



Appendix 12-B(1): Hecate Cider Solar Farm Breeding Grassland Bird Survey



Hecate Cider Solar Farm

Breeding Grassland Bird Survey

October 14, 2020

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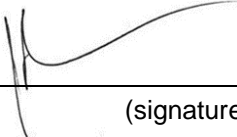
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HECATE CIDER SOLAR FARM

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HECATE CIDER SOLAR FARM

Introduction

1.0 INTRODUCTION

Hecate Energy, LLC (Hecate) is proposing the Cider Solar Farm (the Project), an up to 500-megawatt (MW) solar facility to be located on approximately 3,750 acres of private land (focus area) in the Towns of Elba and Oakfield in Genesee County, New York. Hecate retained Stantec Consulting Services Inc. (Stantec) to conduct breeding bird surveys (BBS) for the Project.

Stantec conducted a BBS to assess baseline use of the Project Site by breeding birds. Breeding bird surveys were targeted in the Project's participant lands (focus area) known at the time of the survey, which occur within the Project Site (**Figure 1**). The Project Site is located north-centrally within Genesee County, approximately five miles north of the City of Batavia. It is roughly bound by County Route 9/Albion Road to the west, Miller Road and vacant land to the east. Lockport Road bisects the Project Site from east to west, while State Route 98 traverses the eastern portion of the Project Site. The Villages of Oakfield and Elba are located approximately 1.5 miles and 0.7 miles (respectively) south of the Project Site southern boundary.

The Project is located in an area generally characterized by active agriculture and rural residential land interspersed with sparsely forested areas/hedgerows with level to rolling topography. The proposed Project Site, as shown in **Figure 1**, includes approximately 7,845 acres of land. Not all of the land included in the Project Site will be included in the final Project footprint; rather, the Project Site represents the broader area within which selected areas will be surveyed, micrositied, and developed with solar panels and related infrastructure. This provides flexibility during project development to minimize impacts to natural and cultural resources, and other sensitive resources.

The Project will consist of the following components:

- Arrays of PV panels mounted on single axis tracking or fixed tilt structures;
- Inverters to convert DC electricity to AC electricity;
- Electrical collections system between the panel arrays;
- A new planned substation to deliver power to an existing onsite transmission facility;
- Access roads which will be approximately 15 to 20 feet wide;
- Fencing which will be approximately 6 feet and 8 feet high; and
- Temporary on-site laydown areas for equipment staging during construction

The proposed Point of Interconnection(s) (POI) will be on the NYPA Dysinger – New Rochester 345kV line. The planned substation will be sited on private land located within the Project Site.

Based on conversations with Hecate, woodland and wetland areas will be avoided to the extent possible by the Project; hence, impacts to listed and conservation concern avian species occupying such habitats are expected to be minimal. The Project is expected to be developed primarily on agricultural land in the Project Site, meaning that impacts to grassland bird species are of primary concern. Further, the entire Project Site is within Grassland "Focus Area 1" of the New York State Department of Environmental Conservation (NYSDEC) Landowner Incentive Program. Consequently, this survey emphasizes the



HECATE CIDER SOLAR FARM

Introduction

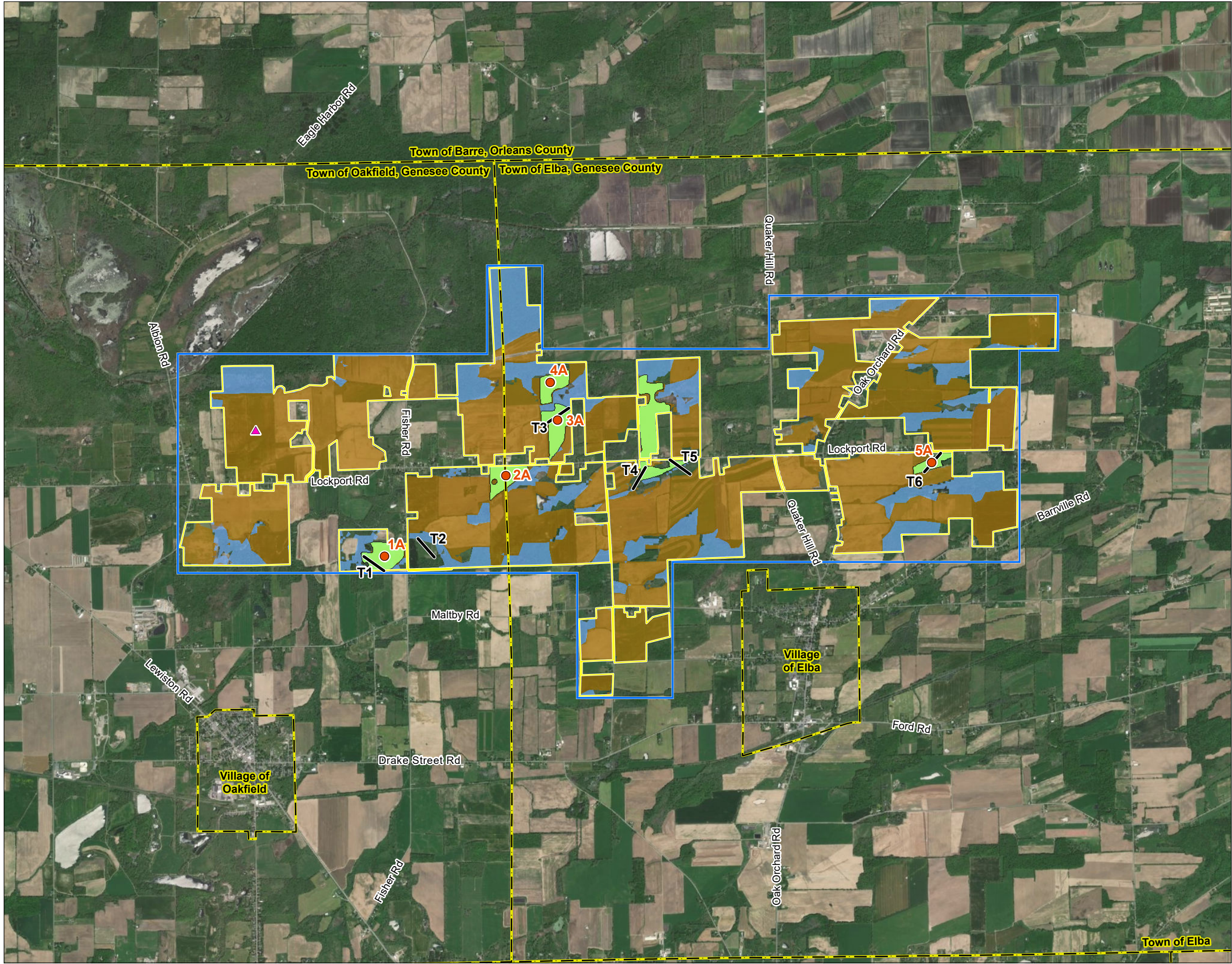
detection of breeding grassland species. However, any incidentally observed avian species were recorded.

Field efforts were conducted as described in the work plans for grassland bird surveys (Stantec 2020). The Project's grassland bird surveys aligned with NYSDEC's Survey Protocol for State-listed Breeding Grassland Bird Species Draft – 2015 (NYSDEC 2015 Protocols) (NYSDEC 2015a). These Protocols represent NYSDEC's most recent publication on avian survey methodologies in grassland habitats.

The following sections outline the objectives, survey methodology, and results for the survey.

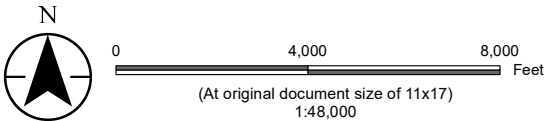


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Legend

- Project Site
- Focus Area
- Osprey Nest
- Point Count Station
- Transect
- Municipal Boundary
- Grassland Habitat
(Area > 10 acres)
- NLCD Land Cover Classification
 - Cultivated Crops
 - Woody Wetlands



Notes
1. Coordinate System: NAD 1983 StatePlane New York West FIPS 3103 Feet
2. Data Sources: NYS Office of Information Technology Services GPO, NYS City and Town Boundaries, 2018; USGS NLCD 2016 Land Cover Conterminous US, 2019
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.



Project Location
Towns of Elba and Oakfield
Genesee County, NY

Prepared by EE on 2020-08-10
TR by CA on 2020-08-12
IR Review by DB on 2020-08-12

Client/Project
Hecate Energy
Cider Solar

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Figure No.
1

Title
Project Site

2.0 METHODS

2.1 OBJECTIVES

The BBS assessed the following within grassland (native and modified) habitats in the Project Site:

- Species observed by sight and sound, including behavior;
- Relative abundance; and
- Distribution.

2.2 FIELD SURVEY

Prior to undertaking the BBS for the Project, Stantec submitted a BBS Survey Plan, based on NYSDEC's Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects (NYSDEC 2016 Guidelines), to NYSDEC for their review (Stantec 2020). Based on NYSDEC's feedback, the Project's BBS Survey Plan was amended to follow the NYSDEC 2015 Protocols (NYSDEC 2015a). As a result, the BBS for the Project were conducted using two methods: (1) transect surveys and (2) point count and meander surveys.

Fieldwork was performed by a qualified Stantec biologist familiar with New York State birds by sight and sound.

2.2.1 Survey Timing

According to the NYSDEC Protocols (2015), BBS are undertaken during the breeding season which occurs from 20 May to 20 July. Further, the NYSDEC Protocols (2015) recommend one survey visit in late May, two in June, and one in July. Stantec had initially planned to conduct weekly surveys during this period. However, given COVID-19 related restrictions and unseasonably cold weather during the month of May, Stantec conducted surveys from 1 June to 20 July (i.e., two in June, two in July).

Overall, Stantec performed two survey visits in early June for the transect surveys, and four survey visits in June and July for the point count surveys.

2.2.2 Transect Surveys

For the transect surveys based on the NYSDEC Guidelines (2016), Stantec proposed to survey six transects, each 300 meters (m) in length (**Figure 2**). The siting of these transects was based on a preliminary habitat assessment, and subsequently updated as the survey proceeded. The five identified grassland areas were well distributed throughout the Project Site, allowing the six transects to provide good overall coverage of the Project Site (**Figure 2**). The biologist was to survey all six transects at each weekly survey, such that each transect was surveyed at least four times during the 1 June to 30 June period. To the extent possible, surveys were scheduled for days projected to have weather for auditory and visual detection of birds. Excessively foggy, rainy, windy, or cold days were avoided.



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Methods

The location of each transect was determined using aerial imagery of the Project and plotted with a Global Positioning System (GPS). The final location of each transect was confirmed during the first visit and recorded with GPS.

Four stationary points, established by GPS, were located at 100 m intervals along each transect (i.e. 0 m, 100 m, 200 m, and 300 m) (Figure 2). Thus, there were 24 stationary points in total for the Site. The biologist surveyed each stationary point for ten minutes and recorded all avian species heard and/or seen; only birds observed during the first 5 minutes were included in the analysis (birds recorded between 5 to 10 minutes were incidentals). The following data were collected at each stationary point:

- Start and end time of the survey period
- Weather including temperature, wind speed, wind direction, and cloud cover
- Species identification and number of individuals
- Approximate distance from observer (i.e., <50 m, 50-100 m, >100 m)
- Mode of species detection (visual or auditory)
- Behavior (nesting, flying, perching, singing, etc.)
- Possible distractions to the observer (e.g., tree-cutting, mowing, vehicle) that may have limited the detection of birds during the survey period

Following NYSDEC 2016 Guidelines, surveys were conducted between first light and approximately 10:00 AM.

2.2.3 Point Count and Meander Surveys

As stated in the Introduction, the BBS methods were updated following discussions with NYSDEC. The following describes the BBS methods using the NYSDEC Protocols (2015).

For the point count and meander surveys, Stantec surveyed each suitable grassland area (patch) that was larger than 10 acres within the Project Site (**Figure 3**). The survey resulted in identifying five grassland areas. The siting of these point counts was based on a preliminary habitat assessment, and subsequently updated as the survey proceeded. The five grassland areas were well distributed throughout the Project Site, allowing the five-point count stations to provide good overall coverage of the Site (**Figure 3**). The biologist surveyed all identified grassland areas during each survey period. Each point count was surveyed four times during the 1 June to 20 July period. To the extent possible, surveys were scheduled for days projected to have weather for auditory and visual detection of birds. Excessively foggy, rainy, windy (i.e., sustained winds at greater than 10-12 mph), or cold days were avoided.

Point count stations, established by GPS, were located at minimum 250 m from adjacent point count stations (**Figure 3**), and 100 m from obstructions (e.g., forests, hedgerows). Each point count station had a 100-m detection radius (observations beyond 100 m were recorded separately as incidentals). The biologist surveyed each stationary point for five minutes (following a 1-2 minute silent period) and recorded all avian species heard and/or seen. The following data was collected at each stationary point:

- Observer name(s), site name, patch name, point count station number
- Start and end time of the survey period



HECATE CIDER SOLAR FARM

Methods

- Weather including temperature, wind speed, wind direction, and cloud cover
- Species identification and number of individuals (<5, 6-10, or > 10, but if possible actual number)
- Approximate distance from observer (i.e., <50 m, 50-100 m, >100 m)
- Mode of species detection (visual or auditory)
- Behavior (nesting, flying, perching, singing, carrying food or fecal sacs, territorial/aggressive/courtship displays, etc.);
- Possible distractions to the observer (e.g., tree-cutting, mowing, vehicle) that may have limited the detection of birds during the survey period

Following NYSDEC Protocols (2015), surveys were conducted between 30 minutes before sunrise and approximately 10:30 AM. No evening surveys were planned as there is no known Henslow's sparrow habitat within the Project Site. The timing of each point count was alternated each survey period. Survey periods were separated by at least seven days.

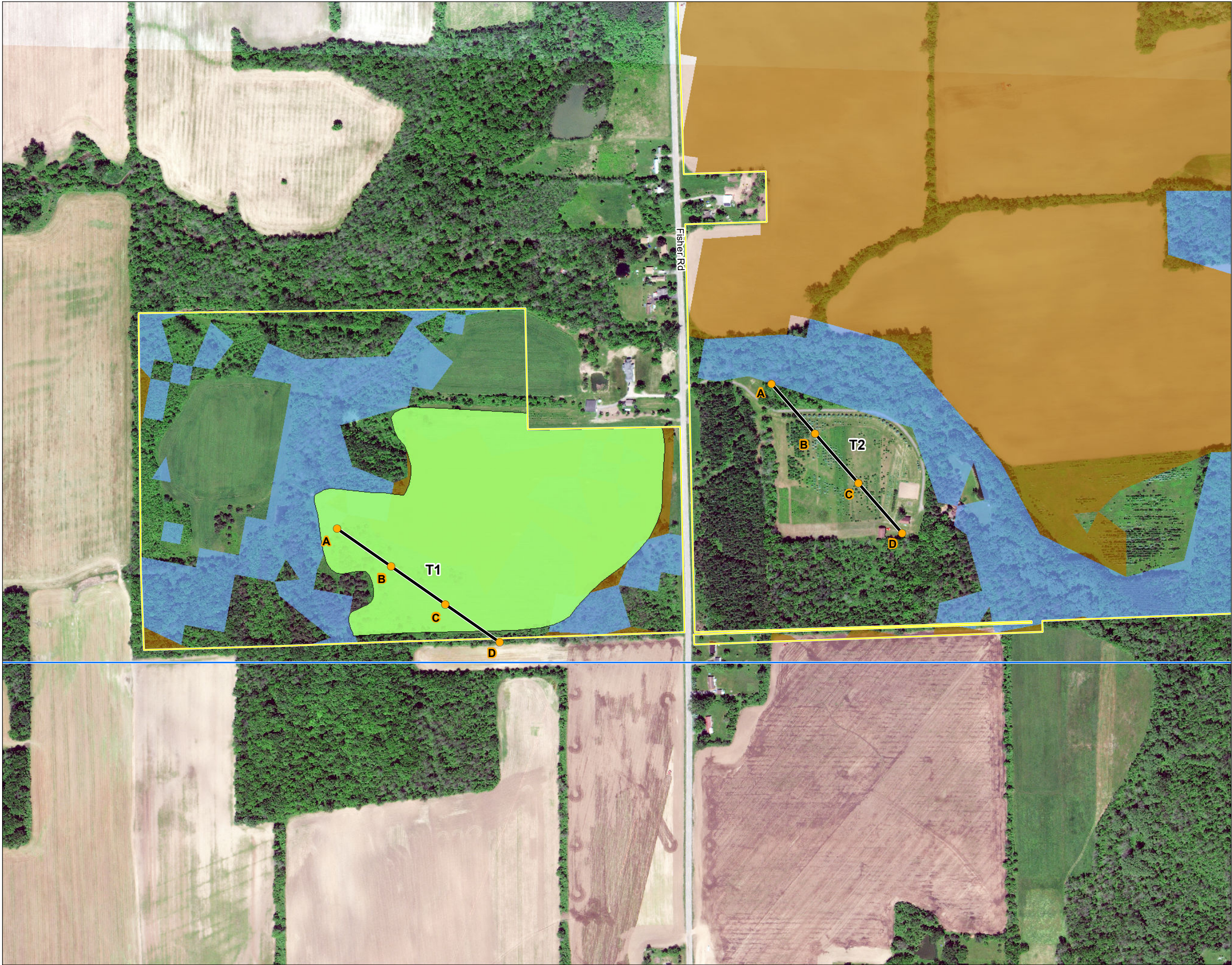
As per NYSDEC guidance, documentation of behavioral observations of threatened and endangered species were as specific as possible, particularly when attempting to identify potential nest locations.

The location of each point count station was determined using aerial imagery of the Project and plotted with a GPS. The final location of each point count was confirmed during the first visit and recorded with GPS. In addition to bird observations, site description information was collected at each point count station, including:

- Patch size
- Habitat type
- Distance from trail or road
- Distance from hedgerow or wood line
- Vegetation measurements within 25 m of station as follows:
 - Percent cover of each vegetation type (i.e., grass, forb, etc.)
 - Dominant grass and forb
 - Percent bare
 - Average vegetation height
 - Litter depth
 - Nearest shrub above vegetation height
 - Presence of invasive species

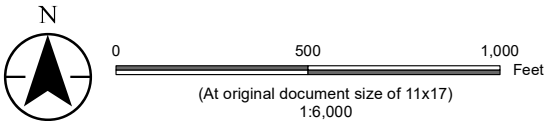
When travelling between point count stations on foot, qualitative incidental observations were recorded via meander surveys. Meander surveys focused only on recording species identification and number of individuals.



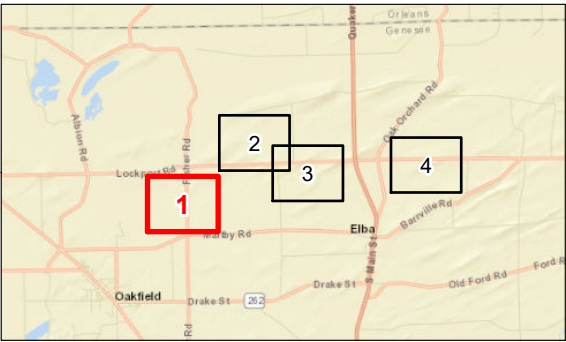


Legend

- Project Site
- Focus Area
- Stationary Point
- Transect
- Municipal Boundary
- Grassland Habitat (Area > 10 acres)
- NLCD Land Cover Classification
 - Cultivated Crops
 - Woody Wetlands



- Notes**
1. Coordinate System: NAD 1983 StatePlane New York West FIPS 3103 Feet
 2. Data Sources: NYS Office of Information Technology Services GPO, NYS City and Town Boundaries, 2018; USGS NLCD 2016 Land Cover Conterminous US, 2019
 3. Background: WorldView-3 satellite imagery purchased on June 6, 2020



Project Location
Town of Oakfield
Genesee County, NY

Prepared by EE on 2020-08-10
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IR Review by DB on 2020-08-12

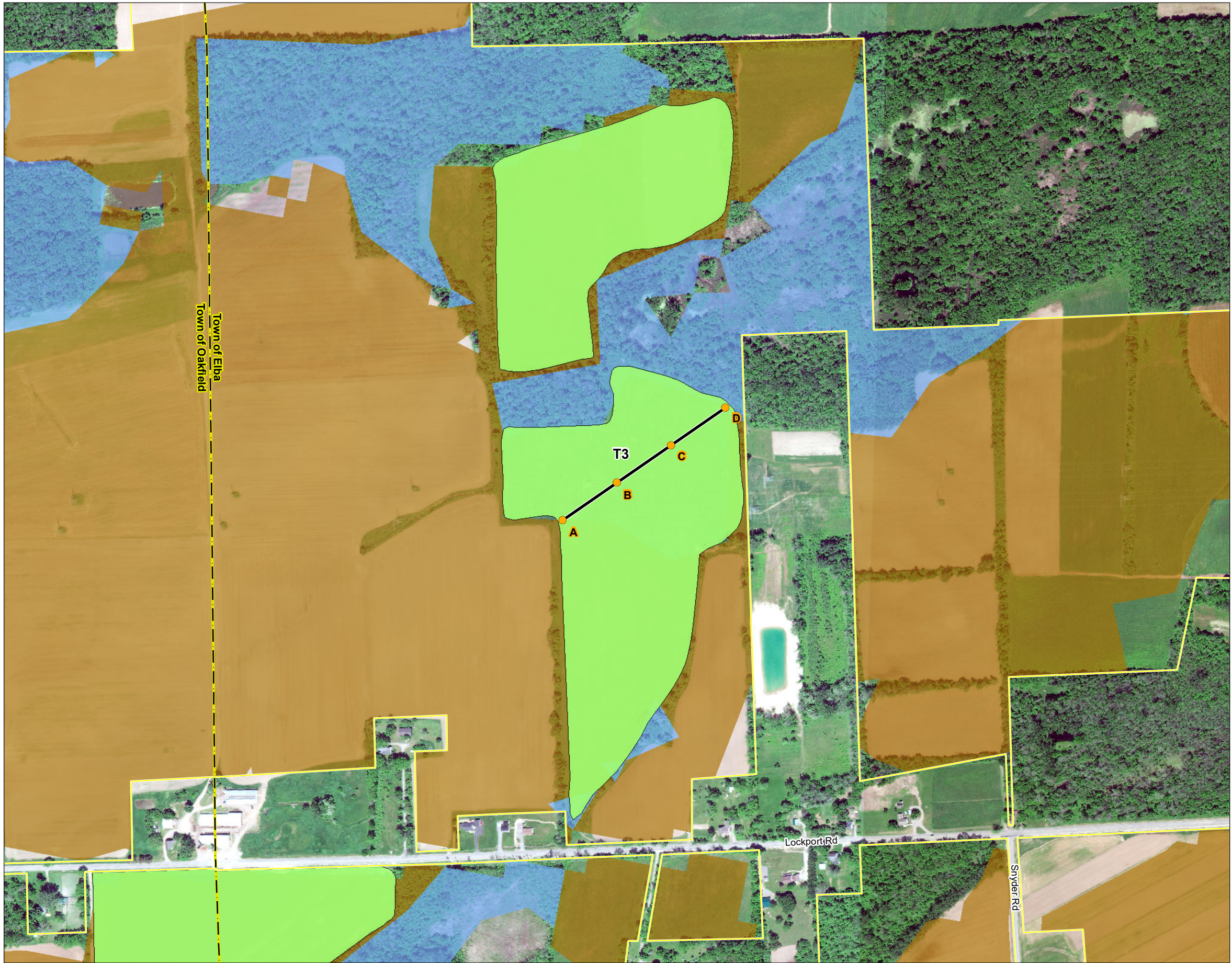
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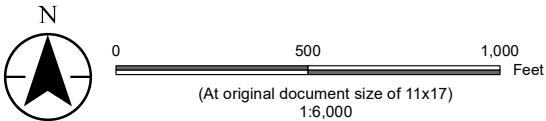
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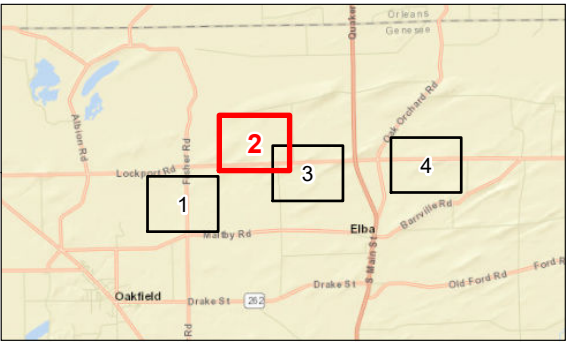


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Project Location
Town of Elba
Genesee County, NY

Prepared by EE on 2020-08-10
TR by CA on 2020-08-12
IR Review by DB on 2020-08-12

Client/Project
Hecate Energy
Cider Solar

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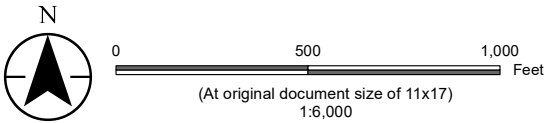
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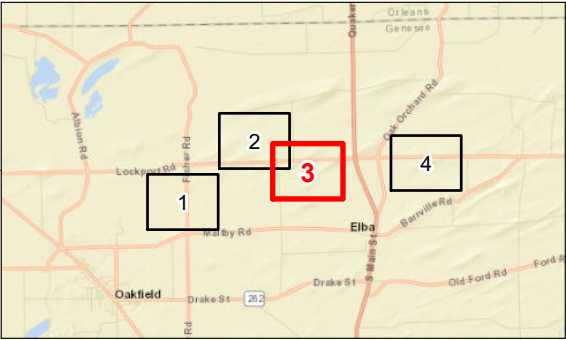


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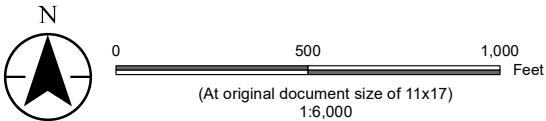
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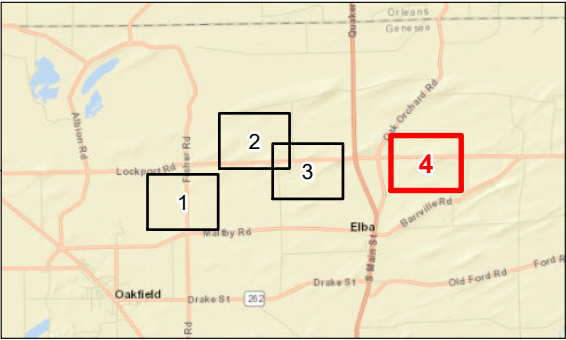


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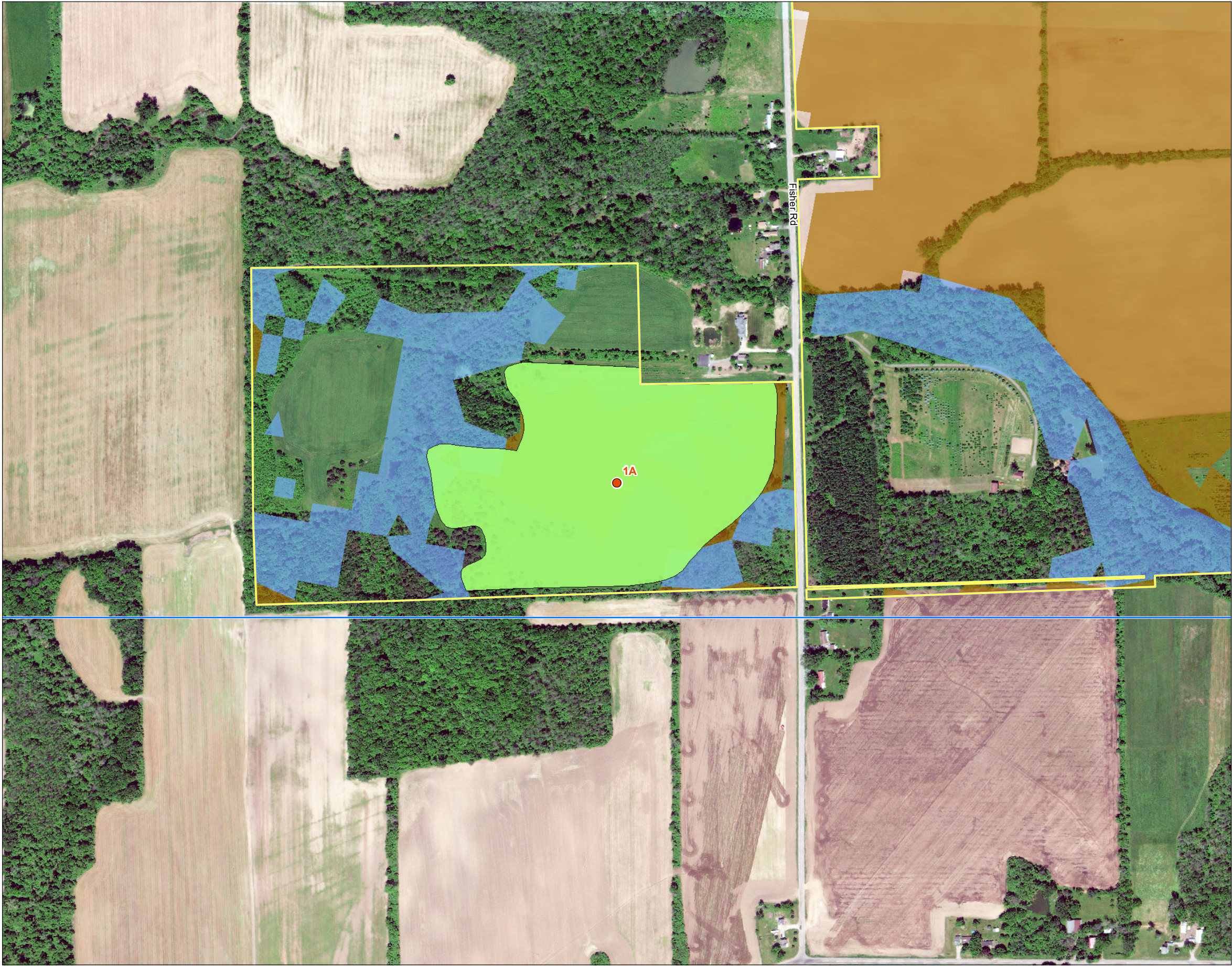
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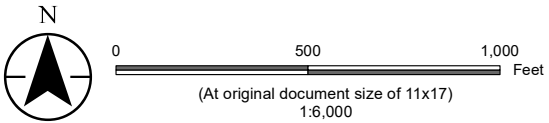
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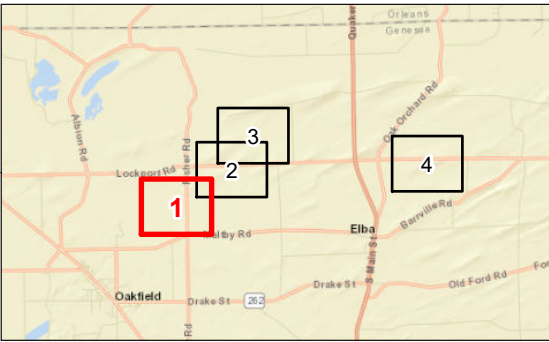


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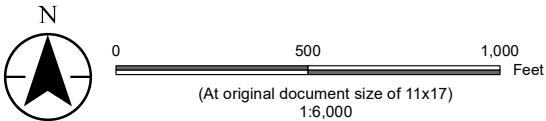
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Breeding Bird Point Count Surveys

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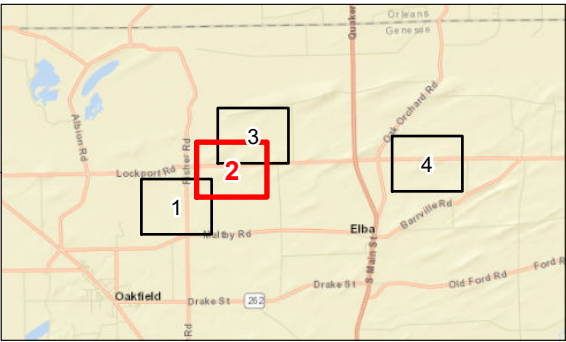


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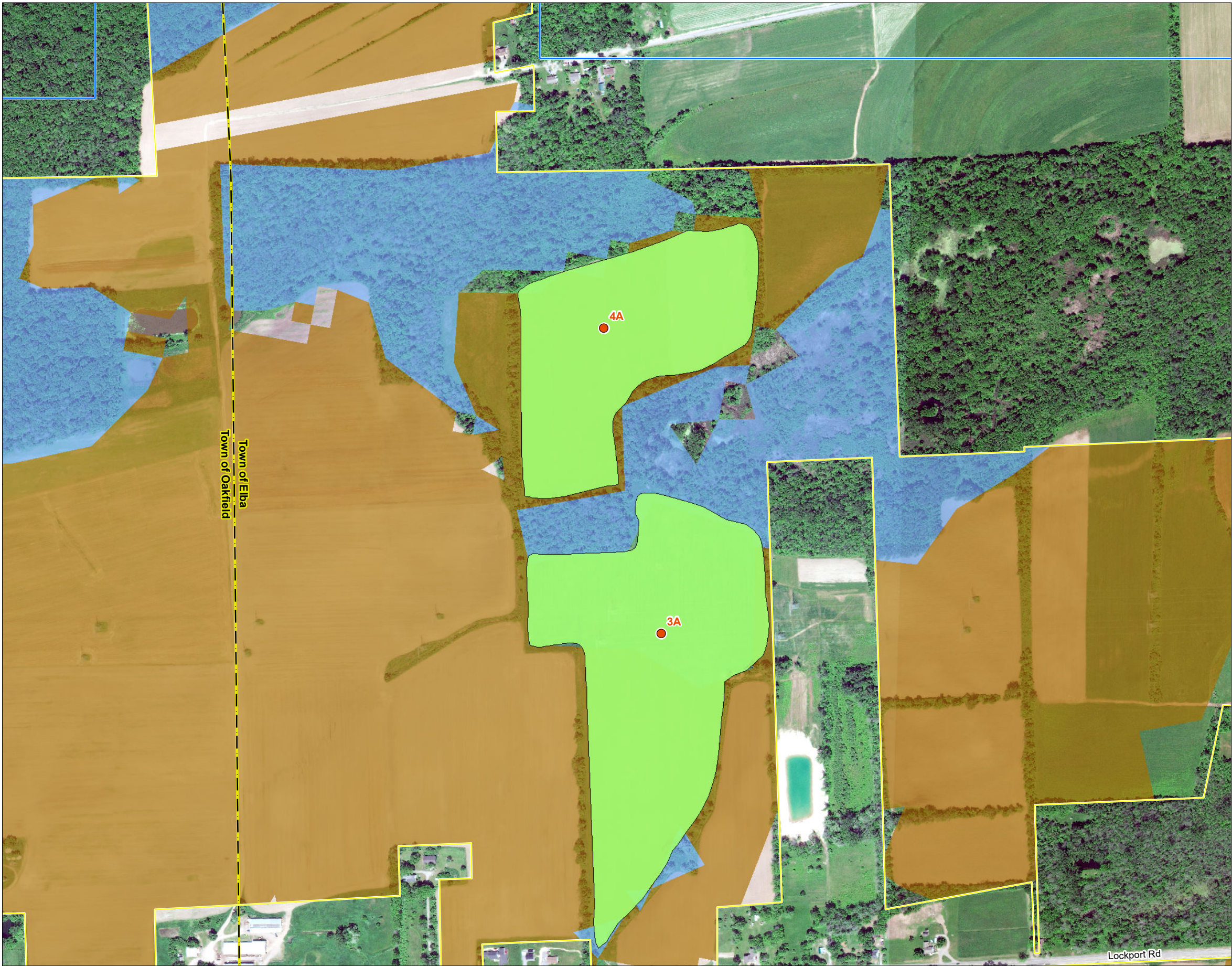
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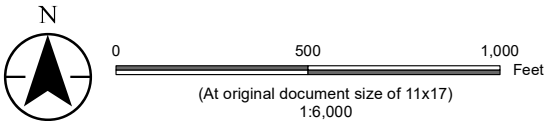
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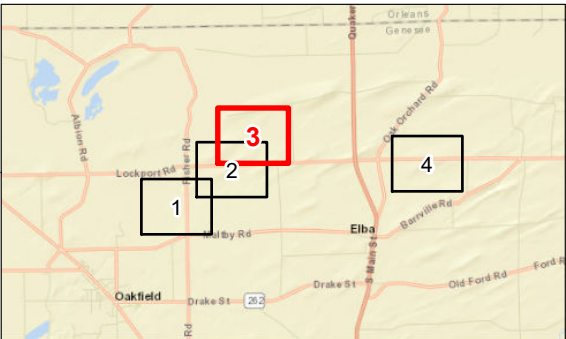


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Genesee County, NY

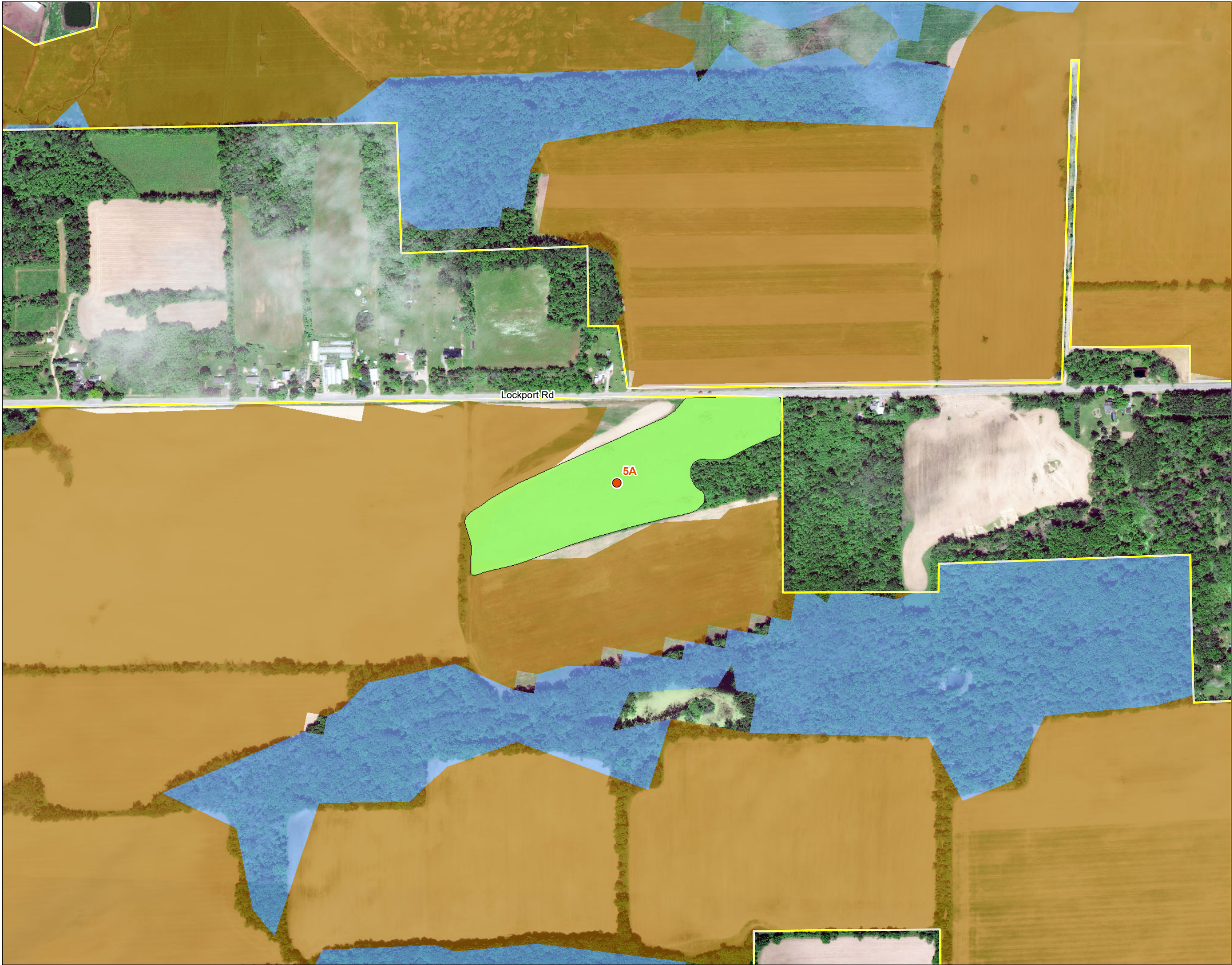
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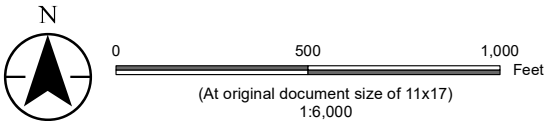
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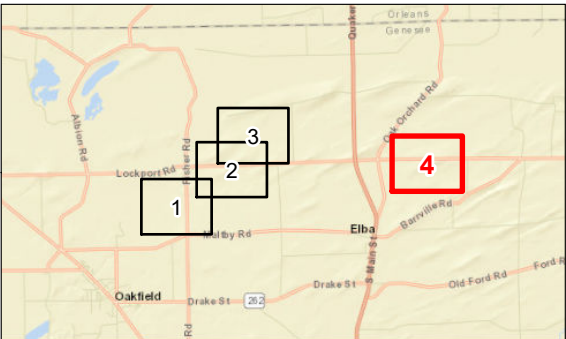


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Title
Breeding Bird Point Count Surveys

Results

2.3 DATA SUMMARY AND ANALYSIS

Data summary addressed the following items (based on the NYSDEC 2016 Guidelines):

- Overall survey period and date, time, and duration of count conducted at each point;
- Description of the habitat surrounding each transect;
- Description of the weather conditions during survey days;
- Number of species observed overall;
- Total number of individuals and relative abundance of each species observed overall (separated by transect observations and point count observations);
- The number of individuals and relative abundance of each species observed at each transect/point count;
- Whether any active nests or recently fledged young were observed;
- List of all species and transects and number of survey visits during which they were observed; and
- Description of any disruptions and/or distractions that occurred during each sampling period that may have precluded an adequate survey.

For the analyses, only those birds observed within 100 m from observers and non-flyovers were used to describe the breeding bird community within the Project Site, and specifically grassland bird habitat. The indices included in the results summary are:

- Species richness is the total number of species that were detected, not including unidentified genera of birds (e.g., unidentified flycatcher, unidentified warbler).
- Relative abundance, quantifies the number of individuals of a species in relation to the total number of individuals observed by survey visit.
- Species diversity is the average number of species observed across all sampling visits.

As the BBS survey focused on grassland habitat, no determination of frequency was undertaken.

For each of the initial six transects, results from the four stationary points were summarized to provide results for the transect overall.

3.0 RESULTS

3.1 SURVEY EFFORT AND WEATHER SUMMARY

3.1.1 Survey Effort

Stantec conducted BBS transect and point count surveys at the Project Site between 1 June and 15 July 2020; transect surveys on 1 June, 5 June and 9 June, and point count surveys on 12 June, 19 June, 29 June, 7 July and 15 July. Effort was consistent with the initial proposed survey methodology (based on NYSDEC 2016 Guidelines) and changes to that methodology based on comments received by NYSDEC (8 June, 2020) that required aligning with the NYSDEC 2015 Protocols.

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A qualified Stantec biologist (Daniel Silver) familiar with New York state birds by sight and sound walked transects between 30 minutes before sunrise and 10:30 AM. The survey visits occurred on those days when weather conditions were conducive to auditory and visual detection and identification of birds (excessively windy, rainy, foggy, or cold days were not surveyed; see Section 3.1.2). The point counts focused on songbirds and included observations of active nests and recently fledged young. The biologist also recorded observations of soaring raptors, waterfowl, and flyovers of all species. Stantec also noted any disruption and/or distraction that occurred during a survey period that may have precluded an appropriate survey.

Stantec sampled six 300-m transects, each with four survey locations along it, and five point count stations (**Figure 2, Table 1**). The point count locations along the transects were positioned at 100-m intervals. The 100-m interval spacing increased the potential for double-counting individuals along each transect, so Stantec noted if individual observations at adjacent survey locations were suspected to be previously recorded individual. Individual observations that were suspected as being previously recorded were not included as part of the analyses.

The initial transects included a mix of grassland (primarily modified – tame pasture/hayland, cultivated) and forested habitats, as well as forest edge habitat (**Table 1**). The updated point count survey stations were focused on grassland habitat, with minimal presence of forest edge habitat within 100 m.

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Table 1 Survey site type, habitat, and dates during breeding bird survey in Cider Solar Project Site

Site ID	Survey Type	Habitat Type	Date of Visits (2020)	Comments
T1	Transect	Hayfield, overgrown field, forest edge	5 June, 12 June	
T2	Transect	Conifer/hardwood forest, forest edge, overgrown field, man-made clearing	5 June	Not surveyed on 12 June due to lack of suitable habitat
T3	Transect	Overgrown field, man-made clearing	5 June, 12 June	
T4	Transect	Hayfield, overgrown field, wetland	1 June, 9 June	
T5	Transect	Hardwood forest, forest edge, wetland, man-made clearing, natural clearing, crop field	1 June, 9 June	
T6	Transect	Crop field, forest edge, over-grown field, recently disturbed	1 June, 9 June	
1A	Point Count	Hayfield, overgrown field	19 June, 29 June, 7 July, 15 July	
2A	Point Count	Hayfield, overgrown field	19 June, 29 June, 7 July, 15 July	
3A	Point Count	Overgrown field (recently ploughed)	19 June, 29 June, 7 July, 15 July	Observed to be ploughed on 7 July – surveyed on July 15
4A	Point Count	Overgrown field (recently ploughed)	19 June, 29 June, 7 July	Observed to be ploughed on 7 July – not surveyed on July 15
5A	Point Count	Overgrown field	19 June, 29 June, 7 July, 15 July	

During the initial visit to Transect 2 (T2) on 5 June it was determined that there was a lack of habitat for grassland birds. For this reason, the habitat patch where T2 was placed was removed from the survey. On 7 July it was observed that point count stations 3A and 4A had been recently ploughed. Therefore, only point count 3A was resurveyed on 15 July and point count 4A was removed due to the lack of grassland bird species on 7 July.

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3.1.2 Weather

Table 2 provides a summary of the range of weather conditions during each survey visit. During the 12 June visit to transects T1 and T3, wind conditions were above the preferred threshold of Beaufort Scale 3 (8-12 mph). However, the biologist was still able to detect birds as the windy conditions were not sustained, and therefore continued with the survey.

Table 2 Daily weather conditions during 2020 breeding bird survey for Cider Solar Project

Date	Survey Site ID	Wind Speed ¹	Temperature (°C)	Daily Sky Conditions ²
1 June	T4, T5, T6	2	10 to 15	1
5 June	T1, T2, T3	0	15 to 18	0
9 June	T4, T5, T6	0	18 to 20	0
12 June	T1, T3	4 to 5	12 to 16	1 to 2
19 June	1A, 2A, 3A, 4A, 5A	1	18 to 25	0
29 June	1A, 2A, 3A, 4A, 5A	0 to 1	15 to 20	0
7 July	1A, 2A, 3A, 4A, 5A	0	16 to 20	0
15 July	1A, 2A, 3A, 5A	0	16 to 20	0
¹ Beaufort Scale: 0 – <1 mph, 1 – 1-3 mph, 2 – 4-7 mph, 3 – 8-12 mph, 4 – 13-18 mph, 5 – 19-24 mph. ² Sky Code: 0 – clear (<15% cloud cover), 1 – partly cloudy (16-50% cloud cover), 2 – mostly cloudy (51-75% cloud cover)				

Full details on weather conditions by survey site are provided in Appendix C, **Table C-1**.

3.1.3 Additional Survey Site Information

To align with the NYSDEC 2015 Protocols, additional information was recorded at each point count station location (**Table 3**). In general, the habitat conditions at each point count station was similar. Information was gathered during the first point count survey visit (19 June).

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Table 3 Point count station additional information (NYSDEC 2015 Protocols)

Point Count ID	Patch size (acres)	Distance from trail/road (m)	Distance from hedgerow/forest edge (m)	Percent cover (%)	Average vegetation height (ft)	Nearest shrub above vegetation height (m)	Invasives (species)	Comments
1A	25	250	150	>90% grass/crop (wheat, red top grass, manna grass); 0% bare	2	75	Patches of Canada thistle	No litter
2A	20	100	100	80% grass (wheat, red top, switch grass); 10% bare	2	50	None	No litter
3A	30	450	125	50% grass (switch grass, timothy); 50% forb (clover tripholium, aster, milkweed)	2.5	125	None	1 in of litter; on 7 July patch was observed to be ploughed (approximately 75% bare ground), patch surveyed due to continued presence of grassland birds
4A	18	320	100	50% grass (bluegrass sp.; sweet grass); 30% forb (clover tripholium, goldenrod sp.); 20% bare ground	1.5	100 (treeline)	None	No litter; on 7 July patch was observed to be ploughed (approximately 75% bare ground), patch not surveyed again after 7 July
5A	10	125	125	80% grass (bluegrass sp, timothy, red top grass, creeping red fescue, sweet grass); 20% forb (goldenrod sp)	4	50	None	2 in of litter



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3.2 OVERALL RESULTS

The biologist detected 787 individuals representing 37 species at the six transects and five point-count stations (**Table 4**). Additional individuals observed that could not be identified to species due to distance from observer or flew over too quickly to identify, included unidentified sparrow, unidentified wren, unidentified warbler, and unidentified woodpecker (see Section 3.2.3; Appendix B, **Table B-1**). Appendix A, **Table A-1** (transect surveys) and Appendix A, **Table A-2** (point count surveys) shows the species detected and numbers of individuals detected by survey site.

Table 4 Summary of breeding bird survey observations for the Cider Solar Project

Survey Type/Site ID	Total Observations	Species Richness	Species Diversity	Total Relative Abundance
Transects				
T1	27	9	4.5	3.4%
T2	27	13	13.0	3.4%
T3	58	14	7.0	7.4%
T4	75	18	9.0	9.5%
T5	43	13	6.5	5.5%
T6	36	7	3.5	4.6%
Transects – Overall	266	33		
Point Counts				
1A	89	5	1.3	11.3%
2A	179	7	1.8	22.7%
3A	151	9	2.3	19.2%
4A	24	3	1.0	3.0%
5A	78	10	2.5	9.9%
Point Count - Overall	521	15		
Total	787	37		
Species Diversity: average number of species observed across all sampling visits				
Relative Abundance: percent of observations of total observations				

In general, the transect surveys had higher species richness (number of species) and species diversity (average species per survey site across all sampling visits) than the point count surveys because the initial transects were not sited to be exclusively in grassland (native or modified) habitat. As indicated in Table 1, habitat in the transects was variable and include intact forest habitat and forest edge habitat. This resulted in both grassland and forest bird species being detected, hence more species overall.

3.2.1 Results by Transect

Excluding flyovers, Stantec observed 266 birds within 100 m of the stationary points along each transect (**Table 4**; Appendix A, **Table A-1**). The two transects that were predominately overgrown field/hayfield (T3

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and T4) had the most individuals observed (n = 58 and 75, respectively), as well as species (n = 14 and 18, respectively).

Table 5 shows the relative abundance of each species observed during the transect surveys, and Appendix A, **Table A-1** shows the species observed by each individual transect during each survey visit. Among the transects, red-winged blackbird (*Agelaius phoeniceus*) had the greatest relative abundance (16.9%), followed by song sparrow (*Melospiza melodia*; 12.8%) (**Table 5**).

3.2.2 Results by Point Count Station

Excluding flyovers, Stantec observed 521 birds within 100 m of the point count stations (**Table 4**; Appendix A, **Table A-2**). Point counts 2A and 3A had the highest number of individual observations (n = 179 and 151, respectively), although species richness was the highest in point count 5A (n=10). The large number of observations in point counts 2A and 3A is attributed to large flocks of European starlings (*Sturnus vulgaris*) at both sites (Appendix A, **Table A-2**).

Table 5 shows the relative abundance of each species observed during the point count surveys, and Appendix A, **Table A-2** shows the species observed by each individual point count station during each survey visit. Among the point count stations, European startling and red-winged blackbird had the greatest relative abundance (63.3% and 13.4%, respectively) (**Table 5**).

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Table 5 Species observations and relative abundance by survey type for Cider Solar Project

Species	Transect		Point Count		Total	
	Number. of Observations	Relative Abundance (%)	Number. of Observations	Relative Abundance (%)	Number. of Observations	Relative Abundance (%)
alder flycatcher	2	0.8%	0	0.0%	2	0.3%
American goldfinch	20	7.5%	5	1.0%	25	3.2%
American robin	10	3.8%	0	0.0%	10	1.3%
Baltimore oriole	1	0.4%	0	0.0%	1	0.1%
barn swallow	22	8.3%	11	2.1%	33	4.2%
black-capped chickadee	4	1.5%	0	0.0%	4	0.5%
blue jay	5	1.9%	0	0.0%	5	0.6%
bobolink*	8	3.0%	13	2.5%	21	2.7%
brown-headed cowbird	17	6.4%	0	0.0%	17	2.2%
cedar waxwing	4	1.5%	0	0.0%	4	0.5%
common grackle	1	0.4%	0	0.0%	1	0.1%
eastern bluebird	1	0.4%	0	0.0%	1	0.1%
eastern kingbird	2	0.8%	0	0.0%	2	0.3%
European starling	15	5.6%	330	63.3%	345	43.8%
field sparrow	6	2.3%	29	5.6%	35	4.4%
grasshopper sparrow*	0	0.0%	5	1.0%	5	0.6%
gray catbird	0	0.0%	2	0.4%	2	0.3%
house sparrow	18	6.8%	0	0.0%	18	2.3%
indigo bunting	1	0.4%	0	0.0%	1	0.1%
killdeer	4	1.5%	0	0.0%	4	0.5%
mallard	3	1.1%	0	0.0%	3	0.4%
mourning dove	2	0.8%	2	0.4%	4	0.5%
northern cardinal	4	1.5%	0	0.0%	4	0.5%
northern mockingbird	5	1.9%	3	0.6%	8	1.0%
purple finch	3	1.1%	0	0.0%	3	0.4%
red-breasted nuthatch	1	0.4%	0	0.0%	1	0.1%
red-tailed hawk	1	0.4%	4	0.8%	5	0.6%
red-winged blackbird	45	16.9%	70	13.4%	115	14.6%
ruby-throated hummingbird	1	0.4%	0	0.0%	1	0.1%
savannah sparrow	13	4.9%	20	3.8%	33	4.2%
song sparrow	34	12.8%	17	3.3%	51	6.5%
spotted sandpiper	2	0.8%	0	0.0%	2	0.3%
tree swallow	0	0.0%	4	0.8%	4	0.5%
turkey vulture	1	0.4%	0	0.0%	1	0.1%
tufted titmouse	3	1.1%	0	0.0%	3	0.4%

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Species	Transect		Point Count		Total	
	Number. of Observations	Relative Abundance (%)	Number. of Observations	Relative Abundance (%)	Number. of Observations	Relative Abundance (%)
vesper sparrow*	0	0.0%	6	1.2%	6	0.8%
yellow warbler	7	2.6%	0	0.0%	7	0.9%
Total Observations	266		521		787	
Total Relative Abundance %	33.8%		66.2%		100.0%	
*State-listed species of special concern or high priority species of greatest conservation need.						

3.2.3 Incidental Species

Stantec observed 24 additional species (n=61 total incidental species; Appendix B, **Table B-1**) at transects and point counts incidentally, either as flyovers or beyond the 100 m detection radius during the 5-minute point count, or during the meandering transect portion of the point count survey. None of these species were federally or state-listed endangered or threatened species, and four were state species of special concern (Appendix B, **Table B-1**).

3.2.4 Rare, Threatened, and Endangered Species

Based on information provided by NYSDEC (20 July 2020), the Project Site and a five-mile buffer (Study Area) surrounding it overlap known habitat for several listed species. Both the Project Site and the Study Area overlap the following:

- Black tern (*Chlidonias niger*) habitat (buffer area only)
- Least bittern (*Ixobrychus exilis*) habitat (northwest portion of Project Site and buffer)
- Sedge wren (*Cistothorus platensis*) habitat (northwest portion of Project Site and Study Area)
- Pied-bill grebe (*Podilymbus podiceps*) habitat (northwest portion of Project Site and Study Area)
- Prothonotary warbler (*Protonotaria citrea*) habitat (northwest portion of Project Site and Study Area)

In addition, the western portion of the Project Site also overlaps breeding and overwintering habitat for northern harrier (*Circus hudsonius*). Also, an active osprey (*Pandion haliaetus*) nest was located on a power line support structure in the Project Site (**Figure 1**).

Stantec did not observe any federally or state-listed endangered or threatened species. Stantec detected five state species of special concern (NYSDEC 2015b): American bittern (*Botaurus lentiginosus*) (n=2; point count 2A [incidental]), Cooper's hawk (*Accipiter cooperii*) (n=1; point count 3A [incidental]), common nighthawk (*Chordeiles minor*) (n=2; transect T3, point count 3A [incidentals]), grasshopper sparrow (*Ammodramus savannarum*) (n = 5; point count 5A [systematic observations]), vesper sparrow (*Poocetes gramineus*) (n=6; point count 5A [systematic observations]) (Appendix A, **Table A-2**; Appendix B, **Table B-1**).

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Discussion

High priority species of greatest conservation need (NYSDEC 2015b) observed included: bobolink (*Dolichonyx oryzivorus*) (n=34; transects T1, T3 and T6, point count 3A, 4A and 5A [systematic observations and incidentals]) and brown thrasher (*Toxostoma rufum*) (n=1; transect T4 [incidental]) (Appendix A, **Tables A-1, A-2**; Appendix B, **Table B-1**)

4.0 DISCUSSION

Transect surveys with stationary points, and standalone point count surveys are common methods used to assess the species composition of breeding birds that sing diurnally. Data collected from these surveys can be used to estimate relative abundance among species detected and characterize bird communities by habitat. The breeding bird survey data collected in 2020 provide baseline information about the breeding bird communities in grassland habitats of the Project Site.

In general, the 2020 breeding bird surveys occurred in suitable weather conditions for detecting birds during the peak breeding period in New York. The survey was based on standard NYSDEC guidelines/protocols for point counts conducted in grassland habitats that are characteristic of the Project Site. The layout of the transects and point count stations targeted those areas that may be affected by the Project.

Species detected during the survey are generally common, regionally abundant, and are representative of the habitats in which they were observed.

5.0 REFERENCES

- New York State Department of Environmental Conservation (NYSDEC). 2015a. Draft Survey Protocol for State-listed Breeding Grassland Bird Species - 2015.
- NYSDEC. 2015b. List of endangered, threatened and special concern fish and wildlife species of New York State. <http://www.dec.ny.gov/animals/7494.html>. Accessed 5 August 2020.
- NYSDEC. 2016. Guidelines for conducting bird and bat studies at commercial wind energy projects. Available: https://www.dec.ny.gov/docs/wildlife_pdf/winguide16.pdf.
- Stantec Consulting Services Inc. (Stantec). 2020. Breeding Grassland Bird Survey Work Plan for the Cider Solar Project. Prepared for Hecate Energy, LLC.

Appendix A SPECIES OBSERVATIONS



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Appendix A Species Observations

Table A-1 Transect summary – observations by date

Common Name	Scientific Name	Transect 1		Transect 2	Transect 3		Transect 4		Transect 5		Transect 6		Total
		5-Jun	12-Jun	5-Jun	5-Jun	12-Jun	1-Jun	9-Jun	1-Jun	9-Jun	1-Jun	9-Jun	
alder flycatcher	<i>Empidonax alnorum</i>						2						2
American goldfinch	<i>Spinus tristis</i>		5	1			2		11	1			20
American robin	<i>Turdus migratorius</i>		1	1	1	2	4			1			10
Baltimore oriole	<i>Icterus galbula</i>									1			1
barn swallow	<i>Hirundo rustica</i>				7	4	9		2				22
black-capped chickadee	<i>Poecile atricapillus</i>			2	1		1						4
blue jay	<i>Cyanocitta cristata</i>	2		2	1								5
bobolink	<i>Dolichonyx oryzivorus</i>				5	3							8
brown-headed cowbird	<i>Molothrus ater</i>			2	6		2	1		4	2		17
cedar waxwing	<i>Bombycilla cedrorum</i>		4										4
common grackle	<i>Quiscalus quiscula</i>						1						1
eastern bluebird	<i>Sialia sialis</i>			1									1
eastern kingbird	<i>Tyrannus tyrannus</i>					1					1		2
European starling	<i>Sturnus vulgaris</i>					5		6		4			15
field sparrow	<i>Spizella pusilla</i>		2		1	2						1	6
house sparrow	<i>Passer domesticus</i>			5			1	10		2			18
indigo bunting	<i>Passerina cyanea</i>		1										1
killdeer	<i>Charadrius vociferus</i>				1		2	1					4
mallard	<i>Anas platyrhynchos</i>						3						3
mourning dove	<i>Zenaida macroura</i>							2					2
northern cardinal	<i>Cardinalis cardinalis</i>			2	1						1		4
northern mockingbird	<i>Mimus polyglottos</i>		2	2					1				5
purple finch	<i>Haemorhous purpureus</i>			3									3
red-breasted nuthatch	<i>Sitta canadensis</i>			1									1
red-tailed hawk	<i>Buteo jamaicensis</i>						1						1
red-winged blackbird	<i>Agelaius phoeniceus</i>		5		10	2	9	5	5	3	6		45
ruby-throated hummingbird	<i>Archilochus colubris</i>								1				1
savannah sparrow	<i>Passerculus sandwichensis</i>				2	2				2		7	13
song sparrow	<i>Melospiza melodia</i>	2	3	2			2	6		1	11	7	34
spotted sandpiper	<i>Actitis macularius</i>						1	1					2
tufted titmouse	<i>Baeolophus bicolor</i>			3									3
turkey vulture	<i>Cathartes aura</i>						1						1
yellow warbler	<i>Setophaga petechia</i>				1		1	1	4				7
Total		4	23	27	37	21	42	33	24	19	21	15	266



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Appendix A Species Observations

Table A-2 Point count summary – observations by date

Common Name	Scientific Name	Point Count 1A				Point Count 2A				Point Count 3A				Point Count 4A		Point Count 5A				Total
		19-Jun	29-Jun	7-Jul	15-Jul	19-Jun	29-Jun	7-Jul	15-Jul	19-Jun	29-Jun	7-Jul	15-Jul	19-Jun	29-Jun	19-Jun	29-Jun	7-Jul	15-Jul	
American goldfinch	<i>Spinus tristis</i>			2				3												5
barn swallow	<i>Hirundo rustica</i>					5	2			2	1								1	11
bobolink	<i>Dolichonyx oryzivorus</i>									3	10									13
European starling	<i>Sturnus vulgaris</i>		50			50	50	50				100							30	330
field sparrow	<i>Spizella pusilla</i>	5		1						1				1	5	3	5	5	3	29
grasshopper sparrow	<i>Ammodramus savannarum</i>															5				5
gray catbird	<i>Dumetella carolinensis</i>															2				2
mourning dove	<i>Zenaida macroura</i>							2												2
northern mockingbird	<i>Mimus polyglottos</i>							2	1											3
red-tailed hawk	<i>Buteo jamaicensis</i>											1	2						1	4
red-winged blackbird	<i>Agelaius phoeniceus</i>	10	20				5			10	10			10	3	2				70
savannah sparrow	<i>Passerculus sandwichensis</i>									2					5	10		3		20
song sparrow	<i>Melospiza melodia</i>					3		3	3		2	1	3					2		17
tree swallow	<i>Tachycineta bicolor</i>				1						3									4
vesper sparrow	<i>Poocetes gramineus</i>															5	1			6
Total		15	70	3	1	58	57	60	4	18	26	102	5	11	13	27	6	10	35	521



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Appendix B Incidental observations

Appendix B INCIDENTAL OBSERVATIONS

Table B-1 Incidentals bird observations

Common Name	Scientific Name	Transect Surveys	Point Count Surveys	Total Observations
alder flycatcher	<i>Empidonax alhorum</i>	2		2
American bittern	<i>Botaurus lentiginosus</i>		2	2
American crow	<i>Corvus brachyrhynchos</i>	12	30	42
American goldfinch	<i>Spinus tristis</i>	10	9	19
American robin	<i>Turdus migratorius</i>	10	66	76
Baltimore oriole	<i>Icterus galbula</i>	5	1	6
barn swallow	<i>Hirundo rustica</i>	13	25	38
black-capped chickadee	<i>Poecile atricapillus</i>	4	6	10
blue jay	<i>Cyanocitta cristata</i>	8	6	14
blue-gray gnatcatcher	<i>Poliophtila caerulea</i>	3		3
blue-winged warbler	<i>Vermivora cyanoptera</i>	1		1
bobolink	<i>Dolichonyx oryzivorus</i>	2	11	13
brown thrasher	<i>Toxostoma rufum</i>	1		1
brown-headed cowbird	<i>Molothrus ater</i>		2	2
Canada goose	<i>Branta canadensis</i>	6	8	14
cedar waxwing	<i>Bombycilla cedrorum</i>		3	3
chipping sparrow	<i>Spizella passerina</i>	4	5	9
common grackle	<i>Quiscalus quiscula</i>	7	1	5
common nighthawk	<i>Chordeiles minor</i>	1	1	2
common raven	<i>Corvus corax</i>	1		1
Cooper's hawk	<i>Accipiter cooperii</i>		1	1
double-crested cormorant	<i>Phalacrocorax auritus</i>	1		1
downy woodpecker	<i>Dryobates pubescens</i>	1	1	2
eastern kingbird	<i>Tyrannus tyrannus</i>		2	2
eastern towhee	<i>Pipilo erythrophthalmus</i>		3	3
European starling	<i>Sturnus vulgaris</i>	72	30	102
field sparrow	<i>Spizella pusilla</i>	10	49	59
gray catbird	<i>Dumetella carolinensis</i>	4		4
great blue heron	<i>Ardea herodias</i>	5	1	6
green heron		1	1	2
hairy woodpecker	<i>Dryobates villosus</i>		1	1
house finch	<i>Haemorhous mexicanus</i>	1		1



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Appendix B Incidental observations

Common Name	Scientific Name	Transect Surveys	Point Count Surveys	Total Observations
house sparrow	<i>Passer domesticus</i>	10		10
house wren	<i>Troglodytes aedon</i>		1	1
indigo bunting	<i>Passerina cyanea</i>	2	4	6
killdeer	<i>Charadrius vociferus</i>	2	5	7
mourning dove	<i>Zenaida macroura</i>	2	13	15
northern cardinal	<i>Cardinalis cardinalis</i>	15	30	44
northern mockingbird	<i>Mimus polyglottos</i>	2	23	25
northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	1	1	2
pine warbler	<i>Setophaga pinus</i>	2		2
red-bellied woodpecker	<i>Melanerpes carolinus</i>	2	2	4
red-tailed hawk	<i>Buteo jamaicensis</i>	3	2	5
red-winged blackbird	<i>Agelaius phoeniceus</i>	21	39	60
ring-billed gull	<i>Larus delawarensis</i>	6		6
rock pigeon	<i>Columba livia</i>	3	15	18
ruby-throated hummingbird	<i>Archilochus colubris</i>		1	1
savannah sparrow	<i>Passerculus sandwichensis</i>	3	7	10
song sparrow	<i>Melospiza melodia</i>	22	49	71
spotted sandpiper	<i>Actitis macularius</i>	1		1
tree swallow	<i>Tachycineta bicolor</i>	1		1
tufted titmouse	<i>Baeolophus bicolor</i>	3	1	4
turkey vulture	<i>Cathartes aura</i>	8	2	10
wood thrush	<i>Hylocichla mustelina</i>		2	2
yellow warbler	<i>Setophaga petechia</i>	18	20	38
unidentified blackbird	Icteridae (gen, sp)	4		4
unidentified sparrow	Passerellidae (gen, sp)	5	9	14
unidentified warbler	Parulidae (gen, sp)	2	3	5
unidentified woodpecker	Picinae (gen, sp)	5		5
unidentified wren	Troglodytidae (gen, sp)	1		1
Total		329	493	822



HECATE CIDER SOLAR FARM

Appendix C Weather Summary

Appendix C WEATHER SUMMARY

Table C-1 Complete weather data

Survey Type	Site ID	Stationary Point ID	Date	Time	Temp (°C)	Wind Speed (Beaufort)	Sky Conditions
Transect	T6	D	6/1/2020	0550 - 0600	10	2	1
Transect	T6	C	6/1/2020	0605 - 0615	10	2	1
Transect	T6	B	6/1/2020	0620 - 0630	10	2	1
Transect	T6	A	6/1/2020	0640 - 0650	10	2	1
Transect	T4	D	6/1/2020	0720 - 0730	12	2	1
Transect	T4	C	6/1/2020	0735 - 0745	12	2	1
Transect	T4	B	6/1/2020	0800 - 0810	12	2	1
Transect	T4	A	6/1/2020	0820 - 0830	12	2	1
Transect	T5	D	6/1/2020	0900 - 0910	15	2	1
Transect	T5	C	6/1/2020	0915 - 0925	15	2	1
Transect	T5	B	6/1/2020	0930 - 0940	15	2	1
Transect	T5	A	6/1/2020	0945 - 0955	15	2	1
Transect	T3	A	6/5/2020	0620 - 0630	15	0	0
Transect	T3	D	6/5/2020	0620 - 0630	15	0	0
Transect	T3	B	6/5/2020	0640 - 0650	15	0	0
Transect	T3	C	6/5/2020	0655 - 0705	15	0	0
Transect	T2	A	6/5/2020	0740 - 0750	18	0	0
Transect	T2	B	6/5/2020	0755 - 0805	18	0	0
Transect	T2	C	6/5/2020	0810 - 0820	18	0	0
Transect	T2	D	6/5/2020	0825 - 0835	18	0	0
Transect	T1	D	6/5/2020	0900 - 0910	18	0	0
Transect	T1	B	6/5/2020	0930 - 0940	18	0	0
Transect	T1	C	6/5/2020	0930 - 0940	18	0	0
Transect	T1	A	6/5/2020	0945 - 0955	18	0	0
Transect	T5	D	6/9/2020	0600 - 0610	18	0	0
Transect	T5	C	6/9/2020	0620 - 0630	18	0	0
Transect	T5	B	6/9/2020	0635 - 0645	18	0	0
Transect	T5	A	6/9/2020	0650 - 0655	18	0	0
Transect	T4	D	6/9/2020	0730 - 0740	18	0	0
Transect	T4	C	6/9/2020	0750 - 0800	18	0	0
Transect	T4	B	6/9/2020	0805 - 0815	18	0	0
Transect	T4	A	6/9/2020	0820 - 0830	18	0	0
Transect	T6	D	6/9/2020	0850 - 0900	20	0	0
Transect	T6	C	6/9/2020	0905 - 0915	20	0	0



HECATE CIDER SOLAR FARM

Appendix C Weather Summary

Survey Type	Site ID	Stationary Point ID	Date	Time	Temp (°C)	Wind Speed (Beaufort)	Sky Conditions
Transect	T6	B	6/9/2020	0920 - 0930	20	0	0
Transect	T6	A	6/9/2020	0935 - 0945	20	0	0
Transect	T1	D	6/12/2020	0600 - 0610	16	4	1
Transect	T1	C	6/12/2020	0615 - 0625	16	4	1
Transect	T1	B	6/12/2020	0635 - 0645	16	4	1
Transect	T1	A	6/12/2020	0650 - 7000	16	4	1
Transect	T3	A	6/12/2020	0800 - 0810	16	5	2
Transect	T3	B	6/12/2020	0815 - 0825	14	5	2
Transect	T3	C	6/12/2020	0830 - 0840	14	5	1
Transect	T3	D	6/12/2020	0845 - 0855	12	5	2
Transect	T2	A	6/12/2020	Abandoned due to lack of suitable grassland habitat			
Transect	T2	B	6/12/2020	Abandoned due to lack of suitable grassland habitat			
Transect	T2	C	6/12/2020	Abandoned due to lack of suitable grassland habitat			
Transect	T2	D	6/12/2020	Abandoned due to lack of suitable grassland habitat			
Point Count	5A		6/19/2020	0552 - 0557	18	0	1
Point Count	3A		6/19/2020	0645 - 0650	20	0	1
Point Count	4A		6/19/2020	0707 - 0712	22	0	1
Point Count	2A		6/19/2020	0740 - 0745	23	0	1
Point Count	1A		6/19/2020	0805 - 0810	25	1	0
Point Count	1A		6/29/2020	0558 - 0603	15	1	0
Point Count	2A		6/29/2020	0620 - 0625	20	0	0
Point Count	4A		6/29/2020	0705 - 0710	20	0	0
Point Count	3A		6/29/2020	0730 - 0735	20	0	0
Point Count	5A		6/29/2020	0800 - 0805	20	0	0
Point Count	3A		7/7/2020	0600 - 0605	16	0	0
Point Count	4A		7/7/2020	0615 - 0620	18	0	0
Point Count	5A		7/7/2020	0705 - 0710	20	0	0
Point Count	2A		7/7/2020	0730 - 0735	20	0	0
Point Count	1A		7/7/2020	0750 - 0755	20	0	0
Point Count	2A		7/15/2020	0600 - 0605	16	0	0
Point Count	1A		7/15/2020	0635 - 0640	18	0	0
Point Count	5A		7/15/2020	0700 - 0705	20	0	0
Point Count	3A		7/15/2020	0730 - 0735	20	0	0
Point Count	4A		7/15/2020	Point abandoned due to disturbance and no observations of grassland bird species			

