



EAST POINT ENERGY CENTER

Case No. 17-F-0599

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 proposed Stipulation 22, dated August 20, 2019, and therefore, the requirements of 16 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)). Of the entire 1,313-acre Project Area, only approximately 10.40 acres of wildlife habitat will be permanently lost due to the placement of Project Components. Moreover, 8.44 of the 10.40 acres (81 percent) of wildlife habitat permanently lost reside in active agricultural areas which already provide limited perpetual wildlife habitat due to the regular disturbances and anthropogenic pressures of active farming practices (see Section 22(f)(4)). Population-level impacts to listed and non-listed wildlife resources known or with potential to occur within the Project Area (including mammals, birds, reptiles and amphibians) are not expected as a result of project development (see Section 22(f)(8)). Additionally, through careful siting of Project Components, there are only 195 square feet of permanent direct impacts to wetlands and 0.34 acre of permanent impacts to a 100-ft adjacent area of a potential NYSDEC wetland proposed within the Project Area (see Section 22(m)).

In addition to Project and Study Area studies, the Applicant conducted a Cumulative Impact Analysis to evaluate potential impacts 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 22-7). The results of this analysis determined that the conversion of grassland habitat types to solar development is not anticipated to have population-level impacts from the Project, or cumulatively, from the 292 Study Projects identified. Additionally, less than 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 22-7).

22(a) Plant Communities

The Project Area resides within the Northern (High) Allegheny Plateau ecological region. This ecoregion resides along the southern tier of New York and the northern tier of Pennsylvania. A

small portion of northwestern New Jersey is also included in this large ecoregion. This ecoregion is defined by high elevation features at the northern end of the Appalachian Plateau. Most of this ecoregion is higher than 1,200 feet above mean sea level and the general landform of the area is mid-elevation hills separated by numerous stream-cut valleys. This ecoregion covers over 16.9 million acres and has the second highest percentage of natural cover (81 percent) of any Northeast Region (Zaremba et al., 2003). Within the ecoregion, deciduous forest covers 52 percent of the land area. Mixed forest covers 21 percent, coniferous forests cover 6 percent, and wetlands cover 0.7 percent of the ecoregion. Agriculture accounts for 18 percent of the total land cover (Zaremba et al., 2003). Dairy farms are the principle agricultural use, with row crop fields limited to the floodplains of river valleys and tablelands located among the hilltops. Residential and urban development cover 1 percent of the ecoregion.

More specifically, the Project Area resides within the Northern Glaciated Allegheny Plateau ecological subregion. The vegetation of the Northern Glaciated Allegheny Plateau is characterized by northern hardwoods and Appalachian oak forests, along with regionally defined ecological communities, such as Appalachian oak-hickory forests, Appalachian oak-pine forests, beech-maple mesic forests, and hemlock-northern hardwood forests (McNab and Avers, 1994). Oaks (*Quercus* spp.) are typically found on south-facing slopes. Mixtures of hardwoods are found on other slopes, with hemlock (*Tsuga canadensis*) in ravines.

The Project Area encompasses approximately 1,313 acres, consisting predominately of active agricultural land, most notably corn and soybeans. Other open fields are maintained for pasture and hay production. Land cover in the Project Area was spatially determined using the Cropland Data Layer (CDL) dataset compiled by the US Department of agriculture (USDA). According to the Cropland Data Layer (CDL), the Project Area contains primarily cultivated crops (48.5 percent), grass/pasture/hay (24.5 percent), and forested land (21.4 percent) (see Table 22-1). Additionally, the CDL indicates that the Project Area includes a marginal amount of successional shrubland (2.1 percent), developed land (2.0 percent), and wetlands (1.2 percent), while open water (0.2 percent) and barren land (<0.1 percent) comprise less than 1 percent of the Project Area. See Figure 22-1 for representative mapping of plant communities and Table 22-1 for land cover types within the Project Area based the USDA CDL.

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

Land Cover Type	Acreage	Percent of Project Area
Cultivated Crops	637.09	48.54
Grassland/Pasture/Hay	321.23	24.47
Forests	280.80	21.39
Shrub/Scrub	27.95	2.13
Developed	26.02	1.98
Woody and Herbaceous Wetlands	16.33	1.24
Open Water	2.88	0.22
Barren Land (Rock/Sand/Clay)	0.22	0.02

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 orthoimagery. 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 and Figure 22-2 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, pastureland, and cultivated crops is extremely common within the Project Area. This land cover class comprises approximately 810.0 acres, or 61.7 percent of the Project Area, according to TRC’s plant community mapping. Approximately 312.5 acres of agricultural land will be used for Project Components and then restored following the decommissioning of the Project. In *Ecological Communities of New York*, there are multiple terrestrial cultural community types with an agricultural land designation, including cropland/row crops (Heritage Rank: unranked cultural), cropland/field crops (Heritage Rank: unranked cultural), and pastureland (Heritage Rank: unranked cultural) (Edinger et al., 2014). Most row crops established within the Project Area are corn (*Zea mays*) and soybean (*Glycine max*), both first observed on July 11, 2017, which are utilized as feedstock, livestock feed, or for human consumption. Hay fields are also scattered throughout the Project Area and are utilized as green chop or open pasture for roaming livestock. Dominant plants in hayfields and pasture in the Project Area were Canada bluegrass (*Poa compressa*), first observed on May 18, 2018; orchard

grass (*Dactylis glomerata*) and red clover (*Trifolium pretense*), both first observed on May 21, 2018; and timothygrass (*Phleum pratense*) and common dandelion (*Taraxacum officinale*), both first observed on July 11, 2017.

Forestland

Forested land covers approximately 384.1 acres, or 29.3 percent, of the total land coverage for the Project Area according to TRC's plant community mapping. Within this cover type are a variety of forested communities with distinguishing characteristics supporting vast assemblages of interacting plant and animal populations. Specific forest communities as defined in *Ecological Communities of New York* found within the Project Area and their descriptions are below.

Beech-maple mesic forest (Heritage Rank: G4 S4 [Apparently secure globally and in New York State]) – Beech-maple mesic forest is common within the Project Area. This community occurs on moist, well-drained soils, usually acidic in content. This forest is described as a northern hardwood forest with sugar maple (*Acer saccharum*) and American beech (*Fagus grandifolia*), both observed on July 11, 2017, occurring codominant with each other. Common associates that occur in the community to a lesser extent are yellow birch (*Betula alleghaniensis*), white ash (*Fraxinus americana*), hop hornbeam (*Ostrya virginiana*), and red maple (*Acer rubrum*), which were all first observed on July 11, 2017. Eastern hemlock (*Tsuga canadensis*), first observed in the Project Area on July 11, 2017, may occur in this forest type at very low quantities. The shrub layer of this forest includes saplings of the aforementioned tree species, as well as American hornbeam (*Carpinus caroliniana*) and witch hazel (*Hamamelis virginiana*), both first observed on July 11, 2017. Saplings of sugar maple and American beech are scattered throughout the ground layer. Herbaceous ground cover includes Canada mayflower (*Maianthemum canadense*), various wood ferns (*Dryopteris* spp.), and stinking benjamin (*Trillium erectum*), all first observed on July 11, 2017, as well as Christmas fern (*Polystichum acrostichoides*), first observed on May 20, 2018.

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 at one time and subsequently cleared for agriculture. Successional forests can develop either after man-made clearing events or in the wake of destructive natural events (e.g., floods, blow-downs, and forest fires). After clearing has occurred and the impacted land begins to revert to forests, plant species that are well-adapted to establishment after disturbance begin to populate the area. Characteristic trees dominating successional northern hardwoods within the Project Area include big-tooth aspen (*Populus*

grandidentata), quaking aspen (*Populus tremuloides*), gray birch (*Betula populifolia*), black cherry (*Prunus serotina*), red maple, and white pine, all first observed on July 11, 2017. White ash, green ash (*Fraxinus pennsylvanica*), and American elm (*Ulmus americana*), all first observed on July 11, 2017, can be found in this community at the Project Area, but in lesser numbers.

Appalachian oak-hickory forest (Heritage Rank: G4G5 S4 [Apparently or demonstrably secure globally, apparently secure in New York State]) – This hardwood forest occurs on ridgetops, upper slopes, and on south- and west-facing slopes. Soils are well-drained and normally have a sandy-loam or general loamy texture. Appalachian oak-hickory forests occur to a lesser extent in the Project Area. Dominant trees in this community include a co-dominance between red oak (*Quercus rubra*) and white oak (*Quercus alba*) species, both first observed on July 11, 2017. Mixed with these oaks at lower densities are shagbark hickory (*Carya ovata*) and pignut hickory (*Carya glabra*), both first observed on July 11, 2017. Red maple, white ash, and hop hornbeam also occur as common associates in this forest community. The shrub layer of this forest includes saplings of the aforementioned tree species and shrubs such as choke cherry (*Prunus virginiana*), red raspberry (*Rubus idaeus*), witch hazel, maple-leaf viburnum (*Viburnum acerifolium*), and gray dogwood (*Cornus racemosa*), all first observed on July 11, 2017. Characteristic ground layer herbs include pointed leaved tick-trefoil (*Hylodesmum glutinosum*), first observed on July 11, 2017, among others.

Hemlock-northern hardwood forest (Heritage Rank: G4G5 S4) – Hemlock-northern hardwood forest communities are mixed and generally occur on the middle to lower slopes of shaded ravines, on cool, mid-elevation hillslopes, and on moist, well-drained sites at the margins of swamps. Eastern hemlock is predominant within the tree stratum and can range in coverage from pure stands to only 20 percent of the tree canopy. An assortment of tree species may be codominant to eastern hemlock within this community. Relative to the Project Area, codominant tree species are pignut hickory, American beech, American basswood (*Tilia americana*), and sugar maple, all first observed on July 11, 2017. Within the shrub layer, striped maple (*Acer pensylvanicum*), first observed on July 11, 2017, is a common species in this community. Along with the saplings of these canopy trees, witch hazel, maple-leaf viburnum, and several *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. However, when present, ground layer herbaceous species include various wood ferns, Christmas fern, stinking benjamin, and northern lady fern (*Athyrium angustum*), all first observed on July 11, 2017. Where pockets

of sunlight penetrate the upper canopy, New York fern (*Thelypteris noveboracensis*), first observed on July 11, 2017, may be found.

Developed Land

Developed land covers approximately 11.4 acres of the Project Area, or roughly 0.9 percent of the total land coverage, according to TRC's plant community mapping. Developed lands in the Project Area represent areas with extreme anthropogenic influence and are characterized by the presence of buildings, roadways, sand/gravel mine, residential areas, 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 tend to propagate when introduced within disturbed areas. In developed areas, non-native plant species often flourish in a community which generally characterizes old-field appearances and functions. Non-native species such as ragweed (*Ambrosia artemisiifolia*), multiflora rose (*Rosa multiflora*), European buckthorn (*Rhamnus cathartica*), Morrow's honeysuckle (*Lonicera morrowii*), common mullein (*Verbascum thapsus*), various upland grasses (*Poa* spp.), all first observed on July 11, 2017, and Canada thistle (*Cirsium arvense*), first observed on July 12, 2017, generally populate these developed areas in the Project Area.

Successional Old-field

Successional old-fields (Heritage Rank: G5 S5) cover approximately 82.8 acres within the Project Area, or approximately 6.3 percent of the total land coverage according to TRC's plant community mapping. This community is defined as a meadow dominated by forbs and grasses that occur on sites that have been cleared or plowed due to agricultural activities or development, and subsequently abandoned. Most old-field communities are irregularly and infrequently mowed. As such, conditions favor the establishment and spread of representative old-field species. Characteristic herbaceous species include many goldenrods (*Solidago* spp.), timothy grass (*Phleum pretense*), various asters (*Symphyotrichum* spp.), Queen Anne's lace (*Daucus carota*),

Virginia strawberry (*Fragaria virginiana*), common dandelion (*Taraxacum officinale*), lesser burdock (*Arctium minus*), common milkweed (*Asclepias syriaca*), chicory (*Cichorium intybus*), and purple vetch (*Vicia americana*), which were all first observed on July 11, 2017. Shrubs can be present within successional old-field communities but represent less than 50 percent of the community. Common shrubs found in this community are honeysuckles (*Lonicera* spp.), various dogwoods (*Cornus* spp.), viburnums (*Viburnum* spp.), *Rubus* spp., and small willows (*Salix* spp.), all first observed on July 11, 2017. If not maintained by infrequent mowing, this relatively short-lived community succeeds to a successional shrubland, woodland, or forest community.

Wetlands

Wetlands represent 81.46 acres, or 6.2 percent, of the Project Area. Specific wetland communities within the Project Area include shallow emergent marshes (Heritage Rank: G5 S5), deep emergent marshes (Heritage Rank: G5 S5), shrub swamps (Heritage Rank: G5 S5), and red maple-hardwood swamps (Heritage Rank: G5 S4S5 [Demonstrably secure globally, apparently or demonstrably secure in New York State]). Additional characterization of the wetland communities is presented in section 22(j).

Successional Shrubland

Successional shrubland (Heritage Rank: G5 S5) covers approximately 19.4 acres (or 1.5 percent of the total land coverage) according to TRC's plant community mapping. This community represents shrublands that were established after a site has been cleared (e.g., for agriculture, logging, or development) or were disturbed by natural events. This community is defined by at least a 50 percent cover of shrub species (Edinger et al., 2014). Successional shrublands are transitory communities between successional old-field and successional forest communities. Characteristic shrubs found within the Project Area are gray dogwood, multiflora rose, intermediate serviceberry (*Amelanchier intermedia*), Allegheny blackberry (*Rubus allegheniensis*), choke cherry, nannyberry (*Viburnum lentago*), silky dogwood (*Cornus amomum*), red osier dogwood (*Cornus sericea*), European buckthorn, various shrub willows (*Salix* spp.), and Morrow's honeysuckle (*Lonicera morrowii*), all first observed on July 11, 2017. Herbaceous species are very diverse in this community but typically represent less than 50 percent of total vegetative cover. Within the Project Area, common herbaceous plants within this community include goldenrods, common dandelion, and white bedstraw (*Galium mollugo*), all first observed on July 11, 2017.

Open Water

Open water communities are somewhat sparse within the Project Area, covering approximately 4.6 acres, or 0.3 percent of the Project Area, according to TRC's plant community mapping. These open water communities include a quarry pond (Heritage Rank: unranked cultural), farm ponds/artificial ponds (Heritage Rank: unranked cultural), eutrophic ponds (Heritage Rank: G4 S4), and deep emergent marsh (Heritage Rank: G5 S5). Specific riverine communities in the Project Area include intermittent streams (Heritage Rank: G4 S4), rocky headwater streams (Heritage Rank: G4 S4), marsh headwater streams (Heritage Rank: G4 S4), and ditch/artificial intermittent streams (Heritage Rank: unranked cultural). Dominant aquatic vegetation in the eutrophic ponds, deep emergent marshes, farm pond/artificial ponds, marsh headwater streams, and ditch/artificial intermittent streams on the Project Area include curly pondweed (*Potamogeton crispus*), first observed on May 18, 2018, and common duckweed (*Lemna minor*), first observed on July 11, 2017. Although aquatic vegetation grows within some of these communities, emergent wetland vegetation often grows along the periphery of these communities as well. Typical emergent wetland species associated with these open water communities within the Project Area include reed canary grass (*Phalaris arundinacea*), common spike-rush (*Eleocharis palustris*), and field horsetail (*Equisetum arvense*), all first observed on July 11, 2017, as well as rice cut grass (*Leersia oryzoides*), first observed on July 12, 2017, among others.

22(b) Impacts to Plant Communities

(1) Proposed Temporary and Permanent Impacts

The Limit of Disturbance for the Project is approximately 408.34 acres, which represents approximately 31.1 percent of the Project Area. The construction and operation of the Project will cause temporary and relatively small permanent impacts to some of the aforementioned ecological communities. Impacts to ecological communities and associated plant communities will occur through vegetation clearing 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 assumed disturbance areas assigned to each Project Component as well as the preliminary design drawings in Exhibit 11. These assumed disturbance areas are described in Table 22-2:

Table 22-2. Impact Assumptions

Project Components	Assumed Vegetative Clearing Area	Assumed Soil Disturbance Area	Area of Permanent Impact
Solar Panel Installations	288.99	0.28	288.99
Access Roads	8.47	8.47	8.47
Collection Lines	2.48	3.11	-
Collection Substation/Inverters	1.00	1.00	1.00
Staging/Laydown Area	9.29	9.32	-
Fence	1.02	1.02	1.02

These impact assumptions were used to calculate temporary and permanent impacts to plant communities resulting from the construction and operation phases of the Project. While the Project layout may ultimately co-locate various Components (e.g., electric collection lines and access road), 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.

Approximately 374.104 acres of plant communities will be disturbed by construction and operation of the Project. This equates to approximately 28.5 percent of the total Project Area. Of this impact amount, approximately 8.95 acres will be only temporarily impacted. Temporary impacts include the burying of underground collection lines, clearing along the margins of access roads and solar array workspaces required for construction, and the construction and use of staging areas during construction. Approximately 312.88 acres will be impacted through built Components of the Project. Permanent impacts to plant communities will affect 0.8 percent of the total Project Area. Permanent impacts will result from access roads, inverters, and substation. Individual impacts on general land cover types are discussed in detail below.

Construction of the Project will result in a temporary disturbance of approximately 7.90 acres of vegetation associated with hayfields and pastures. Agricultural areas with pre-existing pastureland or hayfield communities will be temporarily impacted by the installation of the solar arrays, as a similar grassland community will be planted below the arrays. Temporary impacts to agricultural land will occur from the siting of an underground collection line 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. Site conditions can be restored, and agricultural activities resumed following decommissioning of the Project. A total of approximately 312.45 acres of agricultural land will be employed for site Project Components for the useful life of the Project.

The clearing of forested cover types within the Project Area is unavoidable due to the size and location of forest communities within the Project Area. Permanent impacts occur where forestland will be directly replaced with Project Components. There will be approximately 1.69 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 and 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 in approximately 48.55 acres of forestland in the Project Area. The Applicant plans to remove stumps of forest species only where the placement of Components is intended to occur.

In general, forest fragmentation occurs where forest areas are divided into smaller, isolated patches of forest. This process can result from the creation of natural open areas, farmland expanses, creation of road corridors, or the establishment of developed areas. The proposed Project layout will result in 105.23 acres of peripheral forest area, defined as forest within 300 feet of the forest edge, created through the addition of access roads and developed areas within existing forest patches. Presently, forest patches within the Project Area are small and isolated in the surrounding agricultural matrix, providing sub-optimal habitat for edge-sensitive species.

The creation of peripheral forest in this landscape is not likely to result in additional edge effects which may alter species behavior or community assemblages within the Project Area. For more information on this subject please refer to the subheading *Impacts to Wildlife and Wildlife Habitat*, within Section 22(f) of this Exhibit.

The construction of the Project will also result in the temporary disturbance of approximately 0.20 acres of successional shrubland communities, 0.10 acres of successional old-field communities, and 0.75 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 0.14 acres of successional shrubland communities, 0.05 acres of successional old-field communities, and 0.08 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 Section 23(b)(4) of 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. Temporary, permanent, and conversion impact acreages for each representative community in the Project Area are provided in Table 22-3 below. See Figure 22-1 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	Temporary Impact (Acres)	Permanent Loss (Acres)	Conversion (Acres)
Forestland	0.00	1.69	48.55
Successional Shrubland	0.20	0.14	2.12
Successional Old-Field	0.10	0.05	0.07
Open Water	0.00	0.00	0.0

Table 22-3. Vegetation Impact Calculations

Cover Type	Temporary Impact (Acres)	Permanent Loss (Acres)	Conversion (Acres)
Agricultural Land	7.90	8.44(Useful Life of Project Only)	304.01(Useful Life of the Project Only)
Developed Land	0.75	0.08	0.00
Total	8.95	10.40	354.75

(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(q) of this Exhibit. Control and management methods for high-priority invasive species in the Project Area are further addressed in Appendix 22-6.

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 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 particular 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 comprised 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 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 11-2 for a detailed Landscaping Plan of the Project Area. See Exhibit 5 for additional information on proposed vegetation management practices. Section 5(j) of this Exhibit explains vegetation management practices during the initial operation period and ongoing operation.

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

(1) Avoidance and Minimization of Plant Community Impacts

Avoidance efforts 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 in order to confine disturbances to the smallest area possible. Work areas have been adjusted to utilize open fields wherever possible.

Linear Project Components, such as access roads and collector 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 used to protect adjacent resources during the construction and associated remediation phases of this Project. See Section 23(c)(1) of Exhibit 22 for details and a summary of the Preliminary Stormwater Pollution Prevention Plan (SWPPP), available as Appendix 23-3.

Avoidance, minimization, and mitigation of impacts to vegetative communities will also occur through compliance with on-site environmental monitor guidance, 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.

As discussed in Section 22(b), the Applicant will implement BMPs in accordance with the ISMCP (Appendix 22-6) 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 take place. 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 solar arrays will be planted with a solar farm grass seed mix comprised of grasses that are indigenous to the area. This grass seed mix will provide some favorable wildlife

habitat to grassland species. Trees and shrubs will be planted around solar arrays to create a visual buffer. See Appendix 11-2 for a detailed Landscaping Plan of the Project Area.

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

As stated in Section 22(a) of this Exhibit, there are multiple ecological communities within the Project Area. TRC biologists documented specific plant species and general plant communities during on-site field survey work conducted in the summer of 2017, the spring and summer of 2018, and spring of 2019. During the documentation of plant communities and plant species, TRC biologists adhered to nomenclature and designations put forth in both the *New York Flora Atlas* (Weldy et al., 2016), and the *Ecological Communities of New York* (Edinger et al., 2014). During the field effort, TRC biologists conducted a species inventory and general plant community survey for the Project Area, identifying discernable plant species while walking through impact survey areas and established plant communities. Appendix 22-1 (Plant and Wildlife Inventory List) includes a compiled list of plant species observed at the Project Area. A list and description of plant communities identified on-site are in Section 22(a) of this Exhibit. Wetlands are addressed separately in Section 22(i) through Section 22(o).

(1) Suitable Habitat Assessment

Through reference to online resources associated with the USFWS Environmental Conservation Online System (USFWS, n.d.), NYSDEC Environmental Resource Mapper (NYSDEC, n.d.), and the *U.S. National Wilderness Preservation System Map* (Ronald, 2012), there are no known significant natural communities or habitats of special concern located within the Project Area. As such, the Applicant does not anticipate impacts to any federal or state-listed significant natural communities, habitats of special concern, U.S. National Wilderness Areas, or USFWS-Critical Wildlife Habitats. On-site survey work conducted by TRC biologists confirmed there are no unusual habitats or significant natural communities located at the Project Area.

(2) Wildlife Surveys, Vegetation, Wildlife, and Wildlife Habitat

Birds

On-site observations, field surveys, and inquiries into existing data sources were conducted to create a complete list of bird species that 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 required by the NYSDEC and was conducted during the 2018 breeding season by Tetra Tech, an engineering services company. 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, including:

- northern harrier (*Circus hudsonius*), first observed on June 12, 2018
- upland sandpiper (*Bartramia longicauda*)
- short-eared owl (*Asio flammeus*)
- Henslow's sparrow (*Ammodramus henslowii*)
- sedge wren (*Cistothorus platensis*)
- grasshopper sparrow (*Ammodramus savannarum*), first observed on May 22, 2018
- vesper sparrow (*Pooecetes gramineus*)
- horned lark (*Eremophila alpestris*)

Additional target grassland bird species the subject of the survey included:

- American kestrel (*Falco sparverius*), first observed on May 22, 2018
- bobolink (*Dolichonyx oryzivorus*), first observed on May 22, 2018
- eastern meadowlark (*Sturnella magna*), first observed on March 29, 2019
- golden-winged warbler (*Vermivora chrysoptera*)
- savannah sparrow (*Passerculus sandwichensis*), first observed on May 22, 2018

The survey methodology followed the *NYSDEC Draft Survey Protocol for State-listed Breeding Grassland Bird Species* (NYSDEC, 2015a). A work plan for the survey was submitted to the NYSDEC in June 2018 and approved with comment. A total of 136.5 acres of potential grassland habitat, primarily composed of pasture and hayfields, was determined to be present at the Project Area based on a habitat assessment. After applying obstruction buffers, a total of 67 acres of potential habitat remained that would require 19 survey points. After an initial visit to the Project Area prior to the start of the surveys, 13 of the survey points were removed due to their locations within fields recently planted with agricultural crops, resulting in a total of six survey points available for survey.

Each survey point consisted of a 100-meter radius plot centered on the observation point with a minimum distance of 250 meters (m) between observation points. In conformance with the

NYSDEC survey protocol, nine weekly surveys were performed at the Project Area from May 22 to July 18, 2018. Four additional evening surveys, specifically for Henslow's sparrow, were conducted from June 20 to July 5, 2018. Experienced field biologists conducted weekly point count surveys starting at one-half hour before sunrise until no later than 10:30 AM, per NYSDEC survey protocol. Additional evening surveys were 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 10-12 miles per hour). Each survey was conducted for five minutes at each location. All birds observed within 100 m of the survey point were recorded, and birds observed beyond 100 m from the survey point and during meander surveys (i.e., while traveling between points within the Project Area) were recorded.

Biologists observed a total of 218 individuals representing five grassland bird species (i.e., bobolink, savannah sparrow, grasshopper sparrow, American kestrel, and northern harrier) at the Project Area. This included grassland birds observed at the survey points, outside of the 100-meter radius circular plot, and birds observed during the meander surveys. Bobolinks (n = 153) were the most commonly observed grassland bird species and comprised 70.2 percent of all grassland birds observed. Mean use was highest for bobolinks (2.01 birds/100-meter radius plot/5 minutes), followed by savannah sparrows (0.47 birds/100-meter radius plot/5 minutes), and grasshopper sparrows (0.07 birds/100-meter 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 species is listed as threatened or endangered nor are they species of special concern in need of conservation.

Raptor use was low at the Project Area, with nine raptors from two species (eight American kestrels and one northern harrier) being observed. An adult female northern harrier (a state-listed threatened species) was observed flying low over the open fields of the Project Area early in the morning on June 12, 2018 and is not believed to be nesting at the Project Area. The grasshopper sparrow is a state-listed species of special concern and a total of six grasshopper sparrows were observed at the Project Area.

No state- or federally listed threatened or endangered species were observed, and therefore are not likely to be breeding in the Project Area.

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

No species documented during the survey, regardless of protected status, were observed to be breeding or nesting on site.

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

Wintering Grassland Raptor Surveys

TRC conducted a preconstruction monitoring survey of wintering grassland raptors 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.

The survey methodology followed the *NYSDEC Draft Survey Protocol for State-listed Wintering Raptor Species* (NYSDEC, 2015b). The NYSDEC provided comments on the protocol on December 5, 2018, and the survey protocol was revised accordingly. 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 no further than 1,000 m apart when multiple stationary survey points were needed to cover an area of grassland habitat. Five stationary survey points were located throughout the Project Area, covering habitats that may be used by short-eared owls and/or northern harriers for foraging or roosting. Stationary survey point locations were adjusted in the field when necessary based upon visibility and accessibility. The driving route utilized roads at the Project Area that bordered grassland habitat. Short-duration survey points along this route were identified so survey points were no further than 0.5 miles apart in areas of grassland habitat.

Surveys were performed in winter of 2018-2019 and were conducted between November 15, 2018, and April 15, 2019. Surveys were originally planned to end on March 31, 2019 but were extended due to the observation of a state-listed threatened or endangered species during the

last two weeks of March. This observation was of a bald eagle, observed at the Project on March 29, 2019.

Stationary surveys were conducted at each of the five stationary survey locations at least once every two weeks, with a survey occurring at the Project Area every week. Driving surveys took place every week from December 7, 2019, to April 15, 2019. Stationary surveys were conducted for a total of 94.7 hours, and 22.7 total hours were spent conducting daytime driving surveys.

All survey points were visited bi-weekly, for a total of 11 stationary surveys per survey site at the Project Area over the course of the survey period. Survey dates were targeted to take advantage of the best weather conditions during each week. Stationary surveys were initiated one hour before sunset and concluded when it was too dark to see flying birds, up to one hour after sunset.

Daytime driving surveys were conducted once a week prior to stationary surveys. This was done at the request of the NYSDEC to be more inclusive of temporal and geographic coverage of survey sites. Surveyors followed a set route around grassland areas visible from the road. Short observations of approximately five minutes were made at every location of suitable habitat 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 northern harriers or short-eared owls were observed during winter raptor surveys at the Project Area. Two observations of a state-listed endangered species were made during surveys as discussed below.

Two observations of bald eagles (*Haliaeetus leucocephalus*) were made during stationary surveys located at site EP-4 in the east-central portion of the Project Area. The first observation of a bald eagle occurred on February 5, 2019, and it was observed for 20 minutes perched in several trees before flying off to the south. The second bald eagle observation occurred on March 29, 2019 and was observed flying over the Project Area with a group of waterfowl heading northwest. One bald eagle was observed for five minutes during a driving survey on December 7, 2018 and was soaring over a field [REDACTED] of the Project Area. No breeding behavior was observed.

One state-listed species of special concern, a hawk (*Accipiter* sp.), was observed November 29, 2018. During a stationary survey, the hawk was seen flying over the [REDACTED]

█ and momentarily perched before flying off to the west. The species was not able to be positively identified but was determined to be either a sharp-shinned hawk (*Accipiter striatus*) or Cooper's hawk (*Accipiter cooperii*), both of which are state-listed species of special concern. Behaviors consistent with breeding activity were not observed for any species, however surveys were conducted outside of the breeding season for these species.

The most common raptor species observed at the Project Area was the red-tailed hawk (*Buteo jamaicensis*), first observed on November 28, 2019, which comprised approximately 75 percent and 83 percent of total raptor observations during the stationary and driving surveys, respectively.

Horned larks, which were a target species in the grassland breeding bird survey, were incidentally observed on one occasion in the Project Area during the wintering grassland raptor survey, on November 28, 2019. Horned lark were not observed during breeding bird surveys conducted at the Project. The species is therefore presumed a winter resident only.

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

Other grassland birds observed at the Project Area during field surveys, but not the target species of the grassland breeding bird survey or wintering grassland raptor survey, include the following:

- eastern bluebird (*Sialia sialis*), first observed on January 4, 2019
- eastern kingbird (*Tyrannus tyrannus*), first observed on May 30, 2018
- eastern meadowlark
- killdeer (*Charadrius vociferous*), first observed on March 29, 2019

Based on the grassland breeding bird survey, there is approximately 136.5 acres of potential grassland habitat at the Project Area; however, not all of this potential grassland habitat meets the requisite needs for the target species from the bird surveys. The Project Area may provide suitable habitat for northern harrier at some point during the year; however, the mowing of the hayfields and pastures would discourage them from using the Project Area as they require vegetation greater than 60 cm in height for breeding habitat (Morgan and Burger, 2008). While grasshopper sparrows were observed on-site, the Project Area may not provide suitable breeding habitat for them. Grasshopper sparrows require relatively large (i.e., 125-247 acres) fields with low vegetation density and more than 20 percent bare soil for breeding habitat (Morgan and Burger, 2008). None of the grassland breeding bird survey points were characterized by low

vegetation density and only two points had more than 20 percent bare soil. There may be habitat for horned larks, a target species of the grassland breeding bird surveys, at the Project Area at some point during the year. Horned larks breeding habitat preferences include barren or patchy areas with exposed soil which is characteristic of recently plowed fields at the Project Area. However, there were no observations of the horned lark during the breeding bird survey, and the species is presumed a winter resident only. Consultation with the New York Natural Heritage Program (NYNHP) indicated sedge wren has been documented within the vicinity of the Project Area; however, the Project Area does not provide them with a suitable breeding habitat. Sedge wren prefer wetter areas with vegetation taller than 80 cm (Morgan and Burger, 2008) and the only grassland breeding bird survey point with wet vegetation was 35 cm tall. No SSC were documented during winter raptor surveys, nor were state- or federally listed species documented during either avian survey. Habitat at the Project lacked conditions which would provide suitable nesting habitat for the grassland species observed. Frequent disturbances associated with active agricultural production throughout the Project Area further preclude nesting by species typically found nesting in grassland habitat. Following the initial disturbances associated with Project construction, revegetation efforts will improve nesting habitat quality, creating increased vegetation structure and reduced frequency of disturbance over the life of Project operation (see Section 22(f)(8)).

Terrestrial Invertebrates

The Project Area encompasses a variety of habitat types and as such, a vast multitude of 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 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 top soil. 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 within the Project Area provides marginal habitat due to significant anthropogenic disturbance. Although agricultural areas are too frequently disturbed for successful nesting and breeding, some birds and other wildlife use these areas for foraging or as a stop-over during migration. Characteristic birds of active agriculture include wild turkeys (*Meleagris gallopavo*), American crows (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura*), all first observed on May 30, 2018; as well as a variety of songbirds and waterfowl. Additionally, various mammals – particularly deer, raccoons, and squirrels – may eat agricultural crops as a supplement to natural food sources. A woodchuck (*Marmota monax*) was observed in active agriculture on April 12, 2019. According to the CDL and on-site observations, corn is the primary agricultural row crop within the Project Area (443.3 acres or 33.8 percent of the Project Area) followed by soybean (128.7 acres or 9.8 percent of the Project Area) and alfalfa (*Medicago sativa*) (61.90 acres or 4.7 percent of the Project Area), first observed on June 21, 2018. The largest contiguous area of active agriculture was approximately 194.2 acres, or 14.8 percent, of the Project Area. Evidence of corn seedlings and previously harvested corn were present in two of the grassland breeding bird survey points. A flock of at least 80 wild turkeys were observed once in active agriculture during the wintering grassland raptor survey. The American kestrel is associated with cultivated crops according to the NYSDEC (NYSDEC, 2015c) and eight American kestrels were observed between survey points during the grassland breeding bird survey, presumably in areas of recently planted agriculture. The agricultural row crops at the Project Area may provide suitable feeding habitat for the wildlife observed in these areas. Birds found in pastures and hayfields at the Project Area are the subject of 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 specialist species, however only for those species which do not require large forest expanses. Forest patches within the Project Area were previously fragmented due to conversion to agriculture and therefore not

consistent with forest habitat used by interior forest obligates. 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 are believed to use forest communities within the Project Area and vicinity include the following:

- American black bear (*Ursus americanus*), tracks first observed on July 12, 2017
- American mink (*Neovison vison*)
- bobcat (*Lynx rufus*), first observed on December 4, 2018
- coyote (*Canis latrans*), first observed on November 15, 2018
- eastern chipmunk (*Tamias striatus*)
- eastern cottontail (*Sylvilagus floridanus*), first observed on November 15, 2018
- eastern gray squirrel (*Sciurus carolinensis*)
- eastern raccoon (*Procyon lotor lotor*)
- fisher (*Martes pennanti*), first observed on February 14, 2019
- gray fox (*Urocyon cinereoargenteus*)
- long-tailed weasel (*Mustela frenata*)
- North American porcupine (*Erethizon dorsata*)
- red fox (*Vulpes vulpes*), first observed on March 27, 2019
- red squirrel (*Tamiasciurus hudsonicus*), first observed on March 1, 2019
- southern flying squirrel (*Glaucomys volans*)
- striped skunk (*Mephitis mephitis*), first observed on December 4, 2018
- various mice (*Mus* spp.)
- various moles (*Condylura* spp., *Scalopus* spp., *Parascalops* spp.)
- various shrews (*Blarina* spp., *Cryptotis* spp., *Sorex* spp.)
- Virginia opossum (*Didelphis virginiana*)
- white-tailed deer (*Odocoileus virginianus*), first observed on July 11, 2017

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. Species assumed present 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 red-bellied snake (*Storeria occipitomaculata*)
- northern spring salamander (*Gyrinophilus p. porphyriticus*)
- northern two-lined salamander (*Eurycea bislineata*)
- red-spotted newt (*Notophthalmus viridescens*)
- spotted salamander (*Ambystoma maculatum*)
- spring peeper (*Pseudacris crucifer*)
- wood frog (*Rana sylvatica*)

Bird species observed within the Project Area during field surveys or presumed to use the forest communities within the Project Area include the following:

- American kestrel
- American woodcock (*Scolopax minor*), first observed on March 26, 2019
- Baltimore oriole (*Icterus galbula*)
- barred owl (*Strix varia*), first observed November 19, 2018
- black-capped chickadee (*Poecile atricapillus*), first observed on May 30, 2018
- blue jay (*Cyanocitta cristata*), first observed on May 30, 2018
- dark-eyed junco (*Junco hyemalis*), first observed on January 28, 2019
- fox sparrow (*Passerella iliaca*), first observed on April 5, 2019
- great horned owl (*Bubo virginianus*), first observed on March 1, 2019
- great-crested flycatcher (*Myiarchus crinitus*), first observed on May 30, 2018
- hairy woodpecker (*Dryobates villosus*), first observed on November 25, 2018
- northern cardinal (*Cardinalis cardinalis*), first observed on May 30, 2018
- northern flicker (*Colaptes auratus*), first observed on December 4, 2018
- northern shrike (*Lanius borealis*), first observed on April 11, 2019

- ovenbird (*Seiurus aurocapilla*), first observed on May 30, 2018
- pileated woodpecker (*Dryocopus pileatus*), first observed on November 15, 2018
- red-bellied woodpecker (*Melanerpes carolinus*), first observed on December 4, 2018
- scarlet tanager (*Piranga olivacea*), first observed on May 30, 2018
- warbling vireo (*Vireo gilvus*), first observed on May 30, 2018
- wild turkey (*Meleagris gallopavo*), first observed on May 30, 2018
- wood thrush (*Hylocichla mustelina*), first observed on May 30, 2018
- yellow-bellied sapsucker (*Sphyrapicus varius*)

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

Forests at the Project Area include many tree species, with only a few areas clearly dominated by any one or two species. Trees in the uplands include sugar maple, red maple, bitternut hickory (*Carya cordiformis*); first observed on July 11, 2017; American beech, white ash, eastern hop-hornbeam, and American basswood, eastern hemlock, and eastern white pine (*Pinus strobus*); first observed on July 11, 2017. 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 12-124 acres. None of the forests at the Project Area are part of a TNC matrix forest blocks or serve as a corridor to a TNC matrix forest block. There is little connectivity between these forest patches across the Project Area due to the habitat fragmentation from agricultural conversion. Approximately 246.1 acres, or 63.7 percent of the forestland at the Project Area, can be classified as edge forest, which is defined as forestland within 300 feet of the forest's edge along agricultural land and roads.

Successional Shrubland

Successional shrublands are highly dynamic habitats as the impacted area progresses after disturbance. The diversity present in these environments creates valuable wildlife habitat due to the influx of different wildlife species adapted to varying plants of different seral stages (NRCS, 2007). In many early successional shrubland communities, annual plants produce an abundance of seeds, which are consumed by granivorous birds and small mammals. A variable assortment of plant species provides highly nutritious forage material for herbivore and browser species.

Additionally, the low and oftentimes dense herbaceous and shrub vegetation provides cover for birds and small mammals that are heavily preyed upon. A lack of a closed canopy allows light and heat to penetrate to the ground, providing an essential habitat feature for reptiles that depend on heat sources outside their body for temperature regulation.

Mammals that are believed to utilize successional shrubland communities within the Project Area include the following:

- American black bear
- bobcat
- coyote
- eastern chipmunk
- eastern cottontail
- eastern gray squirrel
- eastern raccoon
- gray fox
- long-tailed weasel
- red fox
- striped skunk
- various mice
- various shrews
- various moles
- Virginia opossum
- white-tailed deer
- woodchuck

Reptiles and amphibians believed to populate successional shrubland communities within the Project Area include the following:

- common garter snake (*Thamnophis sirtalis*)
- Eastern American toad
- eastern milk snake
- northern dusky salamander (*Desmognathus fuscus*)
- northern red-bellied snake

- northern ring-necked snake
- northern two-lined salamander
- spring peeper

Bird species that use successional shrubland identified during field surveys include the following:

- American goldfinch (*Spinus tristis*), first observed on May 22, 2018
- common yellowthroat (*Geothlypis trichas*), first observed on May 30, 2018
- song sparrow (*Melospiza melodia*), first observed on May 30, 2018

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 *rosa multiflora*, European buckthorn, and Morrow's honeysuckle may dominate the successional shrublands over time. If left unmanaged, the successional shrublands may advance into succession 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

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

Mammals believed to utilize successional old-field communities within the Project Area include the following:

- bobcat
- coyote
- eastern cottontail
- gray fox
- long-tailed weasel

- red fox
- striped skunk
- various mice
- various shrews
- various moles
- white-tailed deer
- woodchuck

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

- common garter snake
- Eastern American toad
- eastern milk snake
- northern red-bellied snake
- northern ring-necked snake
- spring peeper

Bird species that may use successional old-fields at the Project Area identified during field surveys include the following:

- American crow
- American goldfinch
- American kestrel
- barn swallow (*Hirundo rustica*)
- bobolink
- brown-headed cowbird (*Molothrus ater*)
- eastern kingbird (*Tyrannus tyrannus*), first observed on May 30, 2018
- grasshopper sparrow
- killdeer (*Charadrius vociferous*), first observed on May 30, 2018
- northern harrier
- red-winged blackbird (*Agelaius phoeniceus*), first observed on May 30, 2018
- savannah sparrow
- song sparrow

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.

Open Water

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

Mammals believed to utilize open water communities within the Project Area include the following:

- American beaver
- American mink
- eastern raccoon
- muskrat (*Ondatra zibethicus*), first observed on January 18, 2019

Reptiles and amphibians believed to populate open water communities within the Project Area include the following:

- American bullfrog (*Lithobates catesbeianus*)
- common snapping turtle (*Chelydra serpentina*)
- green frog (*Rana clamitans melanota*)
- northern leopard frog (*Lithobates pipiens*)
- northern water snake (*Nerodia sipedon*)
- painted turtle (*Chrysemys picta*)
- pickerel frog (*Lithobates palustris*)

- spring peeper

Waterfowl and wading bird species specific to the open water communities within the Project Area, at least infrequently, include the following:

- belted king fisher (*Megaceryle alcyon*)
- black duck (*Anas rubripes*) first observed on April 5, 2019
- blue-winged teal (*Anas discors*)
- Canada goose (*Branta Canadensis*), first observed on November 17, 2018
- common merganser (*Mergus merganser*), first observed on April 5, 2019
- great blue heron (*Ardea herodias*), first observed on November 16, 2018
- green heron (*Butorides virescens*)
- green wing teal (*Anas carolinensis*)
- hooded merganser (*Lophodytes cucullatus*)
- mallard (*Anas platyrhynchos*), first observed December 3, 2018
- wood duck (*Aix sponsa*), first observed on April 5, 2019
- Wilson's Snipe (*Gallinago delicata*), first observed on April 5, 2019

Open water habitats at the Project Area consist primarily of man-made farm ponds and wetlands. The open water habitats at the Project Area are not deep enough to support a diverse assemblage of fish and benthic species. Fish observed in the farm ponds may have been stocked.

(3) Potential Impacts of Perimeter Fencing on Wildlife

Approximately 352 acres, or 26.8 percent of the Project Area, will be enclosed by fencing. Fencing will consist of 2" diamond mesh chain link and will be 8.5 feet in height with a 6-inch clearance from the bottom of the fence to grade to allow for small animal access. This fencing will go through active agriculture, forestland, successional shrubland, and successional old-field communities. Fencing may limit the movement of some wildlife species, particularly species that utilize two adjacent communities, such as forests and grasslands/agriculture. Larger mammals, such as white-tailed deer, eastern cottontail, red fox, coyote, gray fox, bobcat, and striped skunk, are highly mobile and will likely be able to move around the perimeter fencing. The access to foraging habitat may be reduced by the perimeter fencing. Proper siting of fencing will minimize the impact on wildlife travel corridors. There is additional agricultural land and grassland in the vicinity of the Project Area that will be unaffected by the perimeter fence. It is anticipated that wildlife species

unable to access foraging habitat due to the perimeter fencing will find new foraging habitat elsewhere within the vicinity of the Project Area.

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; Breeding Bird Atlas; USGS Breeding Bird Surveys; Christmas Bird Counts; Hawk Migration Association of North America; eBird; and The Nature Conservancy 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 253 endemic and invasive plant species through this effort and created a plant list based on this field effort, which is included in this application. See Appendix 22-1 for the master plant species list.

Birds

USGS Breeding Bird Survey

The U.S. Geologic Survey's (USGS's) North American Breeding Bird Survey (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 time frame. 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 Duanesburg survey route is approximately 3.0 miles southeast of the Project Area and encompasses similar ecological communities present on-site. A total of 118 species have been documented during the lifetime of this survey route. Most birds documented have been common species found within the forests, forest edge, shrublands, old-fields, and wetlands throughout New York State. The most frequent species documented on this survey route include the following:

- red-winged blackbird

- European starling (*Sturnus vulgaris*), first observed on site on November 19, 2018
- American robin (*Turdus migratorius*)
- American goldfinch
- common grackle (*Quiscalus quiscula*), first observed on site on March 13, 2019
- American crow
- house sparrow (*Passer domesticus*), first observed on site on December 26, 2018
- bobolink
- song sparrow
- barn swallow (*Hirundo rustica*)
- common yellowthroat
- yellow warbler (*Setophaga petechia*), first observed on site on May 30, 2018
- rock pigeon (*Columa livia*), first observed on site on December 26, 2018

All of these birds were observed at the Project Area during field surveys. These species are common and widely distributed throughout their respective ranges. Additionally, many of the species listed are habitat generalists which are adapted to changing and increasingly human-altered landscapes. Project development is not expected to adversely impact any species at the population level, or significantly impact local populations in proximity to the Project Area.

New York State Breeding Bird Atlas

The New York State Breeding Bird Atlas (BBA) statewide survey resource was used to identify all bird species that 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 four New York State BBA blocks. A BBA dataset provided a detailed distribution of bird species located within the four survey blocks containing the Project Area. A total of 120 species were observed within the aforementioned survey blocks. See Appendix 22-1 for a complete list of species. Many common avian species were documented through multiple data sets, however species documented solely from the BBA include the following:

- American bittern (*Botaurus lentiginosus*)
- blackburnian warbler (*Dendroica fusca*)
- black-throated blue warbler (*Dendroica caerulescens*)
- pine siskin (*Carduelis pinus*)
- sora (*Porzana carolina*)

None of these species were observed within the Project Area during on-site surveys. The species listed require habitat which is not present within the Project Area (e.g. coniferous forests and marshes).

Audubon Christmas Bird Count

In order to gain understanding of year-round and wintering avian inhabitants of the Project Area, data from the Audubon Christmas Bird Count (CBC) was obtained. 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 each year during a 3-week period around Christmas. Fifteen-mile diameter search areas are created and all bird species and individuals observed in these predetermined search areas are documented. The closest predetermined CBC area is the Fort Plain search area (Audubon Count Code: NYFP). This search area is approximately 10 miles north of the Project Area. Within the Fort Plain search area, on December 30, 2017, a total of 58 different avian species were reported. Most species were also reported in the BBA and the BBS, however species documented solely from the CBC include the following:

- American tree sparrow (*Spizella arborea*)
- common goldeneye (*Bucephala clangula*)
- common merganser
- Lapland longspur (*Calcarius lapponicus*)
- northern shrike (*Lanius borealis*)
- short-eared owl
- snow bunting (*Plectrophenax nivalis*)
- snow goose (*Chen caerulescens*)
- white-crowned sparrow (*Zonotrichia leucophrys*)

Of these species, common merganser, northern shrike, first observed on April 11, 2019; and snow bunting, first observed on November 19, 2018; were observed on-site during field surveys.

eBird

In order to gain a better understanding of year-round avian inhabitants of the Project Area, data from eBird was obtained. 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. A total of 99 different species were observed in the Sharon Springs and Town of Sharon, Schoharie County, New York, hotspot from July 2005 through February 2019. Most species were also reported in the NY BBA, USGS BBS, and Audubon CBC; however, species documented solely from the eBird data included the following:

- Acadian flycatcher (*Empidonax vireescens*)
- black vulture (*Coragyps atratus*)
- evening grosbeak (*Coccothraustes vespertinus*)
- fox sparrow (*Passerella iliaca*)

Of these birds, only fox sparrow was observed at the Project Area (April 5, 2019).

A complete list of bird species that were observed or with potential to occur within the Project Area is located 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 on bat hibernacula and maternity roost trees at the Project Area. There is potential roosting habitat for the northern long-eared bat at and within the vicinity of the Project Area based on field surveys. Potential roost tree species observed at the Project Area include shagbark hickory, sugar maple, red maple, America beech, white ash, American basswood, and eastern hemlock. The average diameter at breast height of the trees was 8-24 inches. The Project Area is suitably situated and has suitable habitat for the following bats, which therefore may occur at the Project Area:

- eastern red bat (*Lasiurus borealis*)
- hoary bat (*Lasiurus cinereus*)
- little brown bat (*Myotis lucifugus*)
- northern long-eared bat (*Myotis septentrionalis*)
- silver haired bat (*Lasionycteris noctivagans*), first observed on December 6, 2018

Amphibians and Reptiles

Access to common amphibian and reptile species ranges in the State of New York is provided through use of the publicly available Amphibian & Reptile Atlas Project (Herp Atlas) provided by the NYSDEC (2017). The Herp Atlas was a 10-year survey that was designed to display the

geographic distribution of New York State herpetofauna. This research effort displayed results of approximately 70 species of amphibians and reptiles in New York State. The unit of measurement for collecting Herp Atlas Project data is the USGS 7.5-minute topographic quadrangle. Based on the Amphibian and Reptile Atlas Project distribution maps provided by the NYSDEC, several reptile and amphibian species were identified as occurring within the Sharon USGS 7.5-minute topographic quadrangle encompassing the Project Area. Based on data associated with the Project Area, amphibian and reptile species found occurring within the Sharon USGS 7.5-minute topographic quadrangle, and thus potentially within the Project Area, include the following:

- spotted salamander
- red-spotted newt
- northern dusky salamander (*Desmognathus fuscus*)
- Allegheny dusky salamander
- northern spring salamander
- northern two-lined salamander
- green frog (*Rana clamitans melanota*)
- gray treefrog
- wood frog
- common snapping turtle (*Chelydra s. serpentina*)
- red-eared slider (*Trachemys scripta elegans*)
- painted turtle (*Chrysemys picta*)

An amphibian's lifecycle is very reliant on water. As such, amphibian habitat preferences are assumed to incorporate wetland and waterbody features along with adjacent upland areas. Some of the wetlands and waterbodies delineated within the Project Area provide good habitat for the listed amphibian species. Wetlands that were forested and/or associated with forested upland areas within the Project Area were noted as having less disturbances. Reduced disturbance levels in habitats tend to be beneficial to most amphibian species as many are very vulnerable to compromised homeostasis. As such, they are known to be good indicators of environmental stress (Blaustein, 1994; Blaustein and Bancroft, 2007). Wetland and waterbody areas that were not largely encompassed by forest tended to be surrounded by active agriculture lands. In some cases, these wetlands 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 that include very mixed habitat preferences specific to their life cycles. It is presumed that representative reptiles can be found throughout the Project Area and in a myriad of microhabitats. Specifically, turtle and snake species are known to use a variety of habitats in New York, including emergent, scrub-shrub, forested, open water wetlands as well as upland areas such as woodlands, old fields, scrublands, meadows, and residential areas. Snakes tend to traverse and utilize a multitude of habitats. As such, snakes are presumed to occur throughout the Project Area, despite no recorded occurrence of snakes within the Sharon USGS 7.5-minute topographic quadrangle, according to the NY Herp Atlas (NYSDEC, 2017). 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 desirable locations for turtles to bask and absorb thermal energy from the vantage point of rocks or fallen logs. 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 30-May 2, 2019. Only one vernal pool was identified, which had one blue spotted salamander (*Ambystoma laterale*) egg mass and 14 Jefferson salamander (*Ambystoma jeffersonianum*) egg masses identified on April 30, 2019. More information about the vernal pool at the Project Area can be found in Section 22(I).

A complete list of amphibian and reptile species observed or presumed to occur within the Project Area is located in the master wildlife inventory list attached in Appendix 22-1.

Mammals

Access to common mammal species ranges in the Northeastern United States is underdeveloped and not readily available to the public. However, observations of mammals were documented during the various on-site field studies conducted as part of this Application. Field observations encompassed the visual siting of specific species and also the discovery of signs of presence, including tracks, scat, and general habitat manipulation. Documentation and evaluation of available habitat for local mammals were also noted. Mammalian species known or presumed to occur within the Project Area based off observation of individuals and signs of presence include:

- American black bear
- bobcat
- coyote
- eastern cottontail

- fisher
- muskrat
- North American beaver (*Castor canadensis*), first observed May 23, 2018
- red fox
- striped skunk
- white-tailed deer
- woodchuck (*Marmota monax*)

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

- North American porcupine
- American mink
- eastern gray squirrel
- eastern raccoon
- eastern chipmunk
- gray fox
- long-tailed weasel
- Virginia opossum
- southern flying squirrel
- various mice
- various moles
- various shrews

A complete list of mammal species that were observed or presumed to occur within the Project Area is in the master wildlife inventory list attached in 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 which typically have a long cylindrical tube-like body and no limbs. Terrestrial species include earthworms and nematodes, which are very common invertebrates that live in the topsoil. Mollusks are another vast group of invertebrates. Of this immense group, a portion of mollusks are terrestrial and include snails and slugs.

An analysis of the Project’s construction, operation, post-construction, and maintenance impacts on vegetation cover types is included in Section 22(b). 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 communities will occur as a result of construction of the project. Approximately 8.95 acres of vegetation will be temporarily impacted. Concurrently, approximately 10.40 acres will be permanently lost due to the siting of Project Components. Although the siting of Project Components will result in the loss of plant community acreages, no specific plant community will be significantly reduced in population or completely eradicated as a result of the Project. The Applicant has taken measures to avoid, minimize, and mitigate impacts on vegetation to the maximum extent practicable.

(1) Bat and Avian Analysis

Grassland Breeding Bird Survey

A discussion of the extent, methodology, and results of the grassland breeding bird survey are in Section 22(d)(2). A summary of the results from the grassland breeding bird survey is in Table 22-4 below.

Table 22-3. Number of Observations and Locations of Grassland Birds Observed During Breeding Bird Surveys, East Point Energy Center, Spring-Summer 2018

Grassland Species	Scientific Name	Hayfield Total (2 points)	Pasture Total (3 points)	Wet Meadow Total (1 Point)	Total Observed ¹	Percent Composition
Bobolink	<i>Dolichonyx oryzivorus</i>	44	66	5	153	70.2
Savannah Sparrow	<i>Passerculus sandwichensis</i>	10	11	5	50	22.9
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	3	1	0	6	2.8

Table 22-3. Number of Observations and Locations of Grassland Birds Observed During Breeding Bird Surveys, East Point Energy Center, Spring-Summer 2018

Grassland Species	Scientific Name	Hayfield Total (2 points)	Pasture Total (3 points)	Wet Meadow Total (1 Point)	Total Observed¹	Percent Composition
American Kestrel	<i>Falco sparverius</i>	0	0	0	8	3.7
Northern Harrier	<i>Circus hudsonius</i>	0	0	0	1	0.5
Upland Sandpiper	<i>Bartramia longicauda</i>	0	0	0	0	0
Short-eared Owl	<i>Asio flammeus</i>	0	0	0	0	0
Henslow's Sparrow	<i>Ammodramus henslowii</i>	0	0	0	0	0
Sedge Wren	<i>Cistothorus platensis</i>	0	0	0	0	0
Vesper Sparrow	<i>Poocetes gramineus</i>	0	0	0	0	0
Horned Lark	<i>Eremophila alpestris</i>	0	0	0	0	0
Eastern Meadowlark	<i>Sturnella magna</i>	0	0	0	0	0
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	0	0	0	0	0
TOTAL	57	78	10	218	100	
1. Includes observations between points.						

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 are in Section 22(d)(2). A summary of the results from the grassland breeding bird survey is in Table 22-5 and Table 22-6 below.

Table 22-5. 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	<i>Buteo jamaicensis</i>	27	75.0
Bald Eagle	<i>Haliaeetus leucocephalus</i>	2	5.6
Great Horned Owl	<i>Bubo virginianus</i>	2	5.6
Unknown Raptor spp.	-	2	5.6
American Kestrel	<i>Falco sparverius</i>	1	2.8
Turkey Vulture	<i>Cathartes aura</i>	1	2.8
Unidentified Accipiter	-	1	2.8
Total Observations		36	-

Table 22-6. 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	<i>Buteo jamaicensis</i>	34	82.93
Rough-legged Hawk	<i>Buteo lagopus</i>	3	7.32
American Kestrel	<i>Falco sparverius</i>	1	2.44
Bald Eagle	<i>Haliaeetus leucocephalus</i>	1	2.44
Broad-winged Hawk	<i>Buteo platypterus</i>	1	2.44
Turkey Vulture	<i>Cathartes aura</i>	1	2.44
Total Observations		41	-

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

Raptor use was low at the Project Area during the grassland breeding bird survey. American kestrel and northern harrier were the only observed raptor species during the grassland breeding

bird survey. The state-threatened northern harrier was observed only once flying in between points during the grassland breeding bird survey. Eight American kestrels (unlisted) were observed near survey point █ during the grassland breeding bird survey. Three of the American kestrels observed were fledglings. Kestrels are a cavity-nesting species and are unlikely to have nested within the Project Area where trees which support nesting (e.g. contain existing cavities) are not present (Smallwood and Bird, 2002). Given the nesting requirements of American kestrels, nesting habitat will not be impacted by the Project.

Wintering grassland raptor surveys indicated that red-tailed hawks are the most common raptor in the Project Area, however the species is also commonly distributed throughout the state of New York. Additionally, of raptor species observed within the Project Area, most are common throughout the state and across their respective ranges. For the entire duration of the survey period, no northern harriers or short-eared owls, the target of surveys, were observed in the Project Area during stationary or driving surveys. Habitat for state- and federally listed grassland raptor species will not be adversely impacted by construction of the Project.

(2) Bat Hibernacula

Consultation with the USFWS, NYNHP, and NYSDEC was conducted to determine the presence of state- and federally-listed bat species. According to the USFWS, there is potential habitat present for the northern long-eared bat (*Myotis septentrionalis*). Based upon initial review and consultation with the NYNHP and NYSDEC, the Project is not located within 0.25 miles of a known occupied hibernacula or within 150 feet of a known, occupied maternity roost tree. Database information from the NYSDEC confirmed there were no occupied hibernacula for the northern long-eared bat within the vicinity of the Project Area. Bats that may be present at the Project Area are listed in Section 22(e). Only one bat species was observed at the Project Area: the silver-haired bat, which is not a state- or federally-listed bat species, therefore bat surveys were deemed unnecessary for the Project and further analyses were not conducted.

(3) Amphibians and Reptiles

Amphibians and reptiles observed or that have the potential to occur at the Project Area are listed in Section 22(e). Only one vernal pool was identified at the Project Area, and it will not be impacted by the construction or operation of the Project.

(4) Construction-related Impacts to Wildlife

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

Incidental Injury and Mortality

Although calculating the incidental injury and/or mortality of wildlife individuals is inherently difficult, it is understood that construction activities could generate injury or mortality to local wildlife in isolated random occurrences. It is presumed that injury and mortality may be inflicted more directly upon sedentary species (e.g., some 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 the most likely cause for construction-related impacts. Such activity will increase with increased traffic from construction operations within the Project Area. Upon the completion of construction, traffic is expected to return to more standard patterns and frequencies, so mortality events as a result of vehicular traffic will reduce to pre-construction levels.

Wildlife Displacement

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

availability of habitat within close proximity for many local wildlife species. These animals will remain within or adjacent to the Project Area.

Habitat Disturbance and Loss

Approximately 8.20 acres of wildlife habitat will be temporarily impacted during construction of the project. However, only approximately 10.32 acres of wildlife habitat will be permanently lost due to the placement of Project Components. Moreover, 8.44 of the 10.32 acres of wildlife habitat permanently lost, along with 7.9 of the 8.20 acres temporarily impacted, reside in active agricultural areas which already provide limited perpetual wildlife habitat due to the regular disturbances and anthropogenic pressures of active farming practices.

Specifically, it is anticipated that approximately 0.20 acres of successional scrubland, 0.10 acres of successional old-field, and 7.90 acres of active agricultural lands will be temporarily disturbed during construction. Concurrently, approximately 1.69 acres of forestland, 0.14 acres of successional scrubland, 0.05 acres of successional old-field, and 8.44 acres of active agricultural lands will be permanently lost as a result of the siting of Project Components. (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). This 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. The USFWS indicated the potential presence of the northern long-eared bat. The NYSDEC Region 4 Wildlife Office was contacted to obtain the most recent breeding, wintering, and habitat data for State-listed species. The NYSDEC database had no records of State-listed species within the vicinity of the Project Area. While the USFWS indicated the potential presence of northern long-eared bat, the Project

is not likely to adversely affect the northern long-eared bat. Correspondence with the USFWS and NYSDEC is included in Appendix 22-8.

(5) Summary Impact Table

A summary table that quantifies anticipated temporary and permanent impacts to wildlife habitats due to the Project construction and operation is provided in Table 22-7 below.

Table 22-7. Impacts to Wildlife Habitat

Wildlife Habitat	Conversion (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impact (acres)
Agricultural Land	304.01	7.90	8.44	320.35
Successional Old Field	0.07	0.10	0.05	0.22
Successional Shrubland	2.12	0.20	0.14	2.46
Forestland	48.55	0.00	1.69	50.24
Total	354.75	8.20	10.32	406.46

(6) Literature and Impact Analysis for Grassland Bird Species

There are relatively few studies quantifying the effects of utility scale solar projects on biodiversity, including birds. The currently available peer-reviewed publications on renewable energy, including solar, are insufficient to thoroughly assess the impact of utility scale solar projects on wildlife populations (Lovich and Ennen, 2011). The two types of direct impacts to birds from utility scale solar projects occur in the form of burning and collisions (Walston Jr. et al., 2016). Mortality studies are inherently lacking with specific reference to utility-scale ground-mounted solar. Of studies which 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 1.9–2.2 birds/week, which had a minimal impact on the local bird population (McCrary et al., 1986). It is important to note

that this study was of a heliostat solar field with a concentrating tower (i.e. “thermal solar”) and did not use PV technology. PV technology, unlike heliostat solar fields, does not involve the concentration of solar rays which creates a high-heat area surrounding the tower, or light reflections which can attract birds and insect prey. PV technology is comparatively safer than thermal solar for birds (National Audubon Society 2017, Walston Jr. et al., 2016).

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 is likely due to decreased risk of burning at the PV solar facility. The study by Walston Jr. et al. (2016) estimated bird mortality from solar facilities in comparison to other sources of bird mortality. The table from their study is shown in Table 22-8 below.

Table 22-8. 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).

The Project is located on the edge of the Mohawk Valley 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
- 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 Mohawk Grassland Focus Area are northern harrier, upland sandpiper, and wintering short-eared owl. Of the highest priority species identified by NYSDEC, northern harrier, grasshopper sparrow, and bobolink have been observed within the vicinity of the Project Area (see Section 22(d)(1) and Appendix 22-2). The grassland breeding bird survey documented bobolink, savannah sparrow, grasshopper sparrow, and northern harrier 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 at least 25-acre fields 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 (*Taraxacum officinale*) (Morgan and Burger, 2008; NYSDEC, 2015c). Savannah sparrows prefer open grasslands with medium vegetation density of at least 12-25 acres (Bollinger and Gavin, 1992; Morgan and Burger, 2008). Grasshopper sparrows prefer open grasslands with low vegetation density of at least 123-247 acres (Bollinger and Gavin, 1992; Morgan and Burger, 2008). A key feature of grasshopper sparrow habitat is little to no litter and large areas of evenly distributed bare soil (Morgan and Burger, 2008; NYSDEC, 2015c). Savannah sparrows prefer open grasslands with medium vegetation density of at least 12 -25 acres in area (Bollinger and Gavin, 1992; Morgan and Burger, 2008). Habitat assessments within the Project Area identified only 67 acres of potential habitat for the species listed above. Over the course of grassland breeding bird surveys conducted at the Project, this area was further reduced as multiple patches were converted to active row crop agriculture. No grassland patches exhibited low density vegetation, and most received some management (e.g. mowing) during the grassland breeding bird Study period. While some components required by these species were present in grasslands throughout the Project Area, conditions would be most consistent with sub-optimal or low-quality breeding habitat.

The suite of grassland birds identified within the Project Area, and those with the potential to occur, are primarily widely distributed throughout 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 facilities including eastern meadowlark, grasshopper sparrow and savannah sparrow (DeVault et al., 2014). Several grassland bird species in fact may benefit from the conversion of agriculture to more structurally diverse vegetation typically seeded beneath and between solar panels. Following construction, solar energy facilities typically use grass seed mixes to establish

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

(7) Impacts from Herbicide Application

As noted in Appendix 22-6, the ISMCP, and Appendix 5-3, Preliminary Operations and Maintenance Plan, the selective use of herbicides may be necessary. Short-term impacts from herbicide application can occur from physical contact and direct toxicity with non-target plant species (Briggs, 1992). Herbicide application, however, 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 a potential change to the vegetation community structure from large-scale, non-selective spraying. Herbicide application will not be performed by broad-scale, non-selective spraying, therefore, long-term impacts resulting in large-scale changes to vegetation community structure are not anticipated. 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 state and federal regulations.

(8) Impacts to Wildlife and Wildlife Habitat

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

Habitat Loss

A direct and permanent loss of approximately 10.32 acres of wildlife habitat will occur as a result of the Project. Total habitat loss represents 0.78 percent of the total 1,313 acres included in the

Project Area. Of this percentage, approximately 16.4 percent of the loss is to forestland, 1.4 percent is to successional shrub lands, 0.5 percent is to successional old-field, while the vast majority, 81.8 percent, is to active agriculture. Approximately 48.55 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 a limited wildlife habitat value, and revegetation following construction may improve habitat conditions for grassland species. In comparison to the Study Area, only 1.8 percent of habitat loss (including habitat conversion) will occur as a result of the Project and is not considered a significant loss to the local setting.

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 continuous forest habitat. Edge effects are changes which occur in populations or community structure at the periphery of two habitats. Areas with small habitat fragments exhibit edge effects that may extend throughout the range.

Edge effects vary somewhat with distance from forest edge, depending on the type of effect and species of vegetation or wildlife (USDA NRS, 2012). However, within New York State, 300 feet is a frequently accepted range for the edge effect disturbance line, which is the distance into a forest where the edge effect disappears and interior forest conditions are proposed to begin generally (USDA NRS, 2012).

Forested area comprises approximately 29.2 percent 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 246.1 acres, or 63.7 percent of the forestland at the Project Area, can be classified as edge forest. It is expected that clearing for all Project Components (access roads, collection lines, and laydown areas) associated with the Project may remove up to 50.24 forested acres, reducing the amount of forest land from 384.13 to 333.89

acres within the Project Area. This would be a relatively minor reduction, amounting to a loss of 13.1 percent of forestland within the Project Area. Also as a result of the placement of Project Components, there will be an assumed net loss of 1.64 acres of interior forest. Interior forest is defined as core forest areas containing a specific ecology and community structure occurring at least 300 feet from the forest edge. Concurrently, forest clearing would result in 7.82 acres of interior forest converted to peripheral forest. Despite a slight reduction in forested area within the Project Area, existing forest patches have been previously fragmented due to conversion to agriculture. These patches are not consistent with conditions which would be expected in intact interior forest and are not likely supporting species assemblages containing rare, interior, of forest specialist species. Changes to forested conditions resulting from Project construction are unlikely to alter species behaviors or diversity following initial disturbances associated with construction activity.

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 likely to result from the construction of the Project. However, as no wetlands will be impacted by the Project, there will be no direct impact to the preferred habitat of amphibians.

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 as a result of immediate disturbance. After the construction phase of the Project is completed, game species generally will adapt to the cleared areas and perimeter fencing. The perimeter fencing will inhibit travel and foraging of larger game species such as whitetail deer; therefore, it is presumed they will search for new foraging habitat elsewhere within the Project Area and nearby vicinity.

(9) Take of Threatened and Endangered Species

A “take” of state- or federally-listed threatened and/or endangered species will not be caused by the operation of the Project. Correspondence with NYSDEC confirmed there were no data sets

for threatened and/or endangered species at the Project Area. Post-construction monitoring will not be necessary, because there will be no take to 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.

(10) Cumulative Impact Analysis

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 22-7 and summarized below. The results of this conservative analysis indicate that the grassland habitat within the boundaries of the 292 Study Projects accounts for less than 1 percent 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 292 Study Projects. Study Projects were identified in 32 of the 36 counties within the Grassland Study Area. Orange County contained the highest concentration of Study Projects with 56 projects identified, followed by Ulster County (23 projects identified) and Albany (22 projects identified). Study Project locations are depicted in Figure 2 of the report. In addition to the Project, nine existing or proposed Study Projects were identified in Schoharie County, where the Project is located.

Study Projects, including the Project, encompass a total of 49,536 acres within the Grassland Study Area. Of the 292 Study Projects, 39 have already been constructed and account for 2,826 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 as additional land area could be included within each project's boundary beyond what is needed to achieve the project's proposed generating capacity.

Study Projects within Oneida County comprised the largest amount of acreage among Study Projects, with total area of 14,193 acres across nine projects. Schoharie County, where the Project is located, has a proposed development area of 1,917 acres (including the Project), accounting for 3.8 percent of the total area of development within the Grassland Study Area.

Several target grassland species were identified in the Project Area during the grassland breeding bird and winter raptor surveys. Species observed included bobolink, savannah sparrow, grasshopper sparrow, American kestrel, and northern harrier. One northern harrier (ST) was observed during the breeding bird surveys, and two bald eagles (SE) were observed during the winter grassland raptor survey. Horned lark (SC) 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 31 counties where Study Projects (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 Schoharie County except for Henslow's sparrow and sedge wren. Few species were less recently recorded or limited in distribution, including:

- Barn Owl; observed in 17 counties; last observed in Schoharie County in 2010
- Henslow's Sparrow; observed in 16 counties; last observed in Schoharie County in 2008
- Sedge Wren; observed in 18 counties; last observed in Schoharie County in 2008
- Upland Sandpiper; observed in 25 counties; last observed in Schoharie County in 2014

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

Together, the 292 Projects comprise 48,753.8 acres of proposed development within the 16,528,129.5-acre Grassland Study Area (0.3% of total area; see report Table 6). Grassland habitat within the boundaries of the Study Projects total 20,529 acres, which covers 42.1% of the proposed area of development among the projects. Grassland habitat among Study Projects accounts for approximately 0.9% 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 16 million acres in New York, The proposed Study Projects development, while overstated in this analysis, represents an insignificant cumulative impact to grassland bird populations both locally and regionally. Provided that all of the 292 Study Projects are developed, these facilities will affect less than 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

Measures to avoid or minimize impacts to vegetation communities are included in Section 22(c)(1).

To the maximum extent practicable, the Project Components have been intentionally sited within active agricultural fields. This effort was done largely to reduce impacts to natural communities and wildlife habitat. Active agricultural areas provide limited wildlife habitat due to recurrent disturbances in the form of clearing, mowing, plowing, and harvesting by the landowner, as well as the general monotypic environment offered. As such, construction of the Project in these areas will minimize the species and habitats impacted by the Project.

As mentioned in Section 22(f)(9), there is no anticipated take to state- or federally-listed species at the Project Area. 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 is not applicable to this Project.

22(i) Map Depicting Wetland Boundaries

(1) Wetland Mapping

Wetland surveys were conducted to identify and delineate wetlands and streams on the Project Area within 500 feet of areas to be disturbed by construction of the Project. Surveys were performed in accordance with the *USACE 1987 Wetlands Delineation Manual* (Environmental Laboratory, 1987), the *2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)* (USACE, 2012), and the *New York State Freshwater Wetlands Delineation Manual* (Browne et al., 1995) 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 1,313 acres of leased and/or purchased private lands within the Project Area. This area is referred to as the Wetland Delineation Survey Area throughout this Exhibit. All wetland and waterbody delineations took place in the summer of 2017, the spring and summer of 2018, and the spring of 2019. See Figure 22-3 depicting TRC-delineated wetlands within the Wetland Delineation Survey Area.

(2) Predicted Wetlands

Wetland estimation occurred on lands controlled by the applicant for wetlands located greater than 500 feet from the areas to be disturbed, and for wetlands located within 500 feet of the limits disturbance but on parcels over which the Applicant does not have control. In order to approximate these wetland boundaries, TRC combined on-site observations with desktop analysis incorporating the interpretation of aerial imagery signatures, 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 outside the established Wetland Delineation Survey Area are referred to as “predicted wetlands.” See Figure

22-3 depicting predicted wetlands within the Wetland Delineation Survey Area and subsequent 500-foot area from Project Components.

(3) Wetland Boundaries

Wetland delineated boundaries were recorded with a Trimble Geo 7000 XH GPS unit with reported sub-meter accuracy. See Appendix 22-4, 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

TRC-delineated wetlands W-AJF-08 and W-CL-01 are part of NYSDEC freshwater wetland SS-6 and therefore (at least portions of these wetlands) fall under state jurisdiction pursuant to Article 24 of the NYS Environmental Conservation Law (ECL). The eastern part of wetland W-AJF-08 extends more than 500 feet beyond the mapped NYSDEC wetland boundary for NYSDEC wetland SS-6, thus regulation of this portion of the wetland pursuant to ECL Article 24 requires a map amendment by the NYSDEC. TRC-delineated wetland W-AJF-15 is assumed to be part of NYSDEC wetland SS-6 and is likely, therefore, to fall under state jurisdiction. TRC-delineated wetland W-AJF-17 is assumed to be part of NYSDEC wetland SS-1 and is, therefore, likely to fall under state jurisdiction. TRC-delineated wetland W-CL-02 could fall under state jurisdiction pursuant to Article 24 of the ECL if the NYSDEC opts to make a map amendment to NYSDEC wetland SS-6. See Appendix 22-4, Wetland and Waterbody Delineation Report, for a detailed description of the wetlands that could fall under NYSDEC jurisdiction. See Figure 22-4 for the extent of the NYSDEC-mapped wetlands. Wetland mapping will indicate USACE and NYSDEC verified wetlands as “jurisdictional wetlands.”

(5) Wetland shapefiles

See Appendix 22-4, 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.

22(j) Characterization of Wetlands within the Project Area

A description of wetland and stream cover types delineated within the aforementioned Wetland Delineation Survey Area associated with the Project Area is 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 or complex community character. Boundaries were demarcated and data plots were taken for each specific cover type within a wetland or waterbody. This method allowed a more complete depiction of specific waterbodies and wetlands and a more informed approach to any potential future mitigation efforts.

Palustrine Emergent wetlands (PEM) – Nineteen wetlands delineated within the Study Area contain emergent wetland classification characteristics. 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 inundated throughout the year.

Emergent wetlands encountered in the Study Area were typically dominated by reed canary grass (*Phalaris arundinacea*), field horsetail (*Equisetum arvense*), sensitive fern (*Onoclea sensibilis*), broad-leaf cat-tail (*Typha latifolia*), fowl blue grass (*Poa palustris*), and spotted touch-me-not. Evidence of wetland hydrology for these wetlands included surface water, saturation, a high water table, drainage patterns, geomorphic position, microtopographic relief, and passing of the facultative (FAC)-neutral test. Hydric soil indicators adhered to descriptions and guidelines outlined in *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 8.2* (USDA NRCS, 2018). Although hydric soil indications were variable, emergent wetlands within the Study Area typically displayed black to dark brown (10YR 2/1 – 10YR 3/2) silty loam soils. 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) – Eight wetlands delineated within the Study Area contained scrub-shrub wetland community characteristics. 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 Study Area were typically dominated by European buckthorn (*Rhamnus cathartica*), silky dogwood (*Cornus amomum*), and willow species (*Salix*

spp.). Herbaceous vegetation in these areas were dominated by sensitive fern, spotted touch-me-not, field horsetail, fowl manna grass (*Glyceria striata*), and various sedges (*Carex* spp.). Evidence of wetland hydrology for these wetlands included surface water, saturation, a high water table, hydrogen sulfide odor, water marks, aquatic fauna, drainage patterns, geomorphic position, micro-topographic relief, and passing the FAC-neutral test. Scrub-shrub wetlands within the Study Area typically displayed black to dark gray (10YR 2/1 – 10YR 4/1) silty loam soils. The soil matrices generally demonstrated Depleted Matrix (F3), Redox Dark Surface (F6), Depleted Below Dark Surface (A11), Loamy Gleyed Matrix (F2), and Hydrogen Sulfide (A4) hydric soil indicators.

Palustrine Forested wetlands (PFO) – Twelve wetlands delineated within the Study Area contained forested wetland characteristics. Forested wetlands are sometimes referred to as swamps and are dominated by tree species 20 feet tall or taller with an understory of shrub and herbaceous species. Understory vegetation presence varies with the amount of sunlight penetrating the tree canopy. Coniferous swamps, lowland hardwood swamps, and floodplain forests are common types of forested wetlands. Soils in forested wetlands are typically inundated or saturated during the early spring into summer. Some forested wetlands may dry up entirely, revealing water stain marks along the trunks of exposed trees as well as shallow root systems indicative of periods of heavy inundation.

Forested wetlands encountered in the Study Area were typically dominated by eastern green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), white willow (*Salix alba*), and American basswood (*Tilia americana*). Understory vegetation typically included saplings of the aforementioned species or shrub species, such as silky dogwood, European buckthorn, common winterberry (*Ilex verticillata*), intermediate serviceberry (*Amelanchier intermedia*), and nanny-berry (*Viburnum lentago*). Herbaceous species included sensitive fern, spotted touch-me-not, fowl manna grass, field horsetail, late goldenrod (*Solidago gigantea*), flat-top goldenrod (*Euthamia graminifolia*), and various sedges. Evidence of wetland hydrology for these wetlands included saturation, a high water table, aquatic fauna, drainage patterns, hydrogen sulfide odor, geomorphic position, and microtopographic relief. Forested wetlands within the Study Area typically displayed black to dark brown (10YR 2/1 – 10YR 3/2) silty loam soils. The soil matrices generally demonstrated Depleted Below Dark Surface (A11), Depleted Matrix (F3), Redox Dark Surface (F6), and Hydrogen Sulfide (A4) hydric soil indicators.

Palustrine Unconsolidated Bottom (PUB) – Four wetlands delineated within the Study Area contained unconsolidated bottom wetland characteristics. Unconsolidated bottom wetlands are characterized by surface water with less than 30 percent vegetative cover and at least 25 percent cover of particles smaller than stones. As these are bodies of standing water, evidence of wetland hydrology was decisively present with standing water ranging from approximately 2-4 feet deep. Dominant vegetative species included reed canary grass and rice cut grass (*Leersia oryzoides*). Unconsolidated bottom wetlands had gray (10YR 5/2) silt soils. The soil matrices demonstrated Depleted Matrix (F3) hydric soil indicators.

Palustrine Aquatic Bottom (PAB) – Two wetlands delineated within the Study Area contained aquatic bottom wetland characteristics. Aquatic bottom wetlands are characterized by surface water with at least 30 percent vegetative cover. Vegetation consists of submerged or floating-leaved rooted vascular plants and free-floating vascular plants. As these are bodies of standing water, evidence of wetland hydrology was decisively present with standing water ranging from approximately 2-4 feet deep. Dominant herbaceous species included curly-leaf pondweed (*Potamogeton crispus*), and reed canary grass. PAB wetlands within the Study Area typically displayed very dark gray to greenish gray (10YR 3/1 – 5BG 6/1) silty loam soils. The soil matrices generally demonstrated Depleted Below Dark Surface (A11), Loamy Gleyed Matrix (F2), and Depleted Matrix (F3) hydric soil indicators.

Streams (RUP, RIN, REPH) – Twenty six streams were delineated within the Study Area. Classification of streams were dependent on a temporal description of their usual level of flow regimes. Perennial streams (RUP) tend to flow all year, except during severe drought conditions. Perennial streams 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 have a groundwater component. Ephemeral streams (REPH) flow sporadically and are entirely dependent on transient precipitation from storm events or from periodic snow melts. Ephemeral streams tend to flow above the water table and are often found as drainage features within the headwater of major stream systems.

Streams encountered in the Study Area were mostly ephemeral in nature and occurred in agricultural communities along moderate gradients (2-4 percent). They generally contained channel substrates of silt, clay, cobble, and gravel with probed stream depths in the range of <1-6 inches. Most streams were determined to be utilized only as drainage features and lacked

substantial features to permit the prevalence of aquatic ecologies. Only one stream within the Study Area was determined to contain significant aquatic habitat to establish and support fish and wildlife populations, that being S-CL-03.

Further characterization of the wetlands and streams can be found in Appendix 22-4.

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 in order to identify and measure exhibited functions and values. For many audiences, such a measurement can be highly subjective. In the past, efforts to 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 in order to collect and describe the functions and values assessment of wetlands in a measurable and un-biased perspective. It is for these reasons that the Applicant elects to specifically follow a modified version of the USACE Highway Methodology and processes outlined in the Supplement to conduct a qualitative assessment of the physical characteristics of the wetlands and identify the functions and values which they exhibit.

The functions and values of wetlands are the favorable roles that a wetland provides to its surrounding environment and towards the benefit of human society. Functions and values are a result of specific biological, chemical, and physical characteristics of the wetland, often stemming from complex relationships maintained between the wetland in its natural surroundings and the general public.

Assessing a specific wetland's function and value is necessary to determine the overall effects an impact or alteration may have on a wetland feature. Ultimately, such a measurement aids in establishing the appropriate type and amount of mitigation that may be required after impacts to a wetland occur. More recently, the assessment of the functions and values for wetlands has 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 aforementioned spreadsheet and receive more detail on the functions and values assessment, see Appendix 22-5. 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/s 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. Wetland functions relate to the ecological significance of wetland properties without regard to subjective human values. The eight functions considered by the Supplement, including short descriptions, are as follows:

1. Flood-flow Alteration - This function applies to the effectiveness of the wetland in reducing flood damage by containing an enhanced ability to store floodwaters for an extended period of time following heavy precipitation and runoff 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 or to contribute base flow to a downgradient waterway. Discharge relates to the potential for the wetland to act as a source of groundwater transfer to the surface, i.e., springs and hillside seeps.

3. Sediment/Pollutant Retention - This function describes the ability of a wetland to hinder the degradation of water qualities downstream. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens based off of 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.
7. Nutrient Removal/Retention/Transformation - This function relates to the wetland's 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 and wildlife habitat. The primary functions and displayed by wetlands within the Wetland Delineation Survey Area include:

- Nutrient Removal/Retention/Transformation (19 wetlands)
- Groundwater Recharge or Discharge (18 wetlands)
- Flood-flow Alteration (2 wetlands)
- Sediment/Shoreline Stabilization (1 wetland)
- Wildlife Habitat (1 wetland)

Wetland Values

Values are the societal benefits stemming from one or more of the aforementioned functions and the physical characteristics associated with a wetland. Most wetlands have corresponding public value to an assessable degree. The value of a particular wetland function, or a combination of functions, is based on the interpretative judgment of the significance attributed to the wetlands through the various functions it provides. The five values defined by the Supplement and adopted

for use in this assessment, including short descriptions defining each value, are documented below:

1. Recreation - This value indicates if the wetland is effective in providing, or assisting in the establishment of, recreational opportunities such as boating, fishing, hunting, and other similar pursuits. Recreation in this capacity includes both consumptive and non-consumptive activities. Consumptive activities consume or diminish the plants, animals, or other resources that are naturally located in the wetland, whereas non-consumptive activities do not.
2. Education/Scientific - This value considers the effectiveness of the wetland as a site for public education or as a location for scientific research.
3. Uniqueness/Heritage - This value applies to wetlands that contain a singular or rare quality. Special qualities may include such things as the wetland's history and the presence of archaeological sites, historical events that may have taken place at the wetland, or unique plants, animals, or geologic features located within, or supported by, the wetland feature.
4. Visual Quality/Aesthetics - This value relates to the visual and aesthetic qualities of the wetland.
5. Threatened or Endangered Species Habitat - This value relates to the effectiveness of the wetland 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. One TRC-delineated wetland, W-AJF-08, coincides with a Class III NYSDEC freshwater wetland SS-8, and is believed to provide the value of Uniqueness/Heritage due to its large size, multiple cover types, and an extensive open water area. One wetland, W-AJF-17, is likely associated with a Class III NYSDEC freshwater wetland SS-1, and is believed to provide the value of Uniqueness/Heritage due to its large size, multiple cover types, and an extensive open water area.

More detail on the functions and values assessment is presented in Appendix 22-5 of this Application.

Vernal Pools

TRC biologists noted the presence of amphibians in wetlands during the wetland and stream delineations. One vernal pool was observed during the wetland and stream delineations and it will not be impacted by the construction or operation of the Project.

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

An analysis of the wetlands in Appendix 22-4 suggests that 26 of the delineated wetlands extend off site and are likely under USACE jurisdiction. An analysis of the streams in Appendix 22-4 suggests that 22 of the delineated streams are hydrologically connected to Waters of the U.S. and therefore are likely under USACE jurisdiction. Four of the delineated wetlands are likely to fall under NYSDEC jurisdiction. Wetlands that extend off site were mapped as “predicted wetlands” based off of aerial imagery, roadside survey, and publicly available data. The construction and operation of the Project will not permanently impact any off site wetlands.

22(m) Temporary and Permanent Wetland Impacts

Through careful siting of Project Components, there are only 195 square feet of permanent wetland impacts in the Project Area. There are no temporary impacts to wetlands in the Project Area. There are no temporary or permanent impacts to NYSDEC wetlands. There are temporary and permanent impacts to the 100-foot adjacent area around one potential NYSDEC wetland. Only two wetlands will be impacted as shown in Table 22-9 below.

Table 22-9. Temporary and Permanent Wetland Impacts

Wetland ID	Cover Class	NYSDEC Wetland ID	Preliminary Design Drawing Page	Temporary Impact (square feet)	Permanent Loss (square feet)	Permanent Conversion (square feet)	Temporary 100-ft Adjacent Area Impact	Permanent 100-ft Adjacent Area Impact	Facilities Crossing Resource*
W-AJF-9	PSS	N/A	C-036A	0	152	0	N/A	N/A	AR ¹
W-AJF-11	PEM	N/A	C-036	0	43	0	N/A	N/A	AR ¹
W-AJF-15	PEM	SS-6	C-038	0	0	0	0.00	0.34	SA, FE, IT, AR

*AR:access road, SA: solar array, FE: fence, IT: infiltration trench

¹note, this is only for grading associated with improving access roads if the existing road is unusable in its current condition.

Table 22-9 represent potential impacts to wetlands W-AJF-9 and W-AJF-11 as a result of grading for an access road. These impacts will only be necessary if the existing road is unusable in its

current condition. The 100-ft adjacent area around NYSDEC wetland W-AJF-15, which consist of active agricultural land, will be permanently impacted (0.34 acres) by grading, the solar array, fence, infiltration trench, and an access road. Avoiding the 100-ft adjacent area around wetland W-AJF-15 would likely result in additional tree clearing and grading for the Project Components. Impacts to the 100-ft adjacent area around wetland W-AJF-15 have been minimized the maximum extent practicable through siting the Project Components along the edge of the 100-ft adjacent area away from the NYSDEC wetland. The impacts to the 100-ft adjacent area will not result in any impact to the NYSDEC wetland.

Only three wetlands, W-ARS-1, W-ARS-3, and W-AJF-13, lie entirely within the Project's fenced area but no Project Components will impact these wetlands.

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

The Project layout design process used information from the wetland and waterbody delineation to place components where they would avoid and/or minimize impacts to wetlands and waterbodies wherever possible. The current Project layout avoids impacts to wetlands and waterbodies by locating solar arrays structures outside of delineated features and routing access roads and collection lines around delineated features where practicable. As mentioned in Section 22(m), impacts to two wetlands may occur if grading is necessary to improve an existing road. The existing road was chosen to minimize the potential for additional grading required for new access roads. The location of the collection substation avoids impacts to wetlands and waterbodies. None of the Project Components will directly impact any wetland or waterbody. Horizontal Directional Drilling (HDD) will be used to avoid temporary impacts to several wetlands and waterbodies from the vegetation clearing and ground disturbance necessary for the buried underground collection line. HDD will be used to avoid impacts to wetlands W-AJF-8, W-AJF-10, and W-CL-2, and stream S-CL-3.

A total of 0.34 acres of permanent impact will occur to the 100-ft adjacent area of a wetland likely to be considered a NYSDEC wetland (W-AJF-15) in an area presently disturbed by agricultural practices. Compensatory mitigation would be necessary if the impacts substantially affect the NYSDEC wetland. Solar arrays, fencing, an access road, and an infiltration trench will cross the 100-ft adjacent area of this possible NYSDEC wetland. The pre-existing landscape setting of the 100-ft adjacent area is agricultural land, which will be converted to an early successional grassland community. Given the landscape setting, it is unlikely the Project Components placed within the 100-ft adjacent area will have a substantial effect on the NYSDEC wetland. The

infiltration trench will prevent stormwater and runoff from entering the NYSDEC wetland. Accordingly, no mitigation is necessary or proposed. Correspondence with the NYSDEC will determine if compensatory mitigation is necessary. If determined necessary, forms of mitigation available to the Applicant include the purchase of credits from an approved in-lieu-fee program, the creation of an on-site compensatory mitigation area, the restoration or enhancement of wetlands in the impacted watershed, or some combination of these options. Correspondence with USACE and NYSDEC agencies will be utilized to assist in the decision-making process as to which mitigation strategy is best suited for the Project based on local and regional constraints.

22(o) Off-site Mitigation

Total permanent impacts to wetlands within the Project Area are less than 0.01 acre; therefore, compensatory mitigation will not be required by the USACE.

Should the NYSDEC require compensatory mitigation for impacts to the 100-ft adjacent area, then off-site mitigation will only be considered after evaluating options within the immediate vicinity of the Project Area.

Alternative siting and routing options were considered during development of the Project layout. The current proposed layout has less permanent conversion than another option that was considered. See Exhibit 9 for a discussion of alternative layout criteria. As mentioned previously, HDD will be used to avoid impacts to wetlands W-AJF-8, W-AJF-10, and W-CL-2 and stream S-CL-3.

Siltation and sedimentation impacts will be negligible throughout the construction phase of the Project. The Applicant will follow a stringent and specific mitigation strategy for indirect impacts to wetlands. Actions that the Applicant will conduct to avoid and minimize indirect impacts include the creation of:

Prohibited Access Areas – Waterbodies will be labeled prohibiting the use of motorized equipment in these areas except where a stream is crossed by permitted access roads or through non-jurisdictional use of temporary matting.

Restricted Activities Areas – A 25-foot protective upland buffer will be assigned to all wetlands and waterbodies. This upland buffer area will be referred to on construction related mapping and guidelines as a “Restricted Activities Area”. Certain specific limitations will be put in place for these areas and will include:

- No placement of cleared vegetation and slash materials within or adjacent to a wetland or waterbody
- No accumulation of construction debris or trash within the restricted area
- No use of herbicide within the restriction area (or as required per manufacturer's instructions)
- No parking of construction equipment, vehicles or mobile operations centers in the restricted area
- No degradation of stream banks
- No equipment washing or refueling within the restricted area
- No storage of any petroleum or chemical material and no disposal of excess concrete or concrete wash water within the restricted area.

A soil erosion and sedimentation control plan will be developed and implemented as part of the SPDES General Permit for the Project. Specific control measures are identified in the Preliminary SWPPP, which can be reviewed in Exhibit 23. The location of all control features will be indicated on construction drawings and reviewed by the contractor and other appropriate parties prior to construction. Through coordination with an on-site Environmental Monitor, these control features will be inspected on a regular basis to assure that they function properly throughout the period of construction, and until completion of all restoration work.

To maintain environmental compliance and the integrity of the Project, the Applicant will provide funding for an independent, third-party environmental monitor to oversee compliance with environmental commitments and permit requirements. The Applicant has an established environmental compliance construction team that will also actively monitor all construction activities. All permit conditions will be tracked to ensure compliance and oversight of the construction effort. Finally, NextEra has a corporate environmental auditing team that will conduct periodic environmental audits during operations. The environmental audits are conducted generally once every three years at the site by a trained team of environmental auditors assessing permit condition compliance and general operating standards and procedures. Audit findings are provided in confidential reports to management and corrective actions and good management practices are all reported as well.

The environmental compliance and monitoring program will be implemented in five phases, which are summarized below.

Preparation Phase

Established environmental monitors will review all environmental permits and prepare an environmental management program that will be used in support of permit guidelines for the duration of the construction and operation of the Project. This program will identify all environmental requirements for construction and restoration included in all Project-related permits and approvals and will be used as a resource for the management of environmental issues that may occur.

Training Phase

Environmental monitors will conduct mandatory environmental training sessions for all contractors and subcontractors before they begin working at the Project Area. The purpose of the training will explain the environmental compliance program in detail, prior to the start of construction, and to assure that all personnel on site are aware of the permitting requirements for construction of the Project. Likewise, the corporate environmental compliance team will provide construction staff training concerning permit conditions and compliance requirements.

Coordination Phase

Prior to construction, environmental monitors along with associated contractors will conduct an on-site walk down of areas to be impacted by construction operations. Work area limits will be defined by flagging, staking, or fencing prior to construction. This walk down will aid in the identification of any landowner preferences and concerns. This walk down will also locate sensitive resources, clearing limits, and proposed wetland and waterbody crossings and impacts. The placement of sediment and erosion control features will also be identified. The pre-construction site review will serve as a critical means of identifying any required changes in the construction of the Project in a timely manner in order to avoid future delays to project construction timeframes. Changes may require an agency notification period and take time for approval to be received.

Construction Phase

The environmental monitor will conduct daily inspection of active work areas. The environmental monitor will conduct inspections of all areas requiring environmental compliance during construction activities, with an emphasis on those activities that are occurring within or close

proximity to jurisdictional/sensitive areas. The environmental monitor will conduct daily operation meetings with contractors to coordinate scheduling, establish daily monitoring priorities, and address compliance issues.

Restoration Phase

When the construction phase of the Project is nearing completion in select areas, the monitor will work with the contractors to locate areas that require restoration. The environmental monitor will define and coordinate the proper restoration of specific area and incorporate the monitoring of these restoration areas in their daily task list. As these areas approach full restoration, the environmental will document the results and determine if further restoration effort is needed or if the restoration area can be removed off of the daily investigation list.

Agricultural Areas

The Applicant will conduct a monitoring and remediation period of no less than two years in agricultural areas after completion of the construction phase of the Project. This two year period will be used to collect and document the temporal response of agricultural lands post-construction with influence of nominal climatic conditions throughout the year. This phase will be used to identify any remaining agricultural impacts associated with construction that are in need of further restoration effort. General conditions to be monitored include topsoil thickness, topsoil compaction level, topsoil texture and rock content, crop production, drainage ability, and the return to pre-existing operational conditions (fence work, tiling etc.), amongst other characteristics. The environmental monitor will identify any issues through on-site monitoring of all agricultural areas impacted by construction and will keep open correspondence between contacts with respective farmland operators and NYSDAM in order to properly mitigate issues.

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

(1) Minimization and Mitigation of Impacts

Discussion on mitigating the impact to plant communities within the Project Area can be reviewed in Section 22(c), Avoidance and Mitigation Measures for Vegetation Impacts. Construction-related impacts to fish and wildlife will be limited to incidental injury and mortality due to construction activity. These activities include use of heavy machinery, vehicular traffic, and minimal silt and sedimentation events as a result of construction occurring within or adjacent to aquatic ecosystems. Also, habitat disturbance and loss will occur due to vegetation clearing, earth moving

activities, and the placement of Project Components. Displacement events will occur due to increased noise, vibration, and human presence during construction in previously undisturbed areas. The mitigation of these construction related impacts will be accomplished through continued careful site design, best management practices, and construction monitoring. Site design practices avoid sensitive habitats by siting solar arrays primarily in agricultural fields, minimizing construction disturbances to the extent practicable, adhere to designated construction limits, and avoid off-limit sensitive areas.

In order to reduce impacts to aquatic resources as a result of construction-related siltation and sedimentation events, the Applicant will utilize an approved sediment and erosion control plan and implement a SWPPP for the construction phase of the Project. The sediment and erosion control plan and Preliminary SWPPP are described in more detail in Exhibit 23. Also, the Preliminary SWPPP is attached as Appendix 23-3, and a Spill Prevention, Containment, and Counter Measures (SPCC) Plan will be developed for implementation within the Project Area to mitigate any potential spill of hazardous chemicals during the construction and operation phases of the Project. Further detail of the SPCC plan is provided in Exhibit 23 this Application.

Through initial impact analysis and careful site design, permanent habitat loss and forest fragmentation have been minimized. As stated previously, a majority of access roads, collection lines, and solar arrays will be sited in agricultural fields in order to minimize impacts to natural communities, including forest fragmentation.

The solar arrays will be installed to minimize the potential for avian and bat collisions. It is not anticipated there will be any avian or bat mortality from collisions with the solar panels. The solar panels will not be high enough for avian or bat collisions to be likely. Post-construction monitoring will be unnecessary as impacts have been minimized through careful siting. As previously mentioned in Section 22(f)(9), there will be no take of threatened or endangered species; therefore, post-construction monitoring for these species is not necessary.

(2) Impacts to State- and Federally Listed Species

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 in order to determine the presence of rare, threatened, endangered, and special concern species (see

Appendix 22-8). Similarly, a list of species encountered during on-site survey work was documented by field staff. Any species that was visually identified on-site that was on the aforementioned state or federal registry was also included in the list of state- and federally-listed species occurring within the Project Area. Information from the USGS BBS, NY BBA, CBC, and eBird was used to find state and federally listed species, species of special concern, and SGCN. A summary impact table containing information on all listed species identified through the above-mentioned procedures was also compiled (see Table 22-10). 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 whether the species was directly observed on site.

Table 22-10. State- and Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site
American Bittern (<i>Botaurus lentiginosus</i>)	-	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 habitat for this species occurs within the Project Area.	D	No
American Black Duck (<i>Anas rubripes</i>)	-	-	SGCN-HP	This species prefers marshes, ponds, rivers, and lakes. This species breeds in freshwater wetlands such as freshwater marshes and forested wetlands. Suitable habitat for this species occurs within the Project Area.	C, D, E, F	Yes
American Kestrel (<i>Falco sparverius</i>)	-	-	SGCN	This species prefers open areas, such as successional old fields, forest edges, scrublands, pastures and hay fields. Suitable habitat for this species occurs within the Project Area.	C, D, E, F	Yes
American Woodcock (<i>Scolopax minor</i>)	-	-	SGCN	This species prefers moist successional shrublands near successional forests, scrub-shrub wetlands, and along rivers. Suitable habitat for this species occurs within the Project Area.	C, D	No
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	-	THR	SGCN	This species prefers undisturbed areas near large lakes, reservoirs, marshes, swamps, or stretches along rivers where they can breed and forage for fish. Suitable habitat doesn't exist at the site, as waterbodies are not large enough to support prey fish populations.	C, E, F	Yes
Black-billed Cuckoo (<i>Coccyzus erythrophthalmus</i>)	-	-	SGCN	This species prefers thickets, successional old-field, orchards, and along forest edges. Nests in shrublands and forest edges. Suitable habitat for this species occurs within the Project Area.	C, D, F	No

Table 22-10. State- and Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site
Black-throated Blue Warbler (<i>Dendroica caerulescens</i>)	-	-	SGCN	This species prefers large, undisturbed tracts of hardwood and mixed deciduous-coniferous forests with a dense understory. This species typically occurs in forests greater than 250 acres. Suitable habitat for this species does not occur within the Project Area, because the forested areas are too small.	D	No
Blue-winged Teal (<i>Anas discors</i>)	-	-	SGCN	This species prefers freshwater habitats such as ponds and marshes surrounded by grassland or successional old fields. Suitable habitat for this species occurs within the Project Area.	C	No
Blue-winged Warbler (<i>Vermivora pinus</i>)	-	-	SGCN	This species prefers brushy hillsides, overgrown pastures, and stream and woodland edges. Breeds in dry uplands in low shrublands. Suitable habitat for this species occurs within the Project Area.	C, D, F	No
Bobolink (<i>Dolichonyx oryzivorus</i>)	-	-	SGCN-HP	This species prefers grasslands, including pastures, successional old fields, and meadows. Suitable habitat for this species occurs within the Project Area.	C, D, F	Yes
Brown Thrasher (<i>Toxostoma rufum</i>)	-	-	SGCN-HP	This species prefers successional shrublands, dense regenerating woods, and forest edges. Suitable habitat for this species occurs within the Project Area.	C, D, F	No
Canada Warbler (<i>Wilsonia canadensis</i>)	-	-	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. Suitable habitat for this species occurs within the Project Area.	C, D	No

Table 22-10. State- and Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site
Common Goldeneye (<i>Bucephala clangula</i>)	-	-	SGCN	This species prefers freshwater habitats such as ponds, lakes, rivers, and forested wetlands. Nests in tree cavities in mature boreal forests. Suitable habitat for this species may occur within the Project Area, although there are no boreal forests.	E	No
Common Nighthawk (<i>Chordeiles minor</i>)	-	SSC	SGCN-HP	This species prefers open or semi-open areas such forest clearings, grasslands, and suburbs. Suitable habitat for this species occurs within the Project Area.	C	No
Cooper's Hawk (<i>Accipiter cooperii</i>)	-	SSC	-	This species prefers to reside in deciduous, mixed, and coniferous forests. Suitable habitat for this species occurs within the Project Area.	C, D, E, F	No
Eastern Meadowlark (<i>Sturnella magna</i>)	-	-	SGCN-HP	This species prefers farm fields, pastures, grasslands, and wet fields. Suitable habitat for this species occurs within the Project Area.	C, D, F	No
Eastern Red Bat (<i>Lasiurus borealis</i>)	-	-	SGCN	This is a migratory bat species that often resides in forested areas and does not overwinter in caves. Suitable habitat occurs within the forested portions of the Project Area.	I	No
Golden-winged Warbler (<i>Vermivora chrysoptera</i>)	-	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. Suitable habitat for this species occurs within the Project Area.	C, D	No
Grasshopper Sparrow (<i>Ammodramus savannarum</i>)	-	SSC	SGCN-HP	This species prefers open fields and prairie including active hay fields, successional old field, and minimally in successional shrublands. Suitable habitat for this species occurs within the Project Area.	C, F	Yes

Table 22-10. State- and Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site
Henslow's Sparrow (<i>Ammodramus henslowii</i>)	-	-	SGCN-HP	This species prefers moist fallow fields and meadows. Breeding occurs in a variety of habitats with tall, dense grass and herbaceous vegetation. Suitable habitat for this species occurs within the Project Area.	D, F	No
Hoary Bat <i>Lasiurus cinereus</i>	-	-	SGCN	This species prefers to roost in dense woodland areas, mainly coniferous forests and forages over open areas or large open bodies of water. Suitable habitat occurs within the Project Area.	I	No
Horned Lark (<i>Eremophila alpestris</i>)	-	SSC	SGCN-HP	This species prefers open habitats with sparse vegetation such as prairies and heavily grazed pastures. Suitable habitat for this species does not occur within the Project Area.	C, D, E	No
Little Brown Bat <i>Myotis lucifugus</i>	-	-	SGCN-HP	This species prefers summer roosts in buildings or trees, under rocks or wood piles. This species hibernates through the late fall and early spring in caves or abandoned mines. Suitable summer roost habitat within the forested portions of the Project Area.	I	No
Louisiana Waterthrush (<i>Seiurus motacilla</i>)	-	-	SGCN	This species prefers gravel-bottomed streams flowing through deciduous forests in ravines. Suitable habitat for this species may occur within the Project Area, although there are no steep ravines within the Project Area.	C, D	No
Northern Goshawk (<i>Accipiter gentilis</i>)	-	SSC	SGCN	This species prefers larger tracts of wild forest. Across much of their range they live mainly in coniferous forests, but may occur in deciduous hardwood forest as well. Suitable habitat for this species occurs within the Project Area.	C, E	No

Table 22-10. State- and Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site
Northern Harrier (<i>Circus cyaneus</i>)	-	THR	SGCN	This species prefers freshwater marshes, wet grasslands, lightly grazed pastures, successional old field, and croplands. Suitable habitat for this species occurs within the Project Area.	A, C, D, E, F	Yes
Northern Long-Eared Bat (<i>Myotis septentrionalis</i>)	THR	THR	SGCN-HP	This species utilizes tree cavities or loose bark of trees for roosting, foraging and raising young. This species hibernates through the late fall and early spring in caves or abandoned mines. Suitable summer roost habitat within the forested portions of the Project Area.	B, I	No
Northern Pintail (<i>Anas acuta</i>)	-	-	SGCN	This species prefers freshwater marshes and nests in pastures, hay fields, croplands, and successional old field.	C	No
Prairie Warbler (<i>Setophaga discolor</i>)	-	-	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. Suitable habitat for this species occurs within the Project Area.	C	No
Red-headed Woodpecker (<i>Melanerpes erythrocephalus</i>)	-	SSC	SGCN	This species prefers open deciduous forests, forest edges, groves, and orchards. Suitable habitat for this species occurs within the Project Area.	C	No
Ruffed Grouse (<i>Bonasa umbellus</i>)	-	-	SGCN	This species prefers a mix of mature forests, successional forests, and successional shrublands. Suitable habitat for this species occurs within the Project Area.	C, D, F	No
Scarlet Tanager (<i>Piranga olivacea</i>)	-	-	SGCN	This species prefers expansive deciduous and mixed forest canopies. Suitable habitat for this species occurs within the Project Area.	E, F, H	Yes

Table 22-10. State- and Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site
Sedge Wren (<i>Cistothorus platensis</i>)	-	THR	SGCN	This species prefers shallow marshes, wet meadows, grasslands, and hayfields. Suitable habitat for this species occurs within the Project Area.	A, C, D, F	No
Sharp-shinned Hawk (<i>Accipiter striatus</i>)	-	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.	C, D, F	Yes
Short-eared Owl (<i>Asio flammeus</i>)	-	THR	SGCN-HP	This species prefers open areas grasslands, prairies, marshes, and meadows. Suitable habitat for this species occurs within the Project Area.	E	No
Snapping Turtle (<i>Cheelydra serpentina</i>)	-	-	SGCN	This species prefers open water habitats such as deep freshwater marshes, ponds, lakes and river. Suitable habitat for this species occurs within the Project Area.	G	No
Upland Sandpiper (<i>Bartramia longicauda</i>)	-	THR	SGCN-HP	This species prefers prairies, grasslands, and successional old field. Suitable habitat for this species occurs within the Project Area.	C	No
Vesper Sparrow (<i>Poocetes gramineus</i>)	-	SSC	SGCN	This species responds quickly to changes in habitat and often occupies abandoned old farm fields and successional shrub lands as they return to forest. Suitable habitat for this species occurs within the Project Area.	C, D, F	No
Wood Thrush (<i>Hylocichla mustelina</i>)	-	-	SGCN	This species prefers deciduous and mixed forests with large trees, moderate understory, shade, and abundant leaf litter. Suitable habitat for this species occurs within the Project Area.	C, D, F	Yes

Table 22-10. State- and Federally Listed Species Occurring or Likely to Occur within the Project Area

Species Name	Federal Status ¹	NYS Status ²	SGCN Listing ³	Habitat Preference ⁴	Source of Potential Presence ⁵	Observed On site
<p>1- 'Federal Status' refers to the species listing as federally endangered (END) OR threatened (THR).</p> <p>2 - 'NYS Status' refers to the species listing as a state-listed endangered (END), threatened (THR), or species of special concern (SSC).</p> <p>3- 'SGCN Listing' refers to 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).</p> <p>4- References for habitat preference were Audubon.org, Allaboutbirds.org, and NYSDEC SWAP</p> <p>5- "Source of Potential Presence" refers to the source of information indication the potential presence of the species at the Project Area:</p> <ul style="list-style-type: none"> A: Species identified by NYNHP as occurring within 10 miles of the Project Area B: Species identified by USFWS online database (IPaC) C: Species identified in the USGS Breeding Bird Survey D: Species identified in the NYS BBA E: Species identified in the Audubon CBC F: Species identified in eBird G Species identified in the NYS Amphibian & Reptile Atlas Project H: Species identified in the NYSDEC Statewide Fisheries Database I: Species distribution range in the NYSDEC SWAP 						

Only two listed species were observed on site, and findings through this review indicate limited potential for additional species to occur. Habitat conditions at the Project are not consistent with habitats required by the majority of listed species identified with potential to occur. Forest patches, where they occur, have been previously fragmented and offer little value to forest-obligate species. Changes to forested conditions resulting from Project construction are unlikely to alter species behaviors or diversity following initial disturbances associated with construction activity. Grassland habitat is limited to 67.1 acres within the Project Area which is insufficient to meet the breeding area requirements of listed and SSC grassland breeding birds. Conversion from active agriculture resultant from Project development may result in a net gain of breeding habitat for these species following revegetation and seeding post-construction. The lack of disturbance expected over the 30-year life of the Project may ultimately support stronger and more persistent local populations. Permanent wetland impacts are less than 0.01 acre and will not adversely impact any species reliant upon those habitats within the Project Area.

22(q) Invasive Species Management and Control Plan

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

- Black locust (*Robinia pseudocacia*)
- Canada thistle (*Cirsium arvense*)
- Common buckthorn (*Rhamnus cathartica*)
- Curly pondweed (*Potamogeton crispus*)
- Garlic mustard (*Alliaria petiolata*)
- Glossy buckthorn (*Frangula alnus*)
- Japanese barberry (*Berberis thunbergii*)
- Leafy spurge (*Euphorbia esula*)
- Morrow honeysuckle (*Lonicera morrowii*)

- Multiflora rose (*Rosa multiflora*)
- Oriental bittersweet (*Celastrus orbiculatus*)
- Purple loosestrife (*Lythrum salicaria*)

As part of the Application and in preparation for construction, an ISMCP was prepared to describe the survey methods utilized to identify invasive species populations currently present on-site (Appendix 22-6). This management plan also includes proposed control procedures of current and introduced invasive populations, including locating and identifying target species, establishing a removal protocol, inspecting construction materials (including fill) and equipment, cleaning equipment, and site restoration. The ISMCP also discusses in detail the monitoring methods which will take place during the construction phase of the Project. As part of the on-site monitoring effort, management guidelines will be established and strictly adhered to. This will be done in order to ensure that all Project workers are informed of the threat of spreading invasive species and be educated on the BMPs, which will be implemented during construction and restoration of the Project.

The Applicant anticipates that post-construction monitoring will occur over a 5-year period. Should new occurrences of invasive species become established, the ISMCP contains a treatment plan to control the introduction and spread of invasive species. Due to invasive species outcompeting native species, invasive populations may naturally increase in distribution and density over time. However, the general goal for the ISMCP is to prevent an increase in invasive species population size or density as a direct or indirect result of the Project. Should the ISMCP fail due to an unforeseen circumstance, a revised management plan will be written with new guidelines and/or protocols in order to create an adaptable and responsive management framework.

22(r) Temporary and Permanent Impacts on Agricultural Resources

According to Table 22-1, active agriculture is the dominant land cover type at the Project Area with 809.2 acres (61.7 percent). According to the USDA Cropland Data Layer, the top agricultural uses of the Project Area are for corn (33.8 percent), other hay/non alfalfa (17.3 percent), soybeans (9.8 percent), and alfalfa (3.7 percent). Agricultural land at the Project Area is within a New York State Certified Agricultural District. 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 mentioned in Section 22(b)(1), temporary impacts to agricultural land will occur primarily from burying an underground collection line and clearing vegetation. Permanent impacts in agricultural land include siting the solar arrays. A total of approximately 312.45 acres of agricultural land will be converted to nonagricultural use due to 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* (2018). In order to minimize and/or mitigate impacts to agricultural resources. Project construction and operation will comply with these guidelines to the maximum extent practicable. If these guidelines cannot be met, then the Applicant with consult with the NYSDAM to discuss acceptable alternatives.

22(s) Grassland Breeding Bird Assessment

A preconstruction monitoring survey of grassland bird species during the breeding season was conducted by Tetra Tech. Survey design was conducted in accordance with the *NYSDEC Survey Protocol for State-listed Breeding Grassland Birds Species (Draft)* (NYSDEC, 2015). A work plan was submitted to the NYSDEC in June 2018 and approved with comment. The objective of the grassland breeding bird survey was to determine the presence and site use of state- and federally listed threatened/endangered and rare grassland bird species within the proposed Project Area.

For a detailed description of the 2018 Grassland Breeding Bird Survey, including figures showing survey locations, methods, and results, please refer to Appendix 22-2.

22(t) Invasive Species Management and Control Plan

Refer to Section 22(q) and Appendix 22-6 for the ISMCP.

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