

Breeding bird surveys were conducted between mid-May and mid-July 2021, which corresponds with the typical breeding period for the vast majority of avian species that may be present within the Facility Area during the breeding season (and the optimal window to survey for state-listed grassland bird species). Surveys began on May 20, 2021, and were performed one day per week until July 20, 2021. Survey locations were visited according to a regimented, alternating rotation so that each individual survey location was surveyed at different times of the day and multiple times throughout the breeding season. Based on comments provided by ORES and NYSDEC staff, the study design was modified in June 2021 in order to allow for increased frequency of surveys in open field portions of the Facility Area. The modified survey frequency and level of effort allowed for survey locations near proposed aboveground Facility components (e.g., wind turbines, access roads, POI substation) in open areas to be surveyed between four and six times throughout the survey period. Refer to Sections 3.2, 3.4, and 6.0 for additional information.

3.2 Survey Methodology

As described in the Breeding Bird Survey Work Plan (Appendix A), the primary method for surveying breeding birds consisted of five-minute point count surveys that were conducted along transects within the Facility Area. Originally, EDR identified a total of 17 meander transects that were 300 meters long, with the exception of Transects T12 and T13, which were 836 meters and 500 meters long, respectively (see Appendix A). Point count survey locations were designated along each transect at intervals of 100 meters (i.e., at 0 meters, 100 meters, 200 meters, 300 meters, etc.). This spacing was proposed to minimize the potential for overlapping detections of the same individuals. Transects were placed to provide coverage of a variety of open field cover types within the Facility Area, while also allowing for detection of avian species that may utilize other habitat types (e.g., field edges, forestland). Thirteen of the transects began at proposed wind turbine sites, one of the transects (Transect T14A) served as an alternate for Transect T14, and three control transects (Transects C1, C2, and C3) were located in areas more than 800 meters from proposed wind turbines.

However, as noted above, the study design was modified in June 2021 based on comments received during a meeting with ORES and NYSDEC staff. In order to allow for increased survey frequency in the vicinity of turbine locations proposed within open fields, surveys were discontinued at Transects C2, T3, T4, T5, and

T15. All of these transects were surveyed only once, with the exception of Transect T4, which was surveyed twice. Transect C2 was located away from areas where Facility components are proposed on the edge of the Facility Area boundary. Transects T3, T4, T5, and T15 were located in forested areas that do not represent suitable habitat for grassland bird species. In addition to these changes, Transect T14 was not ultimately surveyed and was removed from the study design due to a lack of access permission. The remaining (i.e., final) survey locations were surveyed throughout the breeding season (i.e., May to July), and included a total of 51 point count locations designated along 11 meander transects (see Figure 3). Point count locations and meander transects provided extensive visual coverage of open portions of the Facility Area, and visibility from survey locations generally extended several hundred meters in multiple directions. Auditory coverage of bird vocalizations also extended beyond these distances in many cases.

Surveys were conducted once per week between first light (one half hour before sunrise) and approximately 10:30 a.m. as weather conditions permitted. To the greatest extent practicable, surveys were conducted in conditions that were conducive to: (1) hearing bird vocalizations; and (2) seeing birds move about in vegetation and in flight. Surveys were not conducted in conditions that could significantly reduce detectability, such as high winds, steady/heavy precipitation, fog, or extreme temperatures. Survey locations were surveyed in a different order each week to minimize sampling bias, as detectability of some species can vary at different times of day.

Surveys were conducted by qualified biologists with experience and training in both acoustic and visual identification of birds in New York. Upon arriving at each point count location, biologists waited silently for at least one minute before beginning the five-minute survey (to allow birds to habituate to the presence of the observer). During surveys, biologists recorded all birds seen and heard. Visual identification was aided by the use of binoculars with 8x or 10x magnification. Incidental species that were heard or seen along surveys transects between point count survey periods were also recorded, including any species listed by the state as endangered, threatened, or SSC, and birds listed as species of greatest conservation need (SGCN) (NYSDEC, 2015a; NYSDEC, 2015b). Standardized four-letter alpha codes were used for each avian species (Pyle and DeSante, 2021). Behavior and breeding codes were developed based on those used for the New York Breeding Bird Atlas III, and the activity or behavior observed that was most indicative of breeding was documented for each individual bird (eBird, 2021). The following data were recorded for each point count survey:

- Survey date;
- Observer name;
- Station number;
- Start time;
- Pertinent weather conditions including temperature, wind speed and direction, precipitation, cloud cover, and visibility, as applicable;
- General habitat characteristics and vegetation measurements, including photographs;
- Species and number of each individual bird observed;
- Distance of each identified bird from the observer (recorded as 0-100 meters or greater than 100 meters away);

- Location coordinates for all state-listed threatened or endangered species and SSC observed; and
- Observed activities, behaviors, and signs of breeding (if any) for each individual bird.

Incidental Observations

Incidental observations (i.e., birds observed before, after, and between point count surveys) were also documented, including any special status species (i.e., state-listed endangered, threatened, SSC, and/or SGCN) detected.

3.3 Data Analysis

Avian Abundance, Use, Composition, and Frequency

Abundance was calculated as the total number of observations of unique individuals of a given species. However, as it is not always possible to discern among individuals of the same species during a given survey or during subsequent surveys, the abundance metrics presented in this report are effectively relative rather than absolute values.

Relative abundance was calculated for both the areas within and beyond 100 meters from the point count locations. However, in order to avoid duplicate records of the same individuals for adjacent point count locations, and to more closely reflect the characteristics of the avian community observed in close proximity to each point count location, only observations recorded within 100 meters of the point count locations were used to calculate all other metrics discussed in this section (Section 3.3).

Avian use was determined by dividing the relative abundance of a species within 100 meters of point count locations by the total number of surveys conducted. Composition was calculated by dividing the relative abundance of a specific species within 100 meters of point count locations by the total relative abundance of all species observed within 100 meters of point count locations. Frequency was calculated as the percentage of surveys during which a species was recorded within 100 meters of point count locations.

Avian Species Richness and Use

Data analysis included a review of the variability in mean species richness (per survey), total species richness, and spatial use across the Facility Area. Mean species richness was determined by calculating the mean number of species per survey recorded within 100 meters of each point count survey location. Total species richness was determined by calculating the total number of species recorded over the course of the breeding season within 100 meters of each point count survey location. Overall species richness for the Facility Area was also determined by calculating the total number of different species recorded within and beyond 100 from each point count survey location, combined with all incidental avian species observations. Avian use was determined for each point count survey location by dividing the relative abundance for all species by the total number of point count survey conducted at that location.

3.4 Survey Results

Surveys were conducted once per week between May 20 and July 20, 2021. In total, surveys were completed on 10 different days, and included a total of 249 breeding bird point count surveys and 1,245 survey-minutes. Aside from the five transects that were discontinued, survey locations were visited at least four times throughout the survey period, and overall survey effort including travel among point count locations and along meander transects totaled more than 3,080 survey-minutes (more than 51 survey-hours). Completed survey information is provided in Table 1 (see Section 6.0 below).

A total of 2,152 birds representing 65 different species were recorded within 100 meters of point count locations during breeding bird surveys. Song sparrow (*Melospiza melodia*) was the most abundant species recorded at the Facility Area, with 280 observations. Other abundant species included savannah sparrow (*Passerculus sandwichensis*; 254 observations), bobolink (*Dolichonyx oryzivorus*; 209 observations), and red-winged blackbird (*Agelaius phoeniceus*; 189 observations). Together, these four species accounted for 43.30% of all observations. Song sparrow was the most frequently observed species (63.45% of surveys), and savannah sparrow was the second-most frequently observed species (42.97% of surveys). Table 2 (see Section 6.0 below) provides a summary of relative abundance, use, composition, and frequency for each species observed (see Section 3.3 above for a definition of these metrics).

Of the survey locations surveyed throughout the breeding season, point count location T11-300 had the highest mean species richness at 6.50 species per survey, followed by point count locations C3-200, T11-100, T12-700, and T13-500 (each at 6.25 species per survey). Point count location T11-300 was located within a scrub-shrub wetland and adjacent to forested and successional old field habitats. The variety of nearby habitat types could potentially have contributed to the higher mean species richness at this location. Point count location T12-300 had the lowest mean species richness at 3.25 species per survey. This point count location was positioned within pastureland and away from other habitat types.

Of the survey locations surveyed throughout the breeding season, point count locations C1-300 and T8-100 had the highest total species richness, with 30 species recorded at each point count location over the course of the season. Point count location T12-300 had the lowest total species richness, with 13 species recorded. The highest avian use was recorded at point count location T11-200, with an average of 44.50 birds recorded per survey, followed by point T8-200 with 40.40 birds per survey. Table 3 (see Section 6.0, below) provides a summary of relative abundance, use, total species richness, and mean species richness for each point count location.

In addition to bird observation data, habitat data were collected weekly at each point count survey location. Collected data included observations of plant species, vegetation percent cover, vegetation height, distance to the nearest shrub, litter depth (if any), and human activities or other factors that would be likely to alter avian behavior. The dominant open cover types surveyed included field cropland used for hay production, pastureland, and row cropland. Habitat types for each point count location are listed in Table 3 (see Section 6.0 below). Additional habitat information and representative photographs are provided in Appendix C.

Nine additional species were only observed over 100 meters from point count locations. These species included Canada goose (*Branta canadensis*), Carolina wren (*Thryothorus ludovicianus*), common raven (*Corvus corax*), great blue heron (*Ardea herodias*), mallard (*Anas platyrhynchos*), **BEGIN CONFIDENTIAL INFORMATION**<[redacted]>**END CONFIDENTIAL INFORMATION** pileated woodpecker (*Dryocopus pileatus*), veery (*Catharus fuscescens*), and wood duck (*Aix sponsa*). One additional species, ruby-throated hummingbird (*Archilochus colubris*), was only observed incidentally (i.e., independent of timed point count surveys). Incidental species observed during each survey were noted on the survey data sheets in Appendix C.

Eleven species were confirmed as breeding within the Facility Area based on behavioral observations made during the 2021 surveys. Specifically, European starling (*Sturnus vulgaris*) and field sparrow (*Spizella pusilla*) were observed carrying nest material. Red-winged blackbird, rock pigeon (*Columba livia*), and American robin (*Turdus migratorius*) were observed at active nests. Dependent juveniles were documented for the following species: blue jay (*Cyanocitta cristata*), brown thrasher (*Toxostoma rufum*), eastern towhee (*Pipilo erythrophthalmus*), gray catbird (*Dumetella carolinensis*), savannah sparrow, and song sparrow. However, as noted in Appendix D, many other species exhibited behaviors consistent with possible or probable breeding within the Facility Area, including singing males, pairs in suitable breeding habitat, territorial defenses, and/or agitated behavior (refer to eBird, 2021a for details pertaining to breeding codes/definitions).

Special Status Species

BEGIN CONFIDENTIAL INFORMATION<[redacted]>**END CONFIDENTIAL INFORMATION** Two SGCN species were also observed within the Facility Area: scarlet tanager (*Piranga olivacea*), and wood thrush (*Hylocichla mustelina*). These species were typically observed along forested field edges or were heard from within interior forest habitat located adjacent to open fields. Additional information for these observations is provided in Appendices C and D.

4.0 SUMMARY AND CONCLUSIONS

Breeding bird surveys were conducted by EDR biologists within the Facility Area between May 20 and July 20, 2021. A total of 249 point count surveys were conducted over a period of 10 weeks, and the survey locations included in the final study design were surveyed between four and six times during the breeding season. Overall, a total of 2,152 individuals of 65 different species were recorded within 100 meters of point count locations. An additional nine species were observed more than 100 meters from the point count locations and one species was only observed incidentally independent of the point count surveys. The avian community was predominantly composed of common species which prefer agricultural, early successional, and forested habitats. Many of the species observed are widely distributed within and outside of New York.

BEGIN CONFIDENTIAL INFORMATION[redacted]**END CONFIDENTIAL INFORMATION** Breeding by the following eleven species was confirmed within the Facility Area: European starling, field sparrow, red-winged blackbird, rock pigeon, American robin, blue jay, brown thrasher, eastern towhee, gray catbird, song sparrow, and savannah sparrow. In addition, numerous observations of possible or probable breeding behaviors indicate that many of the other species observed may breed within the Facility Area.

BEGIN CONFIDENTIAL INFORMATION[redacted]**END CONFIDENTIAL INFORMATION**. The Applicant will continue consultations with ORES and NYSDEC in order to arrive at a final determination regarding the extent of occupied habitat for state-listed threatened or endangered species pursuant to Section 94-c.

5.0 REFERENCES

eBird. 2021. *Breeding Codes*. Available at: https://ebird.org/atlasny/about/breeding-codes (Accessed July 2021).

New York State Department of Environmental Conservation (NYSDEC). 2015a. L*ist of Endangered, Threatened and Special Concern Fish & Wildlife Species of New York State*. Available at: http://www.dec.ny.gov/animals/7494.html (Accessed July 2021).

NYSDEC. 2015b. *Species of Greatest Conservation Need (SGCN).* Available at: https://www.dec.ny.gov/animals/9406.html (Accessed July 2021).

Pyle, P., and D.F. DeSante. 2021. *Four-letter (English Name) and Six-letter (Scientific Name) Alpha Codes for 2168 Bird Species (and 113 Non-Species Taxa) in accordance with the 62nd AOU Supplement (2021), sorted alphabetically by English name.* The Institute for Bird Populations. Available at: https://www.birdpop.org/docs/misc/Alpha_codes_eng.pdf (Accessed July 2021).

6.0 TABLES

Table 1. Completed Survey Information

Survey Date	Transects Surveyed[1]	Start Time (a.m.)	End Time (a.m.)	Number of Surveyors	Number of Survey-Hours[2]	Temperature Range (°F)	Cloud Cover Range (%)	Wind Direction(s)	Wind Speed Range (mph)	Precipitation	Visibility Range (miles)
5/20/2021	C1, T12-A, T12-B, T4, T8, T11, T14A	5:07	10:23	1	5:16	58-74	15	ENE, SE	3	None	15-14
5/25/2021	T13, T1, T10, C3, T16	5:14	10:20	1	5:06	56-65	60	S	5-6	None	8-10
6/4/2021	T3, T5, T6, C2, T14A, T15	5:14	10:40	1	5:26	61-71	100-25	NW,W	5-6	None	0.5-10
6/11/2021	C1, T12, T4, T8, T11, T14A	5:25	10:43	1	5:18	58-72	15-100	ESE,S	6-7	None	10
6/17/2021	T13, T12, T1, T6, T10, C3	5:24	10:35	1	5:11	39-64	10-5	WSW,W	4-9	None	10
6/25/2021	C1, T8, T11, T14A, T16	5:10	9:44	1	4:34	61-65	10-0	SSE	5-4	None	16-29
7/1/2021	T13, T12, T1, T6, T10, C3	5:17	10:18	1	5:01	64-72	80-90	WSW,NW	5-4	None	10
7/9/2021	C1, T8, T11, T14A, T16	5:12	10:25	1	5:13	65-72	30-100	E,ESE	2	None	10
7/15/2021	T13, T12, T1, T6, T10, C3	5:24	10:24	1	5:00	60-74	20	ESE,SE	2-5	O (Fog)	0.25-10
7/20/2021	C1, T8, T11, T14A, T16	5:08	10:23	1	5:15	64-73	100	W,WNW	2-3	O (Fog)	1-6

[1] Unless otherwise noted, corresponding point count survey locations were also surveyed on the same dates.
[2] The total amount of time surveyors conducted surveys on-site (h:mm).

Table 2. Summary of Avian Species Observed

Alpha Code[1]	Species Common Name	Species Scientific Name	Relative Abundance			Use[5]	Composition[6]	Frequency[7]	Activity Code[8]
			Within 100 m [2]	Beyond 100 m [3]	Total[4]				
ALFL	Alder Flycatcher	*Empidonax alnorum*	16	5	21	0.06	0.74%	4.82%	S
AMCR	American Crow	*Corvus brachyrhynchos*	13	311	324	0.05	0.60%	3.61%	C
AMGO	American Goldfinch	*Spinus tristis*	172	113	285	0.69	7.99%	38.55%	S
AMKE	American Kestrel	*Falco sparverius*	1	0	1	0.00	0.05%	0.40%	FO
AMRE	American Redstart	*Setophaga ruticilla*	8	3	11	0.03	0.37%	3.21%	S
AMRO	American Robin	*Turdus migratorius*	95	143	238	0.38	4.41%	26.10%	ON
BAOR	Baltimore Oriole	*Icterus galbula*	1	1	2	0.00	0.05%	0.40%	S
BARS	Barn Swallow	*Hirundo rustica*	60	50	110	0.24	2.79%	7.63%	H
BAWW	Black-and-white Warbler	*Mniotilta varia*	3	1	4	0.01	0.14%	0.80%	S
BBCU	Black-billed Cuckoo	*Coccyzus erythropthalmus*	1	1	2	0.00	0.05%	0.40%	C
BCCH	Black-capped Chickadee	*Poecile atricapillus*	22	88	110	0.09	1.02%	4.82%	S
BEKI	Belted Kingfisher	*Megaceryle alcyon*	1	1	2	0.00	0.05%	0.40%	C
BGGN	Blue-gray Gnatcatcher	*Polioptila caerulea*	1	0	1	0.00	0.05%	0.40%	C
BHCO	Brown-headed Cowbird	*Molothrus ater*	2	6	8	0.01	0.09%	0.80%	S
BHVI	Blue-headed Vireo	*Vireo solitarius*	1	6	7	0.00	0.05%	0.40%	S
BLJA	Blue Jay	*Cyanocitta cristata*	33	96	129	0.13	1.53%	6.43%	DY
BOBO	Bobolink	*Dolichonyx oryzivorus*	209	168	377	0.84	9.71%	18.07%	CD
BRCR	Brown Creeper	*Certhia americana*	1	0	1	0.00	0.05%	0.40%	1
BRTH	Brown Thrasher	*Toxostoma rufum*	8	2	10	0.03	0.37%	2.01%	DY
BTNW	Black-throated Green Warbler	*Setophaga virens*	3	2	5	0.01	0.14%	1.20%	S
BWWA	Blue-winged Warbler	*Vermivora cyanoptera*	6	8	14	0.02	0.28%	2.41%	S
CANG	Canada Goose	*Branta canadensis*	0	50	50	0.00	0.00%	0.00%	C
CARW	Carolina Wren	*Thryothorus ludovicianus*	0	2	2	0.00	0.00%	0.00%	S
CEDW	Cedar Waxwing	*Bombycilla cedrorum*	67	24	91	0.27	3.11%	14.86%	S
CHSP	Chipping Sparrow	*Spizella passerina*	21	15	36	0.08	0.98%	8.43%	S
COGR	Common Grackle	*Quiscalus quiscula*	10	114	124	0.04	0.46%	2.01%	S
[redacted]			1	0	1	0.00	0.05%	0.40%	V
CORA	Common Raven	*Corvus corax*	0	8	8	0.00	0.00%	0.00%	C

Alpha Code[1]	Species Common Name	Species Scientific Name	Relative Abundance			Use[5]	Composition[6]	Frequency[7]	Activity Code[8]
			Within 100 m [2]	Beyond 100 m [3]	Total[4]				
COYE	Common Yellowthroat	*Geothlypis trichas*	131	155	286	0.53	6.09%	40.16%	S
CSWA	Chestnut-sided Warbler	*Setophaga pensylvanica*	9	7	16	0.04	0.42%	2.81%	S
DEJU	Dark-eyed Junco	*Junco hyemalis*	1	1	2	0.00	0.05%	0.40%	S
DOWO	Downy Woodpecker	*Dryobates pubescens*	5	3	8	0.02	0.23%	2.01%	C
EABL	Eastern Bluebird	*Sialia sialis*	1	0	1	0.00	0.05%	0.40%	C
EAKI	Eastern Kingbird	*Tyrannus tyrannus*	1	3	4	0.00	0.05%	0.40%	S
EAME	Eastern Meadowlark	*Sturnella magna*	1	0	1	0.00	0.05%	0.40%	S
EAPH	Eastern Phoebe	*Sayornis phoebe*	4	2	6	0.02	0.19%	1.61%	S
EATO	Eastern Towhee	*Pipilo erythrophthalmus*	30	34	64	0.12	1.39%	11.65%	DY
EAWP	Eastern Wood-Pewee	*Contopus virens*	8	33	41	0.03	0.37%	3.21%	S
EUST	European Starling	*Sturnus vulgaris*	34	68	102	0.14	1.58%	2.41%	CN
FISP	Field Sparrow	*Spizella pusilla*	35	62	97	0.14	1.63%	11.24%	CN
GBHE	Great Blue Heron	*Ardea herodias*	0	1	1	0.00	0.00%	0.00%	V
GCFL	Great-crested Flycatcher	*Myiarchus crinitus*	3	11	14	0.01	0.14%	1.20%	S
GCKI	Golden-crowned Kinglet	*Regulus satrapa*	4	0	4	0.02	0.19%	1.61%	S
GRCA	Gray Catbird	*Dumetella carolinensis*	49	47	96	0.20	2.28%	18.47%	DY
HAWO	Hairy Woodpecker	*Dryobates villosus*	3	2	5	0.01	0.14%	0.80%	C
HETH	Hermit Thrush	*Catharus guttatus*	3	27	30	0.01	0.14%	1.20%	S
[redacted]			8	0	8	0.03	0.37%	2.41%	S
HOSP	House Sparrow	*Passer domesticus*	36	57	93	0.14	1.67%	1.61%	S
HOWR	House Wren	*Troglodytes aedon*	10	19	29	0.04	0.46%	4.02%	A
INBU	Indigo Bunting	*Passerina cyanea*	9	5	14	0.04	0.42%	3.61%	S
KILL	Killdeer	*Charadrius vociferus*	33	39	72	0.13	1.53%	5.22%	A
LEFL	Least Flycatcher	*Empidonax minimus*	2	1	3	0.01	0.09%	0.80%	S
MALL	Mallard	*Anas platyrhynchos*	0	7	7	0.00	0.00%	0.00%	C
MAWA	Magnolia Warbler	*Setophaga magnolia*	7	1	8	0.03	0.33%	2.01%	S
MODO	Mourning Dove	*Zenaida macroura*	4	63	67	0.02	0.19%	1.61%	S
MOWA	Mourning Warbler	*Geothlypis philadelphia*	5	1	6	0.02	0.23%	1.61%	S
NAWA	Nashville Warbler	*Leiothlypis ruficapilla*	1	0	1	0.00	0.05%	0.40%	S
NOCA	Northern Cardinal	*Cardinalis cardinalis*	4	32	36	0.02	0.19%	1.61%	S

Alpha Code[1]	Species Common Name	Species Scientific Name	Relative Abundance			Use[5]	Composition[6]	Frequency[7]	Activity Code[8]
			Within 100 m [2]	Beyond 100 m [3]	Total[4]				
NOFL	Northern Flicker	*Colaptes auratus*	4	23	27	0.02	0.19%	1.61%	C
NOMO	Northern Mockingbird	*Mimus polyglottos*	1	0	1	0.00	0.05%	0.40%	FO
OVEN	Ovenbird	*Seiurus aurocapilla*	47	73	120	0.19	2.18%	12.05%	S
[redacted]			0	1	1	0.00	0.00%	0.00%	S/C
PIWO	Pileated Woodpecker	*Dryocopus pileatus*	0	2	2	0.00	0.00%	0.00%	C
PUMA	Purple Martin	*Progne subis*	1	0	1	0.00	0.05%	0.40%	V
RBGR	Rose-breasted Grosbeak	*Pheucticus ludovicianus*	5	8	13	0.02	0.23%	2.01%	S
RBWO	Red-bellied Woodpecker	*Melanerpes carolinus*	5	7	12	0.02	0.23%	2.01%	C
REVI	Red-eyed Vireo	*Vireo olivaceus*	30	64	94	0.12	1.39%	10.84%	S
ROPI	Rock Pigeon	*Columba livia*	21	24	45	0.08	0.98%	1.61%	ON
RTHA	Red-tailed Hawk	*Buteo jamaicensis*	4	6	10	0.02	0.19%	1.61%	C
RUGR	Ruffed Grouse	*Bonasa umbellus*	2	0	2	0.01	0.09%	0.80%	C
RWBL	Red-winged Blackbird	*Agelaius phoeniceus*	189	299	488	0.76	8.78%	30.12%	S
SAVS	Savannah Sparrow	*Passerculus sandwichensis*	254	83	337	1.02	11.80%	42.97%	DY
SCTA	Scarlet Tanager	*Piranga olivacea*	1	7	8	0.00	0.05%	0.40%	S
SOSP	Song Sparrow	*Melospiza melodia*	280	246	526	1.12	13.01%	63.45%	DY
SWTH	Swainson's Thrush	*Catharus ustulatus*	1	0	1	0.00	0.05%	0.40%	S
TRES	Tree Swallow	*Tachycineta bicolor*	12	3	15	0.05	0.56%	2.41%	H
TUTI	Tufted Titmouse	*Baeolophus bicolor*	3	8	11	0.01	0.14%	1.20%	S
TUVU	Turkey Vulture	*Cathartes aura*	1	7	8	0.00	0.05%	0.40%	V
VEER	Veery	*Catharus fuscescens*	0	3	3	0.00	0.00%	0.00%	S
WAVI	Warbling Vireo	*Vireo gilvus*	3	2	5	0.01	0.14%	1.20%	S
WBNU	White-breasted Nuthatch	*Sitta carolinensis*	2	4	6	0.01	0.09%	0.80%	S
WIFL	Willow Flycatcher	*Empidonax traillii*	9	4	13	0.04	0.42%	3.60%	S
WITU	Wild Turkey	*Meleagris gallopavo*	1	3	4	0.00	0.05%	0.40%	S
WODU	Wood Duck	*Aix sponsa*	0	1	1	0.00	0.00%	0.00%	C
WOTH	Wood Thrush	*Hylocichla mustelina*	14	42	56	0.06	0.65%	4.42%	A
WTSP	White-throated Sparrow	*Zonotrichia albicollis*	8	1	9	0.03	0.37%	0.80%	C
YBSA	Yellow-bellied Sapsucker	*Sphyrapicus varius*	2	2	4	0.01	0.09%	0.80%	S
YEWA	Yellow Warbler	*Setophaga petechia*	24	37	61	0.10	1.12%	8.03%	S

Alpha Code[1]	Species Common Name	Species Scientific Name	Relative Abundance			Use[5]	Composition[6]	Frequency[7]	Activity Code[8]
			Within 100 m [2]	Beyond 100 m [3]	Total[4]				
YRWA	Yellow-rumped Warbler	*Setophaga coronata*	31	15	46	0.12	1.44%	10.84%	S

[1] Species Codes are based on standardized four-letter AOU alpha codes defined by the Institute for Bird Populations (https://www.birdpop.org/docs/misc/Alpha_codes_eng.pdf).

[2] All observations recorded within 100 meters of point count survey locations during 5-minute point count surveys.

[3] All observations recorded more than 100 meters from point count survey locations during 5-minute point count surveys.

[4] All observations recorded during 5-minute point count surveys, regardless of the distance of the observation from the surveyor.

[5] The mean number of birds recorded per 5-minute point count survey (based on all observations recorded within 100 meters of point count survey locations).

[6] The percentage of the total observations that were of the species (based on all observations recorded within 100 meters of point count survey locations).

[7] The percentage of 5-minute point count surveys during which the species was recorded (based on all observations recorded within 100 meters of point count survey locations).

[8] The activity or behavior observed (based on all observations) that was most indicative of on-site breeding, based on the following hierarchy: CF - carrying food or fecal sac; CN - carrying nesting material; A - agitated behavior; CD – copulation/courtship/display; S – singing bird (or other primary vocalization/sound such as woodpecker drumming); C - calling; H - hunting/foraging; P - perching/roosting; V - visual observation; FO - flyover.

Table 3. Summary of Avian Metrics for each Point Count Survey Location

Survey Location	Primary Habitat Type(s)	Number of Point Count Surveys	Total Observations	Use[1]	Total Species Richness[2]	Mean Species Richness[3]
C1-0	Row Cropland (Corn)	5	81	16.20	26	5.20
C1-100	Row Cropland (Corn)	5	100	20.00	26	5.20
C1-200	Row Cropland (Corn)	5	129	25.80	23	4.60
C1-300	Row Cropland (Corn)	5	193	38.60	30	6.00
C2-0	Successional Shrubland	1	25	25.00	15	15.00
C2-100	Successional Shrubland	1	24	24.00	16	16.00
C2-200	Successional Shrubland	1	23	23.00	16	16.00
C2-300	Successional Shrubland	1	19	19.00	11	11.00
C3-0	Field Cropland (Hay); Successional Old Field	4	66	16.50	24	6.00
C3-100	Field Cropland (Hay); Successional Old Field	4	76	19.00	22	5.50
C3-200	Field Cropland (Hay); Successional Old Field	4	91	22.75	25	6.25
C3-300	Field Cropland (Hay); Successional Old Field	4	83	20.75	22	5.50
T1-0	Row Cropland (Soybeans)	4	49	12.25	14	3.50
T1-100	Row Cropland (Soybeans)	4	54	13.50	19	4.75
T1-200	Row Cropland (Soybeans)	4	57	14.25	21	5.25
T1-300	Row Cropland (Soybeans)	4	58	14.50	20	5.00
T3-0	Successional Mixed Forest	1	9	9.00	6	6.00
T3-100	Successional Mixed Forest	1	10	10.00	6	6.00
T3-200	Successional Mixed Forest	1	16	16.00	11	11.00
T3-300	Successional Mixed Forest	1	17	17.00	10	10.00
T4-0	Successional Mixed Forest	2	38	19.00	21	10.50

Survey Location	Primary Habitat Type(s)	Number of Point Count Surveys	Total Observations	Use[1]	Total Species Richness[2]	Mean Species Richness[3]
T4-100	Successional Mixed Forest	2	29	14.50	17	8.50
T4-200	Successional Mixed Forest	2	32	16.00	17	8.50
T4-300	Successional Mixed Forest	2	35	17.50	21	10.50
T5-0	Successional Mixed Forest	1	11	11.00	9	9.00
T5-100	Successional Mixed Forest	1	13	13.00	10	10.00
T5-200	Successional Mixed Forest	1	13	13.00	9	9.00
T5-300	Successional Mixed Forest	1	21	21.00	13	13.00
T6-0	Successional Old Field	4	99	24.75	19	4.75
T6-100	Successional Old Field	4	97	24.25	18	4.50
T6-200	Successional Old Field	4	100	25.00	19	4.75
T6-300	Successional Old Field	4	117	29.25	15	3.75
T8-0	Row Cropland (Soy)	5	49	9.80	24	4.80
T8-100	Row Cropland (Soy)	5	91	18.20	30	6.00
T8-200	Row Cropland (Soy)	5	202	40.40	27	5.40
T8-300	Row Cropland (Soy)	5	87	17.40	27	5.40
T10-0	Row Cropland; Field Cropland (Hay)	5	83	16.60	24	4.80
T10-100	Row Cropland; Field Cropland (Hay)	5	82	16.40	20	4.00
T10-200	Row Cropland; Field Cropland (Hay)	5	92	18.40	24	4.80
T10-300	Row Cropland; Field Cropland (Hay)	5	107	21.40	23	4.60
T11-0	Mixed Forest	4	43	10.75	18	4.50
T11-100	Successional Old Field	4	82	20.50	25	6.25
T11-200	Successional Old Field	4	178	44.50	24	6.00
T11-300	Scrub-shrub Wetland	4	118	29.50	26	6.50

Survey Location	Primary Habitat Type(s)	Number of Point Count Surveys	Total Observations	Use[1]	Total Species Richness[2]	Mean Species Richness[3]
T12-0	Pastureland	4	49	12.25	21	5.25
T12-100	Pastureland	4	63	15.75	19	4.75
T12-200	Pastureland	4	76	19.00	14	3.50
T12-300	Pastureland	4	82	20.50	13	3.25
T12-400	Pastureland	4	81	20.25	15	3.75
T12-500	Pastureland	4	81	20.25	16	4.00
T12-600	Pastureland; Row Cropland (Corn)	4	92	23.00	22	5.50
T12-700	Pastureland; Row Cropland (Corn)	4	85	21.25	25	6.25
T12-800	Pastureland	4	93	23.25	20	5.00
T12-A[4]	Pastureland	1	32	32.00	17	17.00
T12-B[4]	Pastureland; Row Cropland (Corn)	1	33	33.00	15	15.00
T13-0	Row Cropland (Corn)	4	70	17.50	23	5.75
T13-100	Row Cropland (Corn)	4	67	16.75	19	4.75
T13-200	Row Cropland (Corn)	4	39	9.75	15	3.75
T13-300	Row Cropland (Corn)	4	43	10.75	17	4.25
T13-400	Row Cropland (Corn)	4	50	12.50	22	5.50
T13-500	Row Cropland (Corn)	4	64	16.00	25	6.25
T14A-0	Successional Old Field	6	160	26.67	24	4.00
T14A-100	Successional Old Field	6	156	26.00	29	4.83
T14A-200	Successional Old Field	6	164	27.33	30	5.00
T14A-300	Successional Old Field	6	143	23.83	29	4.83
T15-0	Mixed Forest	1	7	7.00	5	5.00
T15-100	Mixed Forest	1	14	14.00	10	10.00

Survey Location	Primary Habitat Type(s)	Number of Point Count Surveys	Total Observations	Use[1]	Total Species Richness[2]	Mean Species Richness[3]
T15-200	Mixed Forest	1	24	24.00	13	13.00
T16-0	Mixed Forest	4	60	15.00	19	4.75
T16-100	Row Cropland (Corn)	4	58	14.50	16	4.00
T16-200	Row Cropland (Corn)	4	50	12.50	18	4.50
T16-300	Field Cropland (Hay)	4	91	22.75	24	6.00

[1] The mean number of birds recorded per 5-minute point count survey (based on all observations recorded within 100 meters of point count survey locations).

[2] The total number of species observed at the survey location.

[3] The mean number of species observed per 5-minute point count survey.

[4] Point count locations T12-A and T12-B were surveyed only once on May 20, 2021, at which time there were access/safety issues associated with livestock and electric fencing. The subsequent surveys along Transect T12 utilized point count locations T12-800, T12-700, and T12-600 instead once access to this area became available.

Table 4. State-Listed Species Observations

BEGIN CONFIDENTIAL INFORMATION<

Species Common Name	Species Scientific Name	Conservation Status[1]	Number Observed[2]	Sex/Age	Date(s)	Time(s) (24-hour)	Location(s)[3]	Behavior(s)	Description
[redacted]	[redacted]	Threatened	1	Unknown	5/20/2021	8:50	[redacted]	Vocalizing	[redacted]
		Special Concern	1	Unknown	7/9/2021	7:54		Flying, Hunting	Direct, strong flight to west; brief observation; likely hunting due to low flight height, but did not observe a dive or attempted strike.
		Special Concern	6	Male; Unknown	5/20/2021 6/11/2021 6/25/2021	5:23, 6:18 6:26, 9:56		Singing, Calling, Foraging, Flying	[redacted]

[1] Highest conservation status based on the List of Endangered, Threatened and Special Concern Fish & Wildlife Species of New York State (https://www.dec.ny.gov/animals/7494.html).

[2] Includes all observations documented, including those recorded during point count surveys and incidentally.

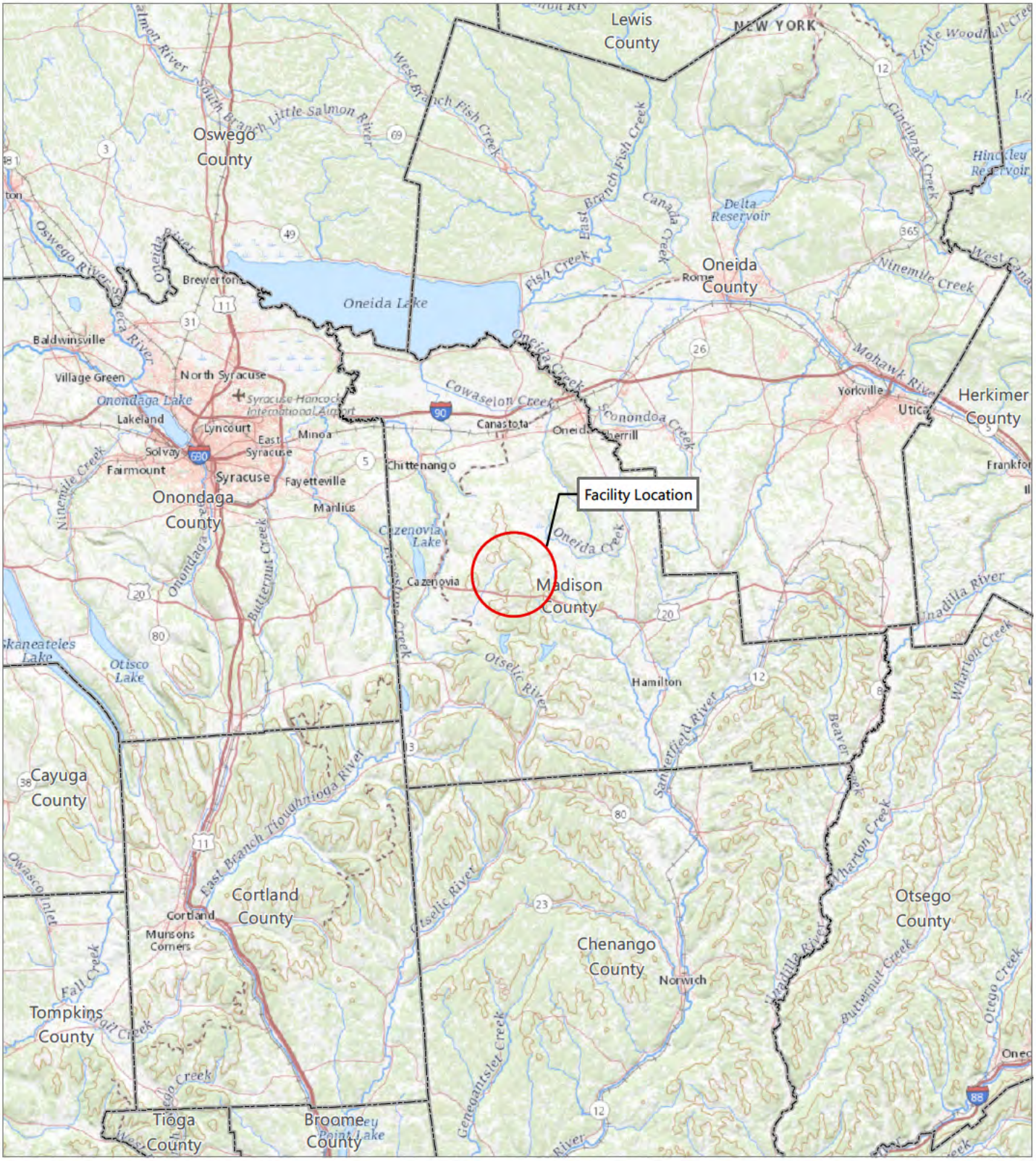
[3] Reflects the nearest survey location or point count location from which observations were made.

[4] Observations that were clearly the same individuals are not included here as additional observations.

>END CONFIDENTIAL INFORMATION

FIGURES

Figure 1. Regional Facility Location



Hoffman Falls Wind Project

Towns of Fenner, Smithfield, and Nelson
Madison County, New York

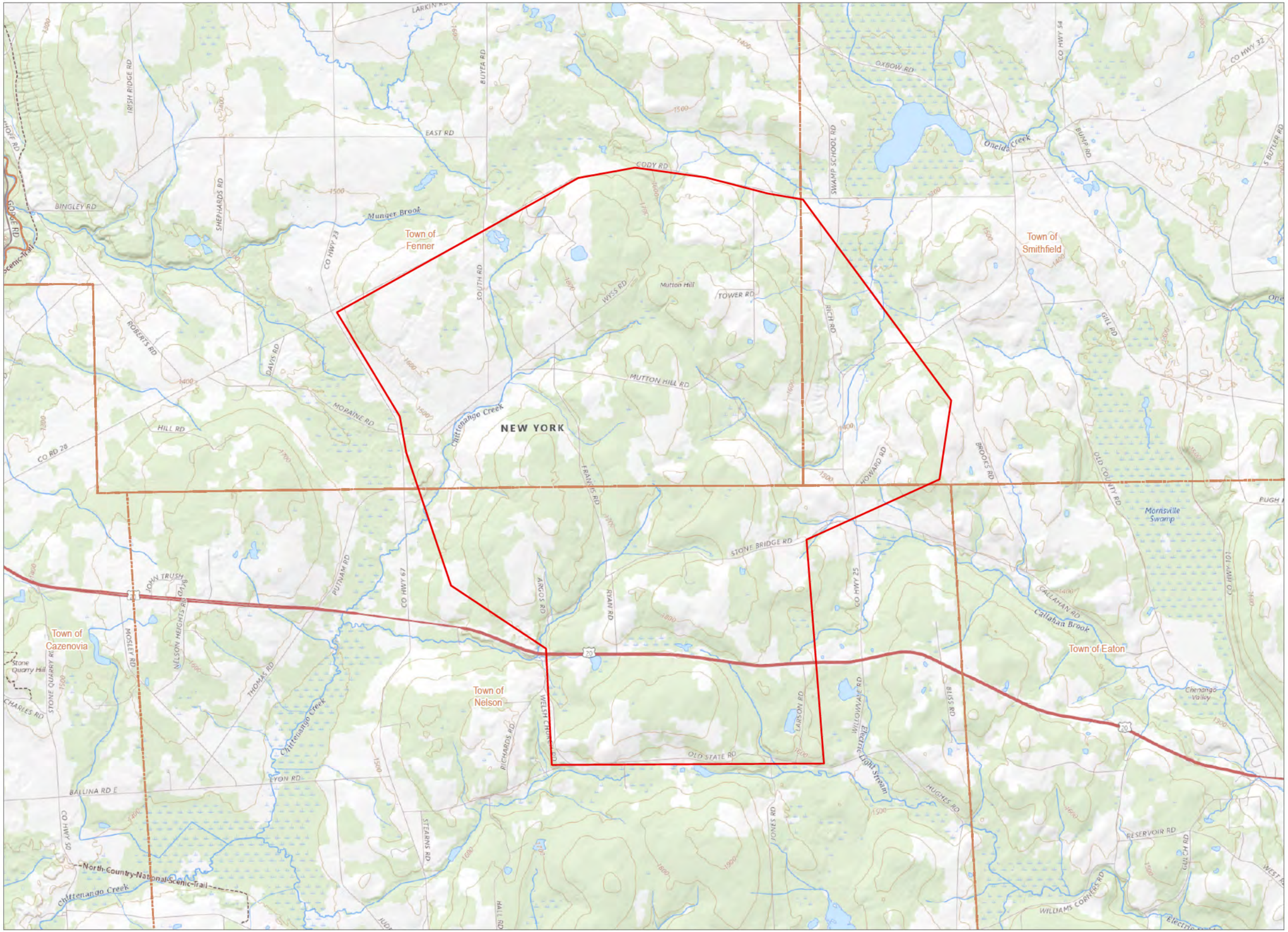
Breeding Bird Survey Report

0 2.5 5 10
Miles

Prepared August 10, 2021
Basemap ESRI ArcGIS Online "USGS Topo" map service.

EDR

Figure 2. Facility Area



Hoffman Falls Wind Project

Towns of Fenner, Smithfield, and Nelson, Madison County, New York

Breeding Bird Survey Report

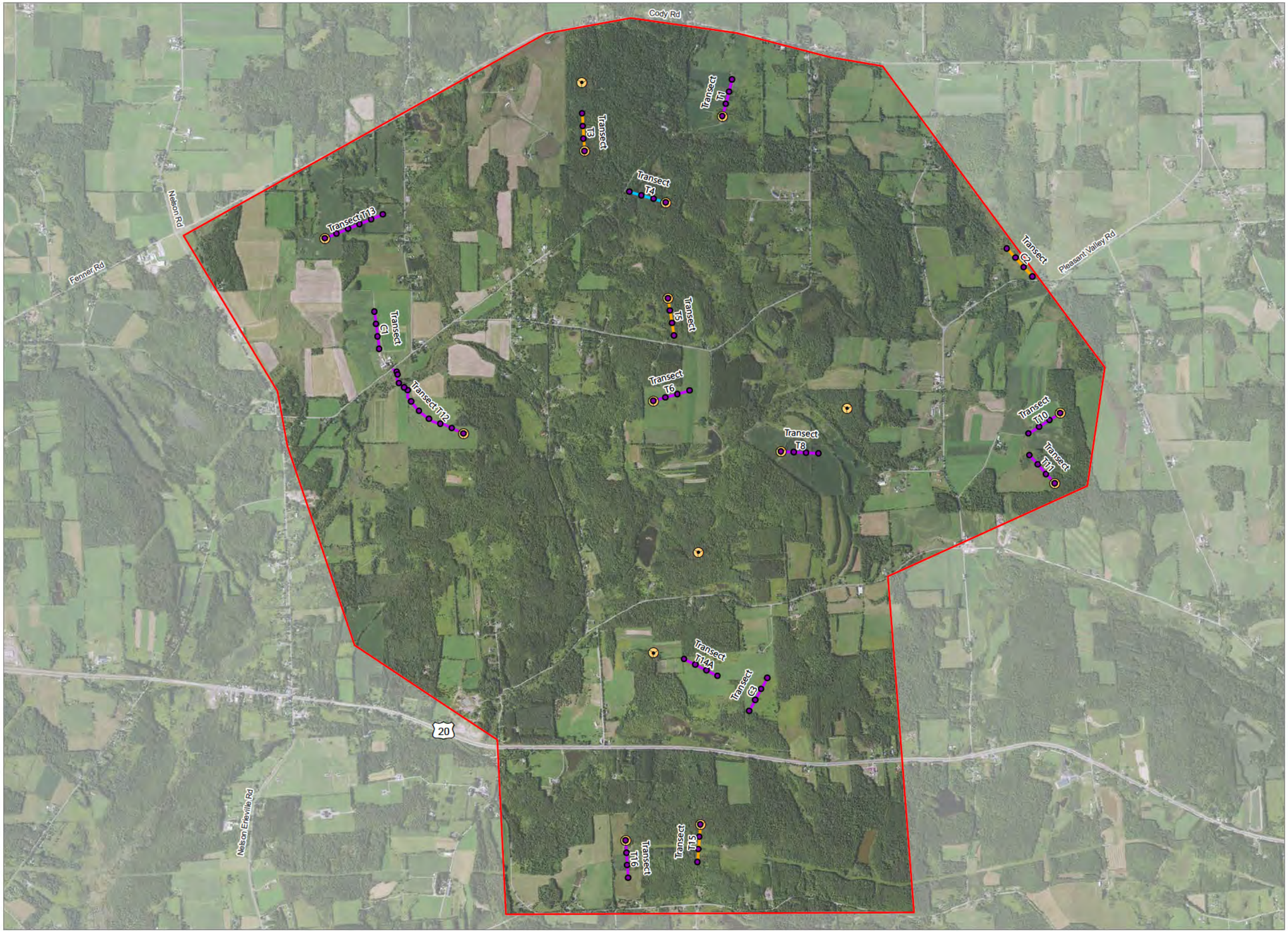
Facility Area

0 0.25 0.5 1
Miles

Prepared August 10, 2021
Basemap ESRI Arcgis Online "USGS Topo" map service.

EDR

Figure 3. Survey Locations



Hoffman Falls Wind Project

Towns of Fenner, Smithfield, and Nelson, Madison County, New York

Breeding Bird Survey Report

- Proposed Wind Turbine
- Point Count Location

Survey Transect

- Surveyed May to July
- Surveyed in May/June
- Surveyed once in June
- Facility Area

0 1,000 2,000 4,000
Feet

Prepared September 23, 2021
Basemap USDA NAIP "2019 New York 60cm" orthoimagery map service

EDR

This figure has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

APPENDIX A

Breeding Bird Survey Work Plan

Breeding Bird Survey Work Plan

Hoffman Falls Wind Project

Towns of Fenner, Nelson, and Smithfield
Madison County, New York

Prepared for:

Liberty Renewables Inc.
90 State Street, Suite 700
Albany, NY 12207

Prepared by:

Environmental Design & Research, D.P.C.
217 Montgomery Street, Suite 1100
Syracuse, New York 13202
www.edrdpc.com

June 2021

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

1.1 Purpose of the Investigation

On behalf of Liberty Renewables Inc. (the Applicant), Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR) has prepared this Breeding Bird Survey Work Plan (Work Plan) for the Hoffman Falls Wind Project, a proposed wind energy generation facility and associated infrastructure (the Facility) located in Madison County, New York. The surveys proposed in this Work Plan will support an Application for a siting permit under New York's Accelerated Renewable Energy Growth and Community Benefit Act, Executive Law § 94-c (Section 94-c) regulations.[1] The results of the surveys will also assist the Applicant in the design and development of the Facility, and the New York State Office of Renewable Energy Siting (ORES) and the New York State Department of Environmental Conservation (NYSDEC) in their review of the proposed Facility in accordance with the requirements of Section 94-c.

Breeding bird surveys will be conducted by qualified biologists between May and July 2021 to identify and document avian species that utilize habitats within the lands being evaluated to host the Facility (the Facility Area). Given the proposed wind turbine locations, the breeding bird survey design will focus primarily on open field areas that could potentially be used by grassland birds (including state-listed species) and forestland; however, some survey locations will also be placed to allow for the detection of birds that utilize other habitat types (e.g., field edges, successional shrubland, wetlands), as well as birds that may fly over/through the Facility Area. The breeding bird surveys have been designed based on the 2016 NYSDEC *Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects* (NYSDEC Survey Protocol; included as Appendix A).

1.2 Facility Location and Description

The Applicant is proposing to construct an up to 55-megawatt (MW) wind-powered electric generating facility within the Towns of Fenner, Nelson, and Smithfield in Madison County, New York (see Figure 1). The proposed Facility will consist of wind turbines, a point of interconnection (POI) substation, access roads, and collection lines. The Facility Area is an approximately 7,000-acre area (see Figure 2) within which a more limited subset of land will be selected for the siting, design, construction, and operation of the Facility. Much of the Facility will be constructed in areas where disturbance has already occurred (e.g., agricultural fields that are used for crop cultivation).

[1] Chapter XVIII, Title 19 of the New York Codes, Rules and Regulations (NYCRR) Part 900. Available at: https://ores.ny.gov/regulations

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

3.1 Survey Period and Frequency

Surveys will be conducted between mid-May and mid-July 2021, which corresponds with the typical breeding period for the vast majority of avian species that may be present within the Facility Area during the breeding season (and the optimal window for surveys for state-listed grassland bird species). Surveys are proposed to begin the week of May 17 and will be performed one day per week for approximately nine weeks until the week of July 19. Survey transects will be visited according to a regimented, alternating rotation so that each individual survey transect can be surveyed at different times of the day and multiple times throughout the breeding season. Five or six survey transects will typically be visited each week as access and weather conditions permit. In total, it is expected that more than 200 timed point count surveys will have been completed by the end of the survey period. The overall survey effort (including travel between/among point count locations) is anticipated to total more than 3,000 survey-minutes (50 survey-hours; see Section 3.2 below for additional survey location information).

Surveys will be conducted between a half hour before sunrise and 10:30 a.m. Surveys will be performed during weather conditions that are conducive to hearing bird vocalizations and visually identifying birds as they move about in vegetation and in flight. Surveys will not be conducted on days when precipitation intensity is greater than a drizzle, fog reduces visibility below 100 meters, and/or when the wind is above a 3 on the Beaufort wind scale (i.e., greater than 12 mph), as detection of birds would be reduced under these conditions.

3.2 Survey Locations

The primary method for surveying breeding birds will consist of a regimented series of five-minute point count surveys conducted along 17 survey transects have been designated within the Facility Area (see Figure 3). All survey transects will be 300 meters long, with the exception of Transects T12 and T13, which are 836 meters and 500 meters long, respectively. Transect T12 follows an existing farm road and a subset of survey points along the transect will be surveyed depending on accessibility (this area contains fenced livestock pastures). Transect T13 has been extended for an additional 200 meters to provide coverage of the proposed POI substation site. Transects were placed to provide coverage of a variety of open field cover types within the vicinity of proposed wind turbines while also allowing for detection of avian species that may utilize other habitat types (e.g., forestland, field edges, wetlands). Point count survey locations will be designated along each transect at intervals of 100 meters (i.e., at 0 meters, 100 meters, 200 meters, and 300 meters for the 300-meter transects). This spacing is proposed to minimize the potential for overlapping detections of the same individuals. Fourteen of the transects will begin at proposed wind turbine sites[2] and three control transects (Transects C1, C2, and C3) will be located in areas that are more than 800 meters from locations where wind turbines are currently proposed. Transect C2 is located on the periphery of the Facility Area, and will provide coverage of an area where no Facility components will be sited.

[2] Note that Transect T14 may or may not be accessible for the breeding bird survey period depending on access permissions and landowner agreements. Therefore, Transect T14-A has been designated as a nearby alternative that will be surveyed in the event that Transect T14 cannot be accessed.

Each point count survey location will consist of a 100-meter radius circular plot centered on the observation point. During timed point count surveys, biologists will record all avian species identified, including those observed within the 100-meter circular plot as well as those located more than 100 meters from the observer. While traveling between/among point count locations, biologists will record a list of incidental avian species observed, including those not otherwise detected during timed point count surveys. Biologists will record all federally listed threatened or endangered species, state-listed threatened or endangered species, and state-listed species of special concern observed when on-site, including during timed counts, when traveling between/among survey locations, and when arriving at/leaving the site. The proposed survey transects for the breeding bird study are shown on Figure 3.

3.3 Surveyor Qualifications

Breeding bird surveys will be conducted by experienced, trained biologists to ensure accurate species identification and compliance with this Work Plan. EDR biologists Max Baber, Ravyn Neville, Tiffany Clay, and Samouel Beguin will conduct and/or provide support and technical direction for the survey effort and ensure that quality assurance and quality control procedures are followed.

Mr. Baber is an Environmental Analyst with more than eight years of experience in wildlife biology, wildlife management, and scientific research. He received a Bachelor of Science degree in wildlife biology from Evergreen State College. Mr. Baber's experience includes threatened and endangered wildlife species surveys, habitat assessments, scientific study design, scientific writing, and statistical analysis. Mr. Baber's professional focus is on avian research and advocacy. He has designed, overseen, and conducted avian surveys implementing a broad range of research methods including nest searching and monitoring, territory mapping, mist netting and banding, point count surveys, radio telemetry and tracking, migratory bird counts, and bioacoustic recording and monitoring. Mr. Baber has also taught these methods to technicians, interns, volunteers, and students. At EDR, Mr. Baber has conducted breeding bird surveys, raptor migration surveys, and wintering raptor surveys, and supports the design and implementation of avian surveys for renewable energy projects.

Ms. Neville is an Environmental Analyst with more than five years of experience in wildlife biology and management and scientific research. She received a Bachelor of Science degree in Biology from Salisbury University and is completing a Master of Science degree in Environmental and Forest Biology from the State University of New York College of Environmental Science and Forestry (SUNY-ESF). Ms. Neville's experience includes threatened and endangered wildlife species surveys, habitat assessments, wildlife management planning, scientific study design, scientific writing, GIS mapping, statistical analysis, and wildlife habitat use evaluations. Specializing in avian research, Ms. Neville has planned, managed, and conducted avian research projects that involve nest searching and surveys, hatchling surveys, mist netting and banding, point counts, and observational focal follows. At EDR, Mrs. Neville has been involved in designing, preparing, and conducting breeding bird surveys and wintering grassland raptor surveys for numerous renewable energy projects.

Ms. Clay is an Environmental Analyst with more than six years of experience in the natural resources field. She received a Bachelor of Science in Environmental Science and Biology from The College at Brockport State University of New York (SUNY Brockport) and a Master's degree in Environmental Science and Ecology from SUNY Brockport. Prior to joining EDR, Ms. Clay spent two field seasons as a crew leader conducting avian community surveys (acoustic and visual) for the Great Lakes Coastal Wetland Monitoring Project. As a long-term volunteer, Ms. Clay has also conducted point count surveys for breeding birds at Montezuma National Wildlife Refuge. Ms. Clay is a member of The Rochester Birding Association and is an avid bird watcher in her free time. At EDR, Ms. Clay has been involved in designing, conducting, and managing avian surveys and habitat assessments for numerous utility- and community-scale renewable energy projects.

Mr. Beguin is a Senior Environmental Analyst with more than seven years of experience in environmental consulting, wildlife biology, and scientific research. He received a Bachelor of Arts degree in Biology and Environmental Studies from Middlebury College and a Master of Science degree in Environmental and Forest Biology from SUNY-ESF. Mr. Beguin's experience includes threatened and endangered wildlife species surveys, habitat assessments, environmental permitting, mitigation planning, agency consultation, GIS mapping and data analysis, and bioacoustic monitoring of avian communities. At EDR, Mr. Beguin has been involved in designing, conducting, and managing avian surveys and habitat assessments for numerous utility- and community-scale renewable energy projects.

3.4 Survey Methodology

The breeding bird surveys will be substantively compliant with the recommendations described in the NYSDEC Survey Protocol (Appendix A). Surveys along each individual transect will be conducted on foot, and biologists will either walk or drive to the next transect, depending on proximity. Transects will be surveyed in a different order during each visit to prevent sampling bias, as detectability of some species can vary at different times of day. For instance, if a transect was visited at 5:00 a.m. during the first visit, this transect would then be visited later in the morning during the next visit (e.g., at 8:00 a.m.). Weather forecasts will be reviewed regularly in order to select appropriate survey days.

At each point count location, biologists will stand silently for a period of at least two minutes after arriving at the designated location before beginning a timed, five-minute survey. The waiting period will allow for habituation by birds in the area to the presence of the biologist. Point count surveys will then be conducted by scanning the surrounding habitat using binoculars with 8x or 10x magnification throughout the five-minute survey interval. The biologists will also listen for bird vocalizations and other sounds (e.g., woodpecker drumming).

Survey data will be recorded in a standardized and organized fashion utilizing project-specific data sheets paired with a mobile geographic information system (GIS) application and a global positioning system (GPS). Data recorded for point count surveys will include the date, observer name, survey location ID, start and end time, the number and identification of each species observed, and behavioral/activity observations. Weather conditions, habitat characteristics, and anthropogenic disturbances (e.g., sources of significant noise, land management activities) will also be noted during surveys, and representative photographs will be taken to provide documentation of on-site conditions.

More detailed vegetation data (i.e., percent cover, dominant species, average height, litter depth, distance to the nearest shrub, as applicable) will be recorded for areas within 25 meters of survey locations that are positioned within open fields dominated by grasses and forbs.

Detailed locations of any threatened or endangered species will be documented, and flight paths, perch/roost/nest point locations, and areas of concentrated use (as applicable) will be identified on aerial-based maps of the Facility Area. All observations of threatened or endangered species (regardless of whether breeding behavior is observed) will be recorded and included with the final report (see below for additional details). Detailed behavioral information will also be recorded for all threatened or endangered species observations.

3.5 Reporting

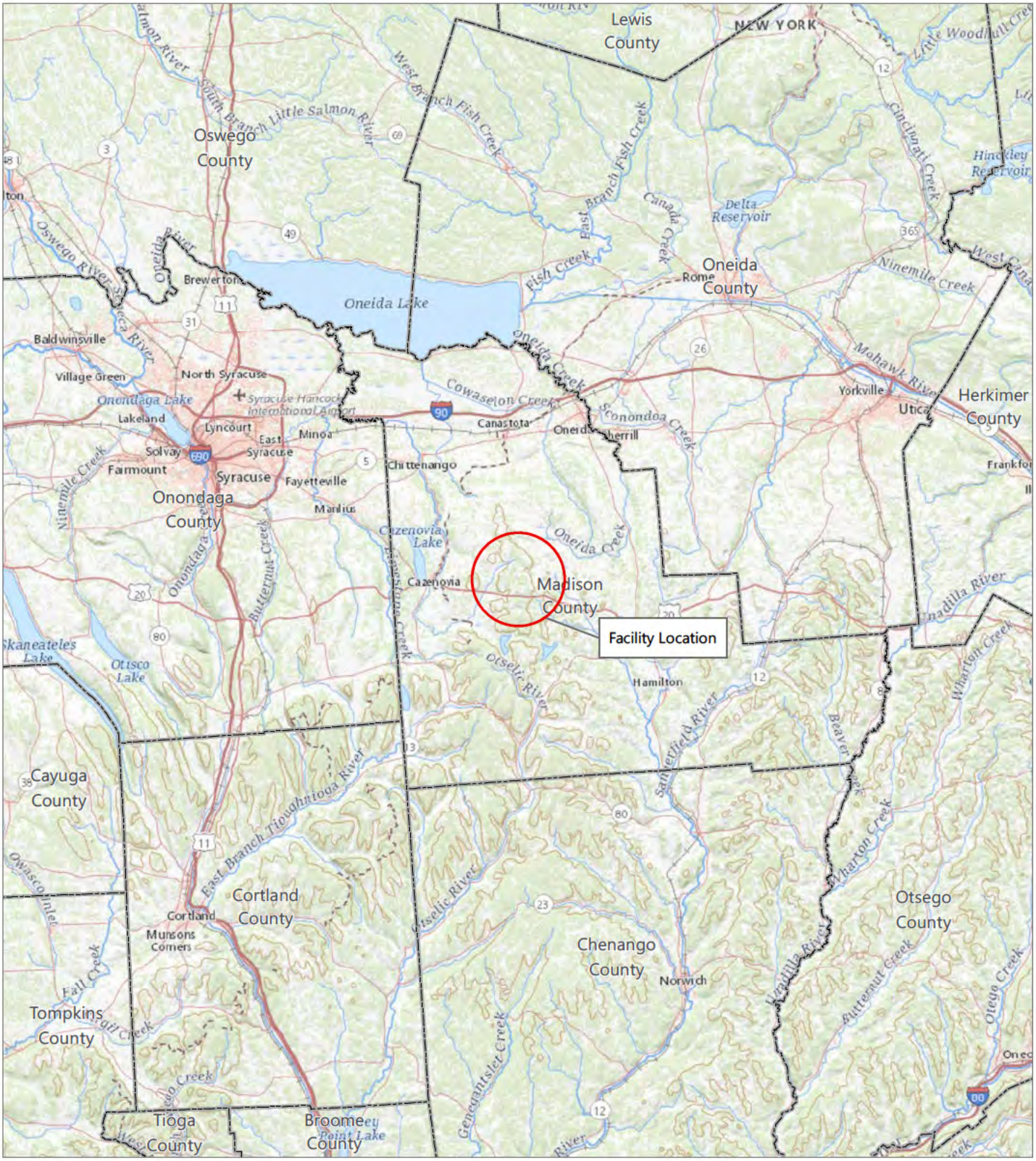
If any threatened or endangered species are observed, a summary of these observations will be prepared and submitted to ORES and NYSDEC within three weeks following completion of the study. A full report summarizing the results of the surveys, along with associated GIS shapefiles, will be provided to ORES and NYSDEC within six weeks following completion of the study. The report will summarize the results of the breeding bird surveys and will include:

- A description of when surveys were completed for each location;
- A summary of weather conditions during surveys;
- A description of the total survey effort;
- An indication of the total number of species observed;
- A list of the most abundant species recorded within the Facility Area;
- The total number of individuals of each species observed;
- A list or table presenting the dates and survey locations at which each species was observed;
- An indication of which activities and behaviors were documented for each species, including the activity or behavior observed that was most indicative of breeding;
- Identification of the survey points and transects that had the highest and lowest number of observed species;
- A summary of avian species metrics based on survey observations, including abundance, use, composition, frequency, richness, and diversity.
- A description of any federally or state-listed species observed, along with detailed location and behavioral information; and
- A description of species that were identified as confirmed or probable breeders.

The report will also include supporting tables, figures, and appendices. In addition, GIS shapefiles will be provided for the survey locations, the Facility Area boundary, and any federally or state-listed threatened or endangered species observations. For threatened and endangered species observations, the report and the GIS shapefiles will provide the date, time observed, number of individuals, behavior/activity, flight height, flight direction, perch location, and other relevant information, as applicable.

FIGURES

Figure 1. Regional Facility Location



Hoffman Falls Wind Project

Towns of Fenner, Smithfield, and Nelson
Madison County, New York

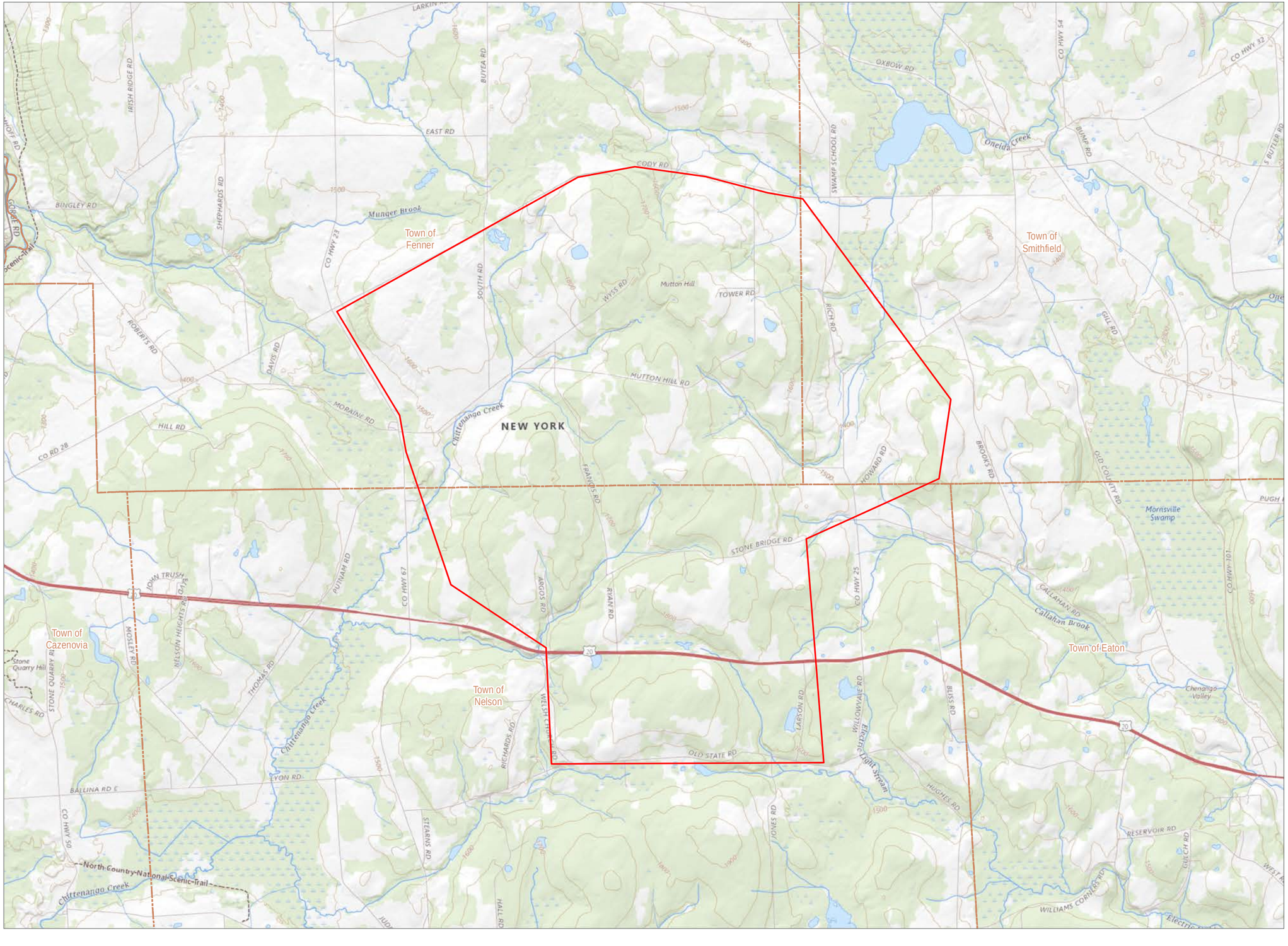
Breeding Bird Survey Work Plan

0 2.5 5 10
Miles

Prepared June 3, 2021
Basemap ESRI ArcGIS Online "USGS Topo" map service.

EDR

Figure 2. Facility Area



Hoffman Falls Wind Project

Towns of Fenner, Smithfield, and Nelson
Madison County, New York

Breeding Bird Survey Work Plan

Facility Area

0 1,000 2,000 4,000
Feet

Prepared June 3, 2021
Basemap ESRI Arcgis Online "USGS Topo" map service.

EDR

Figure 3. Breeding Bird Survey Locations

Hoffman Falls Wind Project

Towns of Fenner, Smithfield, and Nelson
Madison County, New York

Breeding Bird Survey Work Plan

- Turbine
- Survey Transect
- Facility Area

0 1,000 2,000 4,000
Feet

Prepared June 3, 2021
Basemap USDA NAIP "2019 New York 60cm" orthoimagery map service

EDR

APPENDIX A

NYSDEC Survey Protocol

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

GUIDELINES FOR CONDUCTING BIRD AND BAT STUDIES AT COMMERCIAL WIND ENERGY PROJECTS

June 2016

Prepared by New York State Department of Environmental Conservation
Division of Fish and Wildlife

www.dec.ny.gov

Contents

Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects

To help meet our increasing demand for electricity, the 2015 New York State Energy Plan places a priority on increased energy diversity and the use of renewable energy sources, with a goal of 50% of the state's energy generation coming from carbon-free renewable sources by 2030. While wind energy has significant emissions benefits when compared to energy produced from fossil fuel, the New York State Department of Environmental Conservation (DEC or Department) must also consider the potential negative environmental impacts of wind energy production when evaluating proposed projects. Currently, the nature and severity of both site-specific and cumulative impacts that commercial wind energy projects may have on birds and bats and their habitats in New York State is DEC's most pressing issue related to wind energy development. The Department's concern for and jurisdiction over these natural resources derives from the Environmental Conservation Law (ECL) which articulates the policies of the DEC (Article 1), the powers and duties of the Commissioner (Article 3), and the requirements for the protection of fish and wildlife and their habitats (Article 11).

This document sets forth DEC's guidance for commercial wind energy developers on how to characterize bird and bat resources at on-shore wind energy sites, estimate and document impacts resulting from the construction and operation of wind energy projects, and reduce mortality levels through turbine siting and operational modifications. These guidelines provide a general framework for the developer to propose site-specific studies needed to evaluate the potential and/or actual effects of a given wind energy project, and outline consistent and predictable methodologies, based on the latest scientific knowledge, to assist developers in the planning, development, and monitoring process. It should be recognized that the effort required to fully understand the movement of and impact to birds and bats at any given locale would be monumental and would take many years. Therefore, the studies described here are considered the minimum effort necessary to characterize bird and bat activity at a specific project location within a reasonable time frame relative to construction.

This guidance provides two tracks for pre-construction and post-construction studies: "standard" and "expanded." It is anticipated that all sites will warrant at least the standard studies. However, where site-specific conditions or other information suggest the potential for substantial adverse impacts to birds and/or bats, or their habitats, expanded studies and/or additional years of study designed to further evaluate the specific concerns may be necessary.

Along with providing essential data for evaluation of project operation, the protocols set forth herein are intended to allow for comparability of data collection among sites and between years such that the information from each site may contribute to a statewide understanding of the ecological effects of wind energy generation. A list

of web sites, published papers, and other references and information sources is included at the end of the document.

1. Purpose and Definitions

The purpose of this document is to set forth the protocols for conducting bird and bat studies at wind energy projects to provide information necessary for DEC to:

a. assess and understand the ongoing or expected environmental impact of a specific wind energy project; and

b. make a recommendation to the State Environmental Quality Review Act (SEQRA) lead agency or the Public Service Law Article 10 (PSL Article 10) New York State Board on Electric Generation Siting and the Environment (Siting Board), as appropriate, regarding the construction and operation of the project in order to avoid or minimize adverse environmental impact.

c. determine the possible need for an incidental take permit for impacts to state listed species during construction and/or operation of the project, per 6 NYCRR Part 182.

These guidelines are not intended to cover survey recommendations for, or the evaluation of, potential impacts to species other than birds and bats. Developers should coordinate with DEC to determine if other wildlife resources may warrant investigation during the development, construction, and operation of a proposed project.

The following terms are used as defined here:

Adverse impact means 1) mortality of birds or bats due to collision or other possible effects such as barotrauma (sudden, potentially fatal, pressure changes that may rupture or otherwise injure ears, lungs, or other internal organs) caused by a wind turbine; 2) displacement of birds or bats from their habitat due to the presence and/or operation of a wind energy project; 3) a detectable reduction in bird or bat use of the site due to construction or operation of the project; or 4) repeated or continuous disruption of the natural feeding, roosting, breeding, wintering, or migratory behaviors of birds or bats as a result of the construction or operation of the project.

Bird and bat resources includes all species of native and protected birds (Class *Aves*) and bats (Order *Chiroptera*) that use or may use the site, as well as the habitats that support them.

Site, project site, or *project area* means not only the real property boundaries or outline of proposed turbine locations and other project-related infrastructure on the ground, but includes the air space over and surrounding the entire project.

Study area or *surrounding area* is defined as all land and air space within the project area and at least five miles outside of the edge of the project area. The study area may be extended out to fifteen miles, depending on the conditions and landscape of the project area, the proximity of the project to resources of concern and other proposed and existing wind energy projects, and which species are known or suspected to be present within or near the site.

Project components includes all proposed or existing turbines, overhead and underground collection lines and transmission lines, new or expanded public and private roads, substations and transfer areas, meteorological (met) towers, permanent and temporary staging, storage and laydown areas, operation and maintenance buildings, and any other building or infrastructure related to the construction and operation of the project.

As part of its environmental review, DEC must consider information pertaining to the presence and activity of birds and bats at the site and in the study area. One of the most effective means of reducing direct and indirect impacts to birds and bats is to site turbines in a location that will avoid disturbance to migrating, breeding, wintering, roosting, and feeding birds and bats. In addition to direct and indirect mortality caused by turbines, other negative effects from factors such as habitat loss or fragmentation, introduction or spread of invasive species, avoidance of otherwise potentially suitable habitat, increased human activity and development, and increased predator and parasite presence can result from the construction and operation of a wind energy project and should also be considered.

As wind energy development continues to expand throughout New York, more information is needed about the temporal and spatial use of habitats and the species composition of birds and bats using those habitats in order to relate wind energy production to its potential impacts. The studies described in these guidelines are based on DEC's current knowledge of the best procedures for conducting thorough and scientifically meaningful pre- and post-construction studies. As studies are conducted at more projects throughout the state, these guidelines may be fine-tuned to incorporate the most efficient, effective and accurate methodologies to fill data needs. When planning a project, developers should contact DEC as early as possible for the most current recommendations, which may differ from this document. Figure 1 (page 33) illustrates the steps described below for conducting pre- and post-construction studies.

2. Site and Project Description

A characterization of bird and bat resources includes documenting pertinent existing information, and collecting and analyzing additional field data on bird and bat use of the site and surrounding area. Several years of studies have been conducted to date gathering site-specific data on where, when, and how birds and bats use various habitats within the state. These guidelines are intended to provide a template for gathering further information and to aid DEC in assessing impacts and making recommendations to the lead agency, or Article 10 Siting Board, as necessary.

a. *Compile existing information on bird and bat resources*

Prior to expending significant effort in planning a wind energy project, the developer should compile existing information on bird and bat resources at the site and in the surrounding area, including available relevant information from other existing or proposed wind energy projects. The following sources should be consulted:

i. The DEC Central Office Division of Environmental Permits (DEP) and Division of Fish, Wildlife and Marine Resources (DFWMR) should be the initial point of contact for information regarding the environmental review and assessment process for wind energy development;
ii. The New York Natural Heritage Program (NYNHP) should be contacted for information on known state and federally listed endangered, threatened, and special concern species and sensitive ecological communities that may be located in or near the proposed project site and surrounding area;
iii. Screen the project and surrounding area using New York's Environmental Resource Mapper, Nature Explorer, and Biodiversity and Wind Siting Mapping Tool
iv. Biologists in the DEC Regional office(s), as applicable to the project location, should be contacted for available information on specific resources within the site and in the surrounding area;
v. To the extent required by the US Fish and Wildlife Service (USFWS), information collected through the use of DEC's guidelines should be provided to the USFWS. The USFWS Ecological Services New York Field Office should also be contacted for information on federally listed species that may be present within or near a proposed project area;
vi. Local ornithologists, Audubon Societies, birding clubs, hawk watches, and nature centers can provide specific information about bird and bat resources, as well as further information on data from the New York Breeding Bird Survey (BBS), Breeding Bird Atlas (BBA), eBird, and Christmas Bird Count (CBC);
vii. Biologists in the Bureau of Wildlife's Wildlife Diversity Unit can provide site specific information regarding the proximity of bat hibernacula and summer roosting areas, as well as information on technical research being conducted within New York; and
viii. Bat Conservation International (BCI) can provide general information about bats and bat biology.

b. *Identify landscape features and resources of potential concern*

The relative proximity of certain landscape features and/or ecological resources to a site can increase the likelihood that substantial adverse impacts to bird and bat resources will result from a proposed wind energy project. The developer should identify any of the following features or resources within the proposed project site or surrounding area:

i. Habitat of a listed bird or bat species per 6 NYCRR Part 182 (e.g., species of special concern, threatened or endangered). The project sponsor should be aware that if a threatened or endangered species, or habitat known to support those species, is present within or adjacent to the site and/or likely to be impacted by a project, the permit requirements of ECL Article 11-0535 may be applicable. Incidental take of a listed species is prohibited without a permit;

ii. Proximity of the project (approximately 5 miles) to the Atlantic coastline, the shoreline of one of the Great Lakes, Lake Champlain, Oneida Lake, the Finger Lakes, or the corridor of large rivers (e.g. the Delaware, Hudson, St. Lawrence, Niagara);

iii. The presence of, or proximity to, areas that concentrate raptors, waterfowl, or other specifically identified species of concern for the site (approximately 2 miles); or a major bat hibernaculum (approximately 40 miles); and

iv. The presence of any specifically identified habitat or landscape feature that may function to funnel or concentrate birds or bats during migration or for feeding, breeding, wintering, or roosting activities, such as National Wildlife Refuges (NWR), Wildlife Management Areas (WMA), grassland focus areas (Morgan and Burger, 2008), core forest blocks (contiguous areas 150 acres or larger), high elevation mountaintops, prominent ridgelines, or other significant habitat areas.

c. *Provide project information to DEC*

Once existing information is compiled, the developer should meet with DEC to discuss an overview of the proposal, the bird and bat resources of potential concern, and the application of these guidelines to the environmental assessment of the project. DEC understands that some of the information requested below in part 2(c) i-xiii may be considered proprietary, or is likely to evolve as project planning progresses, and may need to be submitted as confidential information/business trade secrets, not subject to public disclosure under the Freedom of Information Law (FOIL) pursuant to Public Officer's Law § 87. To aid in project planning, the project sponsor should prepare a complete description of the project site and surrounding area prior to meeting with DEC, including:

i. Description of the geographical, topographical and other physical features of the site and within 15 miles of the site, even if the proposed project is further than 5 miles from a shoreline, 2 miles from a wildlife concentration area, or 40 miles from a bat hibernaculum;

ii. Identification of federal, state, or locally-regulated wetlands, streams, waterbodies, drainage patterns, and publicly-owned forests, parks, and wildlife or forest management areas;

iii. Location of contiguous or core forest areas, expanses of grassland, large waterbodies, and wetland habitat located within the proposed project township(s) and surrounding study area;
iv. Location of all meteorological (met) towers, a summary of local weather patterns (e.g., annual precipitation, prevailing winds, etc.), and a summary of the wind resource at the site and in the study area; and
v. Maps with vegetation types, soils/bedrock, elevation, land use, and other information relevant to siting the project.

Prior to developing the pre-construction study work plan, additional information regarding the proposed project should be provided including:

vi. Maps of the proposed preliminary turbine layout;
vii. Description of turbine type, size and rotor swept area; and
viii. Figures or maps showing existing and proposed roads, electric line routes, substation location(s), and other project components as defined in Section 1.

Data regarding proposed site development should be provided in the form of shapefiles, for use in Geographical Information Systems (GIS) software via ESRI's ArcGIS suite of software (e.g. ArcMap) including:

ix. Polygon shapefile(s) showing the total project area;
x. Line shapefile(s) for the transmission and interconnect lines, as well as all proposed temporary and permanent access and maintenance roads;
xi. Polygon shapefile(s) of any proposed concrete and building structures, storage and lay down areas;
xii. Point shapefile(s) for all turbine and met tower locations, and any other structures that would be best represented as a point; and
xiii. Polygon shapefile(s) showing all areas proposed to be cleared around turbines, access roads, electric lines, and all other project components.

d. *Select and implement a standard or expanded pre-construction study protocol*

Sites that contain, are within, or are in close proximity to the features or resources of concern listed in 2(b) above have the potential to cause substantial adverse impacts to bird and bat resources. Therefore, for such sites, project sponsors should anticipate conducting expanded pre- and post-construction studies to identify and quantify potential or actual impacts associated with the specific features or resources of concern. In particular, a proposal to site a wind energy project in proximity to a bat hibernaculum (40 miles), wildlife concentration area (2 miles), along a coastline (5 miles), on a prominent ridgeline, or near a known location of a state or federally listed threatened or endangered species will likely justify a need for expanded pre-construction studies. In preparation for conducting either standard or expanded studies:

i. Contact the DEC Bureau of Fish and Wildlife Services' Special Licenses Unit regarding any necessary licenses or permits for collection and possession of birds and bats, or special licenses to handle threatened and endangered species that may be needed;
ii. Contact the USFWS regarding species covered by the Migratory Bird Treaty Act (MBTA), and Endangered Species Act (ESA) permits; and
iii. Engage an individual or firm knowledgeable about New York state fauna, natural history, and sensitive species habitat requirements, with experience in wildlife biology, ecology, and habitat assessment methodologies, and who possesses the ability and means to conduct appropriate studies.

3. Study Objectives and Rationale

The overall goal of the studies described in this document is to determine the potential for a specific wind energy project to have an adverse impact on bird and bat resources by characterizing the use of the site and surrounding area by birds and bats under a variety of environmental conditions throughout the year, and by estimating the mortality rate of birds and bats due to collisions and other effects associated with the project. The effects of construction and operation on habitat, and changes in wildlife use of the site will also be studied to determine any displacement or loss of species related to project construction or operation. Data collected prior to construction can be compared to information collected in a similar manner after construction to determine what impact, if any, the project has on migrating and resident breeding and wintering birds and bats. With regard to migratory bats, the data collected as outlined in this document may assist DEC in quantifying the impact of wind power development on bat populations. DEC may also advise that separate studies be conducted to evaluate the presence of, and potential impacts to, species not covered by this document, including mammals other than bats, reptiles, turtles, amphibians, invertebrates, or aquatic organisms. Ultimately, information gained from pre- and post-construction studies will be used to identify appropriate locations to site a project, and measures that may be used to minimize direct and indirect impacts from project construction and operation. See Appendix A (page 34) for more information on potential methods to reduce bat mortality from turbines, and on-going efforts researching bat population size, distribution, and movement patterns across the landscape.

a. *Pre-construction studies*

The objectives of the pre-construction studies are to determine:

i. To what extent the area of the proposed project is used by migrating, breeding, and wintering birds and bats and how the physical and biological features of the proposed site and surrounding area may influence such use;
ii. The expected and potential direct impact to birds and bats as a result of using the site during operation of the project;

iii. The expected and potential indirect impact to birds, bats, and their habitats as a result of construction and operation of the project;
iv. The best possible siting of turbines and other project components with the least likelihood of adversely impacting birds and bats; and
v. Areas to avoid siting any project components or facilities.

b. *Post-construction studies*

The objectives of the post-construction studies are:

i. To estimate direct impacts of the operating project in terms of the species composition, seasonal timing, and mortality rates of birds and bats caused by collisions or other effects of the turbines;
ii. To document any indirect impacts of construction and operation of the project in the form of habitat fragmentation and habituation/avoidance behavior of birds and bats in the area;
iii. To determine how daily weather events and/or conditions may correlate with the number and species composition of dead or injured animals found beneath daily-searched turbines; and
iv. To determine what types of operational regimes or technological designs would result in the lowest bird and bat mortality levels.

c. *Bird Studies*

Migrating birds, particularly neo-tropical migrants, are sensitive to changes occurring across the landscape that alter the amount and quality of habitat available to them during migration. Many aspects of the biology, population structure, and ecology of these birds are poorly understood. In a general sense, the following is known:

i. Most songbirds, and many shorebirds and waterfowl migrate at night, while raptors, swallows, corvids, and some shorebirds and waterfowl move during the day;
ii. The exact spatial and temporal distribution of this migration is affected by weather patterns, food availability, and geographic features;
iii. Concentrations of species and individual birds vary with the habitat, season, and year;
iv. Birds are much more physiologically vulnerable during migration than at other times of the year; and
v. The effects of human-caused habitat and landscape alterations are persistent over time.

Types of bird surveys include habitat surveys for sensitive and listed species, breeding bird surveys, nest searches and monitoring, migration surveys, eagle use surveys, wintering raptor surveys, waterfowl surveys, and marine radar surveys. The radar surveys provide information on target passage rate, flight altitude, and flight direction. Acoustic monitoring of migratory birds can also be used to identify some species that vocalize in flight, and may provide a rough estimate of flight height for these species. DEC will recommend one or more of these methods based on the

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

depending on the species (Rich et al, 1994; Robinson and Wilcove, 1994). As these studies did not include the presence of a turbine, indirect impacts may extend further into the forest than reported. Therefore, *minimally*, all forested habitat within 300 feet from the edge of a cleared area is considered to suffer indirect impacts, as pertaining to interior forest breeding birds. Larger distances may be needed for some projects, depending on the species present, forest quality, and surrounding habitat.

Indirect impacts in forests and grasslands are likely species-specific and habitat dependent, and include: avoidance of novel tall structures (Shaffer and Buhl, 2015; Stevens et al, 2013; Leddy et al, 1999); increased presence of predators (Keyser et al, 1998), and nest parasites such as brown-headed cowbirds (Howell et al, 2007); the introduction or spread of invasive species; and human disturbance. These, as well as changes in temperature, light penetration, humidity, soil moisture, plant composition, noise levels, prey availability, and other factors may cause birds to avoid forest edges and grasslands during nesting, feeding, and migration periods. This can then lead to increased intra-and inter-species competition for preferred undisturbed habitat, changes in food availability, decreased fledging rates, and increased energy expenditure during foraging and territory defense in sub-par habitat (Wilcove et al, 1986). Every project that impacts interior forest habitat and core grassland areas across the landscape puts cumulative stress on bird and bat populations in New York and across the northeast, which may cause a gradual decline in the overall number and diversity of interior forest- and grassland-dependent species.

c. *Raptor migration surveys*

Raptor migration surveys should be conducted from one or more prominent locations with a clear view of the entire project area during spring and fall migration periods (March 1 to May 31; August 15 to December 15). The size, location, and topography of the proposed project will influence the total number of, and distance between, survey points that DEC recommends. Observations should take place starting at 8:00 a.m. and last until two hours prior to sunset, or later if birds are continuing to move through the area. Surveys should be done at least once every seven days during each season, on days without heavy rain, snow, fog or excessive cloud cover that would limit visibility. Information on the species, number of individuals, sex and age class (if possible), behavior, flight height and direction, time of sighting, and location of each bird relative to the project area should be recorded. Project developers should coordinate with the USFWS for the latest recommendations on conducting eagle use surveys in the project site and surrounding area.

Concurrent with the information described above, observations of the movements of any other large flocks or individual birds (waterfowl, waders, corvids, icterids, swallows, etc.) should be recorded in a similar manner. However, preference should be given to observing and recording data on raptors. The presence and movement of groups or large numbers of individuals of non-raptor species could indicate the area is an important staging, feeding or migratory area.

d. *Breeding and migrating bird surveys*

Breeding bird surveys should be conducted a minimum of once per week from approximately May 15 until June 30 or July 20, depending on the habitat and expected

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

migration, and fall swarming times may also be recommended. Analysis of the data and call identification by software and experienced personnel should focus on determining the presence and species of any Myotis bats detected. At least two different software packages should be utilized to filter recorded calls, with a person(s) experienced in distinguishing and identifying bat calls conducting a visual inspection of all Myotis or other suspect calls flagged by software.

5. **Expanded Pre-construction Studies**

If a developer proposes to construct a wind energy project in or near one of the features or resources of concern identified in Section 2(b), then at least two years of pre-construction study may be needed, incorporating one or more expanded pre-construction studies to provide in-depth information on the bird and bat resources of the site. Similarly, if post-construction study results from a wind energy project in a locale with similar physiographic or ecological features to the proposed project have shown that pre-construction predictions under-estimated the actual post-construction impacts, expanded pre-construction studies may be warranted. Following are examples of the type of expanded studies that DEC may recommend based on site-specific conditions.

a. *Radar studies*

Radar studies include the use of remote sensing marine radar to determine the use of the project and surrounding area by nocturnally migrating birds and bats. The radar should sample concurrently in both horizontal and vertical modes to collect information on target passage rate, flight height, direction, and speed. Radar units should be operated from at least one hour prior to sunset to one hour after sunrise, minimally during the migration periods of March 1 to May 31 and August 1 to October 31. Different date ranges and/or daily sampling times may be recommended, depending on the goal of the study and resources of concern at a particular site. Data should be recorded in digital format, and include weather information, airspace not sampled due to ground clutter or other interference, and all information on targets corrected for the volume of airspace actually sampled and the density of targets detected at various altitudes. Nocturnal visual observations may be undertaken for a minimum of ten minutes each hour during radar operation to estimate the proportion of birds and bats using the airspace immediately over or adjacent to the radar unit. Moon watching, spotlighting, and/or thermal imaging are the most commonly used methods. Project sponsors should consult with DEC biologists to determine an appropriate location, duration, intensity, and time frame for these surveys, as well as the latest data analysis and reporting methods.

An analysis of archived and current Next-Generation Radar (NEXRAD) data from one of the six radar stations that cover land in New York may provide information on mass movements of migrants relative to major nightly weather patterns. Due to limitations in NEXRAD coverage, only projects near the cities of Buffalo (BUF), Binghamton (BGM), Montague (TYX), Burlington, Vermont (CXX), Albany (ENX), or New York City (OKX) are able to utilize this type of information. As NEXRAD largely samples a portion of the airspace far above the highest turbine height, this method does

not generally provide any kind of estimate for number of targets within the rotor swept zone or a likelihood of collision.

b. *Raptor migration surveys*

Expanded raptor migration surveys may be justified for projects proposed to be sited on a ridgeline, in a known or suspected raptor migration route (e.g. close to the shores of Lakes Erie and Ontario), or near an established spring or fall hawk watch. In addition, if observations during a standard study detected migrating raptor species listed by the state or federal government as threatened or endangered, expanded raptor surveys may be recommended. Even in areas known to concentrate raptors during migration, site-specific information on species' flight height, direction, and timing of movement is important in understanding and evaluating the potential risk to birds at a proposed wind project. Surveys should be conducted from one or more prominent locations within the project area during spring and fall migration periods (March 1 to May 31; August 15 to December 31). If standard surveys have already been conducted, expanded surveys should be done from the same observation point(s). Every favorable weather day should be surveyed during the migration periods. All other data and information collected should be the same as for standard raptor migration surveys. Project sponsors should consult with DEC biologists to determine an appropriate survey time frame and frequency for specific target species, which may differ from the above dates.

c. *Waterfowl surveys*

Waterfowl surveys may be recommended if the project is in close proximity to a recognized major waterfowl concentration area, National Wildlife Refuge, or State Wildlife Management Area used for feeding, roosting, wintering, breeding, or migration staging. Surveys should include both driving and static observations in a variety of seasons and weather conditions. Driving surveys consist of slowly driving roads throughout the project site and surrounding area at various times during the day to observe and record the species, numbers, and behavior of birds in wetlands, rivers, fields and other habitats. For static surveys, an observer is stationed for a designated period of time at a given location and recording the same observations as driving surveys. Project sponsors should consult with DEC biologists to determine appropriate location(s), duration, intensity, and time frame for these surveys.

d. *Breeding bird surveys*

Targeted breeding bird surveys for state or federally listed threatened or endangered species, species of concern, or SGCN may be recommended if the project is in close proximity to a wetland, grassland, forest or other habitat area that may harbor marsh birds, nightjars, forest raptors, owls, or other birds that would not easily be detected during a morning survey, either because they are not active during the morning, or are not typically vocal. These surveys may incorporate playback of species-specific songs and calls and/or mobbing calls, and take place in the very early morning and/or in the evening hours until after sunset, depending on the target species. A number of points should be designated in appropriate habitat, where an observer should listen for calling birds before broadcasting a recording and listening again for a

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

projects that have applied for an Incidental Take Permit (ITP) for state or federally listed threatened or endangered species may differ from those described here, per conditions of the permit and agency requirements. All collection and possession permits must be obtained at the state and federal level prior to the commencement of searches. Should a state or federally listed species be found dead or injured anywhere in the project area by any person, either during a regular survey period or incidentally at any time during the life of the project, DEC and USFWS, respectively, are to be notified as soon as possible but no later than 24 hours after the discovery, for direction on how to proceed with handling the animal.

i. Turbine searches – A standardized turbine-search regime should be designed such that one third of the total number of turbines in the project are searched daily, and one third of the total number of turbines in the project are searched weekly, from April 15 to November 15 during the first year of study. At any project with 10 or fewer total turbines, all turbines must be searched daily. At any project with between 11 and 29 turbines, at least 10 turbines must be searched daily, and one third of the remaining number searched weekly. Whether the second and third year of study are done in sequence or postponed to later years (e.g., the fifth or sixth year of operation) will be determined following analysis of data from the first year. Should the project expand to include more turbines, the number and location of turbines in the search pattern will be altered accordingly.

ii. Area to be searched – The area to be searched beneath each turbine should be no less than 1.5 times the rotor diameter. Although plot size will be dependent on specific turbine height and rotor diameter, 120 meters by 120 meters should be adequate for most modern turbines currently being used in New York. Transects should be five (5) meters apart, allowing for a visual search area of approximately 2.5 meters on either side of the centerline. These distances may vary slightly from one site to another, due to varying ground conditions. Full plots are necessary for at least the first study year to produce the most accurate mortality estimate possible. After the first year of study, DEC may discuss with the developer the possibility of a portion of the study turbines being searched only on the cleared gravel road and pad area. If so, the number of carcasses found on the road and pad may be used to estimate fatality rates when compared with full plot searched turbines during the same year.

iii. Ground cover – The type and amount of ground cover under each turbine should be recorded every day that searches occur. Vegetation growth, crop harvesting and other changes in the substrate could greatly alter the efficiency of carcass recovery.

Mowing and/or brush-hogging some or all of the search plots, each in their entirety, is recommended to increase searcher efficiency and provide a relatively consistent ground cover throughout the study area and between projects. Mowing should take place as often as necessary to maintain vegetation height suitable for seeing small, dark, potentially wet or decomposing carcasses at a distance of 2.5 meters. Early notification to and coordination with landowners holding study turbines is essential to ensure an agreement can be made that will be satisfactory to all parties.

iv. Search conditions – Searches should begin as close to sunrise as possible. Overnight weather conditions greatly affect the number of animals that will fly and how they are distributed in the airspace, and thus their exposure to turbine blades. The standard weather data collection noted in Section 4(a) need only be collected on a daily basis for ground searches.

v. Photographs – Digital photographs should be taken of each carcass found. At least one picture of each carcass should include a ruler or other standard item used for scale. These photos, along with all field data information described in 6(a)i-vi, should be sent with the final report to DEC. The file name or folder for each photo or set of photos should be clearly marked with the date and turbine number. At a minimum, documentation for each carcass should include photos showing:
   (1) the position in which it was found;
   (2) the dorsal and ventral sides;
   (3) photos that indicate the gender and reproductive condition of bats (if possible); and
   (4) any identifying characteristics such as bill, foot, wing or tail shape, and plumage coloration for birds.

vi. Data collection – The following data should be recorded for each carcass found during standard searches or incidentally:
   (1) date, time, project name, and turbine number;
   (2) location on plot marked with GPS coordinates;
   (3) distance and cardinal direction from turbine;
   (4) distance and bearing from transect from which it was first spotted;
   (5) condition of carcass (whole or partial, extent of injury and some measure of decomposition and/or scavenging to estimate time of death);
   (6) position of carcass (face-up/down, sprawled, balled up, etc.);
   (7) species, age and sex, if determinable:
   (8) substrate conditions when found (gravel, short/long grass, crops, brush, etc.);

(9) identification of searcher/collector; and
(10) for all carcasses found incidentally (associated with a turbine outside of the study area, under a study turbine during non-survey times, or by someone other than a trained searcher), as much information as possible from 1-9 above should be recorded, and the carcasses labeled and stored in the same manner as a study carcass, with a marker identifying is it as an incidental find.

b. *Searcher efficiency and carcass removal trials*

To accurately estimate mortality rates, searcher efficiency tests, and scavenger removal tests should be conducted throughout the study period for each year of post-construction monitoring, using carcasses of various sizes and species that breed and migrate through the project area. Factors such as ground topography, vegetation cover, current weather conditions, searcher experience and fatigue level, and scavenging rates all affect the overall efficiency of carcass detection for a given project area. Searcher efficiency trials should be conducted to estimate search accuracy, and should take place unbeknownst to the searcher(s). Recovery rates should be calculated separately for bats and small, medium, large and all birds combined. Methodologies for this type of study may evolve as new information is gathered. The following is a standard process for conducting the trials:

i. Carcass placement – A person not performing searches that day should place bird and bat carcasses throughout the search areas under various turbines representing different types of ground cover early in the morning that a trial is to occur. This person should record the location of each carcass within the study area, and any not found by the searchers should be removed at the completion of the day's trial. Carcasses should be discreetly marked with a non-reflective material to identify them as test animals. If enough bat carcasses are not readily available, fresh brown mice may be used as a surrogate for searcher efficiency trials.

ii. Carcass recovery – Information collected on trial carcasses should be identical to all non-test carcasses as outlined in section 6(a)(vi). The number of test carcasses recovered and the accuracy of data recorded will be determined for each searcher, and an efficiency rate calculated for each trial conducted throughout the course of the study.

iii. Carcass removal trials – Most mammalian and avian scavengers quickly recognize easy food sources, can readily incorporate wind projects in their daily routes, and are often active at pre-dawn hours. Insect scavengers are active mostly in warmer months, and in some cases can drastically deteriorate a carcass in a matter hours. Carcass removal trials should continue throughout post-

construction monitoring, as scavenging rates change in response to a steady source of food.

iv. Number and condition of carcasses – Trial carcasses should be as fresh as possible, since long-frozen carcasses may be much more difficult to find and are possibly less attractive to scavengers. The number of carcasses used should not cause an excessive attraction to bring scavengers into the area. Carcasses should be placed in a variety of habitats and checked daily for the first week, and every two days thereafter until the carcass disappears (due to scavenging or decomposition). On each check, the location and condition of the carcass should be recorded to determine if any scavenging has occurred. Any tracks, scat, marks, or other signs that may indicate the type of scavenger should be noted. Scavenging rates for each season, animal taxa, and habitat type in the project area will be calculated.

d. *Bird habituation and avoidance studies*

The pre-construction breeding and migrating bird surveys described in sections 4(d) and 5(d) should be repeated during the first and second years of mortality monitoring. Additional years of study may be recommended for the third, fourth, or fifth year of project operation as determined through consultation with DEC. Post-construction survey transects, points, and methods should be as close as possible to those used during pre-construction surveys. At pre-construction sample locations that become actual turbine sites, surveys should, to the greatest extent possible, take place during a period when turbine noise does not interfere with the observer's ability to hear, see, and record birds. If expanded pre-construction breeding bird surveys were conducted, developers should consult with DEC to determine the scope, methods, and focus species post-construction breeding bird surveys will have. Any land use or habitat changes that may have occurred since pre-construction or the previous post-construction survey was conducted should be noted, as this could potentially alter the bird species composition, density, and distribution within the project area. Information from this post-construction survey is intended to be comparable to pre-construction surveys, and will examine whether the wind project is having any effect on bird use of the site during breeding and migration periods, and whether habituation or avoidance is occurring.

7. **Expanded Post-construction Studies**

For wind energy projects constructed in or near one of the features or resources of concern identified in section 2(b), and for projects that DEC determines may adversely affect a state or federally listed species, expanded post-construction monitoring studies may be needed to provide additional in-depth information to further understand the specific impacts to bird and bat resources of the site. Exact details of these components of post-construction monitoring will be determined on a site-specific basis through discussions between DEC and the project developer.

a. *Radar surveys*

If radar studies during pre-construction surveys showed high passage rates, low flight altitudes, or if other unanticipated conditions that may affect the results and conclusions of the study were observed, then a radar survey may be recommended during the first year of post-construction mortality surveys. The use of radar during subsequent years of post-construction surveys will be contingent on the results of the first year of post-construction study. For any project where post-construction monitoring reveals a higher than expected level of mortality based on pre-construction data and analysis, the use of radar may be recommended for the second year of post-construction study regardless of whether radar surveys were conducted during pre-construction studies. The timing and duration of post-construction radar studies should be determined in consultation with DEC staff.

b. *Raptor migration surveys*

Raptor migration surveys should be repeated during at least the first year of post-construction monitoring if: expanded raptor surveys were conducted during pre-construction surveys; the results of post-construction studies from other projects estimate impacts to raptors that are not consistent with pre-construction expectations; or as recommended by DEC. Raptor migration surveys should be done using the methods described under the expanded pre-construction survey section 5(b), or as recommended by DEC staff.

c. *Waterfowl surveys*

Waterfowl surveys should be repeated during at least the first year of post-construction monitoring if: they were conducted during pre-construction surveys; results of post-construction studies estimate impacts to waterfowl are not consistent with pre-construction expectations; or as recommended by DEC. Waterfowl surveys should be done using the methods described under the expanded pre-construction survey section 5(c), or as recommended by DEC staff.

d. *Wintering bird surveys*

Wintering bird surveys should be repeated during at least the first year of post-construction monitoring if: they were conducted during pre-construction surveys; the results of post-construction studies estimate impacts to wintering birds that are not consistent with pre-construction expectations; or as recommended by DEC. Wintering bird surveys should be done using the methods described under the expanded pre-construction survey section 5(e), or as recommended by DEC staff.

e. *Bat acoustic monitoring*

Bat acoustic monitoring may be recommended on a site-specific basis. If pre-existing data, information collected on site during pre-construction surveys, current conditions, or agency determination indicate a potential for undue impact to Myotis species, post-construction acoustic monitoring may be warranted. Consultation with DEC staff is recommended to determine the most appropriate methods for each site.

8. **Planning and Reporting**

a. *Work plans*

After discussions with DEC staff regarding the application of these guidelines to a particular site, the developer should submit a draft work plan incorporating the necessary elements for study at the site. The work plan should include the site description and maps of the most up to date project layout, as well as shapefiles indicating the locations of all project components, points, and transects used for bird and bat surveys. This information will assist DEC in reviewing the data and evaluating potential impacts to sensitive species and their habitats using GIS software. Pre-construction work plans and shapefiles should be submitted to DEC with enough lead time for all parties to discuss and agree upon the details of the plan before implementation of the proposed field work. A comprehensive post-construction study plan should be developed and submitted to DEC for review prior to completion of project construction, and all work should be conducted in consultation with DEC. Project sponsors should work closely with DEC to provide a work plan detailing the search regime, bias corrections, bat acoustic monitoring, bird displacement/habituation surveys, reporting techniques, and other aspects of a project's post-construction mortality study.

b. *Reports*

After completion of the agreed-upon studies, the developer should prepare a report presenting the results. A description of the proposed project should be provided including maps of the proposed or existing turbine layout and other project components, topography, state and federal wetlands, and any other relevant information and environmental features on or near the site. A composite map containing all project and study information (turbine locations, raptor observations points, breeding and migratory bird transects with observation points, radar unit location (if applicable), wintering bird and waterfowl survey points/routes, acoustic detector locations, and habitat types) should be provided. The preferred format for reporting is described below.

i. Habitat surveys: The habitat survey report should minimally include the following:
   (1) a description of the habitat types found on site, including the location and identity of any invasive species;
   (2) a description of what state and/or federally listed species are associated with each habitat type and may occur in the area;
   (3) a layout map of ground cover (grassland, forest interior/edge, old field, shrub/scrub, young forest, wetland, agricultural/grazing land, developed areas, etc.), and their respective proportions on the landscape within the project site and surrounding area;
   (4) one or more map, as needed, showing the locations of habitat suitable for any listed, special concern or SGCN species, as well as the locations of any actual observations made of listed or sensitive species; and

(5) a detailed discussion of the methods, results, and recommendations, including a description of the listed species presence/absence survey results.

ii. Breeding and migrating bird surveys: The breeding and migrating bird survey report should minimally include the following:

(1) the number, location and length of each turbine, electric line, and control transect;
(2) the overall survey period, and date, time, and duration of surveys conducted at each point;
(3) a description of the habitat surrounding each transect;
(4) the number of species observed overall;
(5) the total number of individuals of each species observed overall;
(6) the number of individuals of each species observed at each transect point;
(7) a summary of the number and behavior of birds seen (e.g. individual, moving in a small flock, feeding, resting, carrying nesting material, food, or fecal sac, etc.), and whether any active nests or recently fledged young were observed;
(8) which birds were identified visually or via vocalizations;
(9) the point(s) and transect(s) with the highest and lowest: number of species, species diversity, frequency, and abundance;
(10) the habitat type(s) with the highest and lowest: number of species, species diversity, frequency, and abundance;
(11) a description of the weather conditions during and immediately prior to survey days;
(12) a list of all species with the dates and points where they were observed;
(13) the number and identification of the observer(s) conducting each survey;
(14) a description of any disruptions and/or distractions that occurred during each sampling period that may have precluded an adequate survey;
(15) a detailed discussion of all methods, results, and recommendations;
(16) one or more table and graph, as needed, depicting the above information, as well as all species with the dates and points where they were observed, the location proposed or existing turbines and other project components;
(17) one or more map, as needed, which displays all observations of all individuals of state and federally listed species, species of concern, SGCN, and any other species targeted at the site. Detailed information on the location, method of detection, behavior, flight paths, and all other

relevant data should be clearly shown on the map, or otherwise made available in the report; and

(18) shapefiles depicting the date, location and behavior of each individual of all state and federally listed species observed on site, and shapefiles of all transects and point locations.

iii. Raptor migration surveys: The raptor migration report should minimally include the following:

(1) the number and location of observation point(s);
(2) the overall survey period, and date, time, and duration of surveys conducted at each point;
(3) a general description of the viewshed from each point, including any area with limited or no visibility of the horizon and sky;
(4) the number of species observed overall;
(5) the total number of individuals of each species observed overall;
(6) the number of individuals of each species observed on each survey;
(7) the flight height and direction of each raptor and vulture, including any changes observed;
(8) the average and median flight height and direction of each raptor and vulture species, and any notable behavior observed;
(9) a description of the weather conditions during each hour of and immediately prior to survey days;
(10) the number and identification of the observer(s) conducting each survey;
(11) a description of any disruptions and/or distractions that occurred during each hour that may have precluded an adequate survey;
(12) a detailed discussion of all methods, results, and recommendations;
(13) one or more table or graph, as needed, depicting the above information;
(14) one or more map, as needed, depicting survey location(s), viewshed(s), the overall mean raptor and vulture flight paths, and locations of any listed species observations; and
(15) shapefiles depicting the date, location and behavior of each individual of all state and federally listed species observed on site, and shapefiles of all observation point locations.

iv. Radar studies: The radar report should minimally include the following:

(1) the radar unit location, elevation, and characteristics of the surrounding vegetation and topography;

(2) the total number of days surveyed overall, and in each season;
(3) the date, time, and number of hours per night and day that surveys took place each season;
(4) the mean, median, minimum and maximum values recorded each hour and overall each season for: target flight height, direction, passage rate in targets/km/hour, and percentage of targets detected below the maximum height of the proposed turbines, all corrected for the volume of airspace actually sampled and density of targets within that space;
(5) the elevation and total height of the proposed turbines;
(6) a detailed discussion of all methods, results, and recommendations;
(7) a discussion and evaluation of results describing the type of equipment used, including capabilities, limitations, and settings used for all equipment, as well as the amount of down time, failures, or suspected malfunctions that may have occurred during the survey periods. All equipment performance data should be reported to better assess the efficiency and accuracy of the units being used at each location;
(8) one or more picture from both the horizontal and vertical screen views indicating the location and amount of ground clutter surrounding the radar unit; and
(9) one or more table or graph, as needed, depicting the above information, as well as times and number of hours actually sampled each night and day in both horizontal and vertical modes, and hourly weather information (particularly wind speed and direction, percent cloud cover, ceiling height, and the presence of fog and/or precipitation).

v. Wintering bird surveys: The wintering bird survey report should minimally include the following:
(1) the number, location and length of all observation points and routes surveyed;
(2) the overall survey period, and date, time, and duration of surveys conducted at each point and driving route;
(3) a general description of the viewshed from each observation point, including areas with limited or no visibility of the targeted habitat;
(4) the number of species observed overall;
(5) the total number of individuals of each species observed overall;
(6) the number of individuals of each species observed on each survey, and at each point;

(7) a description of the behavior (feeding, perching, soaring, flocking, etc.) of the birds observed and the habitat they occupied;
(8) which birds were identified visually or via vocalizations;
(9) the point(s)/route(s) with the highest and lowest: number of species, species diversity, frequency, and abundance;
(10) a description of the weather conditions during an immediately prior to survey days;
(11) any disruptions and/or distractions that occurred during each survey that may have precluded an adequate collection of data;
(12) the number and identification of the observer(s) conducting each survey;
(13) a detailed discussion of all methods, results, and recommendations;
(14) one or more table or graph, as needed, depicting the above information, as well as all species and individuals with the dates and points where they were observed;
(15) one or more map, as needed, showing the locations of the sightings relative to proposed or existing turbine locations and from the survey point/driving route;
(16) any other information as requested by NYSDEC 2014(b); and
(17) shapefiles depicting all survey locations, the viewshed from each, and the date, location, flight direction, and behavior of each individual of all state and federally listed species observed.

vi. Waterfowl surveys: The waterfowl survey report should minimally include the following:
(1) the number, location and length of all observation points and routes surveyed;
(2) the overall survey period, and date, time, and duration of surveys conducted at each point and driving route;
(3) a description of the habitat surrounding each observation point and along routes surveyed;
(4) the number of species observed overall;
(5) the number of individuals of each species observed overall;
(6) the number of individuals of each species observed on each survey and at each point;
(7) a description of the behavior (feeding, resting, flying, flocking, etc.) of birds observed, the habitat they occupied, and any movements of birds within or across the project area;
(8) detailed descriptions of the location and behavior of all state or federally listed species observed;

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

viii. Mortality studies: An interim progress report should be submitted to DEC no later than mid-July summarizing the post-construction survey results from spring of that year. The interim report is not intended to be an exhaustive analysis of methods, results and estimates. At a minimum, this report should include:

(1) the number and species of all dead or injured birds and bats found to date during standardized searches and incidentally, including any state or federally listed species found anywhere on site;
(2) the turbine number at which each animal was found;
(3) the date each animal was found;
(4) an overview of the searcher efficiency and carcass removal trials conducted to date;
(5) one or more map, as needed, identifying each turbine number and location; and
(6) any other notable bird or bat observations made on site.

A draft final report, to be submitted by January 31 following the end of the fall study period, should minimally include the following:

(7) the results of the daily and weekly ground searches;
(8) a description of the habitat type and ground cover height surrounding each turbine, including details of any vegetation management that was done at each turbine;
(9) the cardinal direction and distance from the turbine, in 10 meter increments, each carcass was found during standardized searches and incidentally;
(10) the size class of each carcass (small or large bat, small, medium or large bird);
(11) the condition of each carcass found;
(12) the date each carcass was found;
(13) photographs of all carcasses found;
(14) the age and sex of each carcass, if determinable;
(15) the total area beneath each turbine actually searched;
(16) a description of daily weather conditions prior to and during each search;
(17) the number and identification of people conducting each survey;
(18) the results of the searcher efficiency tests and scavenger removal study. The estimated searcher efficiency should be reported by carcass size, ground cover type, and season for each searcher. Estimated scavenging rate should be reported for each carcass size, habitat type, and season. This should include the types of scavengers present on site (avian, mammalian, insect) and the frequency at which each occurs;
(19) a discussion of all methods, results, and recommendations;

(20) one or more table or graph, as needed, depicting all the above information, as well as showing the number and identification of birds and bats found, and at which turbine, during standardized searches and incidentally; and
(21) one or more map, as needed, identifying each turbine number and location, and the area searched beneath each turbine.

If operational curtailment of all or a portion of the turbines occurred at any time during the survey period, the final report should include detailed information on the following:
(22) which turbines were feathered;
(23) the wind speed at which curtailment took place, and whether that varied between turbines;
(24) the dates and times of curtailment events, as well as total time of curtailment;
(25) a detailed discussion on how the curtailment effort impacted the estimated bird and bat mortality rates; and
(26) any other information relevant to changes in operational cut-in speeds.

All statistical methodologies should be fully explained and justified, and the most appropriate and accurate model used for estimating mortality rates. Project developers should consult with DEC and USFWS to determine the statistical model(s) to be used. Mortality rates should be calculated using at least a 95% confidence interval. Estimates should be made of overall mortality during the study period on a per turbine, per megawatt rated, per megawatt produced, and per rotor swept area for bats and birds (including small, medium and large birds, and all birds together). A separate estimate of bat mortality during the late summer/fall period (approximately mid-July through September) should also be provided, to allow for comparison of results with studies that only evaluated this time frame. All of these estimates should take into account:
(27) searcher efficiency rate;
(28) scavenger removal rate;
(29) the overall search plot size under each turbine;
(30) the amount of area actually searched under each turbine and throughout the project;
(31) the frequency of searches;
(32) operational curtailment, if any;
(33) the number of birds and bats estimated to have fallen outside of the search plot; and
(34) a discussion of any other factor that may have influenced the search regime and results.

ix. Other post-construction surveys: Either inclusive with the mortality report, or as a separate document, information on the post-construction bat surveys, bird habituation/avoidance studies, bird and raptor migration surveys, and/or radar surveys should be reported as described above in 8(b) i-vii, with the following additions: specific avoidance behavior of flying birds and/or bats observed in the project area; and any other information relevant to how birds and bats are using or avoiding the operating project area, especially with respect to the level of habitat restoration that has occurred at the time.

9. References and Sources of Information

Arnett, E .B., W. K. Brown, W. P. Erickson, J. K. Fiedler, B. L. Hamilton, T. H. Henry, A. Jain, G. D. Johnson, J. Kerns, R. R. Koford, C. P. Nicholson, T. J. O'Connell, M. D. Piorkowski, and R. D. Tankersley, Jr. 2008. Patterns of bat fatalities at wind energy facilities in North America. Journal of Wildlife Management. 2008, 72(1):61-78, doi: 10.2193/2007-221.

Arnett, E. B., M. M. P. Huso, M. R. Schirmacher, and J. P. Hayes. 2011. Altering turbine speed reduces bat mortality at wind-energy facilities. Frontiers in Ecology and the Environment. 2010, 9(4):209-214, doi: 10.1890/100103.

Arnett, E. B., G. D. Johnson, W. P. Erickson, and C. D. Hein. 2013. A synthesis of operational mitigation studies to reduce bat fatalities at wind energy facilities in North America. A report submitted to the National Renewable Energy Laboratory. Bat Conservation International. Austin, Texas, USA.

Audubon Christmas Bird Counts
http://www.audubon.org/conservation/science/christmas-bird-count

Audubon of New York Important Bird Areas
http://ny.audubon.org/conservation/what-important-bird-area

Audubon of New York Local Chapters
http://www.audubon.org/audubon-near-you?state=NY

Baerwald, E. F., J. Edworthy, M. Holder, and R. M. R. Barclay. 2009. A large-scale mitigation experiment to reduce bat fatalities at wind energy facilities. Journal of Wildlife Management. 2009, 73(7):1077-1081, doi: 10.2193/2008-233.

Bat Conservation International
http://www.batcon.org/

Biodiversity and Wind Siting Mapping Tool
www.ebd.mapny.info

Cryan, P. M. 2008. Mating behavior as a possible cause of bat fatalities at wind turbines. Journal of Wildlife Management. 2008, 72(3):845-849, doi: 10.2193/2007-371.

Cryan, P. M, R. M. R. Barclay. 2009. Causes of bat fatalities at wind turbines: hypotheses and predictions. Journal of Mammalogy. 2009, 90(6):1330-1340.

Cryan, P. M, P. Marcos Gorresen, C. D. Hein, M. R. Schirmacher, R. H. Diehl, M. M. Huso, D. T. S. Hayman, P. D. Fricker, F. J. Bonaccorso, D. H. Johnson, K. Heist, and D. C. Dalton. 2014. Behavior of bats at wind turbines. Proceedings of the National Academy of Sciences. 2014, 111(42):15126-15131.

eBird
http://ebird.org/content/ebird

Hawk Migration Association of North America
http://www.hmana.org/

Howell, C. A., W. D. Dijak, and F. R. Thompson III. 2007. Landscape context and selection for forest edge by breeding brown-headed cowbirds. Landscape Ecology. 2007, 22:273-284, doi 10.1007/s10980-006-9022-1.

Keyser, A. J., G. E. Hill, and E. C. Soehren. 1998. Effects of forest fragment size, nest density, and proximity to edge on the risk of predation to ground-nesting passerine birds. Conservation Biology. 1998, 12(5):986-994.

Kunz, T. H., E. B. Arnett, W. P. Erickson, A. R. Hoar, G. D. Johnson, R. P. Larkin, M. D. Strickland, R. W. Thresher, and M. D. Tuttle. 2007. Ecological impacts of wind energy development on bats: questions, research needs, and hypotheses. Frontiers in Ecology and the Environment. 2007, 5(6):315-324.

Kunz, T. H., E. B. Arnett, B. M. Cooper, W. P. Erickson, R. P. Larkin, T. Mabee, M. L. Morrison, M. D. Strickland, and J. M. Szewczak. 2007. Assessing impacts of wind-energy development on nocturnally active birds and bats; a guidance document. Journal of Wildlife Management. 2007, 71(8):2449-2486, doi: 10.2193/2007-270.

Leddy, K. L., K. F. Higgins, D. E. Naugle. 1999. Effects of wind turbines on upland nesting birds in conservation reserve program grasslands. Wilson Bulletin. 1999, 111(1):100-104.

McGuire, L., C. Guglielmo,S. Mackenzie, P. Taylor. 2012. Migratory stopover in the long-distance migrant silver-haired bat, *Lasionycteris noctivagans*. The Journal of Animal Ecology. 2012, 81:377-385, doi: 10.1111/j.1365-2656.2011.01912.x.

Morgan, M. and M. Burger. 2008. A Plan for Conserving Grassland Birds in New York: Final Report to the New York State Department of Environmental Conservation under contract #C005137. Audubon New York 159 Sapsucker Woods Rd. Ithaca, NY 14850.

NYSDEC 2014a. DRAFT Grassland Breeding Bird Survey Protocol. November 17, 2014. (work in progress)

NYSDEC 2014b. DRAFT Project Applicant Survey Protocol for State listed Wintering Grassland Raptor Species. December 22, 2014. (work in progress)

New York Natural Heritage Program
http://www.dec.ny.gov/animals/29338.html

NYSDEC Breeding Bird Atlas
http://www.dec.ny.gov/cfmx/extapps/bba/

NYSDEC Division of Environmental Permits
http://www.dec.ny.gov/about/642.html

NYSDEC Division of Fish, Wildlife, and Marine Resources
http://www.dec.ny.gov/about/634.html

NYSDEC Grassland Focus Areas
http://www.dec.ny.gov/pubs/32975.html

NYSDEC Operating and Proposed Wind Energy Projects in New York State
http://www.dec.ny.gov/energy/48089.html

NYSDEC Regional Office Information
http://www.dec.ny.gov/about/255.html

NYSDEC Special Licenses Unit
Collect and Possess: http://www.dec.ny.gov/permits/28633.html
Endangered Species: http://www.dec.ny.gov/permits/25012.html

NYSDEC Species of Greatest Conservation Need (SGCN)
http://www.dec.ny.gov/animals/9406.html

NYSDEC State Listed Species Information
http://www.dec.ny.gov/animals/7494.html

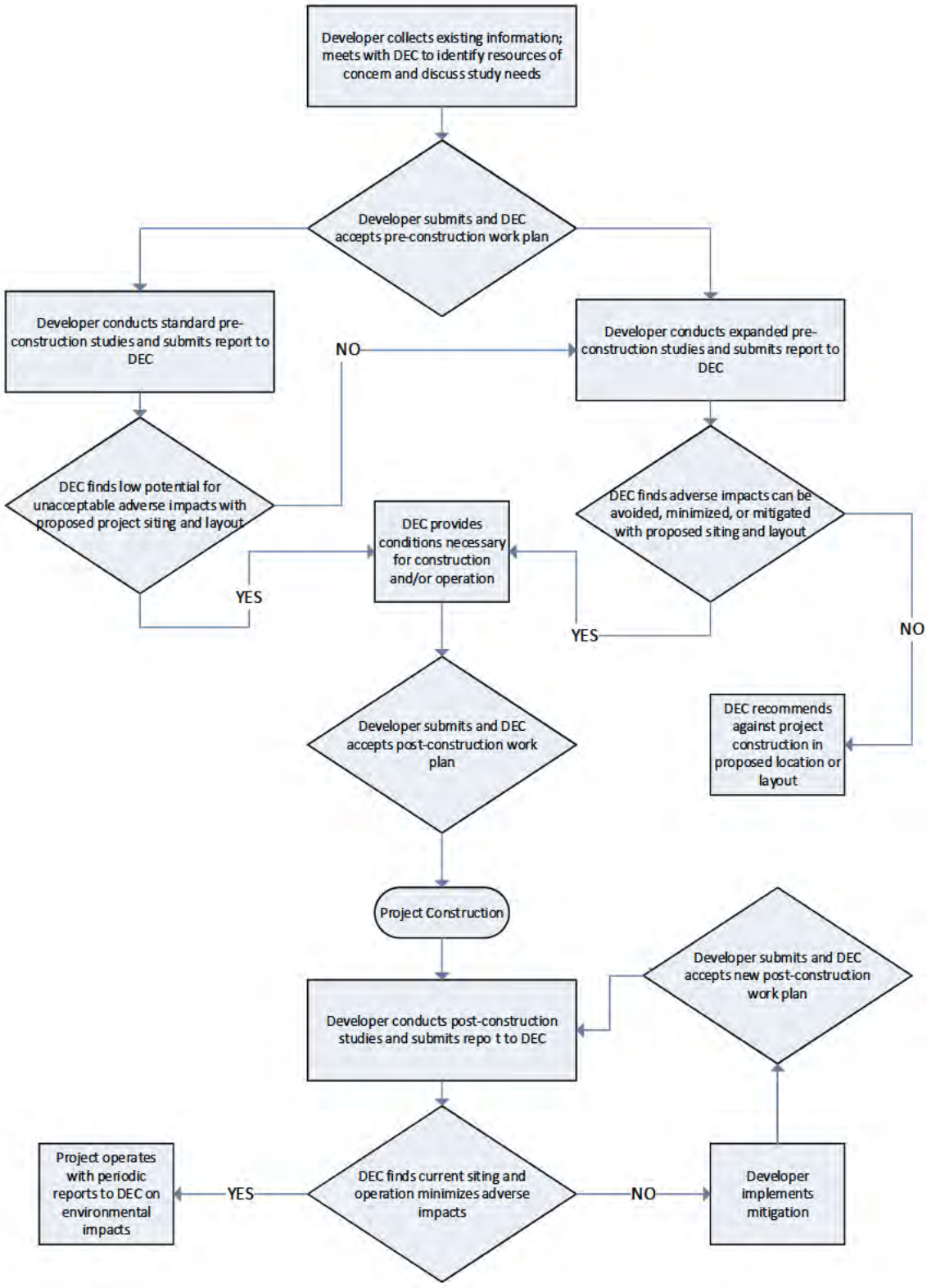
NYSDEC Wind Energy Information
http://www.dec.ny.gov/energy/40966.html

New York Environmental Resource Mapper
http://www.dec.ny.gov/animals/38801.html

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

Figure 1. General Process for Conducting Bird and Bat Studies at Wind Energy Projects in New York



This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

APPENDIX B

Results of Agency Database Review and Consultation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo/es/section7.htm

In Reply Refer To: March 04, 2021
Consultation Code: 05E1NY00-2021-SLI-1758
Event Code: 05E1NY00-2021-E-05601
Project Name: Hoffman Falls Wind

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: http://www.fws.gov/northeast/nyfo/es/section7.htm

[redacted] Additionally, wind energy projects should follow the Services wind

energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
(607) 753-9334

Project Summary

Consultation Code: 05E1NY00-2021-SLI-1758
Event Code: 05E1NY00-2021-E-05601
Project Name: Hoffman Falls Wind
Project Type: POWER GENERATION
Project Description: Proposed Wind project consisting of up to 15 turbines.
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.9461749,-75.74006415914408,14z

Counties: Madison County, New York

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, New York Natural Heritage Program
625 Broadway, Fifth Floor, Albany, NY 12233-4757
P: (518) 402-8935 | F: (518) 402-8925
www.dec.ny.gov

March 16, 2021

Benjamin Roosa
Environmental Design & Research
41 State Street, Suite 806
Albany, NY 12207

Re: Proposed Fenner Wind Project
County: Madison Town/City: Fenner, Smithfield, Nelson, Eaton

Dear Benjamin Roosa:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities that our database indicates occur in the vicinity of the project site. Also enclosed is a report of rare birds documented within 10 miles of the project site, and rare bats documented within 40 miles of the project site, for use in assessing potential impacts of bird and bat collisions. For information on NYSDEC's environmental review of proposed wind energy projects, and and for the document entitled Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects, follow this link:

https://www.dec.ny.gov/regulations/28693.html

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

Our database is continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the Permits staff at the NYSDEC Region 7 Office dep.r7@dec.ny.gov, 315-426-7438.

Sincerely,

Heidi Krahling
Environmental Review Specialist
New York Natural Heritage Program

225

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

* Conservation status in NYS as ranked by NY Natural Heritage Program on a 1 to 5 scale:
  S1 = Critically imperiled
  S2 = Imperiled
  S3 = Rare or uncommon
  S4 = Abundant and apparently secure
  S5 = Demonstrably abundant and secure

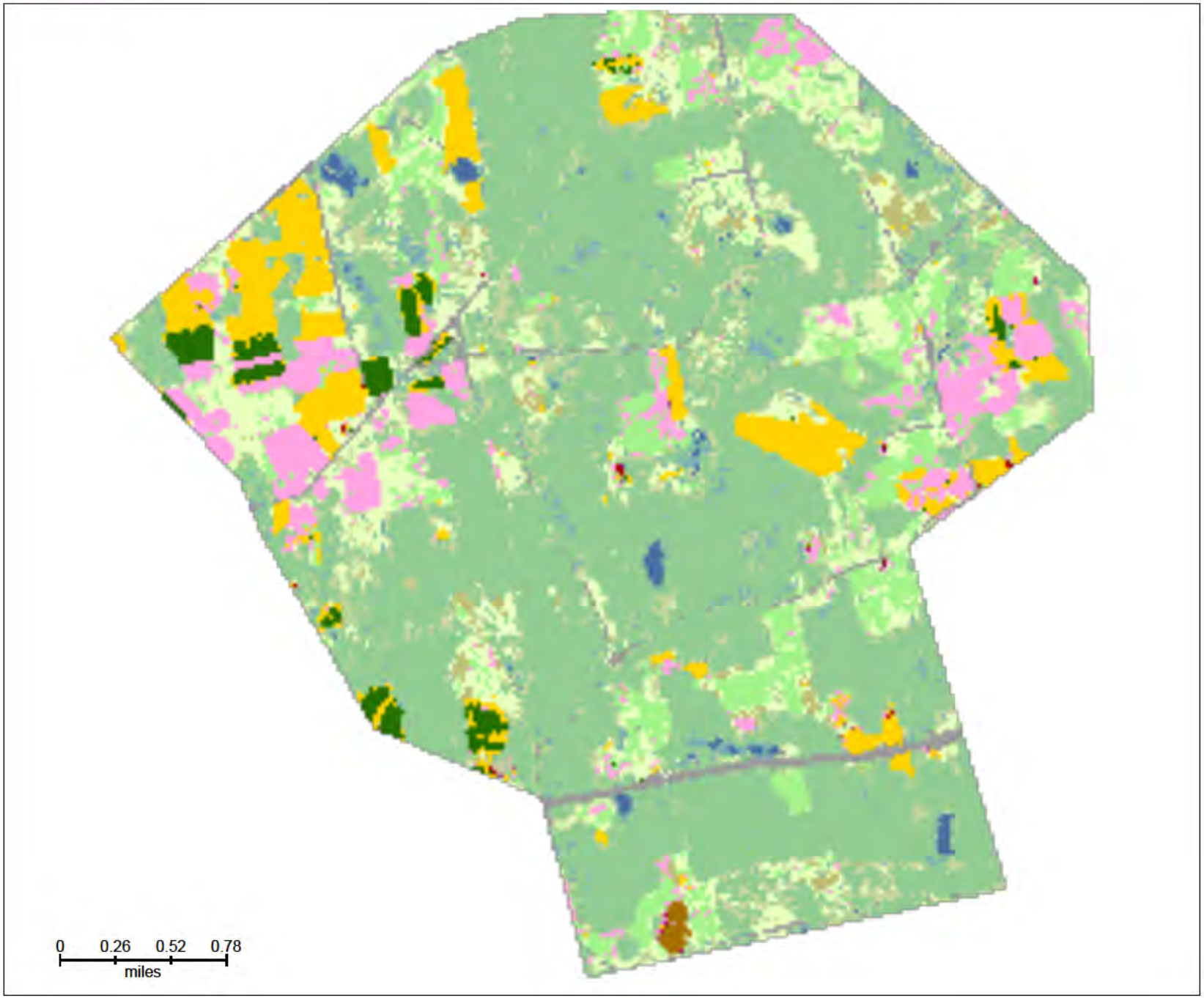
B after one of the above ranks indicates the status rank is for breeding populations only.

N after one of the above ranks indicates the status rank is for nonbreeding wintering populations only.

APPENDIX B

Crop Cover Types within the Facility Area (2016-2020)

CDL2016 Area of Interest



Land Cover Categories
(by decreasing acreage)

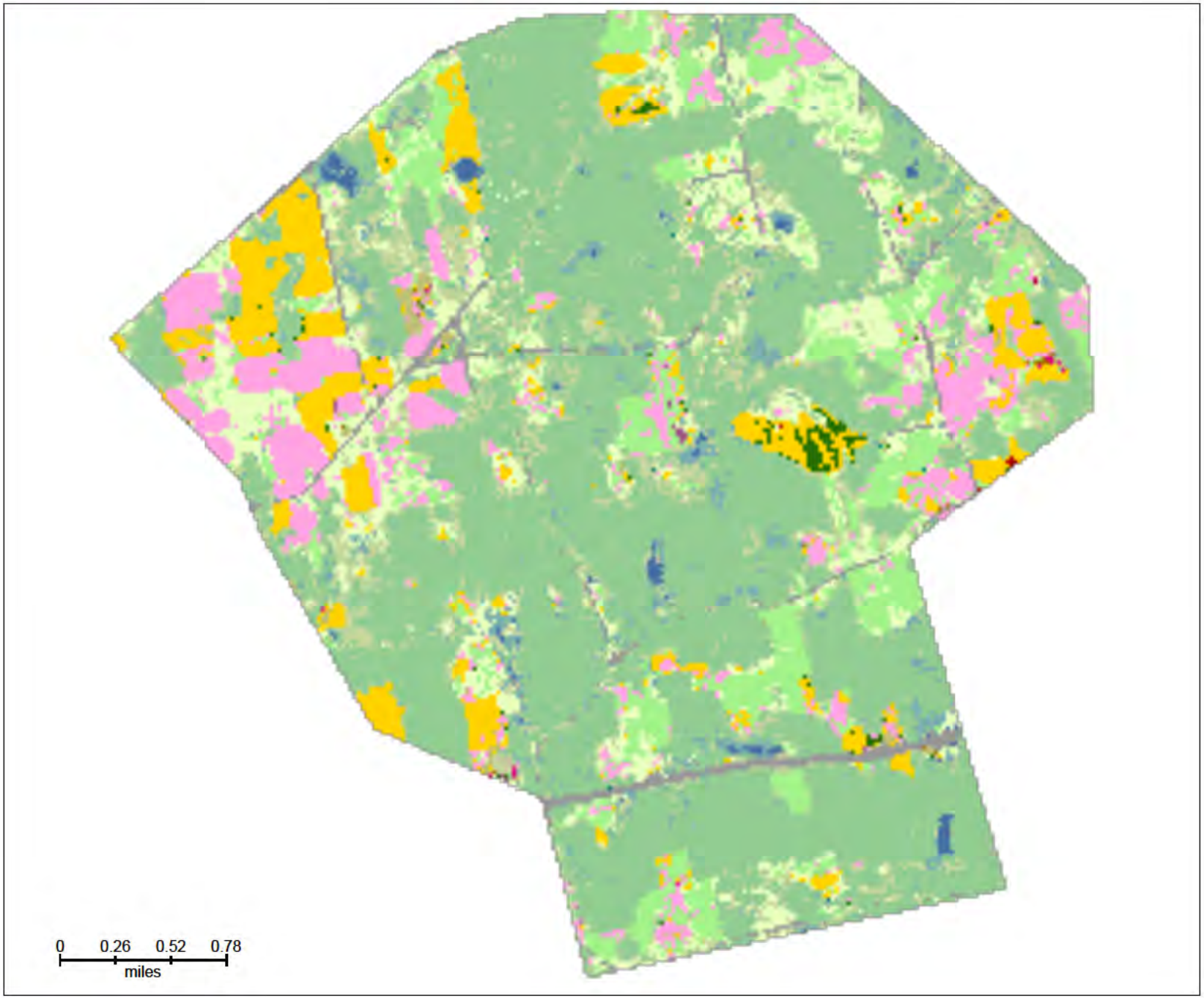
AGRICULTURE*

- Grass/Pasture
- Other Hay/Non Alfalfa
- Corn
- Alfalfa
- Soybeans
- Fallow/Idle Cropland
- Winter Wheat
- Dry Beans
- Oats
- Triticale
- Rye
- Buckwheat
- Millet
- Apples
- Sorghum
- Clover/Wildflowers

NON-AGRICULTURE**

- Deciduous Forest
- Shrubland
- Evergreen Forest
- Woody Wetlands
- Developed/Open Space
- Mixed Forest

CDL2017 Area of Interest



Land Cover Categories
(by decreasing acreage)

AGRICULTURE

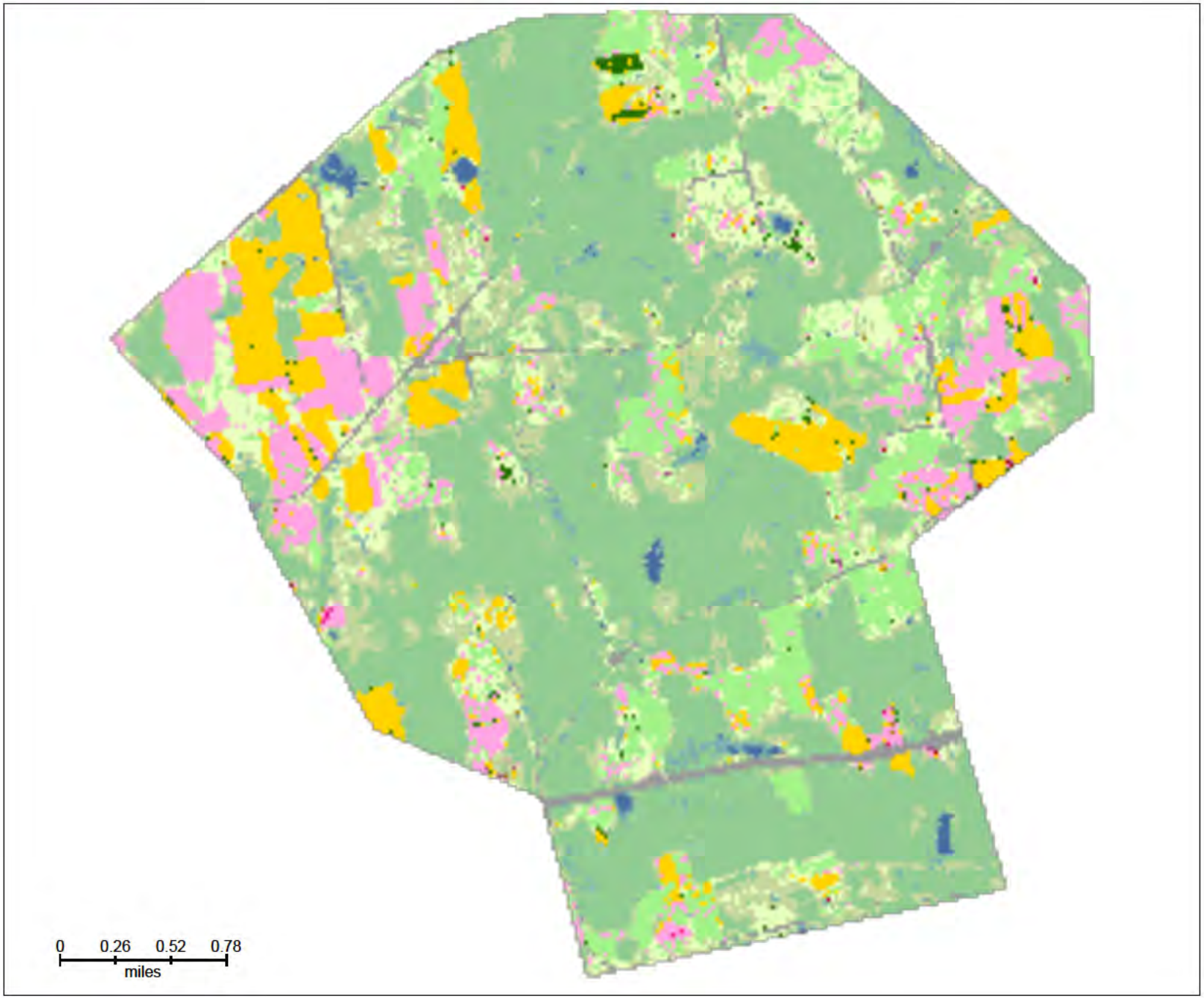
- Grass/Pasture
- Other Hay/Non Alfalfa
- Alfalfa
- Corn
- Fallow/Idle Cropland
- Soybeans
- Oats
- Winter Wheat
- Barley
- Dry Beans
- Christmas Trees
- Clover/Wildflowers
- Apples
- Spring Wheat

NON-AGRICULTURE*

- Deciduous Forest
- Shrubland
- Evergreen Forest
- Woody Wetlands
- Developed/Open Space
- Mixed Forest

REDACTED – Permit Application No. 23-00038

CDL2018 Area of Interest



Land Cover Categories
(by decreasing acreage)

AGRICULTURE

- Other Hay/Non Alfalfa
- Grass/Pasture
- Alfalfa
- Corn
- Soybeans
- Fallow/Idle Cropland
- Oats
- Winter Wheat
- Barley
- Clover/Wildflowers
- Dry Beans
- Apples
- Triticale
- Buckwheat
- Sod/Grass Seed

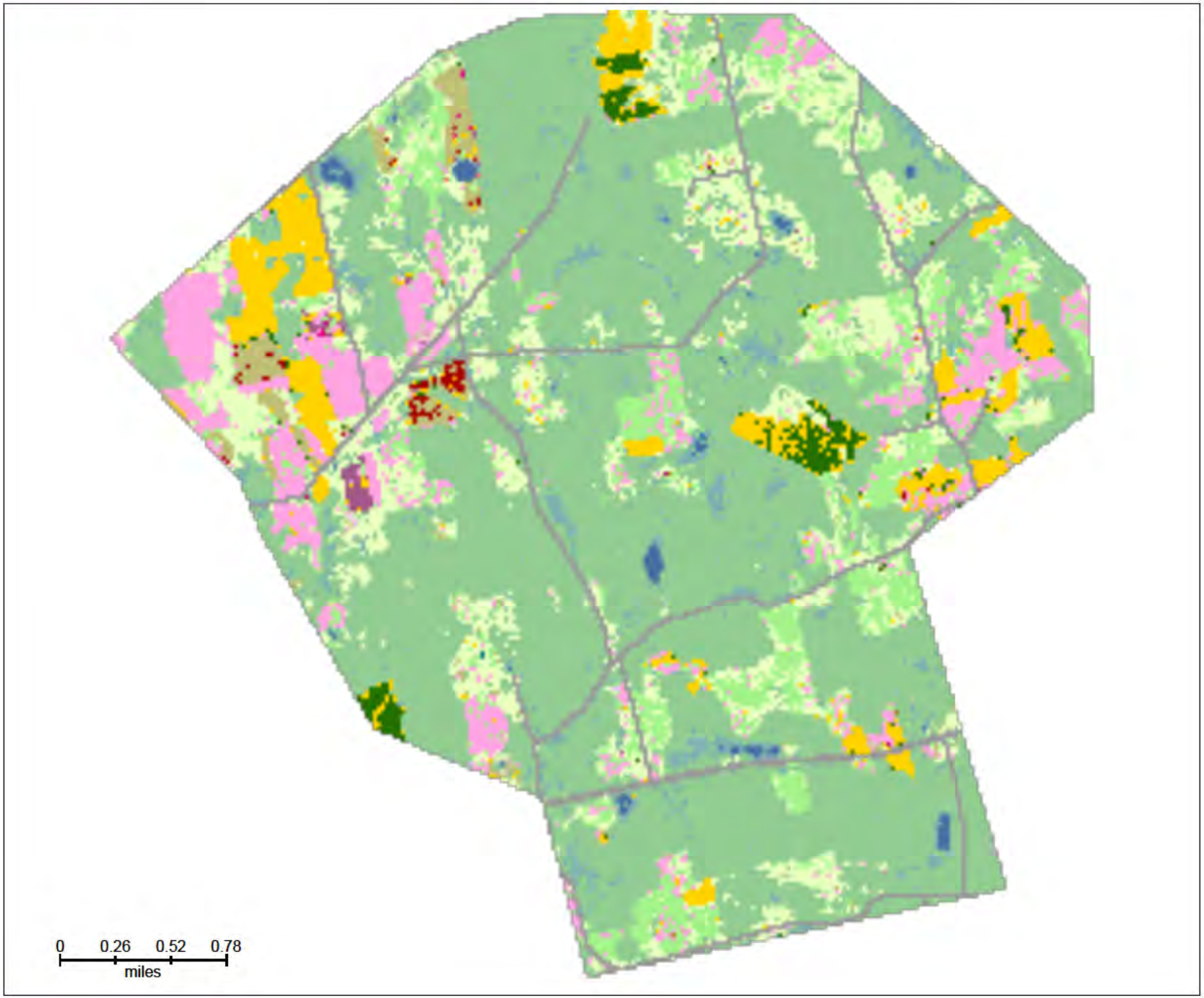
NON-AGRICULTURE*

- Deciduous Forest
- Shrubland
- Evergreen Forest
- Developed/Open Space
- Woody Wetlands
- Mixed Forest

Produced by CropScape - http://nassgeodata.gmu.edu/CropScape

* Only top 6 non-agriculturecategories are listed.

CDL2019 Area of Interest



Land Cover Categories
(by decreasing acreage)

AGRICULTURE*

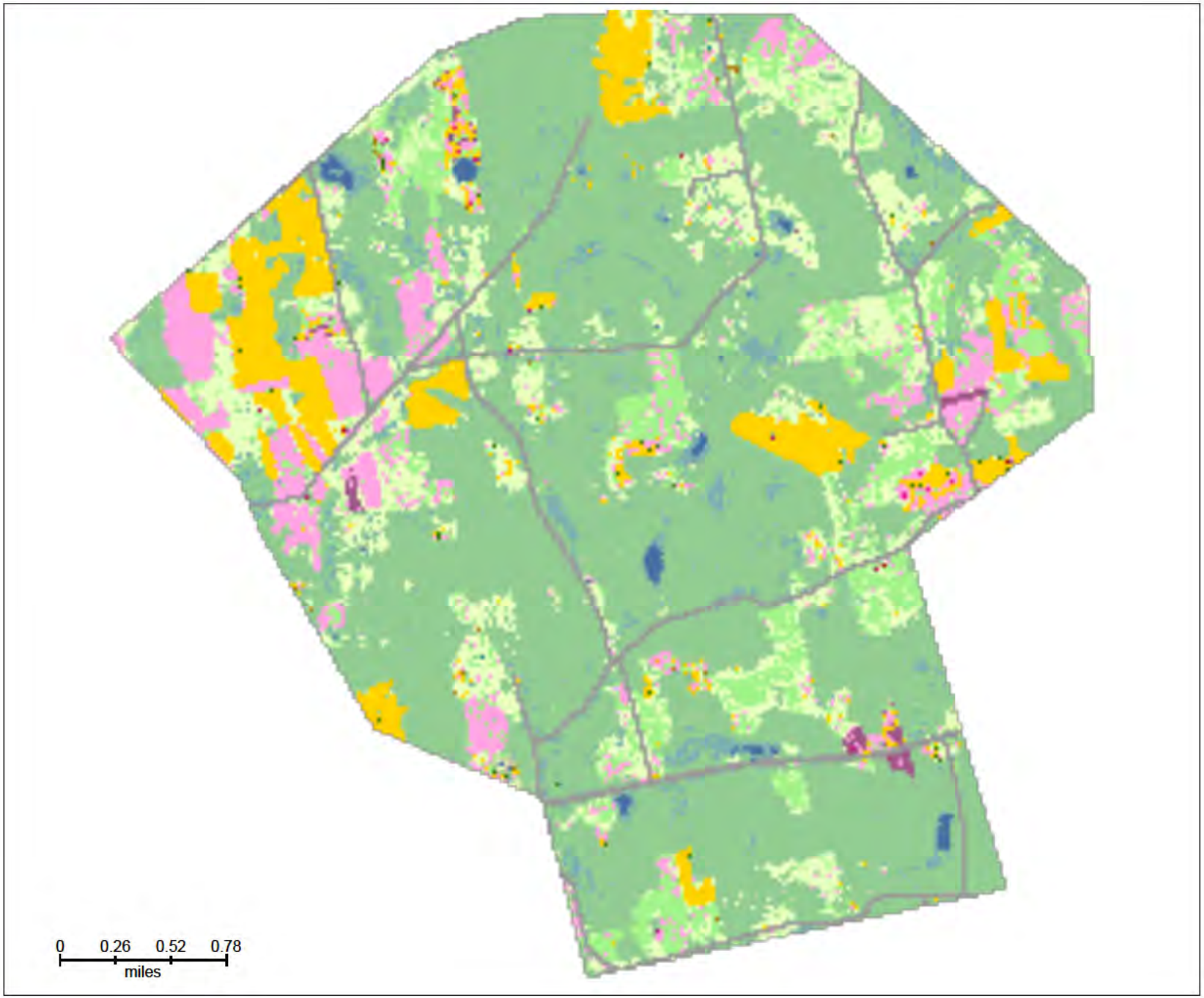
- Grass/Pasture
- Other Hay/Non Alfalfa
- Alfalfa
- Corn
- Fallow/Idle Cropland
- Soybeans
- Oats
- Dry Beans
- Clover/Wildflowers
- Barley
- Winter Wheat
- Triticale
- Christmas Trees
- Carrots
- Rye
- Apples

NON-AGRICULTURE**

- Deciduous Forest
- Evergreen Forest
- Developed/Open Space
- Woody Wetlands
- Mixed Forest
- Shrubland

REDACTED – Permit Application No. 23-00038

CDL2020 Area of Interest



Land Cover Categories
(by decreasing acreage)

AGRICULTURE*

- Grass/Pasture
- Other Hay/Non Alfalfa
- Corn
- Alfalfa
- Oats
- Soybeans
- Winter Wheat
- Fallow/Idle Cropland
- Clover/Wildflowers
- Barley
- Grapes
- Apples
- Rye
- Triticale
- Dry Beans
- Sorghum

NON-AGRICULTURE**

- Deciduous Forest
- Evergreen Forest
- Developed/Open Space
- Woody Wetlands
- Mixed Forest
- Open Water

APPENDIX C

Survey Data Sheets

EDR

21028 Hoffman Falls Wind Checklist

Hoffman Falls Wind Breeding Bird Survey 1

Project	21028 Hoffman Falls Wind
ID	152346
Survey Date	05/20/2021
User	Sam Beguin
Observer(s) Initials:	SB
Project:	21028 Hoffman Falls Wind
Start Time:	05:07
End Time:	10:23

Weather Conditions at Start of Survey

Temperature (F):	58
Cloud Cover (%):	15
Wind Direction (e.g., N, NW, S, SE etc.):	ENE
Wind Speed (mph):	3
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	15

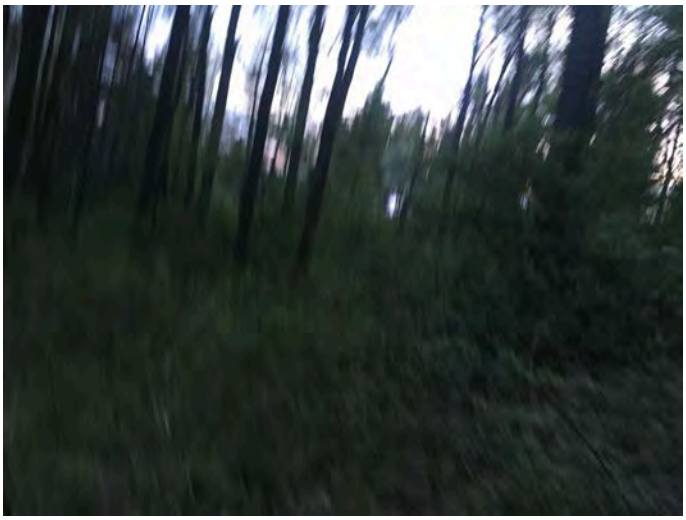
Transect Data 1

Transect ID:	T4
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	SOSP (S), RBGR (S)
Anthropogenic Disturbance:	Lots of logged areas and clearings
Notes:	
Primary Habitat:	Successional mixed forest
Dominant Species:	Cherry trees, maple trees, honeysuckle, raspberry, Norway spruce

Representative Photo:

T4 200 m

T4 300 m



T4 100 m

T4 0 m

T4 0 m

Grass Cover (%):

Forb Cover (%):

Woody Veg Cover (%):

Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	Honeysuckles in understory
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 2

Transect ID:	C1
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	Actively managed farmland; nearby farm buildings; loud motorcycles during point count survey at 0 m
Notes:	Hayfield to east, tilled row cropland to west
Primary Habitat:	Hayfield
Dominant Species:	Clover, trefoil, unknown grasses, bedstraw

Representative Photo:

C1 100 m

C1 200 m

C1 0 m view north

C1 0 m view south

Grass Cover (%):	30
Forb Cover (%):	60
Woody Veg Cover (%):	0
Bare Ground (%):	10
Litter Depth (inches):	0
Average Veg Height (inches):	6
Nearest Shrub above Veg Height (distance from observer in meters):	None nearby
Invasive Species (Common Name and % cover):	None identified
Second Habitat:	Tilled row cropland
Dominant Species:	Dandelions, some residual corn stalks from previous season

Representative Photo:

Field west of transect

Grass Cover (%):	0
Forb Cover (%):	10
Woody Veg Cover (%):	0
Bare Ground (%):	90
Litter Depth (inches):	None
Average Veg Height (inches):	6
Nearest Shrub above Veg Height (meters):	None nearby
Invasive Species:	None observed
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 3

Transect ID:	T12
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	BWWA (S) southwest of transect in shrubby area
Anthropogenic Disturbance:	Dirt farm road
Notes:	Could not continue further toward turbine location - active pasture with

livestock

Primary Habitat:	Pasture adjacent to stream; trees and shrubs present
Dominant Species:	Unknown grasses, dandelion, unknown weeds

Representative Photo:

Point A

Point A

Grass Cover (%):	60
Forb Cover (%):	10
Woody Veg Cover (%):	20
Bare Ground (%):	20
Litter Depth (inches):	NA
Average Veg Height (inches):	10
Nearest Shrub above Veg Height (distance from observer in meters):	5
Invasive Species (Common Name and % cover):	Honeysuckles, unknown teasel
Second Habitat:	Row cropland
Dominant Species:	NA

Representative Photo:

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	100
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	Open pasture
Dominant Species:	Unknown grasses, dandelions
Representative Photo:	

Grass Cover (%):	70
Forb Cover (%):	30
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	6
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 4

Transect ID:	T14-A (Alternate)
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	Road noise from Route 20; tractor idling in field to west during 0 m point count survey
Notes:	
Primary Habitat:	Hayfields
Dominant Species:	Unknown grasses, bedstraw, dandelion, strawberry

Representative Photo:

0 m view south

100 m view NW

Grass Cover (%):	60
Forb Cover (%):	48
Woody Veg Cover (%):	0
Bare Ground (%):	2
Litter Depth (inches):	NA
Average Veg Height (inches):	10
Nearest Shrub above Veg Height (distance from observer in meters):	None nearby
Invasive Species (Common Name and % cover):	None observed
Second Habitat:	Successional old field/hayfield edge
Dominant Species:	Goldenrods, dandelion, red osier dogwood

Representative Photo:

200 m view east

300 m view east

Grass Cover (%):	10
Forb Cover (%):	80
Woody Veg Cover (%):	10
Bare Ground (%):	0

Litter Depth (inches):	4 (dead goldenrod stems)
Average Veg Height (inches):	12
Nearest Shrub above Veg Height (meters):	5
Invasive Species:	Honeysuckle shrubs
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 5

Transect ID:	T11
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	EAKI (T), RTHA
Anthropogenic Disturbance:	
Notes:	
Primary Habitat:	Scrub-shrub wetland
Dominant Species:	Willow, multiflora rose, jewelweed, goldenrod, sensitive fern
Representative Photo:	

300 m view NE

300 m view west

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	

Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	Hayfield
Dominant Species:	Unknown grasses, dandelion, strawberry, clover

Representative Photo:

100 m

100 m

Grass Cover (%):	20
Forb Cover (%):	50
Woody Veg Cover (%):	0
Bare Ground (%):	2
Litter Depth (inches):	4
Average Veg Height (inches):	8
Nearest Shrub above Veg Height (meters):	NA
Invasive Species:	None observed
Third Habitat:	Successional hardwood forest
Dominant Species:	Beech, ash, maple, jewelweed, nettle

Representative Photo:

0 m - turbine

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 6

Transect ID:	T8
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	TRES, BOBO (S) in hayfield north of T8
Anthropogenic Disturbance:	
Notes:	
Primary Habitat:	Tilled row cropland
Dominant Species:	Clover, dandelion, vetch, corn residue

Representative Photo:

300 m

200 m

100 m

0 m

Grass Cover (%):	
Forb Cover (%):	5
Woody Veg Cover (%):	
Bare Ground (%):	98
Litter Depth (inches):	NA
Average Veg Height (inches):	2
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	

Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Additional Weather Conditions (if necessary) 1

Time:	
Temperature (F):	
Cloud Cover (%):	
Wind Direction (e.g., N, NW, S, SE etc.):	
Wind Speed (mph):	
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	

Weather Conditions at End of Survey

Temperature (F):	74
Cloud Cover (%):	15
Wind Direction (e.g., N, NW, S, SE etc.):	SE
Wind Speed (mph):	3
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	

Visibility (miles):

Additional Notes:

EDR

21028 Hoffman Falls Wind Checklist

Hoffman Falls Wind Breeding Bird Survey 1

Project	21028 Hoffman Falls Wind
ID	177501
Survey Date	05/25/2021
User	Tiffany Clay
Observer(s) Initials:	TC
Project:	21028 Hoffman Falls Wind
Start Time:	05:14 AM
End Time:	10:20 AM

Weather Conditions at Start of Survey

Temperature (F):	56
Cloud Cover (%):	60
Wind Direction (e.g., N, NW, S, SE etc.):	S
Wind Speed (mph):	5
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	8

Transect Data 1

Transect ID:	13
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	RTHA, COGR
Anthropogenic Disturbance:	Transmission line
Notes:	
Primary Habitat:	Tilled field in prep for row crops
Dominant Species:	Remnant corn

Representative Photo:

T13 500m

T13 500m

Grass Cover (%):

Forb Cover (%):

Woody Veg Cover (%):

Bare Ground (%):

Litter Depth (inches):

Average Veg Height (inches):

Nearest Shrub above Veg Height (distance from observer in meters):

Invasive Species (Common Name and % cover):

Second Habitat: Forest

Dominant Species: Maple, cherry

Representative Photo:

T13 300m

T13 300m

Grass Cover (%):

Forb Cover (%):

Woody Veg Cover (%):

Bare Ground (%):

Litter Depth (inches):

Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 2

Transect ID:	T1
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	Very windy - difficult to hear birds.
Primary Habitat:	Tilled earth in prep for row crops
Dominant Species:	Remnant corn
Representative Photo:	

T1 300m

T1 300m

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	

Average Veg Height (inches):	
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 3

Transect ID:	10
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	BARS, EAME, EUST
Anthropogenic Disturbance:	
Notes:	
Primary Habitat:	Fallow field
Dominant Species:	Unknown grasses, clover

Representative Photo:

T10 300m

T10 300m

Grass Cover (%):	25
Forb Cover (%):	50
Woody Veg Cover (%):	0
Bare Ground (%):	50
Litter Depth (inches):	0
Average Veg Height (inches):	2
Nearest Shrub above Veg Height (distance from observer in meters):	30
Invasive Species (Common Name and % cover):	
Second Habitat:	Tilled earth in prep for row crops
Dominant Species:	

Representative Photo:

T10 100m

T10 100m

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	

Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 4

Transect ID:	C3
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	
Primary Habitat:	Hayfield and successional old field/ shrubland
Dominant Species:	Unknown grasses and forbs, maple, scotch pine, brambles
Representative Photo:	

C3 300m

C3 300m

Grass Cover (%):	80
Forb Cover (%):	25
Woody Veg Cover (%):	10
Bare Ground (%):	0

Litter Depth (inches):	
Average Veg Height (inches):	10
Nearest Shrub above Veg Height (distance from observer in meters):	10
Invasive Species (Common Name and % cover):	N/A
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 5

Transect ID:	T16
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	
Primary Habitat:	Hayfield
Dominant Species:	Timothy grass and forbs

Representative Photo:

T16 300m

T16 300m

Grass Cover (%):	80
Forb Cover (%):	40
Woody Veg Cover (%):	0
Bare Ground (%):	0
Litter Depth (inches):	0.25
Average Veg Height (inches):	16
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	N/A
Second Habitat:	Tilled earth in prep for row crops
Dominant Species:	

Representative Photo:

T16 200m

T16 200m

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	

Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	Clearing in forest
Dominant Species:	Maple, cherry
Representative Photo:	

T16 0m

T16 0m

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Additional Weather Conditions (if necessary) 1

Time:	06:33 AM
Temperature (F):	56
Cloud Cover (%):	25
Wind Direction (e.g., N, NW, S, SE etc.):	S
Wind Speed (mph):	14
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	10

Weather Conditions at End of Survey	
Temperature (F):	65
Cloud Cover (%):	60
Wind Direction (e.g., N, NW, S, SE etc.):	S
Wind Speed (mph):	6
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	10
Additional Notes:	Added additional weather for adverse wind conditions starting at approximately 6:15 am, heavy winds died down after 8:30 am. Unable to survey Transect 6 - turned away by employee

EDR

21028 Hoffman Falls Wind Checklist

Hoffman Falls Wind Breeding Bird Survey 1

Project	21028 Hoffman Falls Wind
ID	156760
Survey Date	06/04/2021
User	Nick Pusateri
Observer(s) Initials:	NP
Project:	21028 Hoffman Falls Wind
Start Time:	05:14 AM
End Time:	10:40 AM

Weather Conditions at Start of Survey

Temperature (F):	61
Cloud Cover (%):	100
Wind Direction (e.g., N, NW, S, SE etc.):	NW
Wind Speed (mph):	5
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	says 10 but very foggy. .5 miles

Transect Data 1

Transect ID:	T3
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 0m it wasnt raining but the trees were wet so the wind blowing caused it to fall creating lots of noise making surveying more difficult.
Primary Habitat:	forest
Dominant Species:	maple

Representative Photo:

Grass Cover (%):	1
Forb Cover (%):	1
Woody Veg Cover (%):	5
Bare Ground (%):	93
Litter Depth (inches):	2
Average Veg Height (inches):	20
Nearest Shrub above Veg Height (distance from observer in meters):	25
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	

Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 2

Transect ID:	T5
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300m
Primary Habitat:	foresr
Dominant Species:	unknown, maple
Representative Photo:	

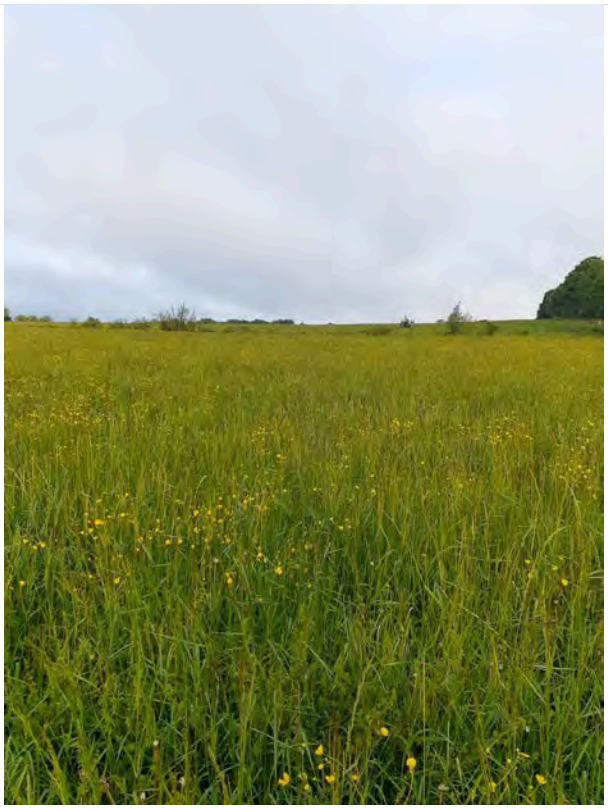
Grass Cover (%):	25
Forb Cover (%):	5
Woody Veg Cover (%):	10
Bare Ground (%):	60
Litter Depth (inches):	1
Average Veg Height (inches):	32

Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 3

Transect ID:	T6
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300m
Primary Habitat:	grassland
Dominant Species:	grass

Representative Photo:



Grass Cover (%):	35
Forb Cover (%):	10
Woody Veg Cover (%):	1
Bare Ground (%):	54
Litter Depth (inches):	1
Average Veg Height (inches):	35
Nearest Shrub above Veg Height (distance from observer in meters):	80
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	

Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 4

Transect ID:	C2
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 0m south end
Primary Habitat:	grassland
Dominant Species:	grass
Representative Photo:	

Grass Cover (%):	20
Forb Cover (%):	15
Woody Veg Cover (%):	5
Bare Ground (%):	60
Litter Depth (inches):	3
Average Veg Height (inches):	25

Nearest Shrub above Veg Height (distance from observer in meters):	20
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 5

Transect ID:	T15
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 0m
Primary Habitat:	forest
Dominant Species:	maple, beech

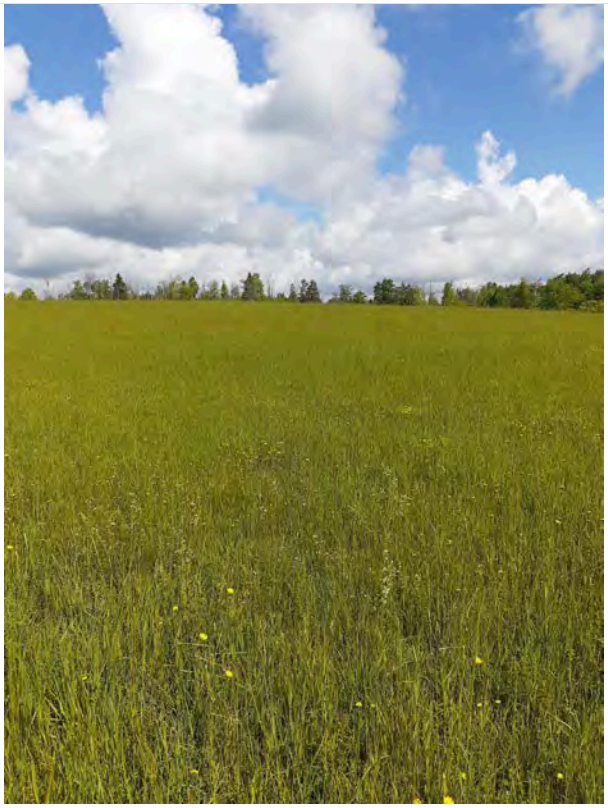
Representative Photo:

Grass Cover (%):	1
Forb Cover (%):	1
Woody Veg Cover (%):	5
Bare Ground (%):	93
Litter Depth (inches):	1
Average Veg Height (inches):	8 and 25ft trees
Nearest Shrub above Veg Height (distance from observer in meters):	25
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	

Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 6

Transect ID:	T14-Alt
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 0m SE side
Primary Habitat:	grassland
Dominant Species:	grass
Representative Photo:	



Grass Cover (%):	55
Forb Cover (%):	5
Woody Veg Cover (%):	1
Bare Ground (%):	39
Litter Depth (inches):	1
Average Veg Height (inches):	25

Nearest Shrub above Veg Height (distance from observer in meters):	250
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Additional Weather Conditions (if necessary) 1

Time:	
Temperature (F):	
Cloud Cover (%):	
Wind Direction (e.g., N, NW, S, SE etc.):	
Wind Speed (mph):	
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	

Weather Conditions at End of Survey

Temperature (F):	71

Cloud Cover (%):	25
Wind Direction (e.g., N, NW, S, SE etc.):	W
Wind Speed (mph):	6
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	10

Additional Notes:

EDR

21028 Hoffman Falls Wind Checklist

Hoffman Falls Wind Breeding Bird Survey 1

Project	21028 Hoffman Falls Wind
ID	158652
Survey Date	06/11/2021
User	Nick Pusateri
Observer(s) Initials:	NP
Project:	21028 Hoffman Falls Wind
Start Time:	05:25 AM
End Time:	10:43 AM

Weather Conditions at Start of Survey

Temperature (F):	58
Cloud Cover (%):	15
Wind Direction (e.g., N, NW, S, SE etc.):	ESE
Wind Speed (mph):	6
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	10

Transect Data 1

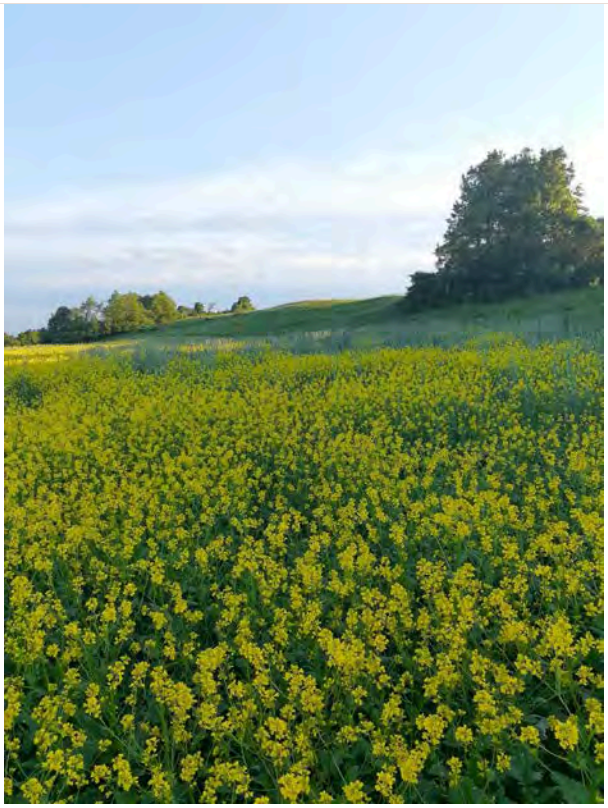
Transect ID:	T8
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300m
Primary Habitat:	farm field
Dominant Species:	unknown

Representative Photo:	
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	

Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 2

Transect ID:	T10
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300m
Primary Habitat:	grassland
Dominant Species:	grass
Representative Photo:	



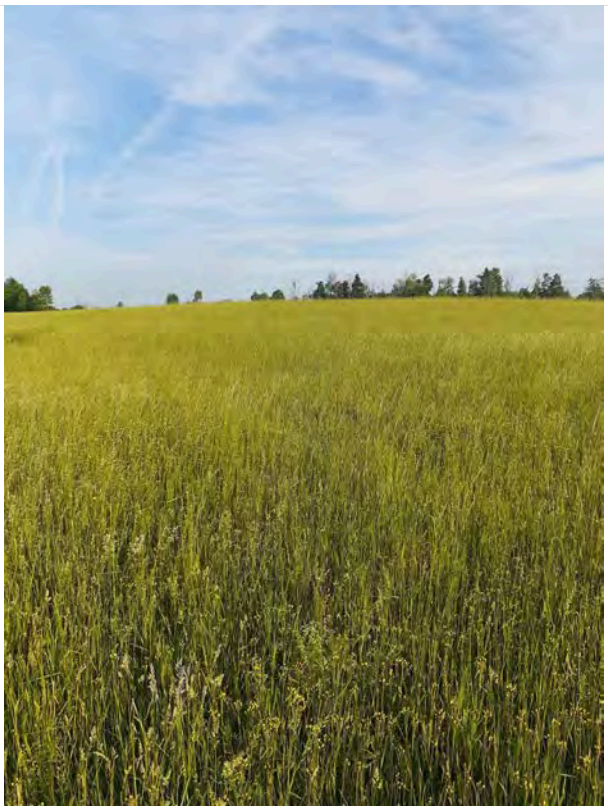
Grass Cover (%):	20
Forb Cover (%):	20
Woody Veg Cover (%):	5
Bare Ground (%):	55
Litter Depth (inches):	1
Average Veg Height (inches):	30

Nearest Shrub above Veg Height (distance from observer in meters):	40
Invasive Species (Common Name and % cover):	
Second Habitat:	cornfield
Dominant Species:	corn
Representative Photo:	

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 3

Transect ID:	T14-A
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	car noise
Notes:	habitat 1 from 0m
Primary Habitat:	grassland
Dominant Species:	grass
Representative Photo:	



Grass Cover (%):	45
Forb Cover (%):	5
Woody Veg Cover (%):	1
Bare Ground (%):	49
Litter Depth (inches):	1
Average Veg Height (inches):	28
Nearest Shrub above Veg Height (distance from observer in meters):	200
Invasive Species (Common Name and % cover):	
Second Habitat:	grassland
Dominant Species:	grass

Representative Photo:	
Grass Cover (%):	20
Forb Cover (%):	25
Woody Veg Cover (%):	5
Bare Ground (%):	50
Litter Depth (inches):	1
Average Veg Height (inches):	30
Nearest Shrub above Veg Height (meters):	20
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 4	
Transect ID:	T12

Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 800m habitat 2 from 100m
Primary Habitat:	grassland
Dominant Species:	grass
Representative Photo:	

Grass Cover (%):	40
Forb Cover (%):	20
Woody Veg Cover (%):	1
Bare Ground (%):	39
Litter Depth (inches):	1
Average Veg Height (inches):	7
Nearest Shrub above Veg Height (distance from observer in meters):	20
Invasive Species (Common Name and % cover):	
Second Habitat:	cornfield
Dominant Species:	corn

Representative Photo:	
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 5

Transect ID:	C1

Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300m
Primary Habitat:	cornfield
Dominant Species:	corn
Representative Photo:	

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	

Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 6

Transect ID:	T4
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300m
Primary Habitat:	forest
Dominant Species:	pine, beech, unknown
Representative Photo:	

Grass Cover (%):	10
Forb Cover (%):	20
Woody Veg Cover (%):	10
Bare Ground (%):	50
Litter Depth (inches):	4
Average Veg Height (inches):	45
Nearest Shrub above Veg Height (distance from observer in meters):	5
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Additional Weather Conditions (if necessary) 1

Time:	
Temperature (F):	
Cloud Cover (%):	
Wind Direction (e.g., N, NW, S, SE etc.):	
Wind Speed (mph):	
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain

	☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	

Weather Conditions at End of Survey	
Temperature (F):	72
Cloud Cover (%):	100
Wind Direction (e.g., N, NW, S, SE etc.):	S
Wind Speed (mph):	7
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	10
Additional Notes:	Much cooler today

EDR

21028 Hoffman Falls Wind Checklist

Hoffman Falls Wind Breeding Bird Survey 1

Project	21028 Hoffman Falls Wind
ID	160143
Survey Date	06/17/2021
User	Nick Pusateri
Observer(s) Initials:	NP
Project:	21028 Hoffman Falls Wind
Start Time:	05:24 AM
End Time:	10:35 AM

Weather Conditions at Start of Survey

Temperature (F):	39
Cloud Cover (%):	10
Wind Direction (e.g., N, NW, S, SE etc.):	WSW
Wind Speed (mph):	4
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	10

Transect Data 1

Transect ID:	C3
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300
Primary Habitat:	grassland
Dominant Species:	unknown grass and forbs

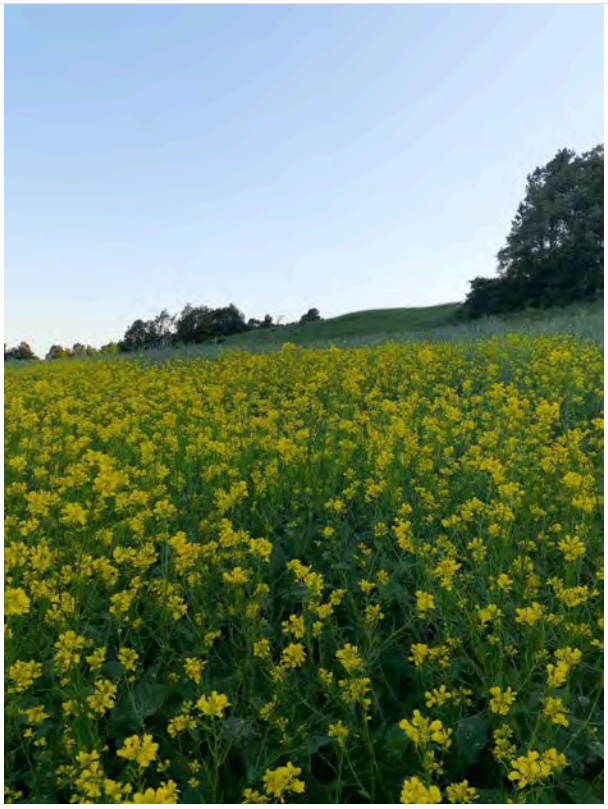
Representative Photo:

Grass Cover (%):	25
Forb Cover (%):	20
Woody Veg Cover (%):	1
Bare Ground (%):	54
Litter Depth (inches):	2
Average Veg Height (inches):	20
Nearest Shrub above Veg Height (distance from observer in meters):	25
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	

Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

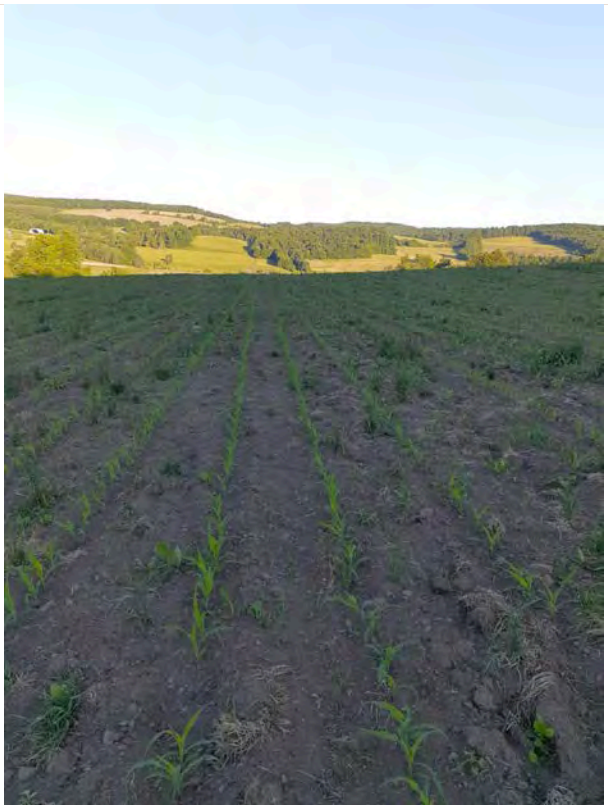
Transect Data 2

Transect ID:	T10
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300 habitat 2 from 100
Primary Habitat:	grassland
Dominant Species:	unknown grasses, birdsfoot trefoil
Representative Photo:	



Grass Cover (%):	30
Forb Cover (%):	20
Woody Veg Cover (%):	1
Bare Ground (%):	49
Litter Depth (inches):	1
Average Veg Height (inches):	32

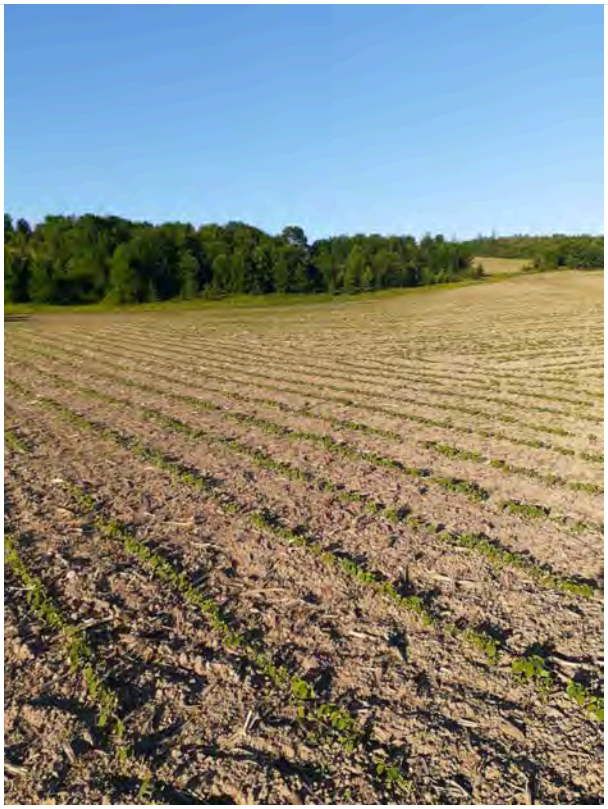
Nearest Shrub above Veg Height (distance from observer in meters):	40
Invasive Species (Common Name and % cover):	
Second Habitat:	cornfield
Dominant Species:	corn
Representative Photo:	



Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 3

Transect ID:	T1
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	habitat 1 from 300
Notes:	
Primary Habitat:	farm field
Dominant Species:	unknown
Representative Photo:	



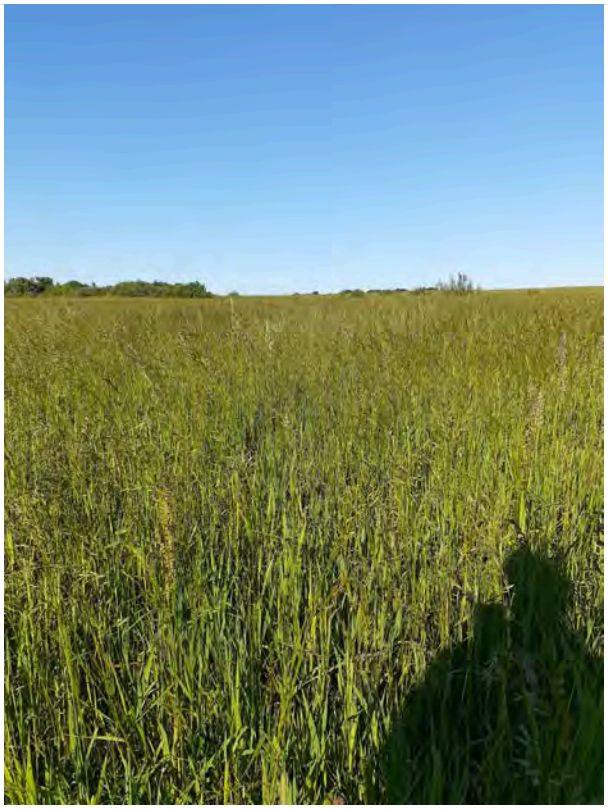
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	

Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 4

Transect ID:	T6
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300
Primary Habitat:	grassland
Dominant Species:	unknown grasses

Representative Photo:

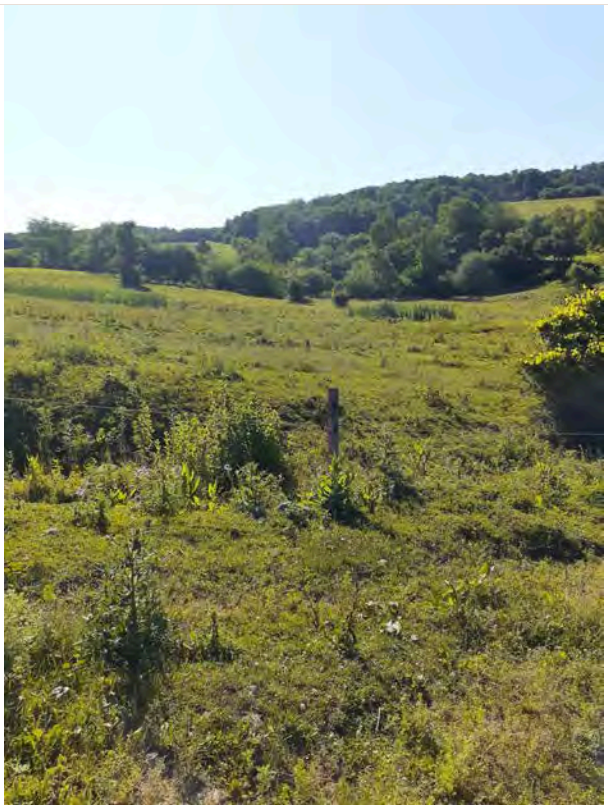


Grass Cover (%):	40
Forb Cover (%):	10
Woody Veg Cover (%):	0
Bare Ground (%):	50
Litter Depth (inches):	2
Average Veg Height (inches):	35
Nearest Shrub above Veg Height (distance from observer in meters):	100
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	

Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 5

Transect ID:	T12
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	farm equipment noise, road noise
Notes:	habitat 1 from 800 habitat 2 from 100
Primary Habitat:	grassland
Dominant Species:	unknown grasses
Representative Photo:	



Grass Cover (%):	40
Forb Cover (%):	15
Woody Veg Cover (%):	5
Bare Ground (%):	40
Litter Depth (inches):	1

Average Veg Height (inches):	6
Nearest Shrub above Veg Height (distance from observer in meters):	10
Invasive Species (Common Name and % cover):	
Second Habitat:	corn field
Dominant Species:	corn
Representative Photo:	

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	

Invasive Species:	

Transect Data 6

Transect ID:	T13
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 500 habitat 2 from 300 habitat 3 from 100
Primary Habitat:	corn field
Dominant Species:	corn
Representative Photo:	

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	forest
Dominant Species:	maple,

Representative Photo:

Grass Cover (%):	1
Forb Cover (%):	5
Woody Veg Cover (%):	10
Bare Ground (%):	84
Litter Depth (inches):	2
Average Veg Height (inches):	12
Nearest Shrub above Veg Height (meters):	20
Invasive Species:	
Third Habitat:	corn field
Dominant Species:	corn

Representative Photo:

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Additional Weather Conditions (if necessary) 1

Time:	01:00 AM
Temperature (F):	
Cloud Cover (%):	
Wind Direction (e.g., N, NW, S, SE etc.):	
Wind Speed (mph):	
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	

Weather Conditions at End of Survey	
Temperature (F):	64
Cloud Cover (%):	5
Wind Direction (e.g., N, NW, S, SE etc.):	W
Wind Speed (mph):	9
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	10
Additional Notes:	A chilly morning below 40 that warmed up to the mid 60s by the end of the survey. Moderately windy and clear skies all day.

EDR

21028 Hoffman Falls Wind Checklist

Hoffman Falls Wind Breeding Bird Survey 1

Project	21028 Hoffman Falls Wind
ID	162302
Survey Date	06/25/2021
User	Max Baber
Observer(s) Initials:	MDB
Project:	21028 Hoffman Falls Wind
Start Time:	05:10 AM
End Time:	09:44 AM

Weather Conditions at Start of Survey

Temperature (F):	61
Cloud Cover (%):	10
Wind Direction (e.g., N, NW, S, SE etc.):	SSE
Wind Speed (mph):	5
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	16

Transect Data 1

Transect ID:	C1
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	Row crop, road
Notes:	
Primary Habitat:	Row crop
Dominant Species:	Corn

Representative Photo:

0m

Grass Cover (%):	30
Forb Cover (%):	0
Woody Veg Cover (%):	0
Bare Ground (%):	70
Litter Depth (inches):	0
Average Veg Height (inches):	12
Nearest Shrub above Veg Height (distance from observer in meters):	160
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	

Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 2

Transect ID:	T8
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	Row crops
Notes:	
Primary Habitat:	Row crop
Dominant Species:	Soy
Representative Photo:	

300m

Grass Cover (%):	70
Forb Cover (%):	10
Woody Veg Cover (%):	0
Bare Ground (%):	20
Litter Depth (inches):	0
Average Veg Height (inches):	3
Nearest Shrub above Veg Height (distance from observer in meters):	57
Invasive Species (Common Name and % cover):	
Second Habitat:	Woodlot
Dominant Species:	Black cherry, goldenrod

Representative Photo:

0m

Grass Cover (%):	5
Forb Cover (%):	80
Woody Veg Cover (%):	60
Bare Ground (%):	10
Litter Depth (inches):	0
Average Veg Height (inches):	36
Nearest Shrub above Veg Height (meters):	1
Invasive Species:	Honeysuckle
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 3

Transect ID:	T11
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	MOWA, NOFL, EAKI
Anthropogenic Disturbance:	
Notes:	
Primary Habitat:	Wetland
Dominant Species:	Goldenrod

Representative Photo:

T11 300m

Grass Cover (%):	0
Forb Cover (%):	95
Woody Veg Cover (%):	15
Bare Ground (%):	0
Litter Depth (inches):	.25
Average Veg Height (inches):	48
Nearest Shrub above Veg Height (distance from observer in meters):	5
Invasive Species (Common Name and % cover):	
Second Habitat:	Grassland
Dominant Species:	Grass sp
Representative Photo:	

T11 200m

Grass Cover (%):	30
Forb Cover (%):	75
Woody Veg Cover (%):	0
Bare Ground (%):	0
Litter Depth (inches):	.1

Average Veg Height (inches):	12
Nearest Shrub above Veg Height (meters):	4
Invasive Species:	
Third Habitat:	Woodlot
Dominant Species:	Beech
Representative Photo:	

T11 0m

Grass Cover (%):	0
Forb Cover (%):	30
Woody Veg Cover (%):	80
Bare Ground (%):	50
Litter Depth (inches):	3
Average Veg Height (inches):	18
Nearest Shrub above Veg Height (meters):	1
Invasive Species:	

Transect Data 4

Transect ID:	T14A
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	TRES, HOWR, Coyote
Anthropogenic Disturbance:	Near mowed track
Notes:	
Primary Habitat:	Grassland
Dominant Species:	Grass sp

Representative Photo:

T14A 0m

Grass Cover (%):	80
Forb Cover (%):	20
Woody Veg Cover (%):	0
Bare Ground (%):	0
Litter Depth (inches):	.25
Average Veg Height (inches):	24
Nearest Shrub above Veg Height (distance from observer in meters):	90
Invasive Species (Common Name and % cover):	
Second Habitat:	Regenerating shrubland
Dominant Species:	Goldenrod
Representative Photo:	

T14A 300m

Grass Cover (%):	5
Forb Cover (%):	100
Woody Veg Cover (%):	0
Bare Ground (%):	0
Litter Depth (inches):	.5

Average Veg Height (inches):	36
Nearest Shrub above Veg Height (meters):	5
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 5

Transect ID:	T16
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	Mowed
Notes:	
Primary Habitat:	Hayfield
Dominant Species:	Grass sp
Representative Photo:	

T16 300m

Grass Cover (%):	90
Forb Cover (%):	10
Woody Veg Cover (%):	0
Bare Ground (%):	0
Litter Depth (inches):	0

Average Veg Height (inches):	6
Nearest Shrub above Veg Height (distance from observer in meters):	60
Invasive Species (Common Name and % cover):	
Second Habitat:	Row crop
Dominant Species:	Corn
Representative Photo:	

T16 200m

Grass Cover (%):	20
Forb Cover (%):	0
Woody Veg Cover (%):	0
Bare Ground (%):	80
Litter Depth (inches):	0
Average Veg Height (inches):	11
Nearest Shrub above Veg Height (meters):	22
Invasive Species:	
Third Habitat:	Woodlot
Dominant Species:	
Representative Photo:	

T16 0m

Grass Cover (%):	20
Forb Cover (%):	80
Woody Veg Cover (%):	40
Bare Ground (%):	5
Litter Depth (inches):	.25
Average Veg Height (inches):	30
Nearest Shrub above Veg Height (meters):	2
Invasive Species:	

Additional Weather Conditions (if necessary) 1

Time:	
Temperature (F):	
Cloud Cover (%):	
Wind Direction (e.g., N, NW, S, SE etc.):	
Wind Speed (mph):	
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	

Weather Conditions at End of Survey

Temperature (F):	65
Cloud Cover (%):	0
Wind Direction (e.g., N, NW, S, SE etc.):	SSE
Wind Speed (mph):	4
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	29

Additional Notes:

EDR

21028 Hoffman Falls Wind Checklist

Hoffman Falls Wind Breeding Bird Survey 1

Project	21028 Hoffman Falls Wind
ID	164739
Survey Date	07/01/2021
User	Nick Pusateri
Observer(s) Initials:	NP
Project:	21028 Hoffman Falls Wind
Start Time:	05:17 AM
End Time:	10:18 AM

Weather Conditions at Start of Survey

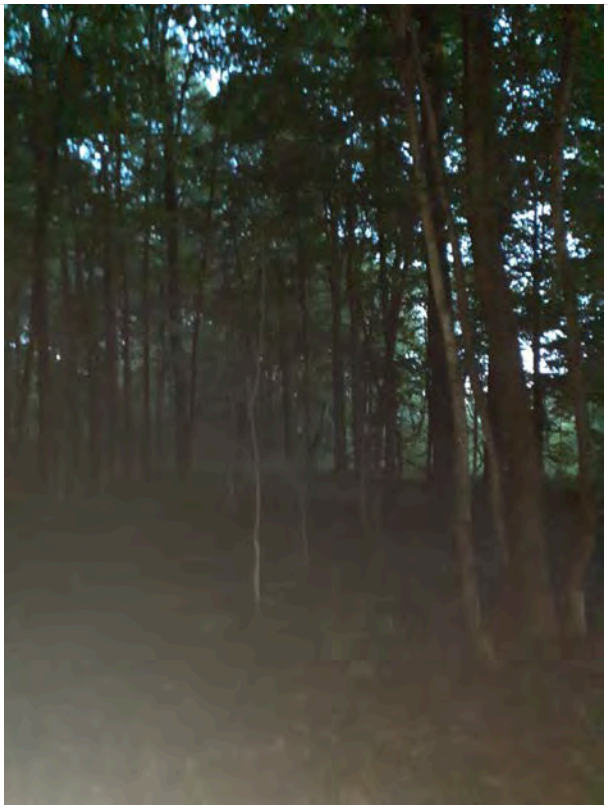
Temperature (F):	64
Cloud Cover (%):	80
Wind Direction (e.g., N, NW, S, SE etc.):	WSW
Wind Speed (mph):	5
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	10

Transect Data 1

Transect ID:	T13
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 500 habitat 2 from 300
Primary Habitat:	cornfield
Dominant Species:	corn

Representative Photo:

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	forest
Dominant Species:	maple, beech, unknown

Representative Photo:	
Grass Cover (%):	5
Forb Cover (%):	5
Woody Veg Cover (%):	5
Bare Ground (%):	85
Litter Depth (inches):	3
Average Veg Height (inches):	6
Nearest Shrub above Veg Height (meters):	5
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 2	
Transect ID:	T12

Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 800 habitat 2 from 100
Primary Habitat:	grassland
Dominant Species:	unknown grass and forbs
Representative Photo:	

Grass Cover (%):	25
Forb Cover (%):	15
Woody Veg Cover (%):	1
Bare Ground (%):	59
Litter Depth (inches):	1
Average Veg Height (inches):	7
Nearest Shrub above Veg Height (distance from observer in meters):	10
Invasive Species (Common Name and % cover):	
Second Habitat:	corn field
Dominant Species:	corn

Representative Photo:	
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 3	
Transect ID:	T6

Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300
Primary Habitat:	grassland
Dominant Species:	unknown grass and forbs
Representative Photo:	

Grass Cover (%):	40
Forb Cover (%):	15
Woody Veg Cover (%):	0
Bare Ground (%):	45
Litter Depth (inches):	2
Average Veg Height (inches):	30
Nearest Shrub above Veg Height (distance from observer in meters):	80
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	

Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 4

Transect ID:	T1
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300
Primary Habitat:	farm field
Dominant Species:	unknown
Representative Photo:	

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 5

Transect ID:	T10
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 0 habitat 2 from 200
Primary Habitat:	corn field
Dominant Species:	corn

Representative Photo:

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	grassland
Dominant Species:	unknown grass and forbs

Representative Photo:	
Grass Cover (%):	30
Forb Cover (%):	15
Woody Veg Cover (%):	1
Bare Ground (%):	54
Litter Depth (inches):	3
Average Veg Height (inches):	7
Nearest Shrub above Veg Height (meters):	150
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 6	
Transect ID:	C3

Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300
Primary Habitat:	grassland
Dominant Species:	unknown grass and forbs
Representative Photo:	

Grass Cover (%):	20
Forb Cover (%):	25
Woody Veg Cover (%):	5
Bare Ground (%):	50
Litter Depth (inches):	2
Average Veg Height (inches):	18
Nearest Shrub above Veg Height (distance from observer in meters):	5
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	

Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Additional Weather Conditions (if necessary) 1

Time:	
Temperature (F):	
Cloud Cover (%):	
Wind Direction (e.g., N, NW, S, SE etc.):	
Wind Speed (mph):	
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	

Weather Conditions at End of Survey

Temperature (F):	72
Cloud Cover (%):	90
Wind Direction (e.g., N, NW, S, SE etc.):	NW
Wind Speed (mph):	4
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	10

EDR

21028 Hoffman Falls Wind Checklist

Hoffman Falls Wind Breeding Bird Survey 1

Project	21028 Hoffman Falls Wind
ID	166987
Survey Date	07/09/2021
User	Max Baber
Observer(s) Initials:	MDB
Project:	21028 Hoffman Falls Wind
Start Time:	05:12 AM
End Time:	10:25 AM

Weather Conditions at Start of Survey

Temperature (F):	65
Cloud Cover (%):	30
Wind Direction (e.g., N, NW, S, SE etc.):	E
Wind Speed (mph):	2
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	10

Transect Data 1

Transect ID:	T16
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	Mowed
Notes:	
Primary Habitat:	Hayfield
Dominant Species:	Grass sp

Representative Photo:

T16 300m

Grass Cover (%):	70
Forb Cover (%):	30
Woody Veg Cover (%):	0
Bare Ground (%):	0
Litter Depth (inches):	.1
Average Veg Height (inches):	11
Nearest Shrub above Veg Height (distance from observer in meters):	60
Invasive Species (Common Name and % cover):	
Second Habitat:	Row crop
Dominant Species:	Corn
Representative Photo:	

T16 200m

Grass Cover (%):	30
Forb Cover (%):	1
Woody Veg Cover (%):	0
Bare Ground (%):	70
Litter Depth (inches):	0

Average Veg Height (inches):	36
Nearest Shrub above Veg Height (meters):	22
Invasive Species:	
Third Habitat:	Woodlot
Dominant Species:	Solidago
Representative Photo:	

T16 0m

Grass Cover (%):	20
Forb Cover (%):	60
Woody Veg Cover (%):	10
Bare Ground (%):	10
Litter Depth (inches):	.25
Average Veg Height (inches):	30
Nearest Shrub above Veg Height (meters):	3
Invasive Species:	

Transect Data 2

Transect ID:	T14A
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	Mowed path nearby
Notes:	
Primary Habitat:	Grassland
Dominant Species:	Grass sp

Representative Photo:

T14A 0m

Grass Cover (%):	80
Forb Cover (%):	30
Woody Veg Cover (%):	0
Bare Ground (%):	0
Litter Depth (inches):	.2
Average Veg Height (inches):	16
Nearest Shrub above Veg Height (distance from observer in meters):	90
Invasive Species (Common Name and % cover):	
Second Habitat:	Regenerating shrubland
Dominant Species:	Solidago
Representative Photo:	

14A 200m

Grass Cover (%):	10
Forb Cover (%):	95
Woody Veg Cover (%):	5
Bare Ground (%):	0
Litter Depth (inches):	.5

Average Veg Height (inches):	36
Nearest Shrub above Veg Height (meters):	5
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 3

Transect ID:	T11
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	ROPI, BOBO, CHSP
Anthropogenic Disturbance:	Sign of tree thinning (stumps, etc; not this season)
Notes:	
Primary Habitat:	Woodlot
Dominant Species:	Maple, jewelweed
Representative Photo:	

T11 0m

Grass Cover (%):	0
Forb Cover (%):	60
Woody Veg Cover (%):	70
Bare Ground (%):	30

Litter Depth (inches):	.5
Average Veg Height (inches):	15
Nearest Shrub above Veg Height (distance from observer in meters):	1
Invasive Species (Common Name and % cover):	
Second Habitat:	Regenerating field
Dominant Species:	Thistle
Representative Photo:	

T11 100m

Grass Cover (%):	20
Forb Cover (%):	85
Woody Veg Cover (%):	0
Bare Ground (%):	0
Litter Depth (inches):	1
Average Veg Height (inches):	36
Nearest Shrub above Veg Height (meters):	23
Invasive Species:	
Third Habitat:	Wetland
Dominant Species:	Forbs, willow

Representative Photo:

T11 300m

Grass Cover (%):	0
Forb Cover (%):	100
Woody Veg Cover (%):	20
Bare Ground (%):	0
Litter Depth (inches):	1
Average Veg Height (inches):	40
Nearest Shrub above Veg Height (meters):	5
Invasive Species:	

Transect Data 4

Transect ID:	T8
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	EAWP, OVEN, CSWA
Anthropogenic Disturbance:	Row crop
Notes:	
Primary Habitat:	Row crop
Dominant Species:	Soy

Representative Photo:

T8 300m

Grass Cover (%):	1
Forb Cover (%):	10
Woody Veg Cover (%):	
Bare Ground (%):	90
Litter Depth (inches):	0
Average Veg Height (inches):	8
Nearest Shrub above Veg Height (distance from observer in meters):	57
Invasive Species (Common Name and % cover):	
Second Habitat:	Woodlot
Dominant Species:	Cherry, solidago
Representative Photo:	

T8 0m

Grass Cover (%):	0
Forb Cover (%):	70
Woody Veg Cover (%):	60
Bare Ground (%):	15
Litter Depth (inches):	1

Average Veg Height (inches):	40
Nearest Shrub above Veg Height (meters):	1
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 5

Transect ID:	C1
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	Road, row crops
Notes:	Road lined by corn to west and wildflowers along stream to east, with corn further to east
Primary Habitat:	Developed, row crops
Dominant Species:	Corn
Representative Photo:	

C1 300m

Grass Cover (%):	20
Forb Cover (%):	20
Woody Veg Cover (%):	0

Bare Ground (%):	60
Litter Depth (inches):	0
Average Veg Height (inches):	36
Nearest Shrub above Veg Height (distance from observer in meters):	100
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Additional Weather Conditions (if necessary) 1

Time:	
Temperature (F):	
Cloud Cover (%):	
Wind Direction (e.g., N, NW, S, SE etc.):	
Wind Speed (mph):	
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	

Weather Conditions at End of Survey	
Temperature (F):	72
Cloud Cover (%):	100
Wind Direction (e.g., N, NW, S, SE etc.):	ESE
Wind Speed (mph):	2
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	10
Additional Notes:	

EDR

21028 Hoffman Falls Wind Checklist

Hoffman Falls Wind Breeding Bird Survey 1

Project	21028 Hoffman Falls Wind
ID	169161
Survey Date	07/15/2021
User	Nick Pusateri
Observer(s) Initials:	NP
Project:	21028 Hoffman Falls Wind
Start Time:	05:24 AM
End Time:	10:24 AM

Weather Conditions at Start of Survey

Temperature (F):	60
Cloud Cover (%):	20
Wind Direction (e.g., N, NW, S, SE etc.):	ESE
Wind Speed (mph):	2
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	heavy fog
Visibility (miles):	.25

Transect Data 1

Transect ID:	C3
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300
Primary Habitat:	grassland
Dominant Species:	unknown grass and forbs

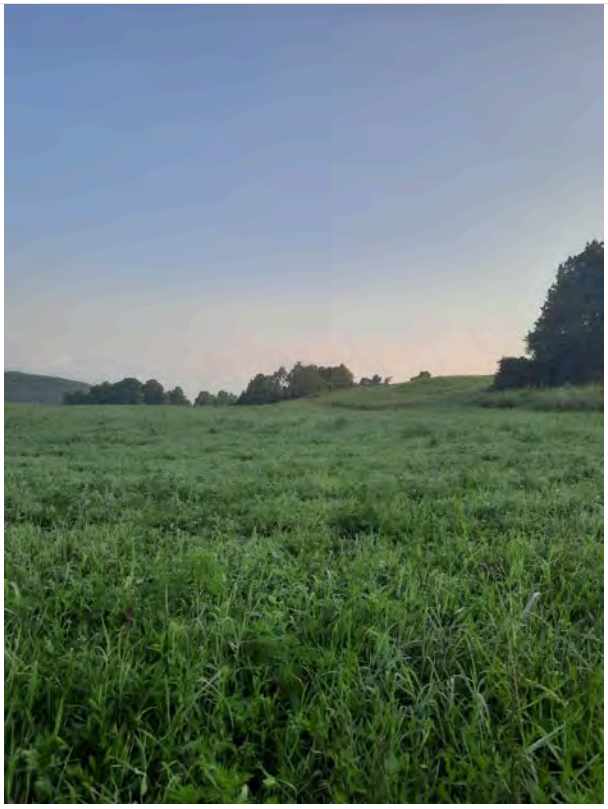
Representative Photo:

Grass Cover (%):	20
Forb Cover (%):	20
Woody Veg Cover (%):	1
Bare Ground (%):	59
Litter Depth (inches):	0
Average Veg Height (inches):	30
Nearest Shrub above Veg Height (distance from observer in meters):	10
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	

Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

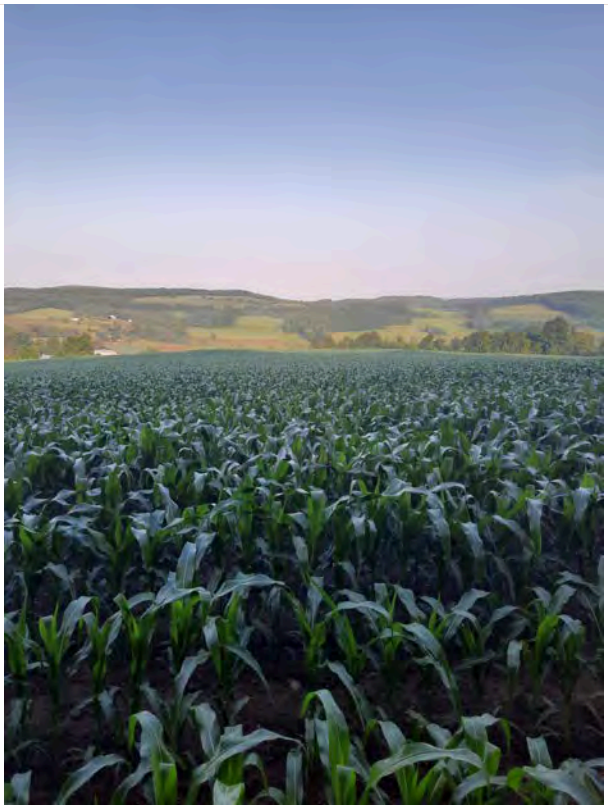
Transect Data 2

Transect ID:	T10
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300 habitat 2 from 0
Primary Habitat:	grassland
Dominant Species:	unknown grass and forbs
Representative Photo:	



Grass Cover (%):	20
Forb Cover (%):	15
Woody Veg Cover (%):	1
Bare Ground (%):	64
Litter Depth (inches):	0
Average Veg Height (inches):	20

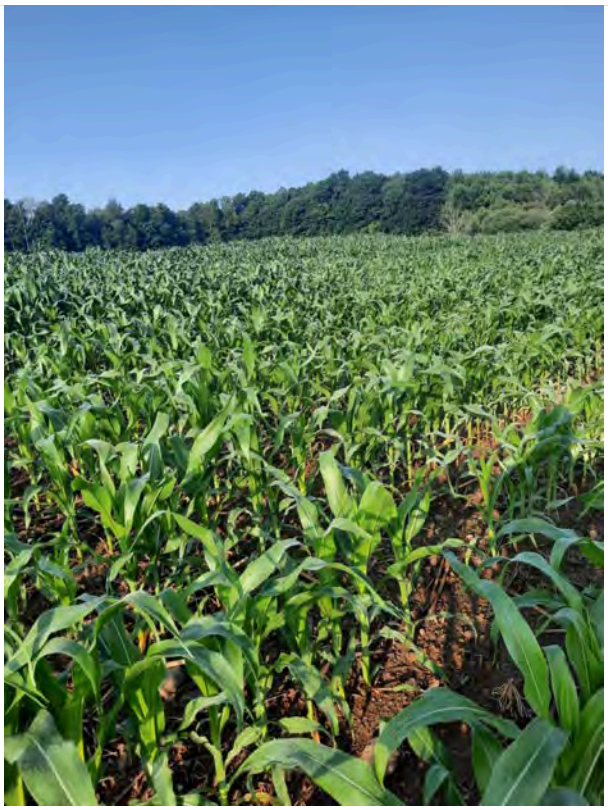
Nearest Shrub above Veg Height (distance from observer in meters):	10
Invasive Species (Common Name and % cover):	
Second Habitat:	corn field
Dominant Species:	corn
Representative Photo:	



Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 3

Transect ID:	T13
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 500 habitat 2 from 300
Primary Habitat:	corn field
Dominant Species:	corn
Representative Photo:	



Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	forest
Dominant Species:	maple

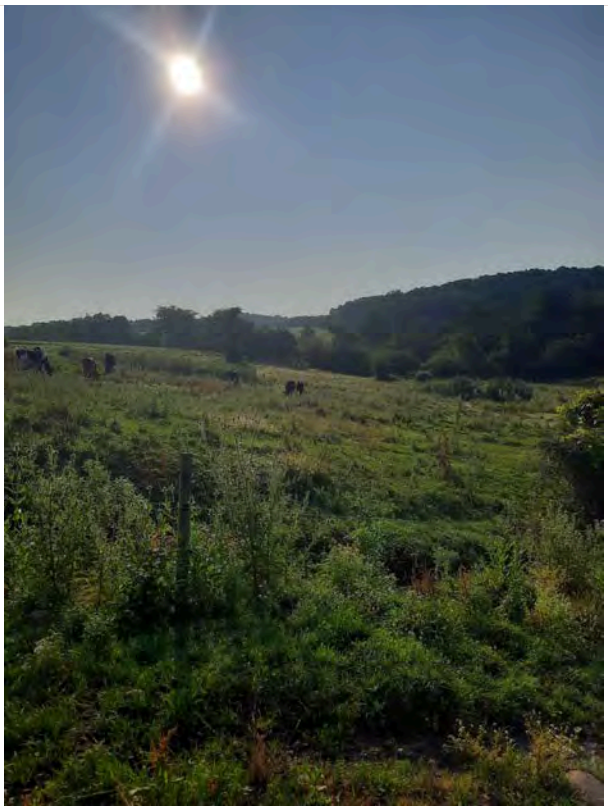
Representative Photo:

Grass Cover (%):	5
Forb Cover (%):	5
Woody Veg Cover (%):	5
Bare Ground (%):	85
Litter Depth (inches):	1
Average Veg Height (inches):	24
Nearest Shrub above Veg Height (meters):	10
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 4

Transect ID:	T12

Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 800 habitat 2 from 100
Primary Habitat:	grassland
Dominant Species:	unknown forbs and grasses
Representative Photo:	



Grass Cover (%):	20
Forb Cover (%):	10
Woody Veg Cover (%):	1
Bare Ground (%):	69
Litter Depth (inches):	0
Average Veg Height (inches):	10
Nearest Shrub above Veg Height (distance from observer in meters):	20
Invasive Species (Common Name and % cover):	
Second Habitat:	corn field
Dominant Species:	corn

Representative Photo:	
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 5	
Transect ID:	T6

Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300
Primary Habitat:	grassland
Dominant Species:	unknown grass and forbs
Representative Photo:	

Grass Cover (%):	20
Forb Cover (%):	15
Woody Veg Cover (%):	0
Bare Ground (%):	65
Litter Depth (inches):	3
Average Veg Height (inches):	32
Nearest Shrub above Veg Height (distance from observer in meters):	100
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	

Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 6

Transect ID:	T1
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	
Notes:	habitat 1 from 300
Primary Habitat:	farm field
Dominant Species:	unknown
Representative Photo:	

Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Additional Weather Conditions (if necessary) 1

Time:	
Temperature (F):	
Cloud Cover (%):	
Wind Direction (e.g., N, NW, S, SE etc.):	
Wind Speed (mph):	
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain

	☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	

Weather Conditions at End of Survey

Temperature (F):	74
Cloud Cover (%):	20
Wind Direction (e.g., N, NW, S, SE etc.):	SE
Wind Speed (mph):	5
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	10
Additional Notes:	heavy fog in morning until about 7:00AM

EDR

21028 Hoffman Falls Wind Checklist

Hoffman Falls Wind Breeding Bird Survey 1

Project	21028 Hoffman Falls Wind
ID	170179
Survey Date	07/20/2021
User	Max Baber
Observer(s) Initials:	MDB
Project:	21028 Hoffman Falls Wind
Start Time:	05:08 AM
End Time:	10:23 AM

Weather Conditions at Start of Survey

Temperature (F):	64
Cloud Cover (%):	100
Wind Direction (e.g., N, NW, S, SE etc.):	W
Wind Speed (mph):	2
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☒ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	Fog
Visibility (miles):	1

Transect Data 1

Transect ID:	C1
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	Road, row crop
Notes:	
Primary Habitat:	Developed/row crop
Dominant Species:	Corn

Representative Photo:

0M

Grass Cover (%):	10
Forb Cover (%):	10
Woody Veg Cover (%):	0
Bare Ground (%):	80
Litter Depth (inches):	0
Average Veg Height (inches):	48
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	

Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 2

Transect ID:	T8
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	Row crop, two track road
Notes:	
Primary Habitat:	Row crop
Dominant Species:	Soy
Representative Photo:	

300M

Grass Cover (%):	1
Forb Cover (%):	15
Woody Veg Cover (%):	0
Bare Ground (%):	84
Litter Depth (inches):	0
Average Veg Height (inches):	8
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	Woodlot
Dominant Species:	Aster, cherry

Representative Photo:

0M

Grass Cover (%):	0
Forb Cover (%):	70
Woody Veg Cover (%):	25
Bare Ground (%):	5
Litter Depth (inches):	1
Average Veg Height (inches):	40
Nearest Shrub above Veg Height (meters):	2
Invasive Species:	Honeysuckle
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 3

Transect ID:	T11
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	RTHU
Anthropogenic Disturbance:	
Notes:	
Primary Habitat:	Wetland
Dominant Species:	Sensitive fern, willow

Representative Photo:

300M

Grass Cover (%):	0
Forb Cover (%):	80
Woody Veg Cover (%):	20
Bare Ground (%):	0
Litter Depth (inches):	.5
Average Veg Height (inches):	36
Nearest Shrub above Veg Height (distance from observer in meters):	3
Invasive Species (Common Name and % cover):	Multiflora rose 5%
Second Habitat:	Regenerating field
Dominant Species:	Solidago, thistle

Representative Photo:

200M

Grass Cover (%):	10
Forb Cover (%):	85
Woody Veg Cover (%):	0
Bare Ground (%):	5
Litter Depth (inches):	.25

Average Veg Height (inches):	24
Nearest Shrub above Veg Height (meters):	4
Invasive Species:	
Third Habitat:	Woodlot
Dominant Species:	Beech, jewelweed
Representative Photo:	

0M

Grass Cover (%):	0
Forb Cover (%):	30
Woody Veg Cover (%):	80
Bare Ground (%):	60
Litter Depth (inches):	1.5
Average Veg Height (inches):	30
Nearest Shrub above Veg Height (meters):	2
Invasive Species:	

Transect Data 4

Transect ID:	T14A
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	Partially mowed
Notes:	
Primary Habitat:	Hayfield
Dominant Species:	Grass sp

Representative Photo:

0M

Grass Cover (%):	80
Forb Cover (%):	25
Woody Veg Cover (%):	0
Bare Ground (%):	0
Litter Depth (inches):	.1
Average Veg Height (inches):	30
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	Regenerating field
Dominant Species:	Solidago
Representative Photo:	

200M

Grass Cover (%):	10
Forb Cover (%):	100
Woody Veg Cover (%):	0
Bare Ground (%):	0
Litter Depth (inches):	.75

Average Veg Height (inches):	36
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	
Dominant Species:	
Representative Photo:	None
Grass Cover (%):	
Forb Cover (%):	
Woody Veg Cover (%):	
Bare Ground (%):	
Litter Depth (inches):	
Average Veg Height (inches):	
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Transect Data 5

Transect ID:	T16
Incidental Species Alpha Codes (if showing breeding behavior denote behavior code):	
Anthropogenic Disturbance:	Mowed, row crop
Notes:	
Primary Habitat:	Hayfield
Dominant Species:	Grass sp
Representative Photo:	

300M

Grass Cover (%):	60
Forb Cover (%):	40
Woody Veg Cover (%):	0
Bare Ground (%):	0
Litter Depth (inches):	.25

Average Veg Height (inches):	12
Nearest Shrub above Veg Height (distance from observer in meters):	
Invasive Species (Common Name and % cover):	
Second Habitat:	Row crop
Dominant Species:	Corn
Representative Photo:	

200M

Grass Cover (%):	60
Forb Cover (%):	0
Woody Veg Cover (%):	0
Bare Ground (%):	40
Litter Depth (inches):	0
Average Veg Height (inches):	60
Nearest Shrub above Veg Height (meters):	
Invasive Species:	
Third Habitat:	Woodlot
Dominant Species:	
Representative Photo:	

0M

Grass Cover (%):	20
Forb Cover (%):	80
Woody Veg Cover (%):	40
Bare Ground (%):	0
Litter Depth (inches):	.25
Average Veg Height (inches):	30
Nearest Shrub above Veg Height (meters):	
Invasive Species:	

Additional Weather Conditions (if necessary) 1

Time:	
Temperature (F):	
Cloud Cover (%):	
Wind Direction (e.g., N, NW, S, SE etc.):	
Wind Speed (mph):	
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	

Weather Conditions at End of Survey

Temperature (F):	73
Cloud Cover (%):	100
Wind Direction (e.g., N, NW, S, SE etc.):	WNW
Wind Speed (mph):	3
Precipitation Code(s):	☐ D = Drizzle ☐ H = Hail ☐ O = Other (write in) ☐ R= Rain ☐ SL = Sleet
"Other" Precipitation Notes	
Visibility (miles):	6

Additional Notes:

APPENDIX D

Breeding Bird Survey Observations

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.

This appendix has been redacted from this publicly available document because it contains protected/confidential information regarding species listed as endangered, threatened, or special concern in New York.