



# **Grassland Breeding Birds Cumulative Impacts Assessment**

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## **High River Energy Center**

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## 1.0 Introduction

### 1.1 Project Description

High River Energy Center, LLC, (High River Energy Center or the Applicant) a wholly-owned indirect subsidiary of NextEra Energy Resources, LLC (NEER), is submitting an application to construct a major electric generating facility, the High River Energy Center (the Project), under Article 10 of the Public Service Law (PSL).

The High River Energy Center Project will have a generating capacity of 90 MW of power and will be located on land leased from owners of private property located in the Town of Florida, Montgomery County, New York (Figure 1). Project facilities will include commercial-scale solar arrays, access roads, inverters, fencing, buried electric collection lines, and electrical interconnection facilities. Proposed interconnection facilities will include a collection substation and point of interconnection (POI) switchyard, which will be transferred to National Grid to own, maintain, and operate. The proposed collection substation and POI switchyard will be located on land within the Project Area, in relative proximity to National Grid's existing Stoner – Rotterdam #12 115 kilovolt (kV) transmission line (see Figure 2), which will be connected to the POI switchyard.

The proposed facility will consist of ground-mounted solar arrays and associated infrastructure with an anticipated footprint of approximately 550 acres within the 1,220-acre Project Area.

### 1.2 Purpose and Objectives

In proposed Stipulation 22(f)(11), dated August 26<sup>th</sup>, 2019, the Applicant agreed to perform a cumulative impact analysis as requested by the New York Department of Environment and Conservation (NYSDEC) to evaluate the actual and expected 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 with a generating capacity greater than or equal to 5 MW occupying grassland habitat within 100 miles of the Project Area. This analysis is based upon the NYSDEC database consisting of mapped solar facilities provided to the Applicant, and any publicly available information researched by the Applicant (Study Projects) located within but not beyond New York State borders (Grassland Study Area). The Applicant was not required to perform any avian field



studies at the Study Projects nor was it required to make Freedom of Information Requests. This analysis includes, at a minimum:

- Examination of publicly available open and grassland habitat data on the Study Projects within the Grassland Study Area using the NYSDEC database and any publicly available information found by the Applicant;
- estimated take of state-listed T&E bird species and their habitats at the Facility, if any, and a description of methods used, and sources consulted to estimate take;
- estimates of available open and grassland habitat within the Grassland Study Area;
- estimates of acres of grassland breeding bird habitat lost directly through installation of panels and other project components at the Study Projects, using best available information or typical industry solar land use metrics;
- estimates of acres of grassland habitat indirectly affected by the Study Projects due to functional loss/degradation of habitat; and
- cumulative impacts of grassland habitat use, particularly potential impacts on state-listed grassland bird species, within the Facility Area.

## **2.0 Literature Review**

### **2.1 Solar Energy Impacts to Grassland Breeding Birds**

#### **2.1.1 Direct Impacts**

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). Burning impacts are not applicable to the High River Energy Center as the use of photovoltaic solar modules is proposed rather than solar thermal technology.

Estimates of annual avian mortality from utility scale solar energy developments in the US ranges from 37,800 to 138,600 (Walston Jr. et al. 2016), which taken in context accounts for an insignificant portion of annual avian mortality from anthropogenic sources (Loss 2015). For example, wind turbines account for an estimated 573,093 deaths annually and power line



collisions kill over 22,800,000 birds each year. A full review of literature regarding impacts is provided within Exhibit 22 of the Article 10 Application for this Project.

### **2.1.2 Indirect Impacts**

Establishing a ground-mounted solar system at the Project Area may not significantly affect grassland birds in the vicinity. 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 of bird use at ground-mounted solar facilities and managed grasslands at airfields found that although bird diversity was lower than adjacent grasslands, bird density was greater at solar facilities. The same study found several grassland birds using solar systems including eastern meadowlark, grasshopper sparrow and savannah sparrow (DeVault et al., 2014).

Grassland birds are declining in New York State due to the loss of agricultural lands such as pastures and hay fields. Most utility-scale solar facilities in the United States are sited in agricultural areas, and construction of facilities often results in conversion of land use out of row crop production. 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.

Following construction, solar energy facilities typically use a 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.

## 2.2 Summary of Previous Site-Specific Studies

### 2.2.1 Grassland Breeding Bird Study

A preconstruction monitoring survey of grassland bird species during the 2018 breeding season required by the NYSDEC was conducted by Tetra Tech, an engineering services company. The survey methodology followed the *NYSDEC Draft Survey Protocol for State-listed Breeding Grassland Bird Species* (NYSDEC, 2015a) and incorporated comments provided by NYSDEC on the site-specific protocol. 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*)
- 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 23, 2018
- vesper sparrow (*Pooecetes gramineus*) first observed on June 20, 2018
- horned lark (*Eremophila alpestris*)

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

- American kestrel (*Falco sparverius*)
- bobolink (*Dolichonyx oryzivorus*), first observed on May 23, 2018
- eastern meadowlark (*Sturnella magna*), first observed on May 23, 2018
- golden-winged warbler (*Vermivora chrysoptera*)
- savannah sparrow (*Passerculus sandwichensis*), first observed on May 23, 2018

Biologists recorded a total of 1,879 observations, including individuals representing five grassland bird species (i.e., bobolink, savannah sparrow, grasshopper sparrow, vesper sparrow, and eastern meadowlark) 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 = 1,501) were the most commonly observed grassland bird species and comprised 56.1 percent of all grassland birds observed. Mean use was highest for bobolinks (8.12 birds/100-meter radius plot/5 minutes), followed by savannah sparrows (1.19 birds/100-meter radius plot/5 minutes), and grasshopper sparrows (0.19 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 there is suitable grassland habitat. No raptor species were observed at the Project Area.

The vesper sparrow is a state-listed species of special concern. One adult was observed incidentally while walking between points on the morning of June 20, 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 31 grasshopper sparrows were observed at the Project Area. No state or federally listed threatened or endangered species were observed to be breeding or nesting on site. For a detailed description of the 2018 Grassland Breeding Bird Survey, including figures showing locations, methods, and results, refer to Appendix 22-3.

### ***2.2.2 Winter 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), and incorporated comments provided by NYSDEC on the site-specific protocol.

Surveys were performed in winter of 2018–2019 and were conducted between November 15, 2018, and March 31, 2019. Driving surveys took place every week from December 7, 2019 – March 31, 2019. Stationary surveys were conducted for a total of 73.5 hours, and 16.3 total hours were spent conducting daytime driving surveys.

No short-eared owls were observed during winter raptor surveys at the Project Area. Three observations of northern harrier were made during stationary surveys during early December and mid-March, consistent with wintering northern harrier movements. Observations of northern harrier comprised 8.7% of total raptor observations during stationary surveys (n=3 individuals). Observations occurred at HR-1 in the north-central portion of the Project Area, HR-3 in the south-central portion, and HR-2. Individuals appeared to be traversing the Project Area, as all three individuals were observed flying in transit between fields which contained survey site locations.



Two males, and one female were observed; the female and one of the two males were determined to be adults. Observations ranged in duration from one to seven minutes.

One juvenile bald eagle (*Haliaeetus leucocephalus*; state-threatened) was observed during a stationary survey in late November. The individual was sighted on November 26, 2018 at location HR-4. The eagle was observed perching then gliding northwest to the ground. The sex of the individual was not determined.

Five Cooper's hawks (*Accipiter cooperii*), a state-listed species of special concern, were observed during both stationary and driving surveys in the Project Area. Four individuals were observed during stationary surveys at locations HR-1, HR-2, and HR-4, the fifth occurred during a daytime driving survey located near HR-2. These survey sites are located in the southeast, northeast and northwest portions of the Project Area. Two adult individuals were observed at HR-4, one perching for 5 minutes before flying to the ground, the other perching for 16 minutes before flying southwest toward HR-1. A third individual of unknown age and sex was observed flying overhead at HR-4 in a northwest direction. An individual of unknown age or sex was observed at HR-2 perched in a tree before flying out of sight. The last individual was also of unknown age and sex. This Cooper's hawk was observed perching in a tree for 14 minutes near site HR-2.

One juvenile sharp-shinned hawk (*Accipiter striatus*; species of special concern) was observed in the northeastern portion of the Project just west of stationary site HR-2. The individual was observed perched along a forest edge for 13 minutes on February 7, 2019. The sex of this individual was not determined.

The most common raptor species observed at the Project Area was the red-tailed hawk (*Buteo jamaicensis*) which comprised approximately 61 percent of total raptor observations during both stationary and driving surveys. For a more detailed description of the wintering grassland raptor survey, including a list of incidental bird observations, please refer to Appendix 22-4.

Winter surveys occur well outside of the breeding period for target species, therefore are intended only to document presence within the Project Area.

## 3.0 Methods

### 3.1 Desktop Review

#### 3.1.1 *Grassland Species Use*

TRC conducted a review of publicly available information to determine grassland bird species with potential to occur within the Project Area and those which may be impacted by solar energy development within the 100-mile Grassland Study Area. This review focused on state and federally listed Threatened (T) and endangered (E) species and grassland species of Special Concern (SC) as designated in the NYSDEC grassland breeding bird survey protocol (NYSDEC 2015a). This review included:

- Route-level data from the USGS North American Breeding Bird Survey for survey routes within the Project Area
- Block-level data from the 2<sup>nd</sup> New York State Breeding Bird Atlas (2000-2005) for survey blocks within the Project Area
- Christmas Bird Count data from counts located closest to the Project Area
- County-level eBird data for Montgomery County and counties with Study Projects in the Grassland Study Area
- County-level data from the NYNHP for Montgomery County and counties with Study Projects in the Grassland Study Area

While additional species in New York may use grassland habitat during some portion of the annual life-cycle and have potential to occur within the Project Area, analyses were restricted to those species considered “Grassland Breeding Birds” in the NYSDEC protocol (NYSDEC 2015a) and the North American Breeding Bird Survey (USGS 2019).

#### 3.1.2 *Study Project Identification*

TRC reviewed the database provided by the NYSDEC for Study Projects with a proposed generating capacity of 5MW or greater within the 100-mile Grassland Study Area and within the New York State boundaries. Projects were cross-referenced with the NYISO Interconnection Queue to obtain additional project-specific information. Few projects reported MW capacity; therefore, a conservative approach was used to identify Study Projects within the database, which met the criteria to be included in further analysis. Any projects with a size of less than 20 acres



reported in the database were eliminated from the Study, based on the standard ratio of 1 MW:4 acres for fixed ground-mounted solar PV arrays<sup>1</sup>.

A literature search was conducted for each remaining Study Project in order to obtain any additional relevant information, which is publicly and electronically available, including Project location, generating capacity, area of impact, and avian studies completed to date.

### **3.2 Spatial Analysis**

TRC used the USGS National Land Cover Database (NLCD) land cover dataset for the conterminous United States, updated 2016, to determine the presence and extent of grassland habitat within the Grassland Study area, the Study Project boundaries, and to characterize habitat available within the proposed Project Area.

The NLCD categorizes each 30x30-meter pixel into one of 20 cover classes. As a conservative approach, for the purposes of this analysis grassland habitat was defined as including both the “Grassland/Herbaceous” category and pixels classified as “Pasture/Hay,” which are consistent with the definition of grassland communities of New York described in Edinger et al. 2014<sup>2</sup>.

NLCD provides the following definition for each of these categories:

- Grassland/Herbaceous - areas dominated by graminoid or herbaceous vegetation, generally greater than 80 percent of total vegetation. These areas are not subject to intensive management such as tilling but can be used for grazing.
- Pasture/Hay - areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation.

Grassland habitat was extracted from the NLCD dataset using a Geographic Information System (GIS) to determine percent area in grassland cover. Acreages and percent cover values were compared between the Project Area, Study Projects (collectively), and the Grassland Study Area.

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<sup>1</sup> Denholm, Paul, and Robert Margolis. *Regional Per Capita Solar Electric Footprint for the United States*. No. NREL/TP-670-42463. National Renewable Energy Lab. (NREL), Golden, CO (United States), 2007.

<sup>2</sup> From Edinger et al. 2014: Grasslands include communities that are dominated by grasses and sedges; they may include scattered shrubs (never more than 50% cover of shrubs), and scattered trees (usually less than one tree per acre, or 3 trees per hectare).



This approach was used to highlight the overall indirect impact posed to grassland breeding birds resulting from habitat conversion/loss associated with Project construction. This methodology conservatively assumes that although the total footprint of the Project is limited to 550 acres, indirect impacts to grassland birds have the potential to affect all grassland habitat acres within the Project Area.

## **4.0 Results**

### **4.1 Grassland Species Use**

#### **4.1.1 Project Area**

Several target grassland species were identified on site during the grassland breeding bird and winter raptor surveys. Species observed included bobolink, savannah sparrow, grasshopper sparrow, vesper sparrow, eastern meadowlark, and northern harrier. Bobolinks (n = 1,501) were the most commonly observed grassland bird species and comprised 56.1 percent of all grassland birds observed. Mean use was highest for bobolinks (8.12 birds/100-meter radius plot/5 minutes), followed by savannah sparrows (1.19 birds/100-meter radius plot/5 minutes), and grasshopper sparrows (0.19 birds/100-meter radius plot/5 minutes).

Three harriers (ST) and one bald eagle (SE) were observed during the winter grassland raptor survey. One individual sharp-shinned hawk (SC) and one Cooper's hawk (SC) were also observed during winter raptor surveys conducted within the Project Area.

Review of publicly available datasets indicated the potential for occurrence of two additional species that breed in grassland habitat. None of the additional species identified are listed as threatened and endangered, and neither has been observed on site.

#### **4.1.2 Study Project Counties**

TRC reviewed the NYNHP and eBird databases to determine the most recent occurrence of grassland birds within each of the 25 counties where Study Projects were identified (Table 2, Table 3). Numerous species were widely distributed and had recent records among the counties, and all have been recently observed (within last 10 years) in Montgomery County except for Henslow's sparrow and sedge wren. Few species were less recently recorded or limited in distribution, including:

- Barn Owl; observed in 13 counties; no observations in Montgomery County
- Henslow's Sparrow; observed in 12 counties; last observed in Montgomery County in 2011
- Sedge Wren; observed in 15 counties; last observed in Montgomery County during the 2<sup>nd</sup> Breeding Bird Atlas between 2000 and 2005.
- Upland Sandpiper; observed in 21 counties; last observed in Montgomery County in 2019

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

## **4.2 Summary of Study Projects Evaluated**

An initial review of the NYSDEC-provided database yielded 424 proposed or constructed solar utility projects within the Grassland Study Area. Multiple projects were identified as duplicate records, with duplicates containing slightly modified project areas. Polygons were merged to retain the full extent of the project area, resulting in 305 unique Study Projects.

Many of the records contained missing data. Of 305 records, only 38 contained the proposed or actual MW capacity. Records were filtered based by MW where available to retain only those greater than 5 MW, or on acreage to retain only those projects greater than 20 acres in size, resulting in the identification of 190 Study Projects. Three projects were removed from the analysis as they were designated with a "Discontinued" status in the database, or as "Withdrawn" from the NYISO queue, resulting in 187 Study Projects considered in the evaluation of impacts. The full list of Study Projects evaluated is provided as Table 4.

Study Projects were identified in 26 of the 32 counties within the Grassland Study Area. Ulster County contained the highest concentration of Study Projects with 23 projects identified, followed by Orange County (18) and Albany (18). The remaining counties had 17 or fewer Study Projects. No Study Projects were identified in Broome, Cayuga, Cortland, Franklin, Jefferson, Oswego, St. Lawrence, Tioga, or Tompkins counties (Table 4; Figure 2). Study Project locations are depicted in Figure 2.



Study Projects, including the Project, encompass a total of 41,093 acres within the Grassland Study Area. Of the 187 Study Projects, 29 have already been constructed and account for 2,365 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. Study Projects in Montgomery County, where the Project is located have a total area of 7,899 acres across 15 projects, accounting for 19.2 percent of the total area of development within the Grassland Study Area.

The results of pre-construction studies of grassland bird use are not publicly available for the majority of Study Projects. Several of the Study Projects have begun the process of filing for an Article 10 permit with the New York Department of Public Service, and as such have made the results of such studies publicly available. This information is summarized below and considered in the evaluation of cumulative impacts. Project narratives were obtained from publicly filed article 10 application exhibits.

#### Avangrid Renewables – Mohawk Solar, Montgomery County

“Mohawk Solar LLC (Mohawk), a wholly-owned subsidiary of Avangrid Renewables LLC (AR), is planning the development of a 90 megawatt (MW) photovoltaic (PV) solar energy generating facility in Montgomery County, New York called the Mohawk Solar Project. The Facility Area comprises approximately 2,761 hectare (ha; 6,600 acre [ac]); however, only approximately 405 ha (1,000 ac) will be used for the Facility.” (Mohawk Solar, 2019)

Grassland breeding bird surveys were conducted from April through July of 2018. Ninety-one species were observed, with the most common being red-winged blackbird (1,878 observations; *Agelaius phoeniceus*), song sparrow (1,248 observations; *Melospiza melodia*), bobolink (1,226 observations) European starling (1,190 observations), and savannah sparrow (1,129 observations). No federally threatened or endangered species were observed. Three state-listed threatened species were observed during surveys and/or incidentally: northern harrier (21



observations); upland sandpiper (two observations); and pied-billed grebe (*Podilymbus podiceps*; two observations).

Winter raptor surveys were conducted between November 2017 and March 2018. A total of 24 species were observed during surveys including the state-listed threatened northern harrier (n=7), state-listed threatened short-eared owl (n=9), and the state-listed threatened bald eagle (n=10).

#### Hecate Energy – Coeymans Solar Farm, Albany County

“Hecate is proposing to construct the Facility on privately owned land located in the Town of Coeymans, between County Route (CR) 101 and United States (US) Route 9W, approximately 7 miles south of the City of Albany, New York. The Facility will have a nameplate capacity of approximately 40 MW (alternating current [AC]) and is expected to generate approximately 73,000 megawatt-hours of energy annually. The Facility will consist of solar arrays and associated infrastructure and have a final footprint that occupies approximately 220 acres (50 percent [%]) of the approximately 436-acre Facility Area.” (Hecate Energy, 2019)

Both Grassland Breeding Bird and Winter Raptor surveys were conducted within the proposed project area. Breeding bird surveys were conducted from May through July of 2018. Grassland species observed include bobolink (*Dolichonyx oryzivorus*), savannah sparrow (*Passerculus sandwichensis*), grasshopper sparrow (*Ammodramus savannarum*), and eastern meadowlark (*Sturnella magna*). No federally-listed species were identified. Grasshopper sparrow is state-listed threatened.

Winter raptor surveys were conducted for two consecutive years, from March through April of 2018, and December 2018 through March 2019. Species observed include peregrine falcon (*Falco peregrinus*) (state-listed endangered), bald eagle (*Haliaeetus leucocephalus*) (state-listed threatened), Cooper’s hawk (*Accipiter cooperii*), merlin (*Falco columbarius*), red-tailed hawk (*Buteo jamaicensis*), and American kestrel (*Falco sparverius*) (state-listed special concern). Additionally, the state-listed threatened Northern harrier (*Circus hudsonius*) was observed during surveys.

#### NextEra Resources – East Point Energy Center, Schoharie County

The East Point facility will consist of ground-mounted solar arrays and associated infrastructure with an anticipated footprint of 401.77 acres within the 1,313-acre facility.



Grassland breeding bird surveys were conducted during the 2018 breeding season. Biologists observed a total of 218 individuals representing 5 grassland bird species (i.e., bobolink, savannah sparrow, grasshopper sparrow, American kestrel, and northern harrier) at the Project Area. One state-threatened northern harrier, and six grasshopper sparrows (species of SC) were observed.

Stationary and driving winter grassland surveys were conducted during 2018-2019. 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. One northern harrier (ST) and two bald eagles (SE) were observed during the survey. Additionally, horned larks (SC) were observed.

### **4.3 Facility Impacts to Grassland Habitat**

Land cover within the High River Energy Center Project Area is predominantly characterized as Hay/Pasture (675.9 acres) comprising 55 percent of land cover within the Project Area (Table 5; Figure 3). Grassland habitat within the Project area consists mainly of hay/pasture, with grassland herbaceous cover accounting for only 73.1 acres, and collectively comprises 749 acres (61%) of the Project Area (Figure 4). When compared with the Grassland Study area, which contains approximately 1.85 million acres of grassland habitat (Figure 5), impacts from the Project will affect less than 0.04% of available habitat within 100-miles in the state of New York.

### **4.4 Cumulative Impacts of Grassland Habitat Use**

Together, the 187 Study Projects comprise 41,093.2 acres of proposed development within the 14,924,026-acre Grassland Study Area (0.9% of total area; Table 6). Grassland habitat within the boundaries of the Study Projects total 18,733 acres, which covers 45.6% of the proposed area of development among the projects. Grassland habitat among Study Projects accounts for approximately 1.01% of available grassland habitat within Grassland Study Area, and less than 0.15% of total land area (Table 6).

The proposed Project is anticipated to impact (directly and indirectly) approximately 749 acres of grassland habitat. The actual limits of disturbance to grassland habitat within each of the Study Projects is unknown and impact studies from the Study Projects are not available. Therefore, to estimate cumulative impacts, a conservative approach was employed and assumed that all



grassland habitat within the 187 Study Projects (18,733 acres) would be developed. Even with this conservative assumption, only approximately 1 percent of available grassland habitat within the Grassland Study Area would be impacted.

## 5.0 Discussion

Mortality studies are inherently lacking with specific reference to ground-mounted solar. As such, providing an accurate or reliable estimate of take of listed species for this or other Projects is infeasible and was therefore not conducted. To date, only two studies within North America have been published, both from projects located in the Western United States. From these limited studies, annual avian mortality events are insignificant, ranging from 37,800 to 138,600 individuals (Walston Jr. et al. 2016). These estimates indicate that at the scale of development proposed within the Grassland Study Area, direct impacts to listed species are unlikely to have measurable impact at the population level.

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. It should be noted that the estimates are speculative in nature due in part 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 in this analysis will ultimately be developed.

Based upon the overly conservative assumptions used in this analysis, the analysis estimates that only approximately 1% of grassland habitat within the more than 14.9-million-acre Grassland Study Area would be impacted in the unlikely event that all 187 Study Projects and the proposed Project are ultimately developed. Considering that the amount of grassland habitat which would be impacted within each Study Project accounts for only a portion of area within the proposed project boundaries, this is a highly conservative estimate and the actual impact will be substantially lower

The suite of species identified, and those with the potential to occur, are primarily widely distributed throughout the Grassland Study Area, with recent and multiple records in counties where grassland habitat exists. A review of the literature surrounding these species indicates that while trends are declining state-wide for many grassland birds, these species are also adapting to changing habitat at the landscape scale. Many grassland bird species in fact may benefit from



the conversion of agriculture to more structurally diverse vegetation typically seeded beneath and between solar panels. While the conversion of grassland habitat types to solar development has the potential to impact individuals among these species, population-level impacts are not anticipated from this Project, or cumulatively from the 187 Study projects identified.

## 6.0 References

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## Tables

**Table 1. Summary of Grassland Species with Potential to Occur Within the Project Area.**

Species Name	Federal Status <sup>1</sup>	NYS Status <sup>2</sup>	SGCN Listing <sup>3</sup>	Habitat Preference <sup>4</sup>	Source of Potential Presence <sup>5</sup>	Observed On site
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
Barn Owl ( <i>Tyto alba</i> )	-	-	SGCN-HP	This species prefers open habitats which include grasslands, marshes, brushy fields, and agriculture. They typically nest in tree cavities, caves, but often in human structures. Suitable habitat for this species occurs within the Project Area.	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
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
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
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
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
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
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

Species Name	Federal Status <sup>1</sup>	NYS Status <sup>2</sup>	SGCN Listing <sup>3</sup>	Habitat Preference <sup>4</sup>	Source of Potential Presence <sup>5</sup>	Observed On site
Ring-necked Pheasant ( <i>Phasianus colchicus</i> )	-	-	-	This species prefers agricultural land and old fields, especially fields that are interspersed with grass ditches, hedges, marshes, woodland borders, and brushy groves. Pheasant may also be found in pasture/hay, particularly alfalfa. Suitable habitat for this species occurs within the Project Area.	E, G	No
Savannah Sparrow ( <i>Passerculus sandwichensis</i> )	-	-	-	The species prefers patches of bare ground or short vegetation interspersed among taller dense grasses, pastures, hayfields, native prairies, the grassy edges of marshes, and reclaimed strip mines. Suitable habitat for this species occurs within the Project Area.	A, C, D, F	Yes
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
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
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>Pooecetes 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

1 'Federal Status' refers to the species listing as federally endangered (END) OR threatened (THR).

2 'NYS Status' refers to the species listing as a state-listed endangered (END), threatened (THR), or species of special concern (SSC).

3 'SGCN Listing' refers to is the species state listed as a Species of Greatest Conservation Need – High Priority (SGCN-HP), Species of Greatest Conservation Need (SGCN), or a Species of Potential Conservation Need (SPCN).

4 References for habitat preference were Audubon.org, Allaboutbirds.org, and NYSDEC SWAP

5 "Source of Potential Presence" refers to the source of information indication the potential presence of the species at the Project Area:

A: Species identified by NYNHP as occurring within 10 miles of the Project Area

B: Species identified by USFWS online database (IPaC)

C: Species 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



**Table 2. Grassland Bird Species Occurrence Records for Study Project Counties (A-N)**

Species	Last Year Observed in County <sup>4</sup>											
	Albany	Chenango	Columbia	Delaware	Dutchess	Essex	Fulton	Greene	Herkimer	Lewis	Madison	Montgomery
American Kestrel <sup>1</sup>	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Bald Eagle <sup>1</sup>	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Bobolink <sup>1</sup>	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Common Barn Owl <sup>2</sup>	1975		1983	2002	1976			1986	1964			
Eastern Meadowlark <sup>1</sup>	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Golden-winged Warbler <sup>2</sup>	2019	2019	2019	2016	2019	2019	2000-2005	2009	2015	2018	2016	2000-2005
Grasshopper Sparrow <sup>1</sup>	2018	2016	2019	2019	2019	2014	2017	2018	2019	2017	2019	2016
Henslow's Sparrow <sup>2</sup>	2017	2000		2014					2010			2011
Horned Lark <sup>1</sup>	2019	2019	2019	2019	2019	2019	2018	2019	2019	2019	2019	2019
Northern Harrier <sup>1</sup>	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Prairie Warbler <sup>1</sup>	2019	2019	2019	2019	2019	2019	2018	2019	2018	2014	2019	2019
Ring-necked Pheasant <sup>1</sup>	2019	2019	2019	2019	2019	2019	2018	2018	2019	2017	2019	2019
Savannah Sparrow <sup>1</sup>	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Sedge Wren <sup>2</sup>	1991				2001	2008	2001	1982	2000-2005	2000-2005		2000-2005
Short-eared Owl <sup>1</sup>	2018	2003	2019	2012	2017	2019	2014	2019	2017	2018	2019	2019
Upland Sandpiper <sup>2</sup>	2016		2010	2016	1983	2019	2012	2014	2001	2017	2013	2019
Vesper Sparrow <sup>1</sup>	2019	2019	2019	2019	2019	2019	2019	2018	2019	2008	2019	2018



**Table 3. Grassland Species Occurrence Records for Study Project Counties (O-Z)**

Species	Last Year Observed in County <sup>4</sup>												
	Oneida	Onondaga	Orange	Otsego	Putnam	Rensselaer	Saratoga	Schenectady	Schoharie	Sullivan	Ulster	Warren	Washington
American Kestrel <sup>1</sup>	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Bald Eagle <sup>1</sup>	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Bobolink <sup>1</sup>	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Common Barn Owl <sup>2</sup>		1971	2015	2000-2005					2010	2008	2018	2018	
Eastern Meadowlark <sup>1</sup>	2019	2019	2019	2019	2011	2019	2019	2019	2019	2019	2019	2019	2019
Golden-winged Warbler <sup>2</sup>	2019	2019	2019	2000-2005		1984	2019	2019	2015	2018	2019	2017	2000-2005
Grasshopper Sparrow <sup>1</sup>	2019	2019	2019	2018	2016	2019	2019	2017	2019	2015	2019	2019	2019
Henslow's Sparrow <sup>2</sup>		2017	1993	2007			1998		2008		2018		2008
Horned Lark <sup>1</sup>	2019	2019	2019	2019	2018	2019	2019	2019	2019	2019	2019	2019	2019
Northern Harrier <sup>1</sup>	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Prairie Warbler <sup>1</sup>	2019	2018	2019	2019	2019	2019	2019	2019	2019	2019	2019	2017	2019
Ring-necked Pheasant <sup>1</sup>	2019	2018	2019	2019	2019	2019	2019	2018	2018	2019	2019	2010	2019
Savannah Sparrow <sup>1</sup>	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Sedge Wren <sup>2</sup>		2019	2011				1997		2008	2002	2006		2019
Short-eared Owl <sup>1</sup>	2018	2018	2019		2017	2018	2018	2019	2007	2012	2019		2019
Upland Sandpiper <sup>2</sup>	2019	2014	2018	2015			2014	2018	2014	2008	2019		2019
Vesper Sparrow <sup>1</sup>	2019	2019	2019	2016	2018	2019	2019	2018	2010	2019	2019	2019	2019

1 Most recent record from eBird database

2 Most recent record taken from either NYNHP or eBird

3 Most recent record from NYNHP

4 A date range of 2000-2005 indicates data retrieved from NY BBA



**Table 4. Summary of Study Projects Evaluated**

NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
2018154	Coeymans Solar Farm	Hecate Energy	Coeymans	Albany	4	40	426.77	Proposed	Kleinfelder
20181201	Proposed solar arrays at 275 Beaver Dam Road, Selkirk		Bethlehem	Albany	4	0	181.65	Proposed	
201857	Sunset Hill Solar, LLC	Cypress Creek Renewables, LLC	Coeymans	Albany	4	20	172.00	Proposed	Borrego Solar Systems, Inc.
2018128	Delvecchio Solar, LLC		Westerlo	Albany	4	0	153.03	Proposed	TRC
2017888	100 Miller Road Solar Project	Dynamic Energy	Guilderland	Albany	4	0	141.69	Proposed	Ingalls & Associates, LLP
2017489	Shepards Park Solar Utility Westerlo, NY	Borrego Solar Systems Inc	Westerlo	Albany	4	0	123.27	Proposed	TRC
2016357	Albany Solar Farm, Berne-Altamont Road		Guilderland, Knox	Albany	4	0	91.85	Proposed	Tetra Tech
2014697	Solar Photovoltaic Solar System, Bridge Street		Bethlehem	Albany	4	0	81.79	Constructed	Ingalls & Associates, LLP
20161148	Bozenkill Solar		Knox	Albany	4	0	66.40	Proposed	Borrego Solar Systems, Inc.
20181387	Dunnsville Road Solar Farm	Ingalls Associates	Guilderland	Albany	4	0	65.00	Proposed	C&S Engineers
20181199	Proposed solar array at 1080 Township Road, Altamont		Knox	Albany	4	0	62.97	Proposed	C&S COMPANIES
2017198	Proposed Selkirk Solar Farm Project, Bridge Street (Route 396)	NextEra Energy Resources, LLC	Bethlehem	Albany	4	0	60.33	Constructed	
			Bethlehem	Albany	4	0	50.59	Constructed	Borrego Solar Systems, Inc.
	Switzkill Solar/ Berne Solar		Berne	Albany	4	0	45.94	Proposed	OneEnergy Renewables
20171489	Quay Road Solar		Knox	Albany	4	0	43.26	Proposed	LaBella Associates, D.P.C.



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
2017762	Bethlehem CSD - LaGrange solar project	Forefront Power	Bethlehem, New Scotland	Albany	4	0	33.53	Proposed	Borrego Solar Systems, Inc.
20171502	Coeymans Solar		Coeymans	Albany	4	0	24.59	Proposed	Cypress Creek Renewables
20181036	Solar array at 115 Orchard Hill Road		New Scotland	Albany	4	0	24.33	Proposed	Borrego Solar Systems, Inc.
20171559	Evans Property		Norwich	Chenango	7	0	96.27	Proposed	LaBella Associates
2018602	Hecate Columbia Solar Facility	Hecate Energy	Copake, Hillsdale	Columbia	4	0	656.26	Proposed	TRC
20181298	Claverack Community Solar Project	Eden Renewables	Claverack	Columbia	4	0	233.77	Proposed	The Environmental Design Partnership, LLP
20161331	Proposed Hidden Meadow Solar project		Livingston	Columbia	4	0	122.11	Proposed	Tetra Tech
	ELP Greenport Solar	ELP Greenport Solar LLC	Greenport	Columbia	4	8	115.98	Proposed	Borrego Solar Systems, Inc.
201893	Beauden Solar, LLC		Clermont	Columbia	4	0	33.94	Proposed	Cypress Creek Renewables
20161122	Scudderhook Solar, LLC Solar Site, 1 John Bay Road	Cypress Creek Renewables	Livingston	Columbia	4	0	30.51	Proposed	OneEnergy Renewables
20161058	Construction of 12-acre solar electric system, 1330A County Route 19		Livingston	Columbia	4	0	27.42	Proposed	
2016745	Davenport Solar Array	Delaware River Solar	Davenport	Delaware	4	0	48.47	Proposed	The Chazen Companies
2017998	Mt. Alvernia Solar		Poughkeepsie	Dutchess	3	0	169.48	Proposed	LRC Group
2017301	Solar project, Seaman Road		East Fishkill	Dutchess	3	0	125.21	Proposed	East Light Partners
2018212	Athanas West Photovoltaic Plant	Gillespie & Stokosa, PLLC	Hyde Park	Dutchess	3	0	118.82	Proposed	Ecological Solutions, LLC
			East Fishkill	Dutchess	3	0	105.00	Proposed	Ecological Solutions, LLC



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
2018211	Athanas East	Gillespie & Stokosa, PLLC	Hyde Park	Dutchess	3	0	83.33	Proposed	Ecological Solutions, LLC
2017211	Underhill Solar	Cypress Creek Renewables LLC	Poughkeepsie	Dutchess	3	0	64.54	Proposed	LRC Group
2018213	129 & 133 Cream Street	Gillespie & Stokosa, PLLC	Hyde Park	Dutchess	3	0	61.67	Proposed	The Chazen Companies
20161175	Cricket Hill Solar, LLC Site (Cypress Creek Renewables)		Dover	Dutchess	3	0	60.29	Proposed	The Chazen Companies
2018257	27 Rombout Rd, Poughkeepsie Solar		La Grange	Dutchess	3	0	59.61	Proposed	YSG Solar
20161320	Brittany Hollow Solar project		Red Hook, Rhinebeck	Dutchess	3	0	49.95	Proposed	LAM Development
2017367	Nexamp Solar, Wappinger (Chazen Job #51711)	Nexamp Solar Energy Solutions	Wappinger	Dutchess	3	0	48.90	Proposed	OneEnergy Renewables
20161348	Arlington School Delineation and Survey	Tetra Tech, Inc.	Union Vale	Dutchess	3	0	44.89	Proposed	Borrego Solar Systems, Inc.
2015295	SolarCity-Oakwood Friends School project, 22 Spackenkill Road		Poughkeepsie	Dutchess	3	0	44.48	Constructed	TRC
201716	East Fishkill Solar	East Fishkill Solar LLC	East Fishkill	Dutchess	3	0	24.16	Proposed	ERM
2017360	108 Cardinal Road		Hyde Park	Dutchess	3	0	24.08	Proposed	
20171357	Cream Street Solar	NexAmp	Hyde Park	Dutchess	3	0	23.97	Proposed	Borrego Solar Systems, Inc.
2018194	Cary Institute Solar Farm, 2801 Sharon Turnpike		Washington	Dutchess	3	0	22.96	Proposed	LAM Development
20181239	Charboneau Solar, LLC	Charboneau Solar, LLC	Ticonderoga	Essex	5	0	199.76	Proposed	Cypress Creek Renewables
2017492	529 Old Chilson Road Solar Utility		Ticonderoga	Essex	5	0	93.99	Proposed	Cypress Creek Renewables
2018133	Avalon Solar, LLC		Moriah	Essex	5	0	78.31	Proposed	Borrego Solar Systems, Inc.



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
2016148	Solar field at 143 County Route 142A		Johnstown	Fulton	5	0	112.22	Constructed	Borrego Solar Systems, Inc.
2018853	Solar arrays at 1639 NY Route 29, Gloversville		Mayfield	Fulton	5	0	104.58	Proposed	Tetra Tech, Inc.
2018851	Solar arrays at 616 County Highway 107		Johnstown	Fulton	5	0	92.47	Proposed	Trident Environmental
2016145	Solar field at 560 Route 29		Broadalbin	Fulton	5	0	87.12	Constructed	Trident Environmental
2018287	State Street, Johnstown Solar Project	Borrego Solar Systems Inc	Johnstown	Fulton	5	0	47.55	Proposed	Borrego Solar Systems, Inc.
20151277	Solar energy development, Perth		Perth	Fulton	5	0	47.55	Constructed	Miller Bros.
20151276F	SoCore NY Development LLC Potential Solar Array, 2461 Route 67, Johnstown		Johnstown	Fulton	5	0	40.82	Proposed	TRC
20161083	Solar Project - Elmwood Ave Ext	PV Envineers PC	Johnstown	Fulton	5	0	33.26	Constructed	Borrego Solar Systems, Inc.
20161126	Ground-mounted solar system, 231 State Highway 331, St. Johnsville		Oppenheim	Fulton	5	0	21.02	Proposed	Borrego Solar Systems, Inc.
20161657	Oppenheim South Solar Facility	Borrego Solar Systems Inc	Oppenheim	Fulton	5	0	20.32	Proposed	Borrego Solar Systems, Inc.
20151033	Proposed 19th Hole solar energy development		Johnstown, Mohawk	Fulton, Montgomery	45	0	203.63	Constructed	Tetra Tech, Inc.
2018867	Flint Mine Solar	Hudson Energy Development, LLC	Athens, Coxsackie	Greene	4	100	1622.80	Proposed	
	Vandenburgh Solar	PDM Consulting	Coxsackie	Greene	4	20	142.05	Proposed	Bergmann Associates
	Inglaside Solar	Cypress Creek Renewables	Greenville	Greene	4	0	127.87	Proposed	TRC
			Cairo	Greene	4	0	126.58	Constructed	TRC



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
	CR 51 and 26 Solar	PDM Consulting	New Baltimore	Greene	4	20	91.16	Proposed	Freepoint Solar LLC
2018970	Grandview Solar	Cypress Creek Renewables	Cairo	Greene	4	0	88.18	Proposed	TRC
2018127	Xavier Solar, LLC		Coxsackie	Greene	4	0	74.19	Proposed	Environmental Design & Research
2018652	Coxsackie Solar	Freepoint Solar LLC	Coxsackie	Greene	4	5	67.80	Proposed	Borrego Solar Systems, Inc.
2017302	Solar project, 665 Platte Cove Road		Hunter	Greene	4	0	67.47	Proposed	Cypress Creek Renewables
20161572	Aspasia Solar, LLC	Cypress Creek Renewables (CCR)	Athens	Greene	4	0	43.42	Proposed	CAIRO PLANNING BOARD
2018814	Potic Road Solar, LLC	Freepoint Solar, LLC	Athens	Greene	4	0	40.75	Proposed	
20161405	Freehold Solar, LLC Site - Installation of ground-mounted solar system on portion of site at 9775-9873 State Route 32	Cypress Creek Renewables	Greenville	Greene	4	0	32.01	Proposed	
2018308	Cairo Solar Site Project	Clean Energy Collective	Cairo	Greene	4	0	30.25	Proposed	
20161154	Sugar Maple Solar		Russia	Herkimer	6	0	160.46	Proposed	OneEnergy Renewables
2018877	Solitude Solar -- Turin -- solar development project at 5047 East Road (Project No. 18.8363)		Turin	Lewis	6	0	148.31	Proposed	
2018874	Solitude Solar -- Croghan -- solar development project at 6985 Belfort Road (Project No. 18.8358)		Croghan	Lewis	6	0	80.93	Proposed	C.T. Male Associates
			Martinsburg	Lewis	6	0	58.92	Proposed	C.T. Male Associates



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
	Lenox Solar Array	Town of Lenox	Lenox	Madison	7	0	151.52	Proposed	Shumaker Consulting Engineering & Land Surveying, D.P.C.
	Helios-Lenox Solar Project	Helios Energy LLC, Solarpark Energy LLC	Lenox	Madison	7	0	79.88	Proposed	
2015625	Twin Lantern Solar Partners LLC & Global Resource Options Inc. (groSolar) solar site		Oneida	Madison	7	0	35.12	Proposed	
20181475	Mohawk Solar	Avangrid Renewables	Canajoharie, Minden	Montgomery	4	90	4573.80	Proposed	Stantec Consulting Services, Inc.
2018569	High River Energy Center	NextEra Energy Resources, LLC	Florida	Montgomery	4	100	1113.22	Proposed	
	Tabletop Solar	SED NY Holdings, LLC	Paletine	Montgomery	4	25	569.00	Proposed	EDR
2017873	OYA Amsterdam Utility-Scale Solar Project	OYA Solar NY LP	Amsterdam	Montgomery	4	0	476.09	Constructed	VHB
2018615	Tayandenega Solar	Cypress Creek Renewables, LLC	St. Johnsville	Montgomery	4	0	248.00	Proposed	
20181202	Proposed solar arrays at 142 Park Drive, Fultonville		Glen	Montgomery	4	0	213.39	Proposed	LRC Group
2018485	Double Lock Solar, LLC	Cypress Creek Renewables, LLC	Minden	Montgomery	4	0	155.37	Proposed	TRC
	Fox Solar	Lightsource BP	St. Johnsville	Montgomery	4	5	142.20	Proposed	
	Nellis Solar	Lightsource BP	Palatine	Montgomery	4	5	122.15	Proposed	Borrego Solar Systems, Inc.
20161146	Leatherstocking Solar		Glen	Montgomery	4	0	77.94	Proposed	Trident Environmental
			Florida	Montgomery	4	0	64.55	Constructed	Borrego Solar Systems, Inc.



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
20161311	Construction of solar electric system at East Main Street (Route 5), Palatine Bridge		Palatine	Montgomery	4	0	54.46	Proposed	OneEnergy Renewables
20181412	Palatine - Caswell Road Solar	NexAmp	Palatine	Montgomery	4	0	43.23	Proposed	Borrego Solar Systems, Inc.
2016146	Solar field at 157 Seebers Lane	Trident Environmental	Canajoharie	Montgomery	4	0	23.61	Proposed	
20161082	Solar project, Log City Road		Amsterdam	Montgomery	4	0	22.08	Proposed	
20181119	Oneida County Solar Project		Verona	Oneida	6	0	13604.20	Proposed	Shumaker Consulting Engineering & Land Surveying, D.P.C.
	Oneida Sutliff West and Sutliff South Solar Project	Oneida DG Solar LLC	Whitestown	Oneida	6	0	196.52	Constructed	Shumaker Consulting Engineering & Land Surveying, D.P.C.
2015485	Revere Copper Products Site and MVCC Site Solar Projects, Old Oneida Road	Twin Solar Partners LLC and Mohawk Valley Solar Partners LLC	Rome	Oneida	6	0	78.66	Constructed	
2014574	Tannery Road Solar Project	Tannery Road Solar LLC	Rome	Oneida	6	0	70.85	Constructed	
2014179	Proposed construction of a ground-mounted solar photovoltaic system on 20-25 acres		Whitestown	Oneida	6	0	69.90	Proposed	Shumaker Consulting Engineering & Land Surveying, D.P.C.
2014575	Rome Steel Solar Project at 530 Henry Street		Rome	Oneida	6	0	51.70	Proposed	
			Camden	Oneida	6	0	51.65	Constructed	Shumaker Consulting Engineering &



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
									Land Surveying, D.P.C.
2014946	City of Rome Lamphear Road Solar Project	Rome Steel Solar, LLC	Rome	Oneida	6	0	42.79	Constructed	Borrego Solar Systems, Inc.
			Whitestown	Oneida	6	0	27.16	Constructed	Invenergy
20181045	Sky High Solar, LLC	Cypress Creek Renewables, LLC	Tully	Onondaga	7	0	274.92	Proposed	LRC Group
20161214	Carley Farm Solar, LLC Site (Cypress Creek Renewables)		La Fayette	Onondaga	7	0	82.63	Proposed	TRC
2016643	Potter Solar Project	SolarCity	Tully	Onondaga	7	0	54.10	Proposed	TRC
	Dewitt Landfill Solar Project	RER Energy Group LLC	Dewitt	Onondaga	7	0	48.54	Proposed	
2015196	SolarCity-Onondaga County Jamesville project at 6660 E. Seneca Turnpike		De Witt	Onondaga	7	0	22.27	Constructed	TRC
2017187	Proposed solar arrays, 51 Muktananga Marg		Montgomery	Orange	3	0	293.11	Proposed	TRC
2018628	East Walden Solar (EDR No. 18037)		Montgomery	Orange	3	0	242.06	Proposed	TRC
20161176	Fogarty Solar, LLC Site (Cypress Creek Renewables)		Walkkill	Orange	3	0	165.34	Proposed	TRC
20161679	Dubois Solar, LLC Site - ground-mounted solar system at 2208 NY State Route 52	Cypress Creek Renewables	Crawford	Orange	3	0	126.17	Proposed	TRC
2016341	Pierson Farms Solar Array Site, Pierson Hill Road		Mount Hope	Orange	3	0	107.38	Proposed	Alpine Environmental Consultants
20161177	Grabinski Solar Property	Cypress Creek Renewables	Montgomery	Orange	3	0	70.49	Proposed	Borrego Solar Systems, Inc.
20171507	Matrix Solar	Matrix Development LLC	Montgomery	Orange	3	0	59.36	Proposed	PV Engineers, D.P.C.



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
2018204	Proposed solar array south of Route 52, Walden		Montgomery	Orange	3	0	52.75	Proposed	Borrego Solar Systems, Inc.
201861	Svenski Solar, LLC	Cypress Creek Renewables, LLC	Crawford	Orange	3	0	50.54	Proposed	TRC
20181341	Solar array at Montgomery Heights Road		Montgomery	Orange	3	0	47.60	Proposed	Borrego Solar Systems, Inc.
2017207	Solar project, Albany Post Road		Montgomery	Orange	3	0	46.33	Proposed	Borrego Solar Systems, Inc.
20181386	Riley Road Solar Project	Green Street Power Partners	New Windsor	Orange	3	0	43.73	Proposed	Borrego Solar Systems, Inc.
20181421	Solar array at Maybrook Road		Hamptonburgh	Orange	3	0	42.83	Proposed	Borrego Solar Systems, Inc.
2017977	Tarbell Solar LLC		Walkill	Orange	3	0	41.15	Proposed	C.T. Male Associates, P.C.
2017493	84 Lakeside Road Solar Utility		Newburgh	Orange	3	0	28.72	Proposed	Borrego Solar Systems, Inc.
201639	Proposed installation of two (2) ground-mounted photovoltaic solar systems along Crans Mill Road and Route 302		Crawford	Orange	3	0	27.72	Proposed	TRC
2017205	Solar project, 103 Long Lane		Crawford	Orange	3	0	25.27	Proposed	Environmental Design & Research
20171219	Clean Energy Collective; Deerpark B		Deerpark	Orange	3	0	20.11	Proposed	Borrego Solar Systems, Inc.
2016761	Laurens Solar Project	Delaware River Solar	Laurens	Otsego	4	0	75.12	Proposed	TRC
2016188	Otsego County Gravel Pit Solar System	SolarCity	Laurens	Otsego	4	0	24.85	Constructed	The Chazen Companies
20161155	Armstrong Solar, LLC Site, Mooney Hill Road	Cypress Creek Renewables	Kent	Putnam	3	0	41.36	Proposed	
			Patterson	Putnam	3	0	40.43	Constructed	ERM



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
		West Wind Farms	Schaghticoke	Rensselaer	4	0	138.63	Proposed	
20181068	Solar project at 1918 Tamarac Road	Borrego Solar Systems Inc.	Pittstown	Rensselaer	4	0	100.37	Proposed	Shumaker Engineering
20151034	Proposed Buskirk solar energy development		Schaghticoke	Rensselaer	4	0	86.46	Proposed	The Environmental Design Partnership, LLP
			Castleton-on-Hudson	Rensselaer	4	0	74.74	Proposed	
20181081	2 River Solar Farm	Eden Renewables	Schodack	Rensselaer	4	0	51.42	Proposed	Tetra Tech, Inc.
20171501	Knickerbocker Solar		Schodack	Rensselaer	4	0	51.26	Proposed	OneEnergy Renewables
2015830	Proposed solar energy development near the intersection of Highway 67 and Cottrell Road, Hoosick Falls		Hoosick	Rensselaer	4	0	44.20	Proposed	Tetra Tech, Inc.
2015831	Proposed solar energy development, 21950 New York Highway 22, Hoosick Falls	Nextera	Hoosick	Rensselaer	4	0	42.55	Proposed	Tetra Tech, Inc.
20161238	NY Solar Electric development at 138 Brick Church Road	Borrego Solar Systems Inc	Brunswick	Rensselaer	4	6	33.90	Proposed	C&S Eningeers
2016642	Proposed Solar Project ΓÇô Cottontail Solar		Schodack	Rensselaer	4	0	28.94	Proposed	
20141281	Proposed solar energy development		Brunswick	Rensselaer	4	0	28.64	Proposed	Tetra Tech, Inc.
			Pittstown	Rensselaer	4	0	27.03	Constructed	
			Brunswick	Rensselaer	4	0	26.67	Proposed	Borrego Solar Systems, Inc.
20176	Ellsworth Solar, LLC Site - ground-mounted solar	Cypress Creek Renewables, LLC	Halfmoon	Saratoga	5	0	179.34	Proposed	Borrego Solar Systems, Inc.



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
	system at 100 Pruyn Hill Road								
2018288	Grooms Road, Clifton Park Solar Project	PV Engineers PC	Clifton Park	Saratoga	5	0	125.17	Proposed	LA Group
2013439	Skidmore College, Possible Solar Facility		Greenfield	Saratoga	5	0	119.30	Constructed	Cypress Creek Renewables
20171570	Ashdown Road Solar Project	PC Engineers PC	Clifton Park	Saratoga	5	0	92.39	Proposed	TRC
2018402	Crooks Grove Solar, LLC	Crooks Grove Solar, LLC	Greenfield	Saratoga	5	0	90.65	Proposed	OneEnergy Renewables
2018875	Solitude Solar - Sugar Hill Road Community Solar	Solitude Solar LLC	Clifton Park	Saratoga	5	0	42.71	Proposed	Borrego Solar Systems, Inc.
			Corinth	Saratoga	5	0	33.73	Proposed	
20181338	Solar array at 267 Sugar Hill Road		Clifton Park	Saratoga	5	0	32.94	Constructed	C.T. Male Associates
20171589	Solar arrays at 234 Sugar Hill Road		Clifton Park	Saratoga	5	0	25.58	Proposed	Borrego Solar Systems, Inc.
2015608	Proposed Halfmoon Solar Project, 252 Lower Newtown Road		Halfmoon	Saratoga	5	0	20.80	Proposed	Borrego Solar Systems, Inc.
2018508	Oak Hill Solar	New PowerCo Inc. / Eden Renewables	Duanesburg	Schenectady	4	5	204.02	Proposed	Trident Environmental
			Rotterdam	Schenectady	4	0	146.77	Proposed	The Environmental Design Partnership, LLP
2016710	Mariaville Road Solar	RER Energy Group	Princetown	Schenectady	4	0	133.00	Proposed	Pennoni
2018597	5971 Mariaville Road, Princetown Solar Array		Princetown	Schenectady	4	0	123.37	Proposed	Cypress Creek Renewables
2018598	172 Mariaville Scotch Road, Pattersonville Solar Arrays		Duanesburg	Schenectady	4	0	96.93	Proposed	Cypress Creek Renewables



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
2018681	Duanesburg Solar, 10516 Western Turnpike		Duanesburg	Schenectady	4	0	95.25	Proposed	Borrego Solar Systems, Inc.
2016785	Proposed solar farm project, north side of Duanesburg Road (NYS Route 7)		Duanesburg	Schenectady	4	0	81.24	Proposed	Ingalls & Associates, LLP
2018224	Solar array at 5489 Mariaville Road		Princetown	Schenectady	4	0	65.94	Proposed	Borrego Solar Systems, Inc.
2016147	Alexander Road Solar	Onyx Renewable Partners	Duanesburg	Schenectady	4	0	65.00	Constructed	Borrego Solar Systems, Inc.
2018129	Talent Solar, LLC		Duanesburg	Schenectady	4	0	50.06	Proposed	Borrego Solar Systems, Inc.
2018130	Turnbull Solar, LLC		Duanesburg	Schenectady	4	0	49.42	Proposed	Ingalls & Associates, LLP
2016949	Schalmont Central School District Solar Array (SOLR 1615)		Rotterdam	Schenectady	4	0	25.87	Proposed	
20181095	East Point Energy Center	East Point Energy Center, LLC	Sharon	Schoharie	4	80	782.24	Proposed	TRC
2018972	Rock District Solar, LLC	Cypress Creek Renewables, LLC	Carlisle, Seward	Schoharie	4	0	322.29	Proposed	TRC
2018354	Sunny Knoll Solar, LLC	Cypress Creek Renewables, LLC	Schoharie	Schoharie	4	0	300.82	Proposed	TRC
2018535	806 Slate Hill Road, Sharon Solar Project		Sharon	Schoharie	4	0	194.13	Proposed	TRC
2018232	Solar array east of Route 30		Schoharie	Schoharie	4	0	141.33	Proposed	Borrego Solar Systems, Inc.
2018592	916 Highway Route 20, Sharon Solar Arrays		Sharon	Schoharie	4	0	55.16	Proposed	Borrego Solar Systems, Inc.
20171125	Risse Trail, Middleburgh Project		Middleburgh	Schoharie	4	0	31.09	Proposed	Borrego Solar Systems, Inc.
20151276C	SoCore NY Development LLC Potential Solar Array, Cliffside Drive, Middleburgh		Middleburgh	Schoharie	4	0	20.21	Proposed	Borrego Solar Systems, Inc.



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
2016586	Baer Road Solar	Xzerta Energy Group	Delaware	Sullivan	3	0	207.05	Proposed	
	Dunntown & Sugar Gum Solar	Cypress Creek Renewables LLC	Mamakating	Sullivan	3	0	80.76	Proposed	TRC
2016784	Proposed solar farm, Mt. Vernon Road		Mamakating	Sullivan	3	0	76.47	Proposed	TRC
20161695	Kuhl Solar, LLC	Cypress Creek Renewables (CCR)	Mamakating	Sullivan	3	0	67.92	Proposed	The Chazen Companies
20131093	Proposed Solar Array at the Center for Discovery	HelioSage LLC	Thompson	Sullivan	3	0	65.57	Proposed	The Chazen Companies
2016587	Hospital Road Solar	Xzerta Energy Group	Delaware	Sullivan	3	0	61.31	Proposed	Shumaker Consulting Engineering & Land Surveying, D.P.C.
			Fallsburg	Sullivan	3	0	50.10	Proposed	The Chazen Companies
2016614	Proposed large-scale groundmount solar farm, Mt Vernon Road		Mamakating	Sullivan	3	0	45.39	Proposed	The Chazen Companies
			Liberty	Sullivan	3	0	44.39	Constructed	BlueWave
2017565	Wood Oak Drive Photovoltaic Plant	Delaware River Solar	Tusten	Sullivan	3	0	29.69	Proposed	BlueWave
20161006	Cochecton Solar Array	Delaware River Solar	Cochecton	Sullivan	3	0	25.72	Proposed	
20161103	Installation of large-scale ground-mount solar farm, Phillipsport Road		Mamakating	Sullivan	3	0	23.56	Proposed	BlueWave
20161121	Saint Ives Solar, LLC Site, 35 Birch Street	Cypress Creek Renewables	Fallsburg	Sullivan	3	0	20.26	Proposed	
20171098	Landau Solar, LLC		Ulster	Ulster	3	0	347.50	Proposed	ECS Mid-Atlantic, LLC
20171587	Blue Stone Solar Project		Saugerties	Ulster	3	0	158.60	Proposed	TRC
			Denning	Ulster	3	0	149.44	Proposed	TRC



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
2017612	New Beginnings Solar, LLC Site at 2585 US-209	Cypress Creek Renewables, LLC	Hurley, Marbletown	Ulster	3	0	125.31	Proposed	TRC
20161303	Kaaterskill Solar Facility, 2007-2073 Old Kings Highway		Saugerties	Ulster	3	0	122.18	Proposed	TRC
20161179	Kamback Solar, LLC Site (Cypress Creek Renewables)		Wawarsing	Ulster	3	0	96.24	Proposed	TRC
20161632	Dejager Solar, LLC Site - ground-mounted solar system at 1781-2897 Lucas Turnpike		Rochester	Ulster	3	0	93.24	Proposed	TRC Environmental Corporation
20161101	Installation of ground-mounted solar system on ~25 acres of Rondout Creek Solar, LLC Site, 12 Pompey's Cave Road	Cypress Creek Renewables	Rochester	Ulster	3	0	80.93	Proposed	The Chazen Companies
2017206	Solar project, 60 Armato Lane		Gardiner	Ulster	3	0	76.66	Proposed	Borrego Solar Systems, Inc.
20161181	Reisender Solar, LLC Site	Cypress Creek Renewables	Wawarsing	Ulster	3	0	76.24	Proposed	Borrego Solar Systems, Inc.
2017491	Meckler Road Solar Utility Wawarsing, NY		Wawarsing	Ulster	3	0	72.93	Proposed	Cypress Creek Renewables
20161410	Windgate Solar, LLC Site - Installation of ground-mounted solar system at 3809-3813 Route 9W	Cypress Creek Renewables	Lloyd	Ulster	3	0	70.17	Proposed	
20161106	Yin Solar, LLC Site, Albany Post Road	Cypress Creek Renewables	Gardiner	Ulster	3	0	59.13	Proposed	Cypress Creek Renewables
20171506	Matrix Development ΓÇô Malden		Saugerties	Ulster	3	0	56.75	Proposed	ERM



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
20161587	Burnt Meadows Solar, LLC Site - installation of ground-mounted solar system at 321 Burnt Meadow Road	Cypress Creek Renewables	Gardiner	Ulster	3	0	51.84	Proposed	C.T. Male Associates, P.C.
20161387	Installation of ground-mounted Photovoltaic (PV) solar system located on the north side of Sawkill Road, immediately east of Hallihans Hill Road		Kingston	Ulster	3	0	46.94	Proposed	Borrego Solar Systems, Inc.
201892	Andoom Solar, LLC		Shawangunk	Ulster	3	0	46.68	Proposed	Borrego Solar Systems, Inc.
			Wawarsing	Ulster	3	0	42.63	Proposed	TRC
2018100	Sarafain Solar, LLC		New Paltz	Ulster	3	0	31.44	Proposed	TRC
2017469	Solar Array, North of Route 209		Rochester	Ulster	3	0	30.28	Proposed	Tetra Tech
2017470	Solar Array, Off Airport Road		Rochester	Ulster	3	0	24.82	Proposed	
2016591	Woodstock WWTP Solar Panel Installation		Woodstock	Ulster	3	0	24.25	Proposed	Geronimo Energy
20181406	CES Marbletown Solar	Con Edison Solutions	Marbletown	Ulster	3	0	23.24	Proposed	Cypress Creek Renewables
2015585	Proposed installation of 2 ground-mounted solar photovoltaic arrays at 721-723 Upper Sherman Road		Queensbury	Warren	5	0	49.96	Proposed	C.T. Male Associates, P.C.
2017415	groSolar Garnet Solar Partners ΓÇô Proposed Solar Development (C.T. Male Project No. 15.5725)		Johnsburg	Warren	5	0	34.77	Constructed	SolarCity
20181324	Argyle Solar	Eden Renewables	Argyle	Washington	5	0	230.18	Proposed	



NHP Project Number	Project Name	Applicant	Municipality	County	DEC Region	MW	Acres	Status	NHP Requesting Agent
20181460	Solar array at 2131 Route 40, Village of Greenwich		Easton	Washington	5	0	105.56	Proposed	Borrego Solar Systems, Inc.
20171496	Greenwich Solar		Greenwich	Washington	5	0	100.61	Proposed	Cypress Creek Renewables
2014987	Great Valley Solar		Easton	Washington	5	0	83.47	Proposed	The Environmental Design Partnership, LLP
2018401	McCaw Solar, LLC		Fort Edward	Washington	5	0	73.93	Proposed	TRC
20161034	Buckley Road Solar Facility	PV Engineers PC	Whitehall	Washington	5	0	61.57	Constructed	Cypress Creek Renewables
20181184	Aviator Way Solar	Cypress Creek Renewables, LLC	Kingsbury	Washington	5	0	56.79	Proposed	OneEnergy Renewables
			Whitehall	Washington	5	0	36.88	Constructed	C&S COMPANIES
20151276B	SoCore NY Development LLC Potential Solar Array, 221 Geer Road, Hudson Falls		Kingsbury	Washington	5	0	27.54	Proposed	Borrego Solar Systems, Inc.

**Table 5. NLCD Land Cover Data for Project Area and relative to Grassland Study Area**

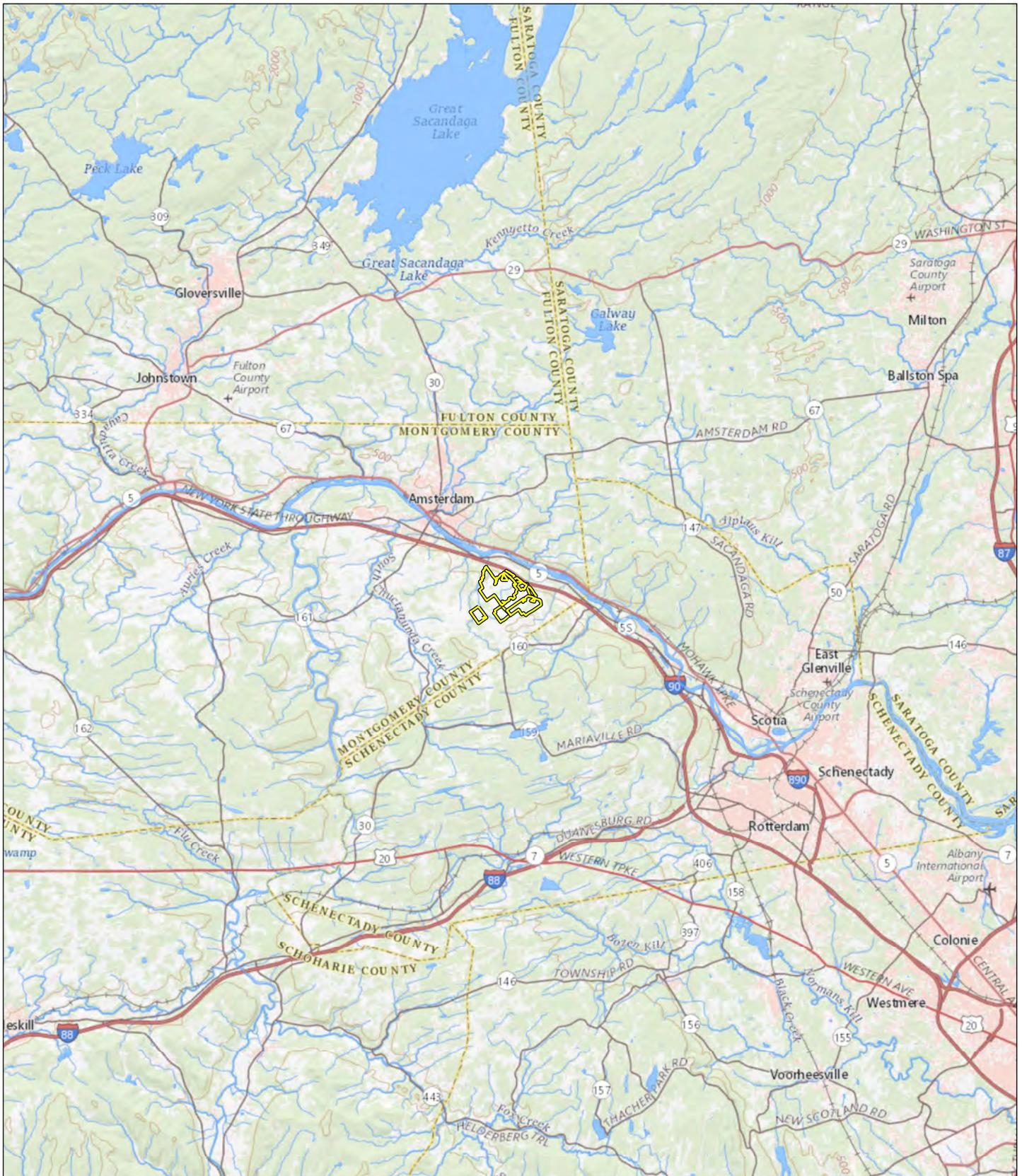
NLCD Land Cover Class	Project Area	Grassland Study Area	Relative Percent of Project Area to GSA <sup>1</sup>
Open Water	0.22	464,598	0.00005
Developed, Open Space	28.80	615,947	0.00467
Developed, Low Intensity	4.66	236,219	0.00197
Developed, Medium Intensity	0.92	102,004	0.00090
Developed, High Intensity	0.00	35,840	0.00000
Barren Land (Rock/Sand/Clay)	0.63	32,095	0.00197
Deciduous Forest	53.73	6,170,733	0.00087
Evergreen Forest	43.97	1,718,036	0.00256
Mixed Forest	168.14	2,028,979	0.00829
Shrub/Scrub	5.76	108,469	0.00531
Grassland/Herbaceous	73.14	119,535	0.06118
Hay/Pasture	675.87	1,728,235	0.03911
Cultivated Crops	157.38	457,937	0.03437
Woody Wetlands	2.67	1,017,222	0.00026
Emergent Herbaceous Wetlands	5.11	88,176	0.00580
<b>Grand Total</b>	<b>1220.99</b>	<b>14,924,026</b>	<b>0.00818</b>

1 Overall contribution of Project Area acres to habitat class within the Grassland Study Area

**Table 6. Percent of Grassland Habitat Among Study Projects Relative to Proposed Project and Available Habitat Within Grassland Study Area**

Area Evaluated	Acres of Grassland Habitat	Total Acres	Percent of Grassland Study Area - Grassland Habitat	Percent of Grassland Study Area - Total Acres
Project Area	749.01	1220.99	0.04%	0.01%
Study Projects	18,733.00	41,093.21	1.01%	0.13%
Grassland Study Area	1,847,770.45	14,924,026.45	N/A	12.38%

## Figures



 Project Area



Base Map: USGS National Map, 2018

**MAP LOCATION**

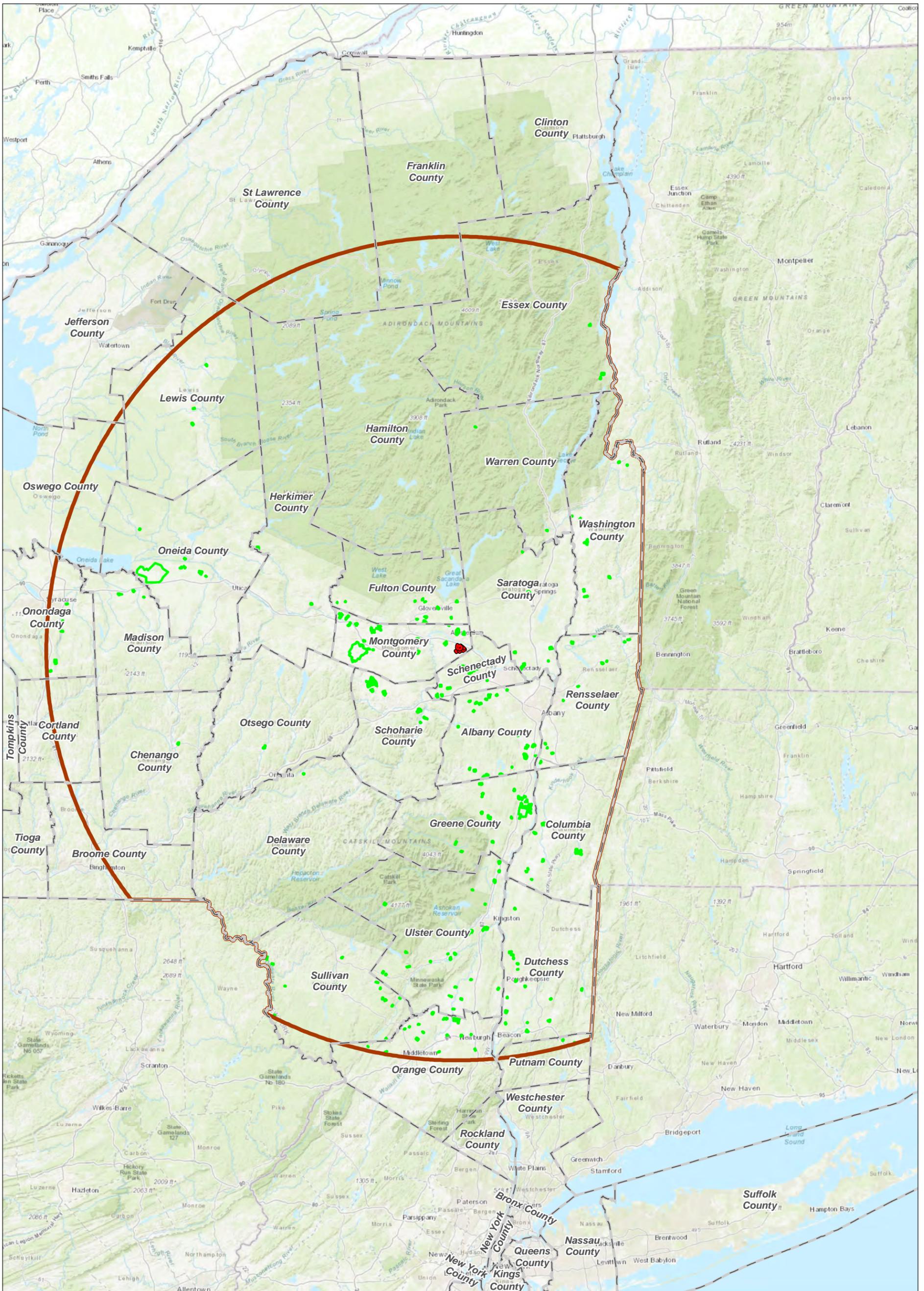


**REGIONAL PROJECT LOCATION**  
**HIGH RIVER**  
**ENERGY CENTER, LLC**  
**TOWN OF FLORIDA, NY**

FIGURE 1

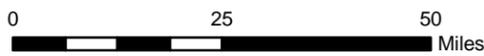
NOVEMBER 2018

Map Produced by 



- Project Area
- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



**MAP LOCATION**

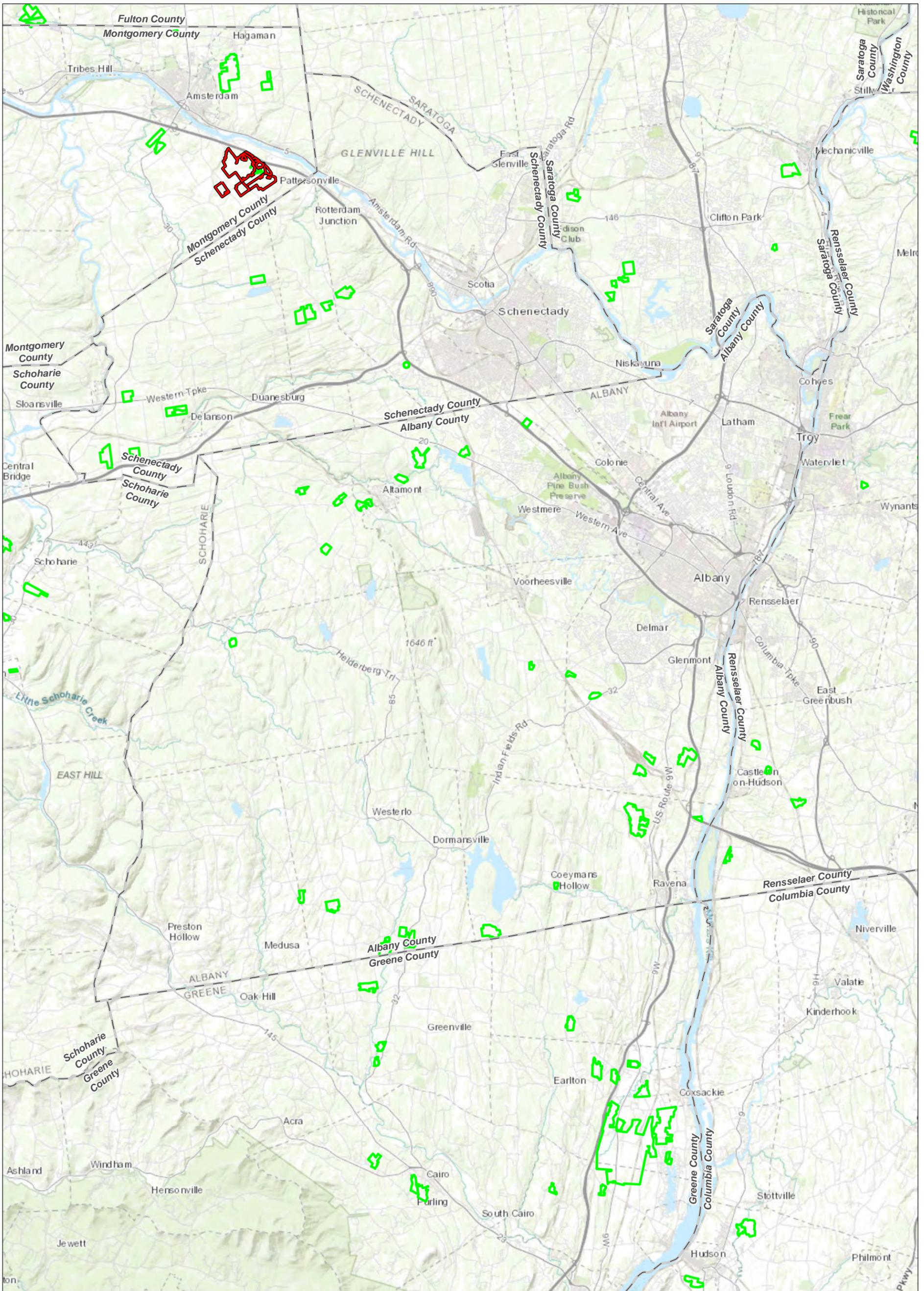


**REGIONAL PROJECT LOCATION**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2

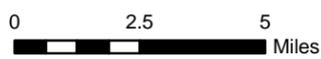
AUGUST 2019

Map Produced by TRC



- Project Area
- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



**MAP LOCATION**

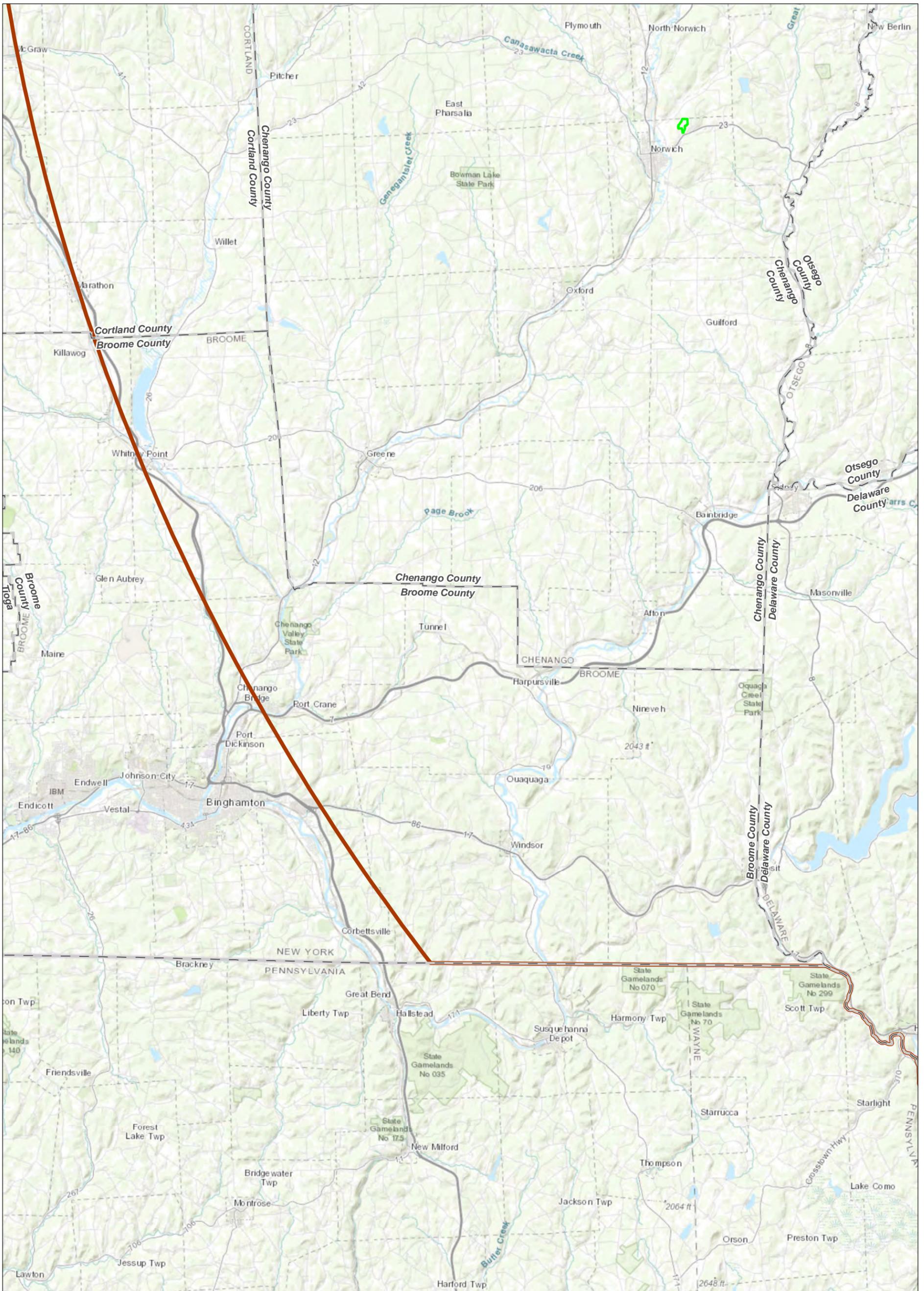


**GRASSLAND STUDY AREA  
ALBANY COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2

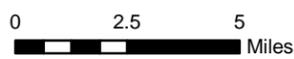
AUGUST 2019

Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



**MAP LOCATION**

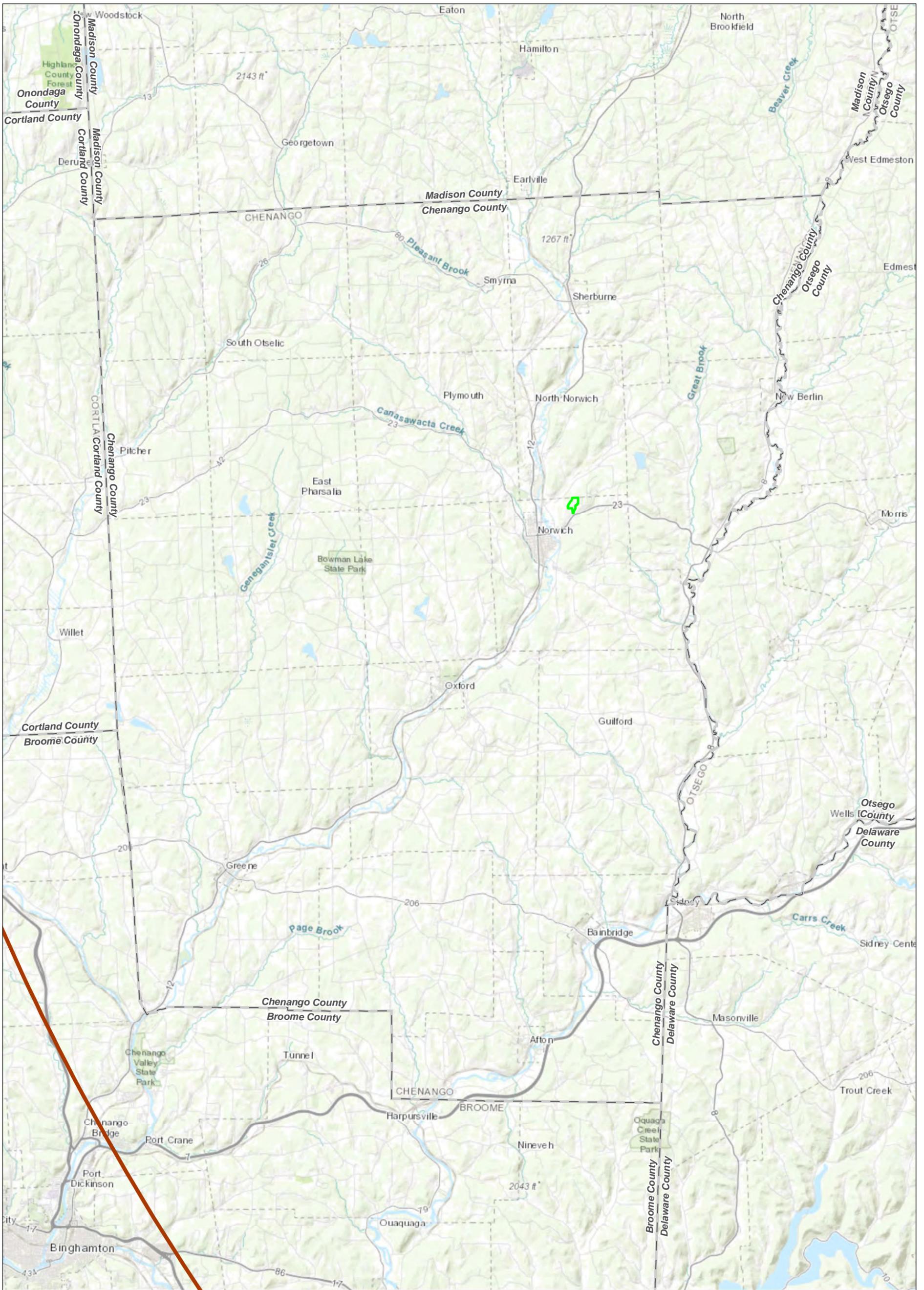


**GRASSLAND STUDY AREA  
BROOME COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2

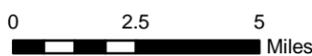
AUGUST 2019

Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



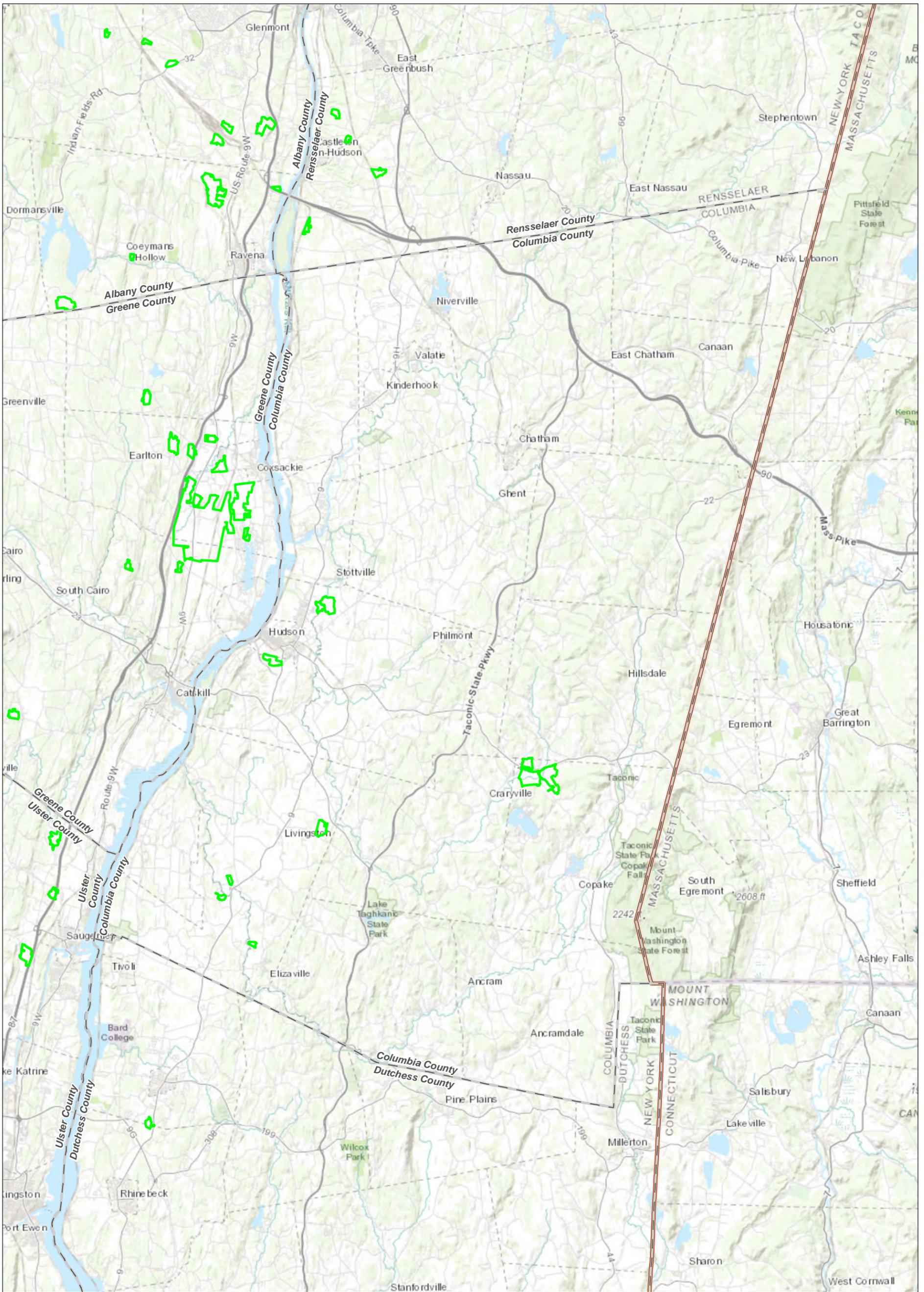
**MAP LOCATION**



**GRASSLAND STUDY AREA  
CHENANGO COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

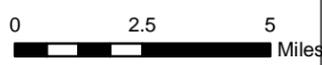
FIGURE 2      AUGUST 2019

Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



**MAP LOCATION**



**GRASSLAND STUDY AREA  
COLUMBIA COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

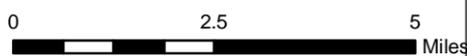
FIGURE 2 AUGUST 2019

Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



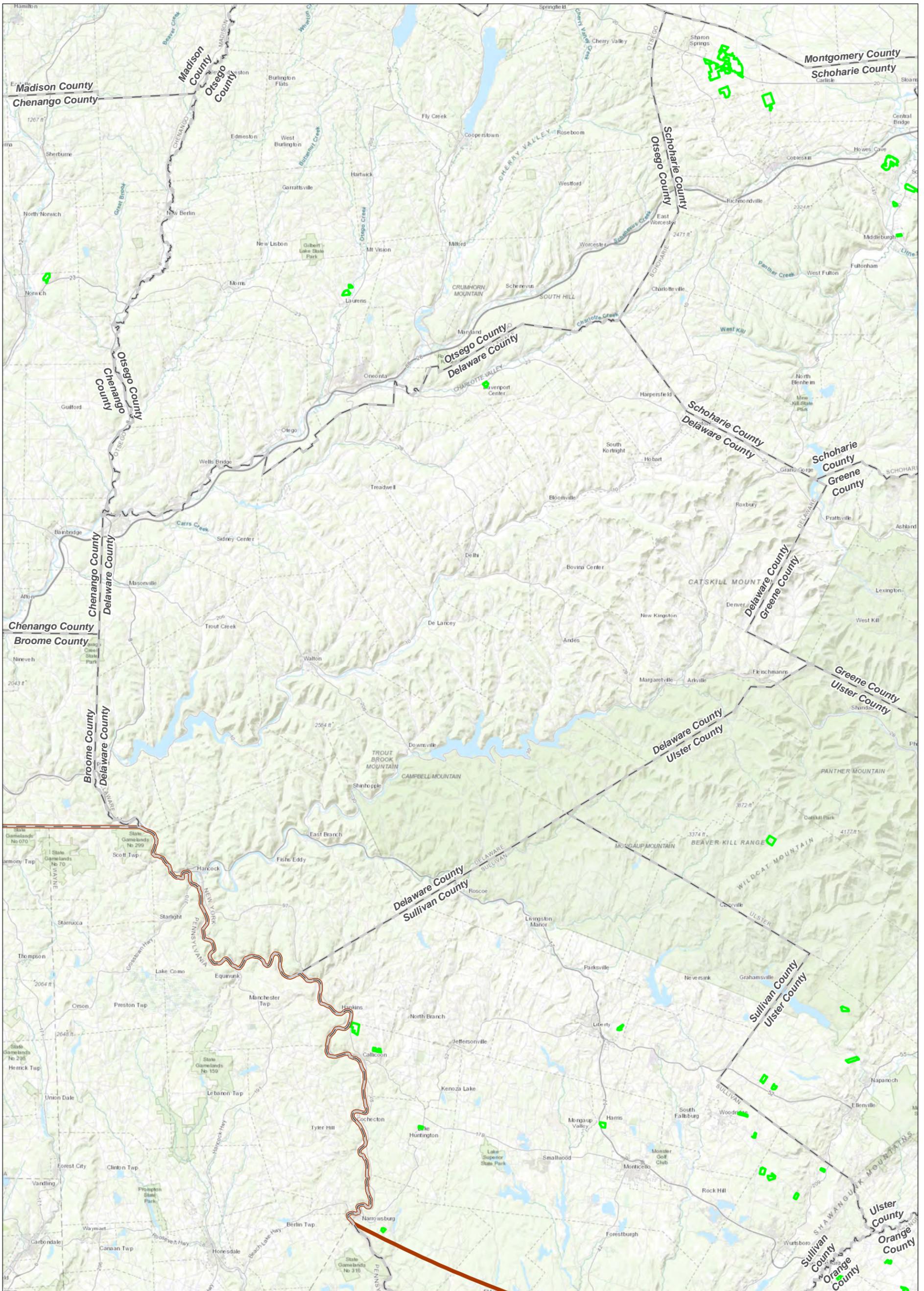
**MAP LOCATION**



**GRASSLAND STUDY AREA  
CORTLAND COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2 AUGUST 2019

Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map

0 2.5 5  
Miles

**MAP LOCATION**

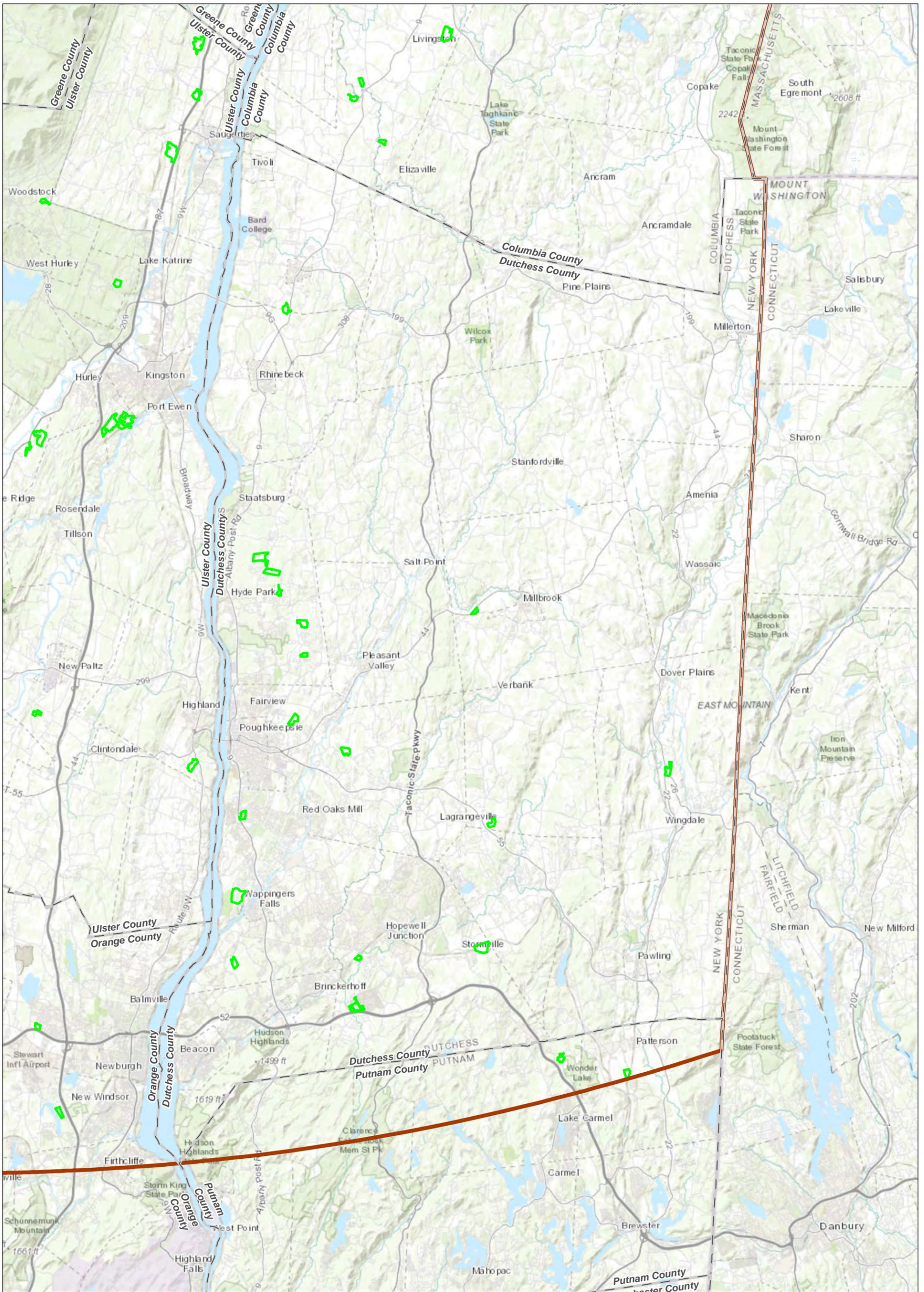


**GRASSLAND STUDY AREA  
DELAWARE COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2

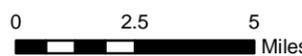
AUGUST 2019

Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



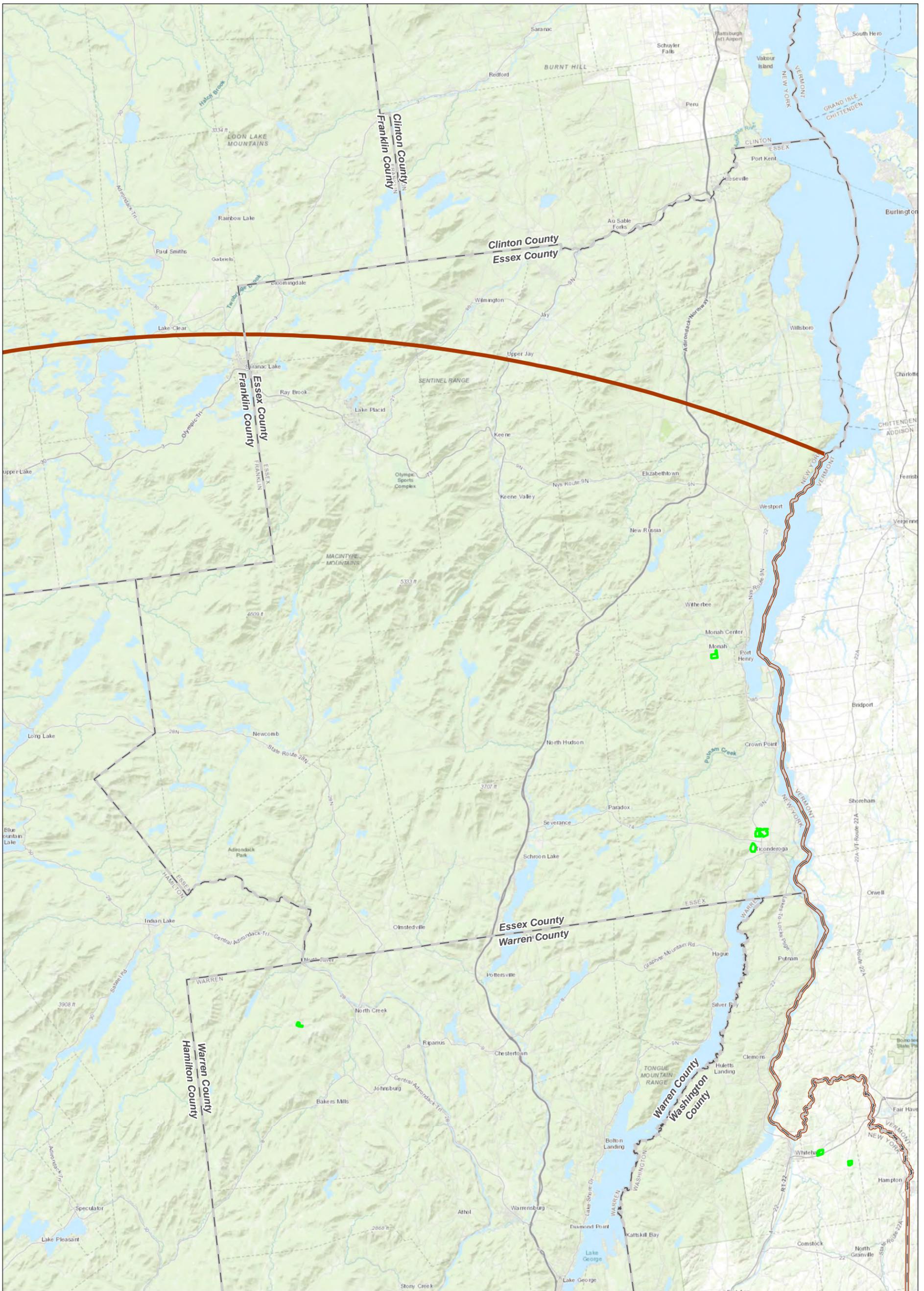
**MAP LOCATION**



**GRASSLAND STUDY AREA  
DUTCHESS COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2 AUGUST 2019

Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

**MAP LOCATION**



0 2.5 5  
Miles

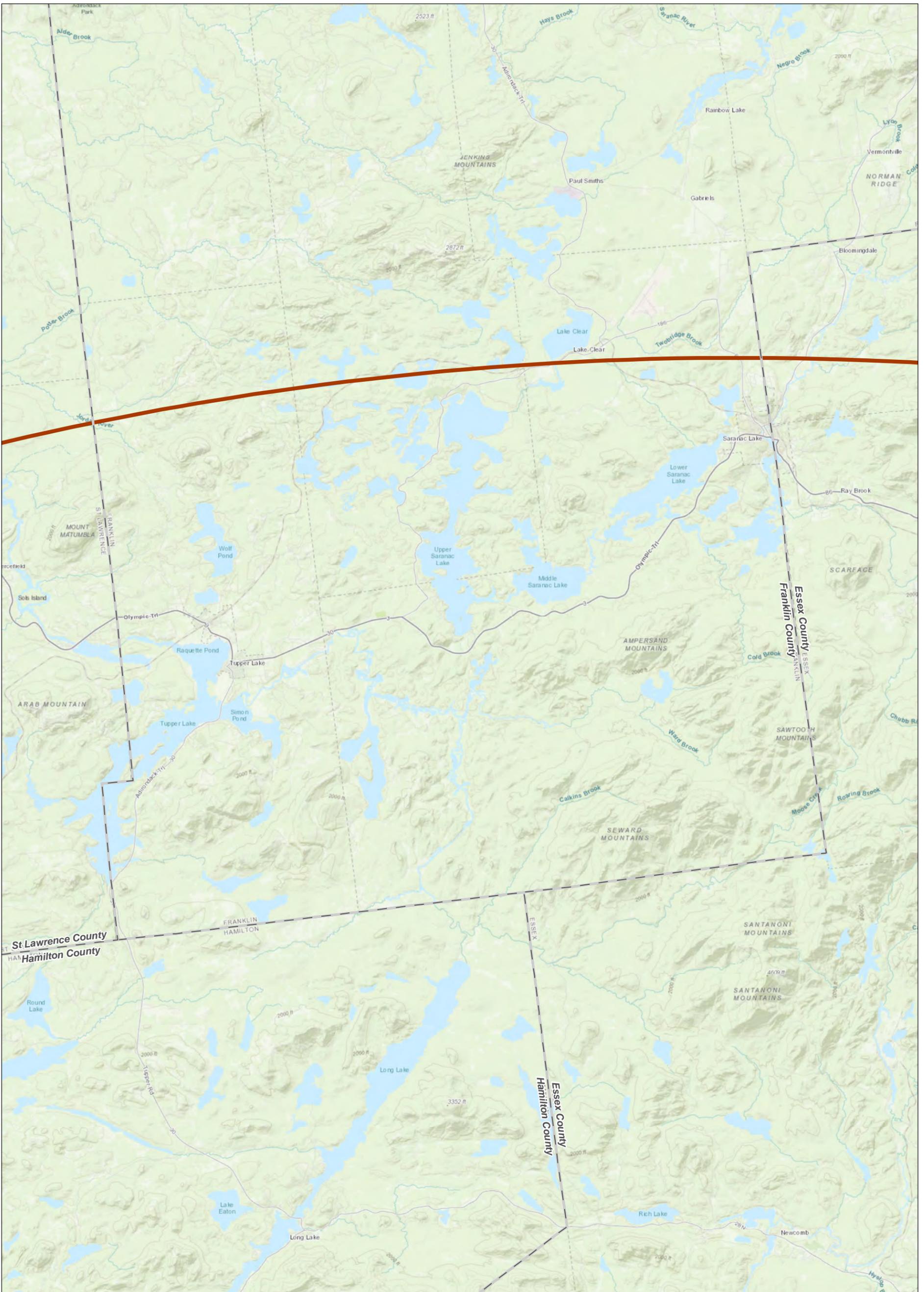


**GRASSLAND STUDY AREA  
ESSEX COUNTY  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY**

FIGURE 2 AUGUST 2019

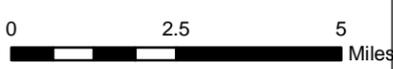
Map Produced by TRC

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map

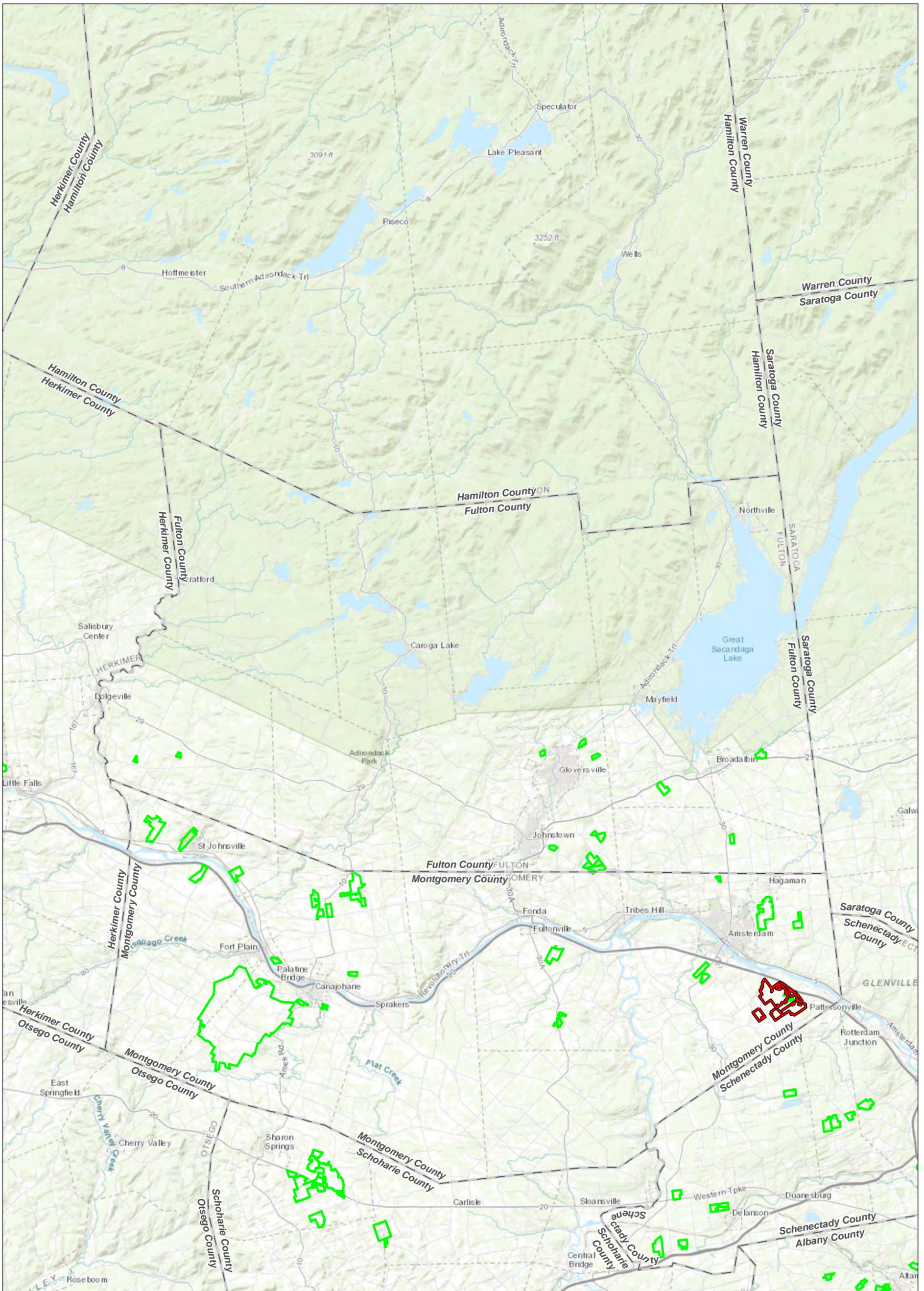




**GRASSLAND STUDY AREA  
FRANKLIN COUNTY**

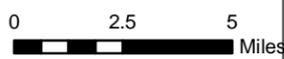
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2	AUGUST 2019
Map Produced by	



- Project Area
- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



**MAP LOCATION**

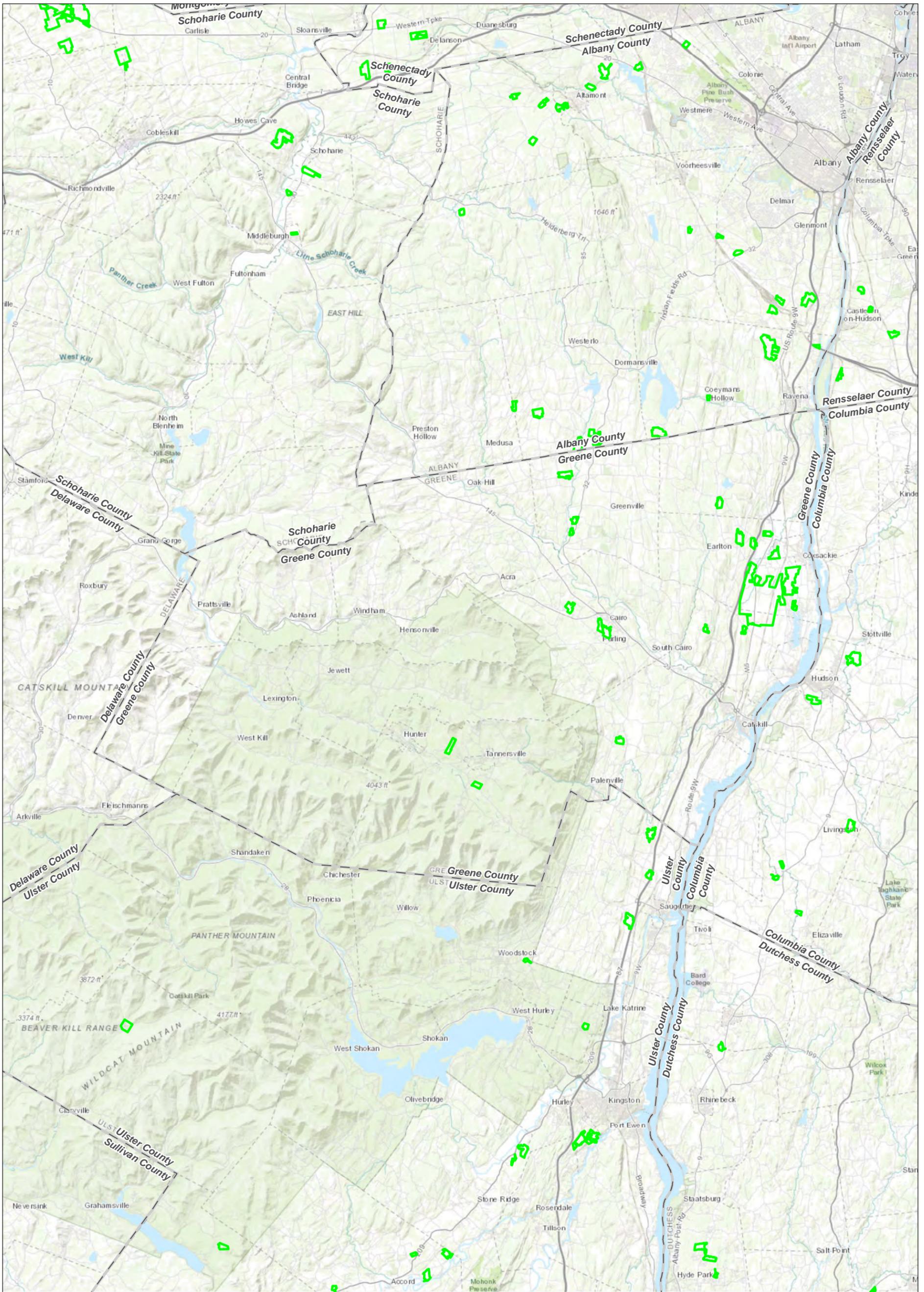


**GRASSLAND STUDY AREA  
FULTON COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2

AUGUST 2019

Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

**MAP LOCATION**



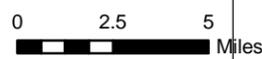
**GRASSLAND STUDY AREA  
GREENE COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

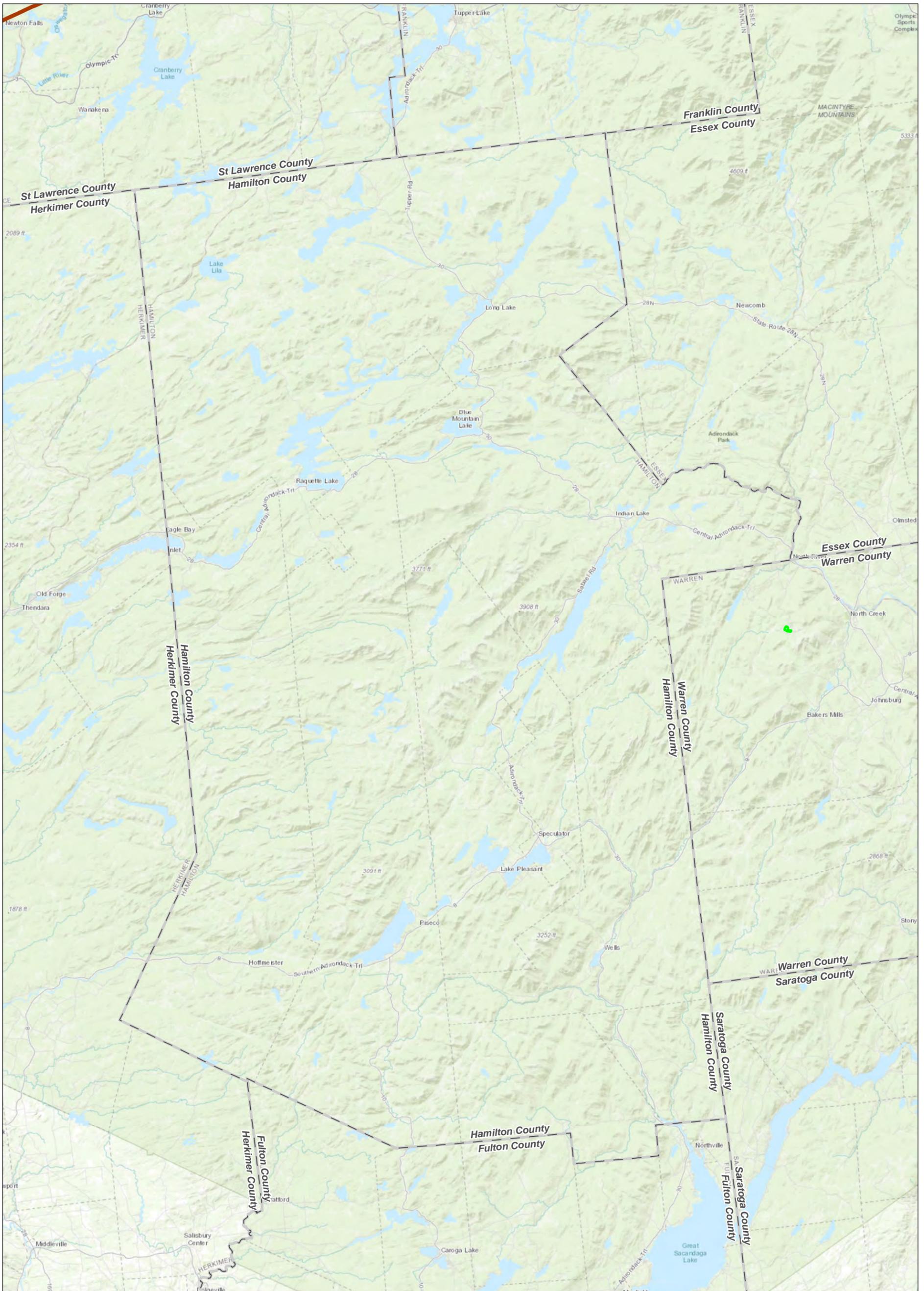
FIGURE 2

AUGUST 2019

Map Produced by **TRC**

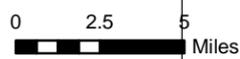
Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map





- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



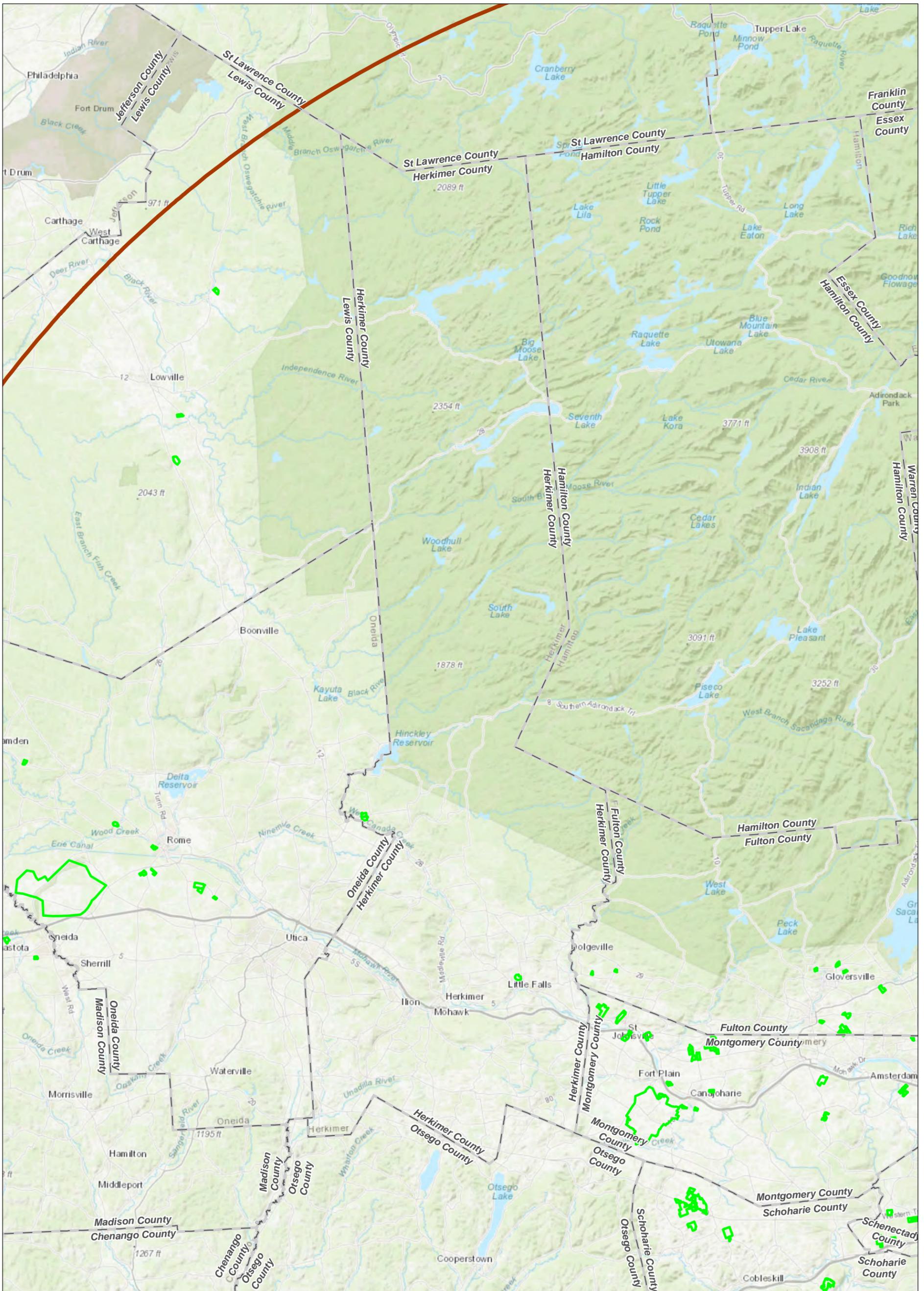
**MAP LOCATION**



**GRASSLAND STUDY AREA  
HAMILTON COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2 AUGUST 2019

Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map

**MAP LOCATION**



0 2.5 5  
Miles

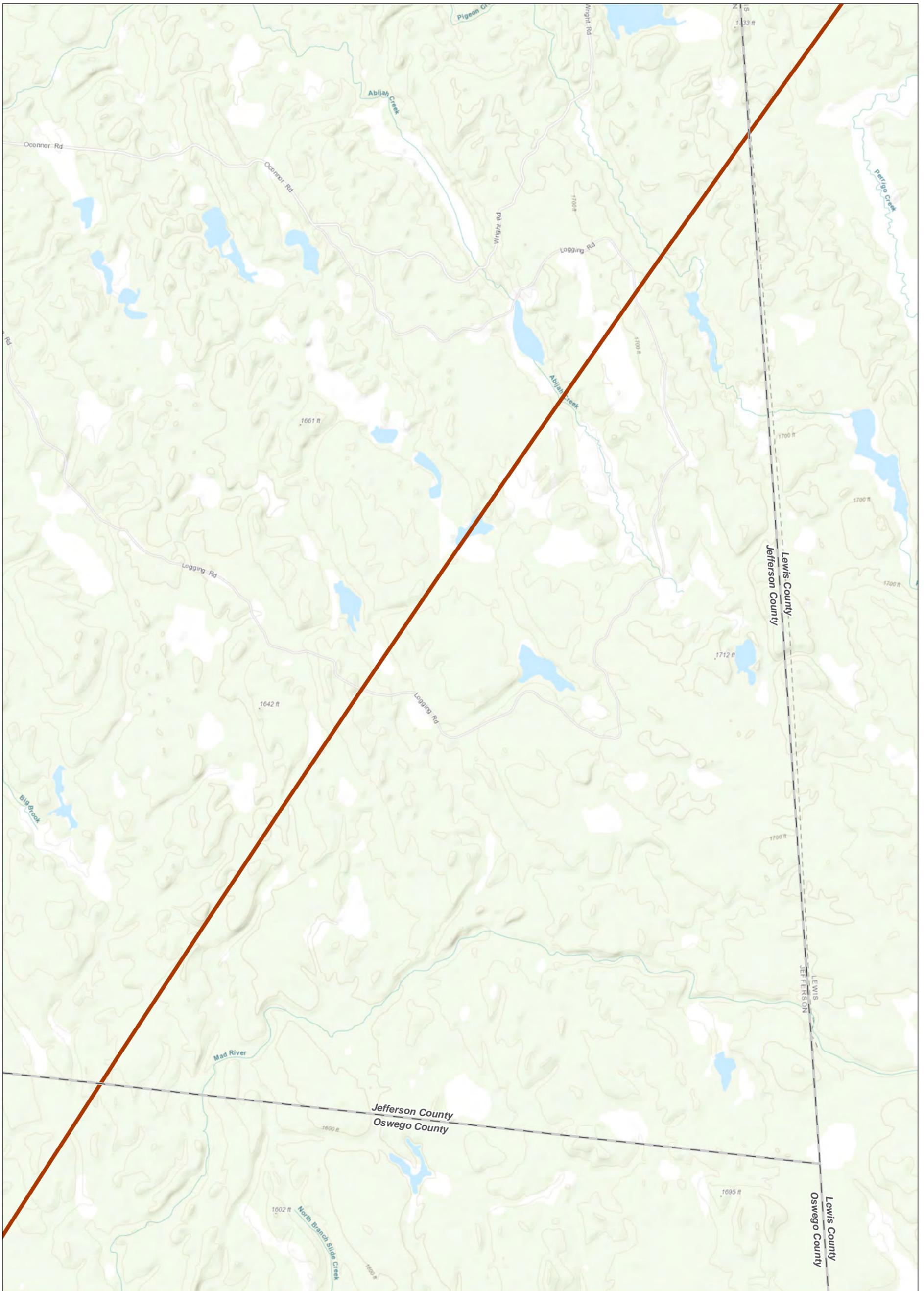


**GRASSLAND STUDY AREA  
HERKIMER COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2

AUGUST 2019

Map Produced by TRC



- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018

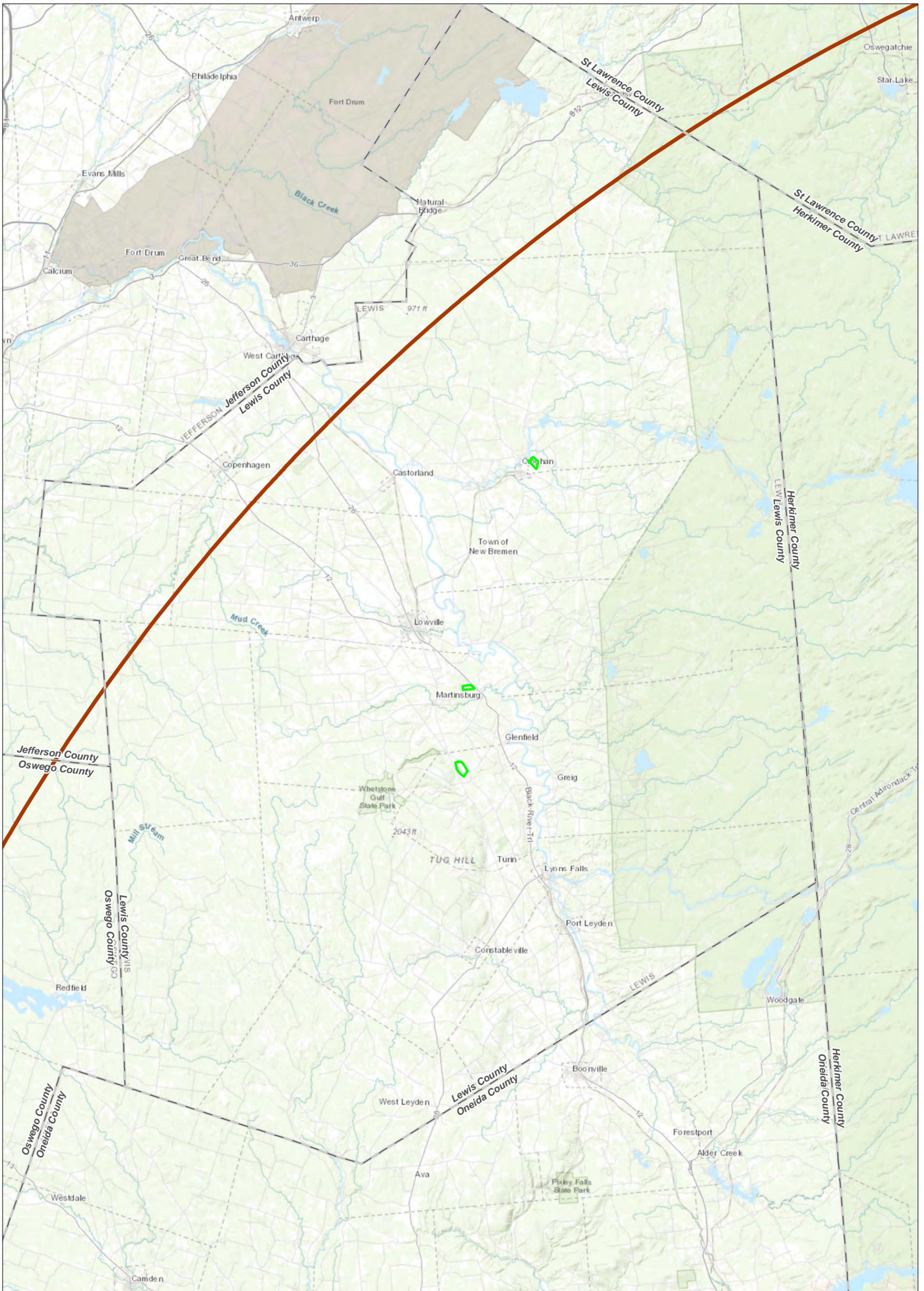
**MAP LOCATION**



**GRASSLAND STUDY AREA  
JEFFERSON COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2      AUGUST 2019

Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



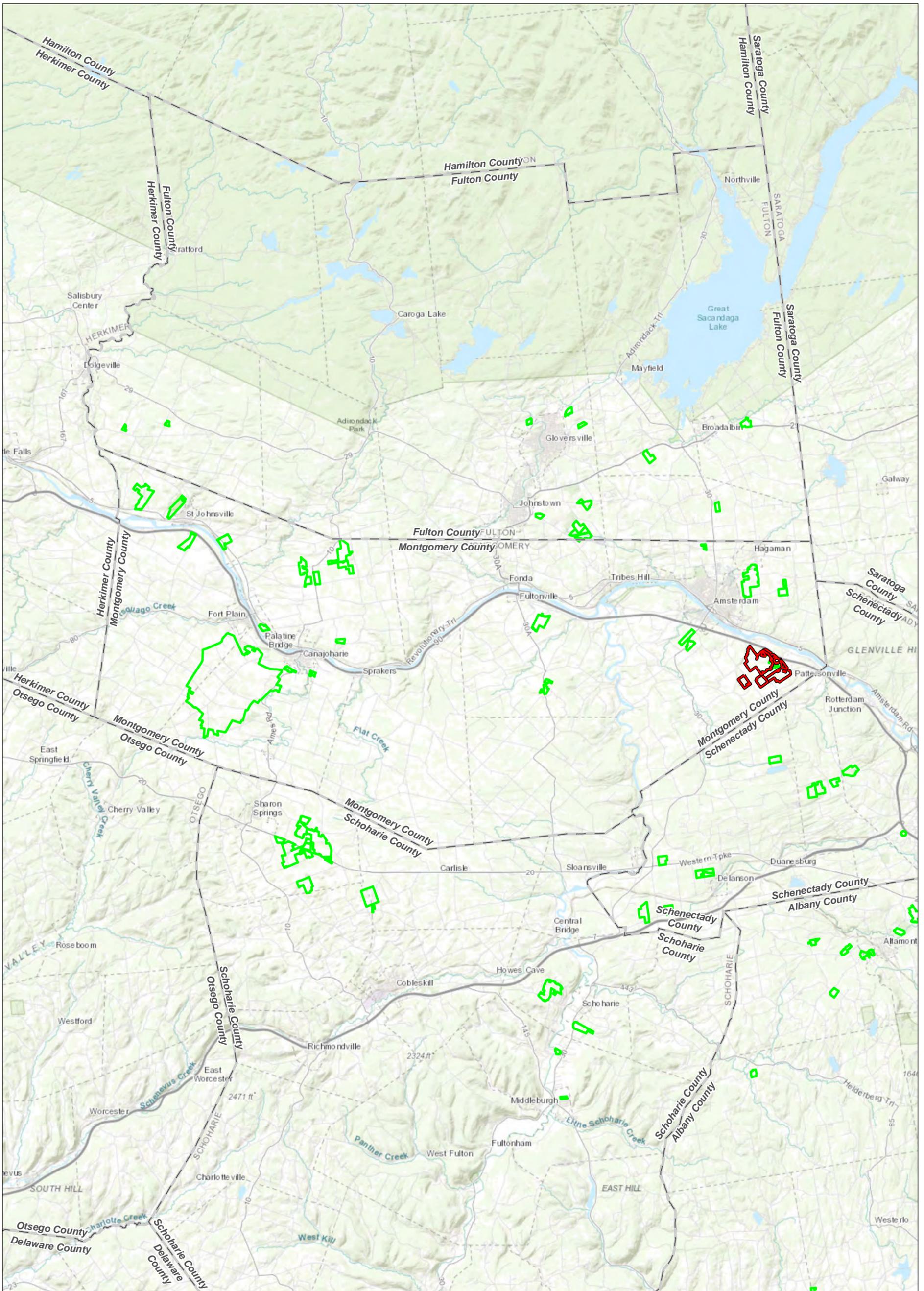
**MAP LOCATION**



**GRASSLAND STUDY AREA  
LEWIS COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

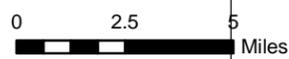
FIGURE 2      AUGUST 2019

Map Produced by TRC



- Project Area
- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



**MAP LOCATION**

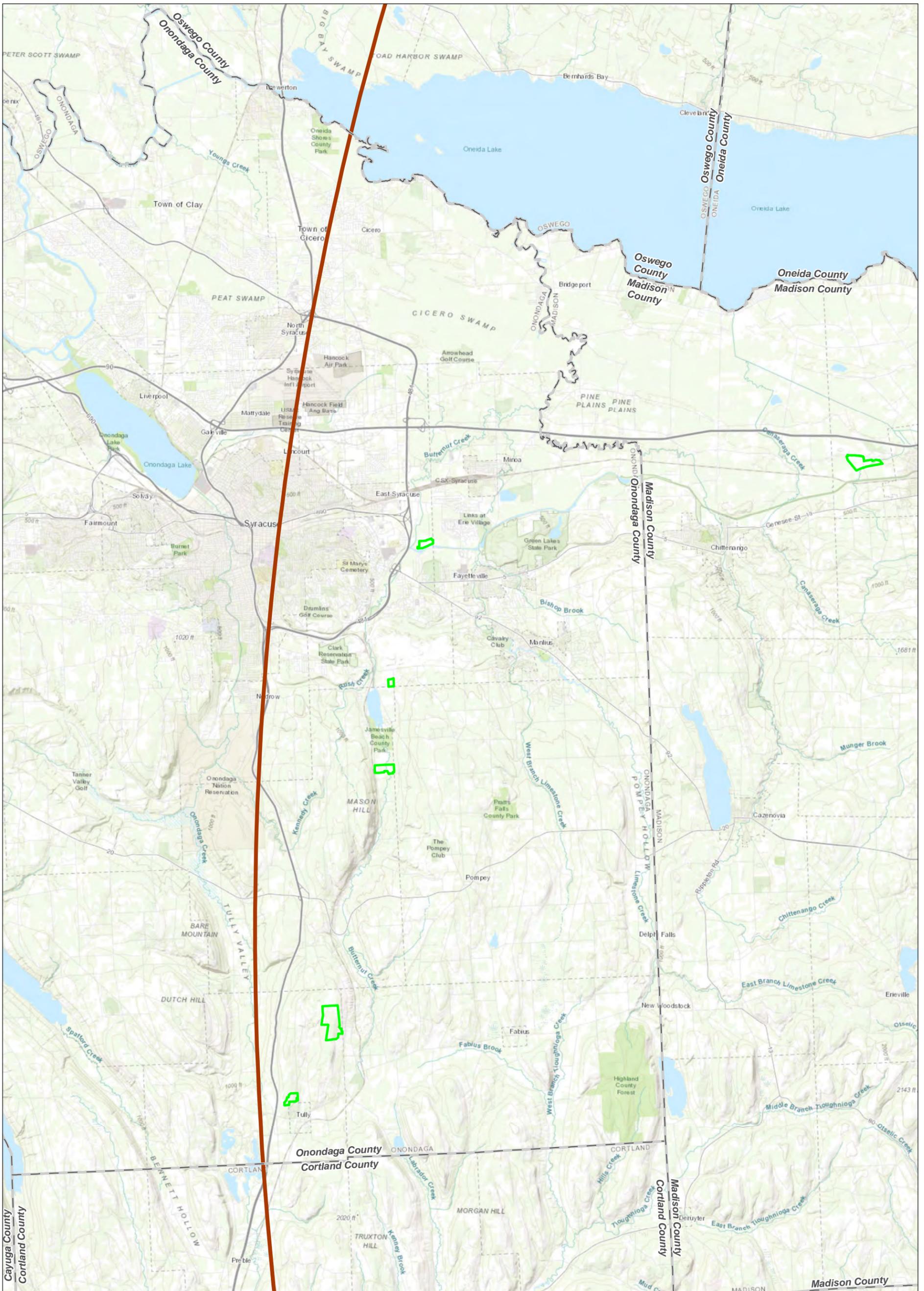


**GRASSLAND STUDY AREA  
MONTGOMERY COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2

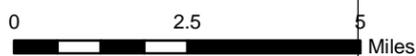
AUGUST 2019

Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



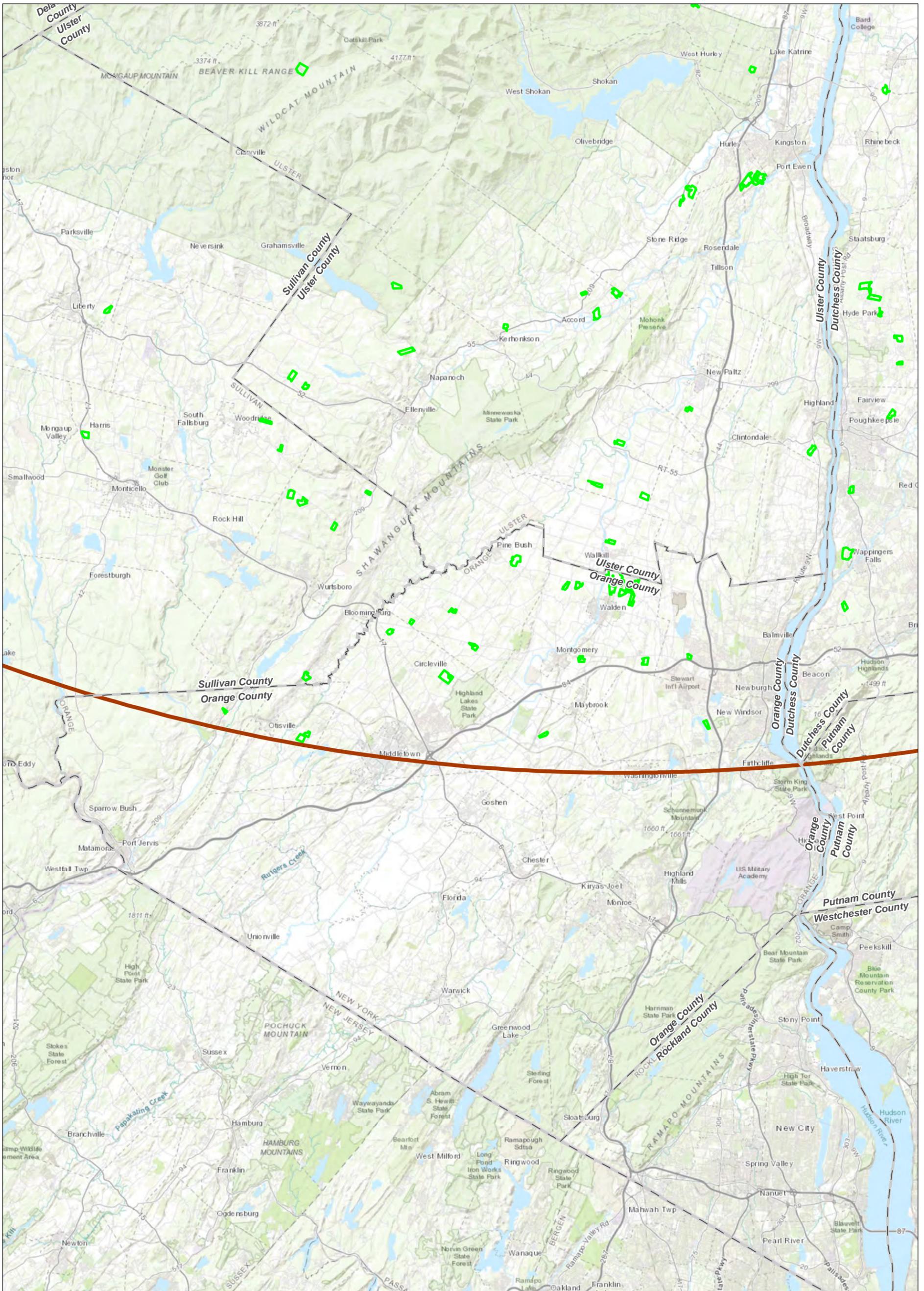
**MAP LOCATION**



**GRASSLAND STUDY AREA  
ONONDAGA COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2 AUGUST 2019

Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

**MAP LOCATION**



N

0 2.5 5 Miles

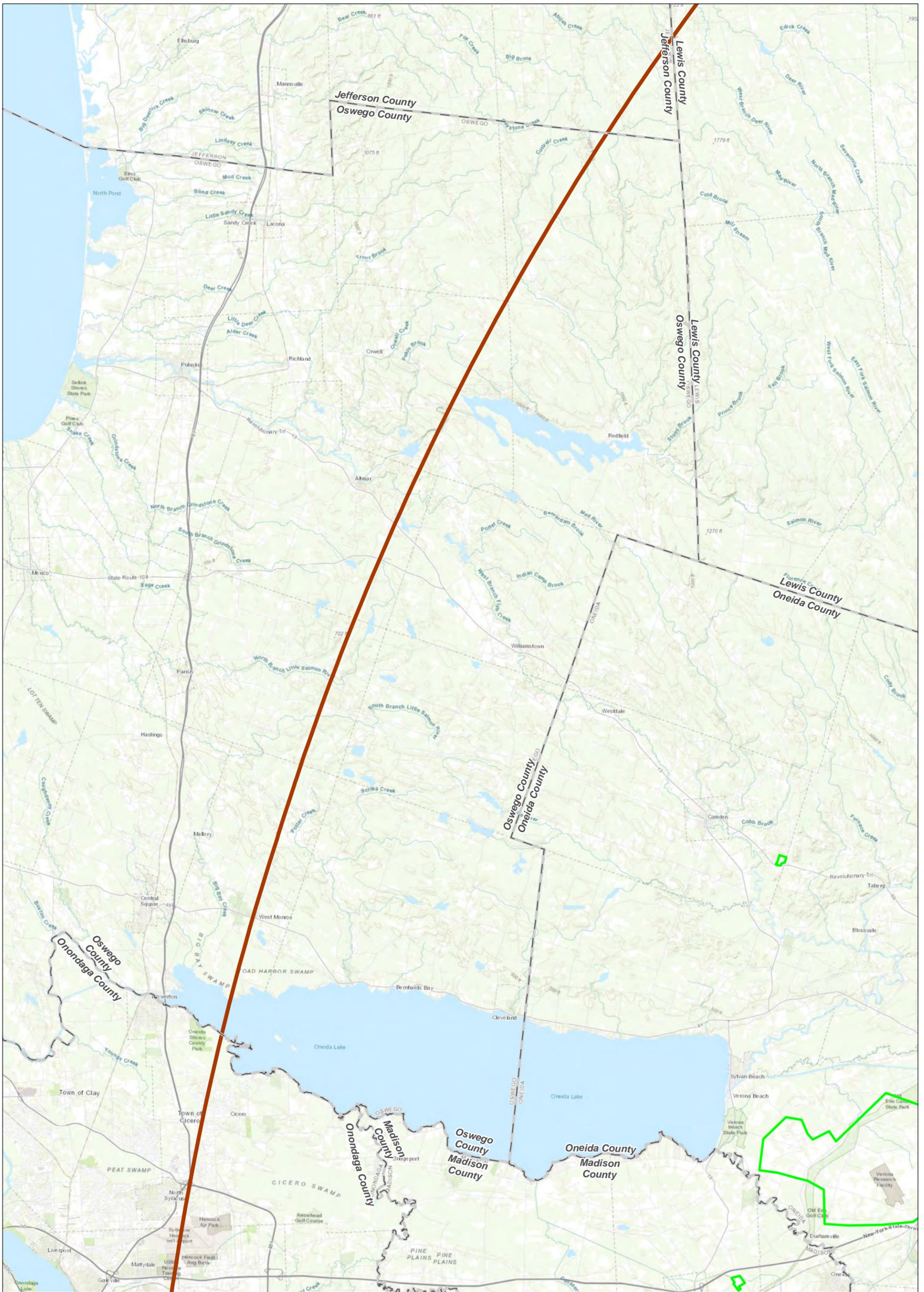


**GRASSLAND STUDY AREA  
ORANGE COUNTY  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY**

FIGURE 2 AUGUST 2019

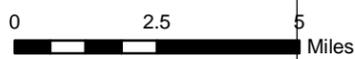
Map Produced by TRC

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



- Solar Project
- County Boundary
- Grassland Study Area

**MAP LOCATION**

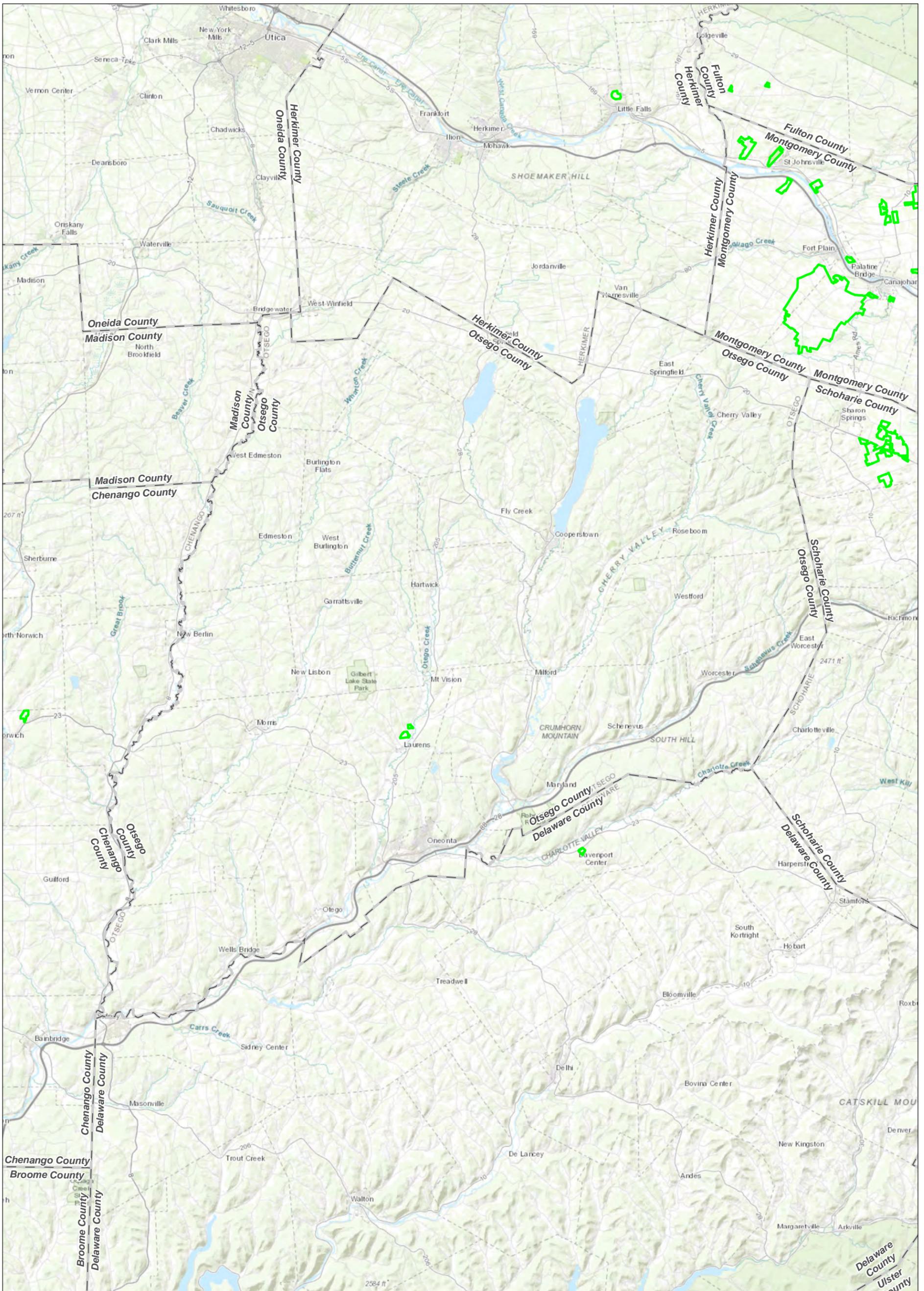


**GRASSLAND STUDY AREA  
OSWEGO COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2      AUGUST 2019

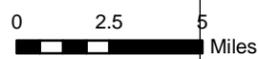
Map Produced by TRC

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



- Solar Project
- County Boundary
- Grassland Study Area

**MAP LOCATION**

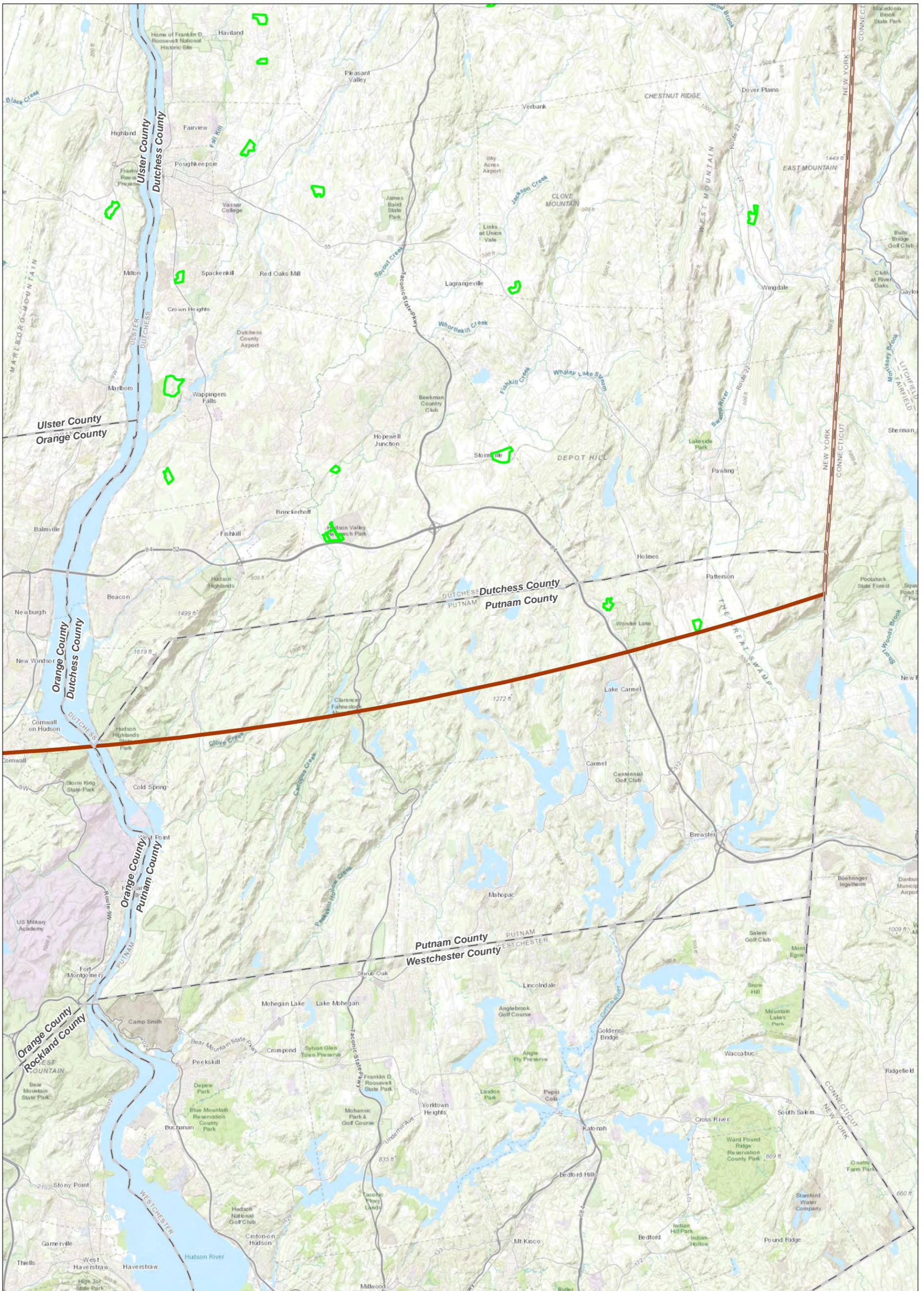


**GRASSLAND STUDY AREA  
OTSEGO COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2 AUGUST 2019

Map Produced by TRC

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



- Solar Project
- County Boundary
- Grassland Study Area

**MAP LOCATION**



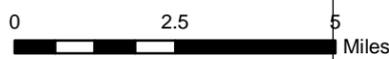
**GRASSLAND STUDY AREA  
PUTNAM COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

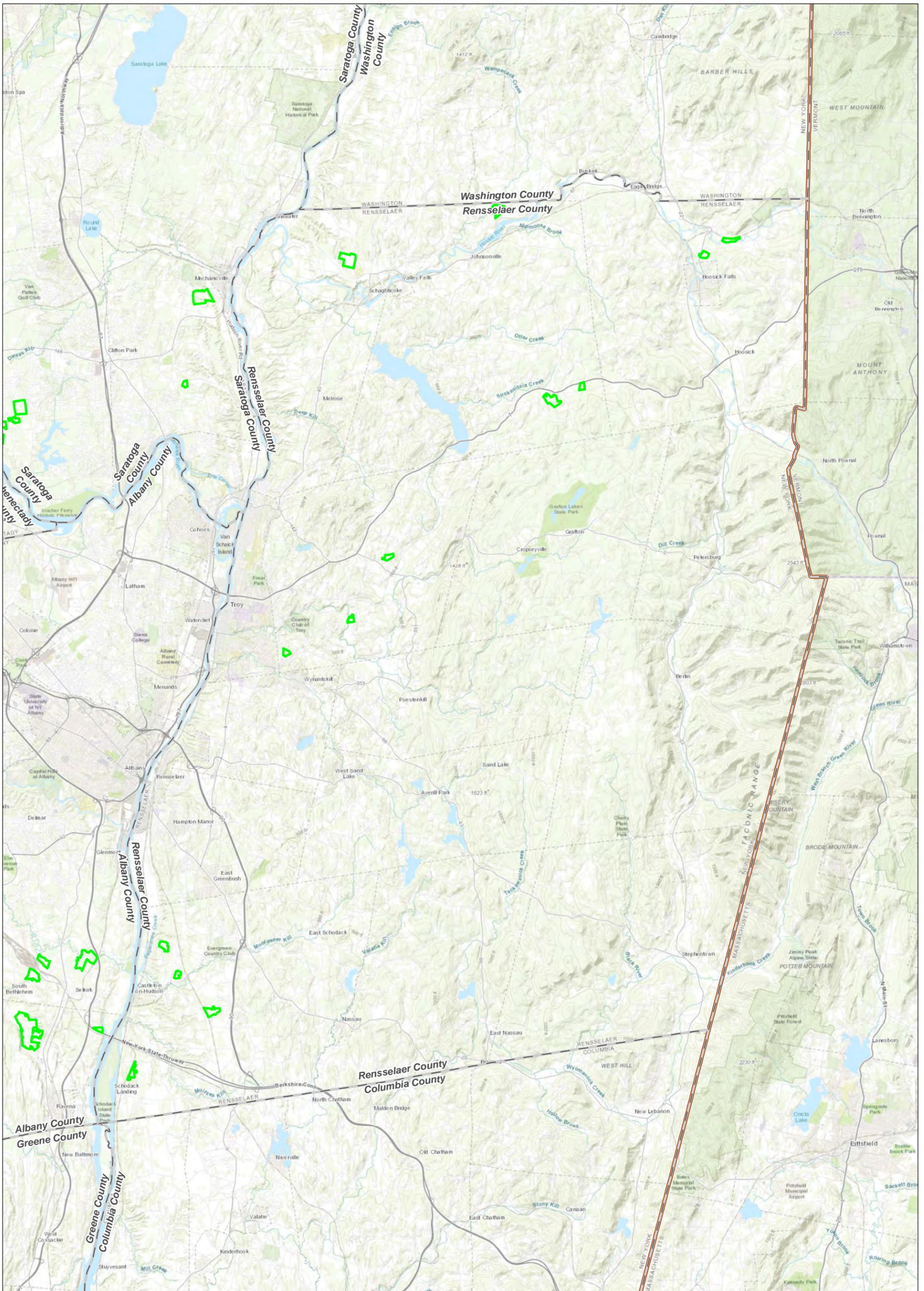
FIGURE 2

AUGUST 2019

Map Produced by TRC

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map





- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



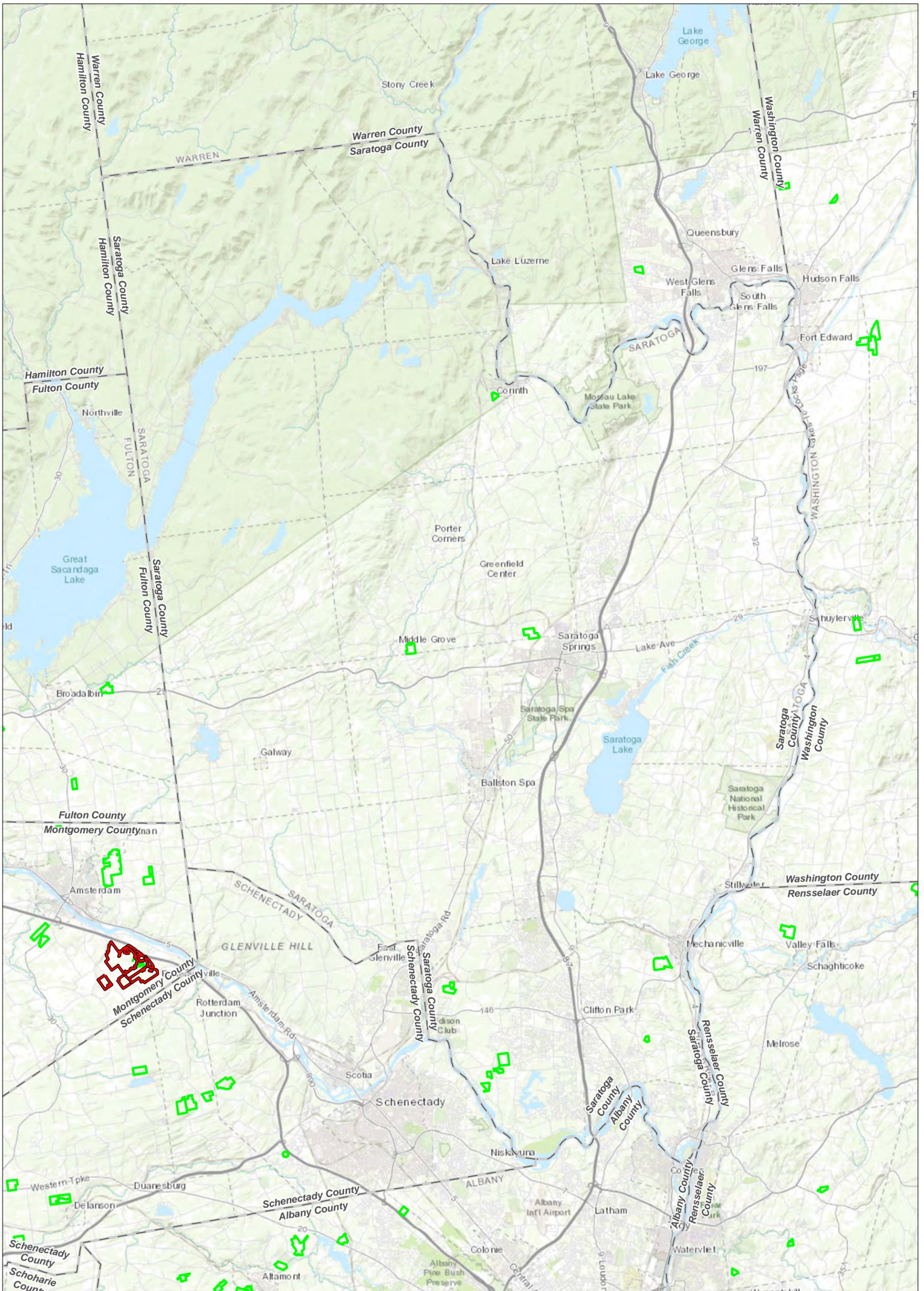
**MAP LOCATION**



**GRASSLAND STUDY AREA  
RENSSELAER COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

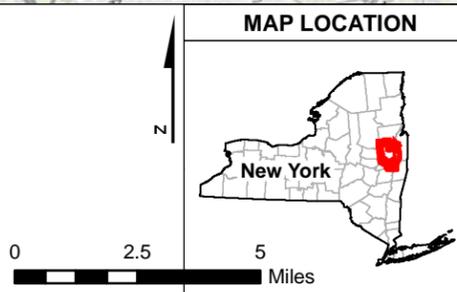
FIGURE 2 AUGUST 2019

Map Produced by TRC



- Project Area
- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map

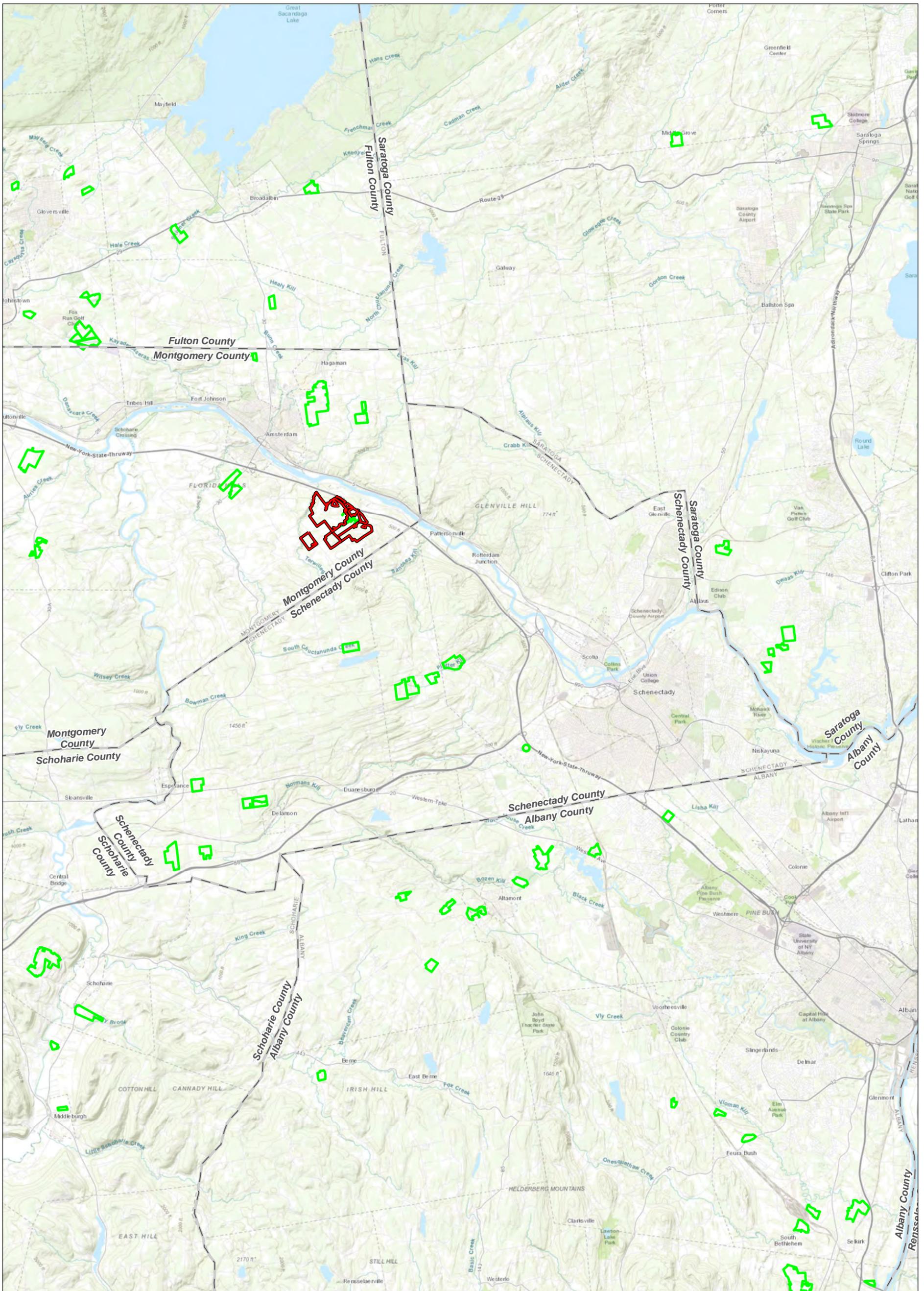




**GRASSLAND STUDY AREA  
SARATOGA COUNTY**

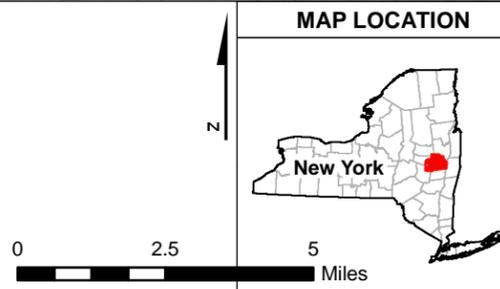
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2	AUGUST 2019
Map Produced by 	

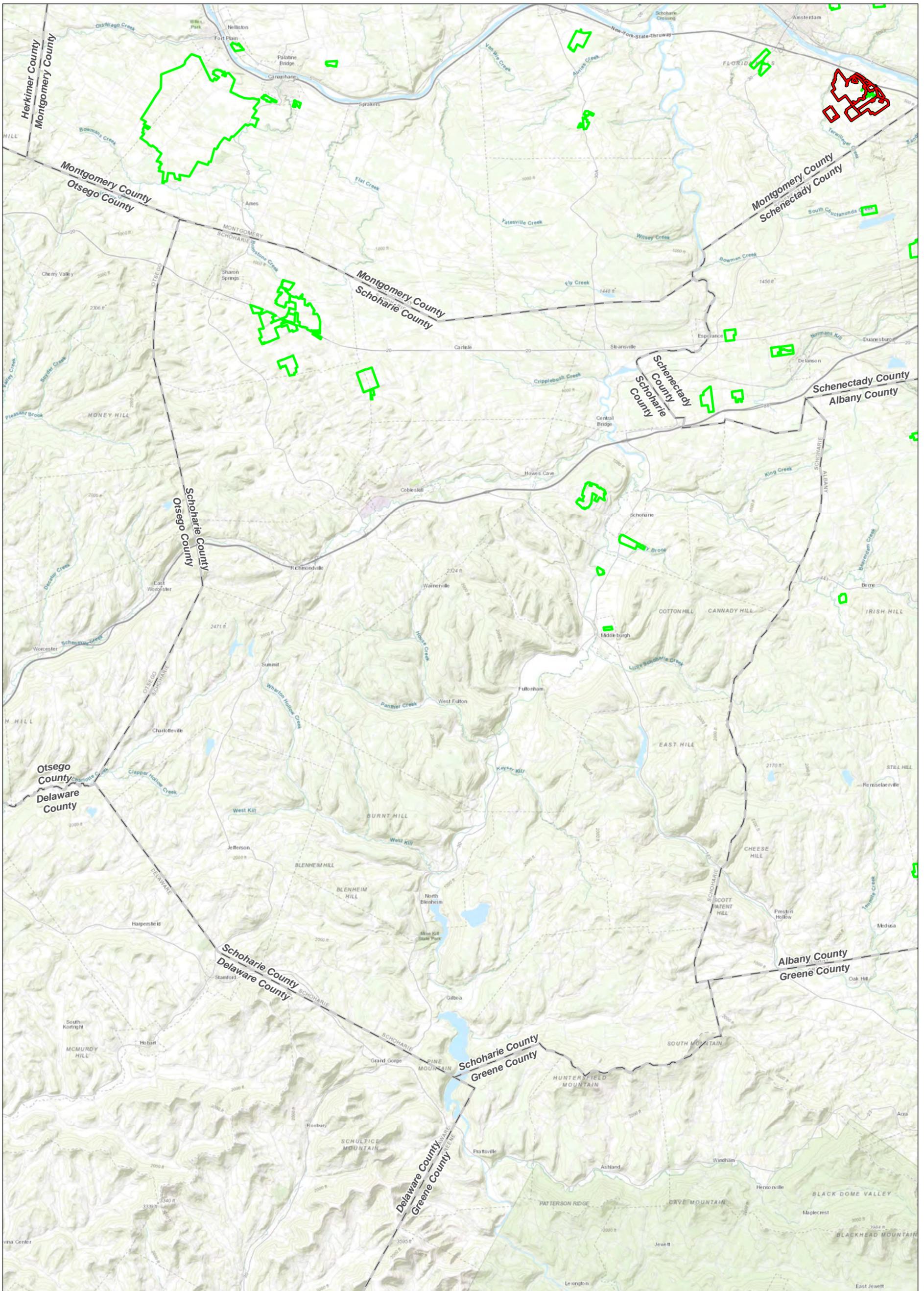


- Project Area
- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map

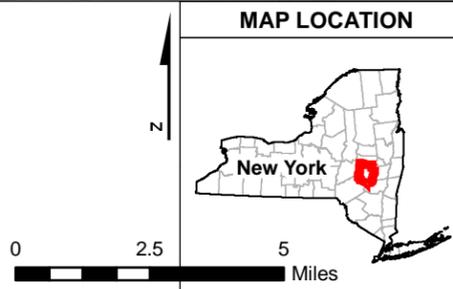


	
<b>GRASSLAND STUDY AREA SCHENECTADY COUNTY</b> HIGH RIVER ENERGY CENTER, LLC TOWN OF FLORIDA, NY	
FIGURE 2	AUGUST 2019
Map Produced by 	



- Project Area
- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



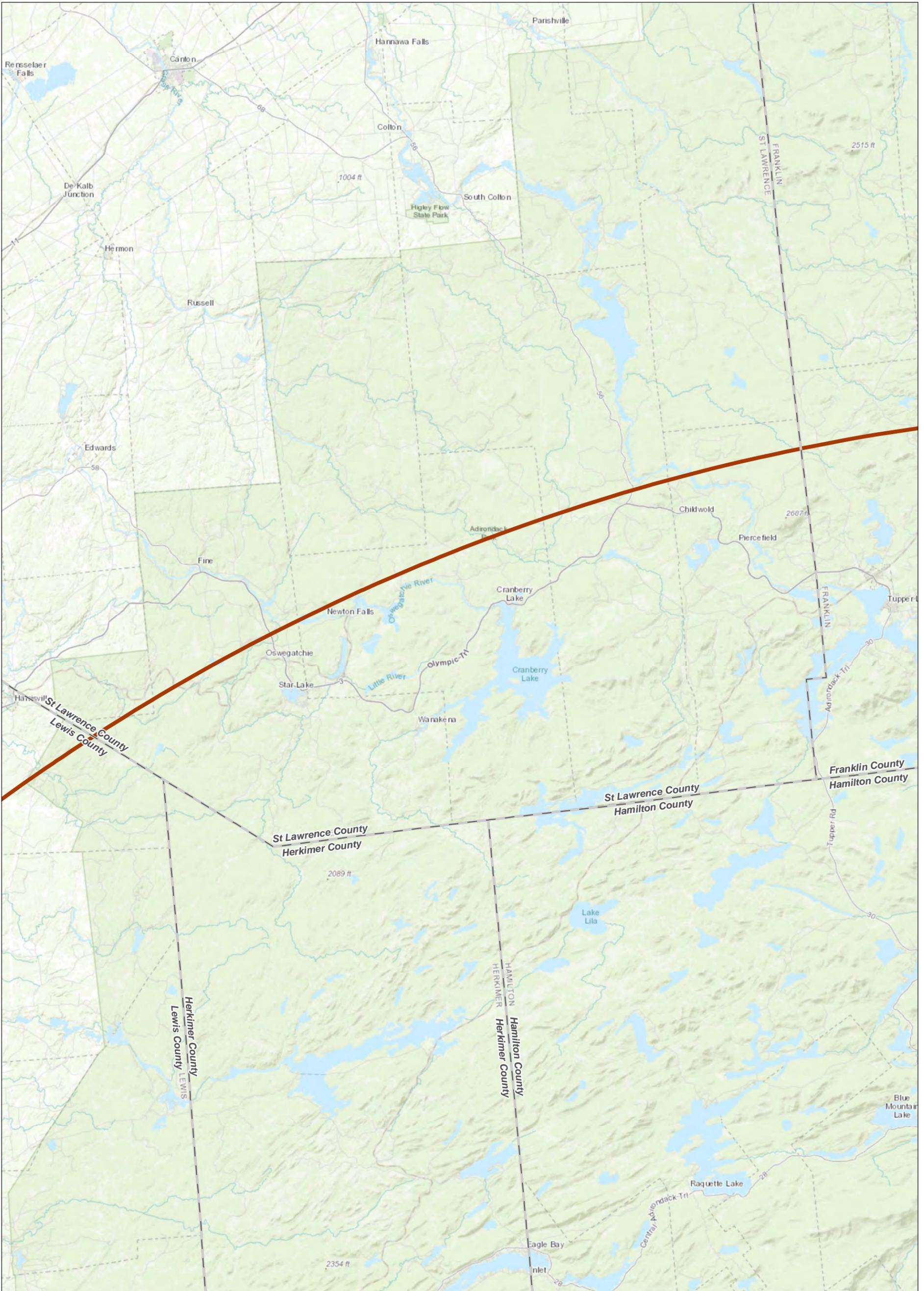
**NEXTERA ENERGY RESOURCES**

**GRASSLAND STUDY AREA  
SCHOHARIE COUNTY**

**HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY**

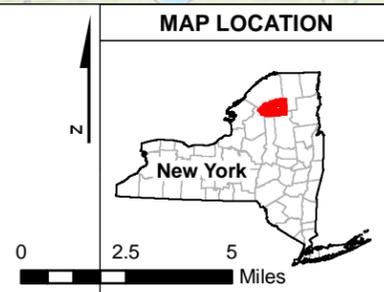
FIGURE 2      AUGUST 2019

Map Produced by **TRC**



- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map

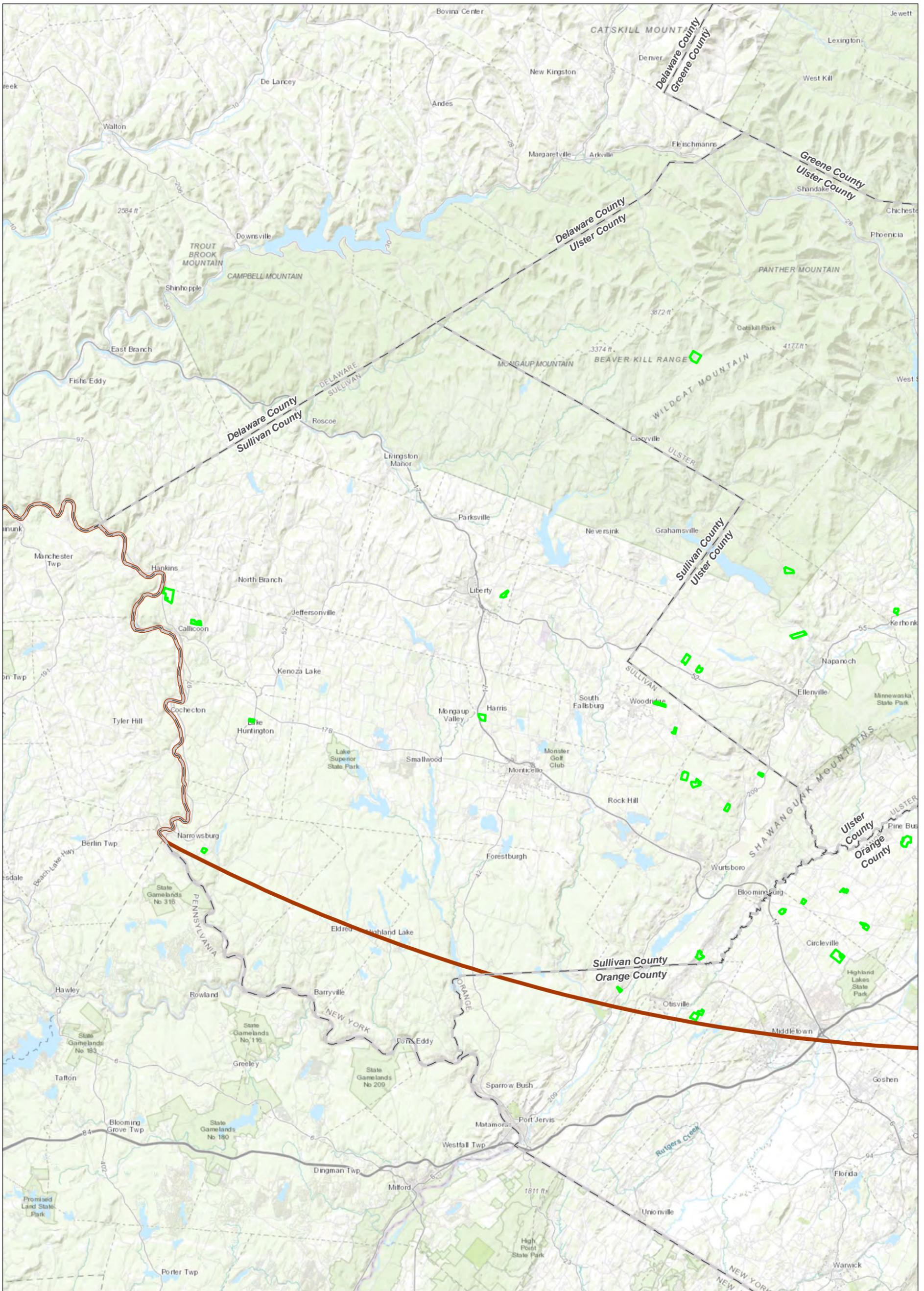




**GRASSLAND STUDY AREA  
ST LAWRENCE COUNTY**

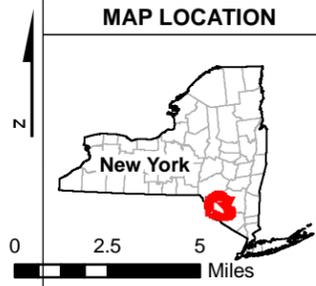
**HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY**

FIGURE 2	AUGUST 2019
Map Produced by	



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map

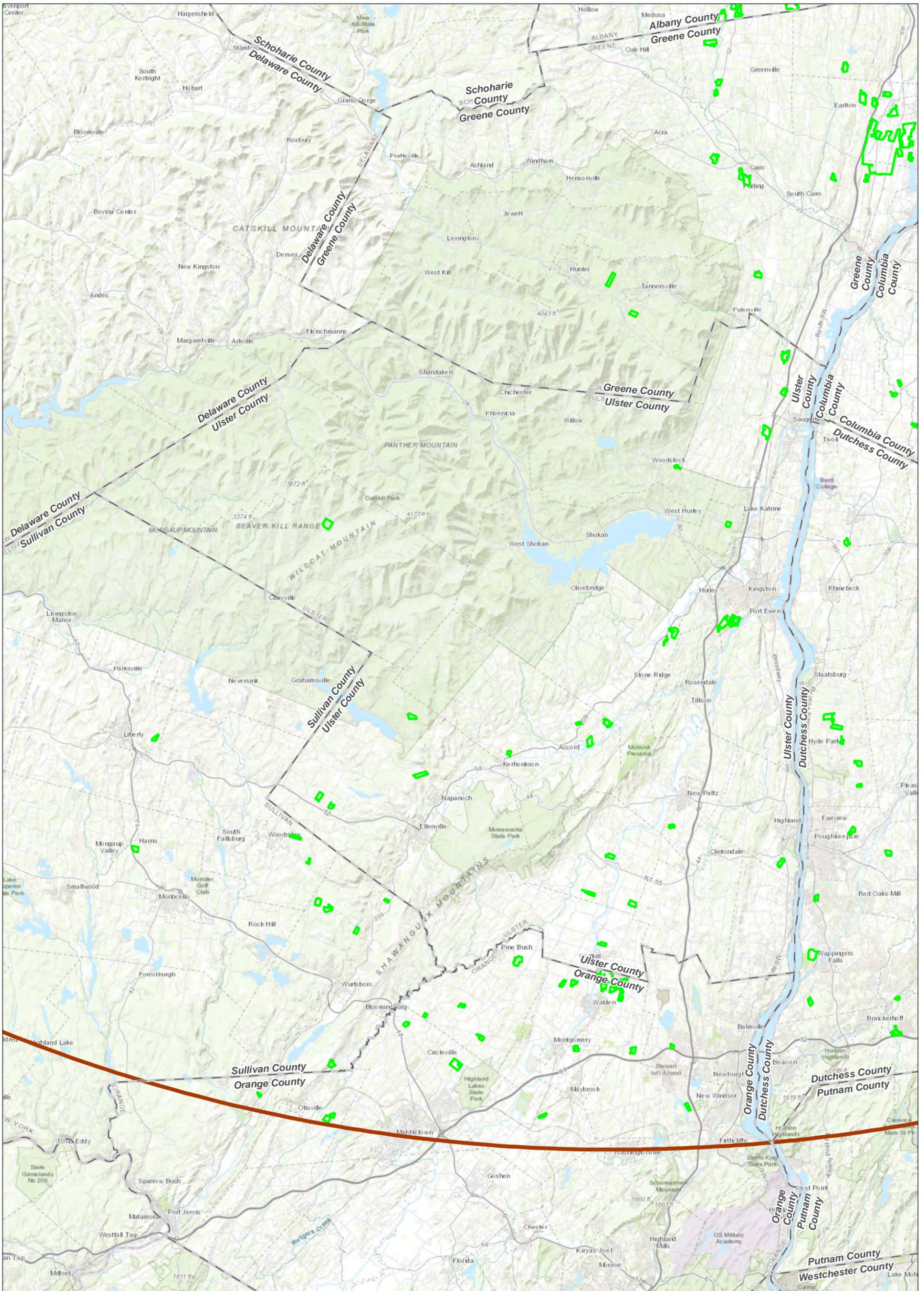




**GRASSLAND STUDY AREA  
SULLIVAN COUNTY**

**HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY**

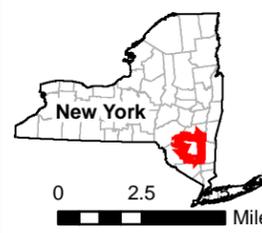
FIGURE 2	AUGUST 2019
Map Produced by <b>TRC</b>	



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map

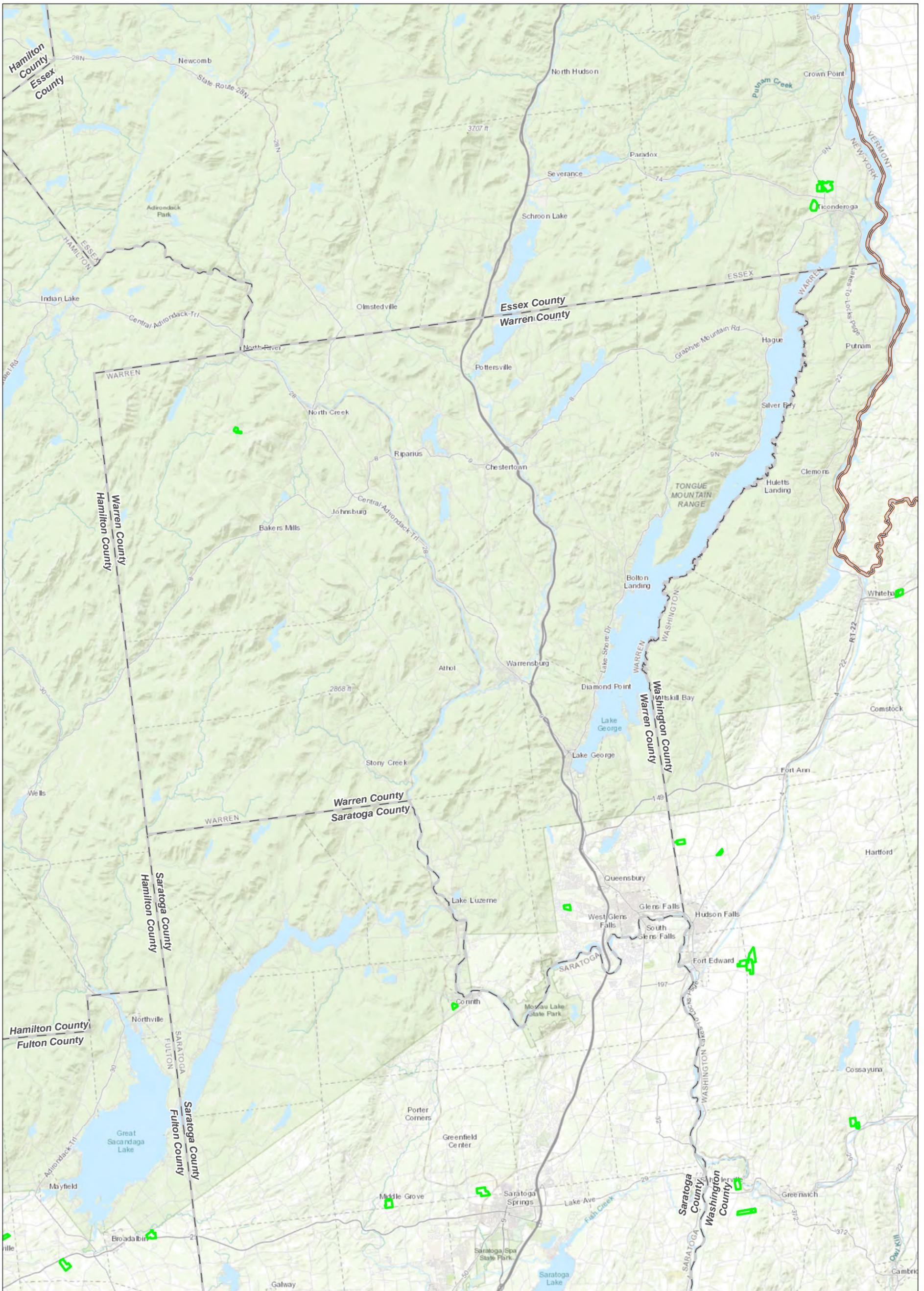
**MAP LOCATION**



**GRASSLAND STUDY AREA  
ULSTER COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2 AUGUST 2019

Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map

**MAP LOCATION**

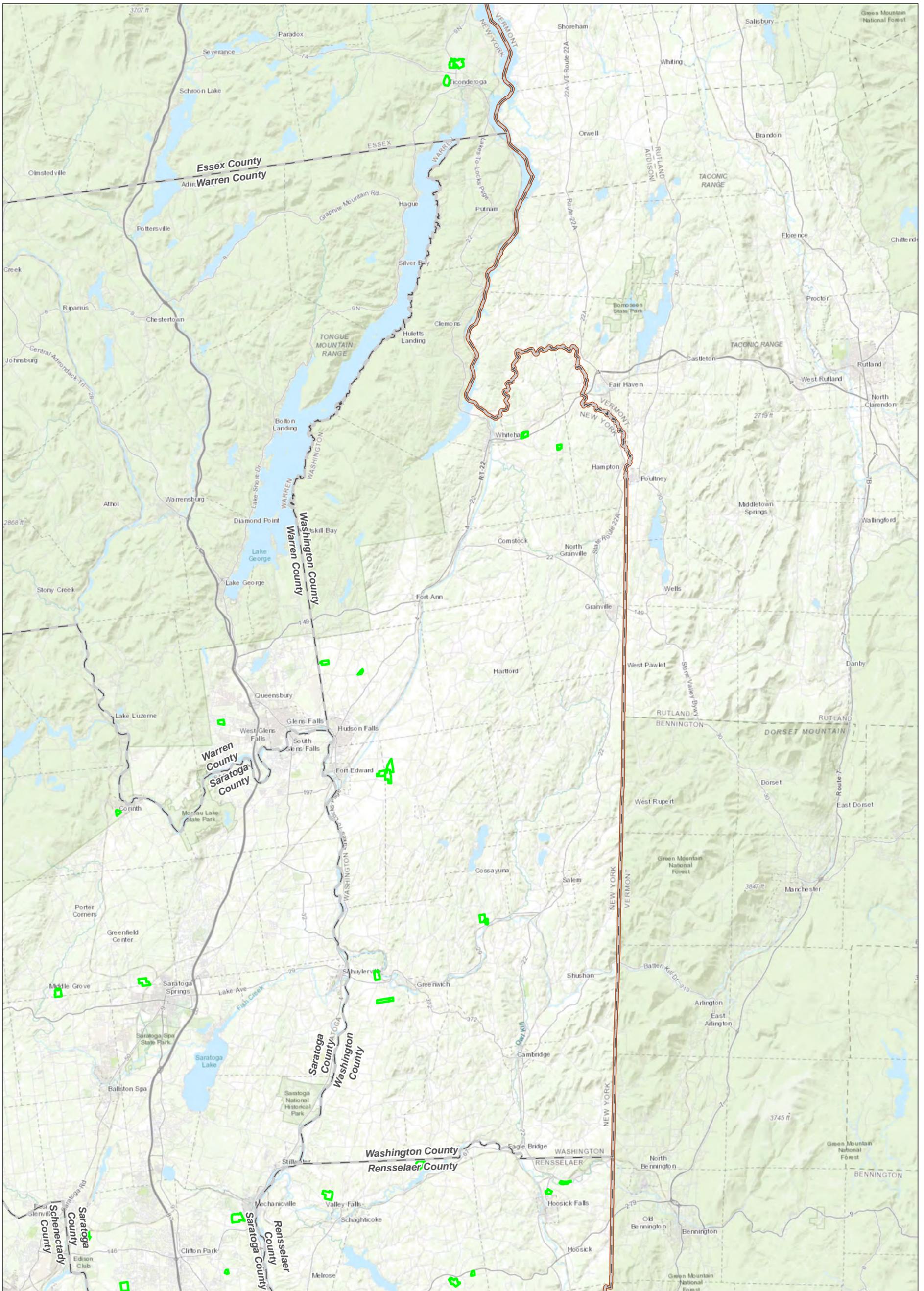


**GRASSLAND STUDY AREA  
WARREN COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

FIGURE 2

AUGUST 2019

Miles Map Produced by TRC



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map

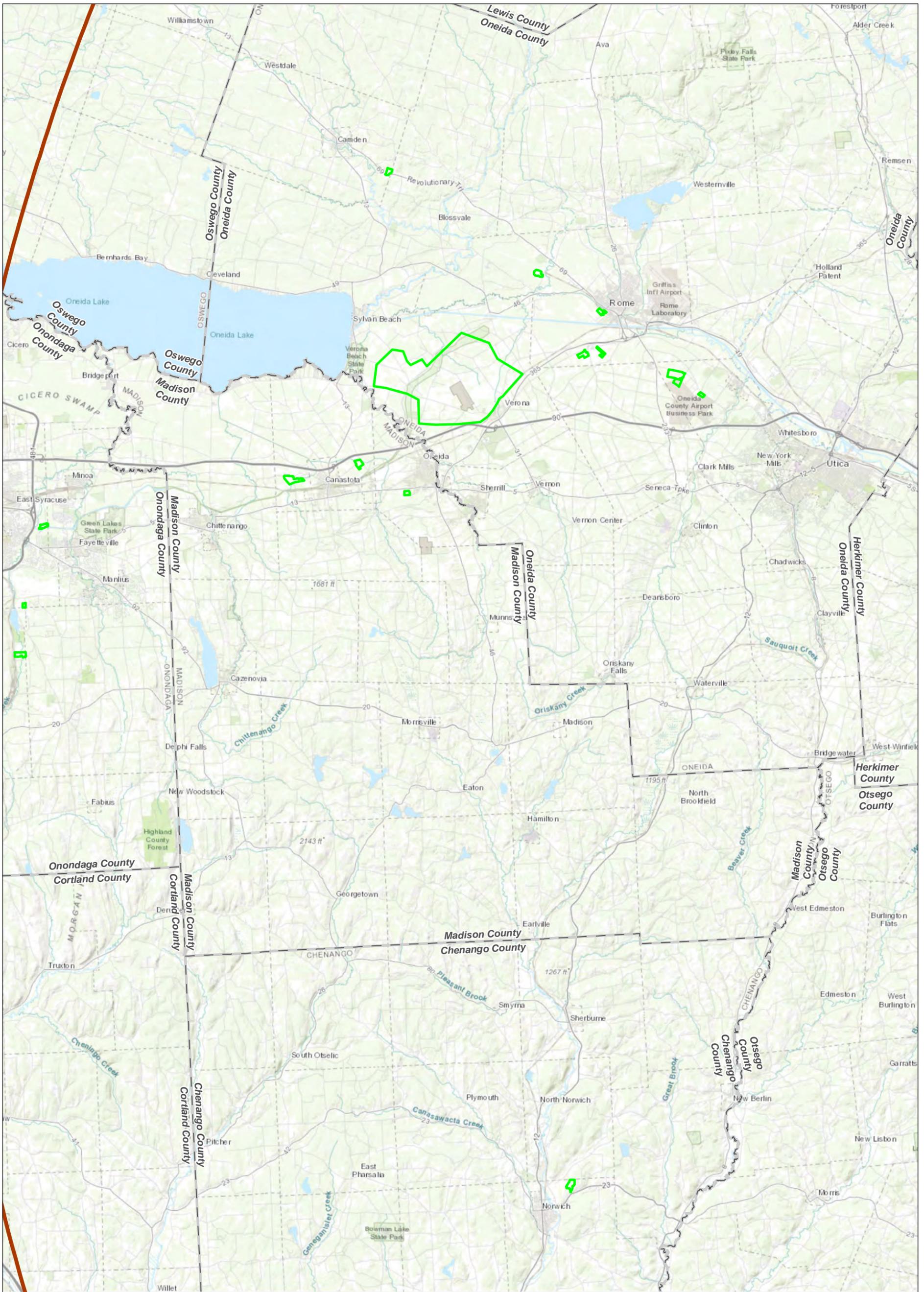
**MAP LOCATION**



**GRASSLAND STUDY AREA  
WASHINGTON COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

5 FIGURE 2 AUGUST 2019

Map produced by **TRC**



- Solar Project
- County Boundary
- Grassland Study Area

**MAP LOCATION**



**GRASSLAND STUDY AREA  
MADISON COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

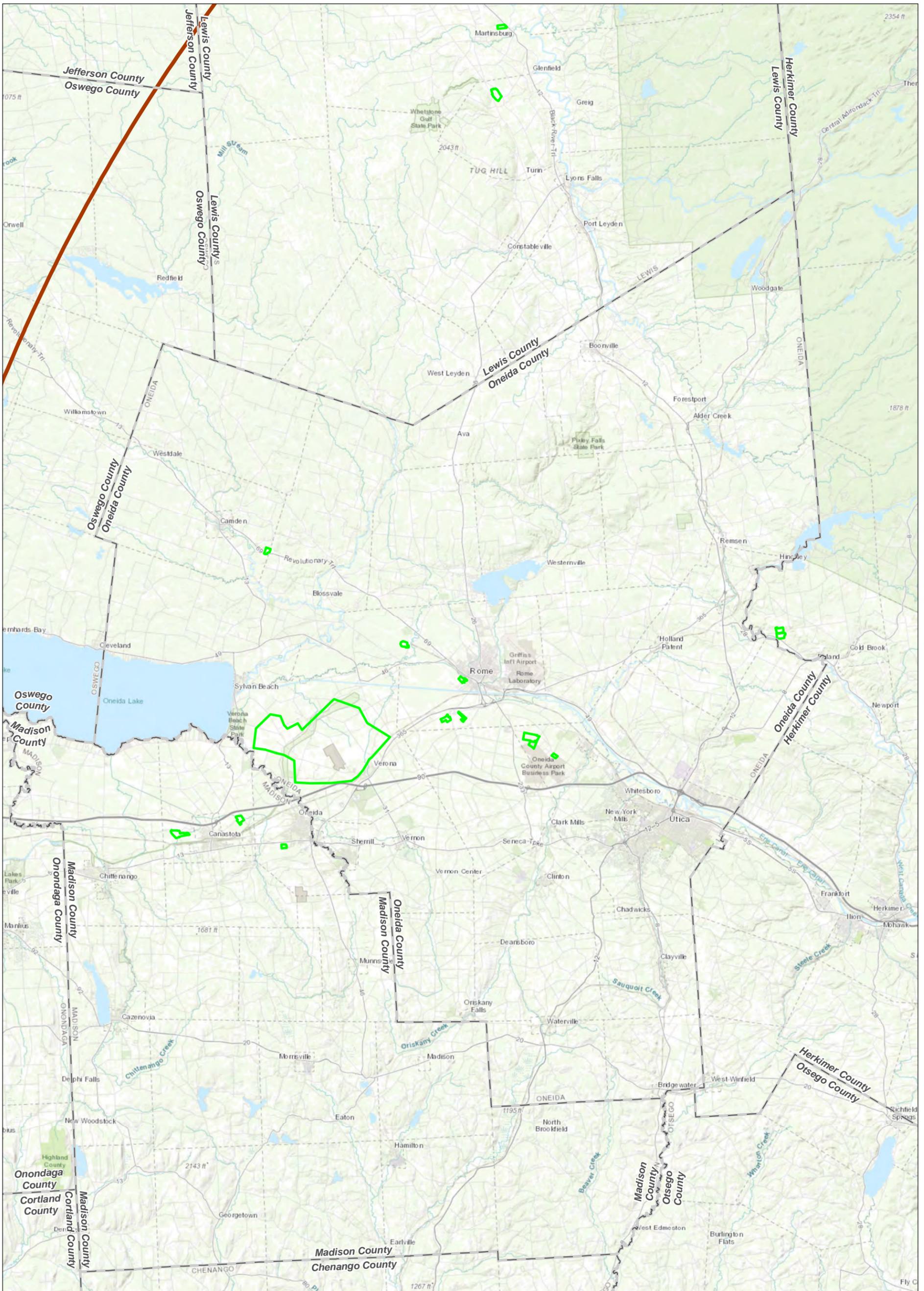
FIGURE 2

AUGUST 2019

0 2.5 Miles

Prepared by TRC

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map



- Solar Project
- County Boundary
- Grassland Study Area

Data: NYS Office of Information Technology Services,  
GIS Program Office, 2018  
Base Map: USGS/The National Map

**MAP LOCATION**

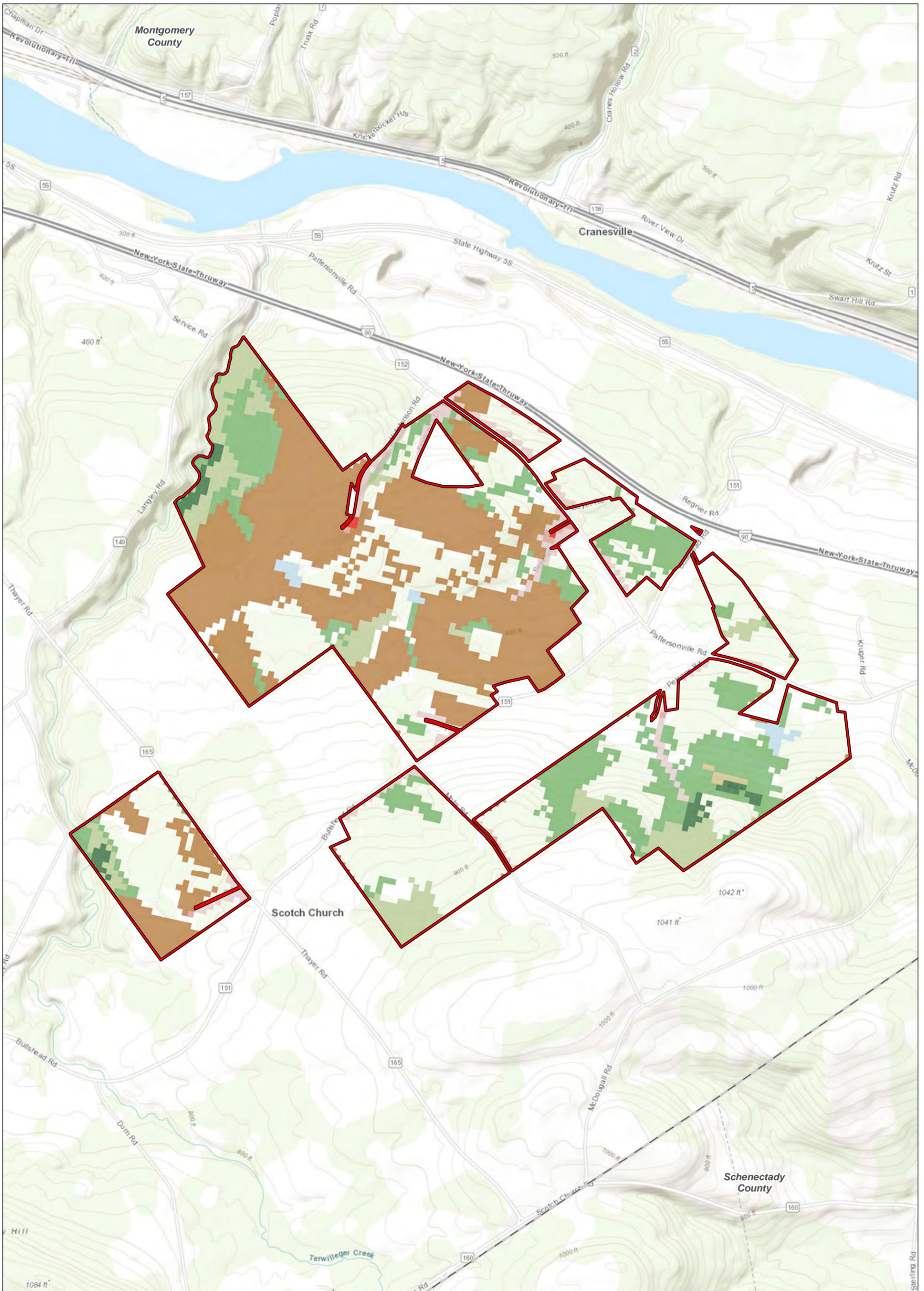


**GRASSLAND STUDY AREA  
ONEIDA COUNTY**  
HIGH RIVER  
ENERGY CENTER, LLC  
TOWN OF FLORIDA, NY

2.5 FIGURE 6

AUGUST 2019





- Project Area
- County Boundary
- Land Cover Classification**
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Cultivated Crops
- Woody Wetlands

Data: USGS National Land Cover Dataset, 2016  
 Base Map: NYS Office of Information Technology Services,  
 GIS Program Office, 2018; Esri and its contributors



**MAP LOCATION**

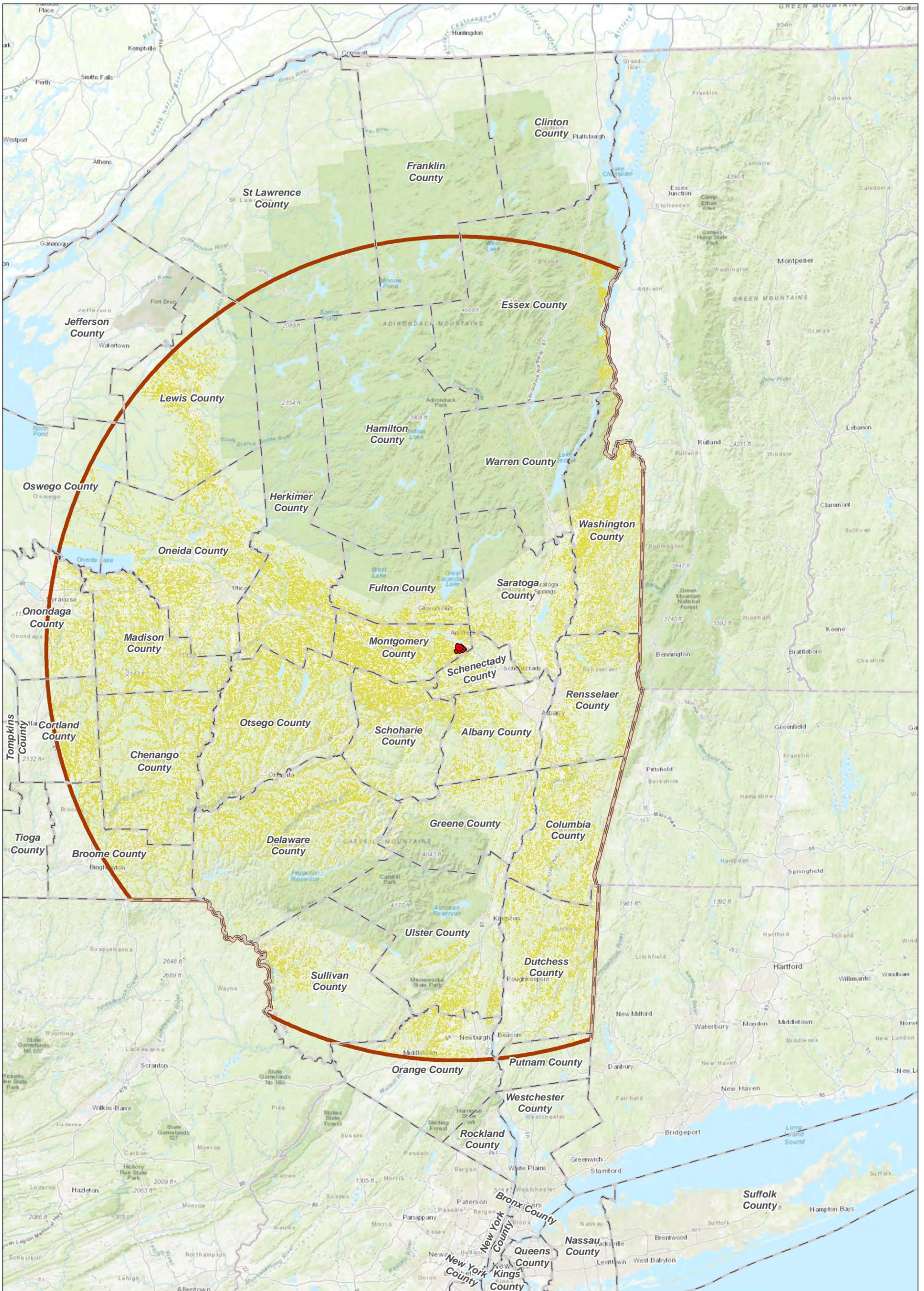


**NLCD PROJECT AREA**  
**HIGH RIVER**  
**ENERGY CENTER, LLC**  
**TOWN OF FLORIDA, NY**

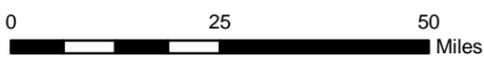
FIGURE 3

AUGUST 2019

Map Produced by TRC



Project Area  
 County Boundary  
 Grassland Study Area  
**Land Cover Classification**  
 Grassland/Herbaceous  
 Hay/Pasture  
 Data: NYS Office of Information Technology Services,  
 GIS Program Office, 2018  
 Base Map: USGS/The National Map



**NLCD - GRASSLAND HABITAT  
 GRASSLAND STUDY AREA**  
**HIGH RIVER**  
**ENERGY CENTER, LLC**  
**TOWN OF FLORIDA, NY**  
 FIGURE 5 | AUGUST 2019  
 Map Produced by