WATKINS GLEN SOLAR ENERGY CENTER

Case No. 17-F-0595

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 February 21, 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, permanent, and conversion impacts to the representative plant communities within the Project Area are not expected to result in the significant loss or extirpation of any representative plant community (see Section 22(b)). Further, no take of listed species or their respective habitat will result from Project development (see Section 22(f)). Of the entire 771-acre Project Area, only approximately 7.07 acres (0.9%) of wildlife habitat including forestlands, grasslands, and shrublands will be permanently lost due to the placement of Project Components. The remaining 26.82 acres (3.5%) proposed for placement of Project Components are currently in use for agricultural production, which provides limited perpetual wildlife habitat due to the regular disturbances and anthropogenic pressures of active farming practices (see Section 22(f)(4)) or already developed land. Further, areas between and under solar arrays will be converted from agriculture to native grasses and may result in a net conservation benefit to species reliant upon these habitats that are limited in New York State. Additionally, through careful siting of Project Components, impacts to wetlands within the Project Area have been minimized to the maximum extent practicable (see Section 22(m)) and no wetlands mapped by the New York State Department of Environmental Conservation (NYSDEC) will be impacted by the Project.

In addition to the Project and Study Area studies, the Applicant, at the request of the NYSDEC, conducted a Cumulative Impact Analysis to evaluate potential impacts from the Project and all proposed and operating solar energy projects greater than or equal to 5 MW, based upon data provided by NYSDEC, occupying grassland habitat within 100 miles of the Project Area in the State of New York on federally and state-listed threatened or endangered species, particularly grassland birds (Appendix 22-4). Grassland habitat within the Project Area includes 266.1 acres of hay/pasture lands, comprising 34.5% of the total Project Area, and less than 0.01% of available grassland habitat within 100 miles of the Project Area. However, revegetation following construction may result in a net increase of available grassland habitat within the Project Area. Cumulative impacts to habitat for grassland breeding birds was estimated for 114 Study Projects identified within a 100-mile radius of the Project Area. 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)(10) and Appendix 22-4). This analysis represents an extremely conservative approach, which 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.

22(a) Plant Communities

The Project Area resides in the Laurentian Mixed Forest Province and The Northern Allegheny Plateau Section ecoregions of the United States as defined by the USDA Forest Service (Bailey, 1995). The Laurentian Mixed Forest Province climate is characterized by long and somewhat severe winters and a short growing season, with average annual temperatures ranging from 35 to 50 degrees Fahrenheit. Altitudes range from sea level to 2,400 feet above mean sea level (AMSL). The vegetation is transitional between the boreal forest and broadleaf deciduous forest zones. Forest vegetation consists of mixed stands of coniferous species (e.g., eastern white pine [*Pinus strobus*, first observed on-site June 6, 2017] and eastern hemlock [*Tsuga canadensis*, first observed on-site April 26, 2019]) and deciduous species (e.g., yellow birch [*Betula allegheniensis*, first observed on-site April 25, 2019], sugar maple [*Acer saccharum*, first observed on-site April 23, 2019], and American beech [*Fagus grandifolia*, first observed on-site April 25, 2019]), and a mosaic of pure deciduous forest and pure coniferous forest depending on the quality of soil (Bailey, 1995).

The Northern Glaciated Allegheny Plateau is characterized by irregular topographic features such as broadly rolling hills and steep valleys. Elevation ranges from 650 to 1,970 feet AMSL. Forest communities include northern hardwoods and Appalachian oak forest. Regionally important forest communities include Appalachian oak-hickory forest, Appalachian oak-pine forest, beech-maple forest, and hemlock-northern hardwood forest (McNab and Avers, 1994).

The Project Area encompasses approximately 771 acres and is composed predominately of agricultural land and forestland. Agricultural areas consist predominately of corn and alfalfa. Land cover in the Project Area was determined using the National Land Cover Data (NLCD), aerial photography, and on-site observations.

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

Cover Type	Acreage	Percent of Project Area
Active Agriculture	360	46.7
Disturbed/Developed	35	4.5
Forestland	305	39.6
Open Water	1	0.1
Successional Old Field	36	4.7
Successional Shrubland	34	4.4
Total	**771**	**100.0**

Plant community mapping was compiled from numerous sources, including data collected during on-site field survey work, roadside observation, desktop analysis, and interpretation of aerial imagery. All documented plant communities within the Project Area are common in the State of New York. Descriptions of these plant communities and their dominant plant species are provided below. Note that the cover types on Figure 22-1 include the communities described in *Ecological Communities of New York State* (Edinger et al., 2014) listed below.

Agricultural Land

Active agricultural land in the form of hay fields and cultivated crops is extremely common within the Project Area and covers approximately 360 acres (46.7%) of the Project Area. Approximately 360 acres of agricultural land will be used for Project Components, then restored following the decommissioning of the Project. In *Ecological Communities of New York*, there are multiple types of terrestrial cultural communities within the agricultural land designation, including cropland/row crops (Heritage Rank: unranked cultural), cropland/field crops (unranked cultural), and pastureland (unranked cultural) (Edinger et al., 2014). Most agricultural land within the Project Area is fallow/idle cropland or non-alfalfa hay fields. Dominant plants in hayfields and pastures in the Project Area were orchard grass (*Dactylis glomerata*, first observed on site June 8, 2017), red clover (*Trifolium pratense*, first observed on site June 6, 2019), and timothy-grass (*Phleum pratense*, first observed on site June 7, 2017). Most row crops established within the Project Area are corn (*Zea mays*) and alfalfa (*Medicago sativa*).

Forestland

Forested land covers approximately 305 acres (39.6%) of the total land coverage for the Project Area. Within this cover type are a variety of forested communities that support some local animal populations. Specific forest communities, as defined in *Ecological Communities of New York*, are found within the Project Area and their descriptions are below.

Appalachian oak-hickory forest (Heritage Rank: G4G5 S4 [Apparently secure globally and in New York State]) – This hardwood forest occurs on ridgetops, upper slopes, and on the south- and west-facing slopes. Soils are well-drained and normally have a sandy loam or general loam texture. The dominant tree in this community was northern red oak (*Quercus rubra*, first observed April 22, 2019). Red maple (*Acer rubrum*, first observed April 26, 2019), white ash (*Fraxinus americana*, first observed June 7, 2017), and eastern hophornbeam (*Ostrya virginiana*, first observed April 25, 2019) occur as common associates in this forest. The shrub layer of this forest includes saplings of the tree species and shrubs such as common blackberry (*Rubus allegheniensis*, first observed June 8, 2017), nannyberry (*Viburnum lentago*, first observed April 23, 2017), and red osier dogwood (*Cornus racemosa*, first observed June 7, 2017).

Beech-maple mesic forest (Heritage Rank: G4 S4 [Apparently secure globally and in New York State]) – 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 and American beech the codominant species. Common associates occurring in the community are yellow birch, white ash, eastern hophornbeam, and red maple. Eastern hemlock may also occur. The shrub layer of this forest includes saplings of the tree species along with American hornbeam (*Carpinus caroliniana*, first observed on April 23, 2019). Saplings of sugar maple and American beech comprise the ground layer.

Hemlock-northern hardwood forest (Heritage Rank: G4G5 S4 [Apparently secure globally and in New York State]) – Hemlock-northern hardwood forest communities are mixed and generally occur on the middle to lower cool slopes of shaded ravines and hillslopes. These communities occur on moist, well-drained, loamy soils. Eastern hemlock is predominant within the tree stratum and can range in coverage from pure stands to comprising only 20% of the tree canopy. Along with eastern hemlock, there is an assortment of tree species that can act as a codominant within this community. Relative to the Project Area, American beech, American basswood (*Tilia americana*, first observed on June 8, 2017), and sugar maple have been observed to be codominant tree species. Along with the saplings of the canopy trees, nannyberry and a range of

raspberries (*Rubus* spp.) populate the shrub layer. Due to the low light environment created by the hemlock dominant tree stratum, the ground layer of this community is generally sparse.

Red maple-hardwood swamp (Heritage Rank: G5 S4S5 [Demonstrably secure globally, apparently or demonstrably secure in New York State]) – Red-maple hardwood swamps occur in poorly drained depressions, usually on inorganic soil, but occasionally on muck or shallow peat. It is a broadly defined community with several regional variants. Generally, red maple is either the only canopy dominant or codominant with one or more hardwoods, including ashes, American elm (*Ulmnus americana*, first observed June 8, 2017), and yellow birch. Other trees present could include American hornbeam and eastern white pine. The shrub layer is usually well-developed and may be quite dense due to characteristic shrubs such as gray alder (*Alnus incana*, first observed April 25, 2019), nannyberry, silky dogwood (*Cornus amomum*, first observed April 23, 2019), and redosier dogwood. The herbaceous layer may be quite diverse and is often dominated by ferns, including sensitive fern (*Onoclea sensibilis*, first observed April 26, 2019), and cinnamon fern (*Osmundastrum cinnamomeum*, first observed April 25, 2019).

Successional northern hardwoods (Heritage Rank: G5 S5 [Demonstrably secure globally and in New York State]) – Successional northern hardwoods are common throughout the Project Area. Most of the Project Area was likely forested and has been cleared for agriculture. Successional forests can develop either after man-made clearing events or in the wake of destructive natural events (floods, blow-downs during high wind events, forest fires, etc.). After clearing has occurred, and the impacted land begins to revert to forests, plant species that are well-adapted to establishment after disturbances begin to populate the area. Characteristic trees dominating successional northern hardwoods within the Project Area include quaking aspen (*Populus tremuloides*, first observed June 7, 2017), black cherry (*Prunus serotina*, first observed April 23, 2019), red maple, and eastern white pine. White ash, green ash (*Fraxinus pennsylvanica*, first observed June 8, 2017), and American elm can be found in this community as well but at lesser numbers.

Disturbed/Developed Land

Disturbed/developed land covers approximately 35 acres (4.5%) 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 tends 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 multiflora rose (*Rosa multiflora*, first observed June 6, 2017), common buckthorn (*Rhamnus cathartica*, first observed June 8, 2017), tartarian honeysuckle (*Lonicera tatarica*, first observed June 8, 2017), purple loosestrife (*Lythrum salicaria*, first observed June 6, 2017), and various upland grasses generally populate these developed areas.

Successional Old Field

Successional old fields (Heritage Rank: G5 S5) cover approximately 34 acres (4.4%) of the Project Area. 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 include many goldenrods (*Solidago* spp.), timothy grass, Queen Anne's lace (*Daucus carota*, first observed June 8, 2017), wild strawberry (*Fragaria virginiana*, first observed June 7, 2017), and common dandelion (*Taraxacum officinale*, first observed June 8, 2017). 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, dogwoods, viburnums, and small willows (*Salix* spp., first observed June 8, 2017). If not maintained by infrequent mowing, this relatively short-lived community succeeds to a successional shrubland, woodland, or forest community.

Wetlands

Wetlands comprise 22.7 acres, or 2.9%, of the delineated Project Area. Specific wetland communities within the Project Area include shallow emergent marshes (Heritage Rank: G5 S5), deep emergent marshes (Heritage Rank: G5 S5), shrub swamps (Heritage Rank: G5 S5), vernal pools (Heritage Rank: G4 S3), and red maple hardwood swamps (Heritage Rank: G5 S4S5

[Demonstrably secure globally, apparently or demonstrably secure in New York State]). A more detailed characterization of the wetland communities can be found in Section 22(j). Note the wetland cover type overlaps with the other plant community types discussed in this section; therefore, the total acreages in this section exceed the total Project Area.

Successional Shrubland

Successional shrubland (Heritage Rank: G5 S5) covers approximately 36 acres (4.7%) of the Project Area. This community represents shrublands that have established after a site has been cleared (e.g., for agriculture, logging, or development) or was disturbed by 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 redosier dogwood, multiflora rose, common blackberry, nannyberry, silky dogwood, common buckthorn, various shrub willows, and tartarian honeysuckle. 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, common dandelion, and sweet-scent bedstraw (*Galium mollugo*, first observed June 8, 2017).

Open Water

Open water communities are sparse within the Project Area, covering approximately 1 acre (0.1%) of the Project Area. Open water areas are characteristic of man-made and natural lacustrine and riverine systems located within the Project Area. Lacustrine systems (i.e., relating to ponds and lakes) within the Project Area include farm ponds/artificial ponds (Heritage Rank: unranked cultural). Specific riverine systems (i.e., relating to confined waterbodies) in the Project Area include intermittent streams (Heritage Rank: G4 S4) and ditch/artificial intermittent streams (Heritage Rank: unranked cultural). Although aquatic vegetation grows within some of these communities, emergent wetland vegetation often grows along the periphery of open water communities as well. Typical emergent wetland species associated with open water communities within the Project Area include reed canary grass (*Phalaris arundinacea*, first observed June 6, 2017), blunt spike-rush (*Eleocharis obtusa*, first observed June 6, 2017), and field horsetail (*Equisetum arvense*, first observed June 6, 2017).

22(b) Impacts to Plant Communities

(1) Proposed Temporary and Permanent Impacts

The Limit of Disturbance for the Project is approximately 391.5 acres, which represents approximately 50.7% of the Project Area. The construction and operation of the Project will cause temporary and relatively small permanent impacts to some of the ecological communities and associated plant communities through vegetation clearing necessary for safe Project-related construction and activities. Areas that are temporarily impacted will be restored to their original condition. Permanent impacts to plant communities will occur in areas designated for permanent operation of the Project. Calculations of specific impacts to these communities within the Project Area are based on disturbance areas assigned to each Project Component as well as the Preliminary Design Drawings in Exhibit 11. These disturbance areas are described in Table 22-2 below.

Table 22-2. Project Component Impact Areas

Project Components	Vegetative Clearing Area (acres)	Soil Disturbance Area (acres)	Area of Permanent Impact (acres)
Solar Panel Installations	296.37	172.81	0.38
Access Roads	8.61	8.76	4.94
Temporary Access Roads	0.26	0.28	0.00
Culvert/Riprap	0.05	0.06	0.06
Temporary Culvert/Riprap	0.01	0.01	0.00
Collection Lines/HDD Bore Pits	2.75	2.82	0.00
Laydown/Parking	6.97	6.97	0.00
Collection Substation/ Switchyard/Inverters	1.67	1.67	1.23
Fence[1]	0.88	0.88	0.00
Tree Clearing[2]	96.37	96.37	0.00

Notes: Project Components may overlap, therefore, the values in this table overestimate the impacts to each community type

1. Remaining security fenced area is not impacted by Project Components.
2. Additional forestland conversion outside Project Components to prevent shading.

While the Project layout may ultimately co-locate various components (e.g., electric collection lines and access roads), the potential impacts identified for this analysis assume no co-location and are instead presented for each component. As such, impact calculations were completed in a conservative manner, and therefore, likely overstate the potential impacts, as the potential for overlap in component impact areas is not assumed in the calculations. This method of impact calculation also alleviates temporal variation of impacts to vegetative communities within the Project Area.

Construction of the Project will result in a temporary disturbance of approximately 4.49 acres of vegetation associated with hayfields and pastures (successional old fields). Agricultural areas with pre-existing hayfield communities will be temporarily impacted by the installation of the solar arrays, as a similar grassland community will be planted below the arrays. Temporary impacts to agricultural land will occur from the siting of 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 grasses and forbs that require periodic mowing. Agricultural areas with row crops will be converted for the useful life of the Project due to the installation of the solar arrays, since the plant community that will be maintained beneath the arrays will be different from the pre-existing row crops. Agricultural land that is used for Project Components will be restored and agricultural activities can be resumed following decommissioning of the Project. A total of approximately 236.00 acres of agricultural land will be employed for Project Components for the useful life of the Project.

The clearing of forested cover types within the Project Area was minimized to the maximum extent practicable. Permanent impacts occur where forestland will be directly replaced with Project Components (i.e., access roads, solar array posts, inverter pads, equipment foundations). There will be approximately 0.44 acres of permanent impact to forests within the Project Area.

There will be no temporary impacts to forests within the Project Area. Forest conversion impacts will occur within the Project Area where forests are initially cleared for Project construction, then maintained as successional old-field or shrubland communities for the life of the Project, due to clearance constraints. Forest conversion is anticipated to occur on approximately 98.54 acres of forestland in the Project Area.

In general, forest fragmentation is the process by which forest areas are divided into smaller, isolated patches of forest. Fragmentation can result from the creation of openings, farmland expansion, the creation or widening of road corridors, or the establishment of developed areas. Approximately 65.8 acres of forestland within the Project Area are interior forest. The proposed Project layout will result in the reduction of 19.7 acres of interior forest (30.4%). Clearing activities will also result in an increase of peripheral forest, defined as forest within 300 feet of the forest edge. Of the forest remaining after clearing, no acres will have been converted to peripheral forest. The additional peripheral will be created through the placement of solar arrays within existing forest patches, and vegetation clearing to prevent shading. Forest patches within the Project Area are located on the periphery of an extensive forested tract, which extends to the south and west, connecting to two state forests: Coon Hollow and Sugar Hill. Construction of the Project will result in a small reduction of forested area; however, significant, protected forest habitat is abundant in the surrounding area. Further, the Project Area consists of a matrix primarily composed of agricultural lands with forested habitat representing only a small component (40%). It is unlikely that edge-sensitive species are presently using the forested areas therein. Increasing the amount of peripheral forest in this landscape is not likely to result in additional edge effects. Physical barriers resulting from this action are minor and unlikely to alter the existing avian communities or significantly change their behaviors. For more information on habitat fragmentation and edge effects caused by the Project, please refer to Section 22(f)(9) of this Exhibit.

The construction of the Project will also result in the temporary disturbance of approximately 0.30 acres of successional shrubland communities, 1.41 acres of successional old field communities, and 0.09 acres of developed land communities. Temporary impacts will occur from the initial clearing and disturbance of these cover types for purposes of construction access, the siting of Project Components, and the burying of underground collection lines. Once the Project becomes operational, these areas will return to their preexisting condition. Permanent loss will occur to approximately 1.13 acres of successional shrubland communities, 4.49 acres of successional old field communities, and 0.76 acres of developed land communities. Permanent loss of these cover types will occur from the siting of Project Components.

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

Temporary, permanent, and conversion impacts to the representative plant communities within the Project Area are not expected to result in the significant loss or extirpation of any

representative plant community. Temporary, permanent, and conversion impact acreages for each representative community in the Project Area are provided in Table 22-3 below. See Figure 22-2 for a depiction of 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. Vegetation Impact Calculations

Cover Type/Habitat	Permanent Impact (Acres)	Temporary Loss (Acres)	Employed for Useful Life of Project (Acres)
Forestland	0.44	1.03	98.54
Successional Shrubland	0.29	1.13	12.12
Successional Old Field	1.41	4.49	7.82
Open Water	0	0	0.00
Agricultural Land	4.38	23.93 (Useful Life of Project Only)	236.00 (Useful Life of Project Only)
Developed Land	0.09	0.76	0.07
Total	**6.51**	**30.58**	**354.47**

(2) Vegetation Management Plans for Construction and Operation

As part of the Application, and in preparation for construction, an Invasive Species Management and Control Plan (ISMCP) was prepared to describe the survey methods that were used to identify invasive species populations present on site, as well as control methods moving forward with the Project. The ISMCP is further detailed in Section 22(p) of this Exhibit. Control and management methods for high priority invasive species in the Project Area are further addressed in Appendix 22-7.

Prior to the start of construction, crews will be educated regarding the contents of the ISMCP to ensure that their activities on site comply with best management practices (BMPs) outlined in the Plan. To prevent the introduction and spread of listed 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.

Following the construction phase of the Project, the Applicant will restore temporarily disturbed areas. The area around and between solar arrays will be planted with a solar farm grass seed mix composed of grasses that are indigenous 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 around the solar arrays in select areas to create a visual buffer. Periodic pruning of these trees and shrubs will be necessary to keep branches from growing over the solar arrays. See Appendix 11-1 for a detailed Landscaping Plan of the Project Area. See Exhibit 5 for 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 and Minimization Measures for Plant Community Impacts

(1) Avoidance and Minimization of Plant Community Impacts

Avoidance and minimization of plant community impacts have been undertaken for the Project. 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 to confine disturbances to the smallest area possible. To minimize impacts to plant communities, solar panels and work areas are located within previously disturbed agricultural areas and open fields to the maximum extent practicable.

Linear Project Components, such as access roads and collection lines, have been co-located to avoid and minimize impacts to plant communities. Solar panels have been proposed in areas already disturbed by agriculture to the maximum extent practicable.

A comprehensive erosion and sediment control plan will be developed and utilized 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 Stormwater Pollution Prevention Plan (SWPPP), available as Appendix 23-3.

Avoidance and minimization of impacts to vegetative communities will also occur by complying with guidance from on-site Environmental Monitors, maintaining clean work sites, employing BMPs during construction, operation, and maintenance, and by demarcating areas highly susceptible to adverse disturbances. These confined areas will be deemed inaccessible to construction equipment and any other disturbance activity.

No mitigation measures for impacts to vegetation are proposed as impacts to vegetative communities resulting from constructing and operating the Project do not include regulatory requirements for mitigation. No threatened or endangered vegetative species or significant natural communities will be disturbed; therefore, no mitigation is required. As part of the required decommissioning, the Project Area will be restored in accordance with Appendix 29-1 and other applicable guidelines at the end of the Project's life.

The Project only requires approximately 0.04 acres of temporary wetland impacts, 0.65 acres of wetland conversion impacts, and no permanent impacts to USACE or NYSDEC-mapped wetlands or NYSDEC wetland adjacent areas. There are no wetlands regulated by the Environmental Conservation Law (ECL) and implementing regulations within the Project Area, and therefore, no mitigation should be required. The Applicant has described potential options for mitigation if it is deemed necessary by the USACE, which include the purchase of credits from an approved in-lieu-fee program, the creation of an on-site compensatory mitigation area, the restoration or enhancement of wetlands in the impacted watershed, or some combination of these options. Correspondence with the USACE will be utilized to assist in the decision-making process as to which mitigation strategy is best suited for the Project, if deemed applicable. Refer to Section 22(n) for additional details.

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

(2) Post-construction Vegetation Restoration

Following the construction phase of the Project, restoration of temporarily disturbed areas will occur. Temporarily disturbed areas (other than impacted agricultural areas) will be seeded with typical native species mixes. These seeded areas will be further stabilized with mulch and left to reestablish preexisting vegetation. 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 grassland species. Trees and shrubs will be planted in select areas around the solar arrays to create a visual buffer.

Woody-type plantings of native species found to be beneficial to pollinators, such as black cherry, downy shadbush (*Amelanchier arborea*), red chokeberry (*Aronia arbutifolia*), common witch hazel (*Hamamelis virginiana*), common snowberry (*Symphoricarpos* spp.), and highbush blueberry (*Vaccinium corymbosum*) may be included in the proposed landscape buffer. Additionally, patches of pollinator seed mix that include a variety of perennial type species will be sown as well to further enhance and supplement pollinator habit created in and around 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 Scrubland			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)
Solar Panel Installations	0.00	0.27	205.39	0.00	0.01	5.13	0.00	0.01	11.36	0.00	0.09 (0.02 acres of interior forest)	73.23 (13.65 acres of interior forest)
Access Roads	0.00	4.02	2.57	0.00	0.21	0.35	0.00	0.28	0.05	0.00	0.33 (0.06 acres of interior forest)	0.18 (0.01 acre of interior forest)
Temporary Access Roads	0.17	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Culvert/Riprap	0.01	0.05	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Temporary Culvert/Riprap	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Collection Lines/ HDD Bore Pits	1.41	0.00	0.00	0.22	0.00	0.00	0.12	0.00	0.00	0.37 (0.01 acre of interior forest)	0.00	0.00
Laydown/Parking	6.14	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.30	0.00	0.00
Collection Substation/ Switchyard/ Inverters	0.00	0.04	0.13	0.00	1.18	0.27	0.00	0.00	0.01	0.00	0.01	0.01 (0.01 acre of interior forest)
Fence	0.00	0.00	0.51	0.00	0.00	0.05	0.00	0.00	0.03	0.00	0.00	0.28 (0.07 acres of interior forest)
Fenced Area[1]	0.00	0.00	26.97	0.00	0.00	1.67	0.00	0.00	0.67	0.00	0.00	0.00
Tree Clearing[2]	0.00	0.00	0.37	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00	23.86 (5.87 acres of interior forest)
Limit of Disturbance[3]	16.20	0.00	0.00	4.27	0.00	0.00	0.49	0.00	0.00	0.37	0.00	0.00

Notes: Project Components may overlap, therefore, the values in this table overestimate the impacts to each community type.

1. Remaining security fenced area not impacted by Project Components.
2. Additional forestland conversion outside Project Components to prevent shading.
3. Remaining Limit of Disturbance, not impacted by Project Components, tree clearing, or within fenced area.

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

Vegetation was characterized through ecological community mapping conducted within the Project Area and proposed limits of disturbance for the Project. Several ecological communities were mapped in the Project Area during field surveys conducted between 2017 and 2019 (see Section 22(a)). TRC biologists documented specific plant species and general plant communities during on-site field surveys in the summer of 2017, the spring and summer of 2018, and spring of 2019. During field efforts, TRC biologists conducted a species inventory and general plant community survey for the Project Area, identifying plants to the species or genera and delineating the boundaries of established plant communities within the proposed limits of disturbance within the larger Project Area. Plant taxonomy was determined and reported based on the New York Flora Atlas (Weldy et al., 2019) and ecological communities described according to Edinger et al., 2014. A complete and compiled list of plant species observed within the Project Area is provided as Appendix 22-1. A list and description of plant communities identified are detailed in Section 22(a) of this Exhibit. Wetlands and wetland wildlife habitat are addressed separately in Sections 22(i) through Section 22(o).

Wildlife and wildlife habitat were evaluated through field reconnaissance and ecological surveys conducted on site, in conjunction with publicly available data from the following sources:

- New York Natural Heritage Program database,
- New York State Amphibian and Reptile Atlas Project,
- New York State Breeding Bird Atlas (BBA),
- United States Geological Survey (USGS) Breeding Bird Survey (BBS) data,
- National Audubon Society Christmas Bird Count (CBC) data,
- Hawk Migration 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 mapping and information provided in the above-mentioned sources are discussed in Section 22(e).

(1) Suitable Habitat Assessment

The Applicant referenced the United States Fish and Wildlife Services (USFWS) Environmental Conservation Online System (USFWS, n.d.), NYSDEC Environmental Resource Mapper (ERM)

(NYSDEC, n.d.), and the *U.S. National Wilderness Preservation System Map* (Ronald, 2012) to determine the presence and extent of significant natural communities or habitats of special concern located within the Project Area. Consultation with the New York Natural Heritage Program (NYNHP) indicated that there were no records of any rare or state-listed species at the Project Area or in the immediate vicinity. No significant natural communities or habitats of concern were found to occur 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. Additionally, no unusual habitats or significant natural communities were identified during field efforts conducted within the Project Area. Ecological communities observed are prevalent throughout New York State.

(2) Survey Reports

Survey reports identified in this Exhibit have been included with this Application. Specifically, the Application includes reports for the Applicant's breeding bird surveys (Appendix 22-2), winter raptor surveys (Appendix 22-3), wetland and stream delineations (Appendix 22-5), and other relevant survey information as noted in this exhibit. Draft Reports were submitted to the NYSDEC via email on January 16, 2020.

(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 present within the Project Area. Sources of publicly available information are listed below along with general discussions of the databases queried.

Grassland Breeding Bird Survey

A preconstruction monitoring survey of grassland bird species was conducted during the 2018 breeding season by the engineering services company Tetra Tech. The objective of the grassland breeding bird survey 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. No additional studies are recommended as the Project is not expected to negatively affect endangered or threatened grassland nesting species.

Bird species for which the presence and site use were surveyed for include:

- northern harrier (*Circus hudsonius*),
- 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*).

Additional grassland bird species that were the subject of the survey included:

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

The survey methodology followed the NYSDEC *Draft Survey Protocol for State-listed Breeding Grassland Bird Species* (NYSDEC, 2015a) and input provided by NYSDEC on similar studies done for the Applicant at other New York project sites. A total of 346.6 acres of potential grassland habitat, primarily composed of pasture and wet meadows, was determined to be present at the Project Area based on a preliminary habitat assessment. After applying obstruction buffers, a total of 69 acres of potential habitat remained, requiring seven survey points. An initial visit to the Project Area prior to the start of the surveys was conducted to verify growing conditions in the current year and resulted in the removal of two survey locations, which were located in fields converted to row crop agriculture. A total of five locations were surveyed for the remainder of the study.

Surveys were conducted within a 100-meter (m) radius plot centered on the survey location with a minimum distance of 250 m between survey locations. Survey protocol was based on the NYSDEC *Survey Protocol for State-listed Breeding Grassland Bird Species DRAFT- 2015* (NYSDEC, 2015a). Between May 21 and July 20, 2018, nine weekly surveys were performed at

the Project Area, and two additional evening surveys were performed specifically for Henslow's sparrow between June 21 and July 3, 2018.

Experienced field biologists conducted weekly point count surveys starting at one-half hour before sunrise until no later than 10:30 AM, per the NYSDEC survey protocol. Additional evening surveys were also conducted for Henslow's sparrow starting one hour before sunset and lasting until two hours after sunset. Surveys were not conducted during inclement weather, including precipitation, fog, or strong winds (i.e., greater than 10 to 12 miles per hour). Point count surveys were 5 minutes, during which all birds observed within 100 m of the survey point were recorded. Birds observed beyond 100 m from the survey point and during meander surveys (i.e., while traveling between points within the Project Area) were recorded as incidental observations.

Biologists observed a total of 297 individuals representing three grassland bird species including bobolink, savannah sparrow, and grasshopper sparrow, all of which were first observed on May 21, 2018, at the Project Area. No state or federally listed threatened or endangered species were observed to be present, breeding, or nesting on site.

Observations on site included grassland birds observed at the survey points, outside the 100-m radius circular plot, and birds observed during the meander surveys. Bobolinks (n = 189) were the most commonly observed grassland bird species comprising 63.6% of all grassland birds observed. Mean use was highest for bobolinks (3.42 birds/100-m radius plot/5 minutes), followed by savannah sparrows (1.21 birds/100-m radius plot/5 minutes), and grasshopper sparrows (0.09 birds/100-m radius plot/5 minutes). Bobolinks and savannah sparrows were the most numerous grassland species observed and these species can be expected where grassland habitat is present. Neither bobolink nor savannah sparrow are listed as threatened, endangered, or as a species of special concern (SSC) in need of conservation; however, the grasshopper sparrow is a state-listed SSC. A total of three grasshopper sparrows were observed at the Project Area during the breeding bird surveys.

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

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 survey of wintering grassland raptors at the Project Area as required 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 and northern harrier. No short-eared owls or northern harriers were observed during the survey.

The survey methodology followed the *NYSDEC Draft Survey Protocol for State-listed Wintering Raptor Species* (NYSDEC, 2015b). The Applicant prepared a site-specific protocol for the Project Area based on NYSDEC comments received on other similar projects. Surveys were performed using both rotating stationary survey points and weekly driving surveys along roads in areas of grassland habitat. Stationary survey points were situated in or near grassland habitat within the Project Area with clear visibility in all or most directions. Stationary survey points were approximately 1,000 m apart when multiple stationary survey points were needed to cover an area of grassland habitat. One stationary survey point was in the center of the Project Area, providing ample unobstructed visibility of habitats that may be used by short-eared owls and/or northern harriers for foraging or roosting. The driving route utilized roads at the Project Area that bordered grassland habitat. Short-duration (approximately 5 minutes) survey points along this route were performed at every location where habitat could be observed from the road, and safety was not compromised.

Surveys were performed in the winter of 2018–2019, and were conducted between November 15, 2018, and March 31, 2019.

Stationary surveys were conducted at the stationary survey location at least once every 2 weeks for the first 3 weeks of the study beginning on November 27, 2018, with study plan revisions resulting in a survey occurring at the Project Area every week from January 5, 2019 through the end of the study period (March 31, 2019). Driving surveys took place every week from January 5, 2019 through March 31, 2019. A total of 16 stationary surveys were conducted, and 13 driving route surveys were completed during the study period. Survey dates were targeted to take advantage of the best weather conditions during each week. Stationary surveys were initiated 1 hour before sunset and concluded when it was too dark to see flying birds, up to 1 hour after sunset.

Daytime driving surveys were conducted once a week prior to stationary surveys. Surveyors followed a set route around grassland areas visible from the road. Short observations of approximately 5 minutes were made at every location of grassland habitat that was visible from the road, where safety was not compromised. Surveys were completed with two surveyors: one person driving and the other making observations. Where raptors were noted between intended stopping locations, the driver pulled over as needed to confirm identification.

No short-eared owls or northern harriers were observed during the study. Red-tailed hawks were the most commonly observed raptor using the Project Area during both stationary and driving surveys and were present throughout the Project Area. No state-listed threatened or endangered species were observed during surveys. State-listed SSC, Cooper's hawk (*Accipiter cooperii*), were observed in the Project Area. Overall, raptor use of the Project Area was concentrated to the eastern half.

Two Cooper's hawks were observed during stationary surveys in the central portion of the Project Area. Cooper's hawk observations made up approximately 22% of total raptor observations during stationary surveys. Both observations were made during a single stationary survey at [redacted] on February 14, 2019. The first observation occurred at 16:29, lasting for 7 minutes. An adult individual of unknown sex was seen perched approximately 30 feet up in the tree line north of the survey site, then flew northward. Subsequently, a second observation was made at 16:45. The surveyor assumed this was most likely the same individual, as the hawk was seen 9 minutes later and in the same vicinity of the first sighting. An adult individual of unknown sex was seen to be perching in a tree northwest of the survey site, and then flew to the same tree as the first individual was seen perching in. The hawk eventually flew west away from the survey site. The second observation lasted for 23 minutes.

For a more detailed description of the wintering grassland raptor survey, including a list of incidental bird observations, please refer to Appendix 22-3.

Grassland Habitat

Based on the grassland breeding bird survey, there are approximately 346.6 acres of potential grassland habitat at the Project Area; however, not all this potential grassland habitat meets the requisite needs for the target species from the bird surveys. The Project Area may provide habitat for northern harrier at some point during the year; however, frequent disturbance associated with agricultural production is likely to discourage them from using the Project Area extensively for

breeding as they require vegetation greater than 60 centimeters in height for breeding habitat (Morgan and Burger, 2008). Further, existing development, including the Watkins Glen International Raceway, within the vicinity of the Project Area experiences frequent noise disturbance during the breeding season. Additionally, these and other state-listed grassland birds that have the potential to occur during the overwintering period (i.e., horned lark, short-eared owl) were not observed.

Grasshopper sparrows were observed limitedly during grassland breeding bird surveys conducted within the Project Area; however, the predominantly agricultural cover present throughout likely provides only marginal breeding habitat for this species. Grasshopper sparrows require relatively large (i.e., 125 to 247 acres) fields with low vegetation density and more than 20% bare soil for breeding habitat (Morgan and Burger, 2008). The dominant crops in the Project Area consist of corn and hay. Although grasshopper sparrows may utilize agricultural areas, the density and monotypic nature of these crops limit suitability for nesting sites. None of the grassland breeding bird survey points were characterized by low vegetation density and only one point had more than 20 % bare soil, which was ultimately converted to row crop. Further, the overall low number of individual birds and species documented during surveys conducted within the Project Area indicates potentially low-quality habitat for grassland breeding birds during any period of the year.

Consultation with the NYNHP indicated that there were no records of any rare or State-listed species at the Project Area or in the immediate vicinity. Although behavior consistent with probable breeding was observed for all special concern species documented during the grassland breeding bird survey, none were observed to be nesting or actively breeding within the Project Area.

Terrestrial Invertebrates

Terrestrial invertebrates are likely to utilize 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. Most of the terrestrial invertebrates' importance is 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 upstate New York are presumed present within the Project Area.

Active Agriculture

Active agriculture (e.g., row crops and fields mowed during the nesting season) provides marginal habitat for most species with potential to occur within the Project Area (see Appendix 22-1) 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 grasshopper sparrow and bobolink, which were observed during the Tetra Tech field surveys. 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. According to the Cropland Data Layer (CDL) and on-site observations, corn is the primary agricultural row crop at the Project Site (33.7 acres or 4.4% of the Project Area), followed by alfalfa (*Medicago sativa*) (32.4 acres or 4.2% of the Project Area), first observed on July 16, 2017, and oats (15.6 acres or 2.0% of the Project Area). Non-alfalfa hay is found within 102.8 acres or 13.3% of the Project Area. The largest contiguous area of active agriculture was approximately 196.5 acres, or 26.4%, of the Project Area. Birds identified in pastures and hayfields at the Project Area are noted in the grassland breeding bird survey and the wintering grassland raptor survey described above and in Appendix 22-2 and Appendix 22-3, respectively.

Forestland

Forest communities within the Project Area provide habitat for forest-associated species, however, only those species which do not require large tracts of contiguous forest. Few isolated patches of contiguous forest occur within the Project Area. Patches range in size from 0.1 to 94 acres and are concentrated in the eastern half of the Project Area. Forest patches are primarily mixed deciduous and dominated by northern red oak and eastern hemlock in the canopy layer.

Forested areas historically present were likely cleared to promote the agricultural production occurring within the Project Area at present. The remaining forest fragments are of such a limited extent that they are unlikely to be utilized by interior forest specialists, further interior forest species were not observed during surveys conducted on site (see below). 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 include the following:

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

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 agricultural, residential, and urban landscapes.

Reptiles and amphibians are believed to inhabit forest communities within the Project Area, based on observations of frogs and salamanders in forested wetlands and vernal pools on site. 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. Other species with potential to utilize forest communities at the Project Area include the following:

- Allegheny dusky salamander (*Desmognathus ochrophaeus*),
- Eastern American toad (*Anaxyrus americanus*),
- eastern milk snake (*Lampropeltis triangulum*),
- gray tree frog (*Hyla versicolor*),
- northern two-lined salamander (*Eurycea bislineata*),
- spotted salamander (*Ambystoma maculatum*),
- Jefferson salamander (*Ambystoma jeffersonianum*),
- spring peeper (*Pseudacris crucifer*), and
- wood frog (*Rana sylvatica*).

Bird species with potential to use the forest communities within the Project Area based on habitat requirements and distribution across New York State include the following:

- American redstart (*Setophaga ruticilla*),
- black-and-white warbler (*Mniotilta varia*),
- black-throated blue warbler (*Setophaga caerulescens*),
- black-throated green warbler (*Setophaga virens*),
- blue jay (*Cyanocitta cristata*),
- brown creeper (*Certhia americana*),
- common raven (*Corvus corax*),
- hooded warbler (*Setophaga citrina*),
- ovenbird (*Seiurus aurocapilla*),
- red-eyed vireo (*Vireo olivaceus*),
- scarlet tanager (*Piranga olivacea*),
- veery (*Catharus fuscescens*), and
- wood thrush (*Hylocichla mustelina*).

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 and the limited extent of forest clearing anticipated.

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 red and sugar maples, white ash, northern red oak, quaking aspen, black cherry, and eastern white pine (*Pinus strobus*). 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 less than 0.1 acre to 94 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 forest patches across the Project Area, which are isolated by agricultural fields that comprise the majority of the Project Area. Approximately 244.2 acres, or 31.6%, of the forestland at the Project Area, can be classified as edge forest, which is defined as forestland within 300 feet of the forest's edge along agricultural land and roads.

Successional Shrubland

Successional shrublands are highly dynamic habitats as the impacted area progresses in successional (seral) stages after a disturbance. The variability present in these environments creates wildlife habitat for wildlife species that are adapted to the complex structure created by regeneration processes across stratums (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, provide highly nutritious forage material for herbivore and browser species. Additionally, the low and oftentimes dense herbaceous and shrub vegetation, which 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 that may utilize successional shrubland communities within the Project Area include:

- coyote,
- eastern chipmunk,
- eastern cottontail,
- eastern gray squirrel,
- eastern raccoon,

- gray fox,
- long-tailed weasel,
- red fox,
- striped skunk,
- various mice,
- various shrews,
- various moles,
- Virginia opossum,
- white-tailed deer, and
- woodchuck (*Marmota monax*).

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

- common garter snake,
- eastern American toad,
- eastern milk snake,
- northern dusky salamander,
- northern two-lined salamander,
- spring peeper,
- northern leopard frog (*Lithobates pipiens*), and
- northern water snake (*Nerodia sipedon*).

Bird species that utilize successional shrubland habitat and with potential to occur in the Project Area include:

- American goldfinch (*Carduelis tristis*),
- American woodcock (*Scolopax minor*),
- brown thrasher (*Toxostoma rufum*),
- chestnut-sided warbler (*Setophaga pensylvanica*),
- common yellowthroat (*Geothlypis trichas*),
- eastern towhee (*Pipilo erythrophthalmus*),
- gray catbird (*Dumetella carolinensis*),
- indigo bunting (*Passerina cyanea*),

- prairie warbler (*Setophaga discolor*),
- song sparrow (*Melospiza melodia*),
- yellow-billed cuckoo (*Coccyzus americanus*), and
- yellow warbler (*Setophaga petechia*).

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

Successional Old Field

The open grassland habitats of successional old fields contain a vast array of grass, sedge, and rush species amongst many other herbaceous plant species. These 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 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 that support macroinvertebrate populations and provide nesting material and cover for grassland-nesting species.

Mammals believed to utilize grassland communities within the Project Area include:

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

- various shrews,
- various moles, and
- woodchuck.

Reptiles and amphibians believed to populate successional old-field communities within the Project Area include:

- common garter snake,
- eastern American toad,
- northern leopard frog, and
- spring peeper.

Two bird species that utilize successional old fields were observed during field surveys, bobolink and savannah sparrow. Bird species that may utilize successional old fields in the Project Area include:

- American goldfinch,
- American woodcock,
- bobolink,
- eastern bluebird (*Sialia sialis*),
- eastern kingbird (*Tyrannus tyrannus*),
- field sparrow (*Spizella pusilla*),
- house finch (*Haemorhous mexicanus*),
- house wren (*Troglodytes aedon*),
- savannah sparrow,
- red-winged blackbird (*Agelaius phoeniceus*), and
- tree swallow (*Tachycineta bicolor*).

There are areas of successional old field at the Project Area large enough to likely support some, but not all, of the species listed above. Bobolinks and savannah sparrows were observed in successional old fields during the grassland breeding bird survey. The high forb content of the successional old fields will likely not provide optimal habitat for some birds that favor grassland habitats, such as northern harrier. 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.

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, HMANA, eBird, and TNC surveys/reports. These sources were supplemented with reasonably available public information, including those identified in paragraph (d) above, and/or not already listed in this paragraph. TRC biologists documented a total of 90 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. See Appendix 22-1 for the master plant and wildlife species lists.

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 Trumansburg survey route is approximately 21 miles northeast of the Project Area extending south and east toward Ithaca and encompasses similar ecological communities present on site. A total of 121 species have been documented during the lifetime of this survey route, which has been surveyed 46 out of the last 53 years. Most birds documented have been common species found within the forests, forest edge, shrublands, old fields, and wetlands throughout New York State. Given the proximity of these observations to the Project Area (>20 miles), these

occurrences cannot be taken to indicate potential for occurrence within the Project Area. The most common species documented on this survey route include the following:

- red-winged blackbird,
- European starling (*Sturnus vulgaris*),
- American robin (*Turdus migratorius*),
- American crow (*Corvus brachyrhynchos*),
- song sparrow,
- common grackle (*Quiscalus quiscula*),
- house sparrow (*Passer domesticus*),
- northern cardinal (*Cardinalis cardinalis*),
- mourning dove,
- chipping sparrow (*Spizella passerina*), and
- barn swallow (*Hirundo rustica*).

Of species documented by the USGS BBS, Cooper's hawk and grasshopper sparrow have been observed at the Project Area during field surveys. Most of these species are common and widely distributed throughout their respective ranges. Additionally, many of the species listed are habitat generalists that 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.

New York State BBA

The New York State BBA statewide survey resource was used to identify any bird species with potential to breed within the Project Area. Survey point counts are conducted by volunteers in a 5-square kilometer survey block across New York State (McGowan and Corwin, 2008). The Project Area is located within a total of two New York State 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 89 species were observed to occur within the noted survey blocks (see Appendix 22-1 for a complete list of species).

One state-listed threatened species, northern harrier, was documented within the BBA survey blocks that overlap the Project Area in 2002. Two state-listed SSC, grasshopper sparrow and sharp-shinned hawk, were documented during the New York State BBA surveys in 2002.

However, the location of these observations within the survey block is unable to be determined, therefore, it cannot be assumed that the species was observed within or even near the Project Area. Consultation with the NYNHP did not indicate that state-listed species (i.e., northern harrier) are known to occur within the Project Area. Grasshopper sparrow were observed in the Project Area during surveys conducted by the Applicant (see Section 22(d)(3) above).

Audubon CBC

Data from the Audubon CBC was obtained to gain understanding on year-round and wintering avian inhabitants of the Project Area. The CBC provides a summary of avian species that inhabit regions during the early winter months. 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. A 15-mile-diameter search area is created in a locale area and all bird species and individuals observed in this predetermined search area are documented. The closest and most similar predetermined CBC zone is the Watkins Glen search area (Audubon Count Code: NYWG). This search area is approximately 5.5 miles northeast from the Project Area and includes the entire Project Area. A total of 57 avian species were reported during the 2018 count, which occurred on December 29, 2018. One state-listed endangered species, peregrine falcon, was identified during the CBC as well as three state-listed threatened species:

- bald eagle,
- northern harrier, and
- pied-billed grebe.

Additionally, Cooper's hawk, horned lark, and sharp-shinned hawks, all state-listed SSC, were identified during the survey. No federally listed endangered or threatened species were identified. Of these, Cooper's hawk have been documented within the Project Area during surveys conducted by the Applicant. Again, the exact location of these observations is not provided in the source data; therefore, these observations are of limited utility in documenting potential occurrence within the Project Area and rather indicate only that these species are locally occurring.

The Cornell Lab of Ornithology eBird

Citizen science data from eBird was obtained for Schuyler County to gain information on public observations within 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. Observations of listed species were reviewed for proximity to the Project Area, and only those species documented within 5 miles of the Project Area are reported, though the full list of species is provided in Appendix 22-1. No federally listed threatened or endangered species were documented on eBird in Schuyler County.

State-listed threatened species documented within 5 miles of the Project Area included:

- bald eagle, last observed in 2018;
- common tern (*Sterna hirundo*), last observed in 2019;
- least bittern (*Ixobrychus exilis*), last observed in 2019;
- northern harrier, last observed in 2020;
- pied-billed grebe (*Podilymbus podiceps*), last observed in 2019; and
- upland sandpiper, last observed in 2016.

Most of these species were documented in the Catherine Creek Marsh State Wildlife Management Area located approximately 4.6 miles east of the Project Area. This area contains extensive undisturbed habitats that attract a variety of species that would be unlikely to occur in the heavily disturbed and human-altered landscape present within the Project Area.

In this citizen-science database, 12 state-listed SSC have been documented in Schuyler County, of which 2 have been observed at the Project, including Cooper's hawk and grasshopper sparrow. Of the species documented in eBird, 119 were not reported in other sources reviewed. A full list of these species can be found in Appendix 21-1.

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. The closest

hawkwatch station to the Project Area is Kestrel Haven Hawkwatch in Mecklenburg, New York, approximately 11.5 miles to the northeast of the site. The site was established for bird banding and hawk count data was collected incidentally. There is a single year of data available for this site (2005). One bald eagle, one northern harrier, and three sharp-shinned hawks were identified on September 11, 2015, while six bald eagles, one northern harrier, four sharp-shinned hawks, and four Cooper's hawks were identified between September 9 and 15, 2016. There were no other federally or state-listed species identified during these surveys. Cooper's hawk were observed within the Project Area.

In total, 260 avian species were documented in the above-referenced sources. However, the majority of species were documented solely in the eBird database (n = 119), which contained records from throughout Schuyler County. Species documented by eBird include those which have limited, or no potential to occur given the habitat conditions present within the Project Area (i.e., wading and open water birds) and often will include species that are extremely rare or unlikely inhabitants of the locality or region. These records, therefore, cannot be presumed to indicate potential occurrence within the Project Area or immediate vicinity. Further, these observations are not recorded in a systematic manner following accepted survey protocols consistent with those used in the New York BBA or USGS BBS. A complete list of avian species that were observed or are presumed to occur within the Project Area, based on the data above, can be found in the master wildlife inventory list attached in Appendix 22-1.

Bats

Refer to Section 22(f)(2) for information on correspondence with the USFWS and NYNHP indicating no known bat hibernacula or maternity roost trees at the Project Area. Based on the knowledge of habitat requirements for tree-roosting bat species, forested habitat within the Project Area contains structural elements that may provide suitable roosting and/or 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*).

The northern long-eared bat is a federally and state-listed threatened species. Based upon a review of the NYSDEC ERM 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 22-8). The NYNHP did not indicate occupied habitat for the northern long-eared bat within the vicinity of the Project Area (i.e., known summer occurrence within 1.5 miles or occupied winter habitat within 5 miles). An initial USFWS Information for Planning and Consultation (IPaC) review conducted on February 1, 2019, indicated the potential for northern long-eared bats to occur within the Project Area; however, an updated IPaC official species list was requested on March 12, 2020, which did not indicate the potential for this species to occur. There is potential roosting and foraging habitat for the northern long-eared bat within the vicinity of the Project Area based on field surveys. Tree species observed included eastern hemlock, red maple, American basswood, sugar maple, white ash, eastern white pine, northern red oak, and eastern hophornbeam. There are various trees on the Project Site that contain exfoliating bark, hollows, or furrows and crevices that 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, vernal pools, and open fields is present, though limited, for the remaining species listed above. Table 22-11 further describes this habitat. Given the limited known occurrences, the minimal amount of disturbance to existing habitat within the Project Area, and the availability of extensive habitat in the immediate surrounding area, it is unlikely that these species will be adversely impacted within the Project Area.

Riparian areas will not be impacted due to Project development, further minimizing impacts to potential habitat for northern long-eared bats and other bat species that may utilize riparian corridors for foraging or travel.

Amphibians and Reptiles

Amphibian and reptile distribution information for the Project Area was accessed through the NYSDEC's continuation of the "Amphibian and Reptile Atlas Project" (Herp Atlas Project) website. The Herp Atlas Project was a 10-year survey from 1990 to 1999 with additional reports that were

gathered up to 2007, designed to document the distribution of the approximately 70 species of amphibians and reptiles found in New York State. The standard "unit of measurement" used to map the distribution of amphibians and reptiles is the USGS 7.5-minute series quadrangle. The Project Area is in the Beaver Dam, New York 7.5-minute series quadrangle, and based on the Herp Atlas Project distribution maps, the reptiles and amphibians documented on these quadrangles include:

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

Scientific Name	Common Name	7.5 Minute Quadrangle
Amphibians		
Ambystoma maculatum	Spotted salamander	Beaver Dam
Bufo a. americanus	American toad	Beaver Dam
Desmognathus ochrophaeus	Allegheny dusky salamander	Beaver Dam
Eurycea bislineata	Northern two-lined salamander	Beaver Dam
Notophthalmus v. viridescens	Red-spotted newt	Beaver Dam
Plethodon c. cinereus	Northern red-back salamander	Beaver Dam
Desmognathus fuscus	Northern dusky salamander	Beaver Dam
Pseudacris crucifer	Spring peeper	Beaver Dam
Lithobates (Rana) catesbeiana	American bullfrog	Beaver Dam
Lithobates (Rana) clamitans	Green frog	Beaver Dam
Lithobates (Rana) sylvatica	Wood frog	Beaver Dam
Reptiles		
Chelydra s. serpentina	Common snapping turtle	Beaver Dam
Chrysemys picta	Painted turtle	Beaver Dam
Glyptemys insculpta	Wood turtle	Beaver Dam
Nerodia s. sipedon	Northern water snake	Beaver Dam
Thamnophis sirtalis	Common garter snake	Beaver Dam

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 of the

wetlands and waterbodies delineated within the Project Area provide potential 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 lifecycles. 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 performed from April 22 to 26, 2019. One vernal pool was identified and mapped. For this survey, vernal pools are defined as any woodland pool or non-manmade water-filled depression that hosts egg masses of indicator species. Indicator species in the Project Area and surrounding region include the following obligate vernal pool breeding amphibians: spotted salamander, blue spotted salamander, Jefferson salamander, and wood frog. These species require vernal pool habitat or similar features to reproduce. Potential vernal pools are woodland depressions that exhibit physical characteristics of vernal pools but lack indicator species egg masses. These features may be actual vernal pools observed at a time when water levels are not conducive to amphibian breeding. Amphibian breeding areas are areas of anthropogenic origin such as ditches, tire ruts, and skidder tracks that contain amphibian egg masses. These features are not considered vernal pools although they can support indicator species. No impacts are proposed to this vernal pool. More information about the vernal pool at the Project Area can be found in Section 22(l).

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.

Mammals

Several common mammal species can be found near the Project Area. 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, and general habitat manipulation. Documentation and evaluation of available habitat for local mammals were also noted. Chiropteran mammals (i.e., bats) are discussed above. Mammalian species known or presumed to occur within the Project Area based on observation of individuals and signs include:

- white-tailed deer,
- eastern gray squirrel,
- eastern cottontail,
- eastern chipmunk, and
- eastern raccoon.

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

- fisher;
- American black bear;
- North American porcupine;
- coyote;
- American mink;
- red fox;
- long-tailed weasel;
- Virginia opossum;
- striped skunk;
- northern flying squirrel (*Glaucomys sabrinus)*;
- various shrews (*Blarnia* spp., *Cryptotis* spp., *Sorex* spp.); 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, 1,309 adult buck white-tailed deer (over 1.5 years old) and a total of 2,815 white-tailed deer were harvested in Schuyler County (NYSDEC, 2019a). There were 10 black bears harvested in Schuyler 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, 21 fishers were trapped in Schuyler County, but no North American river otter, bobcat, or American marten were trapped (NYSDEC, 2019).

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.

Terrestrial Invertebrates

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

An analysis of the Project's construction, operation, post-construction, and maintenance impacts on vegetation cover types is included in Section 22(b). 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 due to construction, operation, post-construction restoration, and maintenance are addressed above in Section (b)(2). Approximately 30.58 acres of vegetation will be temporarily impacted, and an additional 361.15 acres will be employed for the siting of Project

Components. Although the siting of Project Components will result in the loss in acreage of plant communities within the Project Area, no specific plant community will be significantly reduced or completely eradicated as a result of the Project. The Applicant has taken measures to avoid and/or minimize 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) above. Results from the grassland breeding bird survey are summarized in Table 22-6 below.

Table 22-6. Number of Observations and Locations of Grassland Birds Observed During Breeding Bird Surveys, Watkins Glen Solar Energy Center, Spring-Summer 2018

Grassland Species	Scientific Name	Pasture Total (2 points)	Wet Meadow Total (3 points)	Total Observed	Percent Composition
Bobolink	*Dolichonyx oryzivorus*	42	88	130	72.6
Savannah sparrow	*Passerculus sandwichensis*	15	31	46	25.7
Grasshopper sparrow	*Ammodramus savannarum*	0	3	3	1.7
TOTAL		**57**	**122**	**179**	**100.0**

For a detailed description of the grassland breeding bird survey, including figures showing survey locations, methods, and results, please refer to Appendix 22-2.

Wintering Grassland Raptor Survey

A discussion of the extent, methodology, and results of the grassland breeding bird survey is provided in Section 22(d)(2). The results from the grassland winter raptor survey are summarized

in Table 22-7 and Table 22-8 below. For a more detailed description of the wintering grassland raptor survey, please refer to Appendix 22-3.

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

Grassland Species	Scientific Name	Total	Percent Composition
Red-tailed hawk	*Buteo jamaicensis*	5	55.6
Cooper's hawk	*Accipiter cooperii*	2	22.2
Rough-legged hawk	*Buteo lagopus*	2	22.2
Total Observations		**9**	100.0

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

Grassland Species	Scientific Name	Total	Percent Composition
Red-tailed hawk	*Buteo jamaicensis*	18	94.7
Turkey vulture	*Cathartes aura*	1	5.3
Total Observations		**19**	100.0

No state-listed species were observed during Winter Raptor Surveys conducted at the Project. Wintering grassland raptor surveys indicated that the Project Area is most used by red-tailed hawks. Overall, raptor use was concentrated in the central portion of the Project Area. One SSC in New York, the Cooper's hawk, was observed on (February 14, 2019) perching and flying west across the center of the Project Area.

Overall, construction of the Project will result in temporary impacts to 4.49 acres of successional old-field habitat and permanent conversion of 7.82 acres of habitat for grassland birds to support Project Components. Approximately 264.30 acres within the proposed limits of disturbance (67.34%) is in row crop agriculture, offering marginal habitat for grassland-obligate species such as bobolink and grasshopper and savannah sparrow (Morgan and Burger, 2008). While some of this acreage will be permanently converted for the siting of Project Components, the area between and under solar arrays will be converted to open successional field with vegetative structure and

floristic diversity comparable with natural grassland and meadow habitat. These areas will constitute improved habitat quality for species of grassland birds that are not adapted to using active agriculture during the breeding, nesting, and post-breeding periods (DeVault et al., 2014). The disturbance regime associated with Project operations will be less frequent than what is typical of agricultural operations, again reducing the overall direct impact to grassland nesting birds.

Bat Surveys

Bat surveys were deemed unnecessary for the Project. A further description of consultation with USFWS and NYNHP regarding known occurrences of bat species is provided in Section 22(f)(2) below. Additional information regarding wildlife habitats and terrestrial vegetation is discussed in 22(f)(5) below.

(2) Bat Hibernacula and Maternity Roosts

Consultation with USFWS and NYNHP indicated no records of listed species within 5 miles of the Project Area. Further, 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 22-8). An initial USFWS IPaC review, conducted on February 1, 2019, indicated the potential for northern long-eared bats to occur within the Project Area; however, an updated IPaC official species list was requested on March 12, 2020, which did not indicate the potential for this species to occur.

The northern long-eared bat often roosts underneath bark, in cavities, or in crevices of live and dead trees (USFWS, 2013). There is suitable roosting habitat for the northern long-eared bat within the vicinity of the Project Area based on field surveys. Tree species observed included eastern hemlock, red maple, American basswood, sugar maple, white ash, eastern white pine, northern red oak, and eastern hophornbeam. The average diameter at breast height (DBH) of trees observed was 5 to 15 inches. There are various trees on the Project Site that contain exfoliating bark, hollows, or furrows and crevices that could provide suitable summer roosting habitat for bat species, including the northern long-eared bat.

The limits of disturbance for the proposed Project include temporary impacts to 0.44 acres of forested habitat, and permanent loss or conversion of an additional 99.57 acres. The overall impact to individuals or populations of northern long-eared bats is expected to be negligible.

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. Based upon review of the NYSDEC ERM 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 22-8). The NYSDEC published a map of known occurrence of northern long-eared bat by town. A review of this information confirmed there were no known winter or summer occurrences for the northern long-eared bat within the vicinity of the Project Area or the Town of Dix. Based on the factors considered herein, the Project is not likely to adversely impact the northern long-eared bat. Bats that may be present in the Project Area are listed in Section 22(e). 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(e). Wetland delineation efforts conducted during 2017 and 2019 identified 34 wetlands and 26 streams within the Project Area. Aquatic fauna, including green frogs and toad species, were observed utilizing some of these features (see Appendix 22-5). Characteristics observed and documented in the 22.7 acres of wetland and stream habitat may provide habitat for reptiles and amphibians listed in Section 22(d)(2). No vernal pools or amphibian breeding areas were identified in the Project Area. Siting of Project Components and the final layout of solar arrays have been designed to avoid wetlands to the maximum extent practicable. See Section 22(m) and 22(n) for a detailed discussion of impacts, avoidance, and mitigation specific to wetland habitats.

(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 is 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 re-establish in adjacent habitat. If construction occurs while the area is in use by a wildlife individual, then the species that are accustomed to similar land-clearing disturbances are expected to relocate and 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 will remain within or adjacent to the Project Area. Additionally, portions of the Project Area are 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.

Additionally, avoidance of wetland habitat has been incorporated in Project siting and design to mitigate temporary or permanent loss of wetland habitat and displacement of wetland-associated species.

Habitat Disturbance and Loss

Approximately 30.58 acres of wildlife habitat will be temporarily impacted during construction of the Project. However, only approximately 6.51 acres of potential wildlife habitat will be permanently lost due to the placement of Project Components. Moreover, 4.38 of the 6.51 acres of potential wildlife habitat permanently impacted, along with all 23.93 acres temporarily impacted, are currently active agricultural areas that are regularly disturbed and provide limited perpetual habitat for wildlife due to these regular disturbances and anthropogenic pressures of active farming practices.

Specifically, it is anticipated that approximately 1.13 acres of successional scrubland, 4.49 acres of successional old fields, 1.03 acres of forestland, and 23.93 acres of active agricultural lands will be temporarily disturbed during construction. Concurrently, approximately 0.44 acres of forestland, 0.29 acres of successional scrubland, 1.41 acres of successional old field, and 4.38 acres of active agricultural lands will be permanently impacted due to the Project. Note, disturbed/developed areas were excluded from these calculations as wildlife habitat in these areas are presumably present but more marginal in nature where wildlife has adapted to survive in a disturbed setting. The Project avoids direct impacts to open-water habitats. See Exhibit 23 for a detailed discussion on impacts to surface waters defined by on-site wetland and waterbody delineations conducted within the Project Component impact areas.

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

The USFWS Field Office in Cortland, New York, was contacted for the most recent breeding, wintering, and habitat data for federally listed and protected species. In an updated review of the IPaC database requested on March 12, 2020, the USFWS did not indicate the potential for any listed species to occur. The NYSDEC was contacted to obtain the most recent breeding, wintering, and habitat data for state-listed species. The NYSDEC database has no records of state-listed species within the vicinity of the Project Area. Correspondence with the USFWS and NYNHP is included in Appendix 22-8.

(5) Operation and Maintenance Related Impacts to Wildlife

Once construction has been completed and the Project is operational, there will be few, if any, impacts to wildlife. Mortality during the operations phase is expected to be negligible. Though few peer-reviewed studies exist which estimate mortality from photovoltaic (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, Jr. 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. The solar panels and substation are stationary and will not impact wildlife during their operation.

Vehicles will visit the site infrequently and will stay on the access roads; therefore, there will be little opportunity to impact wildlife by driving on the site.

During the operational phase of the Project, disturbance will be limited, and displacement impacts are likely to be negligible. Routine maintenance, including mowing the grass, will occur approximately two to three times depending upon seasonal conditions. Most wildlife that will be within the fenced-in areas of the Project Area 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 a review of aerial imagery and observations during field surveys conducted on site. Riparian corridors are present and may serve as travel corridors or foraging areas for volant species (i.e., bats, avian predators, etc.). Project siting efforts have been designed to retain riparian areas, and no open-water habitats will be impacted. Forest patches are non-contiguous, isolated by large expanses of open habitat. It is not expected that wildlife are utilizing specific areas as travel corridors through much of the Project Area, rather 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. Mapping associated with wildlife, wildlife concentration areas, and wildlife travel corridors are included as Figure 22-5. No impacts to habitats that may serve as wildlife corridors will occur.

(6) Assessment of Herbicide Application

As noted in Appendix 22-7, the ISMCP, and Appendix 5-4, Preliminary Operations and Maintenance Plan, the use of herbicides may be necessary for vegetation not effectively removed by mechanical means. Short-term impacts from herbicide application can occur from physical contact and direct toxicity with non-target plant species (Briggs, 1992). Herbicide application will be performed by spot treatment at targeted concentrations of invasive plant species to minimize the risk of spraying non-target plant species. Herbicides have a minimal short-term effect on animals as herbicides target plant processes and are not acutely toxic to wildlife (Tatum, 2004). The long-term effect of herbicide application is potential change to the vegetation community structure from large-scale, non-selective spraying. Herbicide application at the Project, however, will not be performed by broad-scale, non-selective spraying, therefore, long-term impacts resulting in large-scale changes to the vegetation community structure are not anticipated. Herbicides will be applied as a secondary measure, and will be used on a selective, spot basis. 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 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 the applicable state and federal regulations.

(7) Literature and Impact Analysis for Grassland Bird Species

There are relatively few studies quantifying the effects of utility-scale solar projects on biodiversity, including birds. The currently availably peer-reviewed publications on renewable energy, including solar, are insufficient to thoroughly assess the impact of utility-scale solar projects on wildlife populations (Lovich and Ennen, 2011). The two types of direct impacts to birds from utility-scale solar projects occur in the form of burning and collisions (Walston, Jr. et al., 2016). Mortality studies are inherently lacking with specific reference to utility-scale ground-mounted solar. Of the studies that investigated direct impacts to birds from solar facilities, all were conducted on facilities in the southwestern United States and therefore, are only moderately applicable to 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). 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, which create a high-heat area surrounding the tower, or light reflections, which can attract birds and insect prey. PV technology is comparatively safer than thermal solar for birds (National Audubon Society, 2017).

A study of three utility-scale solar energy facilities in Southern California, including California Solar One, found that the one PV solar facility in the study had a mortality rate of 0.5 birds/MW/year from direct impacts attributed to the solar facility (Walston, Jr. et al., 2016). The avian mortality rate from direct impacts at the PV solar facility was less than the avian mortality rate from direct impacts at the two heliostat solar facilities in the study (10.24 and 3.96 birds/MW/year) (Walston, Jr. et al., 2016). The difference in bird mortality rate from direct impacts between PV and heliostat solar facilities could have been due to decreased risk of burning at the PV solar facility. The study by Walston, Jr. et al. (2016) estimated bird mortality from solar facilities in comparison to other anthropogenic sources of bird mortality. The table from their study is shown in Table 22-9 below.

Table 22-9. 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 Lab reviewed 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 et al., 2015). Mortality is expected to vary seasonally, influenced by influx of migrants and departure of residents, as well as based on local avian abundance, non-facility related causes of mortality, and factors influencing detectability of mortality events (e.g., predation and scavenging). Numerous design factors may influence mortality; however, given the complexity of determining facility-related mortality events, the current understanding of these factors is exceedingly limited.

The Project is located on the edge of the Southern Tier Grassland Focus Area as defined by the NYSDEC Grassland Landowner Incentive Program, which promotes habitat protection for grassland birds. Grassland birds are declining in New York State due to the loss of agricultural lands such as pastures and hay fields. The NYSDEC commissioned a study of breeding grassland birds across New York State that used BBA data to identify regions (i.e., focus areas) with significant remaining grassland bird populations (Morgan and Burger, 2008). As a result, the NYSDEC created a grassland landowner incentive program to protect grassland bird habitat on private lands within these focus areas.

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

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

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

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

The principal bird species targeted for conservation within the Southern Tier Grassland Focus Area are vesper sparrow, grasshopper sparrow, horned lark, savannah sparrow, and wintering short-eared owl. Of the highest priority species identified by NYSDEC, grasshopper sparrow and bobolink have been observed within the vicinity of the Project Area (see Section 22(d)(1), Appendix 22-2, and Appendix 22-3). The grassland breeding bird survey documented bobolink, savannah sparrow, and grasshopper sparrow within the Project Area (see Section 22(d)(1), Section 22(f)(1), and Appendix 22-2).

Grassland birds in New York State are typically found in cultivated crops, pastures, and old fields. While species-specific requirements for grassland birds vary, the habitat provided by row crop cover is generally considered marginal for species such as bobolink, grasshopper sparrow, and savannah sparrow (Morgan and Burger, 2008). Agricultural operations provide reduced foraging opportunities, provide lower vertical structure and horizontal cover, are often monotypic in floristic diversity, and generally experience increased disturbance associated with human activity.

Bobolinks prefer fields of at least 25 acres of medium to low vegetation density with at least 8 years since the last plowing and reseeding (Bollinger and Gavin, 1992; Morgan and Burger, 2008). Vegetation in bobolink habitat typically has a mix of medium-height grasses and a high forb component with plants such as red clover (*Trifolium pratense*) and dandelion (Morgan and Burger, 2008; NYSDEC, 2015c).

Savannah sparrows prefer open grasslands with medium vegetation density at least 12 to 25 acres in area (Bollinger and Gavin, 1992; Morgan and Burger, 2008). Grasshopper sparrows prefers open grasslands with low vegetation density at least 123–247 acres in area (Bollinger and Gavin, 1992; Morgan and Burger, 2008). A key feature of grasshopper sparrow habitat is little to no litter and large areas of evenly distributed bare soil (Morgan and Burger, 2008; NYSDEC, 2015c).

Habitat assessments within the Project Area identified 346.6 acres of potential habitat for the species listed above. No grassland patches exhibited low density vegetation, and most received

management (e.g., mowing) during the grassland breeding bird study. While some components required by these species were present in grasslands throughout the Project Area, conditions would be most consistent with sub-optimal or low-quality breeding habitat.

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

(8) 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 22-10 below.

Table 22-10. Impacts to Wildlife Habitat

Wildlife Habitat	Conversion (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impact (acres)
Agricultural Land	236.00	23.93	4.38	264.30
Successional Old Field	7.82	4.49	1.41	13.71
Successional Shrubland	12.12	1.13	0.29	13.55
Forestland	98.54	1.03	0.44	100.01
Total	**354.47**	**30.58**	**6.51**	**391.57**

(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 through forest fragmentation, disturbances due to solar array operation, and specific mortality due to solar array collisions.

Habitat Loss

A direct and permanent loss of approximately 6.51 acres of wildlife habitat will result from the Project. Total habitat loss represents 0.84% of the total 771 acres included in the Project Area. Of this percentage, approximately 6.65% of the loss is to forestland, 4.39% is to successional shrublands, while the majority, 66.26%, is to active agriculture. Approximately 98.54 acres of forest land will also be converted into successional communities, which are of value to several wildlife species within 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. Considerable habitat is available in the surrounding area including 8,823.38 acres of forest, 123.10 acres of shrubland, and 378.99 acres of open habitat (i.e., grasslands, old fields). In comparison to the surrounding 2-mile Study Area, only 4.20% of

habitat will be lost or converted as a result of the Project representing an insignificant impact to habitat availability in the local area.

Habitat Degradation (Forest Fragmentation)

As stated previously, forest fragmentation occurs when large tracts of forestland are divided into smaller patches due to canopy removal or the overall clearing of forestland. The potential effects of forest habitat fragmentation depend in part on previous land use, the original extent of intact forested habitat, the extent of habitat that will be impacted during and after construction, and the behavioral sensitivity of potentially affected species or species groups, which include both residents and migrants. Impacts to species as a result of forest fragmentation may vary temporally and may have short-term or long-term effects depending on the species.

Fragmentation creates edge effects in areas that were previously contiguous forest habitat. Edge effects are changes in species populations or community structure at the periphery of two habitats. Edge effects are most apparent where patches of habitat are isolated by surrounding patches of dissimilar habitat. Edge effects in forested environments vary somewhat with distance from forest edge, depending on the type of effect and species of plant or wildlife (USDA NRS, 2012). However, within the State of New York, 300 feet is frequently used as a general range for the edge effect disturbance line, which is the distance into a forest patch where the edge effect dissipates and interior forest conditions are generally expected (USDA NRS, 2012). Interior forest is defined as core forest areas containing a specific ecology and community structure occurring at least 300 feet from the forest edge.

Forested area comprises approximately 39.6% of land cover within the Project Area. Forestland within the Project Area has been previously cleared for agriculture, resulting in small, non-contiguous fragments. Approximately 240.3 acres, or 78.8% of the forestland at the Project Area, can be classified as edge forest. It is expected that clearing for all Project Components (access roads, collection lines, and laydown areas) associated with the Project may remove up to 96.4 forested acres, reducing the amount of forest land from 305 to 208.6 acres within the Project Area, a 31.6-% reduction. Although tree clearing will reduce the amount of forest within the Project Area, extensive forested habitat is available directly adjacent to the Project Area in the Coon Hollow and Sugar Hill State Forests, which collectively encompass 11,541 acres. There will be an assumed net loss of 19.7 acres of interior forest due to the placement of Project Components. Forest clearing will not result in additional acres of interior forest being converted to peripheral forest. Forested areas within the Project Area consist of both small, isolated patches, which are

unlikely to support structures and communities of forest-obligate or forest interior species, and larger forest blocks, which 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. However, as no wetlands will be permanently impacted by the Project, there will be no direct impact to the preferred habitat of amphibians. Further, no species of concern have been identified within the Project Area.

Game Species

Immediate disturbances during the construction phase of the Project will cause disruption of local game species (e.g., white-tailed deer, ruffed grouse, and turkey). However, other than the nests sites (eggs) and infant fawns, these species are very mobile. Consequently, injury and mortality are not expected from 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 data records for threatened and/or endangered species at the Project Area. Post-construction monitoring will not be necessary because there will be no take of state or federally listed threatened and/or endangered species. Refer to Section 22(o)(2) for further discussion on 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 is included in Appendix 22-4 and summarized below. The results of this conservative analysis indicate that the grassland habitat within the boundaries of the 114 Study Projects accounts for only 1.1% of available grassland habitat within the entire Grassland Study Area.

An analysis was conducted utilizing a database containing mapped solar facilities (existing or proposed), which was provided by NYSDEC to locate facilities with a generating capacity greater than or equal to 5 MW occupying grassland habitat within 100 miles of the Project Area in the boundary of New York. A desktop review was conducted to determine grassland bird use within the Grassland Study Area using both publicly available information regarding the Study Projects and publicly accessible records of bird occurrence at the county level. Spatial analysis was performed to determine the extent of grassland habitat among Study Projects and within the broader Grassland Study Area. Cumulative impacts were estimated by evaluating the overall loss of habitat relative to the percent of habitat available.

A review of the NYSDEC database returned 114 Study Projects. Study Projects were identified in 26 of the 29 counties within the Grassland Study Area. Monroe County contained the highest concentration of Study Projects with 19 projects identified, followed by Onondaga County (12) and Ontario (10). The remaining counties had 9 or fewer Study Projects. No Study Projects were identified in Delaware, Herkimer, or Niagara counties. Study Project locations are depicted in Figure 2 of the report.

Study Projects, including the Project, encompass a total of 117,932 acres within the Grassland Study Area. Of the 114 Study Projects, 20 have already been constructed and account for 1,109 acres of development. It should be noted that none of the proposed Study Projects in the database

provided information regarding the total impact resulting from construction within their respective project area boundaries; therefore, the total area reported is likely an overestimation.

Study Projects within Oneida County comprised the largest amount of acreage among Study Projects, with a total area of 25,969 acres across nine projects. The Proposed Project is the only solar project located in Schuyler County, with a total area of approximately 771 acres, accounting for approximately 0.66% of the total area of development within the Grassland Study Area.

Several target grassland species were identified within the Project Area during the grassland breeding bird and winter raptor surveys. Species observed included bobolink, savannah sparrow, and grasshopper sparrow. Cooper's hawk (Special Concern) was also observed during winter raptor surveys conducted within the Project Area.

A review of the NYNHP and eBird databases was performed to determine the most recent occurrence of grassland birds within each of the 29 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 Schuyler County except for barn owl, golden-winged warbler, Henslow's sparrow, and sedge wren. Few species were less recently recorded or limited in distribution, including:

- Barn owl; observed in 13 counties, no observations in Schuyler County;
- Golden-winged warbler, observed in 25 counties, no observations in Schuyler County;
- Henslow's sparrow, observed in all 29 counties, last observed in Schuyler County during the 2nd Breeding Bird Atlas between 2000 and 2005;
- Sedge wren, observed in 21 counties, no observations in Schuyler County; and
- Upland sandpiper, observed in 26 counties, last observed in Schuyler County in 2016.

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

Together, the 114 Study Projects comprise 117,932 acres of development (both proposed and constructed) within the 11,555,390-acre Grassland Study Area (1% of total area; Table 6). Grassland habitat within the boundaries of the Study Projects total 23,596 acres, which covers

20% of the proposed area of development among the projects. Grassland habitat among Study Projects accounts for approximately 1.1% of available grassland habitat within Grassland Study Area, and less than 0.2% of total land area (see report Table 6). The total limits of disturbance were unavailable for most of the Study Projects, and as a result, the extent of permanent impacts to grassland habitat within the Grassland Study Area could not be quantified; therefore, these results likely reflect an overestimation.

The Grassland Study Area covers over 14 million acres in New York. The proposed Study Projects' development, while overstated in this analysis, represents an insignificant cumulative impact to grassland bird populations both locally and regionally. If all 114 Study Projects are developed, these facilities will affect approximately 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. Further, substantive research indicates that the conversion from active row crop production to solar facilities could improve habitat quality for avian species reliant upon grassland habitat. Revegetation and seeding efforts following construction create conditions similar to the preferred habitat for species including savannah sparrow, bobolink, and other grassland obligates, providing increased structural and floristic diversity (Walston, Jr. et al., 2016; N.A.S., 2017).

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

Discussion on 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 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 of the Project 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 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 habitats representing 4.20% 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, no habitats identified in the Project Area represent significant natural communities and all are abundant in the immediate vicinity of the Project and throughout New York State.

As mentioned in Section 22(f)(9), there is no anticipated take to state or federally listed species at the Project Area during construction or operation. Therefore, mitigation for state and federally listed species is not necessary.

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

(1) Wetland Mapping

Wetland surveys were conducted to identify wetlands and streams within the Project Area and within 500 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 *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 NYSDPS staff interpretation dated May 31, 2018, concerning the delineation of all federal, state, and locally regulated wetlands present at the Project Area and within 500 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 500 feet of areas to be disturbed by construction. TRC conducted on-site wetland surveys

for approximately 771 acres of leased private lands within the Project Area, and this area is referred to as the Wetland Delineation Survey Area throughout this Exhibit. All current wetland and waterbody delineations occurred in the summer of 2017 and spring of 2019. See Figure 22-3 depicting TRC-delineated wetlands within the Wetland Delineation Survey Area.

(2) Predicted Wetlands

Wetland estimation only occurred for areas within 500 feet of areas to be disturbed by construction of the Project. Wetland boundaries were approximated out to 500 feet from Project Components (beyond the delineated portion), through 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 22-2 depicting predicted wetlands within the Wetland Delineation Survey Area and subsequent 500-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. See Appendix 22-5, Wetland and Waterbody Delineation Report, for a detailed description of the determination of wetland boundaries for the Project. Wetlands identified within the established Wetland Delineation Survey Area are referred to as "delineated wetlands."

(4) Jurisdictional Wetlands

No wetlands delineated inside the Project Area were associated with currently mapped NYSDEC freshwater wetlands; therefore, no wetlands in the Project Area fall under state jurisdiction pursuant to Article 24 of the NYS ECL.

(5) Wetland Shapefiles

See Appendix 22-5, Wetland and Waterbody Delineation Report, for a detailed description of the delineated wetlands including potential jurisdictional status. See Figure 22-3 depicting the TRC-delineated and predicted wetlands within the Wetland Delineation Survey Area and subsequent 500-foot area from Project Components. See Figure 22-4 for the extent of the NYSDEC-mapped wetlands. Shapefiles of the delineated wetlands will be provided to the NYSDEC and NYSDPS.

22(j) Characterization of Wetlands within the Project Area

Wetland and stream cover types delineated within the Wetland Delineation Survey Area associated with the Project Site are described in detail below. Each wetland or waterbody was assigned cover types based on the Cowardin classification system (Federal Geographic Data Committee, 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 done 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 22 wetlands delineated within the Project Area contain characteristics representative of the emergent wetland classification. Emergent wetlands are dominated by an herbaceous layer of hydrophytic (water-tolerant) plant species. Emergent wetlands typically contain deep, nutrient rich soils that remain heavily saturated or even inundated throughout the year.

Emergent wetlands encountered in the Wetland Delineation Survey Area were typically dominated by reed canary grass; fowl bluegrass (*Poa palustris*, first identified June 8, 2017); and sensitive fern. Evidence of wetland hydrology for these wetlands included surface water, saturation, a high water table, drainage patterns, geomorphic position, microtopographic relief, and passing the FAC-neutral test. Hydric soil indicators adhered to descriptions and guidelines outlined in Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 8.2 (NRCS, 2018). Although hydric soils indications were variable, emergent wetlands within the Wetland Delineation Survey Area were typically (10YR 4/2 – 10YR 4/4) silty loam soils. Variations of characteristics in the soil matrices generally demonstrated Depleted Matrix (F3), Redox Dark Surface (F6), and Depleted Below Dark Surface (A11) hydric soil indicators.

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

Scrub-shrub wetlands encountered in the Wetland Delineation Survey Area were typically dominated by common buckthorn, silky dogwood, nannyberry, grey alder, and black elderberry (*Sambucus nigra*, first observed April 24, 2019). Herbaceous species included sensitive fern, cattail (*Typha* spp.), cinnamon fern, American red raspberry (*Rubus idaeus*, first observed April 23, 2019), and curly dock (*Rumex crispus*, first observed June 8, 2017). Evidence of hydrology for these wetlands included saturation, high water table, surface water, saturation visible on aerial imagery, geomorphic position, and a FAC-neutral test. Although hydric soils indications were variable, scrub-shrub wetlands within the Study Area typically displayed (2.5Y 4/1 – 10YR 5/2) silty clay loam soils. Variations of characteristics in the soil matrices generally demonstrated Depleted Matrix (F3) and Depleted Below Dark Surface (A11) hydric soil indicators.

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

Forested wetlands encountered in the Wetland Delineation Survey Area were typically dominated by tree species of black willow (*Salix nigra*, first identified June 8, 2017), red maple, northern red oak, green ash, and American elm. Understory vegetation typically included saplings such as common buckthorn and American hornbeam. Herbaceous species included multiflora rose and tussock sedge (*Carex stricta*, first observed June 6, 2017). Evidence of hydrology for these wetlands included saturation, a high water table, drainage patterns, and geomorphic position. Although hydric soils indications were variable, forested wetlands within the Study Area typically displayed (2.5Y 3/1 – 12.5Y 5/1) clay loam soils. Variations of characteristics in the soil matrices generally demonstrated Depleted Matrix (F3) and Depleted Below Dark Surface (A11) hydric soil indicators.

Palustrine Unconsolidated Bottom (PUB) – A total of five wetlands delineated within the Wetland Delineation Survey Area contained characteristics representative of unconsolidated bottom

wetlands. Unconsolidated bottom wetlands are characterized by surface water and have less than 30-% vegetative cover and at least 25-% cover of particles less than stones. As these are bodies of standing water, evidence of wetland hydrology was decisively present with standing water ranging from approximately 2 to 4 feet in depth. Evidence of wetland hydrology included surface water, high water table, saturation, algal mat or crust, inundation visible on aerial imagery, aquatic fauna, geomorphic position, and a FAC-neutral test. Dominant herbaceous species included sensitive fern, common boneset (*Eupatorium perfoliatum*, first identified June 6, 2017), soft rush (*Juncus effusus*, first identified June 7, 2017), late goldenrod (*Solidago gigantea*, first identified June 6, 2017), redtop (*Agrostis gigantea*, first identified June 8, 2017), reed canary grass, and tussock sedge.

Streams (RUP, RIN, REPH) – A total of 25 streams were delineated within the Project 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 receive groundwater flow sources from springs or groundwater seepages on slopes. Intermittent streams (RIN) flow only during certain times of the year from alternating springs, snow melts, or from runoff from seasonal precipitation events. Intermittent streams can flow above or below the water table. Ephemeral streams (REPH) flow sporadically and entirely depend on transient precipitation from storm events or from periodic snow melts. These streams tend to flow above the water table and are often found as drainage features adjacent to, or within, the headwaters of a more major stream system.

Streams encountered in the Project Area were mostly intermittent in nature along moderate gradients (2 to 4%). Stream widths ranged from 1 to 12 feet. They generally contained channel substrates of silt, clay, cobble, and gravel with probed stream depths in the range of 0 to 6 inches. Most streams were determined to lack substantial features to permit the prevalence of aquatic ecologies. Only a small number of streams within the Project Area were determined to contain significant aquatic habitat to establish and support fish and wildlife populations. Most of the stream systems supporting aquatic habitats were found to be perennial, as an annual flow regime allows for a more readily established lifecycle. Five streams within the Project Area are classified as Class C by NYSDEC and may support fish populations.

Further characterization of the wetlands and streams can be found in Appendix 22-5.

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 unbiased perspective. 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 toward 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 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 thirteen functions and values that are considered by the USACE through their Supplement are listed below. The list includes eight functions and five values. Although the functions and values listed are not the only wetland functions and values possible, they do represent the current working suite provided by the USACE for regulatory consideration and do match well with the wetland benefits depicted within ECL Article 24. As such, they are thought to provide an objective

and meaningful representation of the wetland resources associated with the Project. Based on processes outlined in the Supplement, a spreadsheet was created to include several basic considerations ("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 22-6. 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 within the Wetland Delineation Survey Area displayed multiple functions based on their specific site characteristics. All delineated wetlands were determined to have the ability to provide some function of groundwater recharge/discharge, flood-flow alterations, nutrient removal/retention/transformation, and wildlife habitat. The primary functions displayed by wetlands within the Wetland Delineation Survey Area include:

- Fish and Shellfish Habitat (16 wetlands),
- Sediment/Shoreline Stabilization (17 wetlands), and
- Production Export (30 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 which may have taken place at the wetland, or unique plants, animals, or geologic features located within or supported by the wetland feature.
4. Visual Quality/Aesthetics – This value relates to the visual and aesthetic qualities of the wetland.
5. Threatened or Endangered Species Habitat – This value relates to the effectiveness of the wetland or associated waterbodies to specifically support threatened or endangered species.

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

To receive more detail on the functions and values assessment, please see Appendix 22-6 of this Application.

(1) Vernal Pools

Vernal pools in the Project Area were limited with only one vernal pool found during the spring 2019 surveys. This feature is an isolated depression located on a mowed path inside a small forest on the southeast corner of the Project Area. Canopy closure was approximately 50% and evidence of tire tracks and vehicle travel was observed inside the pool. Egg masses found included spotted salamander and wood frog. No impacts are proposed to this vernal pool as a result of the Project. Please refer to the Wetland Delineation Report in Appendix 22-5 for more information about vernal pools.

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 500 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 500 feet of Project Components was utilized to determine hydrological connections to off-site wetlands, including state-mapped wetlands protected by NYSDEC that may be near Project Components. Ten approximated wetlands were identified. Four of these wetlands are extensions of field-delineated wetlands within the Project Area. One of the approximated wetlands within 500 feet of Project Components is 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. Three of the approximated wetlands appear to be isolated. Jurisdiction over federally regulated wetlands will ultimately be determined by the USACE.

Through desktop analysis, it appears that no approximated wetlands within 500 feet of Project Components have potential hydrological connections to any state-regulated wetlands.

22(m) Temporary and Permanent Wetland Impacts

Through careful siting of Project Components, of the entire 20.7 acres of wetlands delineated, there will be less than 0.01 acre of temporary impacts to a PSS wetland and 0.04 acres of temporary impacts to a PEM wetland, but no permanent impacts proposed within the Project Area. Additionally, all wetlands anticipated to be impacted within the Project Area are isolated and not jurisdictional under USACE or the ECL. There are no impacts to NYSDEC-mapped wetlands or their 100-foot adjacent area.

Table 22-11. Temporary and Permanent Wetland Impacts

Field ID	Wetland Classification	Conversion (Sq Ft)	Temporary Impacts (Sq Ft)	Permanent Impacts (Sq Ft)	Total Impacts (Sq Ft)	Permanent Forest Conversion (Sq Ft)	Crossing Method	Page Number from Civil Drawing
W-DL-2	PFO	7,712	0	0	7,712	7,712	Solar Panels	C.302, C.304
W-DL-2	PEM	0	23,267	0	23,267	0	Solar Panels	C.302, C.304
W-DL-3	PEM	0	45,307	0	45,307	45,307	Solar Panels	C.302
W-JJB-5	PEM	0	9,277	0	9,277	0	Solar Panels, LOD	C.306
W-JJB-14	PSS	0	51	0	51	0	LOD	C.308
W-TC-2	PEM	0	26	0	26	0	Tree Clearing	C.303
W-TC-5	PEM	0	1,044	0	1,044	0	Solar Panels, LOD	C.301
W-TC-8	PEM	0	5,340	0	5,340	0	Solar Panels, Fence, LOD	C.303

Table 22-11. Temporary and Permanent Wetland Impacts

Field ID	Wetland Classification	Conversion (Sq Ft)	Temporary Impacts (Sq Ft)	Permanent Impacts (Sq Ft)	Total Impacts (Sq Ft)	Permanent Forest Conversion (Sq Ft)	Crossing Method	Page Number from Civil Drawing
W-TC-11	PEM	0	1,988	0	1,988	0	Solar Panels	C.302
W-TC-12	PEM	0	15,714	0	15,714	0	Solar Panels, Fence, Tree Clearing	C.300

22(n) Avoidance and/or 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 wetlands and waterbodies wherever possible. The current Project layout avoids permanent impacts to wetlands and waterbodies by locating Project solar array structures outside delineated features to the maximum extent practicable along with routing access roads and collection lines around delineated features. Where streams are encountered and must be bisected by Project Components (access roads), the narrowest and/or previously disturbed portions of the stream will be utilized for the site of impact.

(1) State-regulated Adjacent Areas

As previously discussed, the delineated wetlands within the Project Area are not associated with currently mapped NYSDEC freshwater wetlands or their 100-foot adjacent areas.

(2) Off-site Mitigation (if necessary)

As explained above, there are no permanent impacts to any wetlands within the Project Area. Therefore, mitigation for wetland impacts will not be necessary.

22(o) Identification of State and Federally Listed Species Subject to Potential Impacts

(1) Avoidance and/or Minimization of Impacts

Discussion on minimizing potential impacts to plant communities within the Project Area can be reviewed in Section 22(c). Construction-related impacts to fish and wildlife will be limited to incidental injury and mortality due to construction activity. These activities include the use of heavy machinery, vehicular traffic, and minimal silt and sedimentation events due to construction occurring within or adjacent to aquatic ecosystems. Also, habitat disturbance and loss will occur due to vegetation clearing, earth-moving activities, and the placement of Project Components. Displacement events will also occur due to increased noise, vibration, and human presence during construction in previously undisturbed areas. The minimization of these construction-related impacts will be accomplished through continued careful site design, BMPs, and construction monitoring. Site design practices avoid sensitive habitats by siting solar arrays primarily in agricultural fields, minimizing construction disturbances to the extent practicable, adhering to designated construction limits, and avoiding off-limit sensitive areas.

To reduce impacts to aquatic resources resulting from construction-related siltation and sedimentation events, the Applicant will utilize an approved sediment and erosion control plan and implement a SWPPP for the construction phase of the Project. The sediment and erosion control plan and Preliminary SWPPP are described in more detail in Exhibit 23. Also, the Preliminary SWPPP is attached as Appendix 23-3, and a Spill Prevention, Containment, and Counter Measures (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, as explained above in Sections 22(d)(3) and 22(f)(9) permanent habitat loss and forest fragmentation have been avoided or minimized, to the maximum extent practicable. As stated previously, most access roads, collection lines, and solar arrays will be sited in agricultural fields to minimize impacts to natural communities, including forest fragmentation. Restoration of the agricultural fields will take place following the decommissioning of the Project.

(2) Potential Impacts to State and Federally Listed Species

No state or federally listed species have been documented within the Project Area; therefore, no impacts to listed species are anticipated to occur. Based on Project-specific information received from NYNHP, NYSDEC, USFWS, and direct on-site observations, a list was compiled of state- and federally listed species and species of greatest conservation need (SGCN) that are believed to occur or have the potential to occur within the Project Area. Site-specific information requests to state and federal agencies were made to determine the presence of rare, threatened, endangered, and special concern species (see Appendix 22-8). Similarly, a list of species encountered during on-site survey work was documented by field staff. Any species that were visually identified on site that were listed in the state or federal registry were also included in the list of state and federally listed species occurring within the Project Area. Information from the USGS BBS, New York State BBA, Audubon CBC, Herp Atlas, and eBird was used to find state and federally listed species, SSC, and SGCN. A summary impact table containing information on all listed species identified through the above-mentioned procedures was also compiled (see Table 22-11). The list contains a brief description of the specific habitat requirements for each identified species, the approximated source whereby each species is known to potentially occur within the vicinity of the Project, and if each species was directly observed on site. No listed

species were observed on site, and the findings of this review indicate limited potential for listed species to occur. Habitat for many species is not present within the Project Area. Where habitat for other non-listed species observed on site exists, efforts will be made to avoid siting Project Components to reduce impacts.

The solar arrays will be installed to minimize the potential for avian and bat collisions. It is not anticipated there would be any avian or bat mortality from collisions with the solar panels. Studies regarding collision-related mortality are extremely limited, and to date, no studies have been conducted on solar facilities in the eastern United States. Studies conducted on similar facilities (e.g., ground-mounted photovoltaic solar arrays) have indicated that mortality events are rare (~0.5 birds/MW/year) and substantially lower than other sources of mortality from human development (see Section 22(f)(7)), representing less than 1% 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 22-12. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4]	Source of Potential Presence[5]	Observed On-site	Potential Impacts	Impact Avoidance Measures
Birds									
American Bittern	*Botaurus lentiginosus*	-	SSC	SGCN	This species breeds in freshwater wetlands with tall emergent vegetation, such as freshwater marshes and scrub-shrub wetlands. Nesting can occur in grasslands and successional old fields adjacent to wetland habitat. Suitable nesting habitat for this species occurs within the Project Area.	G	No	Potential direct impacts could include habitat disturbance, degradation and loss, particularly for nesting habitat adjacent to wetlands (less than 0.01 acre). Temporary impacts to nesting habitat in grassland and successional old fields could occur. Indirect impacts could include noise from construction activities.	Impacts to wetland habitat have been avoided and minimized to the maximum extent practicable by siting Project Components in agricultural fields and using HDD when necessary.
American Black Duck	*Anas rubripes*	-	-	SGCN-HP	This species prefers marshes, ponds, rivers, and lakes. This species breeds in freshwater wetlands such as freshwater marshes and forested wetlands. Habitat for this species occurs within the Project Area.	E, G	No	Potential indirect impacts could include habitat disturbance due to noise from construction activities near wetland habitat, and habitat degradation or loss from the 0.65 acres of permanent conversion of PFO wetlands.	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.
American Kestrel	*Falco sparverius*	-	-	SGCN	This species prefers open areas, such as successional old fields, forest edges, scrublands, pastures, and hay fields. Habitat for this species occurs within the Project Area.	D, E, F, G, H	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 354.47 acres of agricultural land, successional old fields, successional shrublands, and forest edges to early successional grasslands. Potential direct impacts include habitat displacement and degradation from the temporary conversion of 6.51 acres of potential habitat. There will be habitat loss of 30.58 acres of potential habitat to Project Components. Potential indirect impacts could include habitat disturbance due to construction activities.	Impacts to agricultural land are unavoidable; however, conversion of agricultural land to planted early successional grasslands at solar facilities has been shown to benefit grassland species with habitat requirements similar to American kestrel (see Section 22(f)(7).
American Woodcock	*Scolopax minor*	-	-	SGCN	This species prefers moist successional shrublands near successional forests and scrub-shrub wetlands. Habitat for this species occurs within the Project Area.	E, G	No	Potential direct impacts are minimal due to the limited amount of successional shrublands (35 acres or 4.5% of the Project Area) and scrub-shrub wetlands (see Appendix 22-4) present. Potential direct impacts include habitat degradation and fragmentation from the conversion of 12.12 acres of successional shrublands to early successional fields. Potential direct impacts include habitat displacement from the temporary conversion of 1.13 acres of successional shrubland. Potential direct impacts include habitat loss from the permanent conversion of 0.29 acres of successional shrubland. Potential indirect impacts could include habitat disturbance due to noise from construction activity.	Potential impacts to successional shrublands and scrub-shrub wetlands have been minimized to the maximum extent practicable by siting Project Components in agricultural land wherever possible.

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

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4]	Source of Potential Presence[5]	Observed On-site	Potential Impacts	Impact Avoidance Measures
Bald Eagle	*Haliaeetus leucocephalus*	-	THR	SGCN	This species prefers undisturbed areas near large lakes, reservoirs, marshes, swamps, or stretches along rivers where they can breed and forage for fish. Habitat does not exist at the Project Area, as waterbodies are not large enough to support prey fish populations; however, it is located nearby (Seneca Lake), therefore, this species has potential to occur within the Project Area. Additionally, no known nests occur within proximity of the Project Area; however, nesting substrate suitable for this species may occur.	F, G, H	No	None, as habitat for bald eagles is not present at the Project Area.	None proposed.
Black-billed Cuckoo	*Coccyzus erythropthalmus*	-	-	SGCN	This species prefers thickets, successional old field, orchards, and along forest edges. Nests in shrublands and forest edges. Habitat for this species occurs within the Project Area.	D, E, G	No	Potential direct impacts include habitat degradation and fragmentation from conversion of 110.66 acres of successional shrublands, successional old fields, and forest edges to early successional grasslands. Potential direct impacts include habitat displacement due to the temporary conversion of 6.65 acres of forest edges successional shrubland and successional old fields. Potential direct impacts include the habitat loss of 6.51 acres of successional shrubland, successional old fields, and forest edges. Potential indirect impacts could include habitat disturbance due to noise from construction activity.	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.
Black-crowned Night Heron	*Nycticorax nycticorax*	-	-	SGCN	Commonly found in wetland habitats throughout North America including marshes, swamps, streams, rivers, lakes, and ponds. The species will also use wet agricultural fields. Requires some terrestrial vegetation for cover. Habitat for this species is found within the Project Area.	G	No	Potential indirect impacts could include habitat disturbance due to noise from construction activities near wetland habitat, and habitat degradation or loss from the 0.65 acres of permanent conversion of PFO wetlands.	Impacts to wetland habitat have been minimized to the maximum extent practicable by siting Project Components in agricultural fields wherever possible and using HDD when necessary.
Black-throated Blue Warbler	*Dendroica caerulescens*	-	-	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. Habitat for this species does not occur within the Project Area because the forested areas are too small.	D, G	No	No potential impacts because habitat in the form of extensive, undisturbed forests are not present at the Project Area (see Section 22(f)(8)).	None proposed.

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

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4]	Source of Potential Presence[5]	Observed On-site	Potential Impacts	Impact Avoidance Measures
Blue-winged Warbler	*Vermivora pinus*	-	-	SGCN	This species prefers brushy hillsides, overgrown pastures, and stream and woodland edges. Breeds in dry uplands in low shrublands. Habitat for this species occurs within the Project Area.	D, G	No	Potential direct impacts are minimal due to the limited amount of successional shrublands (35 acres or 4.5% of the Project Area) and scrub-shrub wetlands (see Appendix 22-4) present. Potential direct impacts include habitat degradation and fragmentation from the conversion of 12.12 acres of successional shrublands to early successional fields. Potential direct impacts include habitat displacement from the temporary conversion of 1.13 acres of successional shrubland. Potential direct impacts include habitat loss from the permanent conversion of 0.29 acres of successional shrubland. Potential indirect impacts could include habitat disturbance due to noise from construction activity.	Impacts to successional shrublands have been minimized to the maximum extent practicable by siting Project Components in agricultural land wherever possible. Some successional shrubland clearing is necessary to avoid woody encroachment into the solar arrays.
Bobolink	*Dolichonyx oryzivorus*	-	-	SGCN-HP	This species prefers grasslands, including pastures, successional old fields, and meadows. Habitat for this species occurs within the Project Area.	D, E, G	Yes	Potential direct impacts include habitat degradation and fragmentation from the conversion of 243.81 acres of agricultural land and successional old fields to early successional fields. Potential direct impacts include habitat displacement and degradation from the temporary conversion of 28.41 acres of agricultural land and successional old fields. There will be a habitat loss of 5.78 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 Project Components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. Active agricultural land provides limited wildlife habitat for bobolink. Conversion of agricultural land to planted early successional grasslands has been shown to benefit grassland bird species (see Section 22(f)(7)) and may improve habitat quality for this species at the Project.
Brown Thrasher	*Toxostoma rufum*	-	-	SGCN-HP	This species prefers successional shrublands, dense regenerating woods, and forest edges. Habitat for this species occurs within the Project Area.	D, G	No	Potential direct impacts include habitat degradation and fragmentation from conversion of 110.66 acres of successional shrublands and forest edges to early successional grasslands. Potential direct impacts include habitat displacement due to the temporary conversion of 1.13 acres of successional shrubland. Potential direct impacts include habitat loss of 0.73 acres of successional shrubland and forest edges. The project layout will create forest edges that may be used by brown thrashers. Potential indirect impact from habitat disturbance due to noise and construction activity.	Impacts to successional shrublands and forests have been minimized to the maximum extent practicable by siting Project Components in agricultural land wherever possible. Tree and shrub clearing is necessary to prevent trees and shrubs overhanging solar arrays.
Canada Warbler	*Wilsonia canadensis*	-	-	SGCN-HP	This species prefers forest undergrowth and shady thickets. Breeding occurs in mixed hardwoods of extensive forests and streamside thickets and nesting occurs near moist habitat. Habitat for this species occurs limitedly within the Project Area.	D, G	No	Potential direct and indirect impacts are unlikely due to limited habitat in the form of extensive forests and streams (see Section 22(f)(8)). Potential direct impacts include habitat degradation and fragmentation from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 acres of forests. Potential indirect impacts include habitat disturbance due to noise and construction activity.	Impacts to forests have been minimized to the maximum extent practicable by siting Project Components in agricultural land wherever possible. Tree clearing is necessary to avoid trees overhanging solar arrays.

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

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4]	Source of Potential Presence[5]	Observed On-site	Potential Impacts	Impact Avoidance Measures
Common Goldeneye	*Bucephala clangula*	-	-	SGCN	This species prefers freshwater habitats such as ponds, lakes, rivers, and forested wetlands. Nests in tree cavities in mature boreal forests. Habitat for this species may occur limitedly within the Project Area, although there are no boreal forests.	G	No	Potential indirect impacts could include habitat disturbance due to noise from construction activities near wetland habitat, and habitat degradation or loss from the 0.65 acres of permanent conversion of PFO wetlands.	Impacts to ponds, lakes, rivers, and forested wetlands have been completely avoided by siting Project Components in agricultural land wherever possible. HDD will be used when necessary to avoid impacts to rivers and wetlands.
Common Nighthawk	*Chordeiles minor*	-	SSC	SGCN-HP	This species prefers open or semi-open areas such as forest clearings, grasslands, and suburbs. Habitat for this species occurs within the Project Area.	G	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 243.81 acres of agricultural land and successional old fields to early successional fields. Potential direct impacts include habitat displacement and degradation from the temporary conversion of 28.41 acres of agricultural land and successional old fields. There will be habitat loss of 5.78 acres of agricultural land and successional old fields to Project Components. Potential indirect impacts could include habitat disturbance due to noise and construction activities.	Impacts to successional old fields have been minimized to the maximum extent practicable. Impacts to open agricultural areas are unavoidable. Most Project Components have been sited within agricultural areas to avoid wetlands and minimize tree clearing.
Cooper's Hawk	*Accipiter cooperii*	-	SSC	-	This species prefers to reside in deciduous, mixed, and coniferous forests. Habitat for this species occurs within the Project Area.	D, F, G, H	Yes	Potential direct impacts include habitat degradation and fragmentation from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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.
Eastern Meadowlark	*Sturnella magna*	-	-	SGCN-HP	This species prefers large expanses of farm fields, pastures, grasslands, and wet fields. Habitat for this species occurs within the Project Area.	D, E, G	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 243.81 acres of agricultural land and successional old fields to early successional fields. Potential direct impacts include habitat displacement from the temporary conversion of 28.41 acres of agricultural land and successional old fields. There will be habitat loss of 5.78 acres of agricultural land and successional old fields to Project Components. Potential indirect impacts could include disturbance due to noise and construction activity.	Impacts to agricultural land are unavoidable, as most Project Components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. Conversion of land to planted early successional grasslands at solar facilities has been shown to benefit grassland birds (see Section 22(f)(7)) and may improve habitat quality for this species at the Project.
Golden-winged Warbler	*Vermivora chrysoptera*	-	SSC	SGCN-HP	This species prefers open woodlands, wet thickets, and successional shrublands. A mosaic of shrubby, open areas, and mature forests are important for this species. Habitat for this species occurs within the Project Area.	D	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 110.66 acres of successional shrublands and forests to early successional grasslands. Potential direct impacts include habitat displacement due to the temporary conversion of 1.13 acres of successional shrubland. Potential direct impacts include habitat loss of 0.29 acres of successional shrubland and forest. 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 agricultural areas. Tree and shrub clearing are necessary to prevent trees from overhanging solar arrays.

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

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4]	Source of Potential Presence[5]	Observed On-site	Potential Impacts	Impact Avoidance Measures
Grasshopper Sparrow	*Ammodramus savannarum*	-	SSC	SGCN-HP	This species prefers open fields and prairie including active hay fields, successional old field, and minimally in successional shrublands. Habitat for this species occurs within the Project Area.	D, E, G	Yes	There are unlikely to be direct or indirect impacts due to the limited grassland habitat suitable for grasshopper sparrow. Potential direct impacts include habitat degradation and fragmentation from the conversion of 236.00 acres of agricultural land and successional old fields to early successional fields. Potential direct impacts include habitat displacement from the temporary conversion of 23.93 acres of agricultural land and successional old fields. There will be a habitat loss of 4.38 acres of agricultural land and successional old fields to Project Components. Potential indirect impacts could include disturbance due to noise and construction activity.	Impacts to agricultural land are unavoidable, as most Project Components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. Active agricultural land provides limited wildlife habitat for grasshopper sparrow. Conversion of agricultural land to planted early successional grasslands for solar facilities has been shown to benefit grasshopper sparrow (see Section 22(f)(7)) and may improve habitat quality for this species at the Project.
Henslow's Sparrow	*Ammodramus henslowii*	-	THR	SGCN-HP	This species prefers moist fallow fields and meadows. Breeding occurs in a variety of habitats with tall, dense grass, and herbaceous vegetation. Habitat for this species occurs within the Project Area.	D	No	There are unlikely to be direct or indirect impacts due to the limited grassland habitat suitable for Henslow's sparrow. Potential direct impacts are habitat degradation and fragmentation from the conversion of 236.00 acres of agricultural land and successional old fields to early successional fields. Potential direct impacts include habitat displacement from the temporary conversion of 23.93 acres of agricultural land and successional old fields. There will be a habitat loss of 4.38 acres of agricultural land and successional old fields to Project Components. Potential indirect impacts could include disturbance due to noise and construction activity.	Impacts to agricultural land are unavoidable, as most Project Components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. Active agricultural land provides limited wildlife habitat for Henslow's sparrow. Conversion of agricultural land to planted early successional grasslands for solar facilities has been shown to benefit grassland bird species (see Section 22(f)(7)) and may improve habitat quality for this species at the Project.
Horned Lark	*Eremophila alpestris*	-	SSC	SGCN-HP	This species prefers open fields, agricultural areas, and open habitats with sparse vegetation such as prairies and heavily grazed pastures. Habitat for this species occurs within the Project Area.	D, E, G	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 243.81 acres of agricultural land and successional old fields to early successional fields. Potential direct impacts include habitat displacement from the temporary conversion of 28.41 acres of agricultural land and successional old fields. There will be habitat loss of 5.78 acres of agricultural land and successional old fields to Project Components. Potential indirect impacts could include disturbance due to noise and construction activity.	Impacts to agricultural land are unavoidable, as most Project Components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. Active agricultural land provides limited wildlife habitat for horned lark. Conversion of agricultural land to planted and managed early successional grasslands for solar facilities has been shown to benefit grassland bird species with habitat requirements similar to horned lark (see Section 22(f)(7)) and may improve habitat quality for this species at the Project.
Least Bittern	*Ixobrychus exilis*	-	THR	SGCN	Breeds in marsh environments that contain tall reeds such as cat-tails and rushes, interspersed with pockets of open water and woody vegetation. Limited habitat for this species occurs within the Project Area.	G	No	Potential indirect impacts could include habitat disturbance due to noise from construction activities near wetland habitat, and habitat degradation or loss from the 0.65 acres of permanent conversion of PFO wetlands.	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 22-12. State & Federally Listed Species Occurring or Likely to Occur within the Project Area

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4]	Source of Potential Presence[5]	Observed On-site	Potential Impacts	Impact Avoidance Measures
Little Blue Heron	*Egretta caerulea*	-	-	SGCN	The species is found in a variety of wetland environments including swamps, marshes, ponds, flooded fields, and ditches. They nest in trees and shrubs near open water. Habitat for this species occurs within the Project Area.	G	No	Potential indirect impacts could include habitat disturbance due to noise from construction activities near wetland habitat, and habitat degradation or loss from the 0.65 acres of permanent conversion of PFO wetlands.	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.
Louisiana Waterthrush	*Seiurus motacilla*	-	-	SGCN	This species uses forested riparian areas, often along ravines, containing gravel-bottomed streams. Habitat for this species may occur within the Project Area, although there are no steep ravines within the Project Area.	D, G	No	There are unlikely to be direct or indirect impacts due to the limited area of habitat for this species. 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. HDD will be used to cross streams.
Northern Bobwhite	*Colinus virginianus*	-	-	SGCN-HP	The species is commonly found in grassland habitat, agricultural fields, and successional shrublands. Habitat for this species is found within the Project Area.	D, G	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 243.81 acres of agricultural land and to early successional fields. Potential direct impacts include habitat displacement and degradation from the temporary conversion of 28.41 acres of agricultural land and successional old fields. There will be habitat loss of 5.78 acres of agricultural land to Project Components. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to agricultural land are unavoidable, as most Project Components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. Conversion of land to planted early successional grasslands at solar facilities has been shown to benefit grassland birds (see Section 22(f)(7)) and may improve habitat quality for this species at the Project.
Northern Goshawk	*Accipiter gentilis*	-	SSC	SGCN	This species prefers larger tracts of wild forest. Across much of their range, they live mainly in coniferous forests; however, they may occur in deciduous hardwood forest as well. Habitat for this species occurs within the Project Area.	G, H	No	Potential direct impacts are unlikely due to the limited habitat in the form of extensive forests (see Section 22(f)(8)). Potential direct impacts include habitat degradation and fragmentation, from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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.
Northern Harrier	*Circus cyaneus*	-	THR	SGCN	This species prefers freshwater marshes, wet grasslands, lightly grazed pastures, successional old field, and croplands. Habitat for this species occurs within the Project Area.	D, E, F, G, H	No	There are unlikely to be direct or indirect impacts due to the limited area of optimal habitat. Potential direct impacts include habitat degradation and fragmentation from the conversion of 243.81 acres of agricultural land and successional old fields to early successional fields. Potential direct impacts include habitat displacement and degradation from the temporary conversion of 28.41 acres of agricultural land and successional old fields. There will be habitat loss of 5.78 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. Conversion of agricultural land to planted early successional grasslands may benefit northern harrier as availability of prey resources may increase in this cover type relative to actively farmed lands.

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

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4]	Source of Potential Presence[5]	Observed On-site	Potential Impacts	Impact Avoidance Measures
Northern Pintail	*Anas acuta*	-	-	SGCN	This species prefers freshwater marshes and nests in pastures, hay fields, croplands, and successional old fields.	G	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 243.81 acres of agricultural land and successional old fields to early successional fields containing Project Components. Potential direct impacts include habitat displacement from the temporary conversion of 28.41 acres of agricultural land and successional old fields. There will be habitat loss of 5.78 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. Converted agricultural areas may provide reduced nesting habitat quality; however, successional grassland habitat under and between solar panels has proven beneficial to some grassland species (see Section 22(f)(7)) and may still provide limited nesting habitat for this species.
Osprey	*Pandion haliaetus*	-	SSC	-	Nest within 12 miles of shallow, fish-filled waters including lakes, ponds, reservoirs, swamps, and marshes. Nesting substrate varies, but must be tall enough to avoid mammalian predators. No waterbodies within the Project Area are large enough to support fish populations, therefore, habitat is not present within the Project Area. However, habitat for this species is located in the vicinity of the Project Area.	D, G, H	No	None, as habitat for ospreys is not present at the Project Area.	None proposed.
Peregrine Falcon	*Falco peregrinus*	-	END	SGCN	The species nests at high elevations on cliffs or tall man-made structures. In migration and winter, this species will use nearly any open habitat. Nesting habitat is not present within the Project Area; however, wintering habitat is available.	F, G, H	No	Potential direct impacts include habitat degradation and fragmentation from converting 255.93 acres of agricultural land, successional shrubland, and successional old fields to early successional grassland. Potential direct impacts include habitat displacement from temporarily converting 29.55 acres of successional shrubland, agricultural land, and successional old field to early successional grassland. Potential direct impacts include a habitat loss of 6.08 acres converted to Project Components. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to successional shrublands and successional old fields have been minimized to the maximum extent practicable by siting most of the Project Components in agricultural areas. Impacts to agricultural land are unavoidable, as most of the Project Components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. However, grassland habitat created under and between solar panels may provide improved habitat quality over active agriculture within the Project Area (see Section 22(f)(7)).
Prairie Warbler	*Setophaga discolor*	-	-	SGCN	This species prefers successional shrubland, successional old-field, brush piles, and pastures. Breeds in dry old field and clearing, edges of forest, and sandy pine barrens. Habitat for this species occurs within the Project Area.	G	No	Potential direct impacts include habitat degradation and fragmentation from converting 255.93 acres of agricultural land, successional shrubland, and successional old fields to early successional grassland. Potential direct impacts include habitat displacement from temporarily converting 29.55 acres of successional shrubland, agricultural land, and successional old field to early successional grassland. Potential direct impacts include a habitat loss of 6.08 acres converted to Project Components. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to successional shrublands and successional old fields have been minimized to the maximum extent practicable by siting most of the Project Components in agricultural areas. Impacts to agricultural land are unavoidable, as most of the Project Components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. However, grassland habitat created under and between solar panels may provide improved habitat quality over active agriculture within the Project (see Section 22(f)(7)).

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

Common Name	Scientific Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference[4]	Source of Potential Presence[5]	Observed On-site	Potential Impacts	Impact Avoidance Measures
Red-headed Woodpecker	*Melanerpes erythrocephalus*	-	SSC	SGCN-HP	This species prefers open deciduous forests, forest edges, groves, and orchards. Habitat for this species occurs within the Project Area.	D, G	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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.
Red-shouldered Hawk	*Buteo lineatus*	-	SSC	SGCN	This species prefers bottomland hardwood or upland mixed forests, though are also typically found inhabiting residential areas. Habitat for this species is present within the Project Area.	D, G, H	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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.
Ruffed Grouse	*Bonasa umbellus*	-	-	SGCN	This species prefers a mix of mature forests, successional forests, and successional shrublands. Habitat for this species occurs within the Project Area.	D, E, F, G	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 110.66 acres of successional shrublands and forests to early successional grasslands. Potential direct impacts include habitat displacement due to the temporary conversion of 1.13 acres of successional shrubland. Potential direct impacts include habitat loss of 0.29 acres of successional shrubland and forests. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Impacts to forested areas and successional shrublands have been minimized to the maximum extent practicable by siting most of the Project Components in agricultural areas. Tree and shrub clearing is necessary to prevent trees and shrubs from overhanging solar arrays.
Rusty Blackbird	*Euphagus carolinus*	-	-	SGCN-HP	Typically found within wet forest environments, breeding in fens, bogs, and near beaver ponds. Winters in swamps and wet woodlands. Habitat for this species is found within the Project Area.	G	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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 and shrubs from overhanging solar arrays.
Scarlet Tanager	*Piranga olivacea*	-	-	SGCN	This species prefers expansive deciduous and mixed forest canopies. Habitat for this species occurs within the Project Area.	D, E, G	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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 and shrubs from overhanging solar arrays.
Sharp-shinned Hawk	*Accipiter striatus*	-	SSC	-	This forest-dwelling raptor prefers to reside in deciduous forests, thickets, forest edges, and mixed woodlands. Suitable habitat for this species occurs within the Project Area.	D, E, F, G, H	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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 and shrubs from overhanging solar arrays.

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Short-eared Owl	*Asio flammeus*	-	END	SGCN-HP	This species prefers open areas grasslands, prairies, marshes, and meadows. Habitat for this species occurs within the Project Area.	G	No	Potential direct and indirect impacts are unlikely due to the limited area of optimal grassland habitat and lack of prairie habitat. Potential direct impacts include habitat degradation and fragmentation from the conversion of 236.00 acres of agricultural land to early successional grasslands. Potential direct impacts include habitat displacement and degradation from the temporary conversion of 23.93 acres of agricultural land. There will be habitat loss of 4.38 acres of agricultural land 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. Impacts to wetlands have been minimized and avoided by using HDD when necessary. Active agricultural land provides limited wildlife habitat for short-eared owl. Conversion of agricultural land to planted early successional grasslands has been shown to benefit grassland bird species (see Section 22(f)(7)) and may improve habitat quality for this species at the Project.
Upland Sandpiper	*Bartramia longicauda*	-	THR	SGCN-HP	This species prefers prairies, grasslands, and successional old field. Habitat for this species occurs within the Project Area.	G	No	There are unlikely to be direct or indirect impacts due to the limited area of optimal grassland and lack of prairie habitat. Potential direct impacts include habitat degradation and fragmentation from the conversion of 243.81 acres of agricultural land and successional old fields to early successional fields. Potential direct impacts include habitat displacement and degradation from the temporary conversion of 28.41 acres of agricultural land and successional old fields. There will be habitat loss of 5.78 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. Active agricultural land provides limited wildlife habitat for upland sandpiper. Conversion of agricultural land to planted early successional grasslands has been shown to benefit grassland bird species (see Section 22(f)(7)) and may improve habitat quality for this species at the Project.
Vesper Sparrow	*Pooecetes gramineus*	-	SSC	SGCN-HP	This species responds quickly to changes in habitat and often occupies abandoned, old farm fields and successional shrub lands as they return to forest. Habitat for this species occurs within the Project Area.	D, G	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 19.94 acres of successional old fields and successional shrublands to early successional fields. Potential direct impacts include habitat displacement and degradation from the temporary conversion of 5.62 acres of successional shrublands and successional old fields. There will be habitat loss of 1.70 acres of successional shrubland and successional old fields to Project Components. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Project Components have been sited in agricultural areas to the maximum extent possible to avoid successional shrublands and successional old fields. Further, conversion of agricultural land to planted early successional grasslands has been shown to benefit grassland bird species (see Section 22(f)(7)) and may improve habitat quality for this species at the Project.
Wood Thrush	*Hylocichla mustelina*	-	-	SGCN	This species prefers deciduous and mixed forests with large trees, moderate understory, shade, and abundant leaf litter. Habitat for this species occurs within the Project Area.	D, E, G	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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 and shrubs from overhanging solar arrays.

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Yellow-billed Cuckoo	*Coccyzus americanus*	THR	-	-	This species prefers open-canopy wooded environments, including successional fields and forested areas with dense understory vegetation. The species is also commonly found in shrub-scrub habitat. Habitat for the species is present within the Project Area.	D, E, G	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 19.94 acres of successional old fields and successional shrublands to early successional fields. Potential direct impacts include habitat displacement and degradation from the temporary conversion of 5.62 acres of successional shrublands and successional old fields. There will be habitat loss of 1.70 acres of successional shrubland and successional old fields to Project Components. Potential indirect impacts could include habitat disturbance due to noise and construction activity.	Project Components have been sited in agricultural areas to the maximum extent possible to avoid successional shrublands and successional old fields. Further, conversion of agricultural land to planted early successional grasslands has been shown to benefit grassland bird species (see Section 22(f)(7)) and may improve habitat quality for this species at the Project.
Mammals									
Eastern Red Bat	*Lasiurus borealis*	-	-	SGCN	This migratory bat species resides in forested areas and does not overwinter in caves. This species roosts in tree foliage of a variety of deciduous tree species. They forage in wooded areas, over waterbodies, open areas, and along edge habitat. Summer habitat occurs within the Project Area.	C	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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.
Eastern Small-footed Bat	*Myotis leibii*	-	-	SGCN	This species hibernates in caves or mines during the winter. In the summer they roost in rock crevices, ledges, and talus areas. Foraging occurs in forested areas and over ponds, streams, and roads. While rock roosting habitat is not prevalent within the Project Area, there is potential summer foraging habitat within the Project Area.	C	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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.
Hoary Bat	*Lasiurus cinereus*	-	-	SGCN	This migratory bat species roosts in forested areas, among the foliage of deciduous and coniferous trees, and forages along open and edge habitat and over open areas or large open bodies of water. This species is not known to hibernate in caves. Summer habitat for this species occurs within the Project Area.	C	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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.
Little Brown Bat	*Myotis lucifugus*	-	-	SGCN-HP	This species roosts in buildings or trees, under rocks or wood piles during the summer. Foraging habitat includes over wetlands, open water, and other riparian habitat. This species hibernates during the winter in caves or abandoned mines. Summer habitat occurs within the Project Area.	C	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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.

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Northern Long-Eared Bat	*Myotis septentrionalis*	THR	THR	SGCN-HP	This species roosts in tree cavities or loose bark during the summer. Foraging habitat typically includes forest interiors as they are clutter specialists. This species hibernates during the winter in caves or abandoned mines. Summer habitat is within the forested portions of the Project Area.	C	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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.
Silver-haired Bat	*Lasionycteris noctivagans*	-	-	SGCN	This bat species may migrate through the Project Area. This migratory bat species resides in forested areas and does not typically overwinter in caves. This species roosts in trees and forages in wooded areas, over waterbodies, and along edge habitat. Summer habitat occurs within the Project Area.	C	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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.
Tri-colored Bat (Eastern Pipistrelle)	*Perimyotis subflavous*	-	-	SGCN-HP	This species hibernates in abandoned mines and caves during the winter. They roost in tree foliage and occasionally in buildings. Foraging habitat includes wooded riparian areas, over water, and forest-field edges. Summer habitat occurs within the Project Area.	C	No	Potential direct impacts include habitat degradation and fragmentation, from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 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.
Reptiles & Amphibians									
Snapping Turtle	*Cheylydra serpentina*	-	-	SGCN	This species prefers open water habitats such as deep freshwater marshes, ponds, lakes, and river. Habitat for this species occurs within the Project Area.	G	No	There will be no direct impacts because deep open water habitats and rivers will not be directly impacted. Indirect impacts include habitat disturbance due to noise and construction activity.	Project Components have been sited in agricultural areas to avoid wetlands and minimize tree clearing. Impacts to wetlands have been minimized and avoided by using HDD when necessary
Wood Turtle	*Glyptemys insculpta*	-	-	SGCN	The species will utilize both terrestrial and aquatic habitat, including slow-moving streams, rivers, and swamps, as well as successional old fields, meadows, and early successional forests. Habitat for this species occurs within the Project Area.	I	No	Potential direct impacts include habitat degradation and fragmentation from the conversion of 98.54 acres of forests to early successional grasslands. Potential direct impacts include a habitat loss of 0.44 acres of forests. 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. Impacts to wetlands have been minimized and avoided by using HDD when necessary. 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.

1 – "Federal Status" refers to the species listing as federally endangered (END) OR threatened (THR).
2 – "NYS Status" refers to the species listing as a state-listed endangered (END), threatened (THR), or species of special concern (SSC).
3 – "SGCN Listing" refers to is 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). Status was determined from the published list available at: https://www.dec.ny.gov/docs/wildlife_pdf/sgnc2015list.pdf
4 – References for habitat preference were Audubon.org, Allaboutbirds.org, and NYSDEC SWAP.
5 – "Source of Potential Presence" refers to the source of information indication the potential presence of the species at the Project Area:
A: Species identified by NYNHP as occurring within 10 miles of the Project Area
B: Species identified by USFWS online database (IPaC)
C: Species distribution range in the NYSDEC SWAP
D: Species identified in the USGS Breeding Bird Survey
E: Species identified in the NYS BBA
F: Species identified in the Audubon CBC
G: Species identified in eBird
H: Hawkwatch
I: Species identified in the NYS Amphibian & Reptile Atlas Project
J: Species identified in the NYSDEC Statewide Fisheries Database

22(p) Invasive Species Management and Control Plan

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 six invasive plant species were observed within the Project Area. Figure 22-1 shows concentration areas of invasive plant species. These species are included in the *New York State Prohibited and Regulated Invasive Plants* (NYSDEC, 2014) and below, as follows:

- black locust (*Robinia pseudocacia*), first observed April 22, 2019;
- common buckthorn (*Rhamnus cathartica*), first observed July 20, 2017;
- Tartarian honeysuckle;
- multiflora rose;
- purple loosestrife; and
- reed canary-grass.

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

The Applicant anticipates that post-construction monitoring will occur over a 5-year period, with monitoring events being conducted in years 1, 3, and 5 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, active agriculture covers 360 acres (46.7%) of the Project Area. However, according to the Cropland Data Layer, 119 acres (15.4%) of the Project Area is fallow/idle cropland, while another 103 acres (13.4%) of the Project Area is composed of non-alfalfa hay. Agricultural land at the Project Area is within a New York State-Certified Agricultural District – Schuyler County District 2. 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. Use of 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 236 acres of agricultural land will be used for non-agricultural land uses for the siting of Project Components during the useful economic life of the project (30+ years).

The New York State Department of Agriculture and Markets (NYSDAM) has issued *Guidelines for Agricultural Mitigation for Solar Energy Projects* (2019). Project construction and operation will comply with these guidelines to the maximum extent practicable to minimize impacts to agricultural resources. If these guidelines cannot be met, then the Applicant with consult with the NYSDAM to discuss acceptable alternatives. Documentation of the Project's consistency with these guidelines is included in Exhibit 21 at Section 21(u).

22(r) Avian Survey Reports

Watkins Glen Solar Energy Center, LLC conducted grassland breeding bird surveys from May 20 to July 20, 2018; and winter raptor surveys from November 15, 2018 to March 31, 2019. The results of these surveys are provided as Appendices 22-2 and 22-3. An assessment of any

potential impacts to grassland bird and/or winter raptor species habitat as a result of the Project is provided in Sections 22(f)(1), 22(f)(9), and 22(f)(11) above.

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