TRELINA SOLAR ENERGY CENTER

Case No. 19-F-0366

1001.22 Exhibit 22

Terrestrial Ecology and Wetlands

Contents

Tables

Figures

Appendices

Exhibit 22: Terrestrial Ecology and Wetlands

This Exhibit will track the requirements of proposed Stipulation 22, dated June 19, 2020, and therefore, the requirements of 16 New York Codes, Rules and Regulations (NYCRR) § 1001.22.

The Trelina Solar Energy Center (Project) has been sited to avoid and/or minimize impacts to terrestrial ecology and wetlands to the maximum extent practicable as detailed in this Exhibit. Temporary, permanent, and conversion impacts to the representative plant communities within the Project Area are not expected to result in the significant loss or extirpation of any representative plant community (Section 22(b)). Further, no take of state or federally listed threatened or endangered species will occur as a result of Project development (Section 22(f)). Of the entire 1,067-acre Project Area, only approximately 9.07 acres of wildlife habitat will be permanently lost due to the placement of Project components. All the wildlife habitat permanently lost resides in active agricultural areas which already provide limited perpetual wildlife habitat due to the regular disturbances and anthropogenic pressures of active farming practices (Section 22(f)(4)). Additionally, through careful siting of Project components, there are minimal direct impacts to wetlands proposed within the Project Area (Section 22(m)).

In addition to Project and Study Area studies, the Applicant conducted a Cumulative Impact Analysis to evaluate potential impacts from the Project throughout the region on grassland habitat for federally and state-listed threatened or endangered species, and specifically grassland birds. The study evaluated the potential cumulative impact of the Project to grassland habitat, along with 132 proposed or operating solar energy projects greater than or equal to 5 megawatt (MW) within 100 miles of the Project Area in the State of New York, as identified based upon data provided by the New York State Department of Environmental Conservation (NYSDEC) (Appendix 22-4) and research conducted by the Applicant. The results of this analysis determined that the use of grassland habitat types to support solar development is not anticipated to have population-level impacts from the Project, or cumulatively, from the 132 Study Projects identified. Additionally, less than 2 percent of available grassland habitat (2,395,074 acres) within the 100-mile study radius has the potential to be impacted cumulatively by all of the projects studied (Section 22(f)(10) and Appendix 22-4). This analysis represents an extremely conservative approach which overestimates impacts due to the lack of information available for the other regional projects reviewed and the low probability that all of these projects will ultimately be developed.

The Project proposes to install fixed or tracker racking systems. As the technology is rapidly evolving for solar panel technology, and market conditions at the time that procurement decisions need to be made are unknown, the Applicant is proposing in this Application to evaluate both types of racking systems, with the final decision to be made and detailed in the Compliance Filing. The tracking or fixed racking systems to be employed would be similar to the Gamechange Solar Genius Tracker™ and the Gamechange Maxspan™ Pile Driven System, respectively, specification sheets of which has have been included as Appendix 2-2 and Appendix 2-3. Regardless of the type of array racking system ultimately selected for the Project, the Applicant intends to use a solar module similar to the Jinko Solar Eagle 72HM G2 380-400-Watt Mono Perc Diamond Cell. A specification sheet for this module has been included as Appendix 2-1. Only selected elements of the Project would change based upon the type of array racking system used, but all changes would be within the component fence line and to the same land uses shown in the Proposed Layout. The location of interior access roads and inverters, depending upon the final locations, could differ from that shown in the Exhibit 11 plans. No significant, adverse environmental impacts would result from using one rather system as opposed to the other. Land coverage ratios will also be adjusted but are not expected to be substantially or significantly different.

Accordingly, the drawings, plan and maps required by Exhibit 11 depict the use of tracker racking systems. As part of the alternative layout evaluation, Exhibit 9 presents a site plan depicting a fixed racking layout which depicts a similar Limit of Disturbance (LOD) for the Project but with panels setting lower off the ground and generally less grading required. The impact areas presented in this Exhibit are based upon the drawings included in Exhibit 11 (tracker). However, as noted above, changes as a result of a final selection of racking technology are expected to be minimal and all impacts would be located within the same Project fence line.

22(a) Plant Communities

The Project Area is located within the Eastern Great Lakes Lowlands ecological region (ecoregion), as defined by the US Geological Service (Geological Service, 2010). This ecoregion includes valleys and lowlands underlain by interbedded limestone, shale, and sandstone rocks that are more erodible than the more resistant rocks composing the adjacent mountainous areas. The topography and soils of the lowlands have also been shaped by glacial lakes and episodic glacial flooding. Limestone-derived soils are fine-textured, deep, and productive. As a result,

much of the region was cleared for agriculture or urban development and fewer native forests remain than in surrounding ecoregions (Geological Service, 2010).

More specifically, the Project Area is within the Ontario Lowlands ecoregion. This ecoregion separates the Finger Lakes Uplands and Gorges to the south from the Erie/Ontario Lake Plain to the north. Historically, this region was dominated by beech-maple forests, but only scattered woodlots remain due to the area's high agriculture activity. Soils are loamy, moist Alfisols derived from limestone and calcareous shale that support dairy farming, livestock, and are suitable for growing fruits and vegetables (Geological Service, 2010).

The Project Area encompasses approximately 1,067 acres and is composed predominately of agricultural land, grass/pasture/hay, and scattered forest. Agricultural areas consist predominately of corn, hay, and soybeans. Other open fields were maintained for pasture and livestock grazing. Land cover in the Project Area was determined using the National Land Cover Data (NLCD), aerial photography, and on-site observations (Table 22-1).

Table 22-1. Land Cover Types within the Project Area

Cover Type	Acreage	Percent of Project Area
Active Agriculture	675	63.2
Disturbed Developed	17	1.6
Forestland	269	25.3
Open Water	28	2.6
Successional Old Field	7	0.6
Successional Shrubland	71	6.7
Total	**1,067**	**100.0**

Plant community mapping was compiled from numerous sources, including data collected during on-site field survey work, roadside observation, desktop analysis, interpretation of current aerial orthoimagery, and NLCD mapping. All documented plant communities within the Project Area are common throughout the State of New York. Descriptions of these plant communities and their dominant plant species are provided below, with the exact location of each community type within

the Project Area and in the 500 feet beyond the Project Area boundary shown in Figures 22-1 and Figure 22-2 respectively. Note that the cover types shown on Figures 22-1 and 22-2 are delineated by community type as described in *Ecological Communities of New York State* (Edinger et al., 2014), with Heritage Program Element Ranks. Shapefiles of plant communities delineated will be provided to New York State Department of Public Service (NYSDPS), NYSDEC, and New York State Department of Agriculture and Markets (NYSDAM).

Invasive Species

Several areas of invasive species were identified during wetland surveys conducted at the Project. Species which were observed within the Project Area are described below based on the ecological community in which they were documented. The location of invasive species identified is shown on Figure 22-1 and Figure 22-2.

Agricultural Land

Active agricultural land in the form of hay fields, pastureland, and cultivated crops is extremely common within the Project Area and covers 675 acres or approximately 63% of the Project Area. Approximately 397 acres of agricultural land will be used for Project components and then restored following the decommissioning of the Project. The agricultural acreage impacted by pole installations, inverter pad installations, new or improved access roads and interconnection facilities totals 2.24 acres, as detailed in Section 22(n)of this Exhibit. In *Ecological Communities of New York*, there are multiple types of terrestrial cultural communities within the agricultural land designation, including cropland/row crops (Heritage Rank: unranked cultural), cropland/field crops (unranked cultural), and pastureland (unranked cultural) (Edinger et al., 2014). Most row crops established within the Project Area are corn (*Zea mays*) and soybean (*Glycine max*), both observed on June 24, 2019, which are used as feedstock, livestock feed, or for human consumption. Hay fields are also scattered throughout the Project Area. Dominant plants in hayfields in the Project Area were orchard grass (*Dactylis glomerata*), red clover (*Trifolium pratense*), and timothygrass (*Phleum pratense*), all observed on June 25, 2019.

Forestland

Forested land covers approximately 269 acres (25%), of the total land coverage for the Project Area. Within this cover type are a variety of forested communities with distinguishing characteristics supporting vast assemblages of interacting plant and animal populations. Specific

forest communities as defined in *Ecological Communities of New York* found within the Project Area and their descriptions are below.

Beech-maple mesic forest (Heritage Rank: G4 S4 [Apparently secure globally and in NYS]) – Beech-maple mesic forest is common within the Project Area. This community occurs on moist well-drained soils with usually an acidic content. This forest is described as a northern hardwood forest with sugar maple (*Acer saccharum*) and American beech (*Fagus grandifolia*) occurring codominant with each other. Common associates occurring in the community to a lesser extent are yellow birch (*Betula alleghaniensis*), white ash (*Fraxinus americana*), and red maple (*Acer rubrum*), all observed June 24, 2019. The shrub layer of this forest includes saplings of the aforementioned tree species and also American hornbeam (*Carpinus caroliniana*) and witch hazel (*Hamamelis virginiana*), both observed on July 9, 2019. Saplings of sugar maple and American beech scatter the ground layer along with Christmas fern (*Polystichum acrostichoides*) and various wood ferns (*Dryopteris* spp.), each observed on July 9, 2019.

Successional southern hardwoods (Heritage Rank: G5 S5 [Demonstrably secure globally and in NYS]) – Successional southern hardwoods are common throughout the Project Area. Most of the Project Area was likely forested in the past and has been cleared for agriculture. Successional forests can develop either after man-made clearing events or in the wake of destructive natural events (floods, blow-downs during high wind events, forest fires, etc.). After clearing has occurred, and the impacted land begins to revert back to forests, plant species that are well-adapted to establishment after disturbances begin to populate the area. Characteristic trees dominating successional southern hardwoods within the Project Area include American Elm (*Ulmus* Americana), observed June 25, 2019; white ash and red maple, both observed June 24, 2019; box elder (*Acer negundo*), observed June 25, 2019; and silver maple (*Acer saccharinum*) and European buckthorn (*Rhamnus catartica*), both observed June 24, 2019.

Developed Land

Developed land covers approximately 17 acres (<2%) of the Project Area. Developed lands represent areas with extreme anthropogenic influence and are characterized by the presence of buildings, roadways, quarries, residential areas, commercial properties, industrial sites, and maintained greenspaces (e.g., mowed lawns, gardens, and parks). Developed land communities in the Project Area include mowed lawn with trees (Heritage Rank: unranked cultural), mowed lawn (Heritage Rank: unranked cultural), mowed roadside/pathway (Heritage Rank: unranked cultural), unpaved road/path (Heritage Rank: unranked cultural), paved road/path (Heritage Rank:

unranked cultural), rural structure exterior (Heritage Rank: unranked cultural), interior of a barn/agricultural building (Heritage Rank: unranked cultural), and interior of a non-agricultural building (Heritage Rank: unranked cultural). Vegetation within these areas tend to be sparse when not artificially planted or influenced. However, when present, certain species that thrive in disturbed environments act as pioneer species or become directly or indirectly introduced. Often in developed areas non-native or invasive plant species flourish in a community which generally characterizes old-field in appearance and function. Non-native/invasive species such as Canada thistle (*Cirsium arvense*), observed July 8, 2019; multiflora rose (*Rosa multiflora*), European buckthorn, Morrow's honeysuckle (*Lonicera morrowii*), all observed June 24, 2019; purple loosestrife (*Lythrum salicaria*), observed July 23, 2019; and, various upland grasses generally populate these developed areas.

Successional Old Field

Successional old fields (Heritage Rank: G5 S5) are relatively uncommon within the Project Area and cover approximately 7 acres (<1%). This community is defined as a meadow dominated by forbs and grasses that occur on sites that have been cleared or plowed as a result of agriculture or development, and subsequently abandoned. Most old-field communities are irregularly and infrequently mowed. As such, conditions favor the establishment and spread of representative old-field species. Characteristic herbaceous species include many goldenrods (*Solidago* spp.), timothy grass (*Phleum pratense*), Queen Anne's lace (*Daucus carota*), Virginia strawberry (*Fragaria virginiana*), common dandelion (*Taraxacum officinale*), chicory (*Cichorium intybus*), common milkweed (*Asclepias syriaca*), and various asters (*Symphyotrichum* spp.), all observed June 26, 2019. Shrubs can be present within successional old-field communities but represent less than half of the community. Common shrubs found in this community are honeysuckles, various dogwoods, viburnums, and small willows (*Salix* spp.), all observed June 24, 2019. If not maintained by infrequent mowing, this relatively short-lived community succeeds to a successional shrubland, woodland, or forest community.

Successional Shrubland

Successional shrubland (Heritage Rank: G5 S5) covers approximately 71 acres (<7%) of the Project Area. This community represents shrublands that have established after a site has been cleared (e.g., for agriculture, logging, or development) or was disturbed as a result of natural events. This community is defined by at least a 50% coverage of shrub species (Edinger et al., 2014). Successional shrublands are transitory communities between old-field and successional

forest communities. Characteristic shrubs found within the Project Area are gray dogwood, multiflora rose, Allegheny blackberry (*Rubus allegheniensis*), silky dogwood (*Cornus alba*), European buckthorn, various shrub willows and Morrow's honeysuckle, each observed June 24, 2019. Herbaceous species are very diverse in this community but typically represent less than half of total vegetative cover. Within the Project Area, common herbaceous plants within this community are goldenrods, common dandelion, and white bedstraw (*Galium mollugo*), each observed June 24, 2017.

Open Water

Open water communities are somewhat sparse within the Project Area covering approximately 28 acres (<3%) of the Project Area. Open water areas are characteristic of man-made and natural lacustrine and riverine systems located within the Project Area. Lacustrine systems (i.e., relating to ponds and lakes) within the Project Area include farm ponds/artificial ponds (Heritage Rank: unranked cultural). Specific riverine systems (i.e., relating to confined waterbodies) in the Project Area include intermittent streams (Heritage Rank: G4 S4) and ditch/artificial intermittent streams (Heritage Rank: unranked cultural). There are no perennial streams within the Project Area. Although aquatic vegetation grows within some of these communities, emergent wetland vegetation often grows along the periphery of these communities as well. Typical emergent wetland species associated with open water communities within the Project Area include narrow-leaf cattail (*Typha angustifolia*) and broad-leaf cattail (*Typha latifolia*), both observed on June 24, 2019, and softstem bulrush (*Schoenoplectus tabernaemontani*), observed July 9, 2019.

Wetlands

Wetlands are interspersed across the aforementioned land cover types and overall represent approximately one quarter (272.24 acres) of the Project Area. Specific wetland communities within the Project Area include shallow emergent marshes (Heritage Rank: G5 S5), deep emergent marshes (Heritage Rank: G5 S5), shrub swamps (Heritage Rank: G5 S5), vernal pools (Heritage Rank: G4 S3), and red maple hardwood swamps (Heritage Rank: G5 S4S5 [Demonstrably secure globally, apparently or demonstrably secure in NYS]). A more detailed characterization of the wetland communities can be found in Section 22(j). Note the wetland cover type overlaps with the other plant community types discussed in this section, therefore, the total acreages in this section exceed the total Project Area.

22(b) Impacts to Plant Communities

(1) Proposed Temporary and Permanent Impacts

The LOD for the Project is 474.08 acres, which represents approximately 44 percent of the Project Area. The construction and operation of the Project will cause temporary and relatively small permanent impacts to some of the aforementioned ecological communities. Impacts to ecological communities and associated plant communities will occur through vegetation clearing and soil disturbance necessary for safe Project-related construction and activities. Areas that are temporarily impacted will be restored to their original condition. Permanent impacts to plant communities will occur in areas designated for permanent operation of the Project. Calculations of specific impacts to these communities within the Project Area are based on disturbance areas assigned to each Project component as well as the Preliminary Design Drawings in Exhibit 11. Table 22-2 provides the extent of clearing and soil disturbance proposed by component type, and specific assumptions are described below.

Table 22-2. Impact Assumptions

Project Components	Vegetative Clearing Area (acres)	Area of Temporary Soil Disturbance (acres)	Area of Permanent Impact (acres)
Solar Panel Installations	340.46	26.3[1]	0.01[2]
Access Roads	3.11	3.11	8.33
Collection Lines (UMV lines)	-	2.49	-
Collection Substation/Switchyard/Inverters	0.24	0.24	1.34
Fence Line	1.65	1.65	-
Rip Rap	-	-	0.07
Culverts	-	-	0.05
Filtration Basins	0.06	0.06	0.23

[1] – this value represents grading within the solar panel array needed to accommodate the rotational movements of the tracker racking system
[2] – Represents the cumulative disturbance of racking support posts.

Installation of solar panels will require approximately 345.52 acres of vegetation to be cleared and will result in soil disturbance on 33.35 acres. The areas under and between solar panels will be restored and revegetated following construction as described in Section 22(c). Permanent impacts to vegetation will occur for the siting of the collection substation and switchyard, access roads, including culvert installation, solar racking support posts, and stormwater management features (Table 22-2). Impacts to specific plant communities are described in Tables 22-3 and 22-4.

These impact assumptions were used to calculate temporary and permanent impacts to plant communities resulting from the construction and operational phases of the Project (Table 22-3). The Project layout proposes co-location of various components (e.g., electric collection lines and access road); however, for the purpose of assessing potential impacts, this analysis assumes autonomous impacts for each component (i.e., no co-location). As such, impact calculations were completed in a conservative manner, and therefore, likely overstate the potential impacts, as the overlap in component impact areas is not assumed in the calculations. This method of impact calculation also alleviates temporal variation of impacts to vegetative communities within the Project Area.

Agricultural areas with pre-existing cropland or hayfield communities will be temporarily impacted by the installation of the solar arrays, as a similar grassland community will be planted below the arrays. Temporary impacts to agricultural land will occur from the siting of an underground collection lines and the clearing of vegetation needed for various components during the construction phase of the Project. Temporarily disturbed active agricultural areas will be stripped of topsoil, which will be set aside prior to construction activities within each area where work is being performed. The topsoil will then be replaced upon completion of the construction activities within each area. Agricultural areas underneath and in the immediate vicinity of the solar panels will be maintained as native cool-season grasses and forbs that require periodic mowing.

Agricultural areas with row crops will be employed for the useful life of the Project due to the installation of the solar arrays, since the plant community that will be maintained beneath the arrays will be different from the pre-existing row crops. Agricultural land that is used for Project components will be restored to substantially its pre-existing condition and agricultural activities can be resumed following decommissioning of the Project should the landowner so choose. A total of 397.6 acres of agricultural land will be employed within the fenced area of the Project for the useful life of the Project.

Temporary, permanent, and conversion impacts to the representative plant communities within the Project Area are not expected to result in the significant loss or extirpation of any representative plant community. Temporary, permanent, and conversion impact acreages for each representative community in the Project Area are provided in **Error! Reference source not found.** Temporary impact calculations include any indirect impacts to existing plant communities and are described by community type. Temporarily impacted areas will be restored to pre-construction conditions to the maximum extent practicable. Permanent impacts include areas disturbed for placement of Project components, and areas of tree clearing for construction of the Project. Acres are also shown for conversion of vegetation from one plant community type to another as a result of Project construction. While these areas may be restored following construction, they will not be restored to the community type previously present. Figure 22-2 (and associated shapefiles) displays the extent of impacts to plant communities. Temporary and permanent impacts to wetlands are discussed in Section 22(m) of this Exhibit.

Construction of the Project will result in the temporary disturbance of approximately 0.17 acre of successional shrubland communities, 0.43 acre of successional old-field communities, and 0.47 acres of developed land communities. Temporary impacts will occur from the initial clearing and disturbance of these cover types for purposes of construction access, the siting of Project components, and the burying of underground collection lines. Once the Project becomes operational, these areas will return to their pre-existing condition. Permanent loss will occur to approximately 0.11 acres of successional shrubland communities and 0.38 acre of developed land communities.

No impacts are anticipated to open-water vegetation communities within the Project Area. A description of impacts to all surface waters within the Project Area is included in Exhibit 23.

Table 22-3. Vegetation Impact Calculations

Cover Type/Habitat	Temporary Impact (Acres)	Permanent Loss (Acres)	Conversion (Acres)
Forestland	8.98	0.54	22.99
Successional Shrubland	0.17	0.11	0.04
Successional Old Field	0.43	0	0

Table 22-3. Vegetation Impact Calculations

Cover Type/Habitat	Temporary Impact (Acres)	Permanent Loss (Acres)	Conversion (Acres)
Open Water	0	0	0
Agricultural Land	54.99	9.07 (Useful Life of Project Only)	372.49 (Useful Life of Project Only)
Developed Land	0.47	0.38	3.43
Total	65.04	10.10	398.95

The clearing of forested cover types within the Project Area is unavoidable due to the size and location of forest communities within the Project Area. There will be approximately 9 acres of temporary impacts to forestland within the Project Area and only 0.54 acres of permanent loss of forestland. Forest conversion impacts will occur within the Project Area where some 31 acres forests are initially cleared for Project construction and then virtually all of it will be replanted or maintained as successional old-field or shrubland communities for the life of the Project. The Applicant plans to remove tree stumps only where the placement of components is intended to occur or where required by landowner agreements.

In general, habitat fragmentation occurs where areas of a particular community are divided into smaller, isolated patches. This process can result from the creation of open areas, farmland expanses, road corridors, or the establishment of developed areas. The creation of fragmented or peripheral habitat can result in edge effects which affect animal and plant populations or community structures that occur at the boundary of fragmented habitats. These effects are most evident in species that exhibit edge-sensitivity. Grasslands comprise approximately 7 acres within the Project Area in the form of successional old field communities. Extensive grassland habitat which might support edge-sensitive species is not present. Proposed forest clearing will result in conversion of approximately 0.93 acres of interior forest to peripheral forest area, defined as forest within 300 feet of the forest edge, created through the addition of access roads and developed areas within existing forest patches. Presently, forest patches within the Project Area are small and isolated in the surrounding agricultural matrix, providing sub-optimal habitat for edge-sensitive species. Given the landscape context of the Project (i.e., primarily agricultural), it is unlikely that edge-sensitive species are actively using the forested areas therein, and further

unlikely that the creation of additional forest periphery will alter species behavior or community assemblages within the Project Area. Physical barriers resulting from this action are minor enough that they are unlikely to alter the bird communities present or significantly change individual behaviors. For more information on habitat fragmentation and edge effects caused by the Project, refer to the subheading *Impacts to Wildlife and Wildlife Habitat,* within Section 22(f) of this Exhibit.

(2) Vegetation Management Plans for Construction and Operation

Vegetation management will occur throughout the Project Area for siting of Project components during construction and to maintain safe operation for the useful life of the Project. The limits of proposed tree clearing are shown on the Preliminary Design Drawings provided in Exhibit 11. Tree clearing for siting of Project components is proposed to occur on 31.64 acres. As part of the Application, and in preparation for construction, an Invasive Species Management and Control Plan (ISMCP) was prepared to describe the survey methods that were used to identify invasive species populations present on-site, as well as monitoring and control methods to be implemented throughout the construction and operation phases of the Project, including the prevention and minimization of the introduction and/or spread of invasive species. The ISMCP is further detailed in Section 22(p) of this Exhibit. Control and management methods for high priority invasive species in the Project Area are further addressed in Appendix 22-7.

Prior to the start of construction, crews will be educated regarding the contents of the ISMCP to ensure that their activities on-site comply with best management practices (BMPs) outlined in the Plan. Additionally, the limits of tree clearing will be clearly marked. To prevent introduction and spread of invasive species, management actions can be grouped into four main categories: material inspection, targeted species treatment and removal, sanitation, and restoration. Within each category, specific actions or combinations thereof can be taken depending on characteristics of a specific species and its density within the target area. Discussion of material handling, including removal and disposal of waste from tree removal is provided in Exhibit 21.

Following the construction phase of the Project, the Applicant will temporarily restore disturbed areas. The area around and between solar arrays will be planted with a solar farm grass seed mix comprised of cool season grasses and forbs that are native to the area. These grasses will mature to a height of approximately 2 to 2.5 feet. The re-established groundcover between solar arrays will require periodic maintenance in the form of mowing. Trees and shrubs will be planted along portions of the outer boundary of the solar arrays to create a visual buffer from houses and

public throughways. Periodic pruning of these trees and shrubs will be necessary to keep branches from growing over or shading the solar arrays. Appendix 11-2 provides a detailed Landscaping Plan for the Project Area. Exhibit 5 provides additional information on proposed vegetation management practices. Specifically, Section 5(j) explains vegetation management practices during the initial operation period and ongoing operation.

22(c) Avoidance, Minimization, and Restoration Measures for Plant Community Impacts

(1) Avoidance and Minimization of Plant Community Impacts

Avoidance efforts have been undertaken during the siting and design of the Project in order to preserve the existing character of plant communities to the maximum extent practicable. Specifically, Project components have largely been sited within existing agricultural fields which already provide limited benefit to wildlife. The Applicant evaluated alternative designs in effort to carefully design the Project to have as minimal an impact on existing ecological communities as was practical (Exhibit 9). The preliminary design of the Project presented in this Application includes avoidance of unnecessary impacts to grasslands, interior forests, wetlands and open water habitats, and shrublands. As a result, impacts to these landscape features (and vegetation communities) will be marginal or wholly avoided. Project components were sited in order to confine disturbances to the smallest area possible. Work areas have been sited to open fields wherever possible.

Linear Project components such as access roads and collector lines, have been co-located where feasible to avoid and minimize impacts to plant communities. Solar panels have been proposed in areas previously disturbed by agricultural operations to the maximum extent practicable. Further, fence lines and access roads have been strategically designed to allow for continued agricultural uses in several areas of the Project, as discussed in Exhibit 9. These features are shown on the Preliminary Design Drawings provided in Exhibit 11.

A final comprehensive erosion and sediment control plan will be developed and used to protect adjacent resources during the construction and associated remediation phases of this Project. See Section 23(c)(1) of Exhibit 23 for details and a summary of the Preliminary Stormwater Pollution Prevention Plan (SWPPP), available as Appendix 23-3, which contains said proposed erosion and sediment control measures.

Avoidance, minimization, restoration of impacts to vegetative communities, where applicable, will also occur by complying with guidance from the on-site Environmental Monitor, maintaining clean

work sites, implementing BMPs during construction, operation, and maintenance, and by demarcating and avoiding areas that are highly susceptible to disturbances. These confined areas will be deemed inaccessible to construction equipment and any other disturbance activity.

As discussed in Section 22(b), the Applicant will implement BMPs in accordance with the ISMCP (Appendix 22-7) to prevent the introduction or spread of invasive species within the Project Area.

The Applicant will employ adaptive management during the post-construction and restoration phases to incorporate emerging approaches and alternative technologies. Specifically, the Applicant will routinely evaluate vegetation management practices and invasive species detection and response measures to ensure restoration efforts are successful in accordance with applicable Article 10 Certificate Conditions.

(2) Post-construction Vegetation Restoration

Restoration of temporarily disturbed areas will occur following the construction phase of the Project. Temporarily disturbed areas (other than impacted agricultural areas) will be seeded with native species blends. These seeded areas will be further stabilized with mulch (as needed and in accordance with the Final SWPPP) and left to reestablish preexisting vegetation. Native grasses planted between and under solar arrays have been shown to benefit grassland birds and pollinating insects (Montag et al. 2015, Walston et al. 2018). As discussed in Section 22(b)(2) of this Exhibit, the area around and between the solar arrays will be planted with a solar farm grass seed mix comprised of cool season grasses that are native to the area. This grass seed mix will provide favorable wildlife habitat to species reliant on grassland habitat, including breeding birds and pollinating insects. Trees and shrubs will be planted in select areas around the solar arrays to create a visual buffer.

(3) Summary Impact Table

A summary impact table quantifying anticipated temporary and permanent impacts associated with the various facility components in relation to Project Area vegetation cover types is provided as Table 22-4.

(4) Impacts of Perimeter Fencing

Proposed perimeter fencing is shown on the Preliminary Design Drawings provided in Exhibit 11. Fencing is primarily proposed in discrete blocks, forming a perimeter around panel arrays which

are primarily located in agricultural fields throughout the Project Area. The perimeter fencing as proposed allows for sufficient space for wildlife crossing between forested and wetland habitats in the northern portions of the Project to those located in the southeastern portions of the Project; e.g., there are multiple corridors (mostly forested) allowing wildlife to travel from Packwood Rd to Border City Road or Pre-Emption Street without being blocked by a fence.

Small losses in connectivity of habitat will occur between forest patches west of the private driveway labeled as Welch Road. Proposed fencing will cut-off access to a 30-meter wooodline which connects two larger forest patches. The fencing as proposed will require wildlife to travel around the fence to move between patches; however, an approximately 30-meter buffer strip of forest is retained outside the fenceline to provide an additional covered corridor.

(5) Characterization of Aquatic and Terrestrial Vegetation, Wildlife and Wildlife Habitats

Wildlife habitat exists primarily in the 269 acres of forestlands and 272 acres of wetlands in the Project Area, as well as in 7 acres of successional old fields as shown in Figures 22-1, 22-4, and 22-5. Forestlands in the Project Area are predominantly mature deciduous forests, with overstory tree communities dominated by beech, maple and hardwoods. Many of the extensive forested areas in the Project are wooded wetlands, with inundation present during much of the year (Figure 22-4). Some areas of upland forest are present in small isolated fragments within lands which have been previously converted to agriculture. Several large wetland complexes exist in the northern and eastern portions of the Project Area (Figure 22-4). These include shrub-scrub, forested and emergent wetlands as well as ponds. Wetland features delineated during on-site surveys are described in further detail in Section 22(i). Small, isolated patches of old successional field cover approximately seven non-contiguous acres in the Project Area.

Some habitats have the potential to support wildlife species. Several avian species of greatest conservation need (SGCN) have been documented on Site in forest patches and successional old fields (Table 22-12). Locations of species observed are provided in Appendices 22-2 and 22-3. Impacts to these areas are described in Section 22(b) and are shown in the Preliminary Design Drawings in Exhibit 11. Impacts to these habitats have been minimized through the siting and design process in efforts to preserve the existing character of wildlife habitat throughout the Project Area. No calcareous shoreline outcrops or karst features are present within the Project Area.

(6) Identification and Delineation of Vernal Pools

A vernal pool survey was conducted during March of 2019. The results of the survey are provided in Section 22(k). Methodology for the vernal pool survey conscribed to seasonal limitations for identification and observation of breeding amphibian species which may utilize vernal pool features. The March 2019 survey documented only one vernal pool. This feature was located in an area that has been excluded from Project development, therefore, the feature will not be impacted by Project development.

(7) Locations of Bat Hibernacula and Maternity Roosts

The United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) system does not indicate the potential for Indiana bats (*Myotis sodalis*) or northern long-eared bats (*Myotis septentrionalis*) to occur within the vicinity of the Project. Additionally, NYSDEC lists no known summer occurrence of northern long-eared bats in Seneca County and no known occurrences during winter or summer in the Town of Waterloo as of June 2018. Formal consultation with NYSDEC indicated occupied Indiana bat habitat (confirmed maternity roost tree) located approximately 2.5 miles north of the Project Area. No known roost trees occur within the Project Area. Additionally, no known hibernacula are located within 5 miles of the Project Area.

Table 22-4. Summary Impact Table

Project Components	Agricultural Land			Successional Old Field			Successional Scrubland			Forestland[1,2]		
	Temporary Impacts (acres)	Permanent Loss (acres)	Conversion (acres)	Temporary Impacts (acres)	Permanent Loss (acres)	Conversion (acres)	Temporary Impacts (acres)	Permanent Loss (acres)	Conversion (acres)	Temporary Impacts (acres)	Permanent Loss (acres)	Conversion (acres)
Solar Panel Installations	0	0	321.47	0	0	0	0	0	0.04	0	0	18.96 (0.38 acres of interior forest)[1]
Access Roads	0	7.38	0	0	0	0	0	0.02	0	0	0.54	0
Collection Lines	2.37	0	0	0.01	0	0	0	0	0	0.07	0	0
Laydown Yards	6.64	0	0	0	0	0	0	0	0	0.39	0	0
Collection Substation	0	0.26	0	0	0	0	0	0	0	0	0	0
Switchyard	39.79	0.92	0	0	0	0	0	0	0	0	0	0
LOD	0	0	0	0.41	0	0	0.15	0	0	7.91	0	0
Fence Line	0	0	1.45	0	0	0	0	0.08	0	0	0	0.19 (0.009 acres of interior forest)
Fenced Area	0	0	49.56	0	0	0	0	0	0		0	3.84 (0.54 acres

Table 22-4. Summary Impact Table

Project Components	Agricultural Land			Successional Old Field			Successional Scrubland			Forestland[1,2]		
	Temporary Impacts (acres)	Permanent Loss (acres)	Conversion (acres)	Temporary Impacts (acres)	Permanent Loss (acres)	Conversion (acres)	Temporary Impacts (acres)	Permanent Loss (acres)	Conversion (acres)	Temporary Impacts (acres)	Permanent Loss (acres)	Conversion (acres)
												of interior forest)
Inverters	0	0.16	0	0	0	0	0	0	0	0	0	0
Sectionalizer	0	0	0	0	0	0	0	0.01	0	0	0	0
Rip Rap	0	0.07	0	0	0	0	0	0	0	0	0	0
Culverts	0	0.04	0	0	0	0	0	0	0	0	0	0
Filtration Basins	0	0.23	0	0	0	0	0	0	0	0	0	0
Bore Pits	0.03	0	0	0			0	0	0	0	0	0
Grading	4.69	0	0	0.01			0.02	0	0	0.50	0	0
Parking Areas	1.47	0	0	0			0	0	0	0.11	0	0

Note: Project Components may be co-located, therefore, the values in this table overestimate the impacts to each community type.

(1) Additional forestland conversion will occur outside of Project Components, to prevent shading. Approximately 22.99 acres of forestland, including 0.93 acre of interior forest, will be converted to prevent shading.

(2) Forestland includes calculation of impacts to beech-maple mesic forest and successional southern hardwoods community types present in the Project Area, as defined in Edinger et al. (2014).

22(d) Characterization of Vegetation, Wildlife, and Wildlife Habitats

The Applicant commissioned TRC to document specific plant species and general plant communities during the summer of 2019. TRC referenced nomenclature and community descriptions provided in the New York Flora Atlas (Weldy et al., 2019) and the Ecological Communities of New York (Edinger et al., 2014) to identify plant species and define plant communities. During the field effort, TRC biologists conducted a species inventory and general plant community survey for the Project Area, identifying discernable plant species while walking through impact survey areas and established plant communities. Appendix 22-1 (Plant and Wildlife Inventory List) includes a compiled list of plant species observed at the Project Area. A list and description of plant communities identified on site can be found in Section 22(a) of this Exhibit. Wetlands are addressed separately in Sections 22(i) through Section 22(n).

Wildlife and wildlife habitat were evaluated through field reconnaissance and/or multi-season surveys conducted on-site with data collected in a manner described in published protocols appropriate to the types of studies being conducted and as appropriate to the nature of the Project Area. These data were supplemented with publicly-available data from the following sources as described:

- New York Natural Heritage Program (NYNHP) database
- New York State (NYS) Amphibian and Reptile Atlas Project
- NYS Breeding Bird Atlas (BBA)
- United States Geological Survey (USGS) Breeding Bird Survey (BBS) data
- National Audubon Society Christmas Bird Count (CBC) data
- Hawk Migrations Association of North America (HMANA) hawk watch count data
- eBird

A list of all wildlife identified within the Project Area is included as Appendix 22-1. Species with potential to occur based on site habitat and information provided in the above-mentioned sources are discussed in Section 22 (e).

(1) Suitable Habitat Assessment

The Applicant does not anticipate impacts to any federally or state-listed significant natural community, habitat of special concern, United States National Wilderness Area, or USFWS-Critical Wildlife Habitat. Based on a review of the USFWS Environmental Conservation Online

System (USFWS, n.d.), NYSDEC Environmental Resource Mapper (NYSDEC, n.d.), and the *U.S. National Wilderness Preservation System Map* (Ronald, 2012), no known significant natural communities or habitats of special concern occur within the Project Area. Consultation with NYSDEC indicated several rare plants and tracked communities located within wetland complexes located approximately 2.5 miles north of the Project Area (Appendix 22-8); however, these species and communities were not observed by TRC biologists during on-site surveys.

(2) Survey Reports for NYSDEC

Survey reports identified in this Exhibit have been included with this Application for NYSDEC review. Specifically, the Application includes reports for the Applicant's BBS (Appendix 22-2), Winter Raptor Surveys (Appendix 22-3), wetland and stream delineations (Appendix 22-5) and other relevant survey information as noted in this Exhibit.

22(e) Wildlife Surveys

On-site observations, field surveys, and reviews of publicly-available data sources were conducted to create a complete list of bird species present or with potential to occur within the Project Area, as well as through consultation with state (NYSDEC, NYNHP) and federal (USFWS) agencies. Details regarding consultations with relevant agencies are discussed below and provided in Appendix 22-8. Sources of publicly available information are listed below along with general discussions of the databases queried.

Avian

Grassland BBS

A preconstruction survey of grassland bird species was conducted by TRC on behalf of the Applicant during the 2019 breeding season (May through July). The objective of the grassland BBS was to determine the presence and site use of federally and state-listed threatened/endangered, rare, and special concern grassland bird species within the proposed Project Area. No state or federally listed threatened or endangered species were observed to be present, breeding, or nesting on site. The Project, therefore, is not expected to negatively affect endangered or threatened grassland nesting species.

Bird species targeted by the BBS include:

- northern harrier (*Circus cyaneus*)
- upland sandpiper (*Bartramia longicauda*)
- short-eared owl (*Asio flammeus*)
- Henslow's sparrow (*Ammodramus henslowii*)
- sedge wren (*Cistothorus platensis*)
- grasshopper sparrow (*Ammodramus savannarum*)
- vesper sparrow (*Pooecetes gramineus*)
- horned lark (*Eremophila alpestris*)

Additional grassland bird species the subject of the survey included:

- American kestrel (*Falco sparverius*)
- bobolink (*Dolichonyx oryzivorus*)
- eastern meadowlark (*Sturnella magna*)
- golden-winged warbler (*Vermivora chrysoptera*)
- savannah sparrow (*Passerculus sandwichensis*)

The survey methodology followed the NYSDEC *Draft Survey Protocol for State-listed Breeding Grassland Bird Species* (NYSDEC, 2015a). A study plan for the survey was submitted to the NYSDEC in May 2019 and approved with the agency's comments incorporated. A total of 622 acres of potential grassland habitat, primarily composed of pasture and hayfields, was determined to be present at the Project Area based on a habitat assessment. After applying obstruction buffers and delineating exclusion areas (where no Project components will be installed), a total of 105 acres of potential habitat remained, requiring 18 survey points. After an initial visit to the Project Area prior to the start of the surveys, eight of the survey points were removed due to being located in recently planted agricultural fields (row crops), resulting in a total of 10 survey points available for survey, with two additional locations later removed once converted to row crop cover.

Each survey point consisted of a 100-meter radius plot centered on the observation point with a minimum distance of 250 meters (m) between observation points. In conformance with the NYSDEC survey protocol, nine weekly surveys were performed at the Project Area between May 24 and July 19, 2019.

Experienced field biologists conducted weekly point count surveys beginning one-half hour before sunrise and continuing until no later than 10:30 AM, per NYSDEC survey protocol. Surveys were

not conducted during inclement weather, including precipitation, fog, or strong winds (i.e., greater than 10 to 12 miles per hour). Each survey was conducted for 5 minutes at each location. All birds observed within 100 m of the survey point were recorded, and birds observed beyond 100 m from the survey point and during meander surveys (i.e., while traveling between points within the Project Area) were recorded as incidental observations.

Biologists recorded a total of 608 observations representing 55 species over the course of the BBS. This included species and individual birds observed at the survey points, outside of the 100m radius circular plot, and birds observed during the meander surveys. During surveys, 142 individuals of 21 species were observed in grassland habitat, including three grassland bird species (bobolink, savannah sparrow, and vesper sparrow). The most common species observed was the red-winged blackbird (*Agelaius phoeniceus*) accounting for 23% of all total individuals observed during surveys. Thereafter, the most common species observed were the Canada goose (*Branta canadensis*), killdeer (*Charadrius vociferus*), and savannah sparrow. Savannah sparrows were the most numerous grassland species observed and these species can be expected where grassland habitat is present. This species is not listed as threatened or endangered nor as a species of special concern (SSC). Three raptor species were observed at the Project Area during the grassland BBS, including red-tailed hawk (*Buteo jamaicansis*), turkey vulture (*Cathartes aura*), and the state-listed threatened bald eagle (*Haliaeetus leucocephalus*).

The vesper sparrow is a state-listed SSC and a single individual was observed twice, once on May 24 and again June 4, 2019. The individual observed was a singing male. The old field where this individual was observed was converted to row crop following the second round of surveys, after which the individual was not seen again.

The horned lark, a state-listed SSC, was observed at several locations during the first two survey visits on May 24 and May 31, and again June 6, 2019. Groups of individuals were observed in fields which were recently plowed for row crop agriculture and characterized by sparse or entirely absent vegetation.

Bobolinks, a grassland bird species targeted by this study, but not a listed species, were observed at two locations within the Project Area on May 24 and June 4, 2019, both incidentally and during timed surveys. The species exhibited probable breeding behavior, including observation of singing males and of male-female pairs. A more detailed explanation of observations is provided in Appendix 22-2.

SSC are those identified as worthy of attention and consideration within the state due to a welfare concern or risk of endangerment, however, do not require special protections granted to those species which are threatened or endangered.

One state-listed species, bald eagle, was observed to be present during these surveys. An adult individual was observed incidentally on June 11 and June 26, 2019 in the vicinity of a known active nest in the Project Area which has been previously documented by the NYSDEC. The nest was confirmed active during other on-site activities in June of 2019. The Applicant has been conducting surveys at the Project in consultation with the NYSDEC regarding this nest site so as not to disturb nesting activity or otherwise engage in actions which may constitute take of the species. Further discussion on the bald eagle is included in Sections 22(g)(2) 22(g)(7).

A detailed description of the grassland BBS results, including incidental observations, can be found in Appendix 22-2.

Wintering Raptor Surveys

TRC conducted a preconstruction monitoring survey of wintering grassland raptors. The objective of the wintering grassland raptor survey was to determine the presence and site use of state-listed threatened/endangered grassland raptors within the proposed Project Area. Target species were short-eared owl (*Asio flammeus*) and northern harrier. Northern harrier were observed on two occasions. Short-eared owl was not observed.

The survey methodology followed the *NYSDEC Draft Survey Protocol for State-listed Wintering Raptor Species* (NYSDEC, 2015b). The NYSDEC provided comments on the Study Plan and protocol on and a revised Study Plan was submitted on December 12, 2019. Surveys were performed using both rotating stationary survey points and weekly driving surveys along roads, with short-duration counts conducted along the route in areas of grassland habitat.

Stationary survey points were situated in or near grassland habitat within the Project Area with clear visibility in all or most directions. Stationary survey points were no further than 1,000 m apart when multiple stationary survey points were needed to cover an area of grassland habitat. Six stationary survey points were located throughout the Project Area, covering habitats that may be used by short-eared owls and/or northern harriers for foraging or roosting, including one survey point specifically designed to provide reference data from habitat located outside of the Project Area. Stationary survey point locations were adjusted in the field if necessary, based upon

visibility and accessibility, and selected to provide maximum visibility of habitat within the Project Area, as well as reference areas located outside of the area of proposed development.

The driving survey was divided into two driving routes, each traversing the east and west side of the Project Area, respectively, with pre-determined stops located along the route where habitat could be observed from the road, and safety was not compromised. One route was surveyed each week, such that each route was surveyed every two weeks throughout the Study Period. Short-duration (approximately five minutes) surveys were conducted at each stop along the route. Locations were no more than 0.5 miles apart where large expanses of potential habitat required multiple locations in adherence to NYSDEC protocol.

Surveys were performed in the winter of 2019-2020 and were conducted between November 1, 2019 and March 31, 2020.

Stationary surveys were conducted at each of the six stationary survey locations at least once every two weeks, with survey staff visiting the Project Area weekly. Driving surveys took place every other week from November 18, 2019 through March 31, 2020. Stationary surveys were conducted for a total of 85.7 hours, and 12.2 total hours were spent conducting daytime driving surveys.

All survey points were visited bi-weekly, for a total of 10 stationary surveys per survey site at the Project Area over the course of the Survey Period. Survey dates were targeted to take advantage of the best weather conditions during each week. Stationary surveys were initiated one hour before sunset and concluded when it was too dark to see flying birds, up to one hour after sunset.

Daytime driving surveys were conducted bi-weekly and scheduled to be completed prior to stationary surveys which occurred on the same day a driving route was surveyed. This was done at the request of the NYSDEC to be more inclusive of temporal and geographic coverage of survey sites. Surveys were completed with two surveyors: one person driving and the other making observations. Where raptors were noted between intended stopping locations, the driver pulled over as needed to confirm identification.

Red-tailed hawks were the most commonly observed raptor using the Project Area during both stationary and driving surveys and were present throughout the Project Area. Twelve observations of state-listed threatened or endangered species were made during surveys. Two state-listed threatened species were observed, bald eagle and northern harrier. Three state-listed

SSC were observed in the Project Area including Cooper's hawk (*Accipiter cooperii*), osprey (*Pandion haliaetus*), and sharp-shinned hawk (*Accipiter striatus*). Overall, raptor use of the Project Area was concentrated to the eastern half.

State-threatened northern harrier was observed on two occasions early in the study. Adult individuals were observed on December 11, 2019 at location REDACTED REDACTED and on December 23, 2019 at REDACTED. Both individuals were adult males and were observed for less than 2 minutes flying low across open fields visible from the survey location. The individual at REDACTED was flying east toward a marsh area. The individual at REDACTED appeared to be descending toward the ground. The observation was recorded in low light conditions after sunset and therefore, a roost area could not be identified or confirmed. Northern harrier was not observed again during the Survey Period. Northern harrier are large, conspicuous raptors and the paucity of observations of this species (n=2) throughout the five-month Study Period suggests that this species is not a regular occupant of the Project Area. The two sightings in mid- and late-December suggest transitory and not resident behavior.

A total of 10 bald eagle observations were recorded during the Winter Raptor Survey. Six observations of bald eagles (state-listed threatened) were recorded during stationary surveys. Observations occurred primarily in proximity to the known nest, which is located REDACTED Two observations of adult individuals were recorded at TR-4 in the central portion of the Project. Individuals were recorded on November 20, 2019 and January 12, 2020. Observations were less than two minutes in duration. Individuals were observed flying either in the direction of the known nest, or in a direction opposite the nest area across the Project Area at 25 to 50 feet high. Two observations were recorded from the reference location TR-R on January 13, 2020 and February 24, 2020. Again, both observations were of adults flying in the direction of the nest area and were less than two minutes in duration. Two additional observations of perching individuals were recorded at TR-2. Both observations were of an adult eagle in the known nest and totaled 71 use minutes. These observations were recorded on February 6, 2020 and March 12, 2020.

Bald eagles were also observed during driving surveys on January 22, 2020 and March 30, 3030. Eagles were observed in proximity to the nest area. A pair was observed in the nest on January 22, 2020 from driving location WR-D7. Two adult individuals were observed at WR-D8 on March 20, 2020. One individual was perched near the nest, and the other was observed flying south from the nest area. Flight paths and perch locations are shown on Figure 22-6.

Three state-listed special concern were observed during stationary surveys. During a stationary survey at site TR-R on November 20, 2019, an adult sharp-shinned hawk was observed perching within the Project Area. The individual flew off to the west over the central portion of the Project. An additional observation of sharp-shinned hawks was recorded on January 9, 2020 at TR-1 along the western border of the Project Area. The adult individual was observed flying up from the ground to perch in a tree line east of the survey location, consistent with hunting behavior. One Cooper's hawk was observed on January 30, 2020 at TR-5 which is located in the center of the Project. The individual was observed flying low from a grassy area west of the survey location. The bird perched for approximately three minutes directly in front of the surveyor before flying low toward a forested area to the east. One osprey was observed during driving surveys on March 30, 2020. The adult individual was observed flying north over the Project Area in the vicinity of driving survey location WR-D8 along Packwood Road.

No additional listed species were observed. No nesting was documented for any species other than the bald eagle, which had been previously known to actively nest within the Project Area. One northern harrier was observed descending toward the ground at late-evening, although a roost location could not be identified or confirmed to be located within the Project Area. Ultimately, the scarceness of observations of this species (n=2) throughout the five-month Study Period suggests that this species is not a regular occupant of the Project Area.

The most common raptor species observed at the Project Area was the red-tailed hawk, first observed on November 20, 2019. This species comprised approximately 56 percent and 63 percent of total raptor observations during the stationary and driving surveys, respectively. Refer to Appendix 22-3 for a more detailed description of the wintering grassland raptor survey, including a list of incidental bird observations.

Grassland Habitat

Based on the grassland BBS, there are approximately 622 acres of potential grassland habitat at the Project Area; however, not all potential grassland habitat meets the requisite needs for many at-risk grassland bird species. The Project Area may, theoretically, provide habitat for northern harrier during the over-wintering period; however, the mowing of the hayfields and pastures would discourage them from using the Project Area as they require vegetation greater than 60 cm in height for breeding habitat (Morgan and Burger, 2008). Grasshopper sparrows, which were not observed on site, require relatively large (125 to 247 acres) fields with low vegetation density and

more than 20 percent bare soil for breeding habitat (Morgan and Burger, 2008). Vesper sparrows were observed within the Project Area, and some fields may provide limited habitat during the breeding season. Morgan and Burger (2008) note a preference for areas with exposed soil, which is prevalent during the early weeks of the breeding season when agricultural crops are first planted. However, once row crop vegetation replaces fallow field conditions, the species is unlikely to continue to use these areas. This is consistent with observations recorded during the grassland breeding bird study conducted within the Project Area. Savannah sparrows were a commonly observed species in the Project Area which, due to their generalist habitat preferences, may contain suitable breeding habitat. However, due to the active practice of mowing for hay and cultivation of fields, this species is likely already being displaced for at least part of the breeding season (Morgan and Burger, 2008).

A review of publicly available data from the NYNHP and consultation with NYSDEC indicated records of active nesting of the state-listed bald eagle within and in the vicinity of the Project Area, though this species is not reliant upon grassland habitat for breeding or other life requisites. Additionally, northern harriers were observed twice during mid- and late December 2019. This paucity of sightings indicates a transitory habitat use as resident occupation of the Project Area would have certainly resulted in additional sightings throughout the five-month Study Period.

No additional records of state-listed grassland bird species exist for the Project Area in sources reviewed or were occurrences indicated by agencies consulted. While some areas of the Project may be used by grassland nesting species, habitat is of limited suitability due to active farming practices which incur frequent disturbance during the nesting and post-breeding periods. The habitat created through restoration and re-vegetation of the Project Area following Project construction may provide more favorable conditions than current land uses for many species reliant upon grassland habitat (Section 22(f)(7)). Although behavior consistent with probable breeding was observed for all special concern species documented at the Project, none were observed to be nesting or actively breeding within the Project Area.

Bog Turtle

The bog turtle is State-listed as endangered wherever it is found in New York. The species has not been observed on site; however, consultation with NYSDEC indicated known occurrences approximately 2.5 miles north of the Project Area. Initial consultation with USFWS through the IPaC system indicated the possibility of bog turtle in the same general area as the Project Area. However, following additional consultation and correspondence with the USFWS, the agency

concluded “no need to address bog turtle for this project as [USFWS] have refined our predictive habitat model that is within IPaC.” Copies of this correspondence are provided in Appendix 22-8.

Bats

Consultation with the NYSDEC and USFWS was conducted to determine the presence and extent of occupied habitat for state and federally listed bat species which have the potential to occur within the Project Area. Consultation with the USFWS was conducted through the IPaC system on February 11, 2020. The Official Species List provided indicated no known occurrence of federal-listed species within the vicinity of the Project Area (Appendix 22-8). Consultation with the NYSDEC was requested to review and provide information and locations of any occurrences or occupied habitats of state-listed species, including bats. A response was provided on January 14, 2020 indicating the NYSDEC does not have any records of hibernacula for listed bat species within 5 miles of the Project Area. Indiana bat summer occupied habitat was identified just over 2 miles from the Project Area.

Terrestrial Invertebrates

The Project Area encompasses a variety of habitat types and, as such, a vast multitude of terrestrial invertebrates are likely to use habitats within the Project Area. Terrestrial invertebrates are a diverse group of animals residing on dry land that neither possess nor develop a backbone. These include a variety of arthropods, including insects (e.g., beetles, bugs, ants, bees, butterflies, moths, cockroaches, mantis, stick insects, dragonflies, mosquitoes, fleas, crickets, grasshoppers, fireflies, cicadas, and flies), arachnids (e.g., various spider species, ticks, and mites), and myriapods (e.g., millipedes and centipedes) amongst many others. Worms are another form of terrestrial invertebrate, which typically have a long cylindrical body and no limbs. Terrestrial species include earthworms and nematodes, which are very common invertebrates that live in the topsoil. Mollusks are another vast group of invertebrates. Of this immense group, a portion of mollusks are terrestrial and include snails and slugs.

Invertebrates are often the keystone components to the health of habitats and ecosystems and support more familiar vertebrate species. Terrestrial invertebrates are critically important to the functioning of ecosystems due to the variety of services and functions this animal group provides. Some important services include pollination, decomposition, nutrient cycling, and the promotion of soil fertility for plant growth. Terrestrial invertebrates are also a vital food source for many larger

species within ecosystems due to their abundant populations. Terrestrial invertebrates common to Western New York are presumed present within the Project Area.

Active Agriculture

Active agriculture provides marginal habitat for most species due to the increase in regularity and intensity of disturbance in these areas. Although agricultural areas may be too frequently disturbed for nesting and breeding, some birds use these areas for foraging and as a stop-over during migration. Grasshopper sparrow, bobolink, and mourning dove (*Zenaida macroura*) are examples of birds known to forage in active agricultural areas, each of which were observed during BBS. Additionally, various mammals may forage on agricultural crops as a supplement to natural food sources. The agricultural row crops at the Project Area may provide suitable feeding habitat for the wildlife observed in these areas. According to the United States Department of Agriculture (USDA) Cropland Data Layer (CDL) and on-site observations, soybean is the primary agricultural row crop at the Project Site (289.2 acres or 27.1 percent of the Project Area), followed by corn (206.9 acres or 19.4 percent of the Project Area), and alfalfa (57.8 acres or 5.4 percent of the Project Area). Non-alfalfa hay is found within 9.7 acres or 0.9 percent of the Project Area. Birds identified in pastures and hayfields at the Project Area are noted in the grassland BBS and the wintering grassland raptor survey described above and in Appendix 22-2 and Appendix 22-3, respectively.

Forestland

Forest communities within the Project Area provide habitat for forest-associated species, however, only for species that do not require large forest expanses. Forest patches within the Project Area have been previously fragmented to promote expansion of agricultural production and therefore, are not consistent with forest habitat used by interior forest obligates. Further interior forest species were not observed during surveys conducted on site. Forests are a unique environment, providing complex physical and physiographic conditions which promote species diversity. Forests often experience decreased anthropogenic disturbance levels, lower light levels, and higher moisture levels; contain a greater density of relatively protected nesting sites, increased vertical structure, and dry shelter sites; are structurally more complex which can increase concealment/camouflage; and, contain diverse plant communities offering variable foraging opportunities. Mammals commonly found throughout forested environments in western New York and that have the potential to use forest communities within the Project Area and vicinity include:

- American mink (*Neovison vison*)
- coyote (*Canis latrans*)
- eastern chipmunk (*Tamias striatus*)
- eastern cottontail (*Sylvilagus floridanus*)
- eastern gray squirrel (*Sciurus carolinensis*)
- eastern raccoon (*Procyon lotor lotor*)
- fisher (*Martes pennanti*)
- gray fox (*Urocyon cinereoargenteus*)
- long-tailed weasel (*Mustela frenata*)
- North American porcupine (*Erethizon dorsata*)
- red fox (*Vulpes vulpes*)
- red squirrel (*Tamiasciurus hudsonicus*)
- southern flying squirrel (*Glaucomys volans*)
- striped skunk (*Mephitis mephitis*)
- various mice (*Mus* spp.)
- various moles (*Condylura* spp.*, Scalopus* spp.*, Parascalops* spp.)
- various shrews (*Blarnia* spp., *Cryptotis* spp., *Sorex* spp.)
- Virginia opossum (*Didelphis virginiana*)
- white-tailed deer (*Odocoileus virginianus*)

Many of these species are adapted to increasingly fragmented habitats and are considered generalists which may inhabit a wide range of habitat types, including agricultural, residential, and urban landscapes.

Reptiles and amphibians are believed to inhabit forest communities within the Project Area, based on observations of frogs and salamanders in forested wetlands and vernal pools on site, and recent records from publicly-reviewed sources (e.g., the NYS Herp Atlas). However, reptile and amphibian populations are presumed to be relatively small owing to the limited amount of requisite open water habitat within the Project Area. Reptiles and amphibian species with potential to occur in the forest communities within the Project Area include:

- coal skink (*Plestiodon anthracinus*)
- common garter snake (*Thamnophis sirtalis*)
- eastern American toad (*Anaxyrus americanus*)

- eastern milk snake (*Lampropeltis triangulum*)
- eastern ribbon snake (*Thamnophis sauritus*)
- gray tree frog (*Hyla versicolor*)
- green frog (*Rana clamitans*)
- northern dusky salamander (*Desmognathis fuscus*)
- northern water snake (*Nerodia sipedon*)
- spotted salamander (*Ambystoma maculatum*)
- spring peeper (*Pseudacris crucifer*)
- wood frog (*Rana sylvatica*)

Bird species observed within the Project Area during field surveys or with potential to occur in the forest communities within the Project Area include:

- American redstart (*Setophaga ruticilla*)
- black-and-white warbler (*Mniotilta varia*)
- black-throated blue warbler (*Setophaga caerulescens*)
- black-throated green warbler (*Setophaga virens*)
- blue jay (*Cyanocitta cristata*)
- brown creeper (*Certhia americana*)
- common raven (*Corvus corax*)
- downy woodpecker (*Picoides pubescens)*
- eastern wood-pewee (*Contopus virens*)
- great crested flycatcher (*Myiarchus crinitus*)
- hooded warbler (*Setophaga citrina*)
- northern cardinal (*Cardinalis cardinalis*)
- northern flicker (*Colaptes auratus*)
- ovenbird (*Seiurus aurocapilla*)
- pileated woodpecker (*Dryocopus pileatus*)
- red-bellied woodpecker (*Melanerpes carolinus*)
- red-eyed vireo (*Vireo olivaceus*)
- scarlet tanager (*Piranga olivacea*)
- veery (*Catharus fuscescens*)
- white-breasted nuthatch (*Sitta carolinensis*)
- wood thrush (*Hylocichla mustelina*)

Of the species observed, none are considered interior forest specialists, and many are in fact habitat generalists, adapted to using fragmented and human-altered landscapes. Project development will pose minimal impacts to these species based on existing levels of forest fragmentation and the limited extent of forest clearing anticipated.

Forests at the Project Area include many tree species, with only a few areas clearly dominated by any one or two species. Trees in the upland include sugar maple, American beech, white ash, and shagbark hickory (*Carya ovata*). The Nature Conservancy (TNC) has defined matrix forest blocks as large contiguous areas capable of supporting species that require interior forest conditions (Anderson and Bernstein, 2003). There are 28 forest patches in the Project Area, ranging from 0.1 acre to 62 acres. None of the forests at the Project Area are part of a TNC matrix forest block or serve as a corridor to a TNC matrix forest block. There is little connectivity between these forest patches across the Project Area due to the habitat fragmentation from agricultural conversion. Approximately 194.3 acres, or 72.2 percent of the forestland at the Project Area, can be classified as edge forest, which is defined as forestland within 300 feet of the forest's edge along agricultural land and roads.

Successional Shrubland

Successional shrublands are highly dynamic habitats as the impacted area progresses in successional (seral) stages after a disturbance. The variability present in these environments creates valuable wildlife habitat due to the influx of different wildlife species which are adapted to the different plants which grow during the different seral stages (United States Natural Resources Conservation Service [NRCS], 2007). In many early successional communities, annual plants produce an abundance of seeds, which are consumed by granivorous birds and small mammals. The variable assortment of plant species provides highly nutritious forage material for herbivore and browser species. Additionally, the low and oftentimes dense herbaceous and shrub vegetation provides cover for birds and small mammals that prefer open habitats but are heavily preyed upon. A lack of a closed canopy also allows light and heat to penetrate to the ground and is an essential habitat feature for reptiles that depend on external heat sources for temperature regulation.

Mammals with potential to occur successional shrubland communities within the Project Area include:

- coyote

- eastern chipmunk
- eastern cottontail
- eastern gray squirrel
- eastern raccoon
- gray fox
- long-tailed weasel
- red fox
- striped skunk
- various mice
- various shrews
- various moles
- Virginia opossum
- white-tailed deer
- woodchuck (*Marmota monax*)

Reptiles and amphibians with potential to occur in successional shrubland communities within the Project Area include:

- common garter snake
- eastern American toad
- eastern milk snake
- spring peeper
- northern leopard frog (*Lithobates pipiens*)
- northern water snake
- wood frog

Bird species that use successional shrubland identified during field surveys included:

- alder flycatcher (*Empidonax alnorum*)
- American goldfinch (*Carduelis tristis*)
- American woodcock (*Scolopax minor*)
- brown thrasher (*Toxostoma rufum*)
- common yellowthroat (*Geothlypis trichas*)
- eastern phoebe (*Sayornis phoebe*)

- gray catbird (*Dumetella carolinensis*)
- indigo bunting (*Passerina cyanea*)
- song sparrow (*Melospiza melodia*)
- willow flycatcher (*Empidonax traillii*)
- yellow warbler (*Setophaga petechia*)

The successional shrublands at the Project Area provide a variety of berries for wildlife. The location of some of the successional shrublands in relation to open fields means they provide some wildlife protection from predators. Invasive shrubs such as multiflora rose, European buckthorn, and Morrow's honeysuckle may dominate the successional shrublands over time. If left unmanaged, the successional shrublands may advance into successional hardwood forests. Due to the limited extent of successional shrubland within the Project Area, it does not provide sufficient habitat for all of the mammal, bird, reptile, and amphibian species mentioned above. While each of the species may use successional shrubland, none use this habitat type exclusively.

Successional Old Field

The open grassland habitats of successional old fields contain a vast array of grass, sedge, and rush species amongst many other herbaceous plant species. These diverse open areas provide habitat for many species that prefer open grassland settings. As with successional shrublands, the variable assortment of plant species provides highly nutritious forage material for herbivore and browser species. Successional old-field habitats typically have a high diversity and abundance of flowering forbs, which provide food for pollinators such as bees, flies, and butterflies.

Mammals with potential to occur in grassland communities within the Project Area include:

- white-tailed deer
- coyote
- eastern cottontail
- gray fox
- long-tailed weasel
- red fox
- striped skunk
- various mice

- various shrews
- various moles
- woodchuck

Reptiles and amphibians with potential to occur in successional old-field communities within the Project Area include:

- American bullfrog (*Lithobates catesbeianus*)
- bog turtle (*Clemmys muhlenbergii*)
- common garter snake
- eastern American toad
- eastern milk snake
- northern leopard frog
- red-eared slider (*Trachemys scripta*)
- spotted turtle (*Clemmys guttata*)
- spring peeper

Bird species that use successional old fields identified during field surveys include:

- American goldfinch
- American robin (*Spinus tristis*)
- barn swallow (*Hirundo rustica*)
- bobolink
- brown-headed cowbird (*Molothrus ater*)
- chipping sparrow (*Spizella passerina)*
- eastern bluebird (*Sialia sialis*)
- field sparrow (*Spizella pusilla*)
- gray catbird
- horned lark (*Eremophila alpestris*)
- killdeer (*Charadrius vociferous*)
- red-winged blackbird (*Agelaius phoeniceus*)
- savannah sparrow
- warbling vireo (*Vireo gilvus*)
- wild turkey (*Meleagris gallopavo*)

There are areas of successional old field at the Project Area large enough to likely support some, but not all, of the species listed above. Bobolinks and savannah sparrows were observed in successional old fields during the grassland BBS. Most of the successional old field habitat at the Project Area is adjacent to active agriculture and roads and is, therefore, subject to disturbance. It is likely that most of the successional old-field habitat at the Project Area is abandoned agricultural land. If left unmanaged, the successional old-field habitat will turn into successional shrubland over time.

Open Water

The open water habitats of ponds and wetlands within the Project Area support a diverse assemblage of semi-aquatic and aquatic species. Open water habitats are very important to surrounding communities as they provide increased nutrient production, facilitate waste and debris decomposition, are high in biodiversity, and provide foraging opportunities and water supply to terrestrial, aquatic, and semi-aquatic species (Keddy, 2010). These habitats can support populations of waterfowl, amphibians, terrestrial and aquatic invertebrates, and semi-aquatic mammals as well as provide water supply and foraging opportunities to terrestrial species.

Mammals with potential to occur in open water communities within the Project Area include:

- American beaver (*Castor canadensis*)
- American mink
- eastern raccoon
- muskrat (*Ondatra zibethicus*)

Reptiles and amphibians with potential to occur in open water communities within the Project Area include:

- American bullfrog
- bog turtle
- common snapping turtle
- eastern ribbon snake
- eastern spiny softshell (*Apalone spinifera*)
- green frog (*Rana clamitans melanota*)
- northern leopard frog
- northern water snake

- painted turtle (*Chrysemys picta*)
- red-eared slider
- spotted turtle
- spring peeper

Waterfowl and wading bird species observed or with potential to occur in the open water communities within the Project Area include:

- bald eagle
- Canada goose (*Branta Canadensis*)
- wood duck (*Aix sponsa*)
- mallard (*Anas platyrhynchos*)
- blue-winged teal (*Anas discors*)
- great blue heron (*Ardea herodias*)
- green heron (*Butorides virescens*)
- belted kingfisher (*Megaceryle alcyon*)
- Louisiana waterthrush (*Parkesia motacilla*)
- common merganser (*Mergus mergansers*)
- hooded merganser (*Lophodytes cucullatus*)

Open water habitats also provide suitable habitat for aquatic insects that act as prey items for many fish species. Other aquatic invertebrates found in these habitats include clams, mussels, and crayfish, which also support species of higher trophic levels.

22(f) Plant and Wildlife Species Inventory

This Application includes master species lists of both plants and wildlife, including species documented during field surveys (e.g., ecological cover type assessments, habitat assessments, bird surveys, and wetland delineations) and based on data available from state and nationwide publicly available databases. Existing data from the following sources were used to compile this inventory of plant and wildlife species known to occur, or reasonably likely to occur, at the Project Area at some point during the year: NYNHP; NYSDEC; USFWS; local bird/wildlife experts; Herp Atlas; Breeding Bird Atlas; USGS BBS; CBC; HMANA; eBird; TNC surveys/reports; the Kingbird publications; and county-based hunting and trapping records maintained by NYSDEC. These sources were supplemented with reasonably available public information, including those

identified in Section 22(d) above. Additionally, habitat assessments completed during on-site field surveys at the Project Area were used to determine presence and extent of suitable habitat for wildlife species, and to identify species that could occur within or in proximity to the Project Area during some portion of the year. TRC biologists documented a total of 124 native and invasive plant species through this effort and created a plant list based on this field effort, which is included in this Application. See Appendix 22-1 for the master plant and wildlife species list. Species listed in the inventory are denoted as observed on-site (*i.e.*, observed by TRC biologists) or as having potential to occur based on one or more of the above-listed sources. Sources which identified potential occurrence of each species are indicated.

Birds

USGS Breeding Bird Survey

The USGS North American Breeding Bird Survey is conducted by the Patuxent Wildlife Research Center of the USGS. This survey is an international avian monitoring program that is designed to track the status and trends of North American bird populations over a large scale and long timeframe. Each survey route is approximately 24.5 miles long. During the survey, 3-minute point counts are conducted at 0.5-mile intervals and every bird seen or heard within a 0.25-mile radius is recorded (Pardieck et al., 2015).

The Macdougall survey route is approximately 0.3 miles south of the Project Area and encompasses similar ecological communities present on-site. The route has been surveyed 30 out of the last 52 years for which data is available (1966-2018). A total of 116 species have been documented during the lifetime of this survey route. Most birds documented are commonly observed species found within the forests, forest edge, shrublands, old fields, and wetlands throughout NYS. None of the species documented are federally or state-listed as threatened, endangered, or special concern. The ten most commonly documented species on this survey route, accounting for approximately 70 percent of observations recorded, include:

- European starling (*Sturnus vulgaris*)
- red-winged blackbird (*Agelaius phoeniceus*)
- common grackle (*Quiscalus quiscula*)
- house sparrow (*Passer domesticus*)
- American robin (*Turdus migratorius*)
- bank swallow (*Riparia riparia*)

- song sparrow (*Melospiza melodia*)
- barn swallow (*Hirundo rustica*)
- American goldfinch (*Spinus tristis*)
- ring-billed gull (*Larus delawarensis*)

Of species documented by the USGS BBS, all but bank swallow and ring-billed gull were observed at the Project Area during field surveys. These species are common and widely distributed throughout their respective ranges. Additionally, many of the species listed are habitat generalists which are adapted to changing and increasingly human-altered landscapes. Project development is not expected to impact any species at the population level, or significantly impact local populations in proximity to the Project Area. No species were identified solely in the USGS Breeding Bird dataset.

Four species listed as threatened in NYS were recorded during USGS breeding bird surveys; however, all records are more than 20 years old. Species include:

- common tern; last observed in 1997
- Henslow's sparrow; last observed in 1989
- northern harrier; last observed 1989
- upland sandpiper; last observed 1981

Several SSC have been documented during breeding bird surveys conducted by the USGS, including:

- cerulean warbler (*Dendroica cerulea*)
- common loon (*Gavia immer*)
- Cooper's hawk
- grasshopper sparrow
- horned lark
- osprey
- red-headed woodpecker (*Melanerpes erythrocephalus*)
- red-shouldered hawk (*Accipiter gentilis*),
- sharp-shinned hawk
- vesper sparrow

NYS BBA

The NYS BBA statewide survey resource was used to identify any bird species with potential to breed within the Project Area. The first Atlas occurred during 1980-1985 and a second Atlas occurred 20 years later during 2000-2005. Field efforts involve surveys performed by volunteers within the 5-square kilometer survey block portioned across all of NYS (McGowan and Corwin, 2008). The Project Area overlaps three of these blocks, although specific locations for these observations are not known. Data from both the first and second Atlases are publicly available from the NYSDEC's website. A total of 95 species were reported within these blocks, noted with an "E" qualifier code in Appendix 22-1. Many common avian species were documented through multiple data sets, with only one species, common moorhen (*Gallinula chloropus*), a marsh bird, documented solely from the BBA. One state-listed threatened species, the northern harrier, was observed during the second Atlas along with several state-listed SSC including cerulean warbler, Cooper's hawk, horned lark, and sharp-shinned hawk. All SSC except the cerulean warbler were observed in the Project Area during surveys conducted by the Applicant (Section 22(d)(3)). No federally listed species, including bald eagle, which was Federally Threatened when both Atlas surveys occurred, but was subsequently delisted (in 2007), have been reported by the BBA within the blocks containing the Project Area.

Audubon CBC

Data from the Audubon CBC was obtained to determine species with potential to use the Project Area year-round and during the over-wintering period. The primary objective of the CBC is to monitor the status and distribution of wintering bird populations in the western hemisphere. Counts occur in a single day during a three-week period around Christmas, providing a summary of avian species present in the count area during the early winter months. A 15-mile diameter search area is created around a central location within which all bird species and individuals observed in a predetermined search area are documented on the day of the count. The closest and most similar CBC count circle is the Geneva search area (Audubon Count Code: NYGE) which entirely encompasses the Project Area. A total of 67 species were recorded during the 2018 count, conducted on December 29, 2018. No federally listed endangered or threatened species were identified.

Four state-listed species were identified during the CBC, including:

- bald eagle (state-threatened)

- northern harrier (state-threatened)
- peregrine falcon (state-endangered)
- short-eared owl (state-endangered)

Several state-listed SSC were observed during the 2018 CBC, including:

- Cooper's hawk
- horned lark
- sharp-shinned hawk

Of the species listed above, as discussed in the preceding subsections of this Exhibit, bald eagle, Cooper's hawk, horned lark, northern harrier, and sharp-shinned hawk have been observed by the Applicant within the Project Area, either during winter raptor or spring BBS. Cooper's hawk, northern harrier, and sharp-shinned hawk were observed within the Project Area boundary during the 2019-2020 winter raptor survey (Appendix 22-3).

The Cornell Lab of Ornithology's eBird

Managed by the Cornell Lab of Ornithology, eBird is the world's largest citizen science project related to biodiversity. Birders submit when, where, and how they went birding and complete a checklist of all birds seen or heard. *Citizen* science data from eBird was obtained for Seneca County to gain information on observations submitted by the public which may be relevant to the Project Area. A total of 309 species have been identified in Seneca County. Observations of listed species were reviewed for proximity to the project Area, and only those species documented within 5 miles of the Project Area are reported, though the full list of eBird species accounts is provided with a "G" qualifier in Appendix 22-1.

Three federally listed species have been documented in the County, including:

- least tern (*Sternula antillarum*; federally endangered); last observed in 2019
- piping plover (*Charadrius melodus*; federally endangered); last observed in 1968
- red knot (*Calidris canutus*; federally threatened); last observed in 2019

Additionally, 10 state-listed species have been documented within 5 miles of the Project Area, including:

- bald eagle (threatened); last observed in 2020

- black tern (*Chlidonias niger*; endangered); last observed in 2019
- common tern (*Sterna hirundo*; threatened); last observed in 2014
- least tern (threatened); last observed in 2019
- northern harrier (threatened); last observed in 2019
- pied-billed grebe (threatened); last observed in 2019
- piping plover (endangered); last observed in 1968
- red knot (threatened); last observed in 2019
- short-eared owl (endangered); last observed in 2018
- upland sandpiper (threatened); last observed in 2005

Most of these observations were recorded along or very proximal to the Seneca Lake shoreline inside Seneca Lake State Park which consists of habitat which is not present within the Project Area. Of the above listed species, six are aquatic or semi-aquatic species which require large open water or shoreline habitat which is not present within the Project Area (i.e., terns, pied-billed grebe, piping plover, and red knot). Therefore, it is unlikely that they will occupy the field and forest habitat within the Project Area.

Nine SSC were recorded in the eBird dataset, including:

- cerulean warbler
- common loon
- common nighthawk (*Chordeiles minor*)
- Cooper's hawk
- grasshopper sparrow
- horned lark
- osprey
- sharp-shinned hawk
- vesper sparrow

The eBird data contains 173 species from observations submitted across Seneca County not documented in other datasets. A full listing of these species is provided in Appendix 22-1.

Seneca County is home to Seneca Lake, a large body of open water which attracts several species not commonly found in other areas of New York, accounting for the large number of species reported in the eBird database. Most of the listed species noted above were documented

in Seneca Lake State Park, which is located approximately 0.5 miles south of the Project Area. While this is within the home range for most species observed, the Project Area lacks habitat which is preferred by the numerous waterfowl and aquatic birds which have been documented along shorelines and in the portions of Seneca Lake adjacent to the park. Additionally, this area contains extensive undeveloped habitats which attract a variety of species which would be unlikely to occur in the heavily disturbed and human-altered landscape present within the Project Area.

HMANA

HMANA is a non-profit organization consisting of over 200 members and affiliate organizations which collectively aim to record and summarize data on raptor populations and migration across the North American continent. Hawkwatch stations are independently operated and report data either as part of long-term monitoring, or short-term, research-focused efforts. There are no HMANA sites within 15 miles of the Project Area. The closest hawkwatch station is Kestrel Haven Hawkwatch located in Burdett, New York, approximately 40.6 miles to the southeast of the site. There is no electronic data available for this station.

In total, 310 avian species were documented in the above-referenced sources. However, the majority of species were documented solely in the eBird database (n = 173) which contained records from throughout Seneca County. Species documented by eBird include those which have limited, or no potential to occur given the habitat conditions present within the Project Area (i.e., wading and open water birds) and often times will include species which are extremely rare or unlikely inhabitants of the locality or region. These records, therefore, cannot be presumed to indicate potential occurrence within the Project Area or immediate vicinity. Further, these observations are not recorded in a systematic manner following accepted survey protocols consistent with those used in the NY BBA or USGS BBS. A complete list of avian species that were observed or are presumed to occur within the Project Area based on the data above can be found in the master wildlife inventory list attached in Appendix 22-1.

Bats

Research on the extent of the current distribution of common bat species ranges in New York is limited. The Applicant conducted a review of publicly available data from the USFWS, NYNHP and NYSDEC. Additionally, information regarding known occurrences of listed bat species, bat

hibernacula, and maternity roost trees, was requested from the NYSDEC and NYNHP (Appendix 22-8 and Section 22(f)((2)).

Based on publicly available information at the time of this study, the USFWS IPaC system does not indicate the potential for northern long-eared bat or Indiana bat to occur within the Project Area. Additionally, NYSDEC lists no known summer occurrence of northern long-eared bats in Seneca County and no known occurrences during winter or summer in the Town of Waterloo as of June 2018. Formal consultation with NYSDEC indicated occupied Indiana bat habitat (confirmed maternity roost tree) located approximately 2.5 miles north of the Project Area. No known roost trees occur within the Project Area. Additionally, no known hibernacula are located within 5 miles of the Project Area.

Both the northern long-eared bat and the Indiana bat are known to roosts in snags (dead trees) or live trees with exfoliating bark, cavities and/or crevices (USFWS, 2008). Tree species observed included eastern hemlock, red maple, American elm, sugar maple, white ash, eastern white pine, northern red oak, and eastern hophornbeam. There are various trees on the Project Site that contain exfoliating bark, hollows, or furrows and crevices which could be suitable for summer roosting habitats for bats. While the Project is primarily open agricultural fields, there are forested patches and forested riparian corridors which could be used as foraging, travelling, and roosting habitat. No bat species, however, were observed within the Project Area Approximately 31.4 acres of forest will be cleared for siting of Project components. Based on the factors considered herein, the Project may affect potential habitat, but will not adversely affect the northern long-eared bat. Further, any incidental take that may occur is not prohibited under the final 4(d) rule at 50 Code of Federal Regulations (CFR) §17.40(o). Based on the knowledge of habitat requirements for tree-roosting bat species, forested habitat within the Project Area contains structural elements which may provide suitable roosting and foraging habitat for the following species:

- Indiana bat (*Myotis sodalis*)
- northern long-eared bat (*Myotis septentrionalis)*
- little brown bat (*Myotis lucifugus*)
- eastern pipistrelle (Tri-colored bat) (*Perimyotis subflavus*)
- big brown bat (*Eptesicus fuscus*)
- eastern red bat (*Lasiurus borealis*)
- silver-haired bat (*Lasionycteris noctivagans*)

- hoary bat (*Lasiurus cinereus*)

Although potential, suitable roosting and/or foraging habitat (albeit limited) occurs within the Project Area in the form of forest edges, wetlands, open water, vernal pools, and open fields, no bat species were observed in the Project Area. Further, while a small amount of acreage within the Project Area will be cleared for the siting of Project Components, much of which relates to hedgerows amongst the open fields, the Project is wholly avoiding clearing in forested wetlands areas, including those to the north of the Project Area where there is the greatest potential for habitat. Table 22-12 further describes this habitat.

Amphibians and Reptiles

Access to common amphibian and reptile species ranges in the State of New York is provided through use of the publicly available Amphibian and Reptile Atlas Project (Herp Atlas Project) provided by the NYSDEC (2017). The Herp Atlas Project was a 10-year survey that was designed to display the geographic distribution of select NYS herpetofauna. This research effort displayed results of approximatively 70 species of amphibians and reptiles in NYS. The unit of measurement for collecting Herp Atlas Project data is the USGS 7.5-minute topographic quadrangle. Based on the Amphibian and Reptile Atlas Project distribution maps provided by the NYSDEC, a range of reptile and amphibian species have been identified as occurring within the Geneva North USGS 7.5-minute topographic quadrangle encompassing the Project Area. Amphibian and reptile species potentially occurring within the Project Area or the Geneva North USGS 7.5-minute topographic quadrangle are shown in Table 22-5 below.

Table 22-5. Amphibians and Reptiles Potentially Occurring within the Project Area

Scientific Name	Common Name	7.5-Minute Quadrangle
Amphibians		
Bufo a. americanus	American toad	Geneva North
Hyla versicolor	Gray treefrog	Geneva North
Pseudacris crucifer	Northern spring peeper	Geneva North
Lithobates (Rana) catesbeiana	American bullfrog	Geneva North
Lithobates (Rana) clamitans	Green frog	Geneva North

Table 22-5. Amphibians and Reptiles Potentially Occurring within the Project Area

Scientific Name	Common Name	7.5-Minute Quadrangle
Lithobates (Rana) sylvatica	Wood frog	Geneva North
Lithobates (Rana) pipiens	Northern leopard frog	Geneva North
Reptiles		
Chelydra s. serpentina	Common snapping turtle	Geneva North
Clemmys guttata	Spotted turtle	Geneva North
Apalone s. spinifera	Eastern spiny softshell	Geneva North
Clemmys muhlenbergii	Bog turtle	Geneva North
Trachemys scripta elegans	Red-eared slider	Geneva North
Chrysemys picta	Painted turtle	Geneva North
Nerodia s. sipedon	Northern water snake	Geneva North
Thamnophis sirtalis	Common garter snake	Geneva North
Thamnophis sauritus	Eastern ribbon snake	Geneva North
Lampropeltis t. triangulum	Eastern milk snake	Geneva North

An amphibian's lifecycle is dependent on water. As such, amphibian habitat preferences are assumed to incorporate wetland and waterbody features and any adjacent upland areas. Some of the wetlands and waterbodies delineated within the Project Area provide good habitat for the listed amphibian species. Wetlands that were forested and/or associated with forested upland areas within the Project Area were noted as having less disturbances. Reduced disturbance levels in habitats tend to be beneficial to most amphibian species as most are vulnerable to compromised homeostasis and thus can be reliable indicators of environmental stress (Blaustein, 1994; Blaustein and Bancroft, 2007). Wetland and waterbody areas that were not encompassed by forest tended to be surrounded by active agriculture lands or areas that are periodically cleared or mowed. Periodic plowing, clearing, and mowing disturbances are believed to moderate the presence of amphibians in these areas.

Reptiles are a very diverse class of fauna and include mixed habitat preferences specific to their life cycles. It is presumed that representative reptiles can be found throughout the Project Area and among myriad of microhabitats. Specifically, turtle and snake species are known to use a variety of habitats in New York, including emergent, scrub-shrub, forested, and open water wetlands; and upland areas, including woodlands, old fields, scrublands, meadows, and residential areas. Snakes tend to traverse and occupy a multitude of habitats. Semi-aquatic turtles, which could occur in the Project Area, are believed to prefer slow-moving, open water wetlands with vegetated banks and a benthic zone of soft soil. Upland areas with little to no canopy cover are also sought after as the turtles can bask and absorb thermal energy from the vantage point of fallen logs or rocks. A select number of delineated wetlands and waterbodies within the Project Area were deemed habitable for turtles.

A vernal pool survey was performed on March 30, 2020. One vernal pool was identified and mapped. For the purpose of this survey, vernal pools are defined as any woodland pool or non-manmade water filled depression that hosts egg masses of indicator species. Indicator species in the Project Area and surrounding region include the following obligate vernal pool breeding amphibians: spotted salamander, blue spotted salamander (*Ambystoma laterale*), Jefferson salamander (*A. jeffersonianum*), and wood frog. These species require vernal pool habitat or similar features in order to reproduce. Potential vernal pools are woodland depressions that exhibit physical characteristics of vernal pools but lack indicator species egg masses. These features may be actual vernal pools observed at a time when water levels are not conducive to amphibian breeding. Amphibian breeding areas are areas of anthropogenic origin such as ditches, tire ruts, and skidder tracks that contain amphibian egg masses. These features are not considered vernal pools although they can support indicator species. More information about the vernal pool at the Project Area can be found in Section 22(l)(1).

A complete list of amphibian and reptile species that were observed or presumed to occur within the Project Area is provided as Appendix 22-1.

Mammals

Access to common mammal species ranges in the Northeastern United States is under-developed and not readily available to the public. However, observations of mammals were documented during the various on-site field studies conducted as part of this Application. Field observations included both sightings of species and detection of animal signs which indicate presence, e.g., tracks, scat, rubs, and general habitat manipulation. Documentation and

evaluation of available habitat for mammal species common in western New York were also noted. Mammalian species, excluding bats (which are discussed in an earlier section), that are known or presumed to occur within the Project Area based on observation of individuals and signs include:

- white-tailed deer
- eastern gray squirrel
- eastern cottontail
- eastern chipmunk
- eastern raccoon
- red squirrel

Additional mammals with potential to occur within the Project Area based on habitat suitability include:

- fisher
- North American porcupine
- coyote
- American mink
- red fox
- long-tailed weasel
- Virginia opossum
- striped skunk
- northern flying squirrel (*Glaucomys sabrinus)*
- various shrews (*Blarnia* spp., *Cryptotis* spp., *Sorex* spp.)
- various moles (*Condylura* spp.*, Scalopus* spp.*, Parascalops* spp.)

NYSDEC Hunting and Trapping Records

NYSDEC keeps records of all white-tailed deer and black bear (*Ursus americanus*) harvested during each season. In 2019, a total of 1,896 white-tailed deer, 854 of which were adult (>1.5 years old) males, were harvested in Seneca County (NYSDEC, 2019a). There were no black bears harvested in Seneca County during 2019 (NYSDEC, 2019b). Records are also kept for total fisher, North American river otter (*Lontra canadensis*), bobcat (*Lynx rufus*), and American marten

(*Martes americana*) that are trapped for their pelts; however, none of these species were harvested during the 2019-2019 trapping season. (NYSDEC, 2019).

A complete list of mammal species that were observed or presumed to occur within the Project Area is provided as Appendix 22-1.

Terrestrial Invertebrates

Numerous terrestrial invertebrates are likely to utilize occupy habitats within the Project Area. Terrestrial invertebrates are a diverse group of animals residing on dry land that neither possess nor develop a backbone. These include a variety of arthropods, including insects (e.g., beetles, bugs, ants, bees, butterflies, moths, cockroaches, mantis, stick insects, dragonflies, mosquitoes, fleas, crickets, grasshoppers, fireflies, cicadas, and flies), arachnids (e.g., various spider species, ticks, and mites), and myriapods (e.g., millipedes and centipedes), among many others. Worms are another form of terrestrial invertebrate which typically have a long cylindrical tube-like body and no limbs. Terrestrial species include earthworms and nematodes, which are very common invertebrates that live in the topsoil. Mollusks are another vast group of invertebrates. Of this immense group, a portion of mollusks are terrestrial and include snails and slugs.

An analysis of the Project's construction, operation, post-construction, and maintenance impacts on vegetation cover types is included in Section 22(b).

22(g) Vegetation, Wildlife, and Wildlife Habitat Impacts from Construction and Operation

Impacts to vegetative cover types due to construction, operation, post-construction restoration, and maintenance are addressed above in Section (b)(1). Approximately 65 acres of vegetation will be temporarily impacted. Concurrently, approximately 10 acres will be permanently lost due to the siting of Project components. Although the siting of Project components will result in the loss of plant community acreages, no specific plant community will be jeopardized as a result of the Project. The Applicant has taken measures to avoid and minimize vegetation impacts to the maximum extent practicable. There are no wildlife conservation areas within the Project Area; therefore, these wildlife habitats will not be impacted by Project construction or operation.

Avian Analysis

Grassland BBS

A discussion of the extent, methodology, and results of the grassland BBS can be found in Section 22(d)(2). A summary of the results from the grassland BBS is in Table 22-6. A detailed description of the grassland BBS, including figures showing survey locations, methods, and results, is provided as Appendix 22-2.

Table 22-6. Frequency of Raptor and Owl Observations During Stationary Surveys as Part of the Grassland BBS

Grassland Species	Scientific Name	Hayfield Total (2 points)	Old Field Total (6 points)	Row Crop Total (10 points)	Total Observed	Percent Composition
Bobolink	*Dolichonyx oryzivorus*	6	0	0	6	4.23
Horned Lark	*Eremophila alpestris*	0	0	7	7	4.93
Savannah Sparrow	*Passerculus sandwichensis*	2	6	2	10	6.34
Vesper Sparrow	*Pooecetes gramineus*	0	1	0	1	0.70
TOTAL		**8**	**7**	**9**	**17**	**16.20**

Wintering Grassland Raptor Survey

A discussion of the extent, methodology, and results of the winter raptor survey are in Section 22(d)(2). A summary of the results from this survey is provided in Tables 22-7 and Table 22-8. A more detailed description of the wintering grassland raptor survey is provided as Appendix 22-3.

Table 22-7. Frequency of Raptor and Owl Observations During Stationary Surveys as Part of the Wintering Grassland Raptor Survey

Grassland Species	Scientific Name	Total Observations	Percent Composition	Use Minutes
American Kestrel	*Falco sparverius*	1	2.6	41

Table 22-7. Frequency of Raptor and Owl Observations During Stationary Surveys as Part of the Wintering Grassland Raptor Survey

Grassland Species	Scientific Name	Total Observations	Percent Composition	Use Minutes
Bald Eagle	*Haliaeetus leucocephalus*	6	15.3	77
Cooper's Hawk	*Accipiter cooperii*	1	2.6	4
Great Horned Owl	*Bubo virginianus*	1	2.6	13
Northern Harrier	*Circus cyaneus*	2	5.1	2
Red-tailed Hawk	*Buteo jamiacensis*	22	56.4	301
Sharp-shinned Hawk	*Accipiter striatus*	2	5.1	2
Unknown Buteo	*Buteo spp.*	1	2.6	1
Unknown Raptor	*n/a*	3	7.7	5
		39	100.0	446

Table 22-8. Frequency of Raptor and Owl Observations During Driving Surveys as Part of the Wintering Grassland Raptor Survey

Grassland Species	Scientific Name	Total	Percent Composition
American Kestrel	*Falco sparverius*	2	6.7
Bald Eagle	*Haliaeetus leucodephalus*	4	13.4
Osprey	*Pandion haliaetus*	1	3.3
Red-tailed Hawk	*Buteo jamaicensis*	19	63.3
Turkey Vulture	*Cathartes aura*	1	3.3
Unknown Raptor	*n/a*	3	10.0
Total Observations		**30**	**100.0**

(1) Amphibian and Reptile Habitat

Amphibians and reptiles observed or that have the potential to occur within the Project Area are listed in Section 22 (d)(2). A single vernal pool feature was identified and mapped within the Project Area during the spring 2020 vernal pool surveys. This feature is a natural depression within a larger forested wetland complex in the northern portion of the Project Area, containing wood frog egg masses. This feature lies in an area that has been excluded from Project development; therefore, the feature will not be impacted by Project development.

Wetland delineation efforts conducted during the 2019 growing season identified 61 wetlands and seven streams within the Project Area. Characteristics observed and documented in the 272.24 acres of wetland and stream habitat may provide habitat for reptiles and amphibians listed in Section 22(d)(2). Siting of Project components and final layout of solar arrays have been designed to avoid wetlands to the maximum extent practicable. See Section 22 (m) and 22 (n) for a detailed discussion of impacts avoidance, and mitigation specific to wetlands.

The Project is located approximately 3 miles from the Junius Ponds Unique Area, a state-protected management area which contains a chain of kettle lakes and fens which support unique assemblages of fish and wildlife. The area is closed to public use and provides habitat for several rare plants and the state-endangered bog turtle. The Junius Ponds Unique Area will not be impacted by Project development.

(2) Construction-related Impacts to Wildlife

Direct and indirect impacts to wildlife may occur as a result of Project construction. Impacts are anticipated to be restricted to incidental injury and mortality due to various operations, displacement due to increased human activity during construction, and habitat disturbance and/or loss (including the loss of travel corridors) as a result of clearing, earth-moving, and the siting of Project components. Each listed impact is addressed in more detail below.

Incidental Injury and Mortality

Although calculating the incidental injury and/or mortality of wildlife individuals is inherently difficult, it is understood that construction activities could generate injury or mortality to local wildlife in isolated random occurrences. It is presumed that injury and mortality will be inflicted more directly upon sedentary species (e.g., small or young mammals, reptiles, invertebrates, and

amphibians). Species which are more mobile have a better ability to vacate construction areas prior to the onset of disturbance.

Mortality events due to vehicular activity is presumed to increase due to increased traffic from construction operations within the Project Area. Upon the completion of construction, traffic is expected to return to more standard patterns and frequencies so mortality events due to vehicular traffic will reduce to pre-construction levels.

Wildlife Displacement

Project construction may cause both temporary and permanent wildlife displacement. The extent of displacement will vary among species and will fluctuate depending on the nature and seasonal timing of construction activities. Displacement impacts, such as noise or simply human presence, may affect breeding, nesting, denning, and other routine use (e.g., travel, foraging, communication, and territorial marking). If construction begins before the initiation of breeding, nesting, denning, or other routine activities, then the associated wildlife will generally avoid the impact area and navigate through, or re-establish in, adjacent habitat. If construction occurs while the area is in use by a wildlife individual, then the species that are accustomed to similar land clearing disturbances are expected to relocate and use similar habitats in close proximity to the construction impact area. Species unable to relocate may become at risk to incidental injury or mortality. Displacement impacts as a result of the Project will be relatively minor due to the availability of habitat within close proximity for many local wildlife species. These animals will remain within or adjacent to the Project Area.

Habitat Disturbance and Loss

Approximately 64.6 acres of wildlife habitat will be temporarily impacted during construction of the Project. However, only approximately 9.7 acres of potential wildlife habitat will be permanently lost due to the placement of Project components. Moreover, 9.1 of the 9.7 acres of potential wildlife habitat permanently impacted, along with all 55.0 of 64.6 acres temporarily impacted, are currently active agricultural areas that are regularly disturbed, and which provide limited perpetual habitat for wildlife due to these regular disturbances and anthropogenic pressures of active farming practices.

Specifically, it is anticipated that approximately 0.17 acre of successional shrubland, 0.43 acre of successional old fields, 8.98 acres of forestland and 55 acres of active agricultural lands will be

temporarily disturbed during construction. No temporary disturbance will occur within forestland. Concurrently, approximately 0.54 acre of forestland, 0.11 acres of successional shrubland, and 9.1 acres of active agricultural lands will be permanently impacted due to the Project. No permanent impacts will occur within successional old fields. Note that disturbed/developed areas were excluded from these calculations as wildlife habitat in these areas are presumably present but inherently marginal in nature where wildlife has adapted to survive in a disturbed setting. The Project avoids direct impacts to open-water habitats. See Exhibit 23 for a detailed discussion on impacts to surface waters defined by on-site wetland and waterbody delineations conducted within the Project component impact areas.

In areas where the siting of Project components requires placement in forestland, successional shrubland, or successional old field, impacts will occur in areas where there is an abundance of available habitat directly adjacent to the impact area. As such, overall impacts to the habitat for wildlife individuals or species in the Project Area will be minor. Construction-related impacts will not be significant enough to adversely affect local populations of any resident or migratory wildlife species.

The USFWS IPaC system was queried and an official species list obtained on February 11, 2020. The response did not indicate the potential presence of any listed species. The USFWS Field Office in Cortland, New York was contacted for the most recent breeding, wintering, and habitat data for federally listed and protected species and no additional information has been received. Given the lack of documented occurrences and the limited extent of tree clearing expected to occur as part of Project construction, the Project is not likely to adversely affect federally protected bat species with the potential to occur in this region.

The NYSDEC was contacted to obtain the most recent breeding, wintering, and habitat data for State-listed species. The NYSDEC indicated occupied habitat for several state-listed species within the vicinity of the Project. NYSDEC provided coordinates for three known active nests of bald eagles (state-listed threatened); one nest is located within the Project Area and the remaining two nests are approximately 2 miles south and 5 miles northwest of the Project Area. Indiana bat summer occupied habitat was noted as occurring “just over 2 miles from the project”, further confirmed from Geographic Information System (GIS) data as occurring approximately 2.5 miles north of the Project Area. Wintering occupied habitat for northern harrier (state-listed threatened) and short-eared owl (state-listed endangered) is located within 2.5 miles of the Project Area to the west and southeast. Mapped bog turtle (state-listed endangered) habitat is located

approximately 2.5 miles north of the Project Area and contains records of several listed plant species. Correspondence with the USFWS and NYSDEC is included in Appendix 22-8.

Construction related impacts to the state-listed bald eagle which is actively nesting in the area will be avoided. The Applicant will adhere to the minimum distance recommendation provided in consultation with the DEC. Specifically, construction activities will not occur within 660 feet of the known active nest located within the Project Area so as to avoid incidental take or undue disturbance to the nesting eagles.

Northern harrier, although briefly observed within the Project Area, were not determined to be residents based on the transitory nature of sightings (two observations across a five-month Survey Period). Project construction will not adversely affect this species or result in any take.

Summary Impact Table

A summary table that quantifies anticipated temporary and permanent impacts to wildlife habitats due to the Project construction and operation is provided in Table 22-9.

Table 22-9. Impacts to Wildlife Habitat

Wildlife Habitat	Conversion (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impact (acres)
Agricultural Land	372.49	54.99	9.07	436.55
Successional Old Field	-	0.43	-	0.43
Successional Shrubland	0.04	0.17	0.11	0.32
Forestland	22.99	8.98	0.54	32.51
Total	**395.52**	**64.57**	**9.72**	**469.80**

(3) Literature and Impact Analysis for Grassland Bird Species

There are relatively few studies quantifying the effects of utility scale solar projects on biodiversity, including birds. The currently availably peer-reviewed publications on renewable energy, including solar, are insufficient to thoroughly assess the impact of utility scale solar projects on

wildlife populations (Lovich and Ennen, 2011). The two types of direct impacts to birds from utility scale solar projects occur in the form of burning and collisions (Walston Jr. et al., 2016). Mortality studies are inherently lacking with specific reference to utility-scale ground-mounted solar and data are too sparse to provide a reliable estimate of overall avian mortality at solar facilities (Walston Jr. et al., 2015). Of studies which investigated direct impacts to birds from solar facilities, all were conducted on facilities in the southwestern United States and include results from concentrated solar power (CSP) facilities and therefore, are only moderately applicable to PV solar projects in the northeast, which contain significantly different habitat, species assemblages, and associated population trends.

A study of avian mortality at a 10 MW heliostat solar power plant in California (California Solar One), a CSP, recorded 70 bird fatalities representing 26 species over a period of 40 weeks (McCrary et al. 1986). Grassland bird species with collision fatalities recorded in this study included horned lark and savannah sparrow. The estimated avian mortality rate was 1.9–2.2 birds/week, which had a minimal impact on the local bird population (McCrary et al., 1986). It is important to note that this study was of a heliostat solar field with a concentrating tower (i.e., “thermal solar”) and did not use PV technology. PV technology, unlike heliostat solar fields, does not involve the concentration of solar rays which creates a high-heat area surrounding the tower, or light reflections which can attract birds and insect prey. PV technology is comparatively safer than thermal solar for birds (National Audubon Society, 2017).

A study of three utility-scale solar energy facilities in Southern California, including California Solar One, found that the one PV solar facility in the study had a mortality rate of 0.5 birds/MW/year from direct impacts attributed to the solar facility (Walston Jr. et al., 2016). The avian mortality rate from direct impacts at the PV solar facility was less than the avian mortality rate from direct impacts at the two heliostat solar facilities in the study (10.24 and 3.96 birds/MW/year) (Walston Jr. et al. 2016). The difference in bird mortality rate from direct impacts between PV and heliostat solar facilities could have been due to decreased risk of burning at the PV solar facility. The study by Walston Jr. et al. (2016) estimated bird mortality from solar facilities in comparison to other sources of bird mortality. The table from their study is shown in Table 22-10 below.

Table 22-10. Estimated Annual Avian Mortality from Anthropogenic Sources in the U.S.

Mortality Source	Estimated Annual Mortality	Percent of Overall Mortality
Buildings and Windows	365–988 million	73–75%
Roadway Vehicles	89–340 million	20–25%
Fossil Fuel Power Plants	14.5 million	1–3%
Communication Towers	4.5–6.8 million	<1%
Wind Energy Developments	140,000–573,000	<1%
Utility Scale Solar Energy Developments	37,800–138,600	<1%

The avian mortality at utility scale solar energy facilities accounts for fewer than 1% of avian mortality and is insignificant when compared to other anthropogenic sources. Solar facilities primarily affect birds at the local scale and not at the population level (Sánchez-Zapata et al., 2016), however, even effects to local populations are minimal at PV solar facilities (Walston Jr. et al. 2016).

Walston Jr. and the Argonne reviewed and synthesized data from seven utility-scale solar facilities in California and Nevada to evaluate avian mortality, including data from some of the studies noted above. Data was collected through both systematic and incidental monitoring from 2011-2014. Over 1,300 mortality events were documented however, cause of death could not be determined for 50 percent of the observations; therefore, a direct link between mortality and the facilities monitored cannot be established (Walston, Jr. et al., 2015). Mortality is expected to vary seasonally, influenced by influx of migrants and departure of residents, as well as based on local avian abundance, non-facility related causes of mortality, and factors influencing detectability of mortality events (e.g., predation and scavenging). Numerous design factors may influence mortality, however, given the complexity of determining facility-related mortality events, the current understanding of these factors is exceedingly limited.

The Project is located on the edge of the Finger Lakes Grassland Focus Area #3 (Finger Lakes Region) as defined by the NYSDEC Grassland Landowner Incentive Program, which promotes habitat protection for grassland birds. Grassland birds are declining in NYS due to the loss of

agricultural lands such as pastures and hay fields. The NYSDEC commissioned a study of breeding grassland birds across NYS that used BBA data to identify regions (i.e., focus areas) with significant remaining grassland bird populations (Morgan and Burger, 2008). As a result, the NYSDEC created a grassland landowner incentive program to protect grassland bird habitat on private lands within these focus areas.

The grassland bird study commissioned by the NYSDEC identified the following as species with the highest priority for conservation:

- northern harrier;
- upland sandpiper;
- short-eared owl;
- sedge wren;
- Henslow's sparrow;
- grasshopper sparrow;
- bobolink; and
- loggerhead shrike (*Lanius ludovicianus*).

The report also identified "high priority species for conservation" including:

- horned lark;
- vesper sparrow;
- eastern meadowlark; and
- savannah sparrow.

The principal bird species targeted for conservation within the Finger Lakes Grassland Focus Area are northern harrier, upland sandpiper, and wintering short-eared owl. Of the highest priority species identified by NYSDEC, northern harrier, grasshopper sparrow, and bobolink have been observed within the vicinity of the Project Area (Section 22(d)(1), Appendix 22-2 and Appendix 22-3). The grassland BBS documented bobolink, savannah sparrow, eastern meadowlark, and grasshopper sparrow within the Project Area (see Section 22(d)(1), Section 22(f)(1), and Appendix 22-2). Northern harrier was observed during Winter Raptor Surveys (Section 22(d)(1), Section 22(f)(1), and Appendix 22-3).

Grassland birds in NYS are typically found in cultivated crops, pastures, and old fields. While species-specific requirements for grassland birds vary, the habitat provided by row crop cover is

generally considered marginal for species such as bobolink, grasshopper sparrow, and savannah sparrow (Morgan and Burger, 2008). Agricultural operations provide reduced foraging opportunities, provide lower vertical structure and horizontal cover, are often monotypic in floristic diversity, and generally experience increased disturbance associated with human activity. Bobolinks prefer fields of at least 25-acres of medium to low vegetation density with at least 8 years since the last plowing and reseeding (Bollinger and Gavin, 1992; Morgan and Burger, 2008). Vegetation in bobolink habitat typically has a mix of medium-height grasses and a high forb component with plants such as red clover (*Trifolium pratense*) and dandelion (Morgan and Burger, 2008; NYSDEC, 2015c). Savannah sparrows prefer open grasslands with medium vegetation density at least 12–25 acres in area (Bollinger and Gavin, 1992; Morgan and Burger, 2008). Grasshopper sparrows prefers open grasslands with low vegetation density at least 123–247 acres in area (Bollinger and Gavin, 1992; Morgan and Burger, 2008). A key feature of grasshopper sparrow habitat is little to no litter and large areas of evenly distributed bare soil (Morgan and Burger, 2008; NYSDEC, 2015c). Savannah sparrows prefer open grasslands with medium vegetation density of at least 12 -25 acres in area (Bollinger and Gavin, 1992; Morgan and Burger, 2008). Habitat assessments within the Project Area identified 593 acres of potential habitat for the species listed above. No grassland patches exhibited low density vegetation, and most received some management (e.g., mowing) during the grassland breeding bird Study period. While some components required by these species were present in grasslands throughout the Project Area, conditions would be most consistent with sub-optimal or low-quality breeding habitat.

The suite of grassland birds identified within the Project Area, and those with the potential to occur, are primarily widely distributed throughout the New York, with recent and multiple records in counties where grassland habitat exists. A review of the literature surrounding these species indicates that while trends are declining state-wide for many grassland birds, many are also adapting to changing habitat at the landscape scale. To date, there has been only one peer-reviewed study of the indirect effects of ground-mounted solar systems and birds (DeVault et al., 2014). This study found that bird density was greater at solar systems when compared with managed grassland at nearby airfields. The same study found several grassland species using solar systems including eastern meadowlark, grasshopper sparrow, and savannah sparrow (DeVault et al., 2014). Several grassland bird species in fact may benefit from the conversion of agriculture to more structurally diverse vegetation typically seeded beneath and between solar panels. Following construction, solar energy facilities typically use grass seed mixes to establish a stabilized vegetative ground cover. These grass seed mixes are comprised of grasses that are

native and/or indigenous to the area and are considered favorable for wildlife habitat and sustainable growth. Additionally, the effects of climate change have been identified as a preeminent threat to continental bird populations (National Audubon Society, 2014). Increasing the capacity to generate energy from renewable sources will indirectly benefit birds through climate change mitigation.

(4) Assessment of Herbicide Application

As noted in the Appendix 22-7, the ISMCP, and Appendix 5-4, Preliminary Operations and Maintenance Plan, the use of herbicides may be necessary as a secondary measure for vegetation not effectively removed by mechanical means. Short-term impacts from herbicide application can occur from physical contact and direct toxicity with non-target plant species (Briggs, 1992). Herbicide application will be performed by spot treatment at targeted concentrations of invasive plant species to minimize the risk of spraying non-target plant species. Herbicides have a minimal short-term effect on animals as herbicides target plant processes and are not acutely toxic to wildlife (Tatum, 2004). The long-term effect of herbicide application is potential change to the vegetation community structure from large-scale, non-selective spraying. Herbicide application at the Project, however, will not be performed by broad-scale, non-selective spraying; therefore, long-term impacts resulting in large-scale changes to vegetation community structure are not anticipated. Though not anticipated, if herbicide application is required in aquatic resources, the Applicant will follow the NYSDEC's *Recommendations Regarding the Use of Aquatic Herbicides in Fish-Bearing Waters of the State* (2015d). The Applicant will use United States Environmental Protection Agency (EPA) and NYSDEC-registered and approved herbicides. Herbicide application will be performed by someone with a Commercial Pesticide Use Applicator's License from the NYSDEC. All herbicide application will comply with state and federal regulations.

(5) Operation and Maintenance Related Impacts to Wildlife

Once construction has been completed and the Project is operational, there will be few, if any, impacts to wildlife. Mortality during the operations phase is expected to be negligible. Though few peer-reviewed studies exist which estimate mortality from PV solar arrays, research indicates collision risk is the primary cause for injury and death (Smith and Dwyer, 2016). Mortality rates at commercial scale solar facilities account for less than 1 percent of mortality from anthropogenic sources (Walston et al., 2016), with reported estimates in the range of 2.7 to 9.9 birds/MW/year.

However, even these estimates may overstate facility-related mortality as some events could not be directly attributable to collision with facility infrastructure. Ultimately, peer-reviewed studies on this topic are scant and insufficient data exists to reliably estimate morality, if any, that may occur during the operation of this Project, understanding that solar panels and appurtenant infrastructure (e.g., inverters, substation) are stationary.

Vehicles will visit the site infrequently and will stay on the access roads; therefore, there will be negligible opportunity to impact wildlife by driving on the site. Routine maintenance, including mowing the grass, will occur approximately 2-3 times a year. Most wildlife found within the fenceline are mobile enough to avoid being impacted due to this activity.

There are no wildlife concentration areas which are apparent within the Project Area, based on review of aerial imagery and observations during field surveys conducted on-site. Forest patches are non-contiguous, isolated by large expanses of open habitat. It is not expected that wildlife are using specific areas as travel corridors through much of the Project Area, rather they are more likely to follow the periphery of the Project Area, and in particular the western and northwest portions, which contain fewer roads and are more heavily forested. No impacts to habitats that may serve as wildlife corridors will occur.

(6) Impacts to Wildlife and Wildlife Habitat

Operation-related impacts, or impacts that can occur to vegetation, wildlife, and wildlife habitat while the solar facility is functioning include direct habitat loss, habitat degradation through forest fragmentation, disturbances due to solar array operation, and specific mortality as a result of solar array collisions.

Habitat Loss

A direct and permanent loss of approximately 9.72 acres of wildlife habitat will occur as a result of the Project. Total habitat loss represents 0.91 percent of the total 1,067 acres included in the Project Area. Of this percentage, approximately 6 percent of the loss is to forestland, 1 percent is to successional shrublands, while the vast majority, 93 percent, is to active agriculture. Approximately 23 acres of forest land will also be converted into successional communities, which are of value to several wildlife species within the Project Area. Active agriculture limits wildlife habitat value, and revegetation following construction may improve habitat conditions for grassland species.

Habitat Degradation (Forest Fragmentation)

Habitat fragmentation will be minimal on the Project. Forested area comprises approximately 25 percent of land cover within the Project Area. Forestland within the Project Area has been previously cleared for agriculture, resulting in primarily small, non-contiguous fragments. Approximately 194 acres, or 72 percent of the forestland at the Project Area can be classified as edge forest. It is expected that clearing for all Project Components (access roads, collection lines, and laydown areas) associated with the Project may remove up to 32.5 forested acres, reducing the amount of forest land from 269 to 236.5 acres within the Project Area. This would constitute a relatively minor reduction, amounting to a loss of 12 percent of forestland within the Project Area. As a result of the placement of Project Components, there will be an assumed net loss of 0.93 acre of interior forest. Interior forest is defined as core forest areas containing a specific ecology and community structure occurring at least 300 feet from the forest edge. Despite a slight reduction in forested area within the Project Area, existing forest patches have been previously fragmented due to conversion to agriculture. These patches are not consistent with conditions which would be expected in intact interior forest and are not likely supporting species assemblages containing rare, interior, of forest specialist species. Changes to forested conditions resulting from Project construction are unlikely to alter species behaviors or diversity following initial disturbances associated with construction activity.

Further, fragmentation will not affect grassland habitat as old successional fields cover only 7 acres within the Project Area.

Amphibians and Reptiles

Immediate disturbances during the construction phase of the Project may cause disruption to travel for amphibians and reptiles at the Project Area. Amphibians and reptiles are less mobile than other species, therefore, injury and mortality are more likely to result from the construction of the Project than to other, more mobile taxa. Further, no species of concern have been identified within the Project Area.

Game Species

Immediate disturbances during the construction phase of the Project will cause disruption of local game species (e.g., white-tailed deer, ruffed grouse, and turkey). However, other than the nests sites (eggs) and infant fawns, these species are highly mobile. Consequently, injury and mortality

are not expected as a result of immediate disturbance. After the construction phase of the Project is completed, game species generally will adapt to the cleared areas and perimeter fencing. The perimeter fencing will inhibit travel and foraging of larger game species such as whitetail deer; therefore, it is presumed they will search for new foraging habitat elsewhere within the Project Area and nearby vicinity.

(7) Impacts to State and Federally Listed Species

A “take” of state or federally listed threatened and/or endangered species will not be caused by the construction or operation of the Project. Correspondence with NYSDEC indicated occupied habitat is only present outside of the Project Area for several species, and an active nest site for the state-listed bald eagle is located within the Project Area. The Applicant has sited Project components in consultation with the NYSDEC to ensure complete avoidance of the known active bald eagle nest within the Project Area. Construction related impacts to the state-listed bald eagle, therefore, will be avoided. The Applicant will adhere to the minimum distance recommendation provided in consultation with the DEC. Specifically, construction activities will not occur within 660 feet of the known active nest located within the Project Area so as to avoid incidental take or undue disturbance to the nesting eagles.

Additionally, as explained in preceding subsections of this Exhibit, northern harrier was observed only twice within the Project Area; however, no observations were consistent with evidence of breeding, nesting, or roosting on site. Therefore, there will be no take of, or adverse habitat modification for, the northern harrier. Refer to section 22(o)(2) for further discussion of state and federally listed species.

(8) Cumulative Impact Analysis for Grassland Habitat

A cumulative impact analysis for grassland habitat was performed at the request of NYSDEC to evaluate possible impacts from the construction, operation, and maintenance of the Project on federally and State-listed threatened or endangered species, particularly grassland birds, in combination with the impacts of proposed and operating solar energy projects within a 100-mile Grassland Study Area. The cumulative impact analysis is included in Appendix 22-4 and summarized below. The results of this conservative analysis indicate that the grassland habitat within the boundaries of the 132 Study projects accounts for 1.6 percent of available grassland habitat within the entire Grassland Study Area.

An analysis was conducted from a database containing mapped solar facilities (existing or proposed) which was provided by NYSDEC to locate facilities with a generating capacity greater than or equal to 5 MW occupying grassland habitat within 100 miles of the Project Area in the boundary of New York. This data base was supplemented by research performed by the Applicant. A desktop review was conducted to determine grassland bird use within the Grassland Study Area using both publicly available information regarding the study projects and publicly accessible records of bird occurrence at the county level. Spatial analysis was performed to determine the extent of grassland habitat among study projects and within the broader Grassland Study Area. Cumulative impacts were estimated by evaluating the overall loss of habitat relative to the percent of habitat available. A review of the NYSDEC database and the Applicant's research identified projects in 30 of the 31 counties within the Grassland Study Area. Monroe County contained the highest concentration of Study Projects with 19 projects identified, followed by Onondaga County (12) and Oneida and Ontario counties (10). The remaining counties had fewer than 7 Study Projects. No study projects were identified in Delaware county. Only one study project in addition to the proposed Project was identified in Seneca County. Study project locations are depicted in Figure 2 of the report.

Study projects, including the Project, encompass a total of 172,797 acres within the Grassland Study Area, and an additional 3,378 acres outside of the Grassland Study Area. Of the 132 study projects, 20 have already been constructed and account for 1,108 acres of development. It should be noted that none of the proposed study projects in the database provided information regarding the total impact resulting from construction within their respective project area boundaries; therefore, the total area reported is likely an overestimation.

Study projects within Oneida County comprised the largest amount of acreage, with total area of 33,351 acres across 10 projects. Study projects in Seneca County, where the Project is located, have a total area of 1,118 acres including the Project, accounting for 0.6 percent of the total area of development within the Grassland Study Area.

Several target grassland species were identified within the Project Area during the grassland breeding bird and Winter Raptor Surveys. Species observed included bobolink, savannah sparrow, vesper sparrow, and northern harrier. Two observations of northern harrier (State-threatened) and 12 observations of bald eagle (State-threatened) were observed during the winter grassland raptor survey. Three SSC were observed including two observations of sharp-shinned

hawk, one observation of osprey and one Cooper's hawk were also observed during Winter Raptor Surveys conducted within the Project Area.

A review of the NYNHP and eBird databases was performed to determine the most recent occurrence of grassland birds within each of the 31 counties where study projects were identified (Appendix 22-4). Numerous species were widely distributed and had recent records among the counties, and all have been recently observed (within last 10 years) in Seneca County except for barn owl. Few species were less recently recorded or limited in distribution, including:

- barn owl; observed in 13 counties; no record in Seneca County
- Henslow's sparrow; observed in 28 counties; last observed in Seneca County in 2002
- Sedge wren; observed in 23 counties; last observed in Seneca County in 2019
- upland sandpiper; observed in 28 counties; last observed in Seneca County in 2019

Recent records for the remaining species indicate widespread distribution within the Grassland Study Area. Although only the most recent record is reported, many of these species (with the exception of those listed above) were also documented in each of these counties during the most recent Breeding Bird Atlas, conducted from 2000-2005, indicating a persisting population over the previous 15-20 years (NYS BBA, 2008).

Together, the 132 Study Projects comprise 172,797 acres of proposed development (1.3% of total acreage within the Grassland Study Area; Table 6). Grassland habitat covers 2,395,074 acres and accounts for 18.4% of land within the Grassland Study Area. Grassland habitat within the boundaries of the 132 Study Projects totals 38,456 acres, which covers 22.3% of the proposed area of development among the projects and accounts for only 1.6% of available grassland habitat within the Grassland Study Area (Appendix 22-4). The total limits of disturbance were unavailable for most of the Study Projects, and as a result the extent of permanent impacts to grassland habitat within the Grassland Study Area could not be quantified; therefore, these results likely reflect an overestimation.

The Grassland Study Area covers over 14 million acres in New York. The proposed study projects' development, while overstated in this analysis, represents an insignificant cumulative impact to grassland bird populations both locally and regionally. Provided that all of the 132 Study Projects are developed, these facilities will affect only 1.6% of available grassland habitat. This analysis represents an extremely conservative approach which certainly overestimates impacts due to the lack of information available regarding the specific limits of disturbance for each of the study

projects reviewed and the probability that the proposed projects included will ultimately be developed. Further, substantive research indicates that the conversion from active row crop production to solar facilities could improve habitat quality for avian species reliant upon grassland habitat. Revegetation and seeding efforts following construction create conditions similar to the preferred habitat for species including savannah sparrow, bobolink, and other grassland obligates, providing increased structural and floristic diversity (Walston Jr. et al. 2016, N.A.S. 2017).

22(h) Avoidance and Minimization of Impacts to Vegetation, Wildlife, and Wildlife Habitat

Discussion on mitigating the impact to plant communities within the Project Area can be reviewed in Section 22(c)(1).

To the maximum extent practicable, the Project components have been sited within active agricultural fields, thereby reducing impacts to natural communities and wildlife habitat. Active agricultural areas provide limited wildlife habitat due to frequent disturbances in the form of clearing, mowing, plowing, and harvesting by the landowner, as well as reduced floristic and structural diversity relative to naturally occurring plant communities, providing reduced foraging opportunities, breeding and sheltering sites, and cover. Wildlife inhabiting the Project Area and surrounding areas are likely to concentrate in natural communities present, i.e., shrublands, forested areas, and wetland habitats. Construction of the Project has been designed to occur within the agricultural portions of the Project Area, thereby minimizing conversion of natural communities where practicable. Impacts to wetlands have been avoided to the maximum extent practicable, as shown in the Preliminary Design Drawings in Exhibit 11. The extent of forest clearing is minimal, with only 31.4 acres proposed for clearing. Much of the interior forest currently within the Project Area will be retained in efforts to avoid impacts to wildlife habitat. Through careful siting and design, the Project will minimize the number of species and individuals impacted by conserving the existing character and extent of wildlife habitat wherever possible. Furthermore, agricultural land used for Project Components can be restored for agricultural use as part of Project's Decommissioning Plan (Exhibit 29).

22(i) Avian and Bat impacts from Wind Powered Facilities

Specific impacts to avian and bat species related to wind powered facilities is not applicable to this Project.

22(j) Map Depicting Wetland Boundaries

(1) Wetland Mapping

Wetland surveys were conducted to identify wetlands and streams within the Project Area and within 100 feet of areas to be disturbed by construction of the Project. Surveys were performed in accordance with the *United States Army Corps of Engineers (USACE) 1987 Wetlands Delineation Manual* (Environmental Laboratory, 1987) and *the 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (Version 2.0) (USACE, 2012), the *New York State Freshwater Wetlands Delineation Manual* (Browne et al., 1995), and the New York State Board on Electric Generation Siting and the Environment (Siting Board) May 6, 2020 Order to reduce the required distance for wetland delineations from 500 feet to 100 feet (Siting Board, 2020), concerning the delineation of all federal, state, and locally regulated wetlands present at the Project Area and within 100 feet of areas to be disturbed by construction, including the interconnections; and predicted presence and extent of wetlands on the remainder of the Project Area properties and adjacent properties within 100 feet of areas to be disturbed by construction. All wetlands and streams observed were delineated, including wetlands within 50 meters (approximately 164 feet) of a state-regulated wetland, regardless of size or connectivity. The wetland delineation effort included documentation and ecological characterization of all vernal pools located within 100 feet of related disturbances on all Project parcels. For any part of the 100-foot survey area which fell outside of the Project Area without accessibility, wetlands were estimated to within 100 feet of the limits of disturbance. TRC conducted on-site wetland surveys for approximately 1,067 acres of leased private lands within the Project Area, and this area is referred to as the Wetland Delineation Survey Area throughout this Exhibit. All current wetland and waterbody delineations took place in the summer of 2019. Figure 22-3 depicts TRC delineated wetlands within the Wetland Delineation Survey Area.

(2) Predicted Wetlands

Wetland estimation only occurred for areas within 100 feet of areas to be disturbed by construction of the Project. In order to approximate wetland boundaries out to 100 feet from Project components (beyond the delineated portion), TRC conducted desktop analysis incorporating the interpretation of aerial imagery signatures, on-site observations, observations made from public roads and adjacent Project parcels, existing databases of hydric soils, other remote sensing data as available, analysis of topography, and existing databases of wetland mapping maintained by

the USFWS National Wetland Inventory (NWI) and NYSDEC. Within this Exhibit, wetlands identified past the established Wetland Delineation Survey Area are referred to as “predicted wetlands.” Figure 22-3 depicts predicted wetlands within the Wetland Delineation Survey Area and subsequent 100-foot area from Project components.

(3) Wetland Boundaries

The boundaries of wetlands were recorded with a Trimble Geo 7000 XH Global-Positioning System (GPS) unit with reported sub-meter accuracy or a Juniper Geode GPS/GLONASS Sub-meter Receiver. Refer to Appendix 22-5, Wetland and Waterbody Delineation Report for a detailed description of the determination of wetland boundaries for the Project. Wetlands identified within the established Wetland Delineation Survey Area are referred to as “delineated wetlands.” No wetlands or waterbody delineations have been verified by the USACE and the NYSDEC as of the time of this Application filing; however, a copy of the full Wetland and Waterbody Delineation Report was provided to each agency during April 2020. Additionally, GIS shapefiles of the wetland and waterbody delineations were digitally provided to the NYSDEC during April 2020.

(4) Jurisdictional Wetlands

Four of the wetlands delineated inside the Project Area are associated with currently mapped NYSDEC freshwater wetlands thus fall under state jurisdiction pursuant to Article 24 of the NYS Environmental Conservation Law (ECL). Regulated wetlands located within the Project Area are described in Tables 2 and 3 of Appendix 22-5. Presumed jurisdictional status is provided in Tables 4 and 5 of Appendix 22-5. All features delineated during the on-site wetland surveys as well as existing mapped features and their status are shown in Figure 22-3 and Figure 22-4, respectively. The Applicant is currently coordinating with the NYSDEC and USACE-Buffalo District to obtain final jurisdictional determination and field verification of delineated wetlands. Final determinations will be provided when complete.

(5) Wetland Shapefiles

Appendix 22-5 (Wetland and Waterbody Delineation Report) provides a detailed description of the delineated wetlands including potential jurisdictional status. Figure 22-3 depicts the TRC delineated and predicted wetlands within the Wetland Delineation Survey Area and subsequent 100-foot area from Project components. Figure 22-4 depicts the extent of the NYSDEC-mapped wetlands. Shapefiles of the state-regulated wetlands, delineated wetlands, likely jurisdictional

wetlands, predicted wetlands, and all corresponding adjacent areas within the Project Site, including all Project components; proposed grade changes; the limits of ground disturbance, and vegetative clearing will be provided to the NYSDEC and NYSDPS concurrently with the filing of this Application.

22(k) Characterization of Wetlands within the Project Area

Each wetland or waterbody was assigned a cover type based on the Cowardin classification system (Federal Geographic Data Committee [FGDC], 2013). In some instances, a delineated wetland or stream contained multiple cover types due to its larger size and/or a more complex community character. Boundaries were demarcated and data plots were taken from each specific cover type within a wetland or waterbody. This method established a more complete depiction of specific features and a more informative approach to any potential future mitigation efforts.

Palustrine Emergent (PEM) wetlands – A total of 53 wetlands delineated within the Project Area contain characteristics representative of the emergent wetland classification. Emergent wetlands are dominated by an herbaceous layer of hydrophytic (water-tolerant) plant species. Emergent wetlands typically contain deep, nutrient rich soils that remain heavily saturated or even inundated throughout the year.

Most PEM wetlands encountered within the Project Area were situated within active agricultural fields and had clear evidence of recent agricultural activity (e.g., plowing, planting). Evidence of wetland hydrology for these wetlands included surface water, high water table, saturation, aquatic fauna, drainage patterns, saturation visible on aerial imagery, geomorphic position, and the facultative (FAC)-neutral test. Hydric soil indicators adhered to descriptions and guidelines outlined in Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 8.1 (NRCS, 2017). Although hydric soils indications were variable, emergent wetlands within the Wetland Delineation Survey Area typically displayed black to dark brown (10YR 2/1 – 10YR 4/2) silty loam, silty clay loam, and sandy clay loam soils. Variations of characteristics in the soil matrices generally demonstrated Depleted Matrix (F3) and Redox Dark Surface (F6) hydric soil indicators. Wetland vegetation species commonly encountered amongst PEM wetlands included: sensitive fern (*Onoclea sensibilis*), soft rush (*Juncus effusus*), blunt spikerush (*Eleocharis obtusa*), cursed buttercup (*Ranunculus sceleratus*), northern water plantain (*Alisma triviale*), and spotted touch-me-not (*Impatiens capensis*); all observed June 25, 2019.

Palustrine Scrub-shrub (PSS) wetlands – A total of three wetlands delineated within the Project Area contained characteristics representative of a scrub-shrub wetland community. Scrub-shrub wetlands are dominated by woody shrub vegetation that stand less than 20 feet tall. Shrub species dominating the wetland could include true shrubs, a mixture of young trees and shrubs, or trees that are small or stunted due to stressors from explicit environmental conditions.

Scrub-shrub wetlands encountered in the Wetland Delineation Survey Area were typically dominated by southern arrowwood (*Sambucus nigra*), silky dogwood, and common buttonbush (*Cephalanthus occidentalis*). Herbaceous vegetation in these areas were dominated by sensitive fern, spotted touch-me-not, and various sedges. Evidence of wetland hydrology for these wetlands included saturation, water-stained leaves, drainage patterns, geomorphic position, and the FAC-neutral test. Scrub-shrub wetlands within the Wetland Delineation Survey Area typically displayed black to dark gray (10YR 2/1 – 10YR 4/2) silty clay loam soils. Variations of characteristics in the soil matrices generally demonstrated Depleted Matrix (F3) and Redox Dark Surface (F6).

Palustrine Forested (PFO) wetlands – A total of 28 wetlands delineated within the Project Area contained characteristics representative of forested wetland. Forested wetlands are sometimes referred to as swamps and are dominated by tree species 20 feet or taller with an understory of shrub and herbaceous species. Understory vegetation presence readily varies, as the upper canopy of tree species may block sufficient light for extensive vegetative growth in the understory. Coniferous swamps, lowland hardwood swamps, and floodplain forests are common types of forested wetlands. Soils in forested wetlands are typically inundated or saturated early spring into summer. Some forested wetlands may dry up entirely, which reveal water stain marks along the trunks of exposed tree species and shallow, buttressed root systems indicative of periods of heavy inundation events.

Forested wetlands encountered in the Wetland Delineation Survey Area were typically dominated by tree species of eastern green ash, red maple, and eastern cottonwood, observed June 24, 2019. Understory vegetation typically included saplings of the aforementioned species or shrub species, such as multiflora rose and European buckthorn. Herbaceous species included sensitive fern, poison ivy (*Toxicodendron radicans*) observed June 24, 2019, and European buckthorn. Evidence of wetland hydrology for these wetlands included saturation, surface water, high water table, water-stained leaves, sparsely vegetated concave surface, microtopographic relief, geomorphic position, and the FAC-neutral test. Forested wetlands within the Project Area typically

displayed black to dark brown (10YR 2/2 – 10YR 4/1) silt loam and silty clay loam soils. Variations of characteristics in the soil matrices generally demonstrated Depleted Below Dark Surface (A11), Depleted Matrix (F3), and Redox Dark Surface (F6).

Palustrine Unconsolidated Bottom (PUB) – A total of four wetlands delineated within the Wetland Delineation Survey Area contained characteristics representative of unconsolidated bottom wetlands. Unconsolidated bottom wetlands are characterized by surface water and have less than 30 percent vegetative cover and at least 25 percent cover of particles less than stones. As these are bodies of standing water, evidence of wetland hydrology was decisively present with standing water ranging from approximately 2–4 feet in depth. Evidence of wetland hydrology included surface water, high water table, saturation, algal mat or crust, inundation visible on aerial imagery, aquatic fauna, geomorphic position, and FAC-neutral test. Dominant herbaceous species included narrow-leaf cattail (*Typha angustifolia*) and common duckweed (*Lemna minor*) observed July 8, 2019. Due to inherent inundation in these wetlands, it is not possible to obtain an accurate soil profile. Since these wetlands are inundated year-round, soils are assumed to be hydric.

Streams (RUP, RIN, and REPH) – A total of seven streams were delineated within the Project Area. Classification of streams were dependent on a temporal description of their usual level of flow regimes. Perennial streams (RUP) tend to flow all year, except during severe drought conditions. Perennial streams can flow below the water table and receive groundwater flow sources from springs or groundwater seepages on slopes. Intermittent streams (RIN) flow only during certain times of the year from alternating springs, snow melts, or from runoff from seasonal precipitation events. Intermittent streams can flow above or below the water table. Ephemeral streams (REPH) flow sporadically and are entirely dependent on transient precipitation from storm events or from periodic snow melts. These streams tend to flow above the water table and are often found as drainage features adjacent to, or within, the headwaters of a more major stream system.

Streams encountered in the Project Area were all intermittent in nature and occurred in agricultural communities along gentle gradients (0-2 percent). They generally contained channel substrates of silt and clay, with probed stream depths in the range of <1–5 inches. Most streams were determined to predominantly drainage and lacked substantial features to permit the prevalence of an aquatic community.

Further characterization of the wetlands and streams, including a description of the vegetation, soils, and hydrology data collected for each of wetland sites identified, based on actual on-site wetland observations, and summary table of wetland delineation information, including the wetland's alpha- numeric code if the wetland is regulated or eligible for regulation under ECL Article 24 can be found in Appendix 22-5.

22(l) Qualitative and Descriptive Wetland Function Assessment

Recognizing the limitations of wetland assessment in only the aspect of numerical weightings and averaging stresses the need for a qualitative description of the physical, chemical, biological, and geological characteristics of wetlands in order to identify and measure exhibited functions and values. For many audiences, such a measurement can be highly subjective. In the past, efforts to use best professional judgments to interpret functions and values would often be unorganized, unpredictable, and legally difficult to defend and document (USACE, 1995). In response, the USACE developed a supplement to the *Highway Methodology Workbook entitled Functions and Values: A Descriptive Approach* (Supplement). This assessment example was created in order to collect and describe the functions and values assessment of wetlands in a measurable and un-biased perspective. It is for these reasons that the Applicant elects to use elements of the USACE, Highway Methodology, and processes outlined in the Supplement, to conduct a qualitative assessment of the physical characteristics of the wetlands and identify the functions and values which they exhibit.

The functions and values of wetlands are the favorable roles that a wetland provides to its surrounding environment and also towards the benefit of human society. Functions and values are a result of specific biological, chemical, and physical characteristics within the wetland and any complex relationships maintained by the wetland within its watershed, local environment, and the general public.

Assessing a specific wetland's function and value is necessary to determine the overall effects an impact or alteration may have on a wetland feature. Ultimately, such a measurement aids in establishing the appropriate type and amount of mitigation after impacts to a wetland occur. More recently, the assessment of the functions and values for wetlands have been used to consider wetland features for their value and functional significance, to better ensure that wetlands with specific and higher functions or values receive proper vindication. Toward that end, a wetland

functions and values assessment was undertaken for the Project Area. A comprehensive description of the functions and values of all wetlands delineated follows.

The thirteen functions and values that are considered by the USACE through their Supplement are listed below. The list includes eight functions and five values. Although the functions and values listed are not the only wetland functions and values possible, they do represent the current working suite provided by the USACE for regulatory consideration and do match well with the wetland benefits depicted within ECL Article 24. As such, they are thought to provide an objective and meaningful representation of the wetland resources associated with the Project. Based on processes outlined in the Supplement, a spreadsheet was created to include several basic considerations (qualifier") that help identify the functions and values provided by wetlands. These considerations are numerous, but include observed vegetation conditions, hydrologic conditions, size, adjacent area conditions, and the availability of public access. Appendix 22-6 provides more detail on this functions and values assessment. Each wetland's functions and values were evaluated based on data collected during field delineation meeting specific conditions. All wetlands identified within the Wetland Delineation Survey Area were entered into the spreadsheet. Various wetland characteristics were identified for each wetland.

Wetland Functions

Wetland functions are the properties or process of a wetland ecosystem which aid in promoting a homeostatic natural environment while in the absence of human interference. A wetland's specific function results from both organic and inorganic components, including physical, geologic, hydrologic, chemical and biological systems. These components include all processes necessary for the self-maintenance of the wetland ecosystem such as, but not limited to, ground water recharge, primary production, nutrient cycling, and sediment retention. Wetland functions relate to the ecological significance of wetland properties without regard to subjective human values. The eight functions defined by the Supplement including short descriptions defining each function are as follows:

1. Flood-flow Alteration - This function applies to the effectiveness of the wetland in reducing flood damage by containing an enhanced ability to store floodwaters for an extended period of time following heavy precipitation events.
2. Groundwater Recharge/Discharge - This function defines the potential for a wetland to act as a source of groundwater recharge and/or discharge. Recharge describes the potential for the wetland to contribute water to an underlying aquifer. Discharge relates to the

potential for the wetland to act as a source of groundwater transfer to the surface i.e., springs and hillside seeps.

3. Sediment/Pollutant Retention - This function describes the ability of a wetland to hinder the degradation of water qualities downstream. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens based off its geomorphic position, connectivity, soil thickness, and other physical characteristics.
4. Fish and Shellfish Habitat - This function defines a wetland's ability to contain or influence suitable habitats for fish and shellfish species.
5. Sediment/Shoreline Stabilization - This function defines a wetland's ability to effectively stabilize streambanks and shorelines against future erosion events.
6. Production (Nutrient) Export - This function relates to a wetland's ability to produce food or usable products for organisms, including humans, within the trophic levels associated with the watershed.
7. Nutrient Removal/Retention/Transformation - This function relates to the wetland containing the ability to prevent excess nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries.
8. Wildlife Habitat - This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and their periphery. Resident and migrating species were considered along with the potential for any state or federally listed species occurring within then target wetland.

Wetlands within the Wetland Delineation Survey Area displayed multiple functions based on their specific site characteristics. All delineated wetlands were determined to have the ability to provide some function of groundwater recharge/discharge, flood-flow alterations, nutrient removal/retention/transformation, sediment/toxicant/pollutant retention, and wildlife habitat. The primary functions and displayed by wetlands within the Wetland Delineation Survey Area include:

- Fish and Shellfish Habitat (15 wetlands)
- Sediment/Shoreline Stabilization (13 wetlands)
- Production Export (43 wetlands)

Wetland Values

Values are the societal benefits stemming from one or more of the aforementioned functions associated with a wetland. Most wetlands have corresponding public value to an assessable

degree. The value of a particular wetland function, or a combination of functions, is based on the interpretative judgment of the significance attributed to the wetlands through the various functions it provides. The five values defined by the Supplement and adopted for use in this assessment, including short descriptions defining each value, are documented below.

1. Recreation - This value indicates if the wetland is effective in providing, or assisting in the establishment of, recreational opportunities such as boating, fishing, hunting, and other leisurely pursuits. Recreation in this capacity includes both consumptive and non-consumptive activities. Consumptive activities consume or diminish the plants, animals, or other resources that are naturally located in the wetland, whereas non-consumptive activities do not.
2. Education/Scientific - This value considers the effectiveness of the wetland as a site for public education or as a location for scientific research.
3. Uniqueness/Heritage - This value applies to wetlands that contain a singular or rare quality. Special qualities may include such things as the wetland's history and the presence of archaeological sites, historical events which may have taken place at the wetland, or unique plants, animals, or geologic features located within, or supported by, the wetland feature.
4. Visual Quality/Aesthetics - This value relates to the visual and aesthetic qualities of the wetland.
5. Threatened or Endangered Species Habitat - This value relates to the effectiveness of the wetland or associated waterbodies to specifically support threatened or endangered species.

Values were found to occur in a limited number of wetlands due to the Study Area not being accessible to the public.

(1) Vernal Pools

The Applicant implemented a site-specific survey to document vernal pool features within the Project Area on March 30, 2020. The entirety of the Project Area was surveyed under appropriate seasonal conditions for identifying amphibian and reptile species which breed in vernal pool habitats. Vernal pools in the Project Area were limited, with only one confirmed vernal pool found during the spring 2020 surveys. This feature is a natural depression located within a larger forested wetland complex in the northern portion of the Project Area, shown on Figure 22-3. This

vernal pool feature is located outside of the proposed limits of disturbance for the Project. Canopy closure was approximately 65% and wood frog egg masses were observed in the pool.

22(m) Off-Site Wetlands Hydrological and Ecological Influence Analysis

Wetlands outside of the Wetland Delineation Survey Area associated with Project infrastructure were approximated within at least 100 feet of Project components using interpretation of aerial imagery, review of wetland mapping databases maintained by the NWI and NYSDEC, reference to on-site observations, and an analysis of publicly available topographic contour mapping. The approximation of wetlands within at least 100 feet of Project components was used to determine hydrological connections to off-site wetlands, including state mapped wetlands protected under ECL Article 24, which may be in close proximity to Project components. Eleven approximated wetlands were identified. Ten of these wetlands were extensions of field-delineated wetlands within the Project Area. Ten of the approximated wetlands within 100 feet of Project Components are presumed to be hydrologically connected to wetlands identified within the Wetland Delineation Survey Area. As such, these specific approximated wetlands would likely be considered federally jurisdictional by the USACE. Jurisdiction over federally regulated wetlands will ultimately be determined by the USACE.

22(n) Temporary and Permanent Wetland Impacts

Through careful siting of Project components, only 2.17 acre of temporary impacts and 0.07 acre of permanent wetland impacts (of the 272.24 acres of wetlands delineated) are proposed within the Project Area. Of the 2.17 acres of temporary wetland impacts and 0.07 acres of permanent impacts, approximately 83% and 31% of the impacts, respectively, occur to wetlands previously and regularly disturbed by agricultural practices. Additionally, no Project components or permanent impacts are proposed to occur within wetlands currently mapped by the NYSDEC, including their respective 100-foot adjacent areas (Appendix 11-1, Appendix 22-4). The Applicant recognizes that a field boundary verification has yet to occur and that the borders of State-jurisdictional wetlands and adjacent areas may expand or contract following verification with NYSDEC. Such changes may result in overlap with Project design; however, the Applicant has taken steps to distance Project components from wetlands to the maximum extent practicable, especially non-agricultural wetlands (i.e., those that are not situated amidst active agricultural fields). Thus, any overlap resulting from an expansion of mapped boundaries would likely be

minimal and most likely related to tree-clearing activities to minimize panel shading. Only those wetlands that will be impacted are shown in Table 22-11.

Table 22-11. Temporary and Permanent Wetland Impacts

Field ID	Conversion (Sq. Ft)	Temporary Impacts (Sq. Ft)	Permanent Impacts (Sq. Ft)	Total Impacts (Sq. Ft)	Permanent Forest Conversion (Sq. Ft)	Impact Type	Temp Impacts In 100-Ft Adjacent Areas (Sq. Ft)	Conversion Impacts In 100-Ft Adjacent Areas (Sq. Ft)	Permanent Impacts In 100-Ft Adjacent Area (Sq. Ft)	Page Number from Civil Drawing
W-JJB-1	-		-	0.00	-	-	19,556	7,791	-	C.300, C.301, C.314
W-JJB-12	-	620	-	620	-	LOD, UMV	20,295	64,878	-	C.304, C.306
W-JJB-13	<1	-	-	<1	-	Fence Line	-	-	-	C.306
W-JJB-14	11,304	-	-	11,304	-	Solar Array Area	-	-	-	C.306
W-JJB-17	196,026	13,644	-	209,670	-	Solar Array Area, Fenced Line, Fenced Area	-	-	-	C.302, C.303, C.304
W-JJB-19	1	2,265	1,558	3,824	1,558	Fence Line, Access Roads, Culverts, Rip Rap, Grading, LOD, UMV	-	-	-	C.307
W-JJB-4	-	1,049	-	1,049	-	LOD	-	-	-	C.302, C.303
W-JJB-6	6,254	-	-	6,254	-	Fenced Area, Solar Array Area	-	-	-	C.302

Table 22-11. Temporary and Permanent Wetland Impacts

Field ID	Conversion (Sq. Ft)	Temporary Impacts (Sq. Ft)	Permanent Impacts (Sq. Ft)	Total Impacts (Sq. Ft)	Permanent Forest Conversion (Sq. Ft)	Impact Type	Temp Impacts In 100-Ft Adjacent Areas (Sq. Ft)	Conversion Impacts In 100-Ft Adjacent Areas (Sq. Ft)	Permanent Impacts In 100-Ft Adjacent Area (Sq. Ft)	Page Number from Civil Drawing
W-JJB-7	-	8	-	8	-	LOD	-	-	-	C.302
W-JJB-8	-	23	-	23	-	LOD	-	-	-	C.303, C.305, C.307
W-JJB-9	2,185	1,704	-	3,889	-	LOD, Fence Line, Fenced Area, Solar Array Area	-	-	-	C.306
W-NWJ-12	1,712	984	-	2,696	-	LOD, Fence Line, Fenced Area, Solar Array Area	-	-	-	C.310, C.311
W-NWJ-13	27,083	-	-	27,083	-	Solar Array Area	-	-	-	C.310
W-NWJ-14	-	67	-	67	-	LOD	-	-	-	C.312
W-NWJ-16	1,872	-	-	1,872	-	Fenced Area	-	-	-	C.312
W-NWJ-17	20,758	-	-	20,758	-	Solar Array Area	-	-	-	C.311
W-NWJ-18	49,728	-	-	49,728	-	Solar Array Area	-	-	-	C.312
W-NWJ-19	4,138	-	-	4,138	-	Fenced Area	-	-	-	C.312

Table 22-11. Temporary and Permanent Wetland Impacts

Field ID	Conversion (Sq. Ft)	Temporary Impacts (Sq. Ft)	Permanent Impacts (Sq. Ft)	Total Impacts (Sq. Ft)	Permanent Forest Conversion (Sq. Ft)	Impact Type	Temp Impacts In 100-Ft Adjacent Areas (Sq. Ft)	Conversion Impacts In 100-Ft Adjacent Areas (Sq. Ft)	Permanent Impacts In 100-Ft Adjacent Area (Sq. Ft)	Page Number from Civil Drawing
W-NWJ-2	-	103	-	103	-	LOD	-	-	-	C.313
W-NWJ-20	21,348	1,680	-	23,028	-	LOD, Fence Line, Fenced Area, Solar Array Area	-	-	-	C.312
W-NWJ-21	85,652	2,083	-	87,735	-	LOD, Fence Line, Fenced Area, Solar Array Area	-	-	-	C.311, C.312
W-NWJ-22	693	1,780	-	2,473	-	LOD, Fence Line, Fenced Area	-	-	-	C.311, C.312
W-NWJ-23	-	793	-	793	-	LOD	-	-	-	C.311, C.312
W-NWJ-25	-	6	-	6	-	LOD	-	-	-	C.309
W-NWJ-26	-	1,226	1,355	2,581	286	Access Roads, Grading, LOD, UMV	-	-	-	C.309
W-NWJ-27	6,113	23,357	-	29,470	-	LOD, Fence Line, Fenced Area, Solar Array Area	-	-	-	C.310

Table 22-11. Temporary and Permanent Wetland Impacts

Field ID	Conversion (Sq. Ft)	Temporary Impacts (Sq. Ft)	Permanent Impacts (Sq. Ft)	Total Impacts (Sq. Ft)	Permanent Forest Conversion (Sq. Ft)	Impact Type	Temp Impacts In 100-Ft Adjacent Areas (Sq. Ft)	Conversion Impacts In 100-Ft Adjacent Areas (Sq. Ft)	Permanent Impacts In 100-Ft Adjacent Area (Sq. Ft)	Page Number from Civil Drawing
W-NWJ-29	-	1,457	94	1,551	94	Access Roads, Grading, LOD	-	-	-	C.304, C.305, C.306
W-NWJ-30	1,578	-	-	1,578	-	Solar Array Area	-	-	-	C.305
W-NWJ-31	75,840	31,026	-	106,866	-	LOD, Fence Line, Fenced Area, Solar Array Area	-	-	-	C.305
W-NWJ-33	-	49	-	49	-	LOD	-	-	-	C.308
W-NWJ-34	-	251	-	251	-	LOD	-	-	-	C.308
W-NWJ-35	4,156	1,148	-	5,304	-	LOD, Fence Line, Fenced Area, Solar Array Area	-	-	-	C.308
W-NWJ-36	9,365	4,940	-	14,305	-	LOD, Fence Line, Fenced Area, Solar Array Area	-	-	-	C.308
W-NWJ-37	13,762	1,649	-	15,411	-	LOD, Fence Line, Fenced Area, Solar Array Area, UMV	-	-	-	C.308

Table 22-11. Temporary and Permanent Wetland Impacts

Field ID	Conversion (Sq. Ft)	Temporary Impacts (Sq. Ft)	Permanent Impacts (Sq. Ft)	Total Impacts (Sq. Ft)	Permanent Forest Conversion (Sq. Ft)	Impact Type	Temp Impacts In 100-Ft Adjacent Areas (Sq. Ft)	Conversion Impacts In 100-Ft Adjacent Areas (Sq. Ft)	Permanent Impacts In 100-Ft Adjacent Area (Sq. Ft)	Page Number from Civil Drawing
W-NWJ-38	914	467	-	1,381	-	LOD, Fence Line, Fenced Area, Solar Array Area, UMV	-	-	-	C.308
W-NWJ-39	2,613	-	-	2,613	-	Solar Array Area	-	-	-	C.308
W-NWJ-41	-	68	-	68	-	LOD	-	-	-	C.308
W-NWJ-42	888	2,180	-	3,068	-	LOD, Fence Line, Fenced Area, Solar Array Area	-	-	-	C.300

Impacts to non-state regulated wetland W-JJB-19 are associated with the installation of a culvert and riprap for a newly constructed access road crossing as shown on preliminary design drawing sheet C-307 included in Appendix 11-1. This road crossing aligns with an existing farmer's access lane which also coincides with the narrowest section of wetland. The disturbances proposed by this Project relate to improvements to this crossing that are necessary to support construction traffic, operations and maintenance passage, and emergency vehicle access. Improvements to the existing farmer's lane will require grading, culvert installation, stormwater features, and fencing, all resulting in a permanent impact of approximately 0.036 acre of the wetland.

Approximately 286 square feet (Sq. Ft) of non-state regulated wetland W-NWJ-26 will be impacted by the installation of an access road and fencing (0.03 acre; sheet C-309, Appendix 11-1). Installation of an access road will permanently impact 94 Sq. Ft of wetland area in wetland W-NWJ-29 (0.002 acre; sheets C-305 & C-306 of Appendix 11-1). Impacts to these wetlands were avoided to the maximum extent practicable; however, where impacts were unavoidable, they were attempted to be minimized by using narrow or existing crossings. For example, the minimal disturbance to N-NWJ-29 relates to improvements along Welch Road, an existing private driveway that separates N-NWJ-29 from W-JJB-12. Due to the limited extent of permanent impacts to the above-mentioned aquatic features (<0.10 acres), mitigation is not proposed. A SWPPP has been drafted and outlines measures which will be implemented to prevent erosion and sedimentation into waterbodies during construction (Appendix 23-3).

Thirty-five wetlands lie within the Project's fenced area, but no Project Components will permanently impact these wetlands. Solar panels will be located within 19 of the 35 wetlands; each of these 19 wetlands, have been disturbed by ongoing agricultural practices. Posts supporting the panels will be installed within the wetland, however, due to the limited size of the posts (0.2 Sq. Ft), the cumulative impacts of these posts are negligible. Additionally; these posts will be driven into the ground and as these depressional wetlands occur in the midst of active agricultural fields, no grading or vegetative clearing, such that would constitute soil disturbance (e.g., stump removal), will be necessary. The Buffalo District of the USACE interprets these actions (i.e., pile driving with no vegetative clearing or grading) as neither a dredge nor a fill and therefore, a federal wetland permit is not required.

22(o) Avoidance and Mitigation of Impacts on Wetlands and Adjacent Areas

The Project layout design process used information from the wetland and waterbody delineation to place components where they would avoid and/or minimize impacts to state-regulated wetlands (and their 100-foot adjacent areas), and waterbodies, wherever possible. The current Project layout also minimizes impacts to wetlands and waterbodies by locating Project solar array structures outside of delineated features wherever practicable and routing access roads and collection lines around delineated features where practicable. Where linear wetlands and streams are encountered and must be bisected by Project components (access roads and collection lines) the narrowest and/or previously disturbed portions of the wetlands will be utilized for the site of impact. Where beneficial and cost effective, the Applicant is anticipating the utilization of Horizontal Directional Drilling (HDD) to avoid impacts to stream channels during the placement of buried collection line.

(1) NYSDEC Regulated Adjacent Areas

Four of the delineated wetlands within the Project Area are associated with currently mapped NYSDEC freshwater wetlands or their 100-foot adjacent areas. No Project components or permanent impacts are proposed to occur within these wetlands or their 100-foot adjacent areas as currently mapped by the NYSDEC (Appendix 11-1, Appendix 22-4). The Applicant recognizes that a field boundary verification has yet to occur and that the borders of NYSDEC-jurisdictional wetlands and adjacent areas may expand or contract following verification with NYSDEC staff. Such changes may result in overlap with Project design; however, the Applicant has taken steps to distance Project components from non-agricultural wetlands to the maximum extent practicable. Thus, any overlap resulting from an expansion of mapped boundaries would likely be minor and involve only limited tree-clearing activities with an adjacency area.

(2) Off-site Mitigation (if necessary)

Although attempts were made to avoid and minimize wetland and waterbody impacts where practicable, there will still be unavoidable minimal impacts to these features as a result of the Project (Section 22(n)). All wetland and stream impacts will occur in wetlands regulated by the USACE only. Less than 0.10 acres of federally jurisdictional wetlands will be permanently impacted from Project development; therefore, mitigation is not expected to be required. However, the Applicant will propose compensatory mitigation, if necessary, to the USACE which will be determined in consultation with d USACE. The potential mitigation effort to be conducted by the

Applicant would establish a “no net loss” of wetlands. Forms of mitigation available to the Applicant include the purchase of credits from an approved in-lieu-fee program, the creation of an on-site compensatory mitigation area, the restoration or enhancement of wetlands in the impacted watershed, or some combination of these options. Correspondence with USACE will be used to assist in the decision-making process as to which mitigation strategy is best suited for the Project based off local and regional constraints. Mitigation for impacts, if required, will be implemented within the Project Area wherever possible and in accordance with recommendations provided during consultation USACE. Off-site mitigation will only be considered if options for mitigation within the immediate vicinity of the Project have been evaluated and determined infeasible.

(3) Impact Avoidance and Minimization Measures Considered

For all proposed wetland impacts, the Applicant considered alternative routing or siting options and utilized narrow crossing locations and existing crossings wherever possible. Where alternatives were not feasible, mitigation measures to reduce impacts were considered.

The feasibility of HDD was evaluated for all stream crossings and has been proposed to avoid wetland impacts throughout the Project Area. Locations and specifications for HDD techniques are described in the Preliminary Design Drawings in Exhibit 11, and a further discussion is provided in Exhibit 21.

The Applicant will employ best management practices (BMPs) for implementation during construction to minimize wetland impacts. The BMPs will be based upon methods previously adopted by the Siting Board in Article 10 certificates. Buffer zones around delineated wetland resources that will be established within which activities and equipment usage which could temporarily impact wetlands will be prohibited. No use of herbicides or disturbances will occur within 100-feet of state-mapped wetland features, with the exception of disturbances associated with proposed HDD. Areas where equipment access is restricted will be clearly delineated.

Erosion and sediment control measures will be implemented during stream crossing activities and where construction activities occur adjacent to wetland habitats to avoid and minimize stream impacts as detailed in the SWPPP provided in Exhibit 23.

Herbicides used for application in aquatic environments, if necessary, will be restricted to those herbicides approved by the EPA for such uses. Applications will be performed only by qualified applicators and in adherence to product specifications.

(4) Environmental Compliance and Monitoring

Environmental compliance and monitoring programs will be implemented during Project construction in adherence to all relevant permit conditions to protect wetlands, streams, and other waterbodies. The programs will include an Environmental Monitor (EM) during construction and restoration activities on the Project Area. The EM will remain on site during construction and restoration activities to evaluate adherence to BMPs, inspect erosion and sedimentation control and ensure measures outlined in the SWPPP are properly implemented. Additionally, the EM will ensure that the work area is clearly delineated in the field as shown in the Preliminary Design Drawing and site plans (Exhibit 11), including the location of staging areas, stockpiles and erosion and sedimentation control features. Plans to restore all temporary disturbances in regulated areas, including replanting trees in disturbed forested areas, will be provided in the Compliance Filing.

22(p) Identification of State and Federally listed Species Subject to Potential Impacts

(1) Minimization and Mitigation of Impacts

Discussion on mitigating the impact to plant communities within the Project Area can be reviewed in Section 22(c), Avoidance and Mitigation Measures for Vegetation Impacts. Construction-related impacts to fish and wildlife will be limited to incidental injury and mortality due to construction activity. These activities include use of heavy machinery, vehicular traffic, and minimal silt and sedimentation events as a result of construction occurring within or adjacent to aquatic ecosystems. Also, habitat disturbance and loss will occur due to vegetation clearing, earth moving activities, and the placement of Project Components. Displacement events will also occur due to increased noise, vibration, and human presence during construction in previously undisturbed areas. The minimization of these construction related impacts will be accomplished through continued careful site design, best management practices, and construction monitoring based upon previously approved Siting Board certificate conditions for other projects. Site design practices avoid sensitive habitats by siting solar arrays primarily in agricultural fields, minimizing construction disturbances to the extent practicable, adhering to designated construction limits, and avoiding off-limit sensitive areas. Sensitive habitats are included in Figure 22-5.

In order to reduce impacts to aquatic resources as a result of construction-related siltation and sedimentation events, the Applicant will utilize an approved sediment and erosion control plan and implement a SWPPP for the construction phase of the Project. The sediment and erosion

control plan and Preliminary SWPPP are described in more detail in Exhibit 23. Also, the Preliminary SWPPP is attached as Appendix 23-3, and a Spill Prevention, Control, and Countermeasures (SPCC) Plan will be developed for implementation within the Project Area to mitigate any potential spill of hazardous chemicals during the construction and operation phases of the Project. Further detail of the SPCC plan is provided in Exhibit 23 of this Application. A final SPCC plan will be submitted in a compliance filing or filed with the Secretary.

Through initial impact analysis and careful site design, as explained above in Sections 22(d)(3) and 22(f)(9) permanent habitat loss and forest fragmentation have been avoided or minimized, to the maximum extent practicable. As stated previously, a majority of access roads, collection lines, and solar arrays will be sited in agricultural fields in order to minimize impacts to natural communities, including forest fragmentation. Restoration of the agricultural fields will take place following the decommissioning of the Project.

State and Federally Listed Species

As explained previously in Subsections 22(e) and 22(f) of this Exhibit, based on Project-specific information received from NYNHP, NYSDEC, USFWS, and direct on-site observations, a list was compiled of state- and federally listed species and SGCN that are believed to occur, or have the potential to occur, within the Project Area. Site-specific information requests to state and federal agencies were made in order to determine the presence of rare, threatened, endangered, and special concern species (see Appendix 22-8). Similarly, a list of species encountered during on-site survey work was documented by field staff. Any species that was visually identified on site that was on the aforementioned state or federal registry was also included in the list of state and federally listed species occurring within the Project Area. Information from the USGS BBS, NYS BBA, Audubon CBC, Herp Atlas, and eBird was used to find state and federally listed species, SSC, and SGCN. A summary table containing information on all listed species identified through the above-mentioned procedures was also compiled (see Table 22-12). The list contains a brief description of the specific habitat requirements for each identified species, the approximated source whereby each species is known to potentially occur within the vicinity of the Project, and if each species was directly observed on site. Seven listed species were observed on site, however, findings through this review indicate limited potential for additional species to occur. Where habitat for non-listed species observed on-site exists, efforts will be made to avoid siting Project components to reduce impacts.

The solar arrays will be installed to minimize the potential for avian and bat collisions. It is not anticipated there would be any avian or bat mortality from collisions with the solar panels. Studies regarding collision-related mortality are extremely limited, and to date no studies have been conducted on solar facilities in the eastern United States. Studies conducted on similar facilities (e.g., ground-mounted photovoltaic solar arrays) have indicated that mortality events are rare (~0.5 birds/MW/year) and substantially lower than other sources of mortality from human development (see Section 22(f)(7)), representing less than 1 percent of avian mortalities from anthropogenic sources annually. As previously mentioned in Section 22(f)(4) and 22(f)(10), there will be no take of threatened or endangered species, or adverse modification to their respective habitat, during construction or operation; therefore, post-construction monitoring for these species is not necessary.

Table 22-12. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Birds									
Bald Eagle	*Haliaeetus leucocephalus*	-	THR	SGCN	This species prefers undisturbed areas near large lakes, reservoirs, marshes, swamps, or stretches along rivers where they can breed and forage for fish. Habitat doesn't exist at the Project Area, as waterbodies are not large enough to support prey fish populations, however, is located nearby (Seneca Lake); therefore, this species has potential to occur within the Project Area. Nests may be constructed in large coniferous trees relatively near foraging habitat.	A, B, F, G, M	Yes	The species is known to nest within the Project Area; however, habitat typically occupied by bald eagles is not present within the Project Area. Active nests will be avoided consistent with state and federal regulations. No impacts to open water habitats will occur resulting from Project development.	Buffer distances and seasonal restrictions for avoidance will be adhered to per state and federal requirements surrounding active nests. However, levels of disturbance are not anticipated to exceed existing anthropogenic sources associated with active agriculture occurring directly adjacent to known nest locations. As no habitat for bald eagle will be impacted, no additional avoidance measures will be implemented aside from avoiding all Project activity within 660 feet of the nest location.
King Rail	*Rallus elegans*	-	THR	SGCN-HP	This species is most often found in shallow marshes, both freshwater and brackish, with tall emergent vegetation.	G	No	None anticipated. There are no proposed impacts to ponds, lakes, rivers, or forested wetlands (Appendix 22-4). Potential indirect impacts may occur due to construction activities near wetland habitat.	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Least Bittern	*Ixobrychus exilis*	-	THR	SGCN	This species is found in sparse populations in coastal and inland marshes, mostly characterized by tall emergent vegetation. They have also been known to use manufactured wetlands, such as golf course ponds.	G	No	None anticipated. There are no proposed impacts to ponds, lakes, rivers, or forested wetlands (Appendix 22-4). Potential indirect impacts may occur from construction activities near wetland habitat.	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary.
Pied-billed Grebe	*Podilymbus podiceps*	-	THR	SGCN	This species is found in lakes and ponds, as well as open wetlands and large, slow-moving rivers.	G	No	None anticipated. There are no proposed impacts to ponds, lakes, rivers, or forested wetlands (Appendix 22-4). Potential indirect impacts may occur from construction activities near wetland habitat.	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary.
Sedge Wren	*Cistothorus platensis*	-	THR	SGCN-HP	In both its breeding and winter ranges, this species may be found in wet fields and marshes dominated by sedges and grasses. Limited to no habitat for this species is present within the Project Area. Marshes exist; however, few are dominated by dense vegetation preferred by this species.	G	No	None anticipated. There are no proposed impacts to ponds, lakes, rivers, or forested wetlands (Appendix 22-4). Potential indirect impacts may occur from construction activities near wetland habitat.	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Upland Sandpiper	*Bartramia longicauda*	-	THR	SGCN-HP	This species is almost exclusively found in grasslands, most notably in the Great Plains. They are however, often found in agricultural fields, including hay fields and pastures. Grassland habitat is not present within the Project Area; however, old fields and pasture/haylands are present to a limited extent. Agricultural fields are widely present within the Project Area.	G, J	No	No direct impacts are expected as habitat for this species is minimally available within the Project Area, and no permanent impacts to existing habitat will occur. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Project components have been sited in agricultural areas to the maximum extent possible to avoid successional shrublands and successional old fields. Further, conversion of agricultural land to planted early successional grasslands has been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.
Loggerhead Shrike	*Lanius ludovicianus*	-	END	SGCN-HP	This species is found in grasslands with abundant perching locations. While old field and marsh habitat is present within the Project Area, grasslands are of limited extent and experience seasonal disturbance from mowing.	G	No	Limited potential direct impacts include habitat degradation and fragmentation from permanent loss or conversion of 0.14 acres of successional shrublands to early successional fields. There will be habitat loss of 0.11 acres of successional shrubland and successional old fields to Project components. Potential indirect	Project components have been sited in agricultural areas to the maximum extent possible to avoid successional shrublands and successional old fields. Further, conversion of agricultural land to planted early successional grasslands has been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
								impacts could include habitat disturbance due to noise and construction activity.	quality for this species at the Project.
Peregrine Falcon	*Falco peregrinus*	-	END	SGCN	This species can be found in a wide variety of habitats, but is most often found along rivers or coastlines, nesting on cliffs, or buildings in urban areas. No breeding habitat exists within the Project Area; however, given the generalist requirements of this species other potential habitat is present (i.e., open fields for foraging).	F, G	No	Limited potential direct impacts include habitat degradation and fragmentation from permanent loss or conversion of 0.14 acres of successional shrublands to early successional fields. There will be habitat loss of 0.11 acres of successional shrubland and successional old fields to Project components. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Project components have been sited in agricultural areas to the maximum extent possible to avoid successional shrublands and successional old fields. Further, conversion of agricultural land to planted early successional grasslands has been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.
Short-eared Owl	*Asio flammeus*	-	END	SGCN-HP	This species can be found in large open areas, often grasslands, marshes, or wet meadows. While old field and marsh habitat is present within the Project Area, grasslands are of limited extent and experience seasonal disturbance from mowing.	F, G, M	No	Limited potential direct impacts include habitat degradation and fragmentation from permanent loss or conversion of 0.14 acres of successional shrublands to early successional fields.	Project components have been sited in agricultural areas to the maximum extent possible to avoid successional shrublands and successional old fields. Further, conversion of agricultural land to

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
								There will be habitat loss of 0.11 acres of successional shrubland and successional old fields to Project components. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	planted early successional grasslands has been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.
American Bittern	*Botaurus lentiginosus*	-	-	SGCN	This species breeds in freshwater wetlands with tall emergent vegetation, such as freshwater marshes and scrub-shrub wetlands. Nesting can occur in grasslands and successional old fields adjacent to wetland habitat. Suitable nesting habitat for this species occurs within the Project Area.	G	No	Potential direct impacts could include habitat disturbance, degradation and loss, particularly for nesting habitat adjacent to wetlands (0.07 acre). Temporary impacts to nesting habitat in grassland and successional old fields could occur. Indirect impacts could include noise from construction activities.	Impacts to wetland habitat have been avoided and minimized to the maximum extent practicable by siting Project components in agricultural fields and using HDD when necessary.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
American Kestrel	*Falco sparverius*	-	-	SGCN	This species prefers open areas, such as successional old fields, forest edges, scrublands, pastures and hay fields. Habitat for this species occurs within the Project Area.	B, E, F, G, J	Yes	Limited potential direct impacts include habitat degradation and fragmentation from permanent loss or conversion of 0.14 acres of successional shrublands. There will be habitat loss of 0.11 acres of successional shrubland and successional old fields to Project components. Additional direct impacts may result from the clearing of 32.5 acres of forested habitat which may be used by the species. Potential indirect impacts from habitat disturbance due to noise and construction activity.	Impacts to agricultural land are unavoidable, however, conversion of agricultural land to planted early successional grasslands at solar facilities has been shown to benefit grassland species with habitat requirements similar to American kestrel (see section 22(f)(6)).

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
American Woodcock	*Scolopax minor*	-	-	SGCN	This species prefers moist successional shrublands near successional forests and scrub-shrub wetlands. Habitat for this species occurs within the Project Area.	B, E, G,	Yes	Limited potential direct impacts include habitat degradation and fragmentation from permanent loss or conversion of 0.14 acres of successional shrublands to early successional fields. There will be habitat loss of 0.11 acres of successional shrubland and successional old fields to Project components. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Potential impacts to successional shrublands and scrub-shrub wetlands have been minimized to the maximum extent practicable by siting Project components in agricultural land wherever possible.
Black-bellied Plover	*Pluvialis squatarola*	-	-	SGCN	While this species spends its breeding season in tundras and high latitude wetlands, during migration it can be found in open grasslands, wet meadows, and edges of waterways. The range of this species overlaps the project Area during migration only. Limited migration habitat for this species exists within the Project Area.	G	No		
Black-billed Cuckoo	*Coccyzus erythropthalmus*	-	-	SGCN	This species prefers thickets, successional old-field, orchards, and along forest edges. Nests in shrublands and forest edges. Habitat for this species occurs within the Project Area.	E, G, J	No	Potential direct impacts include habitat degradation and fragmentation from conversion of 23.03 acres and	Potential impacts to successional shrublands have been minimized to the maximum extent practicable by siting

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
								permanent loss of 0.64 acres of successional shrublands, successional old fields, and forest edges to early successional grasslands. Potential indirect impacts could include habitat disturbance due to noise from construction activity.	Project components in agricultural land wherever possible. The project layout will create forest edges that may be used by Black-billed Cuckoo.
Black-crowned Night-Heron	*Nycticorax nycticorax*	-	-	SGCN	Commonly found in wetland habitats throughout North America including marshes, swamps, streams, rivers, lakes and ponds. The species will also use wet agricultural fields. Requires some terrestrial vegetation for cover. Habitat for this species is found within the Project Area	G	No	No potential direct impacts, because there are no proposed impacts to ponds, lakes, rivers, or forested wetlands (see Appendix 22-4 for a description of wetland habitat in Project Area). Potential indirect impacts are from habitat disturbance due to noise from construction activities near wetland habitat.	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary.
Black-throated Blue Warbler	*Setophaga caerulescens*	-	-	SGCN	This species prefers large tracts of mature forest during the breeding season, and shrubby areas during the post-fledging period.	G	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 22.99 acres and loss of 0.54 acres of forests to early successional	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
								grasslands. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	necessary to prevent trees from overhanging solar arrays.
Blue-winged Warbler	*Vermivora cyanoptera*	-	-	SGCN	This species breeds in the shrublands, scrub habitat, thickets and forest edges and will use similar habitat during migration.	E, G, J	No	Potential direct impacts include habitat degradation and fragmentation from the conversion and loss of 0.14 acres of successional old fields and successional shrublands to early successional fields. There will be habitat loss of 0.11 acres of successional shrubland and successional old fields to Project components. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Project components have been sited in agricultural areas to the maximum extent possible to avoid successional shrublands and successional old fields. Further, conversion of agricultural land to planted early successional grasslands has been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Common Goldeneye	*Bucephala clangula*	-	-	SGCN	This species prefers freshwater habitats such as ponds, lakes, rivers, and forested wetlands. Nests in tree cavities in mature boreal forests. Habitat for this species may occur limitedly within the Project Area, although there are no boreal forests.	F, G	No	There will be no direct impacts, because there are no proposed impacts to ponds, lakes, rivers, or forested wetlands. Potential indirect impacts could include habitat disturbances due to noise from construction activity near wetland habitats.	Impacts to ponds, lakes, rivers, and forested wetlands have been completely avoided by siting Project components in agricultural land wherever possible. HDD will be used when necessary to avoid impacts to rivers and wetlands.
Great Egret	*Ardea alba*	-	-	SGCN	This species is found in marshes and other shallow waterbodies, as well as occasionally inhabiting upland areas.	G	No	No potential direct impacts, because there are no proposed impacts to ponds, lakes, rivers, or forested wetlands (see Appendix 22-4 for a description of wetland habitat in Project Area). Potential indirect impacts are from habitat disturbance due to noise from construction activities near wetland habitat.	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary.
Greater Scaup	*Aythya marila*	-	-	SGCN	This species is most often found in shallow areas of large waterbodies, as well as shallow emergent marshes during the breeding season.	G, J	No	No potential direct impacts, because there are no proposed impacts to ponds, lakes, rivers, or forested wetlands (see Appendix 22-4 for a description of wetland habitat in	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
								Project Area). Potential indirect impacts are from habitat disturbance due to noise from construction activities near wetland habitat.	and using HDD when necessary.
Greater Yellowlegs	*Tringa melanoleuca*	-	-	SGCN	This species is found on the edges of waterbodies, as well as in wetlands.	G	No	No potential direct impacts, because there are no proposed impacts to ponds, lakes, rivers, or forested wetlands (see Appendix 22-4 for a description of wetland habitat in Project Area). Potential indirect impacts are from habitat disturbance due to noise from construction activities near wetland habitat.	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary.
Lesser Scaup	*Aythya affinis*	-	-	SGCN	This species is most often found in shallow areas of large waterbodies, as well as shallow emergent marshes during the breeding season.	F, G	No	No potential direct impacts, because there are no proposed impacts to ponds, lakes, rivers, or forested wetlands (see Appendix 22-4 for a description of wetland habitat in Project Area). Potential indirect impacts are from habitat disturbance due to noise from construction	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
								activities near wetland habitat.	
Little Blue Heron	*Egretta caerulea*	-	-	SGCN	The species is found in a variety of wetland environments including swamps, marshes, ponds, flooded fields and ditches. They nest in trees and shrubs near open water. Habitat for this species occurs within the Project Area.	G	No	No potential direct impacts, because there are no proposed impacts to ponds, lakes, rivers, or forested wetlands (see Appendix 22-4 for a description of wetland habitat in Project Area). Potential indirect impacts are from habitat disturbance due to noise from construction activities near wetland habitat.	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary.
Long-eared Owl	*Asio otus*	-	-	SGCN	This species tends to nest in dense grasslands or shrublands, as well as open woodlands.	G	No	Potential impacts not anticipated as the species is not known to occur in the Project Area based on agency review, publicly available information, and results from the Applicant's grassland bird studies.	Project components have been sited in agricultural areas to the maximum extent possible to avoid successional shrublands and successional old fields. Further, conversion of agricultural land to planted early successional grasslands has been shown to benefit grassland bird species (see Section

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
									22(f)(6)) and may improve habitat quality for this species at the Project.
Northern Goshawk	*Accipiter gentilis*	-	-	SGCN	This species prefers larger tracts of wild forest. Across much of their range they live mainly in coniferous forests; however, they may occur in deciduous hardwood forest as well. Habitat for this species occurs within the Project Area.	G	No	Potential direct impacts are unlikely due to the limited habitat in the form of extensive forests (see Section 22(f)(8)). Potential direct impacts include habitat degradation and fragmentation, from the conversion of 22.99 acres and loss of 0.54 acre of forests to early successional grasslands. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees from overhanging solar arrays.
Northern Pintail	*Anas acuta*	-	-	SGCN	This species is found predominantly in emergent marshes, flooded crop fields, ponds, and other wetland areas. Habitat for this species is present within the Project Area.	B, G	Yes	Limited potential direct impacts, because there are no proposed impacts to ponds, lakes, rivers, or forested wetlands (see Appendix 22-4 for a description of wetland habitat in Project Area). Potential indirect	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary. Impacts to agricultural land are unavoidable,

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
								impacts are from habitat disturbance due to noise from construction activities near wetland habitat. Temporary or indirect impacts could include habitat disturbance related to construction activities.	however, this is a habitat used ephemerally by the species where flooding occurs.
Prairie Warbler	*Setophaga discolor*	-	-	SGCN	This species prefers successional shrubland, successional old-field, brush piles, and pastures. Breeds in dry old field and clearing, edges of forest, and sandy pine barrens. Habitat for this species occurs within the Project Area.	G	No	Potential direct impacts include habitat degradation and fragmentation from the loss or conversion of 0.14 acres of successional shrubland, and successional old fields to early successional grassland. There will be habitat loss of 0.11 acres of successional shrubland and successional old fields to Project components. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to successional shrublands and successional old fields have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Impacts to agricultural land are unavoidable, as most of the Project components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. However, grassland habitat created under and between solar panels may provide improved habitat quality over active agriculture within the Project (see Section 22(f)(6)).

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Red-shouldered Hawk	*Buteo lineatus*	-	-	SGCN	This species prefers bottomland hardwood or upland mixed forests, though are also typically found inhabiting residential areas. Habitat for this species is present within the Project Area.	G, J	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 22.99 acres and loss of 0.54 acre of forests to early successional grasslands. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees from overhanging solar arrays.
Ruddy Duck	*Oxyura jamaicensis*	-	-	SGCN	This species is predominantly found in large marshes and ponds. During migration, they use large wetlands and lakes as stopover habitat. Habitat for this species is limited within the Project Area.	G	No	No potential direct impacts, because there are no proposed impacts to ponds, lakes, rivers, or forested wetlands (see Appendix 22-4 for a description of wetland habitat in Project Area). Potential indirect impacts are from habitat disturbance due to noise from construction activities near wetland habitat.	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Scarlet Tanager	*Piranga olivacea*	-	-	SGCN	This species prefers expansive deciduous and mixed forest canopies. Habitat for this species occurs within the Project Area.	B, E, G, J	Yes	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 22.99 acres and loss of 0.54 acre of forests to early successional grasslands. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees and shrubs from overhanging solar arrays.
Wood Thrush	*Hylocichla mustelina*	-	-	SGCN	This species prefers deciduous and mixed forests with large trees, moderate understory, shade, and abundant leaf litter. Habitat for this species occurs within the Project Area.	B, E, G, J	Yes	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 22.99 acres and loss of 0.54 acre of forests to early successional grasslands. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees and shrubs from overhanging solar arrays.
Yellow-crowned Night-Heron	*Nyctanassa violacea*	-	-	SGCN	This species is found mostly in wetland areas including marshes, ponds, lagoons, and rivers. They are often found in coastal areas.	G	No	No potential direct impacts, because there are no proposed impacts to ponds, lakes, rivers, or forested wetlands (see Appendix 22-4 for a description of wetland habitat in	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
								Project Area). Potential indirect impacts are from habitat disturbance due to noise from construction activities near wetland habitat.	and using HDD when necessary.
American Black Duck	*Anas rubripes*	-	-	SGCN-HP	This species prefers marshes, ponds, rivers, and lakes. This species breeds in freshwater wetlands such as freshwater marshes and forested wetlands. Habitat for this species occurs within the Project Area.	E, F, G, J	No	No potential direct impacts, because there are no proposed impacts to ponds, lakes, rivers, or forested wetlands (see Appendix 22-4 for a description of wetland habitat in Project Area). Potential indirect impacts are from habitat disturbance due to noise from construction activities near wetland habitat.	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary.
Bay-breasted Warbler	*Setophaga castanea*	-	-	SGCN-HP	This species is predominantly found in mature boreal forest. They are occasionally found in other habitats such as pine forest or northern hardwoods. The project Area is located outside of the breeding range for this species and the limited habitat available is likely to be used as stopover habitat only during migration.	G	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 22.99 acres and loss of 0.54 acre of forests to early successional grasslands. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees from overhanging solar arrays.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Bobolink	*Dolichonyx oryzivorus*	-	-	SGCN-HP	This species prefers grasslands, including pastures, successional old fields, and meadows. Habitat for this species occurs within the Project Area.	B, E, G, J	Yes	Direct impacts due to habitat loss and conversion are not expected. The species Is likely to benefit from the conversion of 373.53 acres of agricultural lands and successional old fields to early successional fields. There will be a habitat loss of 9.18 acres of agricultural land and successional old fields to Project components. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to agricultural land is unavoidable, as most of the Project components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. Active agricultural land provides limited wildlife habitat for Bobolink. Conversion of agricultural land to planted early successional grasslands has been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Brown Thrasher	*Toxostoma rufum*	-	-	SGCN-HP	This species prefers successional shrublands, dense regenerating woods, and forest edges. Habitat for this species occurs within the Project Area.	B, G, J	Yes	Potential direct impacts include habitat degradation and fragmentation from conversion of 23.03 acres and loss of 0.65 acre of successional shrublands and forest edges to early successional grasslands, though the species may utilize the newly created grassland habitat. The project layout will create forest edges that may be used by Brown Thrashers. Potential indirect impact from habitat disturbance due to noise and construction activity.	Impacts to successional shrublands and forests have been minimized to the maximum extent practicable by siting Project components in agricultural land wherever possible. Tree and shrub clearing is necessary to prevent trees and shrubs overhanging solar arrays.
Canada Warbler	*Cardellina canadensis*	-	-	SGCN-HP	This species breeds in mixed forest with a shrubby understory. During migration and winter, they are found in densely vegetated edge habitat.	G	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 23.99 acres and loss of 0.54 acre of forests to early successional grasslands. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees from overhanging solar arrays.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Cattle Egret	*Bubulcus ibis*	-	-	SGCN-HP	This species is found in marshes and shallow waterbodies. They are also often found in agricultural areas.	G	No	Limited potential direct impacts, because there are no proposed impacts to ponds, lakes, rivers, or forested wetlands (see Appendix 22-4 for a description of wetland habitat in Project Area). Potential indirect impacts are from habitat disturbance due to noise from construction activities near wetland habitat. Indirect impacts could include habitat disturbance and temporary displacement from 372.49 acres of agricultural habitat due to construction activities.	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary. Impacts to agricultural land are unavoidable, however, this is a habitat used ephemerally by the species where flooding occurs.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Common Nighthawk	*Chordeiles minor*	-	-	SGCN-HP	This species prefers open or semi-open areas such as forest clearings, grasslands, and suburbs. Habitat for this species occurs within the Project Area.	G	No	Potential direct impacts include habitat degradation and fragmentation from conversion of 23.03 acres and loss of 0.65 acre of successional shrublands and forest edges to early successional grasslands, though the species may utilize the newly created grassland habitat. The project layout will create forest edges that may be used by Brown Thrashers. Potential indirect impact from habitat disturbance due to noise and construction activity.	Impacts to successional old fields have been minimized to maximum extent practicable. Impacts to open agricultural areas are unavoidable. Most of the Project components have been sited within agricultural areas to avoid wetlands and minimize tree clearing.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Eastern Meadowlark	*Sturnella magna*	-	-	SGCN-HP	This species prefers large expanses of farm fields, pastures, grasslands, and wet fields. Habitat for this species occurs within the Project Area.	E, G, J	No	Potential direct impacts include habitat degradation and fragmentation from conversion of 23.03 acres and loss of 0.65 acre of successional shrublands and forest edges to early successional grasslands, though the species may utilize the newly created grassland habitat. Potential indirect impact from habitat disturbance due to noise and construction activity.	Impacts to agricultural land are unavoidable, as most of the Project components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. Conversion of land to planted early successional grasslands at solar facilities has been shown to benefit grassland birds (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.
Golden-winged Warbler	*Vermivora chrysoptera*	-	-	SGCN-HP	This species prefers open woodlands, wet thickets, and successional shrublands. A mosaic of shrubby, open areas and mature forests are important for this species. Habitat for this species occurs within the Project Area.	G	No	Potential direct impacts include habitat degradation and fragmentation from conversion of 0.14 acres of successional shrublands and forests to early successional grasslands. Habitat loss will occur on 0.11 acres. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to successional shrublands and forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree and shrub clearing are necessary to prevent trees from overhanging solar arrays.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Grasshopper Sparrow	*Ammodramus savannarum*	-	-	SGCN-HP	This species prefers open fields and prairie including active hay fields, successional old field, and minimally in successional shrublands. Habitat for this species occurs within the Project Area.	G, J	No	Potential direct impacts include habitat degradation and fragmentation from conversion of 23.03 acres and loss of 0.65 acre of successional shrublands and forest edges to early successional grasslands, though the species may utilize the newly created grassland habitat. Potential indirect impact from habitat disturbance due to noise and construction activity.	Impacts to agricultural land is unavoidable, as most of the Project components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. Active agricultural land provides limited wildlife habitat for Grasshopper Sparrow. Conversion of agricultural land to planted early successional grasslands for solar facilities has been shown to benefit grasshopper sparrow (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Horned Lark	*Eremophila alpestris*	-	-	SGCN-HP	This species prefers open fields, agricultural areas, and open habitats with sparse vegetation such as prairies and heavily grazed pastures. Habitat for this species occurs within the Project Area.	B, E, F, G, J	Yes	Direct impacts due to habitat loss and conversion are not expected. The species is likely to benefit from the conversion of 373.53 acres of agricultural lands and successional old fields to early successional fields. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to agricultural land is unavoidable, as most of the Project components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. Active agricultural land provides limited wildlife habitat for Horned Lark. Conversion of agricultural land to planted and managed early successional grasslands for solar facilities has been shown to benefit grassland bird species with habitat requirements similar to Horned Lark (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Northern Bobwhite	*Colinus virginianus*	-	-	SGCN-HP	The species is commonly found in grassland habitat, agricultural fields and successional shrublands. Habitat for this species is found within the Project Area.	G, J	No	Direct impacts due to habitat loss and conversion are not expected. The species Is likely to benefit from the conversion of 373.53 acres of agricultural lands and successional old fields to early successional fields. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to agricultural land are unavoidable, as most of the Project components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. Conversion of land to planted early successional grasslands at solar facilities has been shown to benefit grassland birds (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.
Red-headed Woodpecker	*Melanerpes erythrocephalus*	-	-	SGCN-HP	This species prefers open deciduous forests, forest edges, groves, and orchards. Habitat for this species occurs within the Project Area.	G, J	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 22.99 acres and a loss of 0.54 of forests to early successional grasslands. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees from overhanging solar arrays.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
Rusty Blackbird	*Euphagus carolinus*	-	-	SGCN-HP	Typically found within wet forest environments, breeding in fens, bogs, and near beaver ponds. Winters in swamps and wet woodlands. Habitat for this species is found within the Project Area.	G	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 22.99 acres and a loss of 0.54 acre of forests to early successional grasslands. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees and shrubs from overhanging solar arrays.
Vesper Sparrow	*Pooecetes gramineus*	-	-	SGCN-HP	This species responds quickly to changes in habitat and often occupies abandoned old farm fields and successional shrub lands as they return to forest. Habitat for this species occurs within the Project Area.	B, G, J	Yes	Potential direct impacts include habitat degradation and fragmentation from the conversion of 0.04 acres and a loss of 0.11 acres of successional old fields and successional shrublands to early successional fields. However, the species may benefit from the creation of early successional grassland habitat resulting from conversion of 372.49 acres of agricultural habitat. Potential indirect impacts could include habitat disturbance due to	Project components have been sited in agricultural areas to the maximum extent possible to avoid successional shrublands and successional old fields. Further, conversion of agricultural land to planted early successional grasslands has been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
								noise and construction activity.	
Mammals									
Northern Long-eared bat	*Myotis septentrionalis*	THR	THR	SGCN-HP	This species uses tree cavities or loose bark of trees for roosting, foraging and raising young. This species hibernates through the late fall and early spring in caves or abandoned mines. Summer roosting habitat is within the forested portions of the Project Area.	K	No	Potential direct and indirect impacts are unlikely due to the limited habitat in the form of extensive interior forests (see Section 22(f)(8)).	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees from overhanging solar arrays.
Indiana bat	*Myotis sodalis*	END	END	SGCN-HP	This species hibernates in caves with a very specific temperature range, and in New York are nearly all in one hibernaculum. During the summer, they roost in trees during the daytime.	M, K	No	Potential direct impacts are unlikely due to the limited extent of habitat in the form of extensive forests (see Section 22(f)(8)).	Impacts to forested areas have been minimized to the maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees from overhanging solar arrays.
Eastern red bat	*Lasiurus borealis*	-	-	SGCN	This is a migratory bat species that often resides in forested areas and does not overwinter in caves. This species roosts in tree foliage of a variety of deciduous tree species. They forage in wooded areas, over waterbodies, open areas, and along edge habitat. Summer habitat occurs within the Project Area."	K	No	Potential direct impacts are unlikely due to the limited extent of habitat in the form of extensive forests (see Section 22(f)(8)).	Impacts to forested areas have been minimized to the maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees from

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
									overhanging solar arrays.
Hoary bat	*Lasiurus cinereus*	-	-	SGCN	This migratory bat species roosts in forested area, among the foliage of deciduous and coniferous trees, and forages along open and edge habitat and over open areas or large open bodies of water. This species is not known to hibernate in caves. Summer habitat for this species occurs within the Project Area.	K	No	Potential direct impacts are unlikely due to the limited extent of habitat in the form of extensive forests (see Section 22(f)(8)).	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees from overhanging solar arrays.
Eastern pipistrelle (Tri-colored bat)	*Perimyotis subflavus*	-	-	SGCN-HP	This species hibernates in abandoned mines and caves during the winter. They roost in tree foliage and occasionally in buildings. Foraging habitat includes wooded riparian areas, over water, and forest-field edges. Summer habitat occurs within the Project Area.	K	No	Potential direct impacts are unlikely due to the limited extent of habitat in the form of extensive forests (see Section 22(f)(8)).	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees from overhanging solar arrays.
Little brown bat	*Myotis lucifugus*	-	-	SGCN-HP	This species prefers summer roosts in buildings or trees, under rocks or wood piles. This species hibernates through the late fall and early spring in caves or abandoned mines. There is suitable summer roost habitat within the forested portions of the Project Area.	K	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 22.99 acres and loss of 0.54 acre of forests to early successional grasslands. Potential indirect impacts could include habitat	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project components in agricultural areas. Tree clearing is necessary to prevent trees from overhanging solar arrays.

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures
								disturbance due to noise and construction activity.	
Reptiles									
Bog turtle	*Glyptemys muhlenbergii*	THR	END	SGCN-HP	This species is found in open wetland areas, characterized predominantly by saturated soils and flooding.	D, H	No	No potential direct impacts based on absence of species records in the Project Area, and full avoidance of ponds, lakes, rivers, or forested wetlands (see Appendix 22-4 for a description of wetland habitat in Project Area).	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary.

1. 'Federal Status' refers to the species listing as federally endangered (END) OR threatened (THR).
2. 'NYS Status' refers to the species listing as a state-listed END, THR, or SSC.
3. 'SGCN Listing' refers to is the species state listed as a SGCN – High Priority (SGCN-HP), Species of Greatest Conservation Need (SGCN), or a Species of Potential Conservation Need (SPCN). Status was determined from the published list available at: https://www.dec.ny.gov/docs/wildlife_pdf/sgnc2015list.pdf
4. References for habitat preference were Audubon.org, Allaboutbirds.org, and NYSDEC's State Wildlife Action Plan (SWAP)
5. Figure 22-1 shows areas of potential habitat for listed species. This figure shows ecological communities based on definitions in Edinger et al. (2014). Plant communities which may serve as potential habitat include: southern successional hardwoods, beech-maple mesic forest, successional old fields. More specific locations of wetland habitat are shown in Figures 22-3 and 22-4.
6. "Source of Potential Presence" refers to the source of information indicating the potential presence of the species at the Project Area:

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4,5]	Source of Potential Presence[6]	Observed On Site	Potential Impacts	Impact Avoidance Measures

A: Species observed on-Site by TRC Biologists
B: Species observed on-Site during avian surveys
C: NYSDEC mammals webpage Range Maps and Descriptions
D: Species identified in USFWS online database (IPAC)
E: Species identified in the NYS BBA
F: Species identified in the Audubon CBC
G: Species identified in eBird
H: Species identified in the NYS Amphibian & Reptile Atlas Project
I: Species identified in the NYSDEC Statewide Fisheries Database
J: Species identified by USGS BBS
K: Species distribution range in the NYSDEC SWAP
L: Species identified in the NYSDEC NYS Checklist of Amphibians, Reptiles, Birds and Mammals
M: Species identified during consultations with state or federal agencies

No take of listed species is anticipated to occur as a result of Project development. Areas inhabited by sensitive species known to occur on site, specifically bald eagle, have been avoided. Relatively little natural habitat exists for listed species within the Project Area due to the prevalence of ongoing and historic agriculture and thus impacts are anticipated to be minimal (Table 22-10).

Impacts to forested habitat will occur on 31.4 acres which will be cleared for Project development, representing a reduction of approximately 12 percent of forested habitat. Tree removal is necessary to reduce safety hazards posed by shading and overhang within panel areas. It has been minimized the maximum extent practicable but cannot be reasonably avoided within the Project Area. However, to the maximum extent practicable, panels have been sited away from forest edges to reduce the overall area of vegetation clearing in forested habitat.

Indirect impacts associated with disturbance from construction activities is not likely to exceed the levels of disturbance associated with agricultural production which occurs annually within the Project Area.

22(q) ISMCP

Outside a direct and physical impact to local vegetation communities through construction, the disturbance of naturally occurring ecologies can occur through the introduction of non-native species. While all species compete in the environment to survive, non-native or invasive species, appear to have specific traits or specific combinations of traits that allow them to outcompete native species. As invasive species spread, native species begin to reduce in population as suitable habitat and nutrient resources become more limited. During the plant species survey, a total of 12 invasive plant species were observed within the Project Area. These species are included in the *New York State Prohibited and Regulated Invasive Plants* (NYSDEC, 2014) and below, as follows:

- Autumn olive (*Elaeagnus umbellate*)
- Canada thistle (*Cirsium arvense*)
- Chinese privet (*Ligustrum sinense*)
- Common buckthorn (*Rhamnus cathartica*)
- Common reed (*Phragmites australis*)
- Garlic mustard (*Alliaria petiolata*)
- Japanese Knotweed (*Polygonum cuspidatum*)

- Japanese stiltgrass (*Microstegium vimineum*)
- Morrow honeysuckle (*Lonicera morrowii*)
- Multiflora rose (*Rosa multiflora*)
- Pale swallow-wort (Cynanchum rossicum)
- Purple loosestrife (*Lythrum salicaria*)

As part of the Application and in preparation for construction, an ISMCP was prepared to describe the survey methods used to identify invasive species populations currently present on-site (Appendix 22-7). This management plan also includes proposed control procedures of current and introduced invasive populations, including locating and identifying target species, establishing a removal protocol, inspecting construction materials (including fill) and equipment, cleaning equipment, and site restoration. The ISMCP also discusses in detail the monitoring methods which will take place during the construction phase of the Project. As part of the on-site monitoring effort, management guidelines will be established and strictly adhered to. This will be done in order to ensure that all Project workers are informed of the threat of spreading invasive species and be educated on the BMPs, which will be implemented during construction and restoration of the Project.

The Applicant anticipates that post-construction monitoring will occur over a five-year period, with monitoring events being conducted in years one, three, and five following the completion of construction and restoration. Should new occurrences of invasive species become established, the ISMCP contains a treatment plan to control the introduction and spread of invasive species. Due to invasive species outcompeting native species, invasive populations may naturally increase in distribution and density over time. However, the general goal for the ISMCP is to prevent an increase in invasive species population size or density as a direct or indirect result of the Project. Should the ISMCP fail due to an unforeseen circumstance, a revised management plan will be written with new guidelines and/or protocols in order to create an adaptable and responsive management framework.

22(r) Temporary and Permanent Impacts on Agricultural Resources

According to Table 22-1, agricultural crops are the dominant land cover type at the Project Area with 675 acres (63.2 percent of the Project Area). Agricultural land at the Project Area is within a NYS-Certified Agricultural District – Seneca County District 6. A more detailed discussion on the agricultural use of the Project Area can be found in Exhibit 4. A map depicting areas of prime

farmland, prime farmland if drained, and farmland of statewide importance can be found in Exhibit 4 and Exhibit 21.

As mentioned in Section 22(b)(1), temporary impacts to agricultural land will occur primarily from burying an underground collection line and clearing vegetation. Impacts in agricultural land for the economic life of the Project include siting the solar arrays, collection substation, and switchyard and associated fencing and access roads. A total of approximately 372.49 acres of agricultural land will be employed for nonagricultural use due to the siting of Project components during the useful economic life of the project (30+ years).

The NYSDAM has issued *Guidelines for Solar Energy Projects – Construction Mitigation for Agricultural Lands* dated October 18, 2019. In order to minimize and/or mitigate impacts to agricultural resources, Project construction and operation will comply with these guidelines to the maximum extent practicable. If these guidelines cannot be met, then the Applicant with consult with the NYSDAM to discuss acceptable alternatives. Documentation of the Project's consistency with these guidelines is included in Exhibit 21 at Section 21(u).

References

Anderson, M. G. and Bernstein S. L. eds. 2003. *Planning methods for ecoregional targets: Matrixforming ecosystems.* The Nature Conservancy (TNC), Conservation Science Support, Northeast & Caribbean Division, Boston, MA.

Blaustein, A. R. 1994. *Chicken Little or Nero's fiddle? A perspective on declining amphibian populations*. Herpetologica. Volume 50(1): pages 85-97.

Blaustein, A. R. and Bancroft, B. A. 2007. *Amphibian population declines: evolutionary considerations*. BioScience. Volume 57: pages 437-444.

Bollinger, E. K. and Gavin, T. A. 1992. *Eastern Bobolink populations: ecology and conservation in an agricultural landscape*. Pages 497-506 in J. M. Hagan, III and D. W. Johnston, editors. Ecology and conservation of Neotropical migrant landbirds. Smithsonian Institute Press, Washington, D.C.

Browne, S. et al. 1995. *New York State Freshwater Wetlands Delineation Manual*. New York State Department of Environmental Conservation, Division of Fish and Wildlife, Bureau of Habitat, Albany, NY.

Briggs, S. A. 1992. *Basic Guide to Pesticides: Their Characteristics and Hazards*. Washington, DC: Taylor & Francis.

Bryce, S. A., United States Environmental Protection Agency and United States Natural Resources Conservation Service (NRCS). 2010.Ecoregions of New York: New York State. Reston, Va: Interior--Geological Survey; Denver: for sale by U.S. Geological Survey. [Map] Retrieved from the Library of Congress, https://www.loc.gov/item/2011587021/.

DeVault, T. L. et al. 2014. *Bird use of solar photovoltaic installations at US airports: Implication for aviation safety.* Landscape and Urban Planning. Volume 122: pages 122-128.

Edinger, G. J. et al. eds. 2014. *Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State*. New York Natural Heritage Program, New York State Department of Environmental Conservation.

Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1. U.S. Army Corps of Engineers: Waterways Experiment Station; Vicksburg, MS.

Federal Geographic Data Committee (FGDC). 2013. *The Classification of Wetlands and Deepwater Habitats of the United States.* FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, FGDC and United States Fish and Wildlife Service (USFWS), Washington, DC.

Lovich, J.E. and Ennen, J.R. 2011. *Wildlife Conservation and Solar Energy Development in the Desert Southwest, United States*. Bioscience. Volume 61: pages 982-992.

Keddy, P. A. 2010. *Wetland Ecology: Principles and Conservation*. Cambridge University Press.

McCrary, Michael D., R. L. McKernan, R. W. Schreiber, W. D. Wagner, and T. C. Sciarrotta. 1986. *Avian Mortality at a Solar Energy Power Plant.* Journal of Field Ornithology. Volume 57(2): pages 135-141.

McGowan, K. J. and Corwin, K. J. 2008. *The Second Atlas of Breeding Birds in New York State.* Cornell University Press, Ithaca, NY.

Montag, H., G Parker and T. Clarkson. 2016. *The Effects of Solar Farms on Local Biodiversity; A Comparative Study*. Clarkson and Woods and Wychwood Biodiversity.

Morgan, M. and Burger, M. 2008. *A plan for conserving grassland birds in New York: Final report to the New York State Department of Environmental Conservation under contract # C005137*. New York Audubon.

Natural Resources Conservation Service. 2007. *Early Successional Habitat.* Fish and Wildlife Habitat Management Leaflet Number 41.

National Audubon Society. 2017. *Why Solar Power is Good for Birds*. https://www.audubon.org/news/why-solar-power-good-birds. Accessed August 26, 2019.

New York State Board on Electric Generation Siting and the Environment (Siting Board). *Order Adopting Emergency Rule as a Final Rule*. Presented at a session of the New York State Board on Electric Generation Siting and the Environment held in the City of Albany on May 6, 2020.

New York State Department of Agriculture and Markets (NYSDAM). 2018. *Guidelines for Agricultural Mitigation for Solar Energy Projects*.

New York State Department of Environmental Conservation (NYSDEC). 2019. *Furbearer Pelt Sealing Summary*. https://www.dec.ny.gov/docs/wildlife_pdf/furbearerpeltseal18.pdf. Accessed August 28, 2019.

NYSDEC. 2014. *New York State Prohibited and Regulated Invasive Plants*. New York State Department of Environmental Conservation, Cornell University.

NYSDEC. 2015a. *DRAFT Grassland Breeding Bird Survey Protocol*. (work in progress)

NYSDEC. 2015b. *DRAFT Project Applicant Survey Protocol for State listed Wintering Grassland Raptor Species*. (work in progress)

NYSDEC. 2018a. *White-tailed Deer Harvest Summary*. https://www.dec.ny.gov/docs/wildlife_pdf/2018deerrpt.pdf. Accessed August 28, 2019.

NYSDEC. 2018b. *Black Bear Harvest Summary.* https://www.dec.ny.gov/docs/wildlife_pdf/bbrpt2018.pdf. Accessed August 28, 2019.

NYSDEC. 2005. *Comprehensive Wildlife Conservation Strategy*. http://www.dec.ny.gov/docs/wildlife_pdf/cwcs2005.pdf. Accessed July 2, 2020.

Pardieck K. L. et al. 2015. *North American Breeding Bird Survey Dataset 1966–2014, version 2014.0*. U.S. Geological Survey, Patuxent Wildlife Research Center.https://www.pwrc.usgs.gov/bbs/rawdata/. Accessed on July 19, 2019.

Petranka, J.W., 1998. *Salamanders of the United States and Canada*. Smithsonian Institute Press, Washington, DC.

Sánchez-Zapata J.A. et al. 2016. *Effects of Renewable Energy Production and Infrastructure on Wildlife*. In: Mateo R., Arroyo B., Garcia J. (eds) Current Trends in Wildlife Research. Wildlife Research Monographs, vol 1. Springer, Cham

Tatum, V. L. 2004. *Toxicity, transport, and fate of forest herbicides*. Wildlife Society Bulletin. Volume 32(4): pages 1042-1048.

United States Army Corps of Engineers (USACE). 1995. *The Highway Methodology Workbook Supplement. Wetland functions and Values: A Descriptive Approach.* U.S. Army Corps of Engineers, New England Division. NENEP-360-1-30a. 32 pp.

USACE. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0).* U.S. Army Engineer Research and Development Center, Vicksburg, MS, 162 pp.

USDA NRCS. 2018. *Field Indicators of Hydric Soils in the United States, Version 8.2*. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

USDA Northern Research Station (NRS). 2012. *New York's Forests 2007*. U.S. Forest Service, 11 Campus Blvd. Suite 200, Publications Distribution, New Town Square, PA, 19073-3294.

USFWS. n.d. *Environmental Conservation Online System*. https://ecos.fws.gov/ecp/. Accessed on July 18, 2019.

USFWS. 2008. Section 7 Technical Assistance: Summary of Indiana Bat Ecology. https://www.fws.gov/midwest/endangered/section7/s7process/mammals/inba/INBAEcologySummary.html. Accessed on January 28, 2020.

USFWS. 2015. Northern Long-Eared Bat (*Myotis septentrionalis*). https://www.fws.gov/midwest/Endangered/mammals/nleb/pdf/NLEBFactSheet01April2015.pdf. Accessed January 2020.

Walston Jr, Leroy J., K. E. Rollins, K. E. LaGory, K. P. Smith, and S. A. Meyers. 2016. *A Preliminary Assessment of Avian Mortality at Utility-Scale Solar Energy Facilities in The United States.* Renewable Energy. Volume (92): pages 405-414.

Walston, L. J., S. K. Mishra, H. M. Hartmann, I. Hlohowskyj, J. McCall, and J. Macknick. 2018. *Examining the potential for agricultural benefits from pollinator habitat at solar facilities in the United States*. Environmental science & technology, *52*(13): 7566-7576.

Weldy, Troy, David Werier, and Andrew Nelson. 2019. *New York Flora Atlas*. [S. M. Landry and K. N. Campbell (original application development), University of South Florida Water Institute. University of South Florida. New York Flora Association, Albany, New York.