Song Sparrow Solar Project

Threatened and Endangered Species
Habitat Assessment Report

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Sign-off Sheet

This document entitled Song Sparrow Solar Project Threatened and Endangered Species Habitat Assessment Report was prepared by Stantec Consulting Services Inc. (“Stantec”) for the account of Clearway Energy, Inc. (the “Client”). The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The evidence, findings and conclusions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others.

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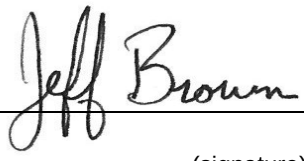
Reviewed by 

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1.0 INTRODUCTION

Clearway Energy LLC (Clearway) is proposing to construct a photovoltaic electric-generating facility and associated infrastructure (the "Project") within 1,405.4 acres of land in Ballard County, Kentucky (**Figure 1**, **Appendix A**). Stantec Consulting Services Inc. (Stantec) was retained by Clearway to conduct a threatened and endangered species habitat assessment concurrently with a wetland and waterbody delineation for the Project as part of the Project's regulatory due diligence. Stantec biologists performed habitat assessment field surveys for threatened and endangered federal and state-listed species on February 20 to 24, 2023, and February 28 to March 3, 2023. Prior to field surveys, Stantec biologists conducted a desktop review of the Project area using publicly available information to coarsely assess the potential for suitable federal and state-listed threatened and endangered species habitats to occur. This report presents the findings from both the desktop review and the threatened and endangered species habitat field surveys.

1.1 REGULATORY FRAMEWORK

1.1.1 Endangered Species Act

The purpose of the Endangered Species Act of 1973, as amended (ESA; 16 United States Code [U.S.C.] §1531–1544) is to conserve threatened and endangered species and the ecosystems upon which they depend. The ESA-listed species and designated critical habitat are governed by the ESA and the implementing regulations of 50 Code of Federal Regulations (CFR) Parts 13 and 17. Sections 7 and 9 of the ESA are most relevant to this document.

Section 7(a)(2) of the ESA requires all federal agencies consult with the United States Fish and Wildlife Service (USFWS) to ensure that any action "authorized, funded, or carried out" by any such agency "is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification" of critical habitat. Actions of federal agencies that are not likely to jeopardize the continued existence of ESA-listed species or result in destruction or adverse modification of their designated critical habitat, but that could adversely affect the species, or result in a take, must be addressed under Section 7 of the ESA.

Section 9 of the ESA prohibits the "take" of any fish or wildlife species listed under the ESA as endangered. Take is defined as "…to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct" (50 CFR §10.12), and "harm" is "an act which actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering" (50 CFR §17.3). Harm is further defined to mean "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering". Harass is "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering".

The 1982 amendments to the ESA established a provision in section 10 of the ESA that allows the USFWS to authorize "incidental take" of ESA-listed wildlife species by non-federal entities through the issuance of Incidental Take Permits (ITPs). Incidental take is defined as take that is "incidental to, and not the purpose

of, the carrying out of an otherwise lawful activity" (50 CFR §402.02). Section 10 of the ESA establishes a program whereby persons seeking to pursue activities that otherwise could give rise to liability for unlawful "take" of ESA-listed species as defined in section 9 of the ESA, may receive an ITP, which exempts them from such liability. Under section 10 of the ESA, applicants may be authorized, through issuance of an ITP, to conduct activities that may result in take of ESA-listed species, if the take is incidental to, and not the purpose of, otherwise lawful activities. The USFWS is charged with regulating the incidental taking of ESA-listed species under its jurisdiction.

Under federal regulation, take of fish or wildlife species listed as threatened is also prohibited unless specifically exempted by a Section 4(d) rule. Take of ESA-listed plants is not prohibited unless they are on federal lands, there is a federal nexus (e.g., federal permit), or are taken in knowing violation of any state law or state regulation or in violation of state trespass law. If the proposed Project will require permitting through the USACE or receive any federal funding, it will be subject to compliance with the ESA.

1.1.2 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) prohibits take and disturbance of eagles and their nests (16 U.S.C. 668). Take permits for birds or body parts are limited to religious, scientific, or falconry pursuits. However, the BGEPA was amended in 1978 to allow mining developers to apply to USFWS for permits to remove inactive golden eagle (*Aquila chrysaetos*) nests in the course of "resource development or recovery" operations. With the 2007 removal of bald eagle from the ESA list of threatened and endangered species, USFWS issued new regulations to authorize the limited take of bald eagles (*Haliaeetus leucocephalus*) and golden eagles under the BGEPA, where the take to be authorized is associated with otherwise lawful activities. A final Eagle Permit Rule was published on September 11, 2009 (74 FR 46836–46879; 50 CFR 22.26).

A permit authorizes limited, non-purposeful take of bald eagles and golden eagles, and can be applied for by individuals, companies, government agencies (including tribal governments), and other organizations to allow disturbance or otherwise take eagles in the course of conducting lawful activities, such as operating utilities and airports. Under BGEPA, take is defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest or disturb." Disturb is defined in the regulations as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle; (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." Most permits issued under the new regulations authorize disturbance. In limited cases, a permit may authorize the physical take of eagles, but only if every precaution is first taken to avoid physical take.

1.1.3 State Regulations

Kentucky wildlife and their habitats are protected under the following legislation: Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), and Title XII, Chapter 150 of the Kentucky Revised Statutes (K.R.S.), and Title 301 of the Kentucky Administrative Regulations (K.A.R.) Chapter 3, Section 061 (Endangered Species) and Chapter 4 (Wildlife).The Kentucky Department of Fish and Wildlife Resources (KDFWR) and the Office of Kentucky Nature Preserves (OKNP) follows the federal regulations and

guidance on Threatened and Endangered species' protection. If appropriate habitats exist for state-listed species, Song Sparrow Solar may conduct voluntary coordination with the KDFWR and the OKNP as part of their due diligence. The state requires no other special permitting/regulations other than abiding by the MBTA. If appropriate habitats exist for federally listed species, Song Sparrow Solar should coordinate with the USFWS Kentucky Ecological Services Field Office in Frankfort, Kentucky.

1.2 LOCATION OF PROJECT

The Project is located approximately 10 miles southwest of Paducah in Ballard County, Kentucky. The Project is within the Humphrey Creek watershed (HUC-12 051402060601) within the Lower Ohio watershed (HUC-6 051402). The Project is drained by Humphrey Creek and an unnamed tributary to Humphrey Branch. Humphrey Creek flows north through the central portion of the Project (**Appendix A, Figure 1**).

1.3 GEOLOGY AND TOPOGRAPHY

The Project lies within the eastern portion of the Mississippi Embayment (Jackson Purchase) physiographic province of Kentucky. This region is typically less than 100 feet in local relief and is generally flat with many sloughs, ponds, and lakes (KGS 2012).

The Mississippian Plateau is part of the Western Mesophytic forest region described by Braun (1950). In the eastern section of the Mississippian Plateau where the Project is located, the slopes contain beech- (*Fagus*) dominated mixed mesophytic forest with oak (*Quercus*), oak-hickory (*Q.-Carya*), and oak-chestnut (*Q.-Castanea*) forest types on the drier slopes and ridges.

2.0 METHODS

2.1 DESKTOP REVIEW

To identify natural resources and habitats in the Song Sparrow Solar Project, Stantec performed a desktop review of land cover data (Multi-Resolution Land Characteristics Consortium [MRLCC] National Land Cover Dataset [NLCD] 2019) and aerial imagery (Google Earth 2023) and relied on expert natural history knowledge of the area. To determine the potential presence of threatened or endangered species within the Project, Stantec reviewed occurrence records and range maps and consulted the Office of Kentucky Nature Preserves (OKNP) and USFWS Information for Planning and Consultation (IPaC) resource list for the Project area. Locations of karst features (especially caves) that may provide suitable habitat for listed bat species were reviewed upon receipt of data from the Kentucky Speleological Society (KSS).

2.2 FIELD SURVEY EFFORT

The threatened and endangered species habitat assessment field survey was conducted concurrently with the wetland and waterbody delineation on February 20 to 24, 2023, and February 28 to March 3, 2023. During the field visit, Stantec biologists performed a pedestrian survey of habitat types within the Project area. If any threatened or endangered species or their habitats were encountered in the field, their locations were recorded with Geographic Positioning Systems (GPS).

As part of the field habitat survey, biologists recorded dominant vegetation species within each habitat and defined the boundaries of each vegetation community identified within the Project area. Habitat boundaries were later delineated using current ArcGIS software and are presented on **Figure 2** (**Appendix A**). The vegetation communities were further categorized in accordance with the NLCD (MRLCC 2019; Anderson 1973), while wetlands identified within the Project area were categorized using the Cowardin system (Cowardin et al. 1979). In addition to recording and delineating vegetative communities, biologists recorded locations, took photographs, and assessed physical characteristics of additional features (e.g., abandoned barns, rock faces, and outcrops) that could serve as habitat for listed species.

3.0 RESULTS

3.1 DESKTOP REVIEW

Initial desktop assessment of land cover revealed the majority of the Project consists of cultivated crops (1,076.9 ac [76.8%]) with smaller amounts of forested areas (deciduous, woody wetlands, mixed forest, and evergreen forest types; 251.50 ac [17.9%], 12.6 ac [0.9%], 2.3 ac [0.2%], and evergreen 1.0 ac [<0.1%], respectively). The majority of forested areas surrounds Humphrey Creek and its tributaries.

Results from the IPaC (USFWS 2023a) requested for the Project area indicated potential for three federally listed mammal species to occur in the Project, and one federally listed mollusk to occur in the 1-mile buffer of the Project. It also indicated potential for bald eagles, protected under the BGEPA (16 U.S.C. 668), to occur in the Project seasonally. Additionally, OKNP identified State-listed species records within 1-mile of the Project. The state listed species includes one insect and two species of plants.

Listed species with the potential to occur in the Project area are listed in **Table 1** below. Species-specific habitats or conditions are also included, as well as impact statements as they apply to the Project. Defined habitat types and boundaries are shown on **Figure 2** (**Appendix A**), representative photographs of habitats are provided in **Appendix B**, and the IPaC and OKNP report are found in **Appendix C**.

The overall topography of the Project ranges in elevation from 390 – 470 feet above mean sea level (USGS 2019). The KSS (2023) reported there are no caves in the Project or within a one-mile buffer and the closest cave is located more than 25 miles to the east.

Results

Table 1. Summary of Potential Federal and State-Listed Threatened and Endangered Species within the Song Sparrow Solar Project Area, Ballard County, Kentucky.

Species Name	Federal/State[1] Listing	Known Within One Mile of Project Area?[2]	Habitat Preference	Potential Habitat Observed in Project Area?	Likelihood of Occurrence	USFWS and KDFWR Comments/Recommendations	Potential for Habitat Impact
Mammals							
Gray Bat (*Myotis grisescens*)	FE, ST	No	Cave-obligate species; uses caves year-round. During winter, hibernates in deep, vertical caves with large rooms that provide stable temperatures. About 95%of the total gray bat population is known to hibernate in fewer than 20 caves. In summer, usually roosts in caves scattered along rivers, also known to roost in anthropogenic structures including under bridges, inside storm sewers, and inside dams. Forages on emerging aquatic insects along waterways including creeks, rivers, and lakes (KDFWR 2021a).	Yes – Foraging	Low	If Project development necessitates tree clearing along streams or impacts to water sources, then additional coordination with USFWS may be required to avoid indirect take of gray bat foraging habitat.	The KDFWR does not have occurrence records of gray bat in Ballard County either for maternity or hibernation. KSS did not identify any caves within the Project, and the closest recorded cave is located more than 25 miles to the east. Humphrey Creek and other perennial streams in the Project may provide suitable foraging habitat. If tree clearing along waterways occurs for Project development impacts to foraging habitat may occur. While trees are not used as long-term roosts, the shade and other aspects of trees help provide habitat for food sources within streams.
Indiana Bat (*Myotis sodalis*)	FE, SE	No	Winter hibernacula consists of caves and abandoned mines; specifically, humid caves that have temperatures below 50° F but above freezing. Following hibernation, the Indiana bat migrates from hibernacula to summer habitat where it typically roosts under loose bark on living or dead trees (USFWS 2007). Indiana bats may change roost sites every 2-3 days and may fly several miles to reach the next roost site (Kurta 2004). Females form maternity colonies while males roost alone or in small groups. Maternity colonies form under loose bark in trees with solar exposure to aid in thermoregulation. Foraging habitat for the Indiana bat incudes upland and bottomland forested areas, forested road and stream corridors, forested wetlands, and along edges of pasture and agricultural fields (USFWS 2019a).	Yes – Roosting/Foraging	Moderate	Coordination with the USFWS is recommended. The Project falls within “Potential Habitat” which includes suitable roosting, foraging and travel/migration habitat for the Indiana bat. Depending on the amount of tree clearing, summer mist net surveys or a contribution to the Imperiled Bat Conservation Fund (IBCF) may be necessary depending on whether the Project has a federal nexus. If the Project assumes presence, then a contribution to the IBCF based on the amount of tree clearing will be required.	USFWS has records of maternity populations in western Ballard County outside of the Project. KSS did not identify any caves within the Project, and the closest recorded cave is located more than 25 miles to the east. Several manmade structures including silos, barns, hunting blinds, and sheds were observed within the Project that could act as temporary roosts for this species. Summer foraging and roosting habitat was observed along in the forested areas along Humphrey Creek and other forested riparian areas. If impacts are proposed to potential habitat, then further surveys and/or consultation may be required. However, if impacts to habitat can be avoided, no impacts to this species are anticipated.
Northern Long-eared Bat (*Myotis septentrionalis*)	FE, SE	No	Typically hibernates in caves and abandoned mines and rarely, basements and crawl spaces of human dwellings, buildings, natural rock outcrops, talus slopes, and other rocky structures (e.g., road-cuts and mine highwalls) (USFWS 2015a, White et al. 2020). Typically hibernates singly in small cracks or crevices in a variety of caves with constant, cool temperatures. In the summer, roosts in live or dead trees of varying size (minimum 3 inches diameter at breast height) in cavities or crevices,	Yes – Roosting/Foraging	Moderate	Coordination with the USFWS is recommended. The Project falls within “Potential Habitat” which includes suitable roosting, foraging and travel/migration habitat for the northern long-eared bat. Depending on the amount of tree clearing, summer mist net surveys or a contribution to the IBCF may be necessary depending on whether the Project has a federal nexus. If the Project assumes presence, then a contribution to the IBCF based on the amount of tree clearing will be required.	KSS did not identify any caves within the Project, and the closest recorded cave is located more than 25 miles to the east. Several manmade structures including silos, barns, hunting blinds, and sheds were observed within the Project that could act as temporary roosts for this species. If tree clearing for Project development does not occur or is relatively limited, minimal impacts to habitat for this species are anticipated. If impacts are proposed to potential habitat, then further surveys and/or consultation may be required. However, if impacts to habitat can be avoided, no impacts to this species are anticipated.

Results

Table 1. Summary of Potential Federal and State-Listed Threatened and Endangered Species within the Song Sparrow Solar Project Area, Ballard County, Kentucky.

Species Name	Federal/State[1] Listing	Known Within One Mile of Project Area?[2]	Habitat Preference	Potential Habitat Observed in Project Area?	Likelihood of Occurrence	USFWS and KDFWR Comments/Recommendations	Potential for Habitat Impact
			and occasionally human-made structures such as barns (USFWS 2015a). Foraging habitat often includes mature forest on hillsides and forested stream or road corridors. Known summer habitat occurs within one mile of the Project (OKNP 2021).				
Tricolored Bat ‡ (*Perimyotis subflavus*)	FC	No	Typically hibernates singly in caves with stable temperatures throughout most of its range, but occasionally hibernates in culverts and bridges in the southern part of its range. After emergence, travels short distances to summer habitat, which consists of forested riparian areas. Small maternity groups are found in clumps of dead leaves of deciduous trees and pine needle clumps, while males roost individually, often in caves or mines. Commonly found foraging over waterways, but occasionally along forest edges and in fields (Boyles et al. 2009).	Yes‡	Moderate	Coordination with the USFWS is recommended. The Project falls within “Potential Habitat” which includes suitable roosting, foraging and travel/migration habitat for the tricolored bat. Depending on the amount of tree clearing, summer mist net surveys or a contribution to the IBCF may be necessary depending on whether the Project has a federal nexus. If the Project assumes presence, then a contribution to the IBCF based on the amount of tree clearing will be required.	KSS did not identify any caves within the Project, and the closest recorded cave is located more than 25 miles to the east. Summer foraging and roosting habitat was observed along in the forested areas along Humphrey Creek. If tree clearing for Project development does not occur or is relatively limited, minimal impacts to habitat for this species are anticipated. If impacts are proposed to potential habitat, then further surveys and/or consultation may be required. However, if impacts to habitat can be avoided, no impacts to this species are anticipated.
Birds							
Bald Eagle (*Haliaeetus leucocephalus*)	BGEPA	No	Suitable habitat for this species includes fish-bearing waters (e.g., estuaries, large lakes, reservoirs, rivers) with adjacent mature forest or trees. Constructs nests in dominant trees, typically within two miles of fish-bearing water; increasingly, nests further from water as population density increases. In winter, congregates in tall trees near open water for roosting and spotting prey. Also forages opportunistically on carrion and may be attracted to confined animal feeding operations (CAFOs) where carcasses are present (Buehler 2020).	Yes	Moderate	If an occupied nest is present during construction, it is recommended that a 660’ buffer be maintained between the nest and construction activities until the eagles and their young have fledged or limited to outside the nesting season.	Potential nesting habitat in the form of dominant, broadly branching trees was observed along Humphrey Creek; however, no eagle nests were observed during field reconnaissance. No obvious eagle attractants (e.g., CAFOs) were observed in the Project, but Humphrey Creek likely provides foraging opportunities for bald eagles. Since there were no known nest observed within the Project and activities are not proposed along Humphries Creek, no impacts to this species are anticipated.
Whooping Crane (*Grus americana*) (Experimental Population)	EXPN	No	The Project area occurs within the winter range and migration routes of the whooping crane. Stopover habitat includes a variety of croplands in or near herbaceous, shallow wetlands. Although the Project area is within the wintering range, it is very rare outside of populations in Texas and Florida (USFWS 2012).	Yes	Low	There are no impacts anticipated as ponds in the Project will not be impacted and the population is considered experimental. Experimental populations of the species are considered “nonessential” and not subject to the same regulations under the ESA. Coordination with USFWS is not required.	The various ponds, wetlands, and agricultural land in the Project area could provide stopover habitat for the whooping crane. Impact to wetlands on the site are minimal and the surrounding area likely provides similar habitat for stopover habitat for the whooping crane. There are no known records of the whooping crane in the KSNPC database so no impacts to this species are anticipated.
Plants							

Results

Table 1. Summary of Potential Federal and State-Listed Threatened and Endangered Species within the Song Sparrow Solar Project Area, Ballard County, Kentucky.

Species Name	Federal/State[1] Listing	Known Within One Mile of Project Area?[2]	Habitat Preference	Potential Habitat Observed in Project Area?	Likelihood of Occurrence	USFWS and KDFWR Comments/Recommendations	Potential for Habitat Impact
Sweet Coneflower (*Rudbeckia subtomentosa*)	SE (Historical Occurrence)	Yes	This species is known to occur in black soil prairies, sand prairies, savannas, gaps in deciduous woodlands, banks of streams and ditches. The sweet coneflower prefers partial or full sun in mesic to moist soil comprised of loam or sandy loam substrates.	Yes†	Low	No comments.	There was one historical record of this species within 1-mile of the Project area. No prairies or prairie remnants were observed in the Project area. The banks along the streams and forested areas may provide suitable habitat. If impacts to habitat can be avoided, no impacts to this species are anticipated. There are no requirements to conduct surveys for state-listed species.
Compassplant (*Silphium laciniatum*)	ST (Historical Occurrence)	Yes	This species is known to occur in black soil prairies, sand prairies, glades, and along roadsides.	Yes†	Low	No comments.	There were two historical records of this species within 1-mile of the Project area identified by OKNP. No prairies or glades were observed in the Project area; however, this species could occur along roadsides with little to no canopy cover. There are no requirements to conduct surveys for state-listed species.
Insects							
Double-ringed Pennant (*Celithemis verna*)	SE (Historical Occurrence)	Yes	Typically breeds in infertile lakes and ponds with sporadic emergent vegetation. In Kentucky it has also been observed in a eutrophic pond. This species can rarely be found in streams and ditches.	Yes†	Low	No comments.	Potentially suitable habitat is located in the ponds throughout the Project area.. However, if impacts to habitat can be avoided, no impacts to this species are anticipated. There are no requirements to conduct surveys for state-listed species.
Monarch Butterfly (*Danaus plexippus*)	FC	No	Herbaceous areas with milkweed (*Asclepias sp.*), which is the host plant for the caterpillar.	Yes	Low	No comments	The majority of the Project is dominated by cultivated crops which provides little suitable habitat for the monarch butterfly. No impacts to this species are anticipated.
Mussels							
Pink Mucket (*Lampsilis abrupta*)	FE	No	The species is typically found in large rivers with fast currents with rock and boulder substrates. It can also be found in impoundments with river-lake situations	No	Low	No comments	No habitat was observed in the Project area.

[1] FE = federally listed endangered; FT = federally listed threatened; FC = candidate for federal listing and under current review; SE = state-listed endangered; ST = state-listed threatened; BGEPA = afforded special protection under Bald and Golden Eagle Protection EXPN = Experimental Population Act (16 U.S.C. 668)
[2] Based on Office of Kentucky Nature Preserves Occurrence Report and eBird (2021) data
† Historical records within 1-miles of the Project area
‡ Identified as having the potential to occur in the Project based on known range and habitat within the Project; not identified by IPaC or OKNP

3.2 TERRESTRIAL HABITATS

Stantec biologists completed field reconnaissance for suitable habitats for federally and state-listed threatened and endangered species within the Project area on February 20 – 24, 2023, and February 28 – March 3, 2023. Similar to the desktop assessment, the Project area was dominated by cultivated crops, which covered approximately 76.8% of the total Project area. Forested landcover (including deciduous forest, woody wetlands, and mixed forest) accounted for approximately 19.1% of total the total project area. Land cover types, as defined by NLCD (MRLCC 2019) and Cowardin et al. (1979), their acreage, their suitability for listed species, and the observed vegetative communities and habitats that compose them are described in **Table 2.** Habitats/vegetative communities are mapped in **Figure 2** in **Appendix A.** Representative photographs habitats are included in **Appendix B**, and photo locations are shown on Figure 2 in Appendix A.

3.2.1 Mammals

Stantec biologists also noted four barns within 1,000 feet of forested habitat that had potential to provide roosting opportunities for Indiana and northern long-eared bats. Locations of these features can be seen **on Figure 3** in **Attachment A.**

Of the 1,402.8 acres within the Project area, 327.2 acres were forested. Forest onsite consisted mostly of mature upland deciduous forests and forested wetlands (**Table 2**). The majority of forested habitat in the Project surrounded the riparian corridors along Humphrey Creek and Humphrey Branch and their tributaries, which provides ideal foraging habitat for bats. Trees with exfoliating bark (e.g., shagbark hickory [*Carya ovata*]) and snags with solar exposure were observed in forested areas and could serve as suitable maternity roost trees for Indiana, northern long-eared, and tricolored bats. addition to forested habitats, other vegetative communities may provide foraging opportunities for bats, including shrub-scrub areas; native grassland; emergent, shrub-scrub, and forested wetlands; open water; and the edges of agricultural fields (**Table 2**). No caves were observed in the Project area, and a search of the KSS database indicated the closest known cave is approximately 25 miles from the Project area.

3.2.2 Birds

No bald eagle nests were observed in the Project and there were no obvious bald eagle attractants (e.g., confined animal feeding operations, fish farms) observed. Due to its relatively large size, Humphrey Creek could serve as potential bald eagle foraging habitat. The various croplands and wetlands in the Project area could stopover habitat for the whooping crane. Impact to wetlands on the site are minimal and the surrounding area likely provides similar habitat for stopover habitat for the whooping crane.

3.2.3 Insects

The monarch butterfly may migrate through the Project area, but it is not expected to utilize the Project area due to the majority of the Project being comprised of cultivated cropland.

3.2.4 Plants

Floral communities in the Project ranged from heavily disturbed ruderal communities dominated by opportunistic invaders to natural communities dominated by native species (**Table 2**). The majority of the Project consist of cultivated crops and provides no habitat for the listed plant species. No prairie or glades remnants were observed in the Project area, however roadsides with little to no canopy cover could provide habitat for the compassplant (*Silphium laciniatum*). Additionally, the streams, ditches, and forested areas in the Project area may provide suitable habitat for the sweet coneflower (*Rudbeckia subtomentosa*). Additional habitat requirements for listed plants are included in **Table 1**. There are no requirements to conduct surveys for state listed species.

3.3 WETLAND AND AQUATIC HABITAT

Forty-four (44) wetlands, 239 streams, and nine (9) open water features were identified within the Project. Fifteen (15) wetlands were classified as palustrine emergent wetlands and totaled 1.5 acres. Two (2) wetlands were classified as palustrine emergent wetlands and palustrine forested and totaled 0.6 acres. Ten (10) wetlands were classified as palustrine forested and totaled 0.7 acres. Three (3) wetlands were classified as palustrine shrub scrub and totaled 0.4 acres. Six (6) wetlands were classified as palustrine shrub scrub and palustrine emergent wetlands and totaled 0.5 acres. Eight (8) wetlands were classified as palustrine shrub scrub and palustrine forested and totaled 1.2 acres. Dominant vegetative species for each wetland classification are provided in **Table 2**. Additionally, a total of 97,700.3 linear feet of stream was observed within the Project area. Eleven (11) streams were considered to have a perennial flow regime. Fifty (50) streams were considered to have intermittent flow regime, and one hundred and eighty (180) streams were considered to have an ephemeral flow regime. Nine (9) open water features were identified in the Project area. Many of the open water features were vernal ponds in forested areas and amphibian eggs were observed within them. Open water features totaled 1.7 acres.

3.3.1 Insects

The thirteen open-water features and streams within the Project area may provide suitable habitat for the double-ringed pennant. No impacts to this species are anticipated as the Project avoids impacting potential habitat.

3.3.2 Mollusks, Fishes, Crayfishes, and Amphibians

Biologists noted that Humphrey Creek was approximately 40 feet wide and was only flowing in the thalweg of the channel although some sections were pooled and deep. The substrates observed included gravel and sand. This stream could provide habitat for the fish, crayfish, and mollusk species in the Project area. Additionally, one cypress slough was observed in the north central portion of the Project that could provide habitat for the double-ringed pennant. **Table 1** provides specific habitat requirements for listed species.

Results

Table 2. Vegetation Communities and Land Cover Found within the Song Sparrow Solar Project Area, Ballard County, Kentucky

Land Cover Type[1]	Vegetation Communities within the Project Area	Degree of Human-Related Ecological Disturbance and Representative Species List	Unique, Rare, or High Quality?	Approximate Acreage	Listed Species Suitability
Deciduous Forest	Mature Deciduous Forest (Upland)	Low to Moderate Disturbance/Natural Community (dominated by native species and/or opportunistic invaders). Dominant species included northern red oak (*Quercus rubra*), white oak (*Q. alba)*, southern red oak (*Q. falcata*),), hackberry (*Celtis occidentalis*), red maple (*Acer rubrum*), and black cherry (*Prunus serontina*)	No	251.5	Indiana, northern long-eared, tricolored bats (foraging and roosting)
Evergreen Forest	Mature Evergreen Forest (Upland)	Low to Moderate Disturbance/Natural Community (dominated by native species and/or opportunistic invaders). Dominant species included eastern red cedar (*Juniperus virginiana*) and Virginia pine (*Pinus virginiana*)	No	1.0	Indiana, northern long-eared, tricolored bats (foraging)
Mixed Forest	Deciduous and Evergreen (Upland) Forest	Low to High Disturbance/Natural Community (dominated by native species and/or opportunistic invaders). Dominant species included hackberry, red maple, black cherry, and eastern red cedar	No	2.3	Indiana, northern long-eared, tricolored bats (foraging and roosting)
Woody Wetlands	Bottomland Hardwood Forest	Moderate Disturbance/Natural Community (dominated by native and herbaceous species and/or opportunistic invaders). Dominant species included American sycamore (*Platanus occidentalis*), box elder (*Acer negundo*), river birch (*Betula nigra*), giant cane (*Arundinaria gigantea*) and bald cypress (*Taxodium distichum*)	No	12.6	Indiana, northern long-eared, little brown, tricolored bats (foraging and roosting)
Scrub-Shrub	Scrub-Shrub	Moderate to Extreme Disturbance/Ruderal Community (dominated by opportunistic invaders and/or native highly tolerant taxa). Dominant plant species included multiflora rose (*Rosa multiflora*), bush honeysuckle (Lonicera maakii	No	1.9	Bats (foraging)
Open Water	Open Water	Low to High Disturbance/Ruderal Community (free of vegetation).	No	1.7	Bats (foraging and drinking)
Riverine*	Creek*	Low Disturbance (free of vegetation).	No	1.0	Mollusks, bats (foraging); (along banks); bald eagle

Results

Land Cover Type[1]	Vegetation Communities within the Project Area	Degree of Human-Related Ecological Disturbance and Representative Species List	Unique, Rare, or High Quality?	Approximate Acreage	Listed Species Suitability
Emergent Wetland	Palustrine Emergent Wetland[2]	Moderate Disturbance/Natural Community (dominated by native and herbaceous species and/or opportunistic invaders). Dominant plant species included, Frank's sedge (*Carex frankii*), fox sedge (*Carex vulpinoidea*), common rush (*Juncus effusus*), fall panicum (*Panicum dichotomiflorum*), and barnyard grass (*Echinochloa crus-gall*)	No	2.6	Bats (foraging, whooping cranes (stopover)
Grassland/ Herbaceous	Hay/Pasture	High Disturbance/Ruderal Community (dominated by planted grasses, opportunistic invaders, and/or highly tolerant native taxa). Dominant species included fall panicum (*Panicum dichotomiflorum*), and barnyard grass (*Echinochloa crus-gall*), and Kentucky bluegrass (*Poa pratensis*)	No	26.2	bats (foraging)
Cultivated Crops	Agricultural Field	Extreme Disturbance/Ruderal Community (dominated by opportunistic invaders, planted non-native species, and/or native highly tolerant taxa). The dominant planted species was corn (*Zea mays*).	No	1,076.9	Bats (foraging), whooping crane (stopover)
Developed	Developed (e.g., residential areas, roadways, manicured lawns)	High to Extreme Disturbance/Ruderal Community (free of vegetation and/or dominated by opportunistic invaders, planted non-native species, and native highly tolerant taxa). Dominant species included henbit deadnettle (*Lamium amplexicaule*) and mixed grasses.	No	30.4	Bats (roosting in barns)
			Total[†]	**1,408.1**	

[1] Land Cover Type is defined by NLCD (MRLCC 2019).
[2] Palustrine Emergent, Scrub-Shrub and Forested wetlands are defined using Cowardin system (Cowardin et al 1979).
* Linear stream features with a width greater than 20 feet were classified as riverine and digitized as polygon features (Humphrey Creek).
[†] Total may slightly differ from value shown, due to rounding and inclusions of field calculations and NLCD calculations.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Stantec conducted a desktop analysis and field surveys for threatened and endangered species and their habitats on February 20 – 24, 2023, and February 28 – March 3, 2023. As part of the field surveys, Stantec recorded dominant habitat types and vegetation communities within the Project area. Habitats found within the Project area included deciduous forest, mixed forest, shrub scrub, open water, riverine, palustrine emergent wetland, row crop, and forested wetland habitats.

During field surveys, Stantec identified suitable habitat for federally and state-listed species within the Project area, including three listed bat species (Indiana bat, northern long-eared bat, gray bat) and one bat species proposed for listing (tricolored bat); bald eagle, which is protected under the BGEPA; the federally listed whooping crane, two state-listed plant (sweet coneflower); one state-listed insect (double-ringed pennant) and monarch butterfly, which is a candidate for listing.

Taxa- and species-specific considerations are described below.

- If Project development will require tree clearing bat mist-net surveys conducted during the maternity season (May 15 – August 15) are recommended to determine summer presence/probable absence of listed bat species, however, presence can also be assumed. Depending on the amount of tree clearing, summer mist net surveys or a contribution to the Imperiled Bat Conservation Fund may be necessary depending on whether the Project has a federal nexus.
- Suitable habitat for bald eagles was observed in the riparian forest area surrounding Humphrey Creek. No bald eagle nests were observed during field surveys. However, bald eagles are prolific nest-builders, and if a bald eagle nest is constructed within the Project area following field surveys, potential disturbance (noise, tree removal) that may occur from Project construction should occur no closer than 660 feet (200 meters) to an occupied nest until the young fledge or be limited to outside the nesting season, which occurs January through July but nest construction can occur as early as October (KDFWR 2022).

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Appendix A FIGURES

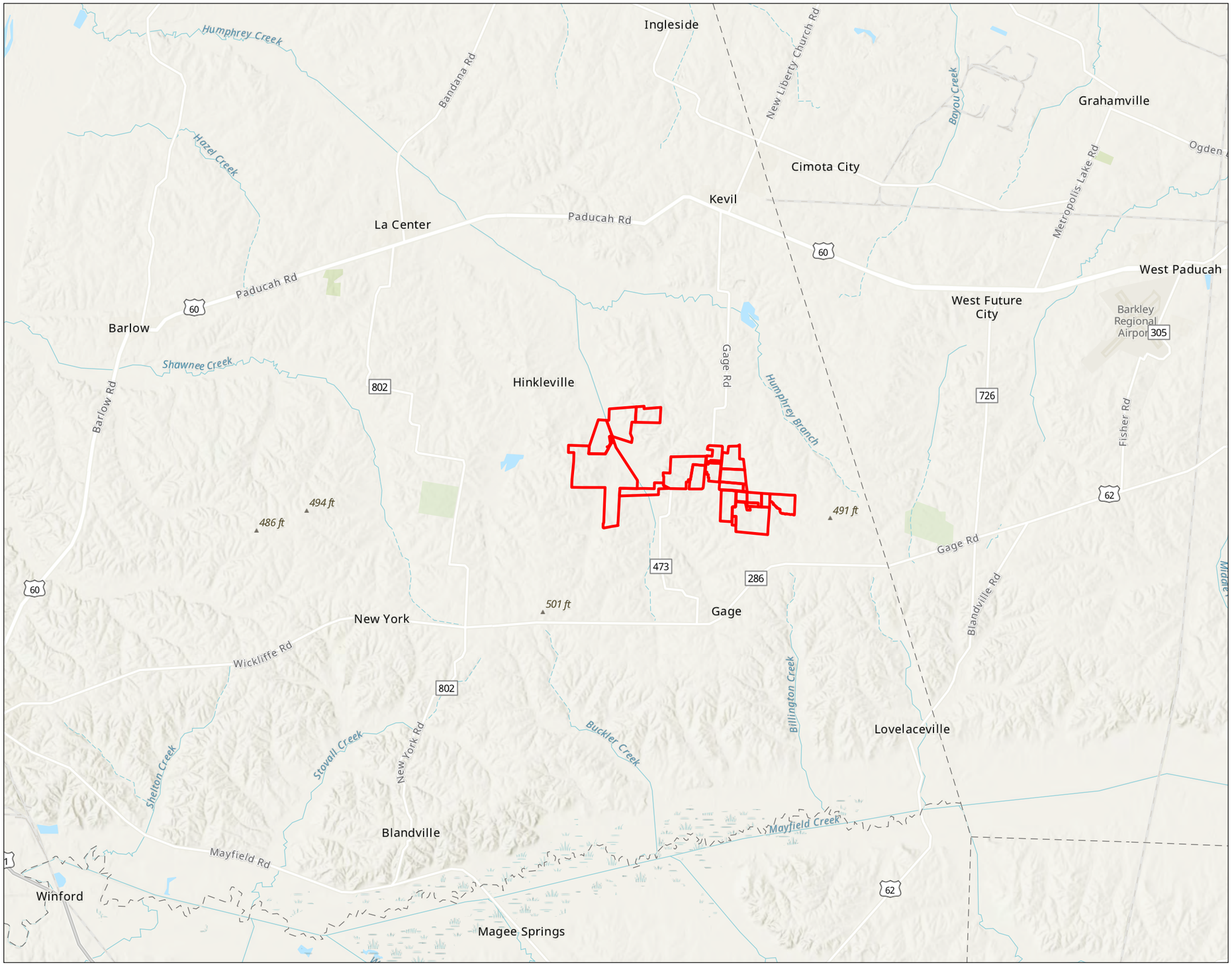


Figure No.
1

Title
Project Overview

Client/Project
172607907
Song Sparrow Solar LLC
Song Sparrow Solar
Threatened and Endangered Species Habitat Assessment

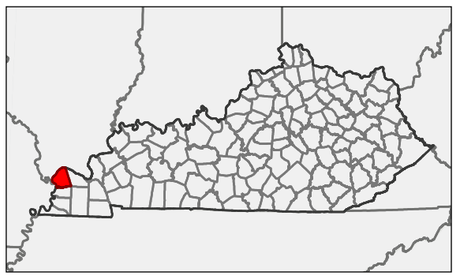
Project Location
Ballard County, Kentucky

Prepared by MNA on 2023-06-13
TR by CMK on 2023-06-16
IR by SPK on 2023-06-16

0 8,000 16,000 Feet

(At original document size of 11x17)
1 inch = 8,000 feet

Legend
Project Boundary



Notes
1. Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
2. Data Sources: Clearway Energy, Inc., Esri Aerial
3. Background: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec Clearway

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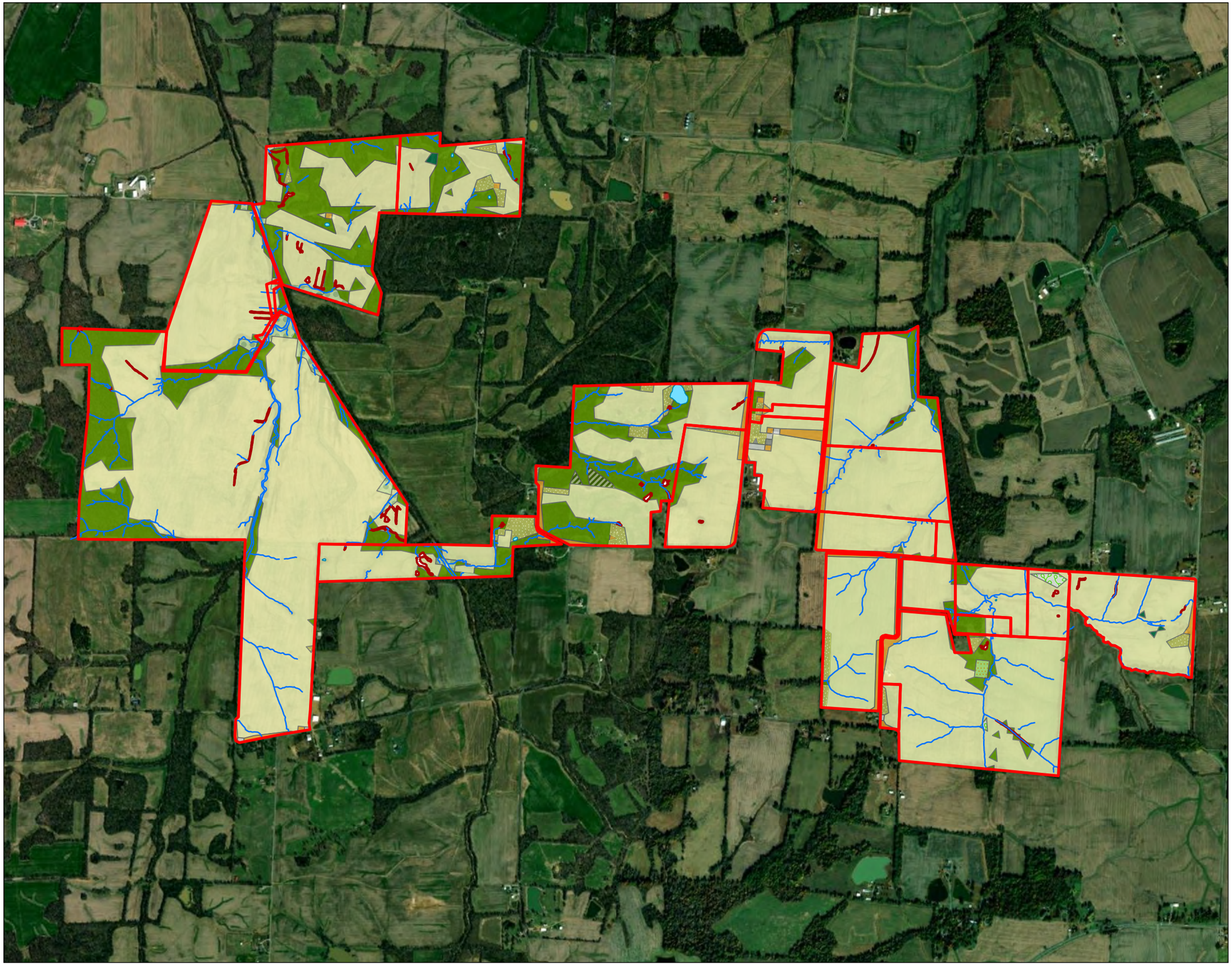


Figure No.

2

Title

National Land Cover Database (NLCD) and Delineated Habitat Map

Client/Project 172607907

Song Sparrow Solar LLC
Song Sparrow Solar
Threatened and Endangered Species Habitat Assessment

Project Location
Ballard County,
Kentucky

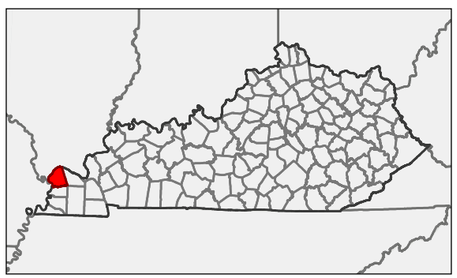
Prepared by MNA on 2023-06-12
TR by MAJ on 2023-06-16
IR by SPK on 2023-06-16

0 1,600 3,200 Feet

(At original document size of 11x17)
1 inch = 1,600 feet

Legend

- Project Boundary
- Delineated Streams
- Delineated Wetlands
- Delineated Open Water
- Cultivated Crops
- Deciduous Forest
- Developed High Intensity
- Developed Low Intensity
- Developed Medium Intensity
- Developed Open Space
- Evergreen Forest
- Grassland/Herbaceous
- Mixed Forest
- Pasture/Hay
- Shrub/Scrub
- Woody Wetlands



Notes

1. Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
2. Data Sources: Clearway Energy, Inc., Esri Aerial
3. Background: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec Clearway

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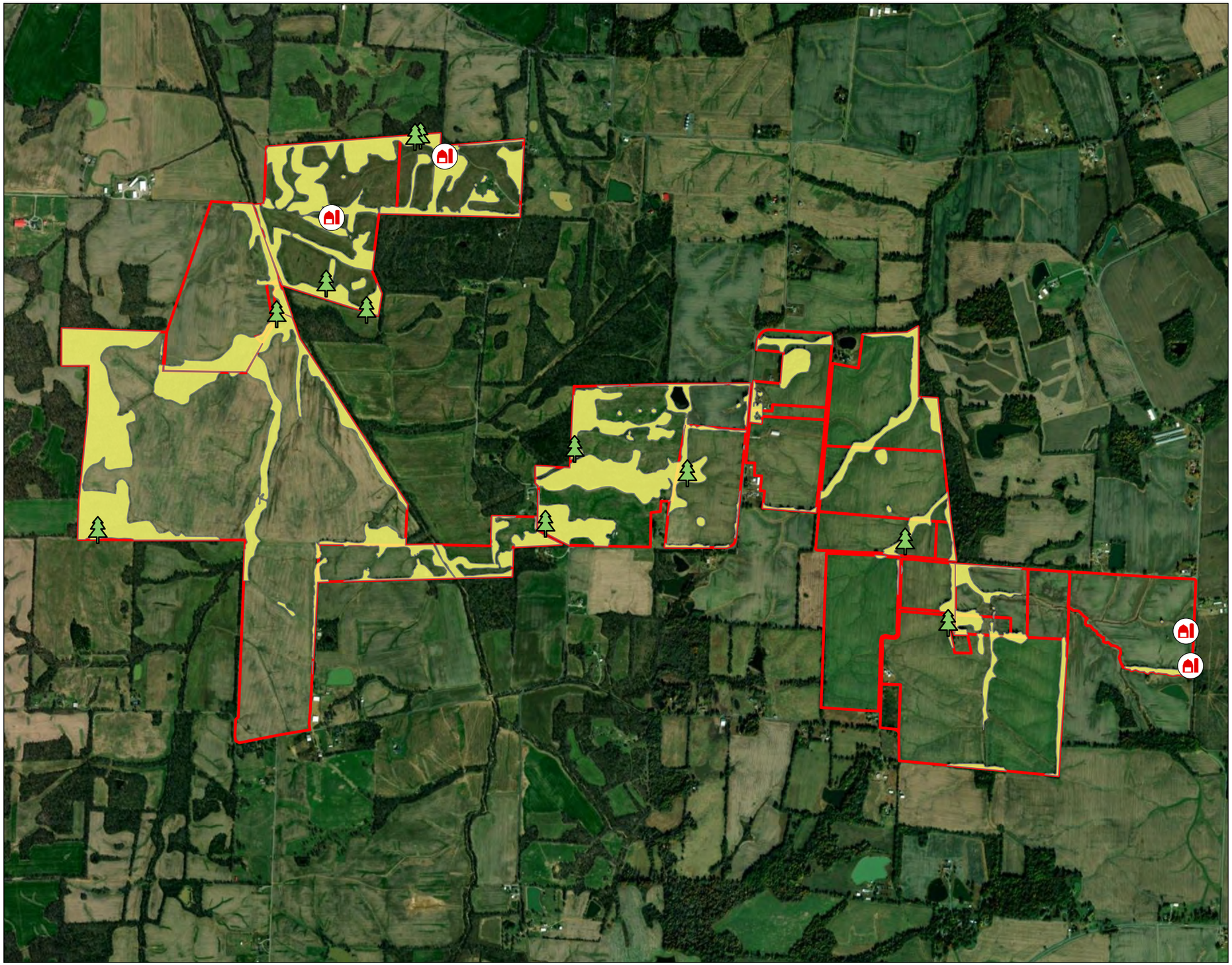


Figure No.

3

Title

Potential Bat Habitat

Client/Project 172607907

Song Sparrow Solar LLC
Song Sparrow Solar
Threatened and Endangered Species Habitat Assessment

Project Location
Ballard County,
Kentucky

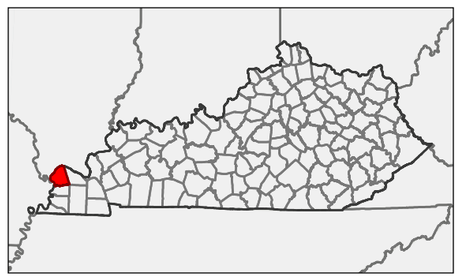
Prepared by MNA on 2023-06-13
TR by MAJ on 2023-06-16
IR by SPK on 2023-06-16

0 1,600 3,200 Feet

(At original document size of 11x17)
1 inch = 1,600 feet

Legend

- Project Boundary
- Potential Bat Habitat
- Potential Roost Trees (MYSO and MYSE)
- Barns



Notes

1. Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
2. Data Sources: Clearway Energy, Inc., Esri Aerial
3. Background: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec Clearway

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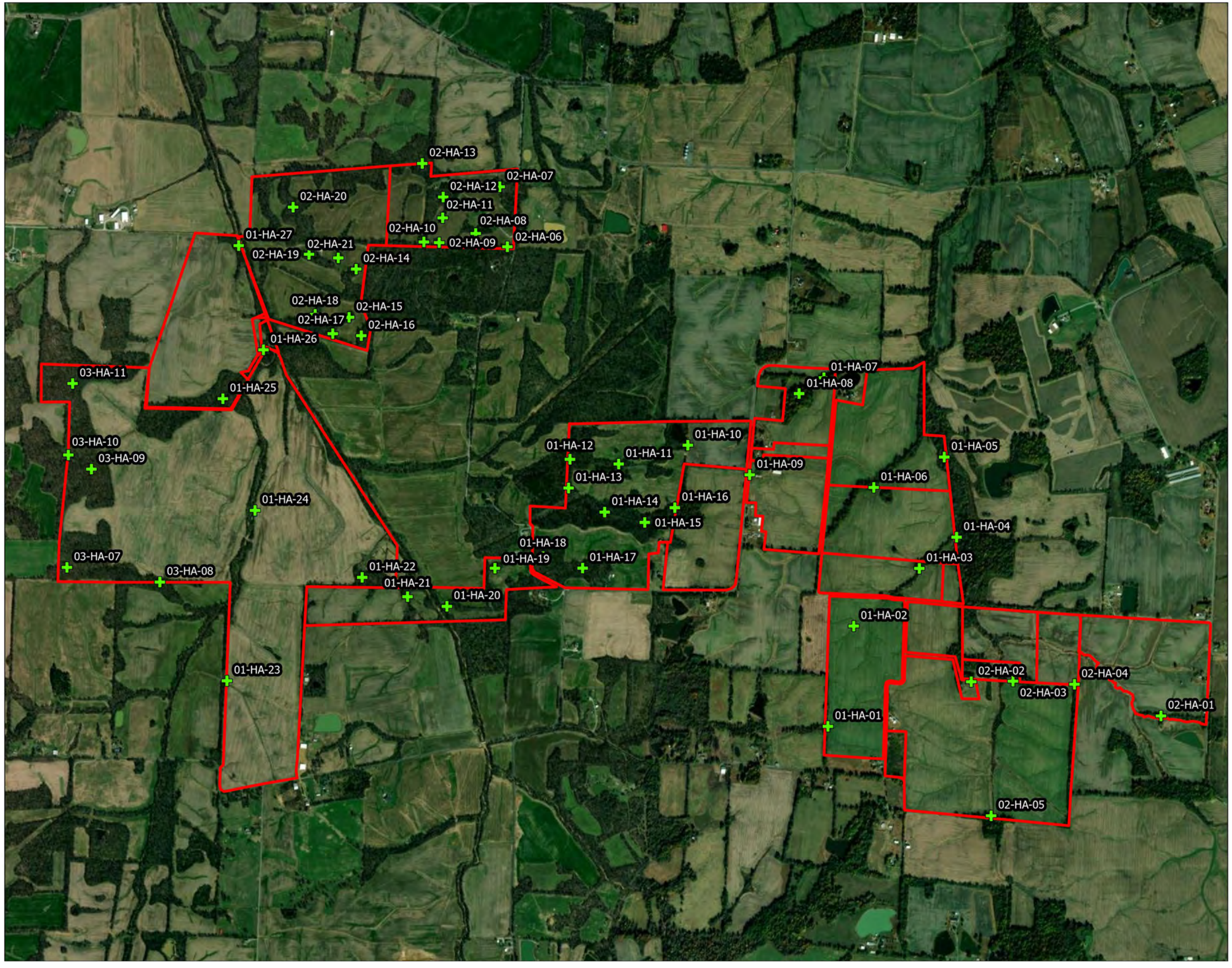


Figure No.
4

Title
Habitat Assessment Points Map

Client/Project 172607907
Song Sparrow Solar LLC
Song Sparrow Solar
Threatened and Endangered Species Habitat Assessment

Project Location
Ballard County,
Kentucky

Prepared by MNA on 2023-06-13
TR by MAJ on 2023-06-16
IR by SPK on 2023-06-16

N

0 1,550 3,100 Feet

(At original document size of 11x17)
1 inch = 1,550 feet

Legend
- Project Boundary
- Habitat Assessment Points

Notes
1. Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
2. Data Sources: Clearway Energy, Inc., Esri Aerial
3. Background: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec Clearway

Figure No.
5

Title
Habitat Assessment Points Map

Client/Project 172607907
Song Sparrow Solar LLC
Song Sparrow Solar
Threatened and Endangered Species Habitat Assessment

Project Location
Ballard County,
Kentucky

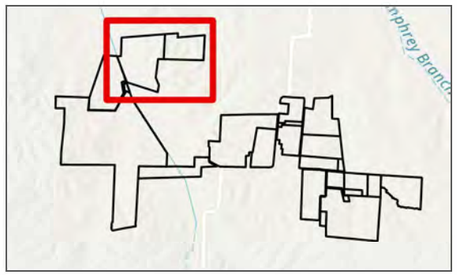
Prepared by MNA on 2023-06-13
TR by MAJ on 2023-06-16
IR by SPK on 2023-06-16

N

0 450 900 Feet

(At original document size of 11x17)
1 inch = 450 feet

Legend
- Project Boundary
- Habitat Assessment Points



Notes
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2. Data Sources: Clearway Energy, Inc., Esri Aerial
3. Background: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec Clearway

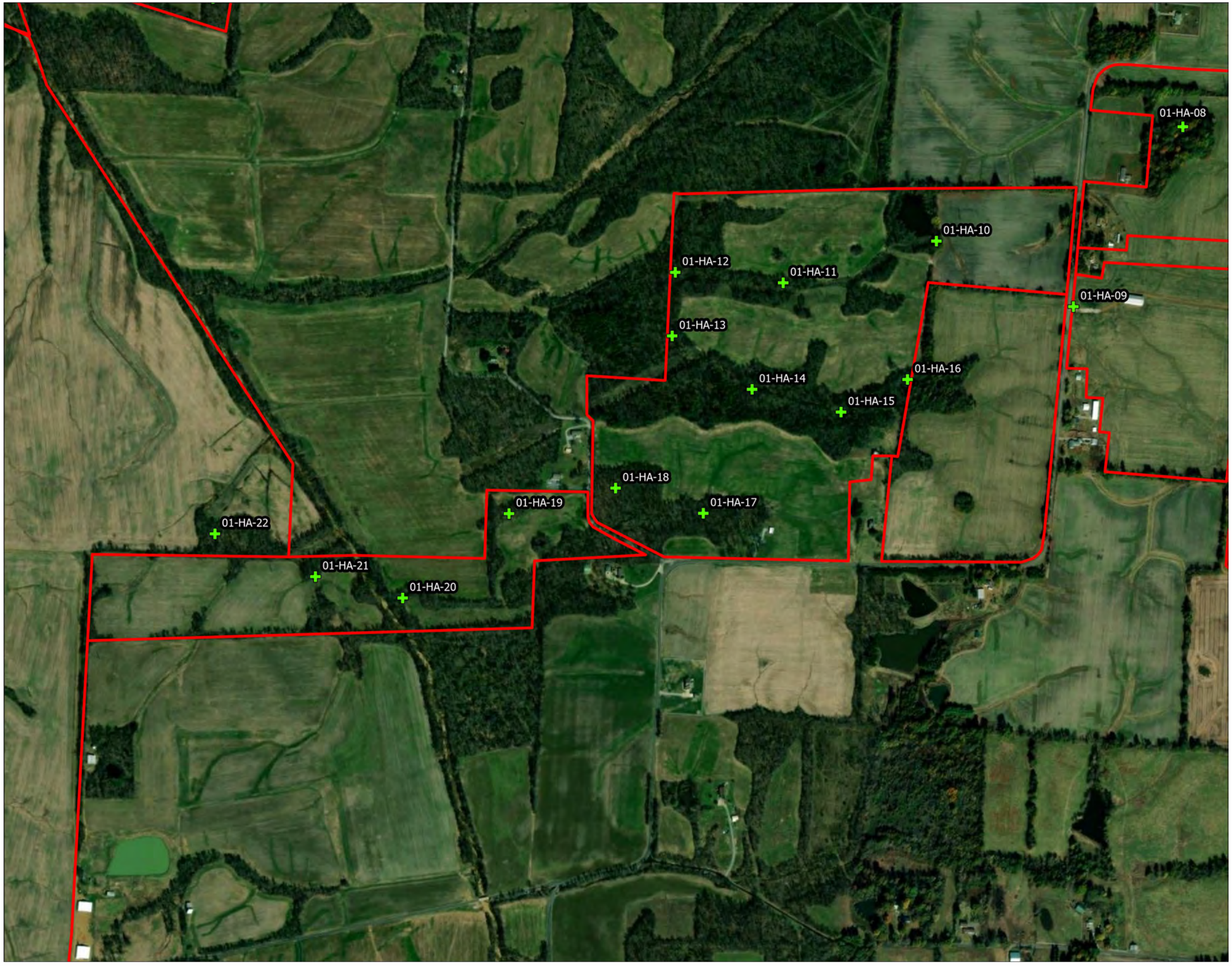


Figure No.
6

Title
Habitat Assessment Points Map

Client/Project 172607907
Song Sparrow Solar LLC
Song Sparrow Solar
Threatened and Endangered Species Habitat Assessment

Project Location
Ballard County,
Kentucky

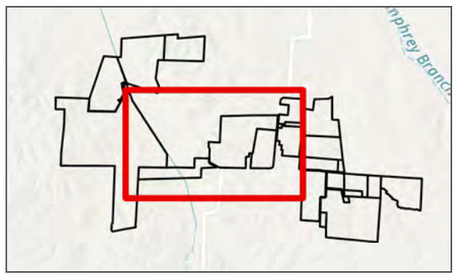
Prepared by MNA on 2023-06-13
TR by MAJ on 2023-06-16
IR by SPK on 2023-06-16

N

0 700 1,400 Feet

(At original document size of 11x17)
1 inch = 700 feet

Legend
- Project Boundary
- Habitat Assessment Points



Notes
1. Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
2. Data Sources: Clearway Energy, Inc., Esri Aerial
3. Background: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec Clearway

Appendix B SITE PHOTOGRAPHS

Stantec

Photographic Log

Client:	**Song Sparrow Solar, LLC**	**Project:**	**Song Sparrow Solar Project**
Site Name:	**Song Sparrow Solar Project**	**Site Location:**	**Ballard County, KY**

Photograph ID: 1 **Point Name:** 01-HA-01 **Photo Location:** 37.0153388890001,-88.883908333 **Direction:** Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/20/2023	
Photograph ID: 2 **Point Name:** 01-HA-02 **Photo Location:** 37.019575,-88.8827416669999 **Direction:** East-Northeast **Comments:** Potential foraging habitat for MYSO, MYSE, and PESU. **Survey Date:** 2/20/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 3 **Point Name:** 01-HA-03 **Photo Location:** 37.0221194440001,-88.879369444 **Direction:** North-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/20/2023	
Photograph ID: 4 **Point Name:** 01-HA-04 **Photo Location:** 37.0221194440001,-88.879369444 **Direction:** North-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/20/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 5 **Point Name:** 01-HA-05 **Photo Location:** 37.027013889,-88.8783472219999 **Direction:** Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/20/2023	
Photograph ID: 6 **Point Name:** 01-HA-05 **Photo Location:** 37.027013889,-88.8783472219999 **Direction:** East-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/20/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 7 **Point Name:** 01-HA-06 **Photo Location:** 37.0254277780001,-88.881930556 **Direction:** North-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/20/2023	
Photograph ID: 8 **Point Name:** 01-HA-07 **Photo Location:** 37.0300333330001,-88.884766667 **Direction:** South-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 9 **Point Name:** 01-HA-07 **Photo Location:** 37.0300333330001,-88.884766667 **Direction:** Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 10 **Point Name:** 01-HA-07 **Photo Location:** 37.0300333330001,-88.884766667 **Direction:** West-Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 11 **Point Name:** 01-HA-07 **Photo Location:** 37.0300333330001,-88.884766667 **Direction:** North-Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 12 **Point Name:** 01-HA-08 **Photo Location:** 37.0293583330001,-88.886052778 **Direction:** East-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 13 **Point Name:** 01-HA-08 **Photo Location:** 37.0293750000001,-88.8860749999999 **Direction:** South **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 14 **Point Name:** 01-HA-08 **Photo Location:** 37.0293583330001,-88.8860472219999 **Direction:** West-Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 15 **Point Name:** 01-HA-08 **Photo Location:** 37.0293750000001,-88.886036111 **Direction:** East-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 16 **Point Name:** 01-HA-09 **Photo Location:** 37.025836111,-88.8885222219999 **Direction:** Northeast **Comments:** Potential MYSE and MYSO habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 17 **Point Name:** 01-HA-09 **Photo Location:** 37.025833333,-88.888525 **Direction:** East-Southeast **Comments:** Potential foraging habitat for MYSE, MYSO, and PESU **Survey Date:** 2/21/2023	
Photograph ID: 18 **Point Name:** 01-HA-09 **Photo Location:** 37.025836111,-88.888536111 **Direction:** South **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 19 **Point Name:** 01-HA-09 **Photo Location:** 37.025861111,-88.8885333329999 **Direction:** West-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 20 **Point Name:** 01-HA-10 **Photo Location:** 37.027022222,-88.891838889 **Direction:** Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 21 **Point Name:** 01-HA-10 **Photo Location:** 37.027038889,-88.89185 **Direction:** West-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. Potential stopover habitat for the whooping crane. **Survey Date:** 2/21/2023	
Photograph ID: 22 **Point Name:** 01-HA-10 **Photo Location:** 37.0270333330001,-88.891838889 **Direction:** North **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 23 **Point Name:** 01-HA-10 **Photo Location:** 37.0270166670001,-88.891847222 **Direction:** South **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 24 **Point Name:** 01-HA-11 **Photo Location:** 37.0260805560001,-88.895522222 **Direction:** West-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 25 **Point Name:** 01-HA-11 **Photo Location:** 37.026083333,-88.895469444 **Direction:** East-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 26 **Point Name:** 01-HA-11 **Photo Location:** 37.0260666670001,-88.8954805559999 **Direction:** South **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 27 **Point Name:** 01-HA-11 **Photo Location:** 37.026083333,-88.895486111 **Direction:** North-Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 28 **Point Name:** 01-HA-12 **Photo Location:** 37.0262777780001,-88.898005556 **Direction:** South-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 29 **Point Name:** 01-HA-12 **Photo Location:** 37.0262805560001,-88.898002778 **Direction:** East **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 30 **Point Name:** 01-HA-12 **Photo Location:** 37.026272222,-88.898038889 **Direction:** West **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 31 **Point Name:** 01-HA-12 **Photo Location:** 37.0262888890001,-88.898011111 **Direction:** North-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 32 **Point Name:** 01-HA-13 **Photo Location:** 37.0249388890001,-88.8980861109999 **Direction:** South-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 33 **Point Name:** 01-HA-13 **Photo Location:** 37.024944444,-88.8980444439999 **Direction:** East-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 34 **Point Name:** 01-HA-13 **Photo Location:** 37.024972222,-88.898063889 **Direction:** North **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 35 **Point Name:** 01-HA-13 **Photo Location:** 37.0249277780001,-88.8980749999999 **Direction:** Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 36 **Point Name:** 01-HA-14 **Photo Location:** 37.024141667,-88.8963027779999 **Direction:** West-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 37 **Point Name:** 01-HA-14 **Photo Location:** 37.0241194440001,-88.8962611109999 **Direction:** South-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 38 **Point Name:** 01-HA-14 **Photo Location:** 37.024113889,-88.896255556 **Direction:** North-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 39 **Point Name:** 01-HA-14 **Photo Location:** 37.024127778,-88.896277778 **Direction:** South-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 40 **Point Name:** 01-HA-15 **Photo Location:** 37.0236861110001,-88.894019444 **Direction:** Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 41 **Point Name:** 01-HA-15 **Photo Location:** 37.023688889,-88.8939972219999 **Direction:** West-Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 42 **Point Name:** 01-HA-15 **Photo Location:** 37.0236694440001,-88.894008333 **Direction:** Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 43 **Point Name:** 01-HA-15 **Photo Location:** 37.0236722220001,-88.894030556 **Direction:** Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 44 **Point Name:** 01-HA-16 **Photo Location:** 37.0243444440001,-88.892338889 **Direction:** North-Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 45 **Point Name:** 01-HA-16 **Photo Location:** 37.024338889,-88.892327778 **Direction:** East-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	
Photograph ID: 46 **Point Name:** 01-HA-16 **Photo Location:** 37.024341667,-88.892377778 **Direction:** Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 47 **Point Name:** 01-HA-16 **Photo Location:** 37.024352778,-88.892333333 **Direction:** West **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	
Photograph ID: 48 **Point Name:** 01-HA-17 **Photo Location:** 37.021641667,-88.8971472219999 **Direction:** Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 49 **Point Name:** 01-HA-17 **Photo Location:** 37.0216333330001,-88.8971611109999 **Direction:** South-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	
Photograph ID: 50 **Point Name:** 01-HA-17 **Photo Location:** 37.0216472220001,-88.897169444 **Direction:** North-Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 51 **Point Name:** 01-HA-17 **Photo Location:** 37.021641667,-88.897205556 **Direction:** West-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	
Photograph ID: 52 **Point Name:** 01-HA-18 **Photo Location:** 37.022075,-88.899327778 **Direction:** South-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 53 **Point Name:** 01-HA-18 **Photo Location:** 37.022080556,-88.899311111 **Direction:** North **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	
Photograph ID: 54 **Point Name:** 01-HA-19 **Photo Location:** 37.0215527780001,-88.9017777779999 **Direction:** Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 55 **Point Name:** 01-HA-19 **Photo Location:** 37.02155,-88.901788889 **Direction:** North **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	
Photograph ID: 56 **Point Name:** 01-HA-19 **Photo Location:** 37.02155,-88.901822222 **Direction:** Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 57 **Point Name:** 01-HA-19 **Photo Location:** 37.021544444,-88.901797222 **Direction:** South-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	
Photograph ID: 58 **Point Name:** 01-HA-20 **Photo Location:** 37.019816667,-88.904302778 **Direction:** Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 59 **Point Name:** 01-HA-20 **Photo Location:** 37.0197666670001,-88.904302778 **Direction:** South-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	
Photograph ID: 60 **Point Name:** 01-HA-20 **Photo Location:** 37.019802778,-88.9042916669999 **Direction:** North **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 61 **Point Name:** 01-HA-20 **Photo Location:** 37.019811111,-88.904288889 **Direction:** East **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	
Photograph ID: 62 **Point Name:** 01-HA-21 **Photo Location:** 37.0202,-88.906430556 **Direction:** Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 63 **Point Name:** 01-HA-21 **Photo Location:** 37.0202166670001,-88.906438889 **Direction:** Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	
Photograph ID: 64 **Point Name:** 01-HA-21 **Photo Location:** 37.020169444,-88.906416667 **Direction:** East-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 65 **Point Name:** 01-HA-21 **Photo Location:** 37.0201777780001,-88.9064 **Direction:** East-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	
Photograph ID: 66 **Point Name:** 01-HA-22 **Photo Location:** 37.020897222,-88.908955556 **Direction:** West-Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 67 **Point Name:** 01-HA-22 **Photo Location:** 37.0209166670001,-88.9090027779999 **Direction:** Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	
Photograph ID: 68 **Point Name:** 01-HA-22 **Photo Location:** 37.020913889,-88.908991667 **Direction:** Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 69 **Point Name:** 01-HA-22 **Photo Location:** 37.020922222,-88.908972222 **Direction:** North **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	
Photograph ID: 70 **Point Name:** 01-HA-23 **Photo Location:** 37.016333333,-88.9158277779999 **Direction:** West-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 71 **Point Name:** 01-HA-23 **Photo Location:** 37.016336111,-88.915836111 **Direction:** South-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	
Photograph ID: 72 **Point Name:** 01-HA-23 **Photo Location:** 37.016344444,-88.9158277779999 **Direction:** South **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 73 **Point Name:** 01-HA-23 **Photo Location:** 37.0163305560001,-88.915819444 **Direction:** East-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	
Photograph ID: 74 **Point Name:** 01-HA-24 **Photo Location:** 37.023638889,-88.914661111 **Direction:** South **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 75 **Point Name:** 01-HA-24 **Photo Location:** 37.023641667,-88.9146638889999 **Direction:** East-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	
Photograph ID: 76 **Point Name:** 01-HA-24 **Photo Location:** 37.0236472220001,-88.914688889 **Direction:** West **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 77 **Point Name:** 01-HA-24 **Photo Location:** 37.0236472220001,-88.914669444 **Direction:** North-Northeast **Comments:** Potential MYSE, MYSO, and PESU foraging habitat. **Survey Date:** 2/23/2023	
Photograph ID: 78 **Point Name:** 01-HA-25 **Photo Location:** 37.028347222,-88.9166361109999 **Direction:** South-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/1/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 79 **Point Name:** 01-HA-26 **Photo Location:** 37.0303638890001,-88.914513889 **Direction:** East-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	
Photograph ID: 80 **Point Name:** 01-HA-26 **Photo Location:** 37.0303666670001,-88.914511111 **Direction:** North-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 81 **Point Name:** 01-HA-26 **Photo Location:** 37.0303638890001,-88.914527778 **Direction:** South **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	
Photograph ID: 82 **Point Name:** 01-HA-26 **Photo Location:** 37.030369444,-88.914522222 **Direction:** North-Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 83

Point Name:
01-HA-27

Photo Location:
37.0348416670001,-88.915980556

Direction:
North-Northeast

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/23/2023

Photograph ID: 84

Point Name:
01-HA-27

Photo Location:
37.0348416670001,-88.915994444

Direction:
West-Southwest

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/23/2023

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 85

Point Name:
01-HA-27

Photo Location:
37.0348333330001,-88.9160027779999

Direction:
South-Southeast

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/23/2023

Photograph ID: 86

Point Name:
01-HA-27

Photo Location:
37.0348277780001,-88.9159861109999

Direction:
East

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/23/2023

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 87 **Point Name:** 02-HA-01 **Photo Location:** 37.0161833330001,-88.8662944439999 **Direction:** West-Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/20/2023	
Photograph ID: 88 **Point Name:** 02-HA-02 **Photo Location:** 37.017563889,-88.876580556 **Direction:** East-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 89 **Point Name:** 02-HA-02 **Photo Location:** 37.017563889,-88.876580556 **Direction:** Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 90 **Point Name:** 02-HA-03 **Photo Location:** 37.017469444,-88.874169444 **Direction:** East-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 91 **Point Name:** 02-HA-04 **Photo Location:** 37.0174027780001,-88.870958333 **Direction:** East-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/21/2023	
Photograph ID: 92 **Point Name:** 02-HA-06 **Photo Location:** 37.0352472220001,-88.902077778 **Direction:** South-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 93 **Point Name:** 02-HA-06 **Photo Location:** 37.0352472220001,-88.902075 **Direction:** South-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	
Photograph ID: 94 **Point Name:** 02-HA-06 **Photo Location:** 37.0351833330001,-88.901761111 **Direction:** Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 95 **Point Name:** 02-HA-07 **Photo Location:** 37.0376555560001,-88.902222222 **Direction:** East **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/24/2023	
Photograph ID: 96 **Point Name:** 02-HA-08 **Photo Location:** 37.0356722220001,-88.903452778 **Direction:** North-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 97 **Point Name:** 02-HA-09 **Photo Location:** 37.035241667,-88.9053888889999 **Direction:** Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	
Photograph ID: 98 **Point Name:** 02-HA-09 **Photo Location:** 37.0352583330001,-88.905383333 **Direction:** Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 99 **Point Name:** 02-HA-11 **Photo Location:** 37.036297222,-88.905241667 **Direction:** North **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	
Photograph ID: 100 **Point Name:** 02-HA-12 **Photo Location:** 37.037208333,-88.905216667 **Direction:** Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/23/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 101

Point Name:
02-HA-13

Photo Location:
37.0385972220001,-88.9062888889999

Direction:
West

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/23/2023

Photograph ID: 102

Point Name:
02-HA-14

Photo Location:
37.0340055560001,-88.9096916669999

Direction:
North-Northwest

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/23/2023

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 103

Point Name:
02-HA-15

Photo Location:
37.032063889,-88.9099027779999

Direction:
South

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/23/2023

Photograph ID: 104

Point Name:
02-HA-16

Photo Location:
37.0312027780001,-88.909327778

Direction:
North-Northeast

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/23/2023

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 105

Point Name:
02-HA-17

Photo Location:
37.0309750000001,-88.910805556

Direction:
North-Northeast

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/28/2023

Photograph ID: 106

Point Name:
02-HA-18

Photo Location:
37.0320583330001,-88.911944444

Direction:
Northeast

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/23/2023

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 107

Point Name:
02-HA-19

Photo Location:
37.034580556,-88.912247222

Direction:
West-Southwest

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/28/2023

Photograph ID: 108

Point Name:
02-HA-19

Photo Location:
37.034577778,-88.912247222

Direction:
South-Southwest

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/28/2023

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 109 **Point Name:** 02-HA-20 **Photo Location:** 37.036694444,-88.913066667 **Direction:** West-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/1/2023	
Photograph ID: 110 **Point Name:** 03-HA-01 **Photo Location:** 36.9954111110001,-88.937027778 **Direction:** East **Comments:** Potential foraging habitat for MYSE, MYSO, and PESU. **Survey Date:** 2/28/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 111 **Point Name:** 03-HA-01 **Photo Location:** 36.9954111110001,-88.937047222 **Direction:** South-Southeast **Comments:** Potential foraging habitat for MYSE, MYSO, and PESU. **Survey Date:** 2/28/2023	
Photograph ID: 112 **Point Name:** 03-HA-01 **Photo Location:** 36.9954111110001,-88.937027778 **Direction:** North-Northwest **Comments:** Potential foraging habitat for MYSE, MYSO, and PESU. **Survey Date:** 2/28/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 113 **Point Name:** 03-HA-01 **Photo Location:** 36.9954111110001,-88.937027778 **Direction:** West **Comments:** Potential foraging habitat for MYSE, MYSO, and PESU. **Survey Date:** 2/28/2023	
Photograph ID: 114 **Point Name:** 03-HA-02 **Photo Location:** 36.9973583330001,-88.942605556 **Direction:** West-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/28/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 115

Point Name:
03-HA-02

Photo Location:
36.9973694440001,-88.942655556

Direction:
Northwest

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/28/2023

Photograph ID: 116

Point Name:
03-HA-03

Photo Location:
37.0079388890001,-88.939144444

Direction:
East-Northeast

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/28/2023

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 117

Point Name:
03-HA-03

Photo Location:
37.0079416670001,-88.939144444

Direction:
West

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/28/2023

Photograph ID: 118

Point Name:
03-HA-03

Photo Location:
37.0079388890001,-88.939133333

Direction:
South

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/28/2023

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 119 **Point Name:** 03-HA-03 **Photo Location:** 37.0079388890001,-88.939144444 **Direction:** East-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/28/2023	
Photograph ID: 120 **Point Name:** 03-HA-04 **Photo Location:** 37.0130500000001,-88.9350805559999 **Direction:** Northeast **Comments:** Potential MYSE, MYSO, and PESU roosting and foraging habitat. Potential stopover habitat for whooping crane. **Survey Date:** 2/28/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 121 **Point Name:** 03-HA-04 **Photo Location:** 37.013052778,-88.9350805559999 **Direction:** South-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/28/2023	
Photograph ID: 122 **Point Name:** 03-HA-04 **Photo Location:** 37.0130500000001,-88.935069444 **Direction:** West-Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/28/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 123 **Point Name:** 03-HA-04 **Photo Location:** 37.0130472220001,-88.935072222 **Direction:** North **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/28/2023	
Photograph ID: 124 **Point Name:** 03-HA-05 **Photo Location:** 37.020886111,-88.931569444 **Direction:** South-Southwest **Comments:** Potential stopover habitat for whooping crane. **Survey Date:** 3/1/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 125 **Point Name:** 03-HA-05 **Photo Location:** 37.020886111,-88.9315722219999 **Direction:** East-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. Potential stopover habitat for whooping crane. **Survey Date:** 3/1/2023	
Photograph ID: 126 **Point Name:** 03-HA-05 **Photo Location:** 37.020875,-88.931530556 **Direction:** North-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. Potential stopover habitat for whooping crane. **Survey Date:** 3/1/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 127 **Point Name:** 03-HA-06 **Photo Location:** 37.021705556,-88.929186111 **Direction:** West **Comments:** Potential MYSE, MYSO, and PESU habitat. Potential stopover habitat for whooping crane. **Survey Date:** 3/1/2023	
Photograph ID: 128 **Point Name:** 03-HA-06 **Photo Location:** 37.021708333,-88.929186111 **Direction:** West-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/1/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 129 **Point Name:** 03-HA-06 **Photo Location:** 37.021708333,-88.929186111 **Direction:** North **Comments:** Potential MYSE, MYSO, and PESU roosting and foraging habitat. **Survey Date:** 3/1/2023	
Photograph ID: 130 **Point Name:** 03-HA-07 **Photo Location:** 37.020913889,-88.9243749999999 **Direction:** West-Northwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/1/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 131 **Point Name:** 03-HA-07 **Photo Location:** 37.0209166670001,-88.924372222 **Direction:** North **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/1/2023	
Photograph ID: 132 **Point Name:** 03-HA-07 **Photo Location:** 37.020913889,-88.924369444 **Direction:** South **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/1/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 133 **Point Name:** 03-HA-07 **Photo Location:** 37.0209166670001,-88.924369444 **Direction:** East **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/1/2023	
Photograph ID: 134 **Point Name:** 03-HA-08 **Photo Location:** 37.020461111,-88.919552778 **Direction:** Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/1/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 135

Point Name:
03-HA-08

Photo Location:
37.0204666670001,-88.9195472219999

Direction:
South

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
3/1/2023

Photograph ID: 136

Point Name:
03-HA-08

Photo Location:
37.020461111,-88.919561111

Direction:
Northwest

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
3/1/2023

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 137 **Point Name:** 03-HA-08 **Photo Location:** 37.020461111,-88.919552778 **Direction:** East-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/1/2023	
Photograph ID: 138 **Point Name:** 03-HA-09 **Photo Location:** 37.025172222,-88.9233694439999 **Direction:** North-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/2/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 139 **Point Name:** 03-HA-09 **Photo Location:** 37.025197222,-88.923388889 **Direction:** West **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/2/2023	
Photograph ID: 140 **Point Name:** 03-HA-09 **Photo Location:** 37.0251388890001,-88.923372222 **Direction:** East-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/2/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 141 **Point Name:** 03-HA-09 **Photo Location:** 37.0251388890001,-88.923388889 **Direction:** South-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/2/2023	
Photograph ID: 142 **Point Name:** 03-HA-10 **Photo Location:** 37.0257472220001,-88.924663889 **Direction:** Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/2/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 143 **Point Name:** 03-HA-10 **Photo Location:** 37.025702778,-88.9246138889999 **Direction:** South-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/2/2023	
Photograph ID: 144 **Point Name:** 03-HA-10 **Photo Location:** 37.0257111110001,-88.9246277779999 **Direction:** South-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/2/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 145 **Point Name:** 03-HA-10 **Photo Location:** 37.025716667,-88.924608333 **Direction:** North **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/2/2023	
Photograph ID: 146 **Point Name:** 03-HA-11 **Photo Location:** 37.0287500000001,-88.924566667 **Direction:** Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/2/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 147 **Point Name:** 03-HA-11 **Photo Location:** 37.0287666670001,-88.924577778 **Direction:** North **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/2/2023	
Photograph ID: 148 **Point Name:** 03-HA-11 **Photo Location:** 37.028769444,-88.9245722219999 **Direction:** West-Southwest **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/2/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 149 **Point Name:** 03-HA-11 **Photo Location:** 37.0287500000001,-88.9245749999999 **Direction:** South-Southeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 3/2/2023	
Photograph ID: 150 **Point Name:** Potential Bat Foraging Habitat **Photo Location:** 37.03581667, -88.90319444 **Direction:** North-Northeast **Comments:** Potential MYSE, MYSO, and PESU habitat. **Survey Date:** 2/22/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 151

Point Name:
Potential Bat Foraging Habitat

Photo Location:
37.019025, -88.87481111

Direction:
Northeast

Comments:
Potential MYSE, MYSO, and PESU habitat.

Survey Date:
2/21/2023

Photograph ID: 152

Point Name:
Potential Bat Foraging Habitat

Photo Location:
37.01838611, -88.87708889

Direction:
Northwest

Comments:
Potential MYSE and MYSO foraging habitat

Survey Date:
2/21/2023

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 153 **Point Name:** Potential Bat Foraging Habitat **Photo Location:** 37.02134444, -88.929675 **Direction:** South-Southeast **Comments:** Potential MYSE and MYSO foraging habitat **Survey Date:** 3/1/2023	
Photograph ID: 154 **Point Name:** Potential Bat Foraging Habitat **Photo Location:** 37.01226944, -88.93600278 **Direction:** East-Northeast **Comments:** Potential MYSE and MYSO foraging habitat **Survey Date:** 2/28/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 155 **Point Name:** Potential Bat Foraging Habitat **Photo Location:** 37.0209, -88.93145556 **Direction:** Southwest **Comments:** Potential MYSE and MYSO foraging habitat **Survey Date:** 3/1/2023	
Photograph ID: 156 **Point Name:** Potential Bat Foraging Habitat **Photo Location:** 37.010957 -88.938098 **Direction:** Northeast **Comments:** Potential MYSE and MYSO foraging habitat **Survey Date:** 3/3/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 157 **Point Name:** Potential Bat Foraging Habitat **Photo Location:** 37.01983889, -88.91155556 **Direction:** East-Northeast **Comments:** Potential MYSE and MYSO foraging habitat **Survey Date:** 2/23/2023	
Photograph ID: 158 **Point Name:** Potential Bat Foraging Habitat **Photo Location:** 37.03457222, -88.91190278 **Direction:** South-Southeast **Comments:** Potential MYSE and MYSO foraging habitat **Survey Date:** 2/28/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 159 **Point Name:** Potential Bat Foraging Habitat **Photo Location:** 37.02752778, -88.89198611 **Direction:** West-Southwest **Comments:** Potential MYSE and MYSO foraging habitat **Survey Date:** 2/21/2023	
Photograph ID: 160 **Point Name:** Potential Bat Foraging Habitat **Photo Location:** 37.03756944, -88.90531389 **Direction:** East-Northeast **Comments:** Potential MYSE and MYSO foraging habitat **Survey Date:** 2/23/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 161 **Point Name:** Potential Bat Foraging Habitat **Photo Location:** 37.0209, -88.90118056 **Direction:** East-Northeast **Comments:** Potential MYSE and MYSO foraging habitat **Survey Date:** 2/22/2023	
Photograph ID: 162 **Point Name:** Potential Bat Roosting Habitat **Photo Location:** 37.02193611, -88.92688611 **Direction:** North-Northeast **Comments:** Potential MYSE and MYSO habitat **Survey Date:** 3/1/2023	

Client:	**Song Sparrow Solar, LLC**	**Project:**	**Song Sparrow Solar Project**
Site Name:	**Song Sparrow Solar Project**	**Site Location:**	**Ballard County, KY**

Photograph ID: 163	
Point Name: Potential Bat Roosting Habitat	
Photo Location: 37.03843333, -88.90731111	
Direction: West	
Comments: Potential MYSE and MYSO habitat	
Survey Date: 2/23/2023	

Photograph ID: 164	
Point Name: Potential Bat Roosting Habitat	
Photo Location: 37.03851389, -88.90697222	
Direction: North-Northeast	
Comments: Potential MYSE and MYSO habitat	
Survey Date: 2/23/2023	

Client:	**Song Sparrow Solar, LLC**	**Project:**	**Song Sparrow Solar Project**
Site Name:	**Song Sparrow Solar Project**	**Site Location:**	**Ballard County, KY**

Photograph ID: 165 **Point Name:** Potential Bat Roosting Habitat **Photo Location:** 37.03039444, -88.91455833 **Direction:** East **Comments:** Potential MYSE and MYSO habitat **Survey Date:** 2/23/2023	
Photograph ID: 166 **Point Name:** Potential Bat Roosting Habitat **Photo Location:** 37.02496111, -88.89803889 **Direction:** Northeast **Comments:** Potential MYSE and MYSO habitat **Survey Date:** 2/21/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 167 **Point Name:** Potential Bat Roosting Habitat **Photo Location:** 37.03183889, -88.91186944 **Direction:** North-Northwest **Comments:** Potential MYSE and MYSO habitat **Survey Date:** 2/23/2023	
Photograph ID: 168 **Point Name:** Potential Bat Roosting Habitat **Photo Location:** 37.016464, -88.864081 **Direction:** South-Southeast **Comments:** Potential roosting habitat for MYSO MYSE. **Survey Date:** 2/20/2023	

Client:	Song Sparrow Solar, LLC	Project:	Song Sparrow Solar Project
Site Name:	Song Sparrow Solar Project	Site Location:	Ballard County, KY

Photograph ID: 169 **Point Name:** Potential Bat Roosting Habitat **Photo Location:** 37.017614, -88.865271 **Direction:** Northeast **Comments:** Potential roosting habitat for MYSO MYSE. **Survey Date:** 2/20/2023	
Photograph ID: 170 **Point Name:** Potential Bat Roosting Habitat **Photo Location:** 37.034879, -88.911578 **Direction:** South **Comments:** Potential roosting habitat for MYSO MYSE. **Survey Date:** 2/28/2023	

Appendix C AGENCY REPORTS

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Ballard County, Kentucky

Local office

Kentucky Ecological Services Field Office

(502) 695-0468
(502) 695-1024
kentuckyes@fws.gov

J C Watts Federal Building, Room 265
330 West Broadway
Frankfort, KY 40601-8670

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Gray Bat Myotis grisescens Wherever found This species only needs to be considered if the following condition applies: • The project area includes potential gray bat habitat. No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat Myotis sodalis Wherever found This species only needs to be considered if the following condition applies: • The project area includes 'potential' habitat. All activities in this location should consider possible effects to this species. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered

Birds

NAME	STATUS
Whooping Crane Grus americana No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/758	EXPN

Insects

NAME	STATUS

Monarch Butterfly Danaus plexippus — Candidate

Wherever found

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/9743

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

Additional information can be found using the following links:

- Eagle Managment https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list,click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

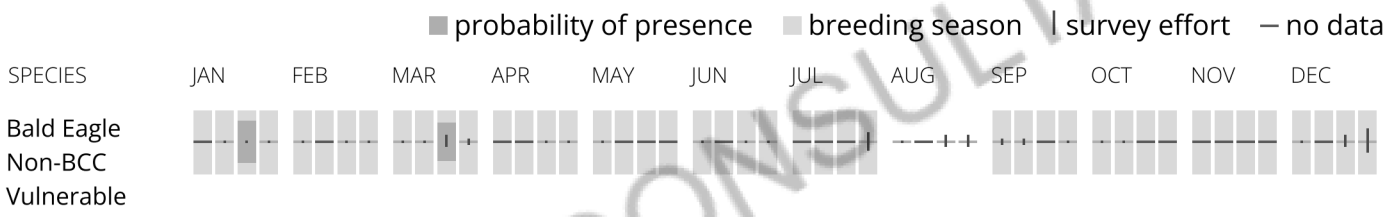
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Kestrel *Falco sparverius paulus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Kentucky Warbler *Oporornis formosus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prairie Warbler *Dendroica discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

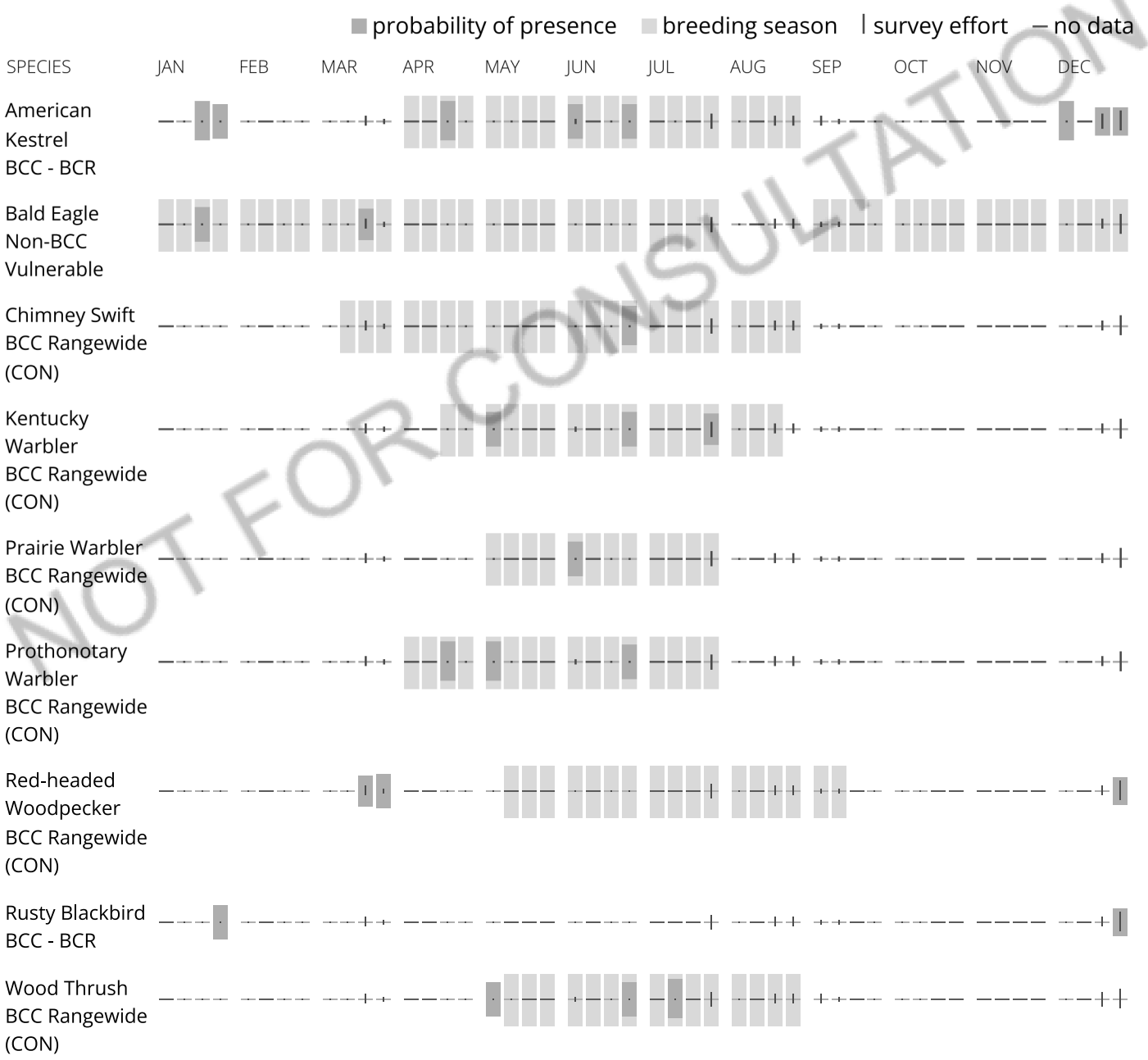
Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn

more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Ballard County, Kentucky

Local office

Kentucky Ecological Services Field Office

(502) 695-0468
(502) 695-1024
kentuckyes@fws.gov

J C Watts Federal Building, Room 265
330 West Broadway
Frankfort, KY 40601-8670

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Gray Bat Myotis grisescens Wherever found This species only needs to be considered if the following condition applies: • The project area includes potential gray bat habitat. No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat Myotis sodalis Wherever found This species only needs to be considered if the following condition applies: • The project area includes 'potential' habitat. All activities in this location should consider possible effects to this species. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Clams

NAME	STATUS
Pink Mucket (pearlymussel) Lampsilis abrupta Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7829	Endangered

Insects

NAME	STATUS

Monarch Butterfly Danaus plexippus — Candidate

Wherever found

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/9743

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date

range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Kestrel Falco sparverius paulus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31
Chimney Swift Chaetura pelagica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Kentucky Warbler Oporornis formosus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler Protonotaria citrea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10

Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
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3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Wood Thrush
BCC Rangewide
(CON)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

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Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

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on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black

vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

This location did not intersect any wetlands mapped by NWI.

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Andy Beshear
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
Office of Kentucky Nature Preserves
300 Sower Boulevard
Frankfort, Kentucky 40601
Phone: (502) 564-3350

Rebecca Goodman
SECRETARY

Sunni Carr
Executive Director

February 6, 2023

Chris Knabel
Stantec
848 west high st
lexington, KY 40508

Project:	Song Sparrow Solar
Project ID:	23-0195
Project Type:	Other (No buffer, $120 fee)
Site Acreage:	1,674.22
Site Lat/Lon:	37.024198 / -88.916136
County:	Ballard
USGS Quad:	BLANDVILLE; HEATH; LA CENTER
Watershed HUC12:	Middle Humphrey Creek; Upper Humphrey Creek

Dear Chris Knabel,

This letter is in response to your data request for the project referenced above. We have reviewed our Natural Heritage Program Database to determine if any of the endangered, threatened, or special concern plants and animals or exemplary natural communities monitored by the Office of Kentucky Nature Preserves occur within your general project area. Your project does pose a concern at this time, therefore please see the attached reports and report key for more detailed information.

I would like to take this opportunity to remind you of the terms of the data request license, which you agreed upon in order to submit your request. The license agreement states "Data and data products received from the Office of Kentucky Nature Preserves, including any portion thereof, may not be reproduced in any form or by any means without the express written authorization of the Office of Kentucky Nature Preserves." The exact location of plants, animals, and natural communities, if released by the Office of Kentucky Nature Preserves, may not be released in any document or correspondence. These products are provided on a temporary basis for the express project (described above) of the requester, and may not be redistributed, resold or copied without the written permission of the Biological Assessment Branch (300 Sower Blvd - 4th Floor, Frankfort, KY, 40601. Phone: 502-782-7828).

Please note that the quantity and quality of data collected by the Kentucky Natural Heritage Program are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Kentucky have never been thoroughly surveyed and new plants and animals are still being discovered. For these reasons, the Kentucky Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of Kentucky. Heritage reports summarize the existing information known to the Kentucky Natural Heritage Program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. We would greatly appreciate receiving any pertinent information

obtained as a result of on-site surveys.

If you have any questions, or if I can be of further assistance, please do not hesitate to contact me.

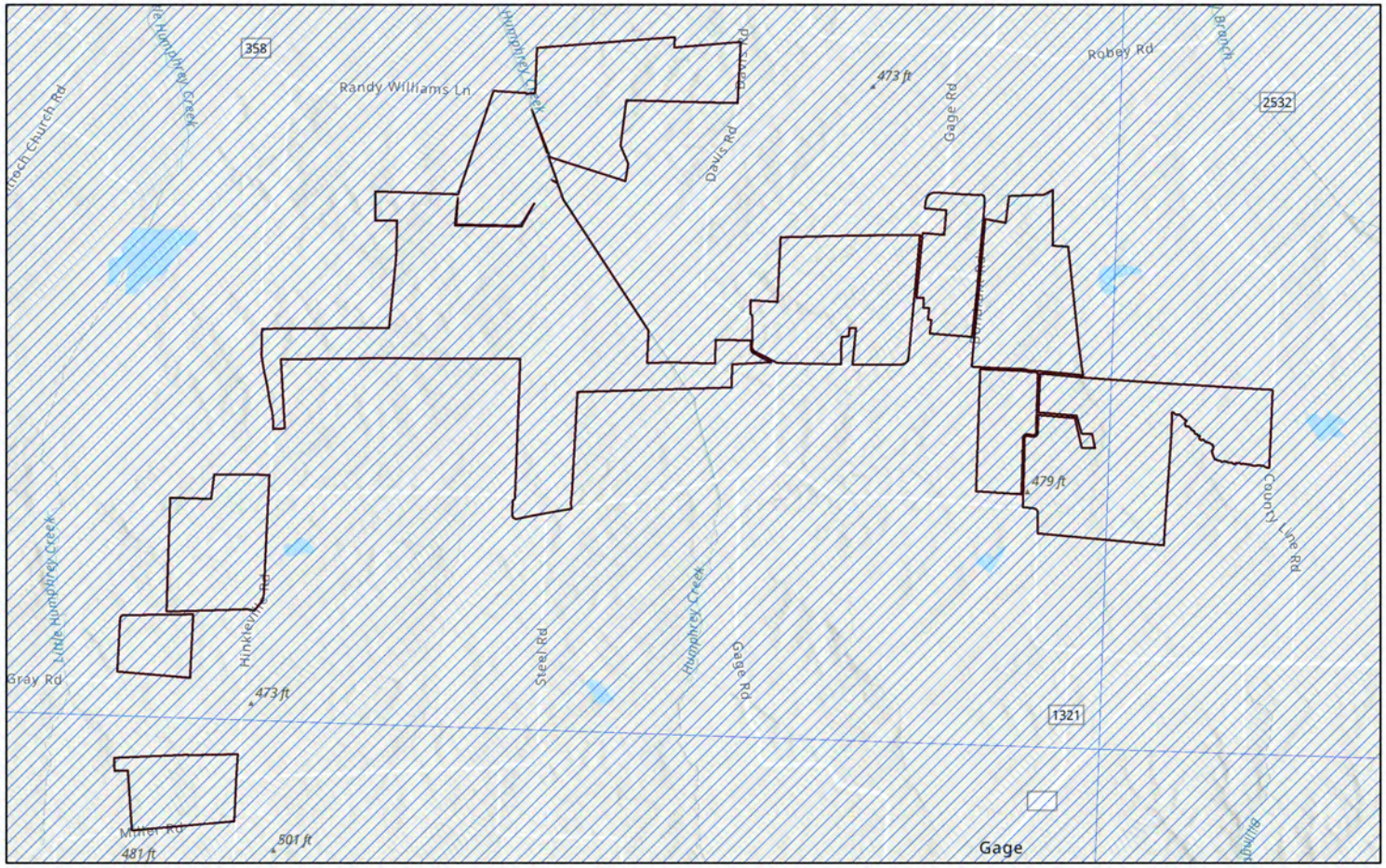
Sincerely,

Alexis R Schoenlaub
Geoprocessing Specialist

Standard Occurrence Report
KNP monitored species within 1 Feet of Project Area

EO ID	Scientific Name	Common Name	GRank	SRank	SPROT	USESA	STWG	Last Obs Date	Precision	EO Rank	Lat / Lon	Directions	Habitat
11336	*Celithemis verna*	Double-ringed Pennant	G5	S1	E		Y	2005-Pre	C	H	37.0586 / -88.9995	Ballard County.	Ponds, lakes, and rarely ditches and streams, with sparse emergent plants or a marginal zone of grassy plants (Dunkle 1989). Usually found at newly created or infertile waters (Dunkle 1989), but in Kentucky it has been found in a eutrophic pond.
5015	*Hypericum lobocarpum*	Five-lobe St. John's Wort	G4Q	S3?	N			No Date	C	H	37.0586 / -88.9995	Ballard County.	
15889	*Lanius ludovicianus*	Loggerhead Shrike	G4	S3S4B,S4N	S		Y	1990-06-28	Q	NR	36.9375 / -88.9375	CW block of quadrangle.	
15952	*Lanius ludovicianus*	Loggerhead Shrike	G4	S3S4B,S4N	S		Y	1988	Q	NR	37.0625 / -88.8125	CW block of quadrangle.	
15953	*Lanius ludovicianus*	Loggerhead Shrike	G4	S3S4B,S4N	S		Y	1988	Q	NR	37.0625 / -88.9375	CW block of quadrangle.	
13591	*Rudbeckia subtomentosa*	Sweet Coneflower	G5	S1	E			1947-06	C	H	37.0586 / -88.9995	Ballard Co.	Prairies and low grounds such as open stream terrace woodlands.
9275	*Silphium laciniatum*	Compassplant	G5	S2	T			1947-06	C	H?	37.0586 / -88.9995	Ballard County	Prairies and barrens.

Song Sparrow Solar



February 6, 2023

Element Occurences

Project Boundary

Buffered Project Boundary

1:33,236

0 0.28 0.55 1.1 mi

0 0.45 0.9 1.8 km

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA,

Andy Beshear
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
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Phone: (502) 564-3350

Rebecca Goodman
SECRETARY

Sunni Carr
Executive Director

February 8, 2023

Chris Knabel
Stantec
848 west high st
lexington, KY 40508

Project:	SongSparrowSolar
Project ID:	23-0201
Project Type:	Standard (*customers will be invoiced), 1 mile buffer ($120 fee)
Site Acreage:	1,674.22
Site Lat/Lon:	37.024198 / -88.916136
County:	Ballard
USGS Quad:	BLANDVILLE; HEATH; LA CENTER
Watershed HUC12:	Middle Humphrey Creek; Upper Humphrey Creek

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KNP monitored species within 1 Miles of Project Area

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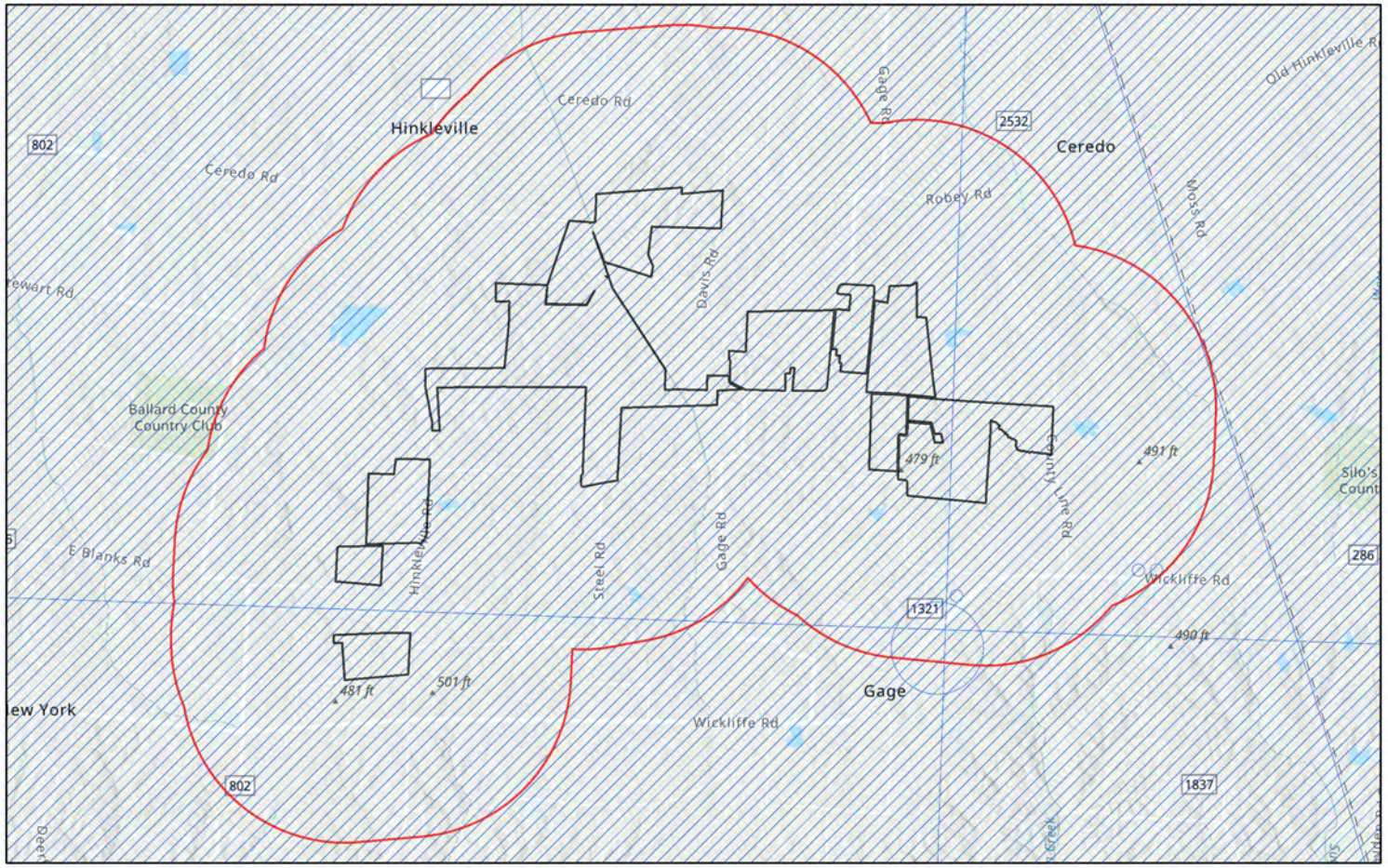
5015	*Hypericum lobocarpum*	Five-lobe St. John's Wort	G4Q	S3?	N			No Date	C	H	37.0586 / -88.9995	Ballard County.	
15888	*Lanius ludovicianus*	Loggerhead Shrike	G4	S3S4B,S4N	S		Y	1990-06-28	Q	NR	36.9375 / -88.8125	CW block of quadrangle	
15889	*Lanius ludovicianus*	Loggerhead Shrike	G4	S3S4B,S4N	S		Y	1990-06-28	Q	NR	36.9375 / -88.9375	CW block of quadrangle.	
15952	*Lanius ludovicianus*	Loggerhead Shrike	G4	S3S4B,S4N	S		Y	1988	Q	NR	37.0625 / -88.8125	CW block of quadrangle.	
15953	*Lanius ludovicianus*	Loggerhead Shrike	G4	S3S4B,S4N	S		Y	1988	Q	NR	37.0625 / -88.9375	CW block of quadrangle.	
3169	*Lithobates areolatus circulosus*	Northern Crawfish Frog	G4T4	S3	S		Y	1991-03-22	S	NR	37.0059 / -88.8538	Just NE of jct KY 286 and KY 1367 (005A) and N side of KY 286, ca 0.1 rd mi W of jct KY 1367 (005B).	Breeds in ponds in farmland and edge. Remains underground throughout most of the year, using crayfish burrows in moist grasslands and meadows.
8695	*Lithobates areolatus circulosus*	Northern Crawfish Frog	G4T4	S3	S		Y	1991-03-22	S	NR	37.0031 / -88.8739	Northwest side of KY 286, ca 0.3 rd mi E of Bethel Cumberland Church.	Breeds in ponds in farmland and edge. Remains underground throughout most of the year, using crayfish burrows in moist grasslands and meadows.
9267	*Lithobates areolatus circulosus*	Northern Crawfish Frog	G4T4	S3	S		Y	1963-03-19	M	H	36.9983 / -88.8758	0.9 mi E of Gage [plotted 0.9 rd mi E on KY 286].	Breeds in ponds in farmland and edge. Remains underground throughout most of the year, using crayfish burrows in moist grasslands and meadows.
13591	*Rudbeckia subtomentosa*	Sweet Coneflower	G5	S1	E			1947-06	C	H	37.0586 / -88.9995	Ballard Co.	Prairies and low grounds such as open stream terrace woodlands.
9275	*Silphium laciniatum*	Compassplant	G5	S2	T			1947-06	C	H?	37.0586 / -88.9995	Ballard County	Prairies and barrens.

THESE DATA ARE VALID ONLY ON THE DATE ON WHICH THE REPORT WAS GENERATED.
THESE DATA MAY ONLY BE USED FOR THE PROJECT NAMED ABOVE.

SongSparrowSolar



February 8, 2023

Element Occurences

Project Boundary

Buffered Project Boundary

1:53,507

0 0.45 0.9 1.8 mi

0 0.75 1.5 3 km

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA,

From: hkalnitz@fuse.net
To: Knabel, Chris
Cc: "Kentucky Speleological Survey"; christopherdmorris@gmail.com; sarahmariecaver@gmail.com; vanders33@yahoo.com; benjamin.tobin@uky.edu; kzachary@ksscaves.org; pat.kambesis@wku.edu; cdecelle@ksscaves.org; "Jules Roush"
Subject: RE: New KSS Data Request from Chris m Knabel
Date: Monday, February 6, 2023 1:48:58 PM

Chris
A search of our database shows no known cave locations or Karst Features in your requested area.

The closest recorded location in our database is more than 25 miles to the east

There is a 50$ fee for search origination, plus 10$ per record, for a total of 50$. You will be invoiced by our organization Treasurer – Julie Roush

This data is shared to aid in our organizational goals of conservation, research, and exploration of caves throughout the Commonwealth of Kentucky. Please remember that data reported by KSS is as has been reported to us, but not guaranteed to be complete or correct. There may be unknown caves, sinks or other unreported or unknown karst features. Additionally unreported or filled in cave entrances can open or subside at any time. Use caution when using this data.

Please mark supplied locations as Privileged and Confidential on all maps associated with this project.

Please note our updated guidelines on request turnaround timing:

> KSS is a volunteer organization. We do try to process standard requests as fast as possible, but cannot guarantee a turnaround time. We try to process non-voted requests in less than 1 month, and will attempt to vote on more complicated requests within 2 months.
> Requestors can contact us if a quick turnaround time is specifically needed.
> Timing is greatly reduced if an ArcGIS .shp file is provided

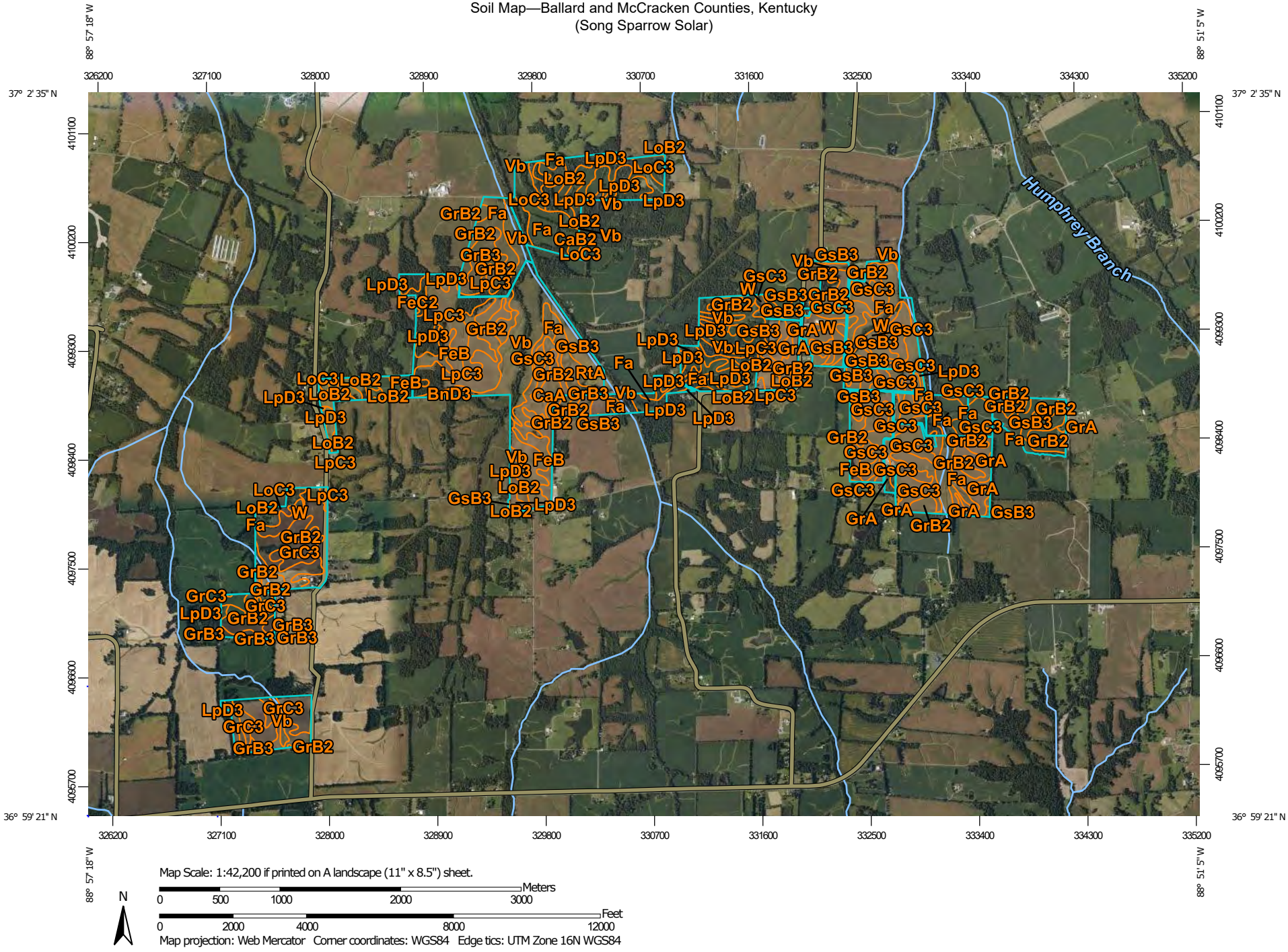
Thank You
Howard Kalnitz
KSS Database Committee

From: Kentucky Speleological Survey <admin@ksscaves.com>
Sent: Monday, February 6, 2023 10:03 AM
To: christopherdmorris@gmail.com; sarahmariecaver@gmail.com; vanders33@yahoo.com; benjamin.tobin@uky.edu; kzachary@ksscaves.org; hkalnitz@fuse.net; pat.kambesis@wku.edu
Subject: New KSS Data Request from Chris m Knabel

Your Name Chris m Knabel
Address: 848 west high st
City: lexington

State:	KY
Phone:	15028360335
Email Address	
Organization:	Stantec
Data Information Requested:	Potential Solar Far
Intended Use of Data/Information:	Environmental Survey
Qualifications:	Environmental Scientist
Attachments:	20230206170317_projectboundary.zip

Soil Map—Ballard and McCracken Counties, Kentucky
(Song Sparrow Solar)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Ballard and McCracken Counties, Kentucky
Survey Area Data: Version 16, Sep 8, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 13, 2011—Sep 25, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BnD3	Brandon silt loam, 12 to 20 percent slopes, severely eroded	4.2	0.3%
CaA	Calloway silt loam, 0 to 2 percent slopes	11.5	0.7%
CaB2	Calloway silt loam, 2 to 4 percent slopes, eroded	10.6	0.6%
Fa	Falaya-Collins complex, 0 to 2 percent slopes, occasionally flooded	200.0	11.9%
FeB	Feliciana silt loam, 2 to 6 percent slopes	57.7	3.4%
FeC2	Feliciana silt loam, 6 to 12 percent slopes, eroded	9.7	0.6%
GrA	Grenada silt loam, 0 to 2 percent slopes	21.0	1.3%
GrB2	Grenada silt loam, 2 to 6 percent slopes, eroded	316.3	18.9%
GrB3	Grenada silt loam, 4 to 6 percent slopes, severely eroded	55.0	3.3%
GrC3	Grenada silt loam, 6 to 12 percent slopes, severely eroded	68.8	4.1%
GsB3	Grenada-Purchase complex, 4 to 6 percent slopes, severely eroded	91.1	5.4%
GsC3	Grenada-Purchase complex, 6 to 12 percent slopes, severely eroded	201.4	12.0%
KrA	Kurk silt loam, 0 to 2 percent slopes	1.9	0.1%
LoB2	Loring silt loam, 2 to 6 percent slopes, eroded	87.3	5.2%
LoC2	Loring silt loam, 6 to 12 percent slopes, eroded	3.2	0.2%
LoC3	Loring silt loam, 6 to 12 percent slopes, severely eroded	48.1	2.9%
LpC3	Loring-Purchase complex, 6 to 12 percent slopes, severely eroded	152.6	9.1%
LpD3	Loring-Purchase complex, 12 to 20 percent slopes, severely eroded	152.8	9.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
RtA	Routon silt loam, 0 to 2 percent slopes	14.9	0.9%
Vb	Vicksburg silt loam, 0 to 2 percent slopes, occasionally flooded	160.6	9.6%
W	Water	5.4	0.3%
Totals for Area of Interest		**1,674.2**	**100.0%**