



EXCELSIOR ENERGY CENTER

Case No. 19-F-0299

1001.22 Exhibit 22

Terrestrial Ecology and Wetlands

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Exhibit 22: Terrestrial Ecology and Wetlands

This Exhibit will track the requirements of Stipulation 22, dated June 6, 2020, and therefore, the requirements of 16 New York Codes, Rules and Regulations (NYCRR) § 1001.22. The 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 and permanent impacts to the representative plant communities within the Project Area, and the use of vegetated communities for the placement of Project Components are not expected to result in the significant loss or extirpation of any representative plant community (see Section 22(b)). Further, no take of listed species will occur due to Project development (see Section 22(f)). Of the entire 3,443-acre Project Area, approximately 47.3 acres of wildlife habitat will be permanently lost due to the placement of Project components. This represents only 1.4% of the total Project Area. Moreover, 46.0 of the 47.3 acres (97.3%) of wildlife habitat permanently lost reside in active agricultural areas, which already provide limited perpetual wildlife habitat due to the regular disturbances and anthropogenic pressures of active farming practices (see Section 22(f)(4)). Additionally, through careful siting of Project components, there are no impacts to wetlands proposed within the Project Area (see Section 22(m)).

In addition to Project and Study Area studies, the Applicant conducted a Cumulative Impact Analysis to evaluate potential impacts on federally and state-listed threatened or endangered grassland birds resulting from the Project and from proposed and operating solar energy projects greater than or equal to 5 megawatts (MW), based, in part, upon data provided by the New York State Department of Environmental Conservation (NYSDEC), occupying grassland habitat within 100 miles of the Project Area in the State of New York (Appendix 22-4). The results of this analysis determined that the use of grassland habitat types to solar development is not anticipated to have population-level impacts from the Project, or cumulatively, from the 107 Study Projects identified. Additionally, only approximately 1.1% of available grassland habitat within the 100-mile study radius has the potential to be impacted cumulatively by all of the projects studied (see Section 22(f)(11) and Appendix 22-4). This analysis represents an extremely conservative approach that overestimates impacts due to the lack of information for each of the Study Projects reviewed and the low probability that many of these projects will ultimately be developed.

As noted in Exhibit 2, the Project proposes to install solar panel modules with tracker racking systems. As the technology is rapidly evolving for solar panel technology, and market conditions at the time procurement decisions will be made are currently unknown, the Applicant is proposing

in this Application to evaluate both tracking and fixed racking systems, with the final decision to be made and detailed in the Compliance Filing. The tracking and/or fixed array racking systems to be utilized would be similar to the Gamechange Solar Genius Tracker™ and the Gamechange Maxspan™ Pile Driven System, respectively. Regardless of the type of array racking system ultimately selected for the Project, the Applicant intends to utilize a solar module similar to the Jinko Solar Eagle 72HM G2 380-400 Watt Mono Perc Diamond Cell. Only selected elements of the Project would change based upon the combination of array racking system types 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 on the Exhibit 11 plans. Land coverage ratios will also be adjusted but they are not expected to be substantial or significant. Again, land uses are the same in all locations. Accordingly, no significant adverse environmental impacts will result from choosing one system over the other.

22(a) Plant Communities

The Project Area is within the Eastern Great Lakes Lowlands ecological region (ecoregion), as shown on the U.S. Geological Survey (USGS) ecoregion map (USGS et al., 2010). This ecoregion, which is assigned the map unit “83,” 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 (USGS et al., 2010).

More specifically, the Project Area is within the NYSDEC’s Ontario Lowlands ecoregion (map unit 83c). This ecoregion separates the Erie/Ontario Lake Plain (83a) to the north from the Northern Allegheny Plateau (map units 60f and 60d) to the south. The Ontario Lowlands are underlain by limestone and calcareous shale that is generally deep and finely textured. Ontario Lowlands soils are loamy, moist Alfisols derived from glacial till that support dairy and livestock farming, and suitable for growing fruit, vegetables, and other specialty crops. The Ontario Lowlands are defined by the extent of the Glacial Lake Iroquois and the region is greatly influenced by the proximity to Lake Ontario (USGS et al., 2010).

The Project Area encompasses approximately 3,443 acres and is composed predominately of agricultural land, forest lots, and successional old fields and successional shrublands. Agricultural areas include the following crops: corn, hay, cabbage, onions, and soybeans. For more information regarding agricultural land use in the Project Area, please refer to Section 4(a) Existing Land Use in Exhibit 4. Land cover in the Project Area was determined using the National Land Cover Data (NLCD), aerial photography, and on-site observations. The determined acreage of each land cover type within the Project Area is listed in Table 22-1 below.

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

Cover Type	Acreage	Percent in Project Area
Active Agriculture		
Row Crops (corn, soy)	2,411.9	70.1
Fields crops (hay, alfalfa)	486.5	14.1
Disturbed Developed	74.7	2.2
Forestland	206.6	6.0
Open Water	6.0	0.2
Successional Old Field	50.5	1.5
Grassland	1.4	<0.1
Successional Shrubland	28.7	0.8
Wetlands	176.4	5.1
Total	3,442.8	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 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 approximate location of each community type within the Project Area and in the 500 feet beyond the Project Area boundary shown on Figure 22-1 and Figure 22-2, respectively. The approximate extent and locations of the identified plant communities are depicted on Figure 22-1. 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 the New York State Department of Public Service (NYS DPS), NYSDEC, and New York State Department of Agriculture and Markets (NYS DAM). Plant community mapping was completed in conjunction with wetland delineation efforts between May 28, 2019, and June 6, 2019. Several invasive plant species were observed during the plant community mapping effort (Figure 22-1) and are further described in Section 22(p). The Applicant has provided an Invasive Species Management and Control Plan (ISMCP) as Appendix 22-8. No wild parsnip (*Pastinaca sativa*) or giant hogweed (*Heracleum mantegazzianum*) were documented on site.

Ecological Communities within the Project Area

The ecological communities that were identified in the Project Area include those listed below and are further described in this section:

- Agricultural Land,
- Forestland,
- Developed Land,
- Successional Old Fields,
- Wetlands,
- Successional Shrubland, and
- Open Water.

Agricultural Land

Active agricultural land covers approximately 2,898.4 acres or 84.2% of the Project Area and is predominantly comprised of hay fields and cultivated crops (e.g., corn, soy). Approximately 1,521.7 acres of agricultural land will be used for Project components and then restored following the decommissioning of the Project. In *Ecological Communities of New York*, there are two types of terrestrial cultural communities within the agricultural land designation, including cropland/row crops (Heritage Rank: unranked cultural) and cropland/field crops (Heritage Rank: unranked cultural) (Edinger et al., 2014). Row crops established within the Project Area include corn (*Zea mays*) and soybean (*Glycine max*), which are utilized as feedstock, livestock feed, or for human consumption. Hay fields are also scattered throughout the Project Area and are predominately utilized as green chop. Dominant plants observed in hayfields and pasture in the Project Area were orchard grass (*Dactylis glomerata*), red clover (*Trifolium pratense*), and timothygrass

(*Phleum pratense*). Several fields of row crop were documented during the on-site investigation from May 28 through May 29, 2019. Crops present during the 2019 season included hayfields consisting of timothy grass, orchard grass, and red clover, corn, and soybean. Additionally, other row crops included alfalfa, onions, and cabbage, observed during grassland breeding bird surveys and site visits conducted throughout the summer and fall of 2019.

Forestland

Forested land covers approximately 206.6 acres (6.0%) 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, usually with an acidic content. This forest is described as a northern hardwood forest with sugar maple (*Acer saccharum*) and American beech (*Fagus grandifolia*), both occurring codominant with each other. Common associates occurring in the community to a lesser extent are white ash (*Fraxinus americana*), hophornbeam (*Ostrya virginiana*), and red maple (*Acer rubrum*). The shrub layer of this forest includes saplings of the aforementioned tree species as well as American hornbeam (*Carpinus caroliniana*), and witch hazel (*Hamamelis virginiana*). Saplings of sugar maple and American beech scatter the ground layer as well as various wood ferns (*Dryopteris* spp.). Several species characteristic of beech-maple mesic forest were observed during on-site investigations between May 28 and May 30, 2019, including sugar maple, American beech, white ash, hophornbeam, red maple, American hornbeam, and witch hazel, as well as various species of wood fern.

Maple-basswood rich mesic forest (Heritage Rank: G4 S3 [Apparently secure globally; vulnerable in New York]) – Maple-basswood rich mesic forests occur on well-drained soils and have a diversity of rich overstory and understory plants that are usually correlated with calcareous or possibly circumneutral bedrock. There is an abundance of American basswood (*Tilia americana*) in association with sugar maple and white ash. Common herb species within this community include various wood ferns and sedges (*Carex* spp.). These communities were documented during on-site investigations on May 30, 2019 and species observed included the dominant species listed above.

Successional southern hardwoods (Heritage Rank: G5 S5 [Demonstrably secure globally and in NYS]) – Successional southern hardwoods are one of the most common communities throughout the Project Area. Most of the Project Areas was likely forested and have been cleared for agriculture prior to TRC field surveys. 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 American elm (*Ulmus americana*), white ash, red maple, box elder (*Acer negundo*), silver maple (*Acer saccharinum*), hawthorns (*Crataegus* spp.), and choke-cherrys (*Prunus virginiana*). Certain introduced species are commonly found in successional forests, including black locust (*Robinia pseudoacacia*) and buckthorn (*Rhamnus cathartica*). Species characteristic of these communities were documented during on-site investigations from May 29 through June 6, 2019.

Developed Land

Developed land covers approximately 74.7 acres (2.2%) 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 plant species flourish in a community that generally characterizes old-field appearances and functions. Non-native species such as Canada thistle (*Cirsium arvense*), multiflora rose (*Rosa multiflora*), common buckthorn, Japanese honeysuckle (*Lonicera japonica*), and various upland grasses (*Poa* spp.) generally populate these developed areas and were documented within the Project Area during on-site investigations from May 29 through June 6, 2019.

Successional Old Field

Successional old fields (Heritage Rank: G5 S5) are relatively uncommon within the Project Area and cover approximately 51.9 acres (1.5%). This community is defined as a meadow dominated by forbs and grasses that occur on sites that have been cleared or plowed due to 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 found within the Project Area include many goldenrods (*Solidago* spp.), timothy grass (*Phleum pratense*), Virginia strawberry (*Fragaria virginiana*), common dandelion (*Taraxacum officinale*), in addition to spreading dogbane (*Apocynum androsaemifolium*) and various asters (*Symphotrichum* spp.). Shrubs can be present within successional old-field communities but represent less than 50% of the community. Common shrubs found in this community are honeysuckles (*Lonicera* spp.), various dogwoods (*Cornus* spp.), and small willows (*Salix* spp.). Species characteristic of these communities were observed during on-site investigations from May 28 through May 31, 2019. If not maintained by infrequent mowing, this relatively short-lived community succeeds to a successional shrubland, woodland, or forest community.

Wetlands

Wetlands represent 176.4 acres (5.1%) of the Project Area. Specific wetland communities within the Project Area include common reed marsh (Heritage Rank: unranked cultural), deep emergent marshes (Heritage Rank: G5 S5), floodplain forest (Heritage Rank: G3G4 S2S3), northern white cedar swamp (Heritage Rank: G4 S2S3), shrub swamps (Heritage Rank: G5 S5), shallow emergent marshes (Heritage Rank: G5 S5), shrub swamps (Heritage Rank: G5 S5), and red maple hardwood swamps (Heritage Rank: G5 S4S5). Wetland delineations were conducted on site from May 28 through June 6, 2019. A more detailed characterization of the wetland communities and vernal pools can be found in Section 22(j) and Section 22(k)(1), respectively. 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.

Successional Shrubland

Successional shrubland (Heritage Rank: G5 S5) covers approximately 28.7 acres (0.9%) 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 due to natural events.

This community is defined by at least a 50% cover 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 grey dogwood (*Cornus racemosa*), multiflora rose (*Rosa multiflora*), black elderberry (*Sambucus nigra*), choke cherry, silky dogwood (*Cornus alba*), common buckthorn, various shrubs, various willows, and various honeysuckles. Herbaceous species are very diverse in this community but typically represent less than 50% of total vegetative cover. Within the Project Area, common herbaceous plants within this community are goldenrods (*Solidago* spp.), common dandelion, and various bedstraws (*Galium* spp.). Species characteristic of this community were observed during on-site investigations from May 28 through May 31, 2019.

Open Water

Open water communities are somewhat sparse within the Project Area covering approximately 6.0 acres (0.2%) 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 only farm ponds/artificial ponds (Heritage Rank: unranked cultural). Specific riverine systems (i.e., relating to confined waterbodies) in the Project Area include confined rivers (Heritage Rank: G4 S3S4), ditch/artificial intermittent streams (Heritage Rank: unranked cultural), intermittent streams (Heritage Rank: G4 S4), and unconfined rivers (Heritage Rank: G4 S3S4). Open water communities in the Project Area typically did not have associated aquatic vegetation. However, emergent wetland vegetation often grows along the periphery of these communities. Typical emergent wetland species associated with open water communities within the Project Area include reed canary grass (*Phalaris arundinacea*), rice cut grass (*Leersia oryzoides*), narrowleaf cattail (*Typha angustifolia*), broadleaf cattail (*Typha latifolia*), various rush (*Juncus* spp.), and field horsetail (*Equisetum arvense*). Species characteristic of these communities were observed during on-site investigations from May 28 through June 6, 2019.

22(b) Impacts to Plant Communities

(1) Proposed Temporary and Permanent Impacts

The Project footprint is approximately 1,716.7 acres, which represents approximately 49.9% of the Project Area and includes all areas within the Limit of Disturbance (LOD) and fence line, as well as areas proposed for access roads and tree clearing to prevent shading. Approximately 5.4 acres within the footprint are located within the fence line but are not proposed for Project development. Impacts to ecological communities and associated plant communities will occur through vegetation clearing necessary for safe Project-related construction 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. Impacts to Vegetation by Project Component Type

Project Components	Vegetative Clearing Area (acres)	Soil Disturbance Area (acres)	Area of Permanent Impact (acres)
Access Roads	-	-	41.9
Energy Storage	-	-	0.5
Collection Lines	-	21.7	-
Culverts	-	-	0.1
Drainage/Filtration Basins	-	-	1.3
Drainage Tiles	-	-	<0.1
Fenced Area	827.4	-	-
Fence Line	4.4	-	-
Grading	128.3	-	-
Horizontal Directional Drilling (HDD) Borepits	-	0.2	-
Inverters	-	-	0.3
Laydown Yards	-	16.2	-

Table 22-2. Impacts to Vegetation by Project Component Type

Project Components	Vegetative Clearing Area (acres)	Soil Disturbance Area (acres)	Area of Permanent Impact (acres)
LOD ¹	-	65.1	-
Parking Areas	-	3.5	-
Rip Rap	-	-	0.2
Solar Arrays	588.7	-	-
Solar Support Posts	-	-	1.9
Substation/Switchyard	-	-	3.0
Tree Clearing ²	16.5	-	-
Grand Total	1,560.8	106.7	49.1

¹ LOD – Limit of Disturbance

² Additional tree clearing to prevent shading of panels will occur on approximately 11.5 acres.

Installation of solar panels will require approximately 588.7 acres of vegetation to be cleared and will result in soil disturbance on 1.9 acres (the physical disturbance required to install the solar array racking system’s supporting posts). 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, energy storage systems, 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.

Efforts have been taken during Project layout design to co-locate various components (e.g., electric collection lines and access road). The potential impacts identified account for co-location and report the maximum area to be impacted for placement of overlapping components. As such, calculations were completed in a conservative manner, and therefore, likely overstate the potential impacts.

Construction of the Project will result in a total temporary disturbance of approximately 1,560.8 acres of vegetation to be converted and will result in soil disturbance on 106.7 acres (where clearing and grubbing are required) resulting from proposed components.

Impacts to Agricultural Lands

Agricultural areas with pre-existing communities (e.g., row crops, field crops) will be temporarily impacted by the installation of the solar arrays and energy storage systems, as a similar grassland community will be planted below the arrays following completion of construction. Temporary impacts to agricultural land will occur from the siting of 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. The topsoil will then be replaced upon completion of the construction phase of the Project. Agricultural areas underneath and in the immediate vicinity of the solar panels will be maintained as native grasses and forbs that require periodic mowing.

Agricultural areas containing row crop will be employed for the placement of solar arrays for the useful life of the Project. Areas beneath and between panels will be seeded with native grasses and forbs. Agricultural land that is used for Project Components will be restored to substantially its pre-existing condition. Agricultural activities can then be resumed following decommissioning of the Project should the landowner so choose. A total of approximately 1,664.6 acres of agricultural land will be employed within the LOD for the useful life of the Project.

Impacts to Forest Areas

Forest represents approximately 206.6 percent (6%) of land cover within the Project Area. Minimal clearing of forested cover types within the Project Area is required to prevent shading and safety hazards around Project Components. Permanent impacts occur where forestland will be directly replaced with Project Components and will require only 0.4 acres, resulting in a minimal reduction of 0.2% of forested habitat available within the overall Project Area. Riparian areas and large, contiguous forest blocks are retained where they occur.

There will be 1.0 acre of temporary impacts to forests within the Project Area. Impacts to forest will occur within the Project Area where forests are initially cleared for the placement of Project Components. These areas will be maintained as successional old-field or shrubland communities for the life of the Project, due to clearance constraints. Forest clearing is anticipated to occur on approximately 22.7 acres of forestland, less than 10% of forest in the Project Area. The Applicant plans to remove stumps of forest species only where the placement of components is intended to occur or where required by landowner agreements.

Total forest clearing will reduce the total forested area within the Project by less than 10% and will not result in the removal of entire forest blocks. A Tree Clearing Plan is presented in Appendix 11-1 and shows that 44.5% of forest clearing will involve the removal of small fragments along forest edges, primarily to prevent shading near panel arrays (10.14 acres). An additional 41.9% of proposed tree clearing will be the removal of individual trees in the panel array area. These activities will not significantly reduce the amount of forest, which is limited within the Project Area, nor will clearing meaningfully alter the character or structure of existing forest habitats. Much of the LOD is focused on developing existing cleared areas and forest fragmentation has been minimized to the maximum extent practical, including the avoidance of development in key patches of forested habitat, as discussed in Exhibit 9. The Project also incorporated a wildlife corridor to establish connectivity between existing forested patches. Forest within the Project Area is characterized by small, isolated patches with limited connectivity to other forested areas.

Approximately 204.8 acres of forest (99%) is considered peripheral forest area, defined as forest within 300 feet of the forest edge. The amount and extent of tree clearing is so minimal that the area of interior forest will not be reduced. Presently, forest patches within the Project Area are small and isolated in the surrounding agricultural matrix, providing sub-optimal habitat for edge-sensitive species, and given the landscape context of the Project (i.e., primarily agricultural) it is unlikely that edge-sensitive species are presently using the forested areas therein. The creation of peripheral forest in this landscape is not likely to result in additional edge effects that may 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 their behaviors. For more information on habitat fragmentation and edge effects caused by the Project, please refer to the subheading *Impacts to Wildlife and Wildlife Habitat*, within Section 22(f) of this Exhibit.

Impacts to Other Communities

Construction of the Project will result in the temporary disturbance of approximately 0.7 acres of successional shrubland communities, 0.4 acres of successional old-field communities, and 6.1 acres of developed land communities. Temporary impacts will occur from the initial clearing and disturbance of these cover types for purposes of construction access, laydown areas, and the burying of underground collection lines. Once the Project becomes operational, these areas will return to their preexisting condition. Permanent loss will occur to approximately <0.1 acre of successional shrubland communities, 0.2 acres of successional old fields, and 0.6 acres of

developed land communities. Permanent loss of these cover types will occur from the siting of permanent Project Components.

Approximately 0.7 acres of open-water vegetation communities within the Project Area will be used for Project Components for the useful life of the Project. A description of impacts to all surface waters within the Project Area is included in Exhibit 23.

Impacts to Plant Communities

Temporary, and permanent impacts to the representative plant communities within the Project Area and the use of vegetated areas for placement of Project Components are not expected to result in the significant loss or extirpation of any representative plant community. Temporary and permanent impact acreages, as well as acres used by Project Components for each representative community in the Project Area are provided in Table 22-3 below. 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 areas of vegetated communities employed for the placement of Project Components over the useful life of the Project. While these areas may be restored following construction, they may 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.

Table 22-3. Impacts to Plant Communities

Cover Type/Habitat	Temporary Impact (Acres)	Permanent Loss (Acres)	Use by Project Components (Acres)
Agricultural Land	98.4	46.0	1,521.7
Developed Land	6.1	0.6	4.5
Forestland	1.0	0.4	22.7
Open Water	<0.1	0.0	0.7
Successional Old Field	0.4	0.2	7.4
Successional Shrubland	0.7	0.0	5.6
Grand Total	106.7	47.2	1,562.7

(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 28.0 acres. As part of the Application, and in preparation for construction, an 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 22-8.

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 listed 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 composed 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. See Appendix 11-2 for a detailed Landscaping Plan of the Project Area. Exhibit 5 provides additional information on proposed vegetation management practices. 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 to preserve the existing character of plant communities to the maximum extent practicable. Specifically, Project components have largely been sited within existing agricultural fields that already provide limited benefit to wildlife. The Applicant evaluated alternative designs in an 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, shrublands, and young successional forests. As a result, impacts to these landscape features (and vegetation communities) will be marginal. Project Components were sited in order to confine disturbances to the smallest area possible. Work areas have been sited within 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 and energy storage systems have been proposed in areas already disturbed by agricultural operations to the maximum extent practicable. 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, and mitigation of impacts to vegetative communities, where applicable, will also occur by complying with guidance from the on-site Environmental Monitor (EM), maintaining clean work sites, implementing BMPs during construction, operation, and maintenance, and by demarcating and avoiding areas that are highly susceptible to adverse 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 22-8) to prevent the introduction or spreading 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

Following the construction phase of the Project, temporarily disturbed areas will be restored. 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 composed of grasses that are native or indigenous 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. The post construction vegetation plan will be implemented following the construction of the Project. Species found to be beneficial to pollinators and native woody species used to recreate or enhance wildlife habitat will be considered for use to the maximum extent practical. See Appendix 11-2 for a detailed Landscaping Plan of the Project Area.

(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 below.

Table 22-4. Summary Impact Table

Project Components	Agricultural Land			Successional Old Field			Successional Shrubland			Forestland		
	Temporary Impacts (acres)	Permanent Loss (acres)	Used for Project Components (acres)	Temporary Impacts (acres)	Permanent Loss (acres)	Used for Project Components (acres)	Temporary Impacts (acres)	Permanent Loss (acres)	Used for Project Components (acres)	Temporary Impacts (acres)	Permanent Loss (acres)	Used for Project Components (acres)
Access Roads	-	40.7	-	-	0.2	<0.1	-	<0.1	<0.1	-	0.4	0.1
Collection Lines	19.3	-	-	0.1	-	-	0.2	-	-	0.3	-	-
Collection Substation/Switchyard/ Inverters	-	3.0	0.4	-	<0.1	<0.1	-	-	-	-	-	-
Culverts	-	0.1	-	-	-	-	-	-	-	-	<0.1	-
Energy Storage System	-	0.5	0.2	-	-	-	-	-	-	-	-	-
Drainage Basins/Tiles	-	1.3	0.4	-	-	-	-	-	-	-	<0.1	<0.1
Fenced Area	-	-	822.1	-	-	3.3	-	-	1.7	-	-	2.9
HDD	0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-
Riprap	-	0.2	-	-	-	-	-	-	-	-	<0.1	-
Solar Arrays and Posts	-	1.9	690.9	-	-	4.0	-	-	4.0	-	-	19.7
Staging/Parking/Laydown Area	19.2	-	-	-	-	-	-	-	-	<0.1	-	-
Other Components in LOD	59.8	-	-	0.3	-	-	0.5	-	-	0.6	-	-

Note: The values in this table reflect the co-location of components.

Additional forestland clearing will occur outside Project Components, to prevent shading. Approximately 28.0 acres of forestland, will be cleared to prevent shading.

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

The Applicant commissioned TRC to document specific plant species and general plant communities during the spring of 2019 and 2020. TRC referenced nomenclature and community descriptions provided in both 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 can be found in Section 22(a) of this Exhibit. Wetlands are addressed separately in Sections 22(i) through 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, and
- 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

Through reference to online resources associated with the United States Fish and Wildlife Service (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), there are no known significant natural communities or habitats of special concern located within the Project Area. However, the NYSDEC Mapper does identify Marl Fen (a strongly minerotrophic wetland in which the substrate is a marl bed derived from either lacustrine marl deposits or actively accumulating marl that is exposed at the ground surface [NYNHP, 2020]) located in the Bergen Swamp (also referred to as the Byron-Bergen Swamp), which is located approximately 0.4 miles northwest of the Project Area. The NYSDEC Mapper does have a 0.5-mile buffer layer around this natural community. A small portion, in the northeastern portion of the Project Area, is within this 0.5-mile buffer area. There are no U.S. National Wilderness Areas or USFWS-Critical Habitat within the Project Area.

As such, the Applicant does not anticipate impacts to any federal or state-listed significant natural community, habitat of special concern, U.S. National Wilderness Area, or USFWS-Critical Wildlife Habitat. On-site survey work conducted by TRC biologists located a single occurrence of a Northern White Cedar Swamp wetland within the Project Area. The Northern White Cedar Swamp community is rare in the vicinity of the Project Area, but not unusual in the regional context; a large Northern White Cedar Swamp occurs within the Bergen Swamp complex which is located 0.4 miles directly northeast of the Project Area. This area is identified by the NYNHP as having the Heritage conservation status of “High-quality Occurrence of Rare Community Type”. The Project will not result in impacts to this community or the Bergen Swamp complex.

(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 (see Appendix 22-6) and other relevant survey information as noted in this exhibit. The BBS, Winter Raptor Surveys, and Wetland and Stream Delineation Report have been submitted to the NYSDEC concurrent with submittal of this Application.

(3) Wildlife Surveys

Avian

On-site observations, field surveys, and inquiries into existing data sources were conducted to create a complete list of bird species known or with potential to occur in the Project Area. Sources of publicly available information are listed below along with general discussions of the databases queried.

Grassland BBS

A preconstruction monitoring survey of grassland bird species was required by the NYSDEC and was conducted during the 2019 breeding season (May through July) by TRC biologists. 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 during the grassland breeding bird surveys. No additional studies are recommended as the Project is not expected to adversely affect endangered or threatened grassland nesting species or their habitat.

State-listed threatened (T), endangered (E), or species of special concern (SC) targeted by breeding bird surveys 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*), and
- horned lark (*Eremophila alpestris*).

Methodology

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. After applying obstruction buffers and delineating exclusion areas where no Project Components will be installed, a total of 69 survey locations were established in areas of grassland habitat. Growing conditions were verified for the 2019 season and locations in fields identified as row crop agriculture were removed, resulting in a total of 60 locations available for survey. Additional locations were removed throughout the study as fields were converted to row crop. A total of 60 survey locations were established in areas of grassland habitat within the Project Area. Each survey point consisted of a 100-meter (m) radius plot centered on the observation point with a

minimum distance of 250 m between observation points. Surveys were conducted weekly at the Project Area between May 21 and July 19, 2019, with roughly half of all survey locations surveyed each week. A full description of the protocol for these surveys is provided in Appendix 22-2.

Results

A total of 120 point count surveys were conducted during the grassland breeding bird survey. Biologists recorded a total of 1,224 observations representing 61 species over the course of the breeding bird study. This included species and individual birds observed at the survey points, outside the 100-m radius circular plot, and birds observed during the meander surveys. During surveys, 533 individuals of 27 species were observed in grassland habitat, including four grassland bird species, bobolink, horned lark (SC), savannah sparrow, and vesper sparrow (SC). The species observed most often during point count surveys was the red-winged blackbird (*Agelaius phoeniceus*) (164 individuals), comprising 30.77% of all individual birds observed. Following the red-winged blackbird, the next most frequently observed species were: savannah sparrow (*Passerculus sandwichensis*), horned lark (*Eremophila alpestris*; SC), American goldfinch (*Spinus tristis*), and barn swallow (*Hirundo rustica*). Savannah sparrows were the most numerous grassland species observed (91 individuals observed at 35 survey points) 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.

Horned larks (SC) were observed at 33 of the 60 points in the Project Area, more locations than any other species observed. Observations were recorded on all dates when point count surveys were conducted; however, the majority of individuals were observed during the first 2 weeks of surveys (21 and 22 May, 29 and 30 May; n= 46 individuals). During regular surveys, 66 individuals were recorded, and an additional 20 observations were recorded incidentally outside the survey radius or in adjoining parcels. All observations of horned larks occurred in fields that had very sparse ground cover or were classified as row crop.

Vesper sparrow (SC) were detected at 2 of the 60 points in the Project Area. One individual was recorded at Point 7 on May 21, 2019, and one individual was recorded at Point 64 on June 26, 2019. Point 7, located in the northeastern corner of the Project Area, was removed from the Study following visit 1 due to conversion to row crop. This conversion may have caused the individual to relocate before nesting activity could occur. Point 64, located in the west-central portion of the Project Area, remained in the Study through visit 4 and was classified as old field. Point 64 was converted to row crop between visits 4 and 5.

Species of special concern 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.

No state-listed threatened or endangered species were observed to be present during these surveys.

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

Wintering Raptor Surveys

TRC conducted a preconstruction monitoring survey of wintering grassland raptors, as requested by the NYSDEC. 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*; E) and northern harrier (T). Northern harriers were observed on two occasions during stationary surveys on November 25, 2019 and February 17, 2020, and on four occasions during driving route surveys on November 19 and December 3, 2019.

Methodology

The survey methodology followed the *NYSDEC Draft Survey Protocol for State-listed Wintering Raptor Species* (NYSDEC, 2015b). A site-specific study plan was developed and submitted to the NYSDEC on November 13, 2019. Comments from the NYSDEC were reviewed, and the study plan revised and re-submitted. Surveys were conducted in the winter of 2019-2020, and were conducted between November 18, 2019, and March 31, 2020. 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. A total of 10 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 designed specifically to provide reference data from habitat located outside the Project Area. 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. 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 the area of proposed development.

Stationary surveys were conducted at each of the 10 stationary survey locations at least once every 2 weeks, with survey staff visiting the Project Area weekly.

Driving surveys took place every other week from November 18, 2019 through March 31, 2020.

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 2 weeks throughout the Study period. Short-duration surveys (approximately 5 minutes) 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.

A full description of the protocol used for stationary and driving surveys is provided in Appendix 22-3.

Results

A total of 92 stationary surveys were conducted for a total of 141.4 hours, and 210 driving route spot-count surveys were conducted for 25.1 total hours. During stationary surveys, 35 observations of four identified raptor species were recorded. During driving route surveys in the Project Area, 71 observations of five species, including two not observed during stationary surveys, were recorded. Red-tailed hawk (*Buteo jamaicensis*) was the most commonly observed raptor species, accounting for 80.0 and 64.8% of stationary and driving route survey observations respectively.

Two state-listed species, including the northern harrier (*Circus cyaneus*), a target species of the survey, and bald eagle (*Haliaeetus leucocephalus*), were documented during the study. One state-listed SC species, the Cooper's hawk (*Accipiter cooperii*), was also observed. No short-eared owl (target species) were observed during the study.

State-threatened northern harrier were observed on six occasions with four of the six observations recorded during November 2019. Individuals were observed from four locations distributed throughout the Project Area, and a total of 4 use minutes were recorded for the six individuals

observed. Flight paths and observation locations are provided in the Winter Raptor Survey Report (Appendix 22-3). Observations were of individuals flying over or through the Project Area, which indicates hunting or migratory behavior. No roost locations or indication of roosting behavior was documented from any individual observed. Observations included adult males, adult females, and juveniles.

A single observation of one adult bald eagle was observed outside the Project Area during driving surveys at EX-D6 on February 25, 2020, for 1 minute at 16:23. The individual was observed flapping while traveling south flying between 1 and 25 feet above the ground over parcels outside the Project Area. The location of observation and flight path are provided in Appendix 22-3.

One state-listed special concern species, Cooper's hawk (*Accipiter cooperii*), was observed for 51 minutes at 15:35 on November 25, 2019. The individual was seen perching, flying, and gliding within the Project Area. One Cooper's hawk was observed incidentally during driving surveys.

No additional listed species were observed. No nesting was documented for any species observed with a nesting period that overlaps the study period. No roosting behaviors or roost locations were identified within the Project Area. For a more detailed description of the wintering grassland raptor survey, including a list of incidental bird observations, please refer to Appendix 22-3.

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 that have the potential to occur within the Project Area. Consultation with the USFWS was conducted through the Information for Planning and Consultation (IPaC) system with the most recent updated species list obtained on July 22, 2020. The Official Species List provided indicated no known occurrence of federal-listed species within the vicinity of the Project Area (Appendix 22-9). Consultation with the NYNHP 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 May 29, 2019, indicating the NYNHP database does not have any records of hibernacula for listed bat species within 5 miles of the Project Area. Given the lack of evidence supporting the potential for listed bat species to occur within the Project Area, no further studies were necessary to establish presence or site use.

Terrestrial Invertebrates

The Project Area encompasses a variety of habitat types and, as such, a variety 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 population abundance. Terrestrial invertebrates common to Western New York (WNY) are presumed present within the Project Area.

Habitat Characterization

Active Agriculture

Active agriculture provides marginal habitat for most species which may utilize the rest of the Project Area due to the increased anthropogenic 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. Characteristic birds of active agriculture include:

- brown-headed cowbird (*Molothrus ater*), first observed on May 22, 2019;
- horned lark, first observed on May 21, 2019; and
- red-winged blackbird, first observed on May 21, 2019.

All were observed during field surveys conducted by TRC during the 2019 breeding season (refer to Appendix 22-2). Additionally, various mammals may eat 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. The primary agricultural row crops in the Project Area are corn and soybean. Alfalfa and non-alfalfa hay are found in the Project Area, as well as among other crops. Birds identified in pastures and hayfields at the Project Area are noted in the grassland breeding bird survey.

Forestland

Forest communities within the Project Area provide habitat for forest associated species; however, only those species that do not require large tracts of contiguous forest. Forest patches within the Project Area were previously fragmented due to conversion to agriculture and therefore, not consistent with forest habitat used by interior forest specialists. Forests contain many characteristics and components that can be utilized to the benefit of individual organisms. Some features include decreased anthropogenic disturbance levels, lower light levels, relatively protected nesting sites, increased shelter structure, dry shelter sites, concealment/camouflage, variable food sources, and even higher moisture levels. Representative mammals that have habitat requirements that overlap with conditions present in the forested habitat within the Project Area and vicinity based on ranges reported by the NYSDEC, ranges shown in the State Wildlife Action Plan, or species observed on site include the following:

- big brown bat (*Eptesicus fuscus*), not observed on site;
- coyote (*Canis latrans*), observed on site;
- eastern chipmunk (*Tamias striatus*), observed on site;
- eastern cottontail (*Sylvilagus floridanus*), observed on site;
- eastern gray squirrel (*Sciurus carolinensis*), observed on site;
- eastern pipistrelle (*Preimyotis subflavus*), not observed on site;
- eastern raccoon (*Procyon lotor lotor*), observed on site;
- eastern red bat (*Lasiurus borealis*), not observed on site;
- eastern small-footed bat (*Myotis leibii*), not observed on site;
- fisher (*Pekania pennanti*), not observed on site;
- gray fox (*Urocyon cinereoargenteus*), not observed on site;
- little brown bat (*Myotis lucifugus*), not observed on site;
- North American porcupine (*Erethizon dorsatum*), not observed on site;

- northern long-eared bat (*Myotis septentrionalis*), not observed on site;
- red fox (*Vulpes vulpes*), observed on site;
- striped skunk (*Mephitis mephitis*), not observed on site;
- various mice (*Mus spp.*);
- various moles (*Condylura spp.*, *Scalopus spp.*, *Parascalops spp.*);
- various shrews (*Blarina spp.*, *Cryptotis spp.*, *Sorex spp.*);
- Virginia opossum (*Didelphis virginiana*), observed on site;
- white-tailed deer (*Odocoileus virginianus*), observed on site; and
- woodchuck (*Marmota monax*), not observed on site.

Many of the species observed are adapted to increasingly fragmented habitats and are considered generalists, which may inhabit a wide range of habitat types, including the many agricultural, residential, and urban landscapes in the surrounding vicinity.

Bird species with potential to occur within the Project Area based on habitat requirements and distribution across NYS have been identified utilizing the USFWS online database (IPaC); USGS BBS; NYS BBA; Audubon CBC; eBird; and Kingbird publications. Additionally, bird species observed within the Project Area are noted in the grassland breeding bird survey and the wintering grassland raptor survey described in Section 22(d)(3) and in Appendix 22-2 and Appendix 22-3, respectively. Studies of avian resources conducted on-site did not include surveys of forested areas. A review of species with potential to occur in the vicinity of the Project Area identified several which are commonly observed in forested habitats (refer to Appendix 22-1).

Species which utilize forested habitat and were observed incidentally to surveys on the Project Area included:

- American crow (*Corvus brachyrhynchos*), first observed May 21, 2019;
- American redstart (*Setophaga ruticilla*), first observed May 29, 2019;
- blue jay (*Cyanocitta cristata*), first observed May 21, 2019;
- common raven (*Corvus corax*), first observed May 22, 2019;
- Cooper's hawk (*Accipiter cooperii*), first observed on November 29, 2019;
- eastern wood pewee (*Contopus virens*), first observed May 29, 2019;
- indigo bunting (*Passerina cyanea*), first observed May 21, 2019;
- northern cardinal (*Cardinalis cardinalis*), first observed May 21, 2019;
- red-bellied woodpecker (*Melanerpes carolinus*), first observed May 22, 2019;

- red-eyed vireo (*Vireo olivaceus*), first observed May 21, 2019;
- tufted titmouse (*Baeolophus bicolor*), first observed May 29, 2019;
- white-breasted nuthatch (*Sitta carolinensis*), first observed May 29, 2019; and
- wood thrush (*Hylocichla mustelina*), first observed May 21, 2019.

A full list of species identified in the databases listed above is provided in Appendix 22-1.

Of the species observed or those likely to occur, 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, the limited extent of forest clearing anticipated, and the ample suitable habitat existing outside the Project Area.

Based on observations of frogs and salamanders in forested wetlands on site and consultation with the New York State Amphibian & Reptile Atlas Project (Herp Atlas), several reptiles and amphibian species likely inhabit forest communities within the Project Area. 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. Reptile and amphibian species with potential to occur in the forest communities within the Project Area include the following:

- Allegheny dusky salamander (*Desmognathus ochrophaeus*),
- eastern American Toad (*Bufo a. americanus*, observed on site),
- eastern ribbon snake (*Thamnophis sauritus*),
- smooth green snake (*Liochlorophis vernalis*),
- black rat snake (*Elaphe o. obsoleta*),
- northern red-back salamander (*Plethodon c. cinereus*),
- northern Spring Peeper (*Pseudacris c. crucifer*, observed on site), and
- common garter snake (*Thamnophis sirtalis*).

Forests at the Project Area include a variety of tree species, with only a few areas clearly dominated by any one or two species. Trees in the upland include sugar maple, American beech, eastern hemlock, and white ash. 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). Forest patches at the Project Area range from 0.1 to 29.0 acres. None of the forests at the Project Area are part of a TNC matrix forest blocks 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 204.8 acres, or 99% 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.

Habitat for Grassland Birds

Approximately 122.7 acres of grassland habitat were documented at the Project Area during grassland breeding bird surveys, nearly all of which (121.4 acres) are currently maintained in hay (i.e., alfalfa, wheat, timothy grass). Remaining areas mapped as field crops in the NLCD and United States Department of Agriculture (USDA) Cropland Data were field-verified as row crop agriculture during on-site surveys. These hay fields, which are mono-crops, provide lower structural and floristic diversity than grasslands containing cool-season, warm-season, or mixed grass species. 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 experience significant 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 reseeded (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 to 25 acres in area (Bollinger and Gavin, 1992; Morgan and Burger, 2008). Grassland breeding birds with more generalist habitat preferences may utilize the hayfields observed within the Project Area; however, area-limited grassland birds or species that require greater structural diversity (e.g., Henslow's sparrow, upland sandpiper) are not likely to use grassland habitats present within the Project Area.

No records of state-listed grassland bird species exist for the Project Area in sources reviewed nor were occurrences indicated by agencies consulted. Northern harrier were observed during the over-wintering period; however, the mowing of the hayfields and pastures would discourage this species from using the Project Area during the breeding season as they require vegetation greater than 60 centimeters in height for breeding habitat (Morgan and Burger, 2008). The species was not observed during breeding bird surveys at the Project.

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. Fields where the species were documented were mowed during the nesting season for this species and individuals were not observed again after mowing occurred.

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 (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. A multitude of species including forbs and woody plants provides highly nutritious forage material for herbivore and browser species. Additionally, the low and oftentimes dense herbaceous and shrub vegetation that regenerates naturally following disturbance 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 heat sources outside their body for temperature regulation.

Mammals identified that may utilize successional shrubland communities within the Project Area include those mammals identified above, which are also believed to utilize forestland successional shrubland habitat within the Project Area. Reptiles and amphibians with the potential to occur within forested portions of the Project may also occur in shrubland communities. Additional species with the potential to occur in shrublands within the Project include green frog (*Rana clamitans melanota*) and the northern leopard frog (*Rana pipiens*).

Bird species observed within the Project Area during on-site surveys that utilize successional shrubland communities include:

- American woodcock (*Scolopax minor*);
- Baltimore oriole (*Icterus galbula*), first observed on May 29, 2019;
- brown thrasher (*Toxostoma rufum*), first observed on May 22, 2019;

- cedar waxwing (*Bombycilla cedrorum*), first observed on May 29, 2019;
- common yellowthroat (*Geothlypis trichas*), first observed on May 21, 2019;
- eastern phoebe (*Sayornis phoebe*), first observed on June 12, 2019;
- eastern towhee (*Pipilo erythrophthalmus*), first observed on May 21, 2019;
- unknown flycatcher (*Empidonax* spp.);
- gray catbird (*Dumetella carolinensis*), first observed on May 21, 2019;
- northern mockingbird (*Mimus polyglottos*), first observed on May 21, 2019;
- song sparrow (*Melospiza melodia*), first observed on May 21, 2019;
- white-crowned sparrow (*Zonotrichia leucophrys*), first observed on May 22, 2019;
- wild turkey (*Melagris gallopavo*), first observed on June 6, 2019;
- yellow-billed cuckoo (*Coccyzus americanus*), first observed on June 12, 2019; and
- yellow warbler (*Dendroica petechia*), first observed on May 21, 2019.

The successional shrublands at the Project Area provide marginal habitat for wildlife. The location of some of the successional shrublands in relation to open fields means they provide some wildlife protection from predators. If left unmanaged, the successional shrublands may advance into successional hardwood forests. Due to the limited extent of successional shrubland compared to active agriculture forestland 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 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, and grasses which support macroinvertebrate populations and provide nesting material and cover for grassland nesting species.

Mammals, reptiles, and amphibians believed to utilize successional old field communities within the Project Area include those mammals which are also believed to utilize forestland and successional shrubland habitat within the Project Area.

Numerous bird species were identified with potential to occur may utilize successional old fields present within the Project Area (refer to Appendix 22-1). Species observed in successional old fields within the Project Area include:

- American goldfinch (*Carduelis tristis*), first observed on May 21, 2019;
- American kestrel (*Falco sparverius*), first observed on May 30, 2019;
- barn swallow (*Hirundo rustica*), first observed on May 22, 2019;
- bobolink (*Dolichonyx oryzivorus*), first observed on May 22, 2019;
- brown-headed cowbird (*Molothrus ater*), first observed on May 22, 2019;
- chipping sparrow (*Spizella passerina*), first observed on May 29, 2019;
- eastern bluebird (*Sialia sialis*), first observed on May 22, 2019;
- eastern kingbird (*Tyrannus tyrannus*), first observed on May 29, 2019;
- European starling (*Sturnus vulgaris*), first observed on May 21, 2019;
- field sparrow (*Spizella pusilla*), first observed on May 21, 2019;
- horned lark (*Eremophila alpestris*, SC), first observed on May 21, 2019;
- house wren (*Troglodytes hiemalis*), first observed on May 29, 2019;
- killdeer (*Charadrius vociferus*), first observed on May 21, 2019;
- red-tailed hawk (*Buteo jamaicensis*), first observed on May 21, 2019;
- red-winged blackbird (*Agelaius phoeniceus*), first observed on May 21, 2019;
- savannah sparrow (*Ammodramus sandwichensis*), first observed on May 21, 2019;
- and
- vesper sparrow (*Pooecetes gramineus*, SC), first observed on May 21, 2019.

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. 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 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*), observed on site;
- eastern raccoon, observed on site; and
- muskrat (*Ondatra zibethicus*), not observed on site.

Waterfowl and wading bird species observed within the Project Area include:

- belted kingfisher (*Megaceryle alcyon*), first observed on May 29, 2019;
- Canada goose (*Branta canadensis*), first observed on May 21, 2019;
- great blue heron (*Ardea herodias*), first observed on May 30, 2019; and
- mallard (*Anas platyrhynchos*), first observed on May 29, 2019.

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

- Allegheny dusky salamander, not observed on site;
- Eastern American toad, observed on site;
- green frog, not observed on site;
- northern leopard frog, observed on site;
- northern red-back salamander, not observed on site;
- northern Spring Peeper, observed on site; and
- northern water snake (*Nerodia s. sipedon*), not observed on site.

Open water habitats also provide suitable habitat for aquatic insects that serve as food source for many fish species. Open water within the Project Area consists of small farm ponds with conditions that could support limited populations of aquatic invertebrates.

(4) Potential Impacts of Fencing on Wildlife

Approximately 1,628.9 acres (47%) of the Project Area will be enclosed by fencing. Fencing will consist of 2-inch diamond mesh chain link and will be 7 feet in height with a 6-inch clearance from

the bottom of the fence to grade to allow for small animal access. This fencing will go through active agriculture, forestland, successional shrubland, and successional old field communities. Larger mammals such as white-tailed deer, eastern cottontail, coyote, and racoon may be affected by the perimeter fencing. The access to foraging habitat may be reduced by the perimeter fencing. Proper siting of fencing will minimize the impact on wildlife travel corridors. No wildlife corridors were identified within the Project Area. Fencing was designed to promote movement between arrays and to allow for unobstructed movement both north-south and east-west through the Project (Appendix 11-1). Existing corridors (i.e., riparian corridors) will be preserved where possible to allow for wildlife and agricultural access. Fencing will be erected around individual solar arrays with enough spacing for uninhibited travel between arrays. Several forested corridors, as shown on Figure 9-1, will be preserved within the Project Area mostly occurring along the larger perennial streams located in the Project Area. It is anticipated that wildlife species unable to access foraging habitat due to the perimeter fencing will find new foraging habitat elsewhere within the vicinity of the Project Area.

(5) Potential Impacts to Habitat for State Species of Greatest Conservation Need, Calcareous Shoreline Outcrops, and Karst Features

A detailed list of species of greatest conservation need (SGCN) that have potential to occur within the Project Area is available in Table 22-11. Additional information regarding potential habitat within the Project Area, potential impacts, and impact avoidance measures for SGCN has also been provided in Table 22-11. Publicly available mapping by the USGS indicates that karst topography is present throughout the Project Area as a narrow band of carbonate rocks which trends east-west across the state from Buffalo to Albany, following the Onondaga Limestone. Karst features and sensitive habitats within proximity of the Project Area are shown on Figure 22-5. Further discussion of potential impacts to karst features can be found in Section 21(m) of Exhibit 21.

(6) Vernal Pool Identification

Vernal pool surveys were conducted on March 31, 2020. Due to COVID-19, survey efforts were stopped following the first day of vernal pool surveys. Vernal pool surveys were conducted on approximately 305 acres of forested land within the Project Area. There were approximately 6.8 acres (2.2%) of forested land identified for survey within the Project Area where vernal pool surveys were not conducted. However, there were no vernal pool features observed within 98.7%

of the overall Project Area that was surveyed on March 31, 2020. Detailed results of the vernal pool survey are included in Section 22(k)(1) and Appendix 22-5.

22(e) 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; BBA; USGS BBS; CBC; Hawk Migration Association of North America; eBird; TNC surveys/reports; the Kingbird publications; and the 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, and/or not already listed in this paragraph. 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, if any, 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 138 native and invasive plant species through this effort and created a master plant list based on this field effort, which is included in this Application. Refer to Appendix 22-1 for the master plant and wildlife species list. The inventory specifies whether species were observed, known to occur in Project Area, or are predicted to occur based on habitat characteristics and historical records, and the data source(s) that documented or predicted the presence of each species are noted.

Mammals

Access to common mammal species ranges in the Northeastern United States is underdeveloped 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 encompassed the visual siting of specific species and discovery of signs of presence, including tracks, scat, rubs, and general habitat manipulation. Documentation and evaluation of available habitat for local mammals were also noted. Mammalian species, excluding bats (which were 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,
- North American beaver,
- eastern gray squirrel,
- eastern cottontail,
- eastern chipmunk,
- eastern raccoon,
- coyote, and
- red fox.

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

- American fisher,
- muskrat,
- North American porcupine,
- American mink,
- long-tailed weasel,
- Virginia opossum,
- striped skunk,
- northern flying squirrel (*Glaucomys sabrinus*),
- various shrews (*Blarina* spp., *Cryptotis* spp., *Sorex* spp.), and
- 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, 2,476 adult buck white-tailed deer (over 1.5 years old) and a total of 5,790 white-tailed deer were harvested in Genesee County (NYSDEC, 2019a). There were no black bears harvested in Genesee 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. During the 2018-2019 season no fishers, North American river otter, bobcat, or American marten were trapped in Genesee County (NYSDEC, 2019c).

A complete list of mammal species that were observed or presumed to occur within the Project Area can be found in the master wildlife inventory list attached as Appendix 22-1.

Bats

Refer to Section 22(f)(2) for information on correspondence with the USFWS and NYNHP indicating no known bat hibernacula, maternity roost trees, or threatened or endangered bat species were identified in the Project Area. Based on publicly available information at the time of this study, NYSDEC lists no known summer occurrence of northern long-eared bats in Genesee County and no known occurrences during winter or summer in the Town of Byron as of June 2018. No bat species were indicated with known occurrences within the vicinity of the Project in the IPaC official species list, updated on July 22, 2020 (Appendix 22-9).

No bat species were observed within the Project Area. 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:

- northern long-eared bat (*Myotis septentrionalis*),
- little brown bat (*Myotis lucifugus*),
- eastern pipistrelle (Tri-colored bat) (*Perimyotis subflavus*),
- big brown bat (*Eptesicus fuscus*),
- eastern small-footed bat (*Myotis leibii*),
- eastern red bat (*Lasiurus borealis*),
- silver-haired bat (*Lasionycteris noctivagans*), and
- hoary bat (*Lasiurus cinereus*).

Based upon initial review and consultation with the NYNHP, the Project is not located within 0.25 miles of a known occupied hibernaculum or within 150 feet of a known, occupied maternity roost tree (Appendix 22-9). There is potential, however limited, for roosting and foraging habitat for the various tree roosting bat species within the vicinity of the Project Area based on field surveys. Various bat species including 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 that may provide suitable habitat and that were observed included red maple, silver maple, American elm, sugar maple, white ash, northern white oak and 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 bat species. While the Project is primarily open agricultural fields, there are forested patches and forested riparian corridors that could be used as foraging, travelling, and roosting habitat. Potential suitable roosting and/or foraging habitat within the Project Area, including forested riparian areas, forest edges, wetlands, open water, and open fields is present, but extremely limited, for the species listed above. Table 22-11 further describes this habitat. Given the limited habitat resources available, it is unlikely that these species occur within the Project Area.

Riparian areas will not be impacted due to Project development, further minimizing impacts to potential habitat for bat species which may utilize riparian corridors for foraging or travel.

Birds

USGS BBS

The USGS North American BBS 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. During the point counts, every bird seen or heard within a 0.25-mile radius is recorded (Pardieck et al., 2015).

The Byron survey route is approximately 5 miles northwest of the Project Area and encompasses similar ecological communities present on-site. A total of 115 species have been documented during the lifetime of this survey route. Most birds documented have been common species found within the forests, forest edge, shrublands, old fields, and wetlands throughout NYS. The species documented most frequently on this survey route include the following:

- American Crow (*Corvus brachyrhynchos*),
- American Goldfinch (*Carduelis tristis*),
- American Robin (*Turdus migratorius*),
- chipping Sparrow (*Spizella passerina*),
- common grackle (*Quiscalus quiscula*),
- European starling (*Sturnus vulgaris*),
- house sparrow (*Passer domesticus*),
- mourning dove (*Zenaida macroura*),

- red-winged blackbird (*Agelaius phoeniceus*), and
- song sparrow (*Melospiza melodia*).

These species are common and widely distributed throughout their respective ranges and were all observed at the Project Area during field surveys. 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.

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 a 5-square kilometer survey block portioned across all of NYS (McGowan and Corwin, 2008). The Project Area is located within a total of five NYS BBA blocks. A BBA dataset provided a detailed distribution of bird species located within these specific survey blocks inside the Project Area. A total of 98 species were observed to occur within the noted survey blocks (see Appendix 22-1 for a complete list of species). Several species documented from the Breeding Bird Survey were also recorded during the most recent BBA. The following species were documented solely from the BBA:

- great egret (*Ardea alba*),
- Henslow's sparrow (State-listed Threatened; *Ammodramus henslowii*),
- northern bobwhite (*Colinus virginianus*), and
- rose-breasted grosbeak (*Pheucticus ludovicianus*).

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 3-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 predetermined CBC zone is the Oak Orchard Swamp (Audubon Count Code: NYOO). This search area is approximately 11 miles northwest from the Project Area. Within the Oak Orchard Swamp search area, on December 27, 2019, a total of 54 avian species were reported. The species documented in the CBC database for this search area are provided in Appendix 22-1. Due to the proximity of the search area to the Project, presence of a species in the search area should not be taken to indicate likely presence within the Project Area.

The Cornell Lab of Ornithology eBird

Citizen science data from eBird were reviewed to determine occurrences of listed species within 5 miles of the Project Area. 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 from hotspot locations within 5 miles of the Project Area to gain information on observations submitted by the public, which may be relevant to the Project. A total of 149 species have been documented within the vicinity of the Project Area, including three species state-listed as threatened. State-listed threatened species documented included:

- bald eagle, last observed April 8, 2020;
- northern harrier, last observed November 13, 2016; and
- sedge wren (*Cistothorus stellaris*), last observed May 19, 1962.

A total of 10 state-listed species of special concern have been documented in this citizen-science database, of which three have been observed at the Project, including Cooper's hawk, horned lark, and vesper sparrow. A full list of these species can be found in Appendix 22-1.

HMANA

HMANA is a non-profit organization consisting of over 200 members and affiliate organizations that 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 Braddock Bay Hawkwatch Site in the Town of Greece, New York, approximately 23 miles to the northeast of the Project.

Kingbird Publication

Rare birds as reported in Kingbird publications are restricted to those that are the rarest in NYS. In other words, these records are of species which are extremely infrequently observed in the state or are considered only irregular breeders. These species are not expected to be found in New York and other than those species denoted by asterisk are not considered breeding birds within the state. Species documented in Genesee County include:

- barnacle goose (*Branta leucopsis*),
- black-bellied whistling-duck (*Dendrocygna autumnalis*),
- Brewer's blackbird (*Euphagus cyanocephalus*),
- cackling goose (*Branta hutchinsii*),
- common eider (*Somateria mollissima*)*,
- curlew sandpiper (*Calidris ferruginea*),
- Harris's sparrow (*Zonotrichia querula*),
- king rail (*Rallus elegans*)*,
- lark bunting (*Calamospiza melanocorys*),
- lazuli bunting (*Passerina amoena*),
- marbled godwit (*Limosa fedoa*) – removed from list of rare birds 2017,
- Nelson's sparrow (*Ammospiza nelsoni*) – removed from list of rare birds (no date),
- northern wheatear (*Oenanthe oenanthe*),
- piping plover (*Charadrius melodus*)*,
- Ross's goose (*Anser rossii*) – removed from list of rare birds 2005,
- ruff (*Calidris pugnax*),
- sandhill crane (*Antigone canadensis*) – removed from list of rare birds 2000,
- Say's phoebe (*Sayornis saya*),
- scissor-tailed flycatcher (*Tyrannus forficatus*),
- tricolored heron (*Egretta tricolor*)*,
- tufted duck (*Aythya fuligula*),
- western sandpiper (*Calidris mauri*),
- white-winged dove (*Zenaida asiatica*), and
- yellow-headed blackbird (*Xanthocephalus xanthocephalus*) – removed from list of rare birds (no date).

The habitat requirements for several of the species listed above overlap with habitats that are available within the Project Area; however, due to the rarity of these species within NYS, it is unlikely that any of them will occur within the Project Area with any regularity, if at all. Several records contained in the kingbird database are also reported in eBird; however, none of the species listed above were documented in the vicinity of the Project Area in any other source reviewed.

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 approximately 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 Byron USGS 7.5-minute topographic quadrangle encompassing the Project Area. Based on reviewing data associated with the Project Area, amphibian and reptile species potentially occurring within the Project Area or the Byron USGS 7.5-minute topographic quadrangles are shown in Table 22-5 below.

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

Common Name	Scientific Name	7.5-Minute Quadrangle
Amphibians		
Northern Redback Salamander	<i>Plethodon c. cinereus</i>	Byron
Allegheny Dusky Salamander	<i>Desmognathus ochrophaeus</i>	Byron
Northern Coal Skink	<i>Eumeces a. anthracinus</i>	Byron
Eastern American Toad	<i>Bufo a. americanus</i>	Byron
Northern Spring Peeper	<i>Pseudacris c. crucifer</i>	Byron
Green Frog	<i>Rana clamitans melanota</i>	Byron
Northern Leopard Frog	<i>Rana pipiens</i>	Byron
Reptiles		
Northern Water Snake	<i>Nerodia s. sipedon</i>	Byron
Queen Snake	<i>Regina septemvittata</i>	Byron

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

Common Name	Scientific Name	7.5-Minute Quadrangle
Common Garter Snake	<i>Thamnophis sirtalis</i>	Byron
Eastern Ribbon Snake	<i>Thamnophis sauritus</i>	Byron
Smooth Green Snake	<i>Liochlorophis vernalis</i>	Byron
Black Rat Snake	<i>Elaphe o. obsoleta</i>	Byron
Eastern Massasauga	<i>Sistrurus c. catenatus</i>	Byron
Common Snapping Turtle	<i>Chelydra s. serpentina</i>	Byron
Spotted Turtle	<i>Clemmys guttata</i>	Byron

An amphibian’s lifecycle depends on water. As such, amphibian habitat preferences are assumed to incorporate wetland and waterbody features and any adjacent upland areas. Some 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 many are very vulnerable to compromised homeostasis and are known to be good 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 were areas that were cleared and mowed periodically. 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 very mixed habitat preferences specific to their life cycles. It is presumed that representative reptiles can be found throughout the Project Area and in a 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 utilize 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 conducted on March 31, 2020, the results of which are can be found in Appendix 22-5.

A complete list of amphibian and reptile species that were observed or presumed to occur within the Project Area can be found in the master wildlife inventory list attached as Appendix 22-1.

Terrestrial Invertebrates

As previously stated in Section 22(d)(3), it is assumed that terrestrial invertebrates which are common to WNY likely utilize habitats within the Project Area.

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

22(f) 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)(2). Approximately 106.7 acres of vegetation will be temporarily impacted and an additional approximately 1,610 acres will be employed for the siting of Project components. Although the siting of Project components will result in limited loss in acreage of plant communities within the Project Area, virtually all of it will be reseeded, and no specific plant community will be significantly reduced in population or completely eradicated as a result of the Project. The Applicant, therefore, has taken measures to avoid and minimize for vegetation impacts to the maximum extent practicable.

(1) Avian Analysis

Grassland Breeding Bird Survey

A discussion of the extent, methodology, and results of the grassland breeding bird survey can be found in Section 22(d)(2). A summary of the results from the grassland breeding bird survey is in Table 22-6. A detailed description of the grassland breeding bird survey, including figures showing survey location, methods, and results, is provided as Appendix 22-2. Geographic Information System (GIS) shapefiles showing all breeding bird survey locations will be provided to NYSDEC under applicable confidentiality protections.

Table 22-6. Number of Observations and Locations of Grassland Birds Observed During Breeding Bird Surveys, Excelsior Energy Center, Spring–Summer 2019

Grassland Species	Scientific Name	Hayfield Total (10 points)	Old Field Total (12 point)	Row Crop Total (47 points)	No Individuals Observed ¹	Percent Composition
Bobolink	<i>Dolichonyx oryzivorus</i>	7	0	0	16	3.0
Horned Lark	<i>Eremophila alpestris</i>	3	7	22	66	12.4
Savannah Sparrow	<i>Passerulus sandwichensis</i>	10	9	17	91	17.1
Vesper Sparrow	<i>Pooecetes gramineus</i>	0	2	0	2	0.4

Does not include incidental observations.

Wintering Grassland Raptor Survey

A discussion of the extent, methodology, and results of the grassland winter raptor survey is provided in Section 22(d)(2). The results from the grassland winter raptor survey are summarized in Tables 22-7 and 22-8 below. For a more detailed description of the wintering grassland raptor survey, please refer to Appendix 22-3. GIS shapefiles showing all wintering bird survey locations will be provided to NYSDEC under applicable confidentiality protections.

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

Species Observed	Scientific Name	Total	Percent Composition
Red-Tailed Hawk	<i>Buteo jamaicensis</i>	28	80
Northern Harrier	<i>Circus cyaneus</i>	2	5.7
Cooper's Hawk	<i>Accipiter cooperii</i>	1	2.9
Rough-legged Hawk	<i>Buteo lagopus</i>	1	2.9

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

Species Observed	Scientific Name	Total	Percent Composition
Unknown Raptor	N/A	3	8.5
Total Observations		35	100.0

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

Species Observed	Scientific Name	Total	Percent Composition
Red-Tailed Hawk	<i>Buteo jamaicensis</i>	46	64.8
Turkey Vulture	<i>Cathartes aura</i>	16	22.5
Northern Harrier	<i>Circus cyaneus</i>	4	5.6
Unknown Raptors	N/A	4	5.6
Bald Eagle	<i>Haliaeetus leucocephalus</i>	1	1.4
Cooper's Hawk	<i>Accipiter cooperii</i>	0	0.0
Total Observations		71	100.0

(2) Bat Hibernacula and Maternity Roosts

Information on bat hibernacula and maternity roosts was presented in Section 22(e). Consultation with the USFWS and NYNHP was conducted to determine the presence of state and federally listed bat species. According to the USFWS's IPaC system, consulted July 22, 2020, no state or federally listed bat species occur within the Project Area. Based upon initial review and consultation with the NYNHP, the Project is not located within 0.25 miles of a known occupied hibernaculum or within 150 feet of a known, occupied maternity roost tree (see Appendix 22-9). Database information from the NYSDEC confirmed there were no occupied hibernacula within the vicinity of the Project Area. No bat species were observed within the Project Area.

(3) 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) along with suitable habitat identified within the Project Area. Consultation with the USFWS on July 22, 2020 indicated the potential for one listed reptile to occur within the vicinity of the Project Area. Eastern massasauga have been documented in areas near the proposed Project, and habitat which supports this species occurs limitedly within the Project Area. This species is restricted to wet prairies and marshes, however, may use adjacent uplands absent of woody vegetation (i.e., grasslands, successional old fields), which cover only 110.3 acres (3.2%) of the Project Area. The area of grassland habitat impacted from Project development will be 8.0 acres (0.2%), and no wetlands will be directly impacted (Section 22(m)). During the vernal pool surveys, no features (including vernal pools, potential vernal pools, or amphibian breeding areas) associated with amphibian breeding were identified and mapped within the Project Area. No impacts to vernal pool or vernal pool species are expected as a result of the construction or operation of the Project. See Section 22(k)(1) for additional information on vernal pools.

Wetland delineation efforts conducted during the 2019 growing season identified 60 wetlands and 24 streams within the Project Area. Characteristics observed and documented in the 176 acres of wetland and stream habitat may provide habitat for reptiles and amphibians listed in Section 22(d)(2). Siting of Project Components and the final layout of solar arrays have been designed to avoid wetlands to the maximum extent practicable. See Sections 22(m) and 22(n) for a detailed discussion of impacts avoidance and minimization measures specific to wetlands, respectively.

The Project Area is located approximately 1 mile southwest of the Byron-Bergen Swamp. The Byron-Bergen Swamp corresponds to NYSDEC-regulated wetland BY-11 and is prime amphibian and reptile habitat. The Project does not overlap NYSDEC wetland BY-11, though does overlap its buffer zone. No impacts to the buffer zone are expected resulting from Project development, consequently, no impact to resident reptile or amphibian species are expected as a result of the construction or operation of the Project.

(4) Construction-related Impacts to Wildlife

Direct and indirect impacts to wildlife will occur due to Project construction. Impacts are anticipated to be restricted to incidental injury and mortality due to various construction activities, displacement due to increased human activity during construction, and habitat disturbance and/or

loss (including the loss of travel corridors) due to 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 that are more mobile have a better ability to vacate construction areas prior to the onset of disturbance.

Mortality events due to vehicular activity are presumed to increase due to increased traffic from construction activities 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. A full analysis of traffic volumes associated with construction and operation of the Project is provided in Exhibit 25.

Wildlife Displacement

Project construction may cause both temporary and permanent wildlife displacement. The extent of displacement will vary between species and will fluctuate depending on the nature and seasonal timing of construction activities. Displacement impacts such as noise or 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 reestablish 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 utilize similar habitats near the construction impact area. Species unable to relocate may become at risk to incidental injury or mortality. Displacement impacts due to the Project will be relatively minor due to the availability of habitat close by for many local wildlife species. These animals are likely to remain within or adjacent to the Project Area following construction and during the operation of the Project. Additionally, much of the Project Area is actively farmed, and therefore, subject to considerable disturbance throughout the growing season. Construction activities are not expected to exceed the existing

level of disturbance, which would otherwise occur as a result of routine agricultural activities in the Project Area.

Fencing may restrict wildlife movement within the Project Area; however, the fencing will be erected with sufficient space around individual solar arrays to promote uninhibited travel between. No wildlife corridors or significant wildlife concentration areas were identified within the Project Area during on-site surveys and of 204.8 acres of forested habitat (99%) is considered peripheral forest. Further, landscape connectedness was assessed using TNC resilient land-mapping tool, which indicated predominantly below average connectivity throughout the entire Project Area (TNC, 2020). Limited tree clearing will occur throughout the Project Area for placement of Project Components and to prevent shading of panel arrays. Tree clearing is not expected to reduce or inhibit travel by wildlife as areas proposed for clearing represent a significant reduction in contiguous forest, or the removal of forested corridors which connect forested habitat (Appendix 11-1).

Habitat Disturbance and Loss

Approximately 106.7 acres of wildlife habitat will be temporarily impacted during construction of the Project and 1,560.8 acres will be employed for the useful life of the Project. And then substantially restored during decommissioning. However, only approximately 49.1 acres of potential wildlife habitat will be permanently lost due to the placement of Project components. Moreover, 1,521.7 of the 1,560.8 acres of potential wildlife habitat to be employed along with all 98.4 acres temporarily impacted, are currently active agricultural areas that are regularly disturbed, and which provide limited habitat for wildlife due to these regular disturbances and anthropogenic pressures of active farming practices. Nearly all of the wildlife habitat permanently impacted (45.6 of 49.1 acres) also reside in active agriculture, such as corn, soy, or other row crops.

It is anticipated that approximately 0.4 acres of successional scrubland, 0.7 acres of successional old fields, and 98.4 acres of active agricultural lands will be temporarily disturbed during construction. One acre of temporary disturbance will occur within forestland. Concurrently, approximately 0.4 acres of forestland, <0.1 acres of successional scrubland, 0.2 acres of successional old field, and 46.0 acres of active agricultural lands will be permanently impacted due to the Project. Disturbed/developed areas were excluded from these calculations as wildlife in these areas are presumably present, however, 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.

Placement of Project Components in forestland, successional shrubland, or successional old field, impacts have been minimized to the maximum extent practicable (Exhibit 11). Forested and shrubland habitat within the Project Area account for 235.4 acres, representing approximately 6.8% of the Project Area overall, of which only 0.5 acres will be permanently converted due to construction of the Project. 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 Field Office in Cortland, New York, was contacted for the most recent breeding, wintering, and habitat data for federally listed and protected species. The NYSDEC was contacted to obtain the most recent breeding, wintering, and habitat data for State-listed species. The NYSDEC database has records of state-listed species outside of the Project Area. Correspondence with the USFWS and NYSDEC is included in Appendix 22-9.

(5) 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

Cover type/ Wildlife Habitat	Used for Project Components (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impact (acres)
Agricultural Land	1,521.7	98.4	46.0	1,666.1
Successional Old Field	7.4	0.4	0.2	8.0
Successional Shrubland	5.6	0.7	<0.1	6.4
Forestland	22.7	1.0	0.4	24.2
Grand Total	1,557.5	100.6	46.6	1,704.7

(6) 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 available 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 photovoltaic (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), recorded 70 bird fatalities representing 26 species over a period of 40 weeks (McCrary et al., 1986). At the 377-MW Ivanpah heliostat solar facility in California, a total of 262 avian mortalities from known causes were documented during spring and summer of 2016 (WEST, Inc.). Grassland bird species with collision fatalities recorded in this study included horned lark and savannah sparrow. The estimated avian mortality rate was 1.9 to 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 that creates a high-heat area surrounding the tower, or light reflections that 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% 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 the 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 in the WNY Grassland Focus Area 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,
- grasshopper sparrow,
- bobolink, and
- loggerhead shrike.

The report also identified “high priority species for conservation” including:

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

Habitat assessments within the Project Area identified 122.7 acres of potential habitat for the species listed above, characterized primarily by hayfields. No grassland patches were dominated by native grasses, but rather consisted of monocultures of cultivated grass and hay species. Further, no hayfields exhibited low density vegetation, and most were mowed during the grassland breeding bird surveys conducted on site. 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 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 more structurally diverse vegetation typically seeded beneath and between solar panels, relative to the habitat provided by existing row crop cover. Following construction, solar energy facilities typically use grass seed mixes to establish a stabilized vegetative ground cover. These grass seed mixes are composed 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.

(7) Assessment of Herbicide and Biocide Application

As noted in the Appendix 22-8, the ISMCP, and Appendix 5-3, Preliminary Operations and Maintenance Plan, the use of herbicides may be necessary as a secondary measure for vegetation not effectively removed by mechanical means. Herbicides are typically used as a spot treatment, foliar spray and are specific to the target species on site. The amount of herbicide to be used is specified on the product label and is regulated by the NYSDEC. 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 a method that will not be used in the Project area. Herbicide application at the Project 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. The expected, regulated

herbicides to be used are known to break down rapidly in the soil and exposure to the sun will also result in an increase in degradation. 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.

As the Applicant will use EPA and NYSDEC-registered and approved herbicides and its application will be performed by a NYSDEC-licensed Commercial Pesticide Use Applicator, there will be no unacceptable impacts to soil, groundwater, livestock, food crops and identified water supply wells.

(8) 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 that 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% 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 mortality, if any, that may occur during the operation of this Project, understanding that solar panels, energy storage system, and substation are stationary so will not impact wildlife due to their operation.

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 that will be within the fenced-in areas of the Project are mobile enough to avoid being impacted due to that activity.

There are no wildlife concentration areas that are apparent within the Project Area, based on review of aerial imagery, observations during field surveys conducted on site, and an assessment of landscape connectivity using TNC resilient land mapping tool (TNC 2018). A riparian corridor is along Bigelow Creek, which transects a parcel in the southern portion of the Project Area;

however, this area will not be impacted by Project development. Project siting efforts have been designed to retain riparian areas, and no open-water habitats will be impacted. Forest patches are non-contiguous and isolated by large expanses of primarily agricultural open habitat. It is not expected that wildlife are utilizing specific areas as travel corridors through much of the Project Area, rather, they are more likely to utilize the periphery of the Project Area, and in particular the western border, which contains fewer roads and is more heavily forested. No impacts to habitats that may serve as wildlife corridors are expected to occur during the operation and maintenance of the Project.

(9) 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 though primarily to existing agricultural habitat, disturbances due to solar array operation (e.g., artificial lighting, vehicular traffic, routine maintenance), and potential direct mortality from solar array collisions.

Habitat Loss

A direct and permanent loss of approximately 46.6 acres of wildlife habitat will occur as a result of the Project. Total habitat loss represents 1.4% of the total 3,443 acres included in the Project Area. Relative to the extent of these habitat within the Project Area, approximately 0.2% of available forestland will be permanently lost, 0.7% of successional old fields, and 1.6% of active agriculture. Approximately 22.7 acres (11%) of forest land will also evolve into successional communities, which are of value to several wildlife species within or potentially occurring in the Project Area. As stated previously, active agriculture supports wildlife habitat of marginal quality, and revegetation efforts following construction may improve habitat quality for grassland-associated species. Land cover in the Town of Byron is similarly predominantly agricultural (57.9%); however, provides 7,586.0 acres of wildlife habitat including open water (0.2%), forestlands (27.0%), successional shrubland and old fields (1.3%) and grasslands (0.02%). .

Revegetation following Project construction is likely to provide enhanced habitat for the sensitive species listed above over the existing conditions (i.e., monotypic hay and alfalfa fields) as areas under and between panels will be seeded with native grasses (see Section 22(f)(7)). The active practice of mowing for hay and cultivation of fields is likely displacing the species noted above for at least part of the breeding season (Morgan and Burger, 2008). Mowing occurred in all but two

hayfields in the Project Area during grassland breeding bird surveys, which may have substantial impact on grassland nesting species that nest early in the season. The reduced frequency of mowing required for vegetation maintenance on the proposed Project is likely to reduce disturbance relative to existing farming practices, thereby improving habitat quality for grassland nesting birds.

Habitat Degradation (Forest Fragmentation)

Forested area comprises approximately 6.0% of land cover within the Project Area the majority of which has been previously cleared for agriculture, resulting in small, non-contiguous fragments. Approximately 204.6 acres, or 99% of the forestland at the Project Area, can be classified as peripheral, i.e., within 300 feet of non-forested habitat. It is expected that clearing for all Project Components (access roads, collection lines, and laydown areas) associated with the Project may remove up to 28.0 forested acres representing a minor reduction amounting to a loss of 13.5% of forestland within the Project Area. There will be no assumed net loss of interior forest due to the placement of Project Components. Concurrently, forest clearing would result in no conversion of interior forest to peripheral forest. Forested areas within the Project Area consist of small, isolated patches that are unlikely to support structures and communities of forest-obligate or forest interior species; and larger forest blocks that are contiguous with extensive forest tracts extending well beyond the Project. For those patches that have been previously fragmented to produce the agricultural landscape present in the Project Area currently, changes to forested conditions resulting from Project construction are unlikely to alter species behaviors or diversity following initial disturbances associated with construction activity. For those larger tracts that are present at the Project boundaries, these areas are likely already subject to edge effects given immediate adjacency to farmed areas and human development. The wildlife communities present there are likely to represent edge-tolerant species, and therefore, would be adaptable to changing conditions, simply receding to the shifting boundary of the forest edge.

Amphibians and Reptiles

Immediate disturbances during the construction phase of the Project may cause disruption of amphibians and reptiles at the Project Area. Travel between habitats that may be used by amphibians and reptiles may be disrupted. 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. Minimal wetland impacts are proposed, resulting in both temporary and permanent impacts to habitat for amphibians and reptiles. Temporary stream

crossings may disrupt seasonal movements of select amphibians and reptiles that utilize stream habitats. No species reliant upon these habitats were observed within the Project Area. Areas temporarily impacted by stream crossings will be restored to previous conditions following construction. Therefore, any impacts resulting from these activities will be of short-term duration. Culverts may alter the flow of streams, dislodge substrate used by species in stream habitats, and inhibit upstream movement. Wetland habitats within the Project Area were not determined to support breeding amphibian populations and given the heavily farmed agricultural context of the surrounding landscape, are unlikely to support sensitive species.

Game Species

Immediate disturbances during the construction phase of the Project will cause disruption of local game species (e.g., white-tailed deer, pheasant, ruffed grouse, and turkey). However, other than the nests sites (eggs) and infant fawns, these species are very 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 ample habitat located in the surrounding areas.

(10) 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 confirmed there were no records for threatened and/or endangered species at the Project Area. One species was observed on site by TRC biologists, state-listed northern harrier (Section 22(d)(3)). No take of this species is expected to occur. Observations were made over six occasions, all during early winter, and no roosts or roosting behavior were observed. Further, the species was not documented during breeding bird surveys. These findings suggest that the species may utilize grassland habitats within the Project Area limitedly in transit to permanent breeding and over-wintering habitat. No direct take of state- or federally listed threatened and/or endangered species is anticipated as a result of Project development. In the event “take” is determined likely to occur, refer to section 22(o)(2) for further discussion on direct and indirect impacts to state and federally listed species.

(11) 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 report is included in Appendix 22-4 and results are briefly summarized below.

Methodology

The analysis was based, in part, on data provided by the NYSDEC containing mapped solar facilities (existing or proposed). The database was queried to identify 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. A desktop review was conducted to determine grassland bird use within the Grassland Study Area using both publicly available information regarding the Study Projects including the Department of Public Service (DPS) Document and Matter Management (DMM) system and New York Independent System Operator (NYISO) interconnection queue and publicly accessible records of bird occurrence at the county level, including from the NYS BBA, NYNHP, and eBird. 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.

Results

A review of the NYSDEC database returned 107 Study Projects. Study Projects were identified in 22 of the 24 counties within the Grassland Study Area. In addition to the Project, four Study Projects were identified in Genesee County. Study Project locations are depicted on Figure 2 of the report. Genesee County, where the Project is located, has a proposed development area of 3,745.3 acres (the Project, plus 4 Study Projects), accounting for 3.5% of the total area of development within the Grassland Study Area.

Study Projects, including the Project, encompass a total of 106,585.7 acres within the Grassland Study Area. Of the 107 Study Projects, 13 have already been constructed and account for 594.1 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.

During the winter grassland raptor survey, six northern harrier (ST) observations occurred within the Project Area, as well as two Cooper's hawk (SC) observations. Horned lark (SC) was also observed during winter raptor surveys conducted within the Project Area.

Grassland breeding birds were identified within each of the 31 counties where Study Projects were identified (see Tables 2 and 3 of the report). Numerous species were widely distributed and had recent records among the counties, and all have been recently observed (within last 10 years) in Genesee County except for barn owl, Henslow's sparrow, and prairie warbler. Listed species were observed in multiple counties where Study Projects occur, including:

- bald eagle, observed in 24 of 24 counties;
- Henslow's sparrow, observed in 24 of 24 counties;
- northern harrier, observed in 24 of 24 counties;
- sedge wren, observed in 18 of 24 counties;
- short-eared owl, observed in 24 of 24 counties; and
- upland sandpiper, observed in 22 of 24 counties.

Publicly available data from avian surveys conducted at Study Projects was limited (n=7/107); therefore, it was not possible to determine the presence for all Study Projects evaluated, and further to confidently estimate cumulative take of listed species. For Study Projects with accessible data, listed species were observed in the following counties:

- Erie (Henslow's sparrow, northern harrier, short-eared owl, and upland sandpiper);
- Livingston (Henslow's sparrow, northern harrier, and upland sandpiper);
- Niagara (northern harrier and short-eared owl); and
- Seneca (bald eagle and northern harrier).

Together, the 107 Study Projects comprise 106,585.7 acres of proposed development within the Grassland Study Area (0.2% of total acreage within the Grassland Study Area; Table 5). Grassland habitat covers 1,521,214.2 acres and accounts for 16.6% of land within the Grassland Study Area. Grassland habitat within the boundaries of the 107 Study Projects totals 16,484.8 acres, which covers 15.5% of the proposed area of development among the projects and accounts for approximately 1.1% of grassland habitat within the Grassland Study Area (see Table 6 of the report). 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 9 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 107 Study Projects are developed, these facilities will affect only 1.1% 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.

The suite of species identified, and those with the potential to occur, are primarily widely distributed throughout the Grassland Study Area with recent and multiple records in counties where grassland habitat exists. A review of the literature surrounding these species indicates that while populations of many grassland-associated species are declining state-wide (NYS BBA, 2008; Brennan & Kuvlesky, Jr., 2005), these species are also adapting to changing habitat at the landscape scale (Walston, Jr., et al., 2018). Further, substantive research indicates that the use of 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).

(12) Identification of State, County, and Local Wildlife Concentration or Migration Areas

There are no significant wildlife concentration areas identified by the NYSDEC or in other databases queried including the NYNHP, Audubon Important Bird Areas, and the Genesee County Parks website. A state-designated Important Bird Area is located to the north of the Project Area within the Bergen-Byron Swamp. This area may support large concentrations of resident and migratory birds. The swamp is outside the Project Area and will not be impacted by Project development. No other natural habitats that would support large concentrations of local or migratory wildlife are present within the existing Project Area, which has been heavily altered by agricultural practices.

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

A discussion on avoiding or minimizing 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 intentionally sited within active agricultural fields. This effort was done largely to reduce impacts to natural communities and wildlife habitat. Active agricultural areas provide limited wildlife habitat due to recurrent disturbances in the form of clearing, mowing, plowing, and harvesting by the landowner. Agricultural fields are often monotypic in nature consisting of large expanses of a single crop, offering reduced floristic diversity and structural complexity that supports more diverse wildlife assemblages. Prioritizing construction and siting of components within these areas will minimize the species and habitats impacted by the Project. The revegetation effort following construction is likely to produce higher quality habitat in the areas beneath and between panels, containing a greater diversity of plants and insect prey, providing additional cover for ground-nesting species, and providing novel perching substrate. Furthermore, agricultural land used for Project Components can be substantially restored for agricultural use at the end of the Project's active operational life as part of Project's Decommissioning Plan (see Exhibit 29).

Overall mortality resulting from Project construction and operation is expected to be negligible, with no significant impact to local or regional populations of any species. Total habitat loss will occur in forested, shrubland, and old field habitat representing less than 1.0% of available habitat within the surrounding 2-mile Study Area, and no single habitat present within the Project Area will be entirely eradicated. As discussed in Section 22 (d)(1) above, only one habitat identified in the Project Area represents a significant natural community which will not be impacted by the Project. The rest of the habitats identified within the Project Area are all abundant in the immediate vicinity of the Project and throughout NYS.

Impacts to listed T&E species or their habitats are not expected to occur as a result of the Project. Therefore, a draft Net Conservation Benefit Plan has not been included with this Application.

22(h) Avian and Bat impacts from Wind-Powered Facilities

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

22(i) Map Depicting Wetland Boundaries

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 where the survey teams had property access. 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 DPS Staff interpretation date May 31, 2018, 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. Figure 22-3 shows the delineated boundaries based on on-site identification of all federal and state-regulated wetlands within the Project Area and within 100 feet of areas to be disturbed by construction, and the interconnections, for land under control by the Applicant. Figure 22-3 also includes an estimation of the presence and extent of wetlands located greater than 100 feet from the areas to be disturbed, on land controlled by the Applicant, or are located within 100 feet of the limits of areas to be disturbed but are on parcels over which the Applicant does not have control. The methodology for estimating wetlands is further described below. TRC conducted on-site wetland surveys for approximately 3,455 acres of leased private lands within the Project Area, and this area is referred to as the Wetland Delineation Survey Area throughout this Exhibit. Wetland and waterbody delineations took place during May and June of 2019 and June of 2020. See Figure 22-3 depicting TRC-delineated wetlands within the Wetland Delineation Survey Area.

(1) Wetland Mapping

Wetlands within the Project Area were delineated, as described above, including those within 50 m (164 feet) of a state-regulated wetland, regardless of size or connectivity, were also delineated and are included on Figure 22-3. There were no vernal pools identified within the Project Area. See Appendix 22-5. Wetlands within 100 feet of disturbance but outside the Applicant's control are described in further detail below and included on Figure 22-3.

(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, soils mapping, 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.” See Figure 22-3 depicting 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. Refer to Appendix 22-6, Wetland and Stream 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

TRC identified and delineated a total of 62 wetlands and assumes that 42 of the delineated wetlands have the potential to be under USACE jurisdiction, as they are hydrologically connected to Waters of the United States (WOTUS), or extend off site where connections are presumed. There are no federally protected buffers or setbacks associated with USACE-regulated wetlands. There are 20 delineated wetlands that do not have a direct physical connection to WOTUS and have the potential to be considered isolated and hence non-jurisdictional. As such, they are likely to be non-jurisdictional under the USACE. There are three delineated wetlands considered to represent NYSDEC-mapped freshwater wetlands and therefore, are likely under NYSDEC jurisdiction. These wetlands correspond with NYSDEC-mapped wetlands identified by NYSDEC wetland identification numbers BY-13, BY-18, and BY-25. Refer to Appendix 22-6, Wetland and Stream Delineation Report, for further analysis of jurisdictional wetlands, identification of

delineated wetlands, which correspond with NYSDEC-mapped wetlands, and wetlands that meet NYS criteria for jurisdiction. See Figure 22-3 for the extent of the NYSDEC-mapped wetlands. See Figure 22-4 for the extent of wetlands delineated during the on-site investigation within the Project Area. A request for a review of the boundaries and jurisdictional status of wetlands and streams observed during the on-site delineation has been requested from both the NYSDEC and USACE. The results of these reviews will be provided during compliance filings associated with the Application.

(5) Wetland Shapefiles

Refer to Appendix 22-6, Wetland and Stream Delineation Report, for a detailed description of the delineated wetlands including potential jurisdictional status. See Figure 22-2 depicting the TRC delineated and predicted wetlands within the Wetland Delineation Survey Area and subsequent 100-foot area from Project Components. See Figure 22-3 for the extent of the NYSDEC-mapped wetlands. Shapefiles of the delineated wetlands, predicted wetlands, and all corresponding adjacent areas within the Project Area will be provided to the NYSDEC and NYSDPS. Shapefiles will also include all Project Components, proposed grade changes, limits of ground disturbance, and vegetative clearing.

22(j) Characterization of Wetlands within the Project Area

A description of wetland and stream cover types delineated within the Wetland Delineation Survey Area associated with the Project Site is described in detail below. Each wetland or waterbody was assigned cover types based on the Cowardin classification system (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 was performed to establish a more complete depiction of specific waterbodies and wetlands and a more informative approach to any potential future mitigation efforts.

Palustrine Emergent wetlands (PEM) – A total of 45 wetlands delineated within the Wetland Delineation Survey 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.

Emergent wetlands encountered in the Wetland Delineation Survey Area were typically dominated by purple-stem American-aster (*Symphotrichum puniceum*), narrow-leaf cat-tail (*Typha angustifolia*), common reed (*Phragmites australis*), blunt spike-rush (*Eleocharis obtuse*), cursed buttercup (*Ranunculus sceleratus*), reed canary grass (*Phalaris arundinacea*), spotted touch-me-not (*Impatiens capensis*), and fowl blue grass (*Poa palustris*). Evidence of wetland hydrology for these wetlands included saturation, saturation visible on aerial imagery, inundation visible on aerial imagery, geomorphic position, surface water, high water table, and aquatic fauna. Variations of characteristics in the soil matrices generally demonstrated redox dark surface (F6) and depleted matrix (F3) hydric soil indicators.

Palustrine Scrub-Shrub Wetlands (PSS) – A total of 10 wetlands delineated within the Wetland Delineation Survey Area contained characteristics representative of a scrub-shrub wetland community. Scrub-shrub wetlands are dominated by woody shrub vegetation that stands 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 (Cowardin et al., 1979).

Scrub-shrub wetlands encountered in the Wetland Delineation Survey Area were typically dominated by black willow (*Salix nigra*), silky dogwood (*Cornus amomum*), gray dogwood (*Cornus racemosa*), and gray willow (*Salix bebbiana*). Evidence of wetland hydrology for these wetlands included high water table, saturation, algal mat or crust, geomorphic position, water-stained leaves, high water table and watermarks. Variations of characteristics in the soil matrices generally demonstrated depleted matrix (F3), depleted below dark surface (A11), and redox dark surface (F6) hydric soil indicators.

Palustrine Forested Wetlands (PFO) – A total of 21 wetlands delineated within the Wetland Delineation Survey Area contained characteristics representative of a forested wetland community. Forested wetlands are dominated by trees and shrubs that are at least 6 m tall. Forested wetlands typically have a mature tree canopy and depending upon the species and density, can have a broad range of understory and groundcover community components (Cowardin et al., 1979).

Forested wetlands encountered in the Wetland Delineation Survey Area were typically dominated by red maple (*Acer rubrum*), American elm (*Ulmus americana*), swamp white oak (*Quercus bicolor*), green ash (*Fraxinus pennsylvanica*), and silver maple (*Acer Saccharinum*). Evidence of

wetland hydrology for these wetlands included water-stained leaves, surface water, saturation, high water table, saturation, algal mat or crust, sparsely vegetated concave surface, watermarks, and thin muck surface. Variations of characteristics in the soil matrices generally demonstrated depleted matrix (F3) and depleted below dark surface (A11) hydric soil indicators.

Palustrine Unconsolidated Bottom Wetlands (PUB) – A total of 11 wetlands delineated within the Wetland Delineation Survey Area contained characteristics representative of unconsolidated bottom wetland communities. Unconsolidated bottom wetlands include wetland and deepwater habitats with at least 25% cover of particles smaller than stones, and a vegetative cover less than 30%. Water regimes are restricted to subtidal, permanently flooded, intermittently exposed, and semi-permanently flooded (Cowardin et al., 1979).

Unconsolidated bottom wetlands in the Wetland Delineation Survey Area were predominantly unvegetated; however, dominant vegetation observed on the borders of PUB wetlands included black willow (*Salix nigra*), green ash (*Fraxinus pennsylvanica*), and narrow-leaf cat-tail (*Typha angustifolia*). Evidence of wetland hydrology for these wetlands included surface water, high water table, saturation, inundation visible on aerial imagery, and geomorphic position. Due to inherent inundation in these wetlands, it is not possible to obtain an accurate soil profile because these wetlands are inundated year-round, soils are assumed to be hydric.

Streams (RUP, RIN, REPH) – A total of 27 streams or stream segments were delineated within the Wetland Delineation Survey Area. Classification of streams depended 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 typically receive groundwater flow from springs or groundwater seepages. Intermittent streams (RIN) flow only during certain times of the year from springs, snow melts, and runoff from seasonal precipitation events. Intermittent streams can flow above or below the water table but do have a connection to the water table. Ephemeral streams (REPH) flow sporadically and entirely depend on transient precipitation from storm events or from periodic snow melts. These streams tend to be disconnected from the water table and are often drainage features adjacent to or within the headwaters of a more major stream system.

Streams encountered in the Wetland Delineation Survey Area were mostly intermittent in nature with a few larger perennial streams running through the Project Site as well. These were flowing along shallow gradients of approximately 1 to 5%. Stream substrates observed were diverse and

included gravel, silt/clay, cobble, sand, riprap, and organic matter. Stream depths ranged from 0 inches to 4 feet deep. Most streams supported some form of aquatic ecology with a few of the streams, especially the larger perennial streams, containing significant aquatic habitat and flow regimens able to support fish and wildlife populations.

Further characterization of the wetlands and streams, including wetland determination data forms and a summary table of wetland delineation information, can be found in the Wetland and Stream Delineation Report (refer to Appendix 22-6).

22(k) 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 to identify and measure exhibited functions and values. For many audiences, such a measurement can be highly subjective. In the past, efforts to utilize 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 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 utilize 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 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 needed 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 eight functions and five values that are considered by the USACE through their Supplement are listed below. 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 Environmental Conservation Law (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 (“qualifiers”) 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. To see the spreadsheet and receive more detail on the functions and values assessment, see Appendix 22-7. 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. Based on these data, the functions and values provided by each wetland were determined.

Wetland Functions

Wetland functions are the properties or process of a wetland ecosystem that 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 groundwater 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 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 on 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 the target wetland.

Wetlands delineated within the Wetland Delineation Survey Area displayed multiple functions based on their specific characteristics. Each of the wetlands identified within the Wetland Delineation Survey Area were determined to have the ability to provide the functions of groundwater recharge/discharge, flood-flow alteration, sediment/toxicant/pathogen retention, nutrient removal/retention/transformation, and wildlife habitat. Other functions displayed within wetlands delineated within the Wetland Delineation Area include:

- Fish and Shellfish Habitat (10 wetlands),
- Sediment/Shoreline Stabilization (10 wetlands), and
- Production Export (38 wetlands).

Wetland Values

Values are the societal benefits stemming from one or more of the functions associated with a wetland. Most wetlands have corresponding public value to an assessable degree. The value of a 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 that 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 most but not all wetlands within the Wetland Delineation Survey Area based on this assessment. None of the values looked at in this assessment were found to occur within all wetlands in the Wetland Delineation Survey Area. Of the 63 wetlands located in the Wetland Delineation Survey Area, the values that were found to occur include:

- Recreation (35 wetlands),

- Educational or Scientific Value (4 wetlands),
- Uniqueness and Heritage (4 wetlands),
- Visual Quality and Aesthetics (21 wetlands), and
- Threatened or Endangered Species Habitat (12 wetlands).

To receive more detail on the functions and values assessment, please see Appendix 22-7 of this Application.

(1) Vernal Pools

No vernal pools were identified in the Project Area during the on-site investigations conducted during spring of 2020. Multiple potential vernal pool areas were investigated, though no evidence of amphibian breeding activity was documented. These potential vernal pools were predominantly co-located with forested wetland complexes previously delineated during the wetland and stream delineation surveys.

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

As described previously, wetlands outside 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 utilized to determine hydrological connections to off-site wetlands, including state-mapped wetlands protected by NYSDEC, which may be located near Project components. A total of 43 approximated wetlands were identified. Of these wetlands, 21 were extensions of field-delineated wetlands within the Wetland Delineation Survey Area, and 5 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. Twenty-one of the approximated wetlands appear to be isolated. Jurisdiction over federally regulated wetlands will ultimately be determined by the USACE. In addition, 10 streams were approximated, 6 of which appear to be extensions of on-site delineated streams. There are two streams within 100 feet of Project Components that are likely connected to delineated streams within the Project Area. Of

the six approximated, two streams appear to be isolated, and seven are connected to NYSDEC-mapped streams.

Through desktop analysis it appears that no approximated wetlands within 100 feet of Project Components have potential hydrological connections to any state wetlands.

22(m) Temporary and Permanent Wetland Impacts

Through careful siting of Project components, no wetland impacts will result from Project development. Further, there are no impacts to NYSDEC mapped wetlands or their 100-foot adjacent area. Impacts to surface waters, including a discussion of temporary and permanent impacts from stream crossings, are discussed in Exhibit 23.

22(n) Avoidance and Minimization 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 avoids impacts to wetlands and waterbodies by locating Project solar array structures outside delineated features along with 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. The Applicant is anticipating the utilization of Horizontal Directional Drilling (HDD) for all proposed stream crossings to avoid impacts to stream channels during the placement of buried collection line.

(1) NYSDEC-regulated Adjacent Areas

Two delineated wetlands within the Project Area are associated with currently mapped NYSDEC freshwater wetlands or their 100-foot adjacent areas. No impacts to these wetlands or the associated 100-foot adjacent areas are proposed in the current Project design (Appendix 11-1).

(2) Off-site Mitigation (if necessary)

As discussed above, the Project will result in no impacts to wetlands. Therefore, no mitigation is required.

(3) Avoidance and Minimization Methods

The Applicant considered all plausible alternative routing or siting options for proposed stream and wetlands crossings, utilizing 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 in several locations 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 BMPs during construction to minimize unavoidable wetland impacts. BMPs will be based on methods previously adopted by the Siting Board in Article 10 Certificates. Buffer zones with restricted access to heavy equipment will be established around delineated wetland resources. Activities and equipment usage which could temporarily impact wetlands will be prohibited inside buffer zones. No use of herbicides or soil 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 prior to construction, and personnel alerted to the existence and extent of these areas. 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 EPA-approved herbicides for such uses. Applications will be performed only by qualified applicators and in adherence to product specifications.

(4) Environmental Compliance

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. An EM will be present throughout the construction and restoration phases of the Project to monitor 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(o) Identification of State and Federally-listed Species Subject to Potential Impacts

(1) Avoidance and Minimization of Impacts

Discussion on avoiding and minimizing the impact to plant communities within the Project Area can be reviewed in Section 22(c), Avoidance, Minimization, and Restoration Measures for Plant Community Impacts. Construction-related, temporary impacts to fish and wildlife including the use of heavy machinery, vehicular traffic, and minimal silt and sedimentation events to aquatic ecosystems may result in incidental injury, mortality events. Also, temporary habitat disturbance and loss will occur due to vegetation clearing, earth moving activities, and the placement of Project Components. Temporary displacement events will also occur due to increased noise, vibration, and human presence during construction in previously undisturbed areas, though not in excess of existing agricultural activities routinely occurring throughout the Project Area. Careful site design, the use of BMPs, and construction monitoring based upon previously approved Siting Board certificate conditions for other projects will help to minimize these impacts. The Project has been designed to avoid sensitive habitats by siting solar arrays primarily in agricultural fields. The Applicant will adhere to designated construction limits and avoid off-limit sensitive areas designated by the EM during construction.

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 discussed in Exhibit 23. Also, the Preliminary SWPPP is attached as Appendix 23-3. A Spill Prevention, Containment, and Control (SPC) 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 SPC plan is provided in Exhibit 23 of this Application. A final SPC plan will be submitted in a compliance filing or filed with the Secretary.

Through initial impact analysis and careful site design (Sections 22(d)(4) and 22(h)), permanent habitat loss and forest fragmentation have been avoided or minimized, to the maximum extent practicable. The majority of Project Components, including access roads, collection lines, and solar arrays will be sited in agricultural fields in order to minimize impacts to natural communities,

and reduce fragmentation and degradation of wildlife habitats. Restoration of the agricultural fields will occur following the decommissioning of the Project.

(2) Potential Impacts to State and Federally Listed Species

Site-specific information requests to state and federal agencies were made to determine the presence of rare, threatened, endangered, and special concern species (see Appendix 22-9). 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 state or federal registry was also included in the list of state and federally listed species occurring within the Project Area. Table 22-11 summarizes impacts to listed species with potential to occur within the Project Area or their habitats. The table 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.

Habitat for many species is not present within the Project Area. Further, habitat modification is not expected to result in direct take of listed T&E species (Section 22(f)(10)). Minimal habitat losses will result in Project development, particularly because habitat that supports listed species is limited. The preliminary design of the Project presented in this Application includes the avoidance of unnecessary impacts to grasslands, interior forests, wetlands, shrublands, and young successional forests insofar as they occur. The proposed Project Components were sited in an area previously degraded by agricultural production to the maximum extent practicable. As a result, impacts to these communities will be marginal. Forest clearing is expected on approximately 11.0% of the Project's forested acreage, and no impacts to wetlands will occur. Habitat for sensitive species was avoided in the siting of Project components. Further, Project Components have been co-located wherever feasible to reduce the overall LOD and associated impacts to plant communities. Impacts to wildlife habitat are further described in Table 22-10.

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)(8)), representing less than 1% of avian mortalities from anthropogenic sources annually. Post-construction monitoring will be unnecessary as impacts have been minimized through careful siting. As previously mentioned in Section 22(f)(4) and 22(f)(10), there will be no take of threatened or endangered species during construction or operation; therefore, post-construction monitoring for these species is not necessary.

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
American Bittern (<i>Botaurus lentiginosus</i>)	-	SSC	SGCN	This species prefers marshes and reedy lakes. This species breeds in freshwater marshes, mainly large, shallow wetlands with much tall marsh vegetation (cattails, grasses, sedges), and areas of open, shallow water. Suitable habitat for this species occurs within the Project Area.	C, F, I	No	No potential direct impacts because there are no proposed impacts to wetland habitats (refer to Appendix 22-6 for a description of wetland habitat in the Project Area). 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.
American Black Duck (<i>Anas rubripes</i>)	-	-	SGCN-HP	This species prefers marshes, ponds, rivers, and lakes. This species breeds in freshwater wetlands such as freshwater marshes and forested wetlands. Suitable habitat for this species occurs within the Project Area.	F, I	No	No potential direct impacts, because there are no proposed impacts to wetland habitats (refer to Appendix 22-6 for a description of wetland habitat in the 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.

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
American Kestrel (<i>Falco sparverius</i>)	-	-	SGCN	This species prefers open areas, such as successional old fields, forest edges, scrublands, pastures and hay fields. Suitable habitat for this species occurs within the Project Area.	F		Limited potential direct impacts include habitat degradation and fragmentation from permanent loss or placement of Project Components on 5.6 acres of successional shrublands. There will be habitat loss of 0.2 acres of successional shrubland and successional old fields to Project components. Additional direct impacts may result from the clearing of 28.0 acres of forested habitat that 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, use of agricultural land will result in an increase of successional grasslands at solar facilities which has been shown to benefit grassland species with habitat requirements similar to American kestrel (see Section 22(f)(6)).
American Woodcock (<i>Scolopax minor</i>)	-	-	SGCN	This species prefers moist successional shrublands near successional forests, scrub-shrub wetlands, and along rivers. Suitable	C, F, I	Yes	Limited potential direct impacts include habitat degradation and fragmentation from permanent loss or placement of Project Components of on 5.6	Potential impacts to successional shrublands and scrub-shrub wetlands have been minimized to the maximum

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				habitat for this species occurs within the Project Area.			acres of successional shrublands to early successional fields. There will be habitat loss of 0.2 acres of successional shrubland and successional old fields to Project Components. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	extent practicable by siting Project Components in agricultural land wherever possible.
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	-	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. Suitable habitat does not exist at the site, as waterbodies are not large enough to support prey fish populations.	C, E, F, I	Yes	Habitat typically occupied by bald eagles is not present within the Project Area. No impacts to open water habitats will occur resulting from Project development.	No habitat for bald eagle will be impacted, no additional avoidance measures will be implemented.
Black Tern	-	END	SGCN-HP	This species prefers fresh marshes, lakes. For nesting	C, F, I	No	No potential direct impacts, because there are no proposed	Impacts to wetland habitat have been minimized to the

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
<i>(Chlidonias niger)</i>				this species favors fresh waters with extensive marsh vegetation and open water, also sometimes in smaller marshes and wet meadows. Suitable habitat for this species occurs within the Project Area.			impacts to ponds, lakes, rivers, or forested wetlands (refer to Appendix 22-6 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.	maximum extent practicable by siting Project components in agricultural fields wherever possible and using HDD when necessary.
Black-billed Cuckoo <i>(Coccyzus erythrophthalmus)</i>	-	-	SGCN	This species prefers thickets, successional old field, orchards, and along forest edges. Nests in shrublands and forest edges. Suitable habitat for this species occurs within the Project Area.	C, D, F, I	No	Potential direct impacts include habitat degradation and fragmentation from placement of Project Components of on 5.6 acres of shrublands and 22.7 acres of forest to early successional grassland and permanent loss of 0.6 acres of successional shrublands, successional old fields, and forest edges to early successional grasslands. Potential indirect impacts could include habitat disturbance due to	Potential impacts to successional shrublands have been minimized to the maximum extent practicable by siting Project components in agricultural land wherever possible. The Project layout will create forest edges that may be used by black-billed cuckoo.

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
							noise from construction activity.	
Black-throated Blue Warbler (<i>Setophaga caerulescens</i>)	-	-	SGCN	This species prefers large, undisturbed tracts of hardwood and mixed deciduous-coniferous forests with a dense understory. This species typically occurs in forests greater than 250 acres. Suitable habitat for this species does not occur within the Project Area because the forested areas are too small.	C, F, I	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 22.7 acres and loss of 0.4 acres 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 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.
Blue-winged Teal (<i>Spatula discors</i>)	-	-	SGCN	This species prefers freshwater habitats such as ponds and marshes surrounded by grassland or successional old fields. Suitable habitat for this species occurs	C, I	No	Potential direct impacts include habitat degradation and fragmentation, from the placement of Project Components of on 22.7 acres and loss of 0.4 acres of forests to early successional grasslands. Potential indirect impacts could	Impacts to forested areas have been minimized to maximum extent practicable by siting most of the Project Components in agricultural areas. Tree clearing is

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				within the Project Area.			include habitat disturbance due to noise and construction activity.	necessary to prevent trees from overhanging solar arrays
Blue-winged Warbler (<i>Vermivora cyanoptera</i>)	-	-	SGCN	This species prefers brushy hillsides, overgrown pastures, and stream and woodland edges. Breeds in dry uplands in low shrublands. Suitable habitat for this species occurs within the Project Area.	C, D, F, I	No	Potential direct impacts include habitat degradation and fragmentation from the placement of Project Components of on 7.4 acres of successional shrublands to early successional fields. There will be habitat loss of 0.2 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. Areas used for Project Components will be maintained as early successional grasslands for the useful life of the Project. Presence of this habitat at solar facilities has been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
Bobolink (<i>Dolichonyx oryzivorus</i>)	-	-	SGCN-HP	This species prefers grasslands, including pastures, successional old fields, and meadows. Suitable habitat for this species occurs within the Project Area.	C, D, F, I	Yes	Direct impacts due to habitat loss and placement of Project Components are not expected. The species is likely to benefit from the use of 1,521.7 acres of agricultural lands and successional old fields which will be maintained as early successional fields for the useful life of the Project. There will be a habitat loss of 46.0 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. Areas used for Project Components will be maintained as early successional grasslands for the useful life of the Project. Presence of this habitat at solar facilities has been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
Bonaparte's Gull (<i>Chroicocephalus Philadelphia</i>)	-	-	SGCN	This species prefers ocean bays, lakes, and muskeg. Breeds on the edges of northern forest, where coniferous trees are near lakes or bogs. Suitable habitat for this species occurs within a small portion of the Project Area.	I	No	Potential direct impacts include habitat degradation and fragmentation, from the placement of Project Components on 22.7 acres and loss of 0.4 acres 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 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.
Brown Thrasher (<i>Toxostoma rufum</i>)	-	-	SGCN-HP	This species prefers successional shrublands, dense regenerating woods, and forest edges. Suitable habitat for this species occurs within the Project Area.	C, D, F, I	Yes	Potential direct impacts include habitat degradation and fragmentation from placement of Project Components of on 28.3 acres and loss of 0.6 acres 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	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

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
							may be used by brown thrashers. Potential indirect impact from habitat disturbance due to noise and construction activity.	overhanging solar arrays.
Caspian Tern (<i>Hydroprogne caspia</i>)	-	-	SGCN	This species prefers large lakes, coastal waters, beaches, bays, favoring protected waters such as bays, lagoons, rivers, lakes. Inland, more likely on large lakes than on small ponds. Suitable habitat for this species may occur within the Project Area, although there are no large areas of open water.	F, I	No	Potential direct impacts include habitat degradation and fragmentation from placement of Project Components on 28.3 acres and loss of 0.6 acres of successional shrublands and forest edges to early successional grasslands, although impacts to rivers and lakes with large standing bodies of water will not be impacted.	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.
Cerulean Warbler (<i>Dendroica cerulea</i>)	-	SSC	SGCN	This species prefers deciduous forests, especially in river valleys. Breeds in mature hardwoods either in uplands or along streams. Suitable habitat for	C, D, I	No	Potential direct impacts include habitat degradation and fragmentation from placement of Project Components on 28.3 acres of successional shrublands and forests	Impacts to successional shrublands and forested areas have been minimized to the maximum extent practicable by

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				this species may occur within the Project Area, although river valley is not present.			to early successional grasslands. Habitat loss will occur on 0.6 acres. Potential indirect impacts could include temporary habitat disturbance due to noise and construction activity.	siting most of the Project Components in agricultural areas. Tree and shrub clearing is necessary to prevent trees from overhanging solar arrays.
Common Snapping Turtle (<i>Chelydra s. serpentine</i>)	-	-	SGCN	This species prefers slow-moving, shallow water with muddy bottoms. Suitable habitat for this species occurs within the Project Area.	G, I	No	There will be no direct impacts as impacts to wetland habitats that would support this species have been avoided.	Impacts to ponds and wetland habitats 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.
Eastern Massasauga (<i>Sistrurus c. catenatus</i>)	-	END	SGCN-HP	This species prefers shallow wetland areas, sphagnum bogs, fens, swamps, marshes, peatlands, wet meadows, and floodplains. Suitable habitat for this	B, G, I	No	Direct impacts due to habitat loss and placement of Project Components of are not expected. The species is likely to benefit from the use of 1,521.7 acres of agricultural	Impacts to successional shrublands and forested areas have been minimized to the maximum extent practicable by

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				species occurs within a small portion of the Project Area.			lands and successional old fields which will be maintained as early successional fields for the useful life of the Project. Potential indirect impacts could include habitat disturbance due to machines and equipment use through shallow wetlands.	siting most of the Project Components in agricultural areas areas. Wetland habitats have been entirely avoided.
Eastern Meadowlark (<i>Sturnella magna</i>)	-	-	SGCN-HP	This species prefers farm fields, pastures, grasslands, and wet fields. Suitable habitat for this species occurs within the Project Area.	C, D, F, I	No	Potential direct impacts include habitat degradation and fragmentation from placement of Project Components on 28.3 acres and loss of 0.6 acres 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 temporary 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. Areas used for Project Components will be maintained as early successional grasslands for the useful life of the Project. Presence of this habitat at solar facilities has

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
								been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat quality for this species at the Project..
Eastern Pipistrelle (<i>Perimyotis subflavus</i>)	-	-	SGCN-HP	This species prefers woodlands and riparian forests and can also be found foraging in early successional and open habitats. They roost in or below the canopy of live or dying trees. Suitable summer habitat occurs within the forested portions of the Project Area, in addition to the open habitat.	I	No	Potential direct impacts are unlikely due to the limited extent of habitat in the form of extensive forests (see Section 22(f)(9)). Potential direct impacts include habitat degradation and fragmentation, from the placement of Project Components on 28.3 acres and loss of 0.6 acres 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 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	-	-	SGCN	This is a migratory bat species that often resides in	I	No	Potential direct impacts are unlikely due to the limited extent of habitat	Impacts to forested areas have been

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
<i>(Lasiurus borealis)</i>				forested areas and does not overwinter in caves. They roost in tree foliage of a variety of deciduous tree species. Roosts are often on the edge of streams, open fields, and forest canopy gaps. They forage over open water, pastures, and forest edges. Suitable summer habitat occurs within the forested portions of the Project Area.			in the form of extensive forests (see Section 22(f)(9)). Potential direct impacts include habitat degradation and fragmentation, from the placement of Project Components on 28.3 acres and loss of 0.6 acres of forests to early successional grasslands. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	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 Ribbon Snake <i>(Thamnophis sauritus)</i>	-	-	SGCN	This species prefers aquatic habitats, frequenting the edges of ponds, marshes, bogs, streams, and thick vegetation such as shrubs for shelter and grassy areas adjacent to water for basking. Suitable habitat for this species occurs	G, I	No	Potential direct impacts include habitat degradation and fragmentation from placement of Project Components on 28.3 acres of successional shrublands and forests to early successional grasslands. Habitat loss will occur on 0.6 acres. Potential indirect impacts could include habitat disturbance due	Impacts to successional shrublands and forested areas have been minimized to maximum extent practicable by siting most of the Project Components in shallow wetland areas. Tree and shrub clearing is

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				within the Project Area.			to machines and equipment use through shallow wetlands	necessary to prevent trees from overhanging solar arrays.
Eastern Small-footed Bat (<i>Myotis leibii</i>)	-	SSC	SGCN	This species uses rock crevices and talus features as day-roosts in the summer season and hibernacula include natural caves and mines. They have been found foraging in deciduous forests and over ponds and streams in the summer. Potential suitable summer foraging habitat can be found in the forested and ponded portions of the Project Site; however, day-roost habitat is not present in the Project Area.	I	No	Potential direct impacts include habitat degradation and fragmentation, from the placement of Project Components on 22.7 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.4 acres of forests. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	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
Grasshopper Sparrow (<i>Ammodramus savannarum</i>)	-	SSC	SGCN-HP	This species prefers open fields and prairie including active hay fields, successional old	C, D, F, I	No	Potential direct impacts include habitat degradation and fragmentation from placement of Project	Impacts to agricultural land is unavoidable, as most of the Project Components have

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				field, and minimally in successional shrublands. Suitable habitat for this species occurs within the Project Area.			Components on 28.3 acres and loss of 0.6 acres 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.	been sited in agricultural areas to avoid wetlands and minimize tree clearing. Active agricultural land provides limited wildlife habitat for grasshopper sparrow. Areas used for Project Components will be maintained as early successional grasslands for the useful life of the Project. Presence of this habitat at solar facilities has been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.
Greater Yellowlegs (<i>Tringa melanoleuca</i>)	-	-	SGCN	This species prefers open marshes, mudflats, streams, and ponds; in summer, wooded	F, I	Non	No potential direct impacts because there are no proposed impacts to wetland habitats (refer to	Impacts to wetland habitat have been avoided to the maximum extent practicable by

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				muskeg and spruce bogs. During migration and winter, this species is found in tidal flats, estuaries, open beaches, salt and fresh marshes, and the shores of lakes and ponds, riverbanks. Suitable habitat for this species occurs within the Project Area.			Appendix 22-6 for a description of wetland habitat in the Project Area). Potential indirect impacts are from habitat disturbance due to noise from construction activities near wetland habitat.	siting Project Components in agricultural fields wherever possible and using HDD when necessary.
Hoary Bat (<i>Lasiurus cinereus</i>)	-	-	SGCN	This migratory species prefers to roost in deciduous and coniferous trees among the foliage and forages over open areas or large open bodies of water. Suitable summer habitat occurs within the Project Area, although coniferous trees are not dominant in the forested sections of the Project Area.	I	No	Potential direct impacts are unlikely due to the limited extent of habitat in the form of extensive forests (see Section 22(f)(9)). Potential temporary indirect impacts could include habitat disturbance due to noise and construction activity.	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.

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
Horned Lark (<i>Eremophila alpestris</i>)	-	SSC	SGCN-HP	This species prefers open habitats with sparse vegetation such as prairies and heavily grazed pastures. Suitable habitat for this species occurs within the Project Area.	C, D, E, F, I	Yes	Direct impacts due to habitat loss and placement of Project Components are not expected. The species is likely to benefit from the use of 1,521.7 acres of agricultural lands and successional old fields which will be maintained as early successional fields for the useful life of the Project. There will be a habitat loss of 46.0 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 horned lark. Areas used for Project Components will be maintained as early successional grasslands for the useful life of the Project. Presence of this habitat at solar facilities has been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
Lesser Scaup (<i>Aythya affinis</i>)	-	-	SGCN	This species prefers marsh ponds, lakes, bays, and estuaries, and summers around large marshes in prairie or forested regions. Suitable habitat for this species occurs within the Project Area.	F, I	No	No potential direct impacts because there are no proposed impacts to wetland habitats (refer to Appendix 22-6 for a description of wetland habitat in the 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.
Little Brown Bat (<i>Myotis Lucifugus</i>)	-	-	SGCN-HP	This species are habitat generalists, found in mixed, deciduous, and coniferous forests, roosting in buildings or trees, under rocks or wood piles. They forage over wetlands and open water. Suitable summer roost and foraging habitat within the forested portions and some ponds of the Project Area.	I	No	Potential direct impacts include habitat degradation and fragmentation, from the placement of Project Components on 22.7 acres and loss of 0.4 acres 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 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.

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
Northern Bobwhite (<i>Colinus virginianus</i>)	-	-	SGCN-HP	This Species prefers farms, brushy open country, roadsides, wood edges, brushy meadows, overgrown fields, or pastures or agricultural fields next to hedgerows or woodlots. Suitable habitat for this species occurs within the Project Area.	D, I	No	Direct impacts due to habitat loss and placement of Project Components are not expected. The species is likely to benefit from the use of 1,521.7 acres of agricultural lands and successional old fields which will be maintained as early successional fields for the useful life of the Project. There will be a habitat loss of 46.0 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 are unavoidable, as most of the Project Components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. Areas used for Project Components will be maintained as early successional grasslands for the useful life of the Project. Presence of this habitat at solar facilities has been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.
Northern Harrier (<i>Circus cyaneus</i>)	-	THR	SGCN	This species prefers freshwater marshes, wet grasslands, lightly grazed	C, D, E, F, I	Yes	There are unlikely to be direct or indirect impacts due to the limited area of optimal	Impacts to agricultural land are unavoidable, as most of the

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				pastures, successional old field, and croplands. Suitable habitat for this species occurs within the Project Area.			habitat. Potential direct impacts include habitat degradation and fragmentation from the use of 1,529.1 acres of agricultural land and successional old fields for Project Components. Potential direct impacts include habitat displacement and degradation from the temporary conversion of 98.8 acres of agricultural land and successional old fields. There will be habitat loss of 46.2 acres of agricultural land 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 avoid wetlands and minimize tree clearing. Areas used for Project Components will be maintained as early successional grasslands for the useful life of the Project. Presence of this habitat at solar facilities may benefit northern harrier as availability of prey resources may increase in this cover type relative to actively farmed lands.
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	THR	THR	SGCN-HP	This species utilizes tree cavities or loose bark of trees for roosting, foraging and raising young.	I	No	Potential direct and indirect impacts are unlikely due to the limited habitat in the form of extensive	Impacts to forested areas have been minimized to the maximum extent

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				They prefer mature interior forests and are clutter specialists. Forested patches that could provide potential suitable summer roosting and foraging habitat. Additionally, these forested patches can provide travel corridors to larger patches of forest in the surrounding areas.			interior forests (see Section 22(f)(9)). Potential direct impacts include habitat degradation and fragmentation from the placement of Project Components on 28.3 acres and loss of 0.6 acres of forests to early successional grasslands. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	practicable by siting most of the Project Components in agricultural areas. Tree clearing is necessary to prevent trees from overhanging solar arrays.
Northern Pintail (<i>Anas acuta</i>)	-	-	SGCN	This species prefers freshwater marshes and nests in pastures, hay fields, croplands, and successional old field. Suitable habitat for this species occurs within the Project Area.	F, I	No	Limited potential direct impacts because there are no proposed impacts to wetland habitats (refer to Appendix 22-6 for a description of wetland habitat in the Project Area). Potential indirect impacts are from habitat disturbance due to noise from construction activities near wetland habitat. Temporary or 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, however, this is a

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
							impacts could include habitat disturbance related to construction activities.	habitat used ephemeraly by the species where flooding occurs.
Prothonotary Warbler (<i>Protonotaria citrea</i>)	-	-	SGCN-HP	This species prefers wooded swamps and nests near borders of lakes, rivers, and ponds, normally only in areas with slow-moving or standing water. Suitable habitat for this species occurs within the Project Area.	I	No	Limited potential direct impacts because there are no proposed impacts to wetland habitats (refer to Appendix 22-6 for a description of wetland habitat in the Project Area). Potential indirect 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.	Impacts to ponds, lakes, and rivers 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.
Queen Snake (<i>Regina septemvittata</i>)	-	END	SGCN-HP	This species prefers rivers and streams with a rocky or gravel substrate. Overhanging woody vegetation is typical and individuals can be found among or under rocks at the	G, I	No	Potential direct impacts include habitat degradation and fragmentation from placement of Project Components on 28.3 acres of successional shrublands and forests to early successional	Impacts to successional shrublands and forested areas have been minimized to the maximum extent practicable by siting most of the

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				water's edge. Suitable habitat for this species occurs within the Project Area.			grasslands. Habitat loss will occur on 0.6 acres. Potential indirect impacts could include habitat disturbance due to machines and equipment use through shallow wetlands.	Project Components in shallow wetland areas. Tree and shrub clearing is necessary to prevent trees from overhanging solar arrays.
Red-headed Woodpecker (<i>Melanerpes erythrocephalus</i>)	-	SSC	SGCN-HP	This species prefers open deciduous forests, forest edges, groves, and orchards. Suitable habitat for this species occurs within the Project Area.	C, F, I	No	Potential direct impacts include habitat degradation and fragmentation, from the placement of Project Components on 22.7 acres and a loss of 0.4 acres 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 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.
Red-shouldered Hawk (<i>Buteo lineatus</i>)	-	SSC	SGCN	This species prefers bottomland woods, wooded stream-sides, and swamps. Suitable habitat for this species occurs	F, I	No	Potential direct impacts include habitat degradation and fragmentation from the placement of Project Components on 22.7 acres and loss of 0.4 acres of forests to early	Impacts to forested areas have been minimized to the maximum extent practicable by siting most of the Project

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				within the Project Area.			successional grasslands. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Components in agricultural areas. Tree clearing is necessary to prevent trees from overhanging solar arrays.
Ruddy Duck (<i>Oxyura jamaicensis</i>)	-	-	SGCN	This species prefers fresh marshes, ponds, and lakes; in winter, salt bays. Breeds on fresh or alkaline lakes and ponds with extensive marshy borders and with areas of open water. Limited areas of suitable habitat for this species occurs within the Project Area.	I	No	No potential direct impacts, because there are no proposed impacts to ponds, lakes, rivers, or forested wetlands (refer to Appendix 22-6 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.
Rusty Blackbird (<i>Euphagus carolinus</i>)	-	-	SGCN-HP	This species prefers river groves, wooded swamps; muskeg in summer. During migration and winter, favors areas with trees near water, as in wooded swamps and riverside forest.	F, I	No	Potential direct impacts include habitat degradation and fragmentation, from the placement of Project Components on 22.7 acres and a loss of 0.4 acres of forests to early successional grasslands. Potential	Impacts to forested areas have been minimized to the maximum extent practicable by siting most of the Project components in agricultural areas.

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				Suitable habitat for this species occurs within the Project Area.			indirect impacts could include habitat disturbance due to noise and construction activity.	Tree and shrub clearing is necessary to prevent trees from overhanging solar arrays.
Scarlet Tanager (<i>Piranga olivacea</i>)	-	-	SGCN	This species prefers expansive deciduous and mixed forest canopies. Suitable habitat for this species occurs within the Project Area.	C, D, I	No	Potential direct impacts include habitat degradation and fragmentation from the placement of Project Components on 22.7 acres and loss of 0.4 acres 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.
Silver-haired Bat (<i>Lasionycteris noctivagans</i>)	-	-	SGCN	This migratory species prefers temperate, northern hardwoods with ponds or streams nearby. They typically forage along in forests, forest edges, open water, and other	I	No	Potential direct impacts include habitat degradation and fragmentation, from the placement of Project Components on 22.7 acres of forests to early successional grasslands. Potential direct impacts include a	Impacts to forested areas have been minimized to the maximum extent practicable by siting most of the Project Components in agricultural areas.

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				riparian areas. Suitable summer habitat occurs within the forested portions of the Project Area.			habitat loss of 0.4 acres of forests. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Tree clearing is necessary to prevent trees from overhanging solar arrays.
Smooth Green Snake (<i>Liochlorophis vernalis</i>)	-	-	SGCN	This species prefers wet grassy areas along stream or woodland edges, meadows and abandoned farmland, as well as manicured lawns provided that there is sufficient nearby cover. Suitable summer habitat occurs within the forested portions of the Project Area.	G, I	No	Potential direct impacts include habitat degradation and fragmentation from placement of Project Components on 28.3 acres of successional shrublands and forests to early successional grasslands. Habitat loss will occur on 0.6 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 the maximum extent practicable by siting most of the Project Components in shallow wetland areas. Tree and shrub clearing is necessary to prevent trees from overhanging solar arrays.
Spotted Turtle (<i>Clemmys guttata</i>)	-	SSC	SGCN-HP	This species prefers a mosaic of habitats including ponds, emergent marshes, shrub swamps, forested wetlands, fens, wet meadows,	G, I	No	There will be no impacts to ponds and large standing bodies of water. Potential direct impacts include habitat degradation and fragmentation from	Impacts to successional shrublands and forested areas have been minimized to the maximum extent

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				seasonal pools, streams, rivers, and forests and other upland habitats. Suitable habitat for this species occurs within the Project Area.			placement of Project Components on 28.3 acres of successional shrublands and forests to early successional grasslands. Habitat loss will occur on 0.6 acres. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	practicable by siting most of the Project Components in agricultural areas. Tree and shrub clearing is necessary to prevent trees from overhanging solar arrays.
Tennessee Warbler (<i>Leiothlypis peregrina</i>)	-	-	SGCN	This species prefers Deciduous and mixed forests; in migration, groves, brush. Breeds in bogs, swamps, and forests. Suitable habitat for this species occurs within the Project Area.	F, I	No	Potential direct impacts include habitat degradation and fragmentation from placement of Project Components on 22.7 acres of successional shrublands and forests to early successional grasslands. Habitat loss will occur on 0.4 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 is necessary to prevent trees from overhanging solar arrays.

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
Vesper Sparrow (<i>Poocetes gramineus</i>)	-	SSC	SGCN-HP	This species responds quickly to changes in habitat and often occupies abandoned old farm fields and successional shrublands as they return to forest. Suitable habitat for this species occurs within the Project Area.	C, D, F, I	Yes	Potential direct impacts include habitat degradation and fragmentation from the placement of Project Components of on of 5.6 acres and a loss of <0.1 acre of successional shrublands to early successional fields. However, the species is likely to benefit from the use of 1,521.7 acres of agricultural lands and successional old fields which will be maintained as early successional fields for the useful life of the Project. . 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. Areas used for Project Components will be maintained as early successional grasslands for the useful life of the Project. Presence of this habitat at solar facilities has been shown to benefit grassland bird species (see Section 22(f)(6)) and may improve habitat quality for this species at the Project.
Wood Thrush (<i>Hylocichla mustelina</i>)	-	-	SGCN	This species prefers deciduous and mixed forests with large trees, moderate	C, D, F, I	Yes	Potential direct impacts include habitat degradation and fragmentation, from the placement of Project	Impacts to forested areas have been minimized to the maximum extent

Table 22-11. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site	Potential Impacts ⁶	Impacts Avoidance Measures
				understory, shade, and abundant leaf litter. Suitable habitat for this species occurs within the Project Area.			Components on 22.7 acres and loss of 0.4 acres of forests to early successional grasslands. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	practicable by siting most of the Project Components in agricultural areas. Tree clearing is necessary to prevent trees and shrubs from overhanging solar arrays.
<p>1 - 'Federal Status' refers to the species listing as federally endangered (END) OR threatened (THR).</p> <p>2 - 'NYS Status' refers to the species listing as a state-listed endangered (END), threatened (THR), or species of special concern (SSC).</p> <p>3 - 'SGCN Listing' refers to the species state listed as a Species of Greatest Conservation Need – High Priority (SGCN-HP), Species of Greatest Conservation Need (SGCN), or a Species of Potential Conservation Need (SPCN).</p> <p>4 - References for habitat preference were Audubon.org, Allaboutbirds.org, NYNHP, and NYSDEC Species Wildlife Action Plan (SWAP).</p> <p>5 - "Source of Potential Presence" refers to the source of information indication the potential presence of the species at the Project Area:</p> <p>A: Species identified by NYNHP as occurring within 10 miles of the Project Area</p> <p>B: Species identified by USFWS online database (IPaC)</p> <p>C: Species identified in the USGS BBS</p> <p>D: Species identified in the NYS BBA</p> <p>E: Species identified in the Audubon CBC</p> <p>F: Species identified in eBird</p> <p>G: Species identified in the Herp Atlas</p> <p>H: Species identified in the NYSDEC Statewide Fisheries Database</p> <p>I: Species distribution range in the NYSDEC SWAP</p> <p>6 - Habitat for listed species with potential to occur is shown on Figures 22-1 and 22-3.</p>								

22(p) 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 wetland delineations, a total of 14 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/or identified by the WNY Partnership for Regional Invasive Species Management (PRISM). These species are listed below:

- alder/glassy buckthorn,
- black locust,
- common buckthorn,
- common reed,
- Canada thistle,
- dames rocket¹,
- garlic mustard,
- Japanese barberry,
- Japanese honeysuckle,
- morrow honeysuckle (*Lonicera morrowii*)²,
- multiflora rose,
- reed canary grass¹,
- pale swallow wart, and
- yellow flag iris.

As part of the Application and in preparation for construction, an ISMCP was prepared to describe the survey methods utilized to identify invasive species populations currently present on site (Appendix 22-8). This management plan also includes proposed control procedures of current and introduced invasive populations, including locating and identifying target species, establishing

¹ Not Listed as prohibited on the NYSDEC *Prohibited and Regulated Invasive Plants* list; Identified as invasive by WNY PRISM

² Not identified by WNY PRISM; Listed as prohibited on the NYSDEC *Prohibited and Regulated Invasive Plants* list

a removal protocol, inspecting construction materials (including fill) and equipment, cleaning equipment, and site restoration. The ISMCP also discusses in detail the monitoring methods that 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 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 5-year period with monitoring events being conducted the first, third, and fifth years 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 to create an adaptable and responsive management framework.

22(q) Temporary and Permanent Impacts on Agricultural Resources

According to Table 22-1, cultivated crops and grass/pasture/hay are the dominant land cover types at the Project Area with 2,411.9 acres (70.1% of the Project Area) in row crop agriculture and 486.5 acres (14.1% of the Project Area) in hay/alfalfa/wheat. Agricultural land at the Project Area is within a New York State-certified Agricultural District – Genesee County District 4. 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.

As noted 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 1,521.7 acres of agricultural land will be employed for nonagricultural use for the siting of Project components during the useful economic life of the Project (30+ years).

The NYSDAM has issued *Guidelines for Agricultural Mitigation for Solar Energy Projects* (2018). Project construction and operation will comply with these guidelines to the maximum extent practicable to minimize and/or mitigate impacts to agricultural resources. If these guidelines cannot be met, then the Applicant will 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(w). This discussion includes detailed information as to how Project construction, operation, and ultimate decommissioning activities within agricultural areas will be implemented and monitored, in accordance with the above-listed guidelines.

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