Mayfield Solar Project
Graves County, Kentucky

Protected Species Review

Submitted to:

MYSO, LLC

c/o: Mr. Bob Roy

515 N Flagler Drive, Ste 250

West Palm Beach, FL 33401

Submittal Date:

March 20, 2025

BFW Ref. #23694

March 20, 2025

Mr. Bob Roy
MYSO, LLC
515 N Flagler Drive, Ste 250
West Palm Beach, FL 33401

RE: Protected Species Review
Mayfield Solar Project
BFW Project No: 23694

Dear Mr. Roy:

Bacon Farmer Workman Engineering & Testing, Inc. (BFW) is pleased to submit our report documenting the findings of the Protected Species Review for for the Mayfield Solar Project in northern Graves County, Kentucky. The study area for the project encompassed 70 parcels totaling approximately 2,080 acres. The purpose of the review was to evaluate and document whether suitable habitat is present for protected species with the potential to be present in the vicinity of the project.

The study area contains approximately 375 acres of wooded areas and some scattered trees that provide suitable summer roosting and foraging habitat for the Indiana bat, northern long-eared bat, and tricolored bat. Clearing of suitable wooded habitat for permitted projects can often be authorized through arranging a payment to the Imperiled Bat Conservation Fund with the U.S. Fish and Wildlife Service. Suitable habitat is present for the bald eagle, and temporary construction restrictions could be required if the project is in the vicinity of an eagle nest. A bald eagle nest survey has been conducted and two potential nests have been identified in the vicinity of the project parcels. Follow-up visits are planned to one of the potential nest locations to determine whether a nest is present and is being used by bald eagles, but this visit has not been completed as of the publication date of this report. Suitable habitat is present within the study area for the gray bat, whooping crane, and monarch butterfly, but the project is not expected to have significant impacts to these species.

We appreciate the opportunity to serve you and look forward to future association with you on this and other projects. If you have questions concerning this report or require further clarification of the findings, please call our office at (502) 526-3613.

Sincerely,

Laura Darnell
Wetland Scientist / Ecologist

Attachment: Protected Species Review Report

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LIST OF ACRONYMS AND ABBREVIATIONS

BFW	Bacon Farmer Workman Engineering & Testing, Inc.
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practices
DBH	Diameter at Breast Height
DD	Data Deficient
ECOS	Environmental Conservation Online System
EPA	Environmental Protection Agency
ESA	Endangered Species Act
EXPN	Experimental Population, Non-essential
IBCF	Imperiled Bat Conservation Fund
IPaC	Information for Planning and Consultation
KDFWR	Kentucky Department of Fish and Wildlife Resources
KDOW	Kentucky Division of Water
KFO	Kentucky Field Office
KGS	Kentucky Geological Society
KRS	Kentucky Revised Statutes
KSNPC	Kentucky State Nature Preserves Commission
MBTA	Migratory Bird Treaty Act
NRCS	Natural Resources Conservation Service
OHWM	Ordinary High Water Mark
OKNP	Office of Kentucky Nature Preserves
PEM	Palustrine Emergent
PFO	Palustrine Forested
PUB	Palustrine Unconsolidated Bottom
SGCN	Species of Greatest Conservation Need
SWAP	State Wildlife Action Plan
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1. INTRODUCTION

Bacon Farmer Workman Engineering & Testing, Inc. (BFW) performed a Protected Species Review for the Mayfield Solar Project (**Figure 1**). The field work was completed in several visits between November 13 and December 15, 2023. Figures referred to in this text are included in **Appendix A** at the end of this report.

1.1 PURPOSE

The purpose of the assessment was to determine if habitats for protected species were present or potentially present within the study area. The species to be evaluated were identified using the United States Fish & Wildlife Service (USFWS) Information for Planning and Consultation webpage (IPaC) as well as the Natural Heritage Program Database maintained by the Office of Kentucky Nature Preserves (OKNP) and the database maintained by the Kentucky Department of Fish and Wildlife Resources (KDFWR).

1.2 PROJECT SCOPE

The Mayfield Solar Project will involve the construction of solar panels along with associated on-site power lines, access roads, a substation, battery storage, and other required infrastructure. The overall project will include a gen-tie line to connect the solar facility to an existing electric substation in southern McCracken County. The gen-tie line is not included in the scope of this study, with the exception that the initial protected species database inquiries used a project area containing both the parcels and a gen-tie. The proposed project site consists of 70 parcels totaling approximately 2,080 acres and is located east of US Highway 45 near Folsomdale, Kentucky in northeastern Graves County (**Figures 1 and 2**).

2. METHODOLOGY FOR ANALYSIS

2.1 DATABASE INQUIRIES

The protected listed species to be evaluated were identified using the USFWS IPaC database. The "Action Area" that was submitted as the query input consisted of the study area boundary as shown in **Figure 1** with a five-mile buffer applied to account for potential offsite impacts to protected species. Activities with potential offsite impacts to protected species could include blasting, pile driving, alterations to streamflow or water quality, habitat fragmentation, installation of barriers to wildlife movement, installation of new lighting, and/or construction noise. An initial inquiry into IPaC for a list of protected species that could be present was generated in February 2024. An updated document was generated on February 7, 2025, and is included in **Appendix B**.

The IPaC output also included a General Project Design Guidelines document which presents recommendations to minimize impacts to listed bats and aquatic species. This document is included in **Appendix B.**

Note that if consultation with the USFWS under Section 7 of the Endangered Species Act (ESA) is required, a detailed analysis of project development plans may find that the site assessment area or Action Area need to be expanded to include adjacent land that could be affected by the project. If potential impacts to protected species need to be assessed beyond the Action Area (the site with a five-mile buffer), a revised inquiry to IPaC would be needed.

An information request was submitted to the KDFWR environmental coordinator on February 29, 2024. The request included the unbuffered parcels with a gen-tie route. Ms. Emily Lawson of the KDFWR replied on March 12, 2024 with a letter which is attached in **Appendix B.** A separate request for information was sent to the KDFWR's avian biology specialist, Ms. Kate Slankard, on February 12, 2024 requesting information about bald eagle nesting habitat. Ms. Slankard sent information including habitat suitability mapping for bald eagles on February 14, 2024.

A query was also submitted to the Natural Heritage Program Database maintained for the State of Kentucky by the OKNP. The query included the unbuffered parcels with a gen-tie route. This database includes records for both federally-listed species and state-listed species. The OKNP database inquiry was generated on February 29, 2024, and is included in **Appendix B.**

2.2 DOCUMENT REVIEW

Contextual maps, databases, and scientific publications were reviewed to gather vital background data on physical and biological characteristics of the site, protected species with historical ranges within the site vicinity, and descriptions of listed species and their habitats. These resources were utilized to define habitat characteristics that would be identifiable and aid in assessing potential habitat during the site visit. These resources are listed in **Section 7 (References)** of this report.

2.3 SITE VISITS

After reviewing the applicable documents, site visits were conducted to characterize on-site habitats and determine first-hand if potential suitable habitat was available for the species listed in the database reviews. The site visits were conducted on several days between November 13 and December 15, 2023.

2.3.1 Eagle Nest Survey

BFW personnel performed a bald eagle nest survey for the Mayfield Solar Project on multiple visits in November and December 2023 and April 2024. The survey consisted of an in-house review, aerial drone survey work, and ground-based survey work on the project parcels and a buffer of 660 feet around these parcels. The bald eagle nest survey was performed to evaluate whether bald eagles are nesting in the vicinity of the project and have the potential to be disturbed by site construction activities. The ground survey personnel observed bald eagles at two locations in the project parcels but these observations appears to be temporary uses of the area by eagles. The drone survey imagery identified two potential bald eagle nest locations, both of which are outside the project parcels. Follow-up visits are planned to one of the potential nest locations to determine whether a nest is present and is being used by bald eagles, but this visit has not been completed as of the publication date of this report. After the follow-up visit, the methods and findings of the bald eagle nest survey will be documented in a separate report.

3. SITE DESCRIPTION

The project site is located in the Mississippi Valley Loess Plains Level III ecoregion, and the Loess Plains Level IV ecoregion according to the Environmental Protection Agency's ecoregion mapping system (Woods et al. 2002). This area is typically composed of gently rolling uplands, broad bottomlands, and terraces. Most of the original vegetation has now been replaced by cropland. Extensive corn, soybean, wheat, hay, tobacco, livestock, and poultry farming occurs. Agricultural runoff has degraded surface water quality. High turbidity and siltation are common in the streams and rivers of this ecoregion and many streams have been channelized.

The surrounding properties consists primarily of agricultural fields, woodlands, and residential and commercial properties to the south and west. A railroad borders the site to the southeast and US Highway 45 borders the site to the northwest.

3.1 TOPOGRAPHY

The topography of the study area is primarily flat with some gentle slopes. Surface elevations range from around 380 to 440 feet above mean sea level. See **Appendix A** for a United States Geologic Survey (USGS) 7.5-Minute topographic map of the site (**Figure 1**).

3.2 GEOLOGY AND SOILS

According to the available subsurface geologic mapping from the Kentucky Geological Survey, the site is underlain primarily with Alluvium, Loess, and some Continental Deposits. The primary lithology of the site is sand, silt, and gravel.

Based on the Natural Resources Conservation Services (NRCS) Soil Survey, the predominant soils in the western, slightly higher part of the site are Grenada silt loam and Calloway silt loam. The predominant soil deposits on the eastern part of the site near Mayfield Creek include Collins silt loam, Waverly silt loam, and Falaya silt loam, with some areas of Kurk silt loam and Routon silt loam.

3.3 TERRESTRIAL HABITATS

Habitats within the study area include agricultural crop fields, open field habitat, scrub-shrub habitat, upland forest, forested wetland, and emergent wetland. See **Appendix A** for a habitat map (**Figure 4**) and **Appendix C** for representative photographs of habitats.

Agricultural Crop Field: The agricultural fields are generally cultivated in corn, wheat, or soybeans but many fields were fallow at the time of the field visits.

Open Field: Some areas on the margins of crop fields or between other land uses are maintained as open fields by periodic mowing. Common plant species in the open fields included fescue (*Schedonorus arundinaceus*), Kentucky bluegrass (*Poa pratensis*), Canada goldenrod (*Solidago canadensis*), Bermuda grass (*Cynodon dactylon*), Japanese honeysuckle (*Lonicera japonica*), broomsedge (*Andropogon virginicus*), and blackberry (*Rubus allegheniensis*).

Upland Forest, Wooded Fence Rows, and Scrub-Shrub Habitat: Upland wooded and scrub-shrub habitats is present in scattered woodlots, wooded stream corridors, and wooded fencerows. Common plant species in these habitats included common hackberry (*Celtis occidentalis*), slippery elm (*Ulmus rubra*), southern red oak (*Quercus falcata*), white oak (*Quercus alba*), Japanese chaff flower (*Achyranthes japonica*),

microstegium grass (*Microstegium vimineum*), field garlic (*Allium vineale*), Japanese honeysuckle, riverbank grape (*Vitis riparia*), and greenbrier (*Smilax rotundifolia*).

3.4 AQUATIC AND WETLAND HABITATS

The position of the site in relation to other streams is depicted in **Figure 3.** Mayfield Creek is a large perennial stream which flows in a northern direction along the eastern side of the project area. Surface water in the northern section of the study area generally flows northeast into tributaries to Mayfield Creek. Surface water in the southern section of the study area also flows northeast into tributaries of Mayfield Creek, including the perennial stream Carney Creek.

Palustrine emergent and palustrine forested wetland habitats and open water ponds are scattered through the study area. The water/wetland delineation mapped a total of seven perennial streams (including Mayfield Creek), seven intermittent streams, 26 ephemeral streams, 49 wetlands, and ten ponds within the 2,080-acre study area (BFW 2025). See **Appendix C** for representative photographs of the streams, wetlands, and ponds observed on the site.

Mayfield Creek: Mayfield Creek is a large perennial stream with a watershed of approximately 150 miles at the project location. It flows northward along the eastern edge of the study area. At the study area, Mayfield Creek has an Ordinary High Water Mark (OHWM) approximately 120 feet wide. During the field visits, it contained flowing water with depths ranging from a few inches in riffles to three feet of more in pools. The stream substrate consists of silt, sand, gravel, and cobble. In the project vicinity, Mayfield Creek is generally highly channelized and flows between agricultural fields within a narrow wooded riparian corridor.

Please note that this reach of Mayfield Creek (miles 16.1 to 35.75) is listed by the Kentucky Division of Water (KDOW) as a special-status water. This stream reach qualifies for a special status because it is classified as impaired (Non-Support) for warm water aquatic habitat for the parameter Sedimentation/Siltation, and the parameter or source is related to habitat. The suspected sources are Agriculture, Channelization, and Loss of Riparian Habitat.

Other Perennial Streams: Six other perennial streams are located across the site. These streams range from two to 30 feet wide at the OHWM with bank heights of one to eight feet. During the field visits, these streams typically contained pools up to 18 inches deep interspersed with areas of dry stream bed or trickle flow. These perennial streams had substrates that were generally dominated by silt, sand, and gravel, with some cobble.

Intermittent Streams: The study area contains seven intermittent streams which are scattered throughout the study area and generally flow through narrow, channelized wooded corridors between agricultural fields. The intermittent streams ranged from three to ten feet wide at the OHWM with bank heights of two to six feet. During the field visits in November and December 2023, the intermittent streams were generally dry or contained water in small pools. The intermittent stream substrates were generally dominated by silt and gravel.

Ephemeral Streams: The study area contains a total of 26 ephemeral streams which are scattered throughout the study area and most are partially to completely channelized. Most of the ephemeral streams ranged from two to three feet wide at the OHWM with bank heights of one to four feet. During the field visits, the ephemeral streams were generally dry or contained water in small pools. The ephemeral stream

substrates were generally dominated by silt, with some gravel. The majority of the ephemeral streams flow through wooded corridors.

Emergent Wetlands: The majority of the palustrine emergent (PEM) wetlands in the study area are located in isolated low spots within agricultural fields. Many of these wetlands are highly disturbed through agricultural activities and contain a few weedy grass species. Common plant species in the emergent wetland habitats included redtop panic-grass (*Coleataenia rigidula*) barnyard grass (*Echinochloa crus-galli*), green bulrush (*Scirpus atrovirens*), false nettle (*Boehmeria cylindrica*), and cocklebur (*Xanthium strumarium*).

Forested Wetlands: Palustrine forested (PFO) wetland habitats are scattered through the study area and occur mostly in woodlots between agricultural fields. Common plant species in the forested wetland habitats included included green ash (*Fraxinus pennsylvanica*), sweetgum (*Liquidambar styraciflua*), American elm (*Ulmus americana*), river birch (*Betula nigra*), red maple (*Acer rubrum*), false nettle, and riverbank grape.

Open Water Ponds: The study area contains ten open water ponds that contain palustrine unconsolidated bottom (PUB) habitat. These ponds are generally small features which have been created through excavation and/or the construction of a dam on their downstream side. Most of the ponds do not have an outlet.

3.5 UNDERGROUND HABITATS AND MAN-MADE STRUCTURES

The potential for subterranean habitat such as caves and mines was investigated through a search of available geological data. The Kentucky Geologic Map Service website (KGS 2025) maps the entire area of Graves County as “non-karst potential.” No karst features such as sinkholes are mapped in the county. No springs are mapped within or in the vicinity of the site.

The Kentucky Mine Mapping Information System (KGS 2024b) was utilized to obtain shapefiles of mine portal locations and mined out areas. No mine portal records or mined out areas are mapped in Graves County or the surrounding area of Kentucky.

According to USFWS guidance (USFWS 2022), abandoned structures (e.g., barns, uninhabited houses) that are planned to be demolished may need to be assessed for bat use for projects where consultation is required under the ESA. One barn is present on the southern edge of Parcel 36 in the southern portion of the site in the west-central part of the study area. A few abandoned small outbuildings such as sheds are also scattered through the study area. **No assessment of structures for bat use has been conducted at this time.**

4. FINDINGS FOR FEDERALLY-PROTECTED SPECIES AND CRITICAL HABITAT

The site was reviewed to determine if habitats for protected species were present or had the potential to exist within the study area depicted on **Figure 1** in **Appendix A**. As discussed in **Section 2.1 (Database Inquiries)**, the "Action Area" that was submitted to the USFWS IPaC database as the query input consisted of the study area boundary with a five-mile buffer applied to account for potential offsite impacts to protected species. The USFWS IPaC database output letter for the five-mile buffered Action Area is included in **Appendix B.**

Note that for consultation with the USFWS under Section 7 of the ESA, a detailed analysis of project development plans may find that the site assessment area or Action Area needs to be expanded beyond the current study area to include adjacent land that could be affected by the project. Activities with potential offsite impacts to protected species could include blasting, pile driving, alterations to streamflow or water quality, habitat fragmentation, installation of barriers to wildlife movement, installation of new lighting, or construction noise. If potential impacts to protected species need to be assessed beyond the Action Area boundary (the site with a five-mile buffer), a revised inquiry to IPaC would be warranted.

The protected species that were included in the IPaC database results are summarized in **Table 4-1** and discussed in the sections below.

Table 4-1. Summary of Federally-Protected Species

Species	Federal Status	General Habitat Description	Supporting/Limiting Factors
Gray bat (*Myotis grisescens)*	Endangered	Roosting: Caves and mines Foraging: Stream corridors and waters	No caves or mines Streams and ponds present
Indiana bat (*Myotis sodalis)*	Endangered	Winter roosting: Caves and mines Summer roosting: Suitable trees, bridges, man-made structures Foraging: Wooded habitat	No caves or mines Wooded habitat present Barn and abandoned outbuildings present
Northern long-eared bat (*Myotis septentrionalis)*	Endangered		
Tricolored bat (*Perimyotis subflavus)*	Proposed Endangered		
Whooping Crane (*Grus americana*)	Experimental Population, Non-Essential	Palustrine wetlands and agricultural fields	These habitats are present
Bald eagle (*Haliaeetus leucocephalus*)	Protected by BGEPA and MBTA	Nests in large trees near large bodies of water	Large and medium streams and ponds present Two bald eagles observed on site; two potential nests observed on drone imagery
Migratory birds	Protected by MBTA	Various	Wooded habitat blocks and individual trees present
Monarch butterfly (*Danaus plexippus*)	Proposed Threatened	Woodland, field, and suburban areas	These habitats are present

BGEPA = Bald and Golden Eagle Protection Act; MBTA = Migratory Bird Treaty Act

4.1 DESIGNATED CRITICAL HABITATS

According to the IPaC database, there are no designated critical habitats for any of the listed species within the project area.

4.2 MAMMALS

4.2.1 Gray Bat (*Myotis grisescens*)

Habitat Description: With rare exceptions, gray bats live in caves year-round. During the winter, gray bats hibernate in deep, vertical caves. In the summer, they roost in caves which are scattered along rivers. These caves are in limestone karst areas of the southeastern United States. They do not use houses or barns. Gray bats have been documented to regularly migrate 10-271 miles between summer maternity sites and winter hibernacula. Gray bats can fly 12-35 miles during daily flights to feed within riparian and forested habitats. Foraging gray bats fly over open water of rivers, streams, lakes, or reservoirs that are bordered by wooded habitat. Although the species may travel up to 21 miles between prime feeding areas, most data support foraging locations between 2.5 miles from the maternity colonies. There is no designated critical habitat for this species.

Site Assessment Findings: The study area has no known caves or mines and therefore is assumed to have no gray bat roosting habitat. Streams and ponds within the study area may provide foraging habitat for gray bats.

Impacts to water quality to streams within or downstream of the study area could have indirect effects on the gray bat because this could reduce or alter the populations of insects that are a food source for this bat. Implementation of Best Management Practices (BMPs) such as erosion and sediment control measures and maintaining vegetated buffers could minimize these potential impacts.

4.2.2 Indiana Bat (*Myotis sodalis*), Northern Long-eared Bat (*Myotis septentrionalis*), and Tricolored bat (*Perimyotis subflavus*)

Winter Habitat Description: Indiana bats, northern long-eared bats, and tricolored bats hibernate during winter in caves or, occasionally, in abandoned mines. For hibernation, they require cool, humid caves with stable temperatures, under 50°F but above freezing. Very few caves within the range of the species have conditions of temperature, humidity, and air currents that are suitable for hibernation. Where caves are sparse, tricolored bats are often found roosting in road-associated culverts where they exhibit shorter torpor bouts and forage during warm nights.

Summer Habitat Description: After hibernation, these bats migrate to their summer habitat in wooded areas where they usually roost under loose tree bark on dead or dying trees. During summer, males roost alone or in small groups, while females may roost in larger groups of up to 100 bats or more.

Suitable summer habitat consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded

corridors may be dense or loose aggregates of trees with variable amounts of canopy closure. A potential roost tree for Indiana bats would include live trees and/or snags ≥ five (5) inches in diameter at breast height (DBH) that have exfoliating bark, cracks, crevices, and/or hollows. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet of other forested/wooded habitat. Summer habitat for the northern long-eared bat overlaps greatly with Indiana bat habitat and includes additional use of trees as small as three (3) inches DBH.

Indiana bats and northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges and bat houses (artificial roost structures); therefore, these structures should also be considered potential summer habitat.

The tricolored bat uses similar summer habitat as the Indiana and northern long-eared bats. These bats roost primarily among leaves of live or recently dead deciduous hardwood trees, but may also be found in Spanish moss, pine trees, and occasionally human structures. Tricolored bats are expected to be federally listed as Endangered in the near future; once tricolored bats are listed, additional evaluation will be needed to determine the presence or absence of this species.

Site Assessment Findings: Maps depicting point-based locations of known habitat for the Indiana bat and northern long-eared bat within Kentucky have been developed by the USFWS as of 2019 and the portions of these maps that include this project are depicted in **Figures 5 and 6**. "Known habitat" refers to suitable summer or winter habitat located within a determined distance of an occurrence record for a bat species (USFWS KFO 2016). The study area is not overlapped by a known habitat circle for either the Indiana bat or the northern long-eared bat; therefore, the site is considered to be in "Potential" habitat zones for both species. The KDFWR letter indicated that there was a record for the tricolored bat within one mile of the project parcels and gen-tie.

No caves or underground mines were identified during this assessment. Therefore, it does not appear that winter roosting habitat for these three bats is present within the study area. The study area contains one barn on Parcel 36 and several small abandoned outbuildings such as sheds. These structures may provide suitable summer roosting habitat for bats. **No assessment of abandoned structures within the study area for bat use has been completed at this time.**

Many wooded areas that provide potential summer roosting and foraging habitat for the Indiana bat, northern long-eared bat, and tricolored bat are present within the study area. These include areas of upland woodland habitat and forested wetlands. A total of approximately 375 acres of this wooded habitat was mapped within the study area and is depicted on **Figure 4.** Some scattered trees also provide suitable bat roosting or foraging habitat and are depicted on **Figure 4.**

Clearing wooded areas that provide potential summer roosting and foraging habitat (**Figure 4**) would reduce the amount of available habitat within the study area for the listed bat species. Clearing suitable habitat could have direct impacts on the Indiana bat, northern long-eared bat, and tricolored bat if individuals of these species were present in trees during clearing activities. The potential for these direct impacts would be limited to the seasons when the bats would be present in the area. For "Potential" habitat zones as mapped by the

USFWS Kentucky Field Office (KFO), the Occupied season is defined as April 1st though October 14th. In addition, the interval from June 1 through July 31 is defined as a more sensitive Occupied Non-Volant season, which means that bats too young to fly could be present in trees and are highly vulnerable because they would be unable to escape a felled tree.

Tree clearing could also have indirect impacts to the listed bats if the bats formerly used the cleared trees for roosting and foraging and then had to expend time and energy finding new habitat. Habitat loss could potentially have cumulative effects to the listed bat species, which relate to the potential effect of project activities combined with any known unrelated future non-federal activities that are reasonably certain to occur within the action area that are likely to affect the species.

Clearing suitable wooded habitat for permitted projects in Kentucky can often be authorized through arranging a payment to the Imperiled Bat Conservation Fund (IBCF) with the USFWS. More information about the IBCF is presented in **Section 6** below. The authorization to use the program is at USFWS discretion and is not available for every project although denials are often related to unique habitats or resources at a project location. If a payment to the IBCF is not allowed, the USFWS could require a presence/absence survey for bats which could be conducted as a mist net survey or acoustic survey.

4.3 BIRDS

4.3.1 Whooping Crane (*Grus americana*)

Habitat Description: This large, long-legged, long-necked bird occurs in eastern and central North America. The only self-sustaining population of whooping cranes migrates from Canada across the Great Plains and down to the Texas coast. Critical habitat is designated along this flight corridor. Although this species is listed as Endangered under the ESA, the listing status for the population with a range overlapping the study area is designated as an experimental population that is non-essential (EXPN). The geographic range of the experimental population that contains Kentucky extends from northern Alabama and Georgia to central Tennessee, and north through Kentucky up into Indiana. The whooping crane is a migratory species in Kentucky.

Whooping cranes breed, migrate, over-winter, and forage in a variety of wetland and other habitats. They use coastal marshes and estuaries, inland marshes, lakes, ponds, wet meadows and rivers, and agricultural fields. This crane primarily prefers shallow, seasonally and semi permanently flooded palustrine wetlands for roosting and winter habitat includes salt marshes and tidal flats on the mainland and barrier islands, dominated by salt grass, saltwort, smooth cordgrass, glasswort, and sea ox-eye.

Site Assessment Findings: It appears that potential habitat for whooping crane is present in the project vicinity because palustrine wetland habitat and agricultural fields are present and could be inhabited by the crane. However, the onsite habitats are relatively disturbed and the surrounding area likely provides similar stopover habitat for the whooping crane.

4.3.2 Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle was formerly listed under the ESA but was delisted due to successful recovery efforts for the species. However, bald eagles are protected under the Bald and Golden Eagle Protection Act (BGEPA) and Migratory Bird Treaty Act (MBTA).

Habitat Description: Bald eagles generally nest near coastlines, rivers, large lakes or streams that support an adequate food supply. They often nest in mature or old-growth trees; snags (dead trees); cliffs; rock promontories; or rarely on the ground; and with increasing frequency on human-made structures such as power poles and communication towers. In forested areas, bald eagles often select the tallest trees with limbs strong enough to support a nest that can weigh more than 1,000 pounds. Nest sites typically include at least one perch with a clear view of the water where the eagles usually forage.

Site Assessment Findings: No records of bald eagles were returned from the inquiries to the USFWS, KDFWR, and OKNP. Biologists and academics at Eastern Kentucky University and the KDFWR have cooperatively developed a bald eagle nesting habitat suitability model for Kentucky (Castle et al. 2023). The model was developed through analyzing habitat characteristics at known bald eagle nest locations. Initial research into eagle activity at the project site included an inquiry to Ms. Kate Slankard, an avian biologist with the KDFWR. Ms. Slankard shared output from the bald eagle nesting habitat suitability model for land in the vicinity of the Mayfield Solar project. The KDFWR has indicated that this model is not binding from a regulatory standpoint but can inform biological survey work. The model output is depicted in relation to the project on **Figure 7.**

The model indicates “High Suitability” (red) habitat for bald eagles in a few locations adjacent to Mayfield Creek where wooded habitat blocks are present. Some wooded areas throughout the site and around Mayfield Creek are mapped as “Medium Suitability” (yellow) with the remainder of wooded areas being mapped as “Lower Suitability” (blue). A large area of “High Suitability” habitat is mapped approximately 1.5 mile north of the site where a large block of forest, a 21-acre lake, and the forested corridor of Mayfield Creek occur together near US Highway 45. Other small areas of “High Suitability” are mapped along the forested corridor of Mayfield Creek to the southeast of the site.

BFW completed a bald eagle nest survey on the buffered project parcels which is described in **Section 2.3.1**. The survey noted two live individuals (Observations #MY-1 and #MY-2 on **Figure 7**) which appear to be temporary uses of the area by bald eagles. The survey also observed two potential eagle nest locations outside the project parcels (Observations #MY-3 and #MY-4 on **Figure 7**). A follow-up visit is planned to one of the potential nest locations to determine whether a nest is present and is being used by bald eagles, but this visit has not been completed as of the publication date of this report. After the follow-up visit, the methods and findings of the bald eagle nest survey will be documented in a separate report.

4.3.3 Migratory Birds

The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the USFWS. The USFWS has the responsibility under

the MBTA to proactively prevent the mortality of migratory birds whenever possible and the USFWS encourages implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Site Assessment Findings: Wooded habitat and individual trees are present that could provide nesting habitat for migratory birds. The study area contains approximately 375 acres of wooded habitat along with several scattered trees.

4.4 INSECTS

4.4.1 Monarch Butterfly (*Danaus plexippus*)

Habitat Description: The USFWS issued a proposed rule on December 12, 2024 to list the monarch butterfly as a Threatened species. Monarch butterflies have a migratory life cycle and the monarchs in this region overwinter in Mexico and spend other parts of the year migrating, foraging, and breeding in eastern North America. Monarchs use a variety of habitats that include mixed and coniferous woodlands, hedgerows, savanna, grassland, old fields, and suburban areas. They obtain nectar from a variety of flowers but require milkweed plants (*Asclepias* sp.) as a host plant to feed the larval (caterpillar) life stage.

Site Assessment Findings: The study area contains open fields, scrub-shrub habitat, and wooded habitat that could be inhabited by the Monarch butterfly. However, the project is not expected to have significant impacts on the species.

4.5 PROTECTED SPECIES NOT EVALUATED IN DETAIL

4.5.1 Pink Mucket Pearlymussel (Lampsilis abrupta)

As noted in **Section 2.1 (Database Inquiries)**, the IPaC database inquiry used a five-mile buffer around the project. One species, the pink mucket, was included in the species list as having a range overlapping the buffer. However, based on more detailed range information for this species, it was not evaluated in detail.

Per the USFWS general project guidelines for freshwater mussels in **Appendix B**, the pink mucket is known to occur or may potentially occur in the Barren, Green, Licking, Rolling Fork, and Salt River basins. The project site drains to Mayfield Creek which drains directly into the Mississippi River near Wickliffe, Kentucky. Therefore, the project is not located in a watershed where the pink mucket is known to occur.

5. STATE-LISTED SPECIES

The site was also reviewed to determine if state-listed species and their habitats had the potential to exist within the study area. State-listed species for Kentucky have been established through regulations such as KRS Chapter 146.610, which authorized the OKNP to develop and maintain lists of state threatened and endangered plants. However, the state-listed species do not have statutory protection and KRS Chapter 146.615 specifically states that "The lists promulgated under KRS 146.610 shall not serve to impede the development or use of public or private lands." Natural resource agencies such as the USFWS could request project measures to minimize impacts to state-listed species on projects where they have jurisdiction, and concerns about impacts to state-listed species could potentially be raised in projects with public comment periods or opposition.

The state-listed species to be evaluated were identified through a review of the Natural Heritage Program Database maintained for the state of Kentucky by the OKNP. The OKNP recommends a two-mile buffer for new installation, maintenance, or removal of solar projects; therefore, this recommended buffer was utilized to generate the list of species with records overlapping the project area. The output letter for the project parcels and gen-tie with a two-mile buffer is included in **Appendix B.**

Additional species records from the KDFWR database were provided by the KDFWR biologist in response to the project information request. The KDFWR response letter is attached in **Appendix B.** The KDFWR maintains the Kentucky State Wildlife Action Plan (SWAP) under a federal grant from the USFWS, and one component of the SWAP is the designation of some species as Species of Greatest Conservation Need (SGCN) in Kentucky. Species with SGCN status are indicated in **Table 5-1** below.

Some KDFWR records were returned for federally-listed species records within ten miles of the project parcels and gen-tie. These included the Indiana bat, northern long-eared bat, tricolored bat, pink mucket, orangefoot pimpleback, sheepnose, fat pocketbook, rabbitsfoot, longsolid, and alligator snapping turtle). The Indiana bat, northern long-eared bat, tricolored bat, and pink mucket were discussed in **Section 4** above. The remaining species are located within or adjacent to major river systems with no records in Mayfield Creek; thus, these species were not included in **Table 5-1** below or discussed in this section.

5.1 HABITAT DESCRIPTIONS

The state-listed species that were included in the Kentucky Natural Heritage Program Database and KDFWR results are summarized in **Table 5-1** and discussed in **Section 5.2** below.

Table 5-1. Summary of State-Listed Species

Species	OKNP State Status	KDFWR Status	Habitat Description	Last OKNP Observation Year	Suitable Habitat in Study Area?
Amphibians					
Northern Crayfish Frog *(Lithobates areolatus circulosus)*	State Special Concern	DD	Grasslands, prairies, open woodlands, ponds, and wetlands.	N/A	Yes
Birds					
Barn Owl (*Tyto alba*)	State Special Concern	SGCN	Grasslands, farmlands, marshes, and woodland edges. Nests in tree cavities, barns, and	2004	Yes
Loggerhead Shrike *(Lanius ludovicianus)*	State Special Concern	SGCN	Grasslands, shrublands, pastures.	1990	Yes
Sharp-Shinned Hawk *(Accipiter striatus)*	State Special Concern	SGCN	Dense forests and woodlands, suburban areas in winter.	1985	Yes
Crustaceans					
Swamp Dwarf Crayfish *(Cambarellus puer)*	State Endangered	DD	Swamps, marshes, ditches, and heavily vegetated ponds.	1980	Yes
Fishes					
Cypress Minnow (*Hybognathus hayi*)	State Endangered	SGCN	Slow-moving, swampy streams, oxbow lakes, and backwaters with sandy or muddy bottoms.	N/A	Yes
Finescale Stoneroller (*Campostoma pullum*)	State Special Concern	None	Clear, fast-flowing streams and rivers with gravel or rocky substrates.	N/A	Yes
Plants					
Chaffweed (*Lysimachia minima*)	State Threatened	None	Wetlands, along pond edges, ditches, and disturbed areas.	1920	Yes
Crimson-Eyed Rose-Mallow (*Hibiscus lasiocarpus*)	None	None	Marshes, swamps, riverbanks, and moist meadows.	2022	Yes
Eastern Blue-Star *(Amsonia salicifolia)*	None	None	Open woodlands, prairies, and well-drained rocky or sandy soils.	1967	Yes
Lance-Leaved Loosestrife *(Lythrum lanceolatum)*	None	None	Moist meadows, stream banks, pond edges, and open wetlands.	2022	Yes
May Grass (*Phalaris caroliniana*)	None	None	Ditches and wet, sandy, open fields.	1971	Yes

Species	OKNP State Status	KDFWR Status	Habitat Description	Last OKNP Observation Year	Suitable Habitat in Study Area?
Rosinweed *(Silphium integrifolium)*	None	None	Dry, open prairies, grasslands.	1968	Yes
Sweet Coneflower (*Rudbeckia subtomentosa*)	State Endangered	None	Moist prairies, open woodlands, stream banks, and roadside ditches.	1977	Yes
Zigzag Iris (*Iris brevicaulis*)	State Threatened	None	Moist forests, shaded woodland edges, and rich, well-drained soils.	1974	Yes

SCGN = Species of Greatest Conservation Need (from KDFWR 2023);
DD = Data Deficient (more information is needed to determine the rarity of the species)
N/A = Not Applicable (the record for the species is from KDFWR only)

5.2 STATE-LISTED SPECIES DISCUSSION

The study area contains a mix of terrestrial habitats including agricultural crop fields, open field habitat, scrub-shrub habitat, upland forest, and wooded fencerows. Aquatic and wetland habitats include a Mayfield Creek and several smaller perennial streams, intermittent streams, ephemeral streams, forested wetlands, emergent wetlands, and open water ponds. It appears that there is suitable habitat within the study area for most of the state-listed species.

The OKNP database output returned four records for state-listed species which overlapped the boundary of the parcels and gen-tie (loggerhead shrike, chaffweed, may grass, and rosinweed). However, all records date from 1990 or earlier, and several records have a general location description that is mapped over a large area. The record for may grass (*Phalaris caroliniana*) in 1971 is listed as “ditches and banks of the railroad crossing of Wice Baptist C” (Wice Church Road), which appears to be in the path of the planned gen-tie. The site assessments were conducted only on the project parcels (not the gen-tie) and were conducted outside the growing season so the presence/absence of state-listed species within the project has not been evaluated.

The KDFWR records indicated that four species listed as SGCN had records within one mile of the parcels and gen-tie (finescale stoneroller, cypress minnow, northern crawfish frog, and barn owl). The KDFWR letter stated that “records of the state-listed finescale stoneroller are near the project area in Carney Creek.” A segment of Carney Creek flows northeast through the central portion of the project area until it empties into Mayfield Creek outside of the project area. Thus, KDFWR recommends that erosion control measures be implemented prior to construction to reduce siltation into waterways and reduce potential impacts to state-listed species near the proposed project footprint.

6. DISCUSSION

Once detailed designs are developed for a portion or the entire site, an analysis of the project area can be performed to develop determinations of whether the project activities will potentially impact federally-listed species.

Several construction activities may require agency permits. Coordination may be required with the USFWS, Kentucky state agencies, and/or the U.S. Army Corps of Engineers (USACE) on construction projects prior to conducting tree thinning, tree removal, in-stream work, or the filling of wetlands, streams, or ponds. Section 7 of the ESA requires consultation with the USFWS for projects that receive a federal permit, federal funding, or federal oversight, and Section 10 of the ESA applies to many activities that may affect listed species and their habitats, even without a federal nexus. Consultation with the USFWS should be conducted once final design plans are completed and it is determined which activities have the potential to affect protected species.

Suitable habitat is present within the study area for the gray bat, whooping crane, and monarch butterfly, but the project is not expected to have significant impacts to these species. An old record of a state-listed plant, may grass, appears to occur along the path of the gen-tie but it is unknown if this species is currently present at this location. There are records for the state-listed finescale stoneroller near the project area in Carney Creek, and erosion control measures are recommended prior to construction to reduce potential impacts to this fish.

Bats: The study area contains approximately 375 acres of wooded areas and some scattered trees that provide suitable summer roosting and foraging habitat for the Indiana bat, northern long-eared bat, and tricolored bat. Clearing suitable wooded habitat for permitted projects can often be authorized through arranging a payment to the IBCF with the USFWS. Authorized payments to the IBCF are calculated on a per-acre rate based on current real-estate values along with multipliers related to the presence or absence of known bat habitat in the area and the time of year that clearing would be conducted. A per-acre payment to the IBCF for the project would cover potential effects to multiple bat species together, and separate or duplicate payments for multiple bat species are not required.

Based on available maps from the USFWS, the study area is located within “Potential” habitat zones for the northern long-eared bat and the Indiana bat. Therefore, per-acre rates for authorized clearing through the IBCF are expected to be $2,650 per acre for clearing during the Unoccupied season (October 15 through March 31) or $5,300 per acre for clearing during the Occupied season (April 1 to May 31 and August 1 to October 14). Authorization to pay into the IBCF for clearing during the Occupied Non-Volant interval (June 1 to July 31) interval may be granted at USFWS discretion at an elevated rate of $10,600 per acre with a maximum of 20 acres.

Bald Eagles: These birds are delisted from the ESA but are still protected under the BGEPA and MBTA. The USFWS has prepared National Bald Eagle Management Guidelines (USFWS 2007), which are intended to help people minimize activities that impact bald eagles, particularly where the activities would result in “disturbance,” which is prohibited by the BGEPA. The USFWS also administers a permit program for “take” of eagles under the BGEPA where disturbance is unavoidable. As of 2024, the USFWS issues two broad types of eagle disturbance permits: specific permits for eagle nest disturbance that can be issued for up to five years, and general permits for eagle disturbance that are issued for a maximum of one year. However, many activities do not require eagle disturbance permits. USFWS guidelines state that typical construction activities over 660 feet from an active bald eagle nest generally do not require a permit. Construction activities that create extremely loud noises (such as

blasting) require a permit if the activity is closer than a half-mile to an active eagle nest. KDFWR recommendations are more stringent and state that disturbance to hawks and eagles (triggering a flight response) can occur from activities as far as one mile from the nest in some cases.

Two adult bald eagles were observed within the project parcels during the field assessments. A bald eagle nest survey was conducted for the site and a 600-foot buffer, and the drone imagery from this survey identified two potential bald eagle nest locations outside the project parcels. Follow-up visits are planned to one of the potential nest locations to determine whether a nest is present and is being used by bald eagles, but this visit has not been completed as of the publication date of this report. If bald eagle nests are identified, coordination with the USFWS may be required.

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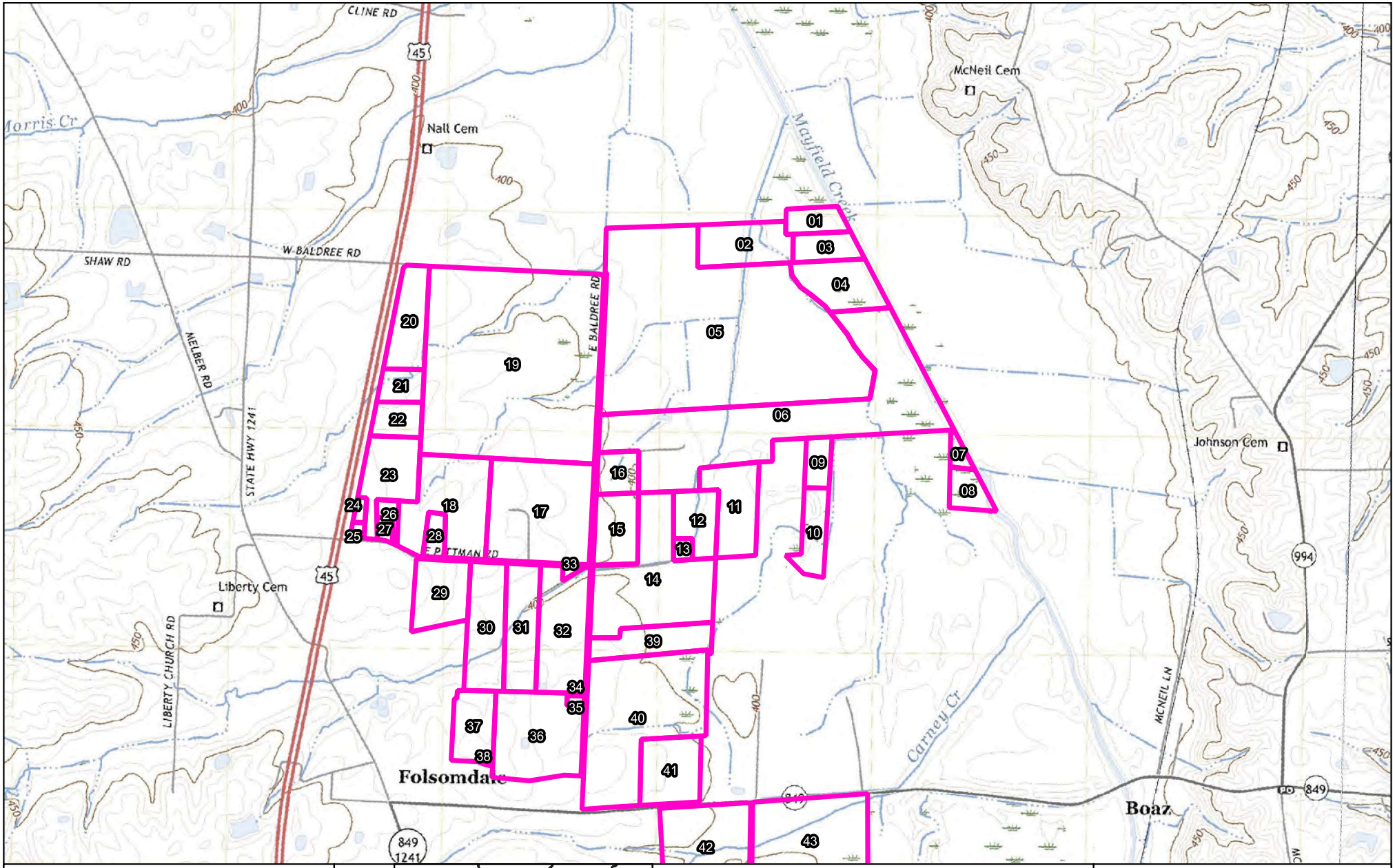
Appendix A

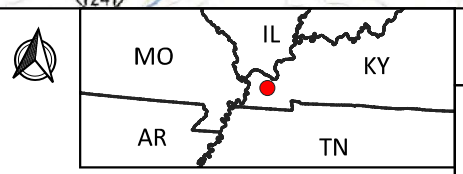
Figures



LEGEND

Project Data

Project Parcels



0 2,000 4,000 ft

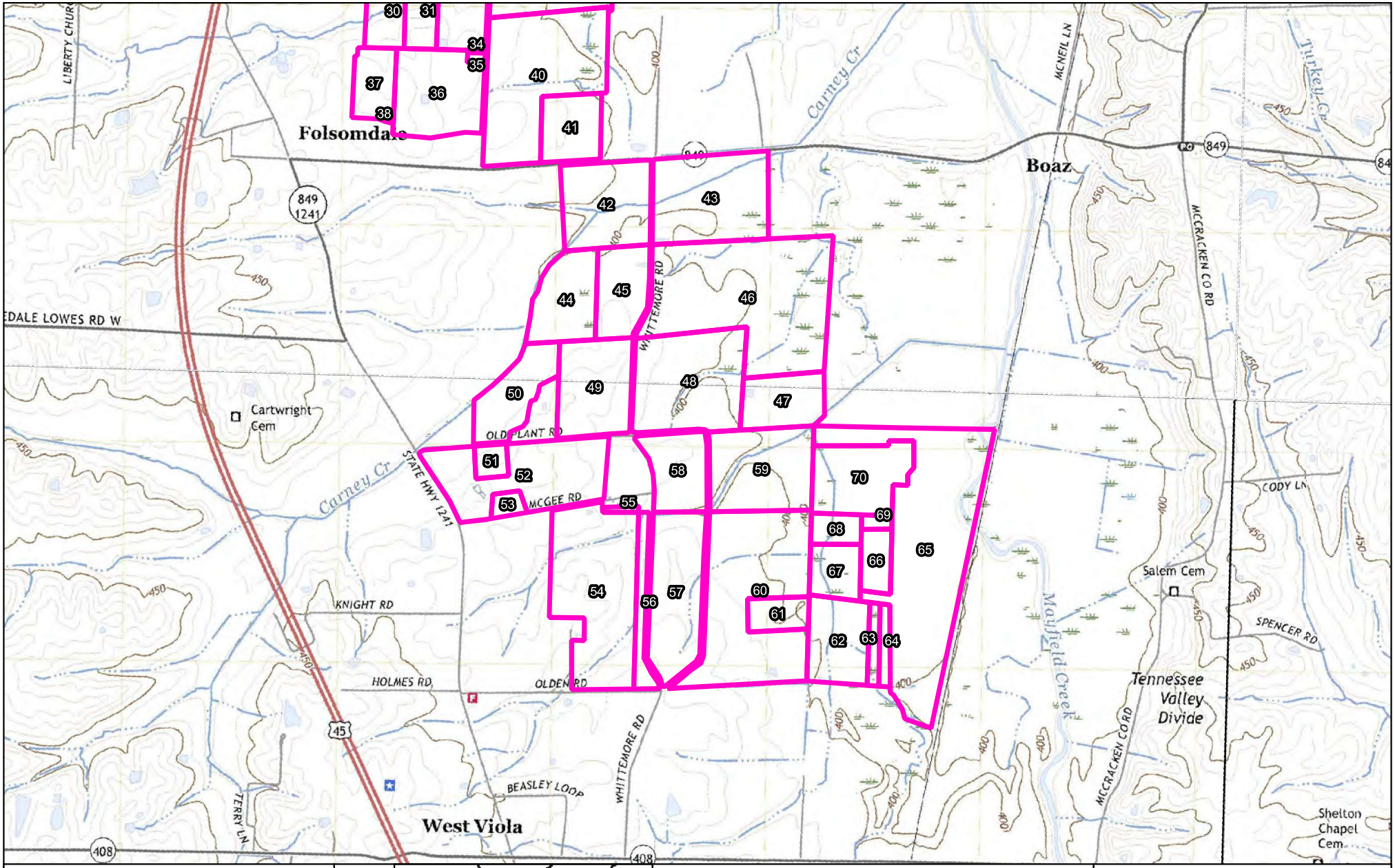
1 inch : 2000 feet

Figure 1 - USGS Topographic Map
Sheet 1/2

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
23694	HK/LD	2025-02-14

BFW SM



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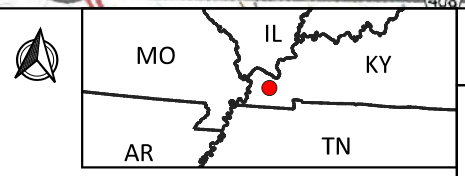
Project Data

Project Parcels



0 2,000 4,000 ft

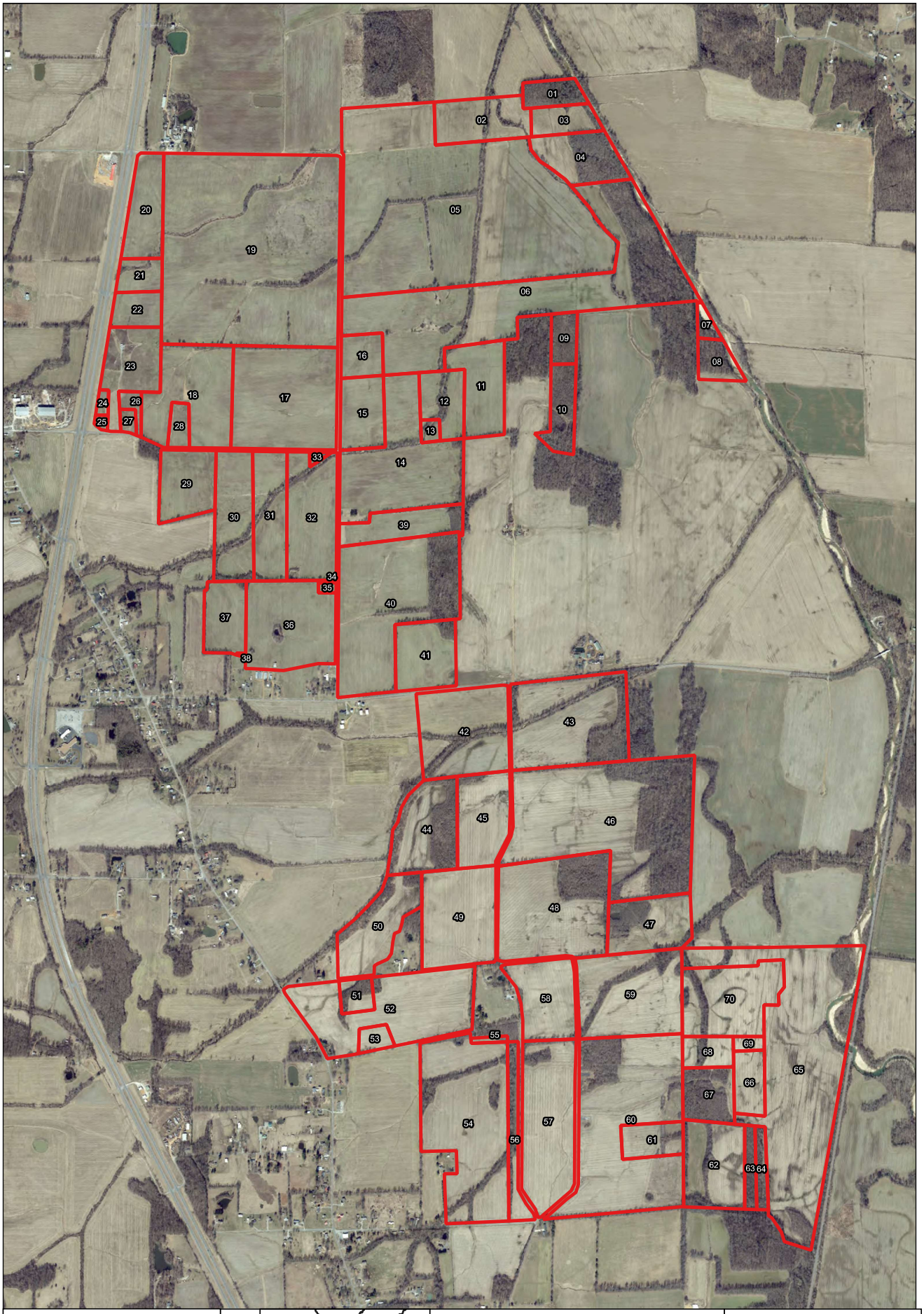
1 inch : 2000 feet

Figure 1 - USGS Topographic Map
Sheet 2/2

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
23694	HK/LD	2025-02-14

BFW SM



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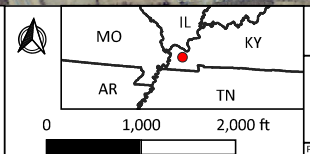
Project Data

Study Area



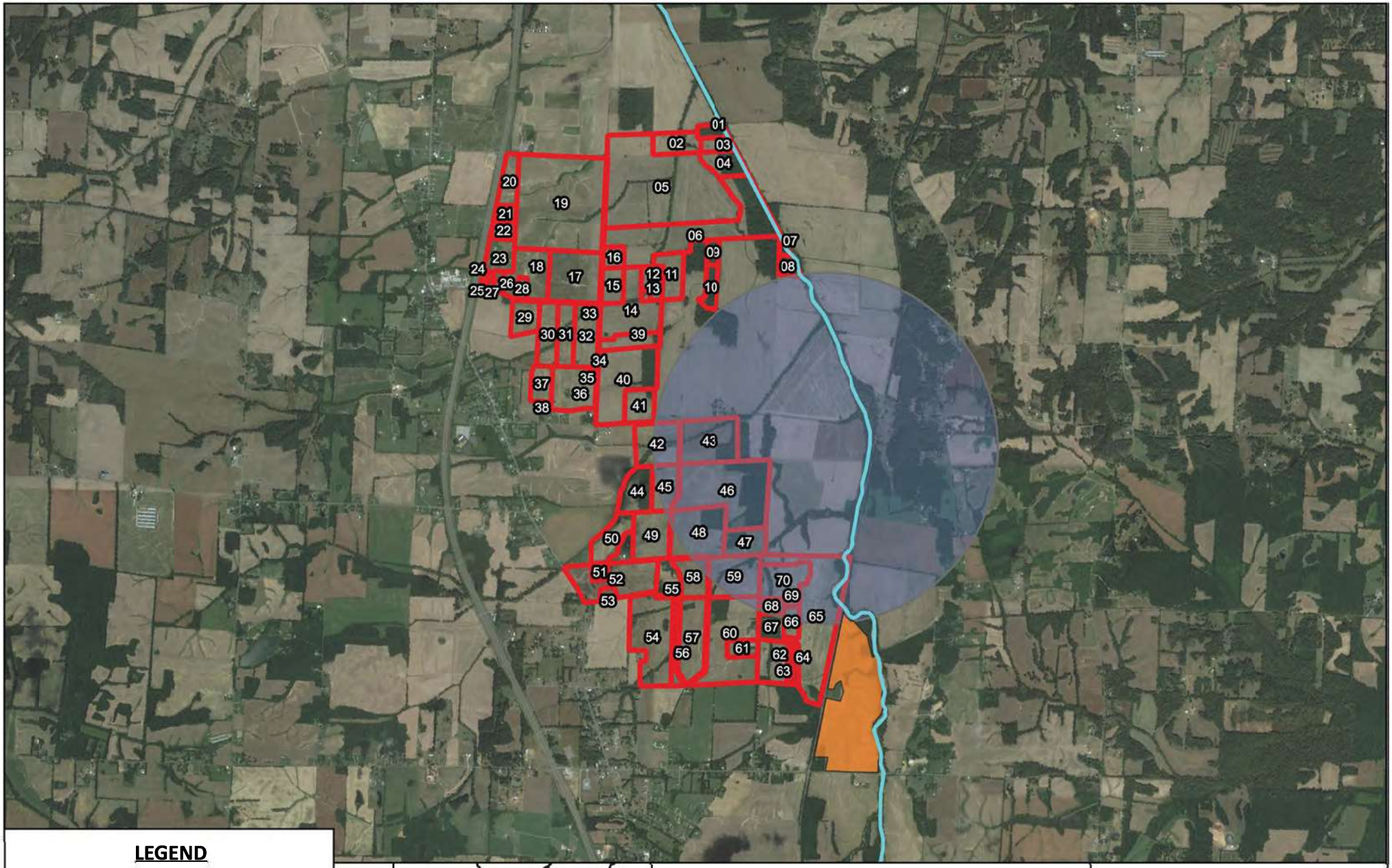
1 inch : 1300 feet

Figure 2 - Aerial Photograph Map

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
23694	HK/LD	2025-03-18

BFW SM



LEGEND

Project Data

Project Parcels

KDOW-Designated Resources

NRCS Wetland Reserve Easement

Protected Areas Database Manager Type

Listed impaired Water (Mayfield Creek mile 16.1 to 35.75)

KDOW Mitigation Site with One-Mile Buffer

0 4,000 8,000 ft

1 inch : 4000 feet

Figure 3 - Protected Resource Map

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
23694	HK/LD	2025-02-19

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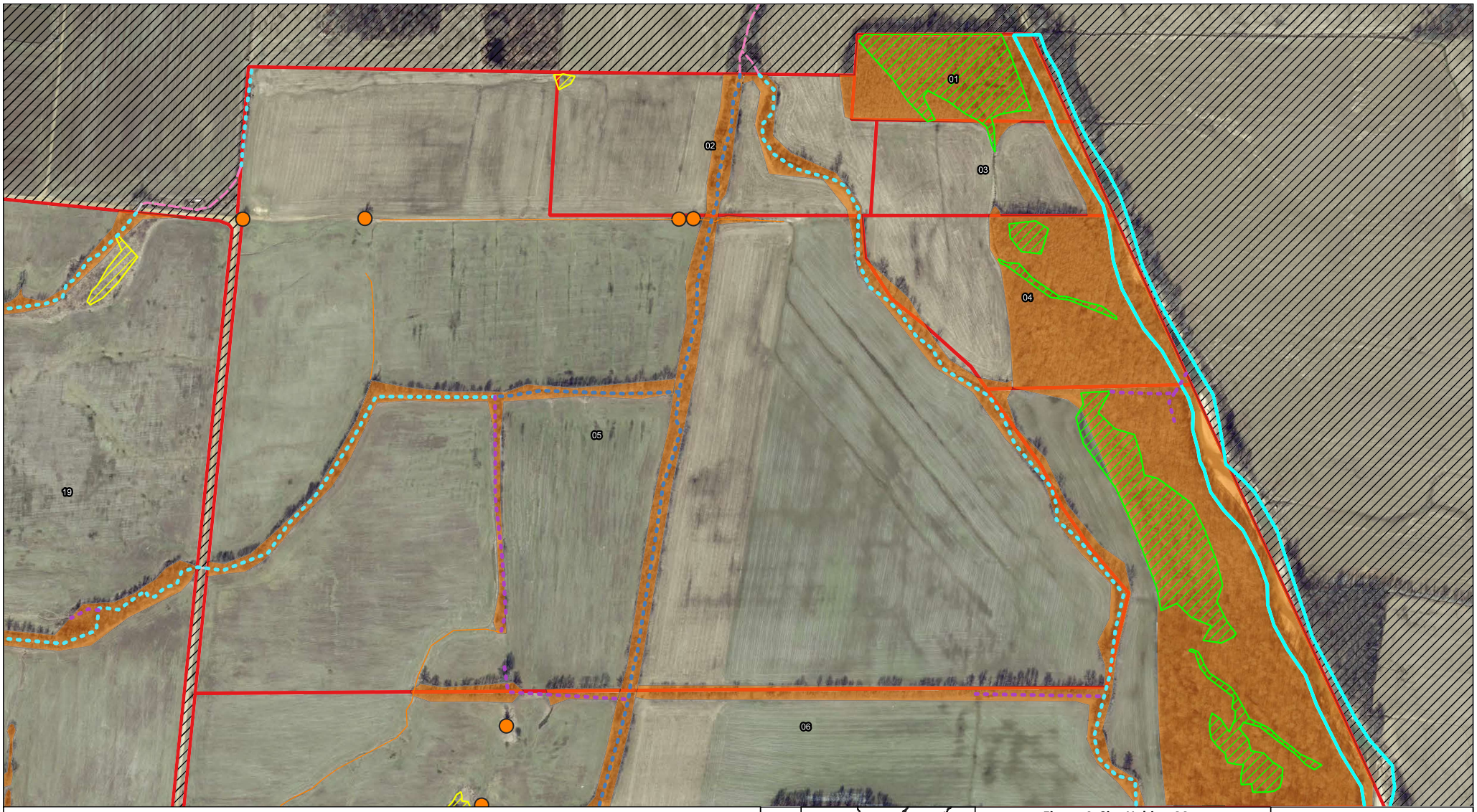

LEGEND

Project Data
- Study Area
- Offsite Properties

Water and Wetland Features
- Mayfield Creek
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream
- Offsite Stream Connections
- Culverts
- Ditches
- Forested Wetland
- Emergent Wetland
- Pond

Bat Habitat Features
- Suitable Habitat - Potential Habitat Zone
- Suitable Habitat Tree - Potential Habitat Zone

0 400 800 ft

1 inch : 400 feet

Figure 4: Site Habitat Map
Sheet 1/8

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
23694	HK/LD	2025-03-18

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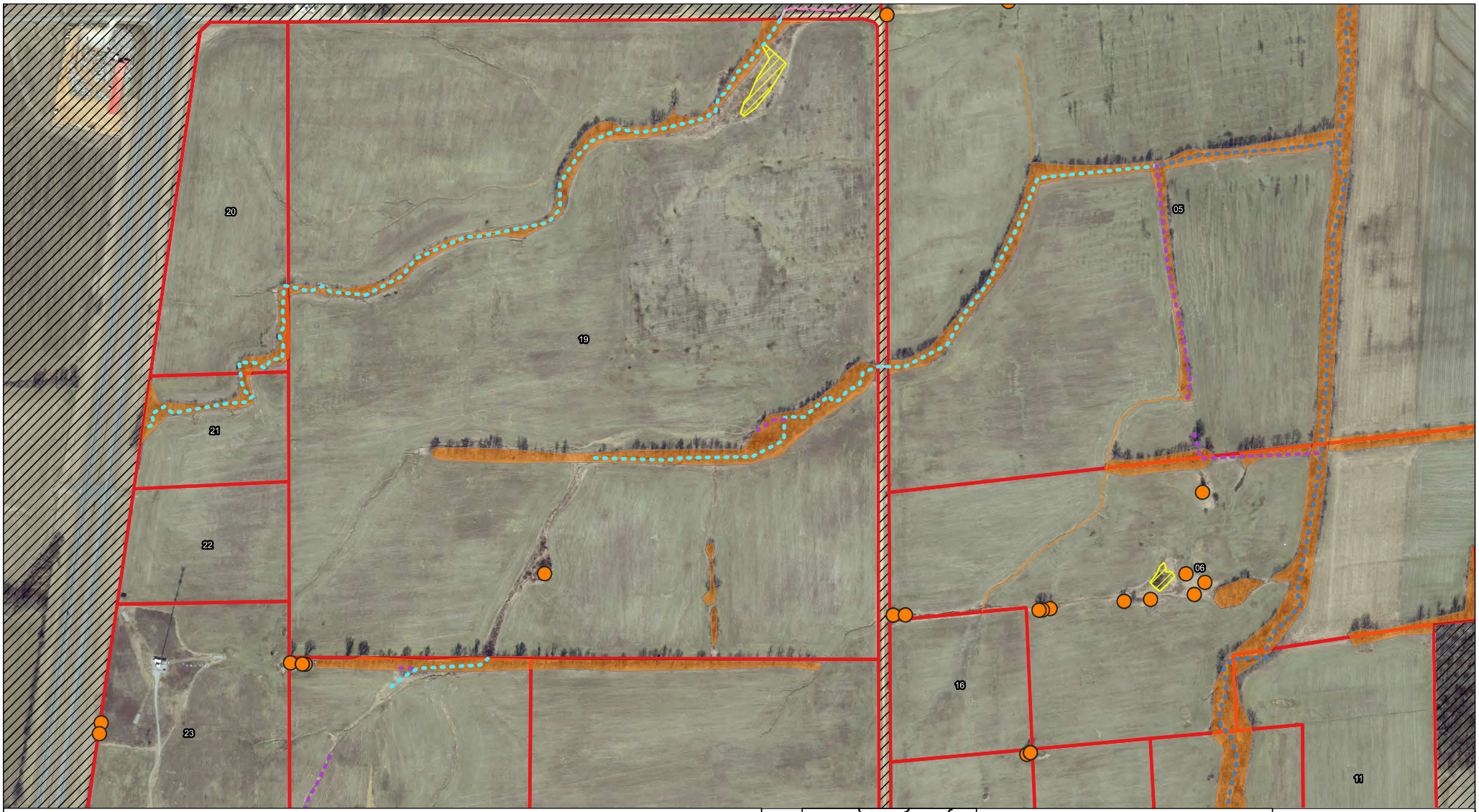

LEGEND

Project Data
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Water and Wetland Features
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- Culverts
- Ditches
- Forested Wetland
- Emergent Wetland
- Pond

Bat Habitat Features
- Suitable Habitat - Potential Habitat Zone
- Suitable Habitat Tree - Potential Habitat Zone

0 400 800 ft

1 inch : 400 feet

Figure 4: Site Habitat Map
Sheet 2/8

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
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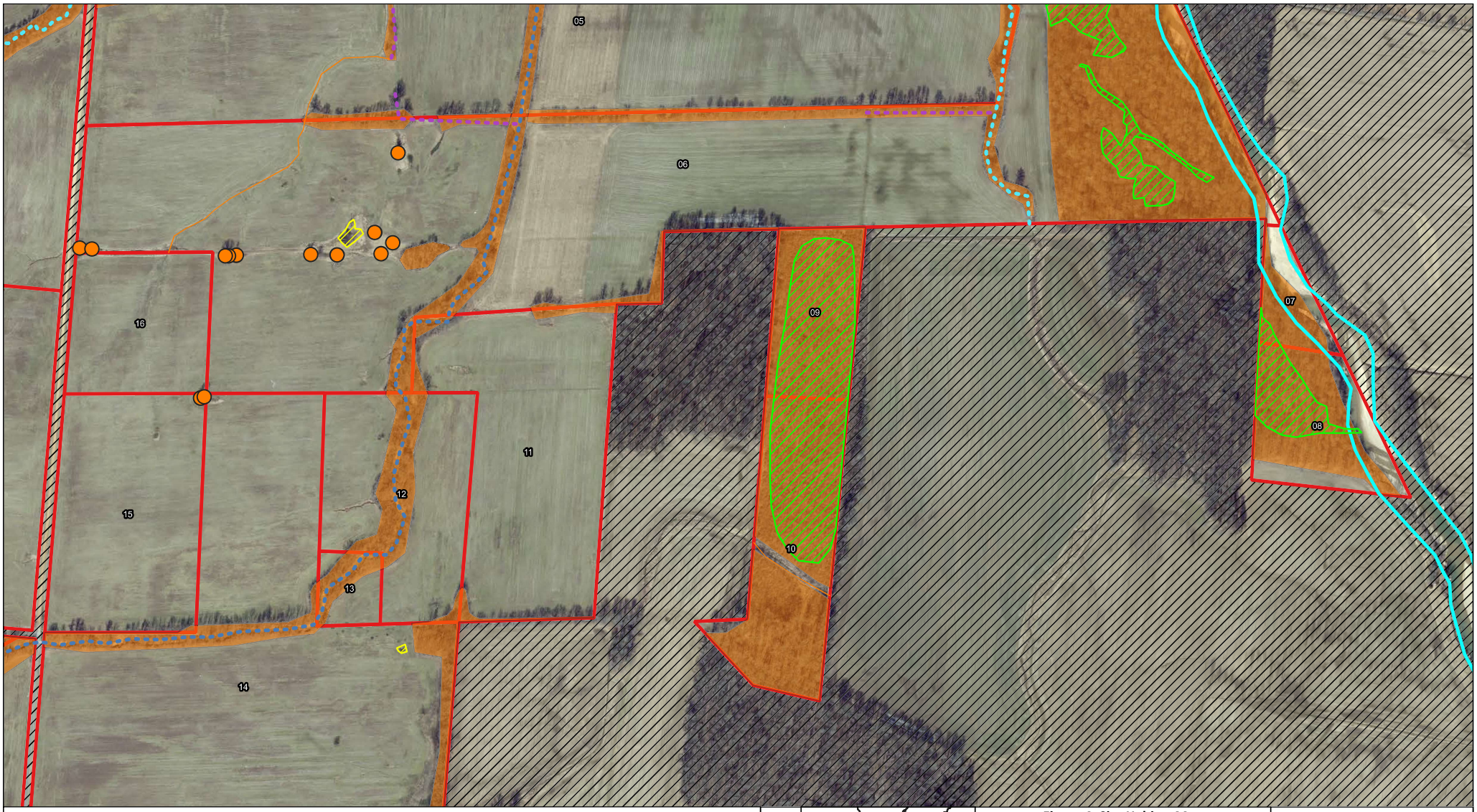

LEGEND

Project Data
- Study Area
- Offsite Properties

Water and Wetland Features
- Mayfield Creek
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- Ephemeral Stream
- Offsite Stream Connections
- Culverts
- Ditches
- Forested Wetland
- Emergent Wetland
- Pond

Bat Habitat Features
- Suitable Habitat - Potential Habitat Zone
- Suitable Habitat Tree - Potential Habitat Zone

0 400 800 ft

1 inch : 400 feet

Figure 4: Site Habitat Map
Sheet 3/8

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
23694	HK/LD	2025-03-18

BFW SM

LEGEND

Project Data
- Study Area
- Offsite Properties

Water and Wetland Features
- Mayfield Creek
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- Ditches
- Forested Wetland
- Emergent Wetland
- Pond

Bat Habitat Features
- Suitable Habitat - Potential Habitat Zone
- Suitable Habitat Tree - Potential Habitat Zone

0 400 800 ft

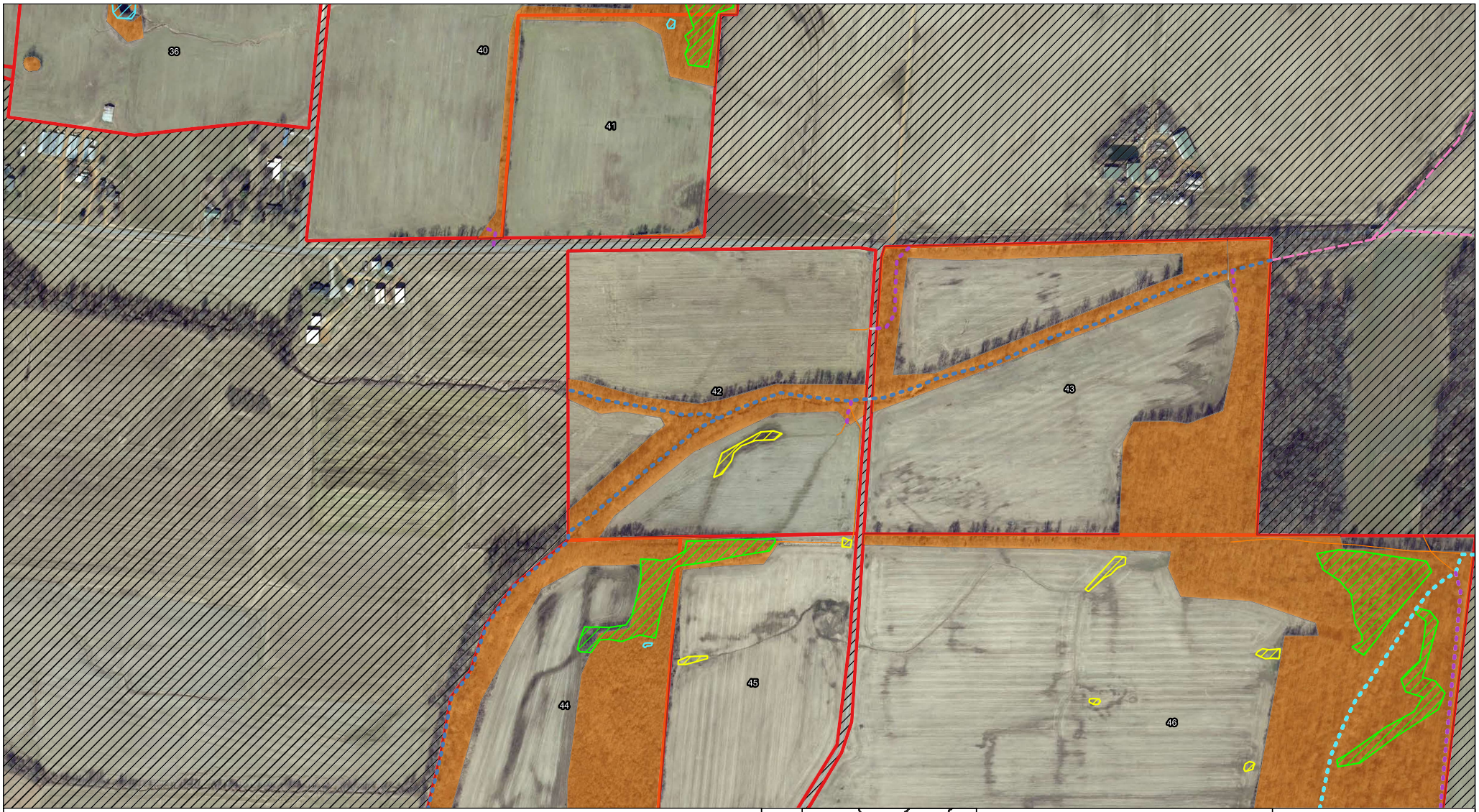
1 inch : 400 feet

Figure 4: Site Habitat Map
Sheet 4/8

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
23694	HK/LD	2025-03-18

BFW SM



LEGEND

Project Data
- Study Area
- Offsite Properties

Water and Wetland Features
- Mayfield Creek
- Perennial Stream
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- Offsite Stream Connections
- Culverts
- Ditches
- Forested Wetland
- Emergent Wetland
- Pond

Bat Habitat Features
- Suitable Habitat - Potential Habitat Zone
- Suitable Habitat Tree - Potential Habitat Zone

0 400 800 ft

1 inch : 400 feet

Figure 4: Site Habitat Map
Sheet 5/8

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
23694	HK/LD	2025-03-18

BFW SM

LEGEND

Project Data
- Study Area
- Offsite Properties

Water and Wetland Features
- Mayfield Creek
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream
- Offsite Stream Connections
- Culverts
- Ditches
- Forested Wetland
- Emergent Wetland
- Pond

Bat Habitat Features
- Suitable Habitat - Potential Habitat Zone
- Suitable Habitat Tree - Potential Habitat Zone

0 400 800 ft

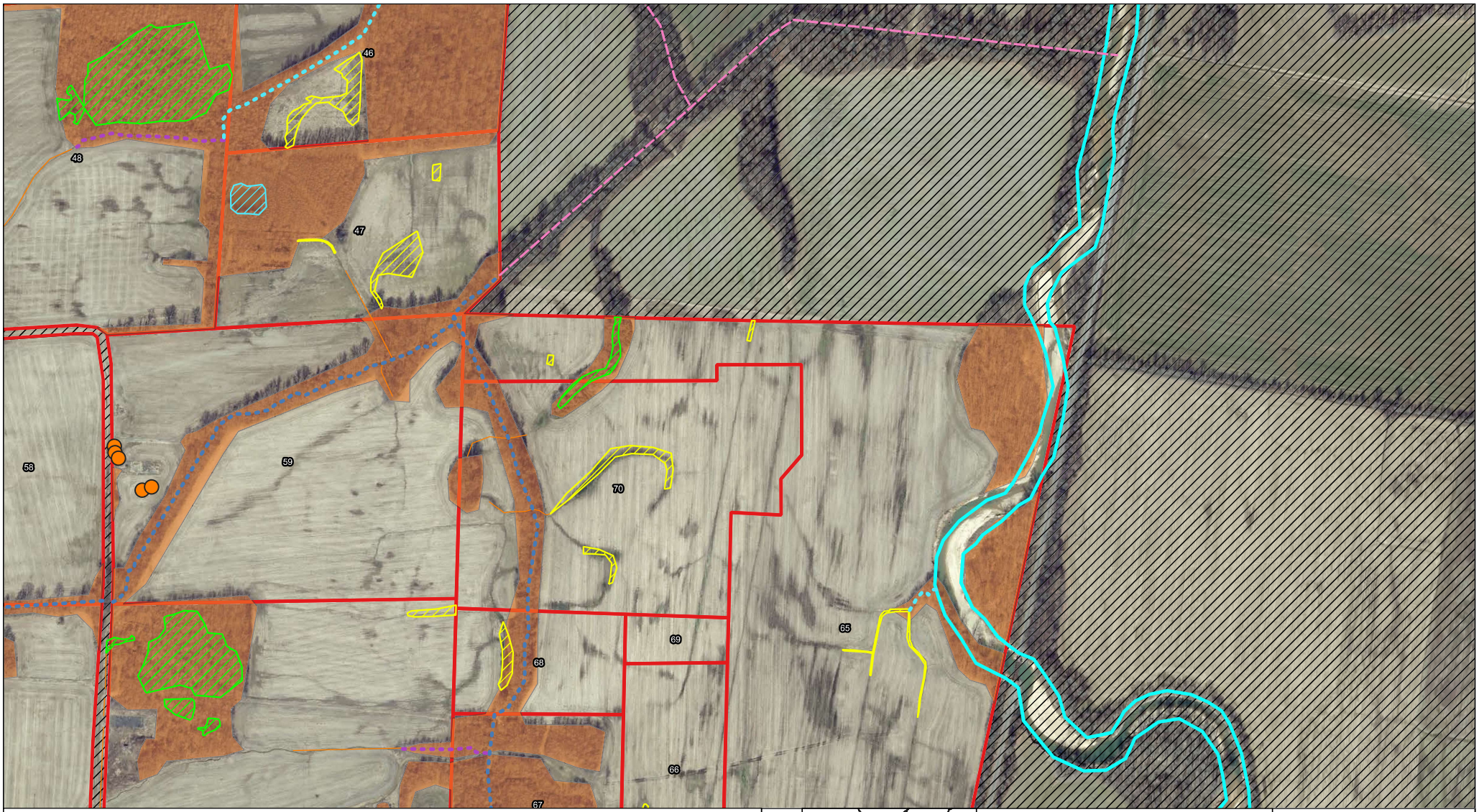
1 inch : 400 feet

Figure 4: Site Habitat Map
Sheet 6/8

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
23694	HK/LD	2025-03-18

BFW SM



LEGEND

Project Data
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Water and Wetland Features
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Bat Habitat Features
- Suitable Habitat - Potential Habitat Zone
- Suitable Habitat Tree - Potential Habitat Zone

0 400 800 ft

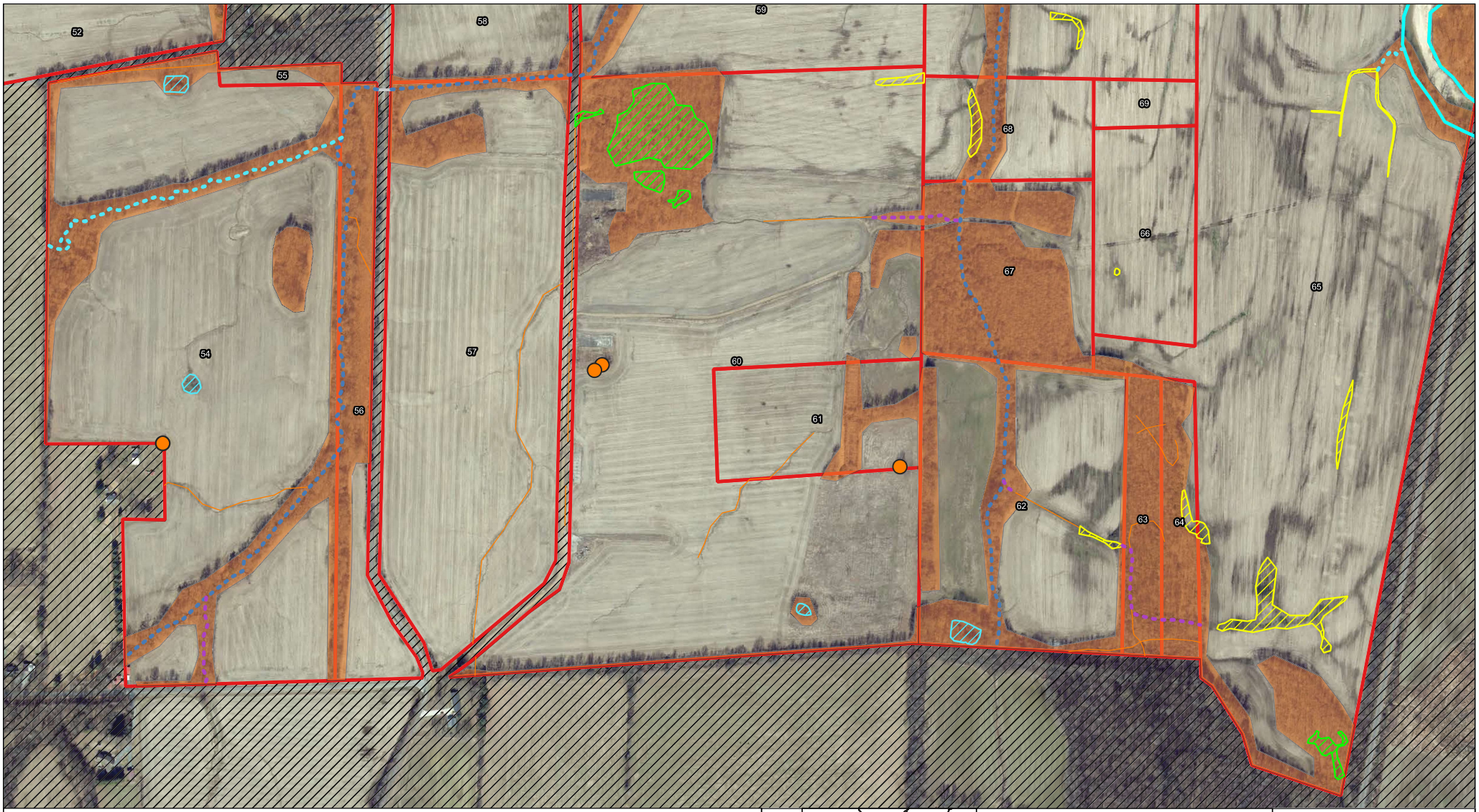
1 inch : 400 feet

Figure 4: Site Habitat Map
Sheet 7/8

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
23694	HK/LD	2025-03-18

BFW SM



LEGEND

Project Data
- Study Area
- Offsite Properties

Water and Wetland Features
- Mayfield Creek
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream
- Offsite Stream Connections
- Culverts
- Ditches
- Forested Wetland
- Emergent Wetland
- Pond

Bat Habitat Features
- Suitable Habitat - Potential Habitat Zone
- Suitable Habitat Tree - Potential Habitat Zone

0 400 800 ft

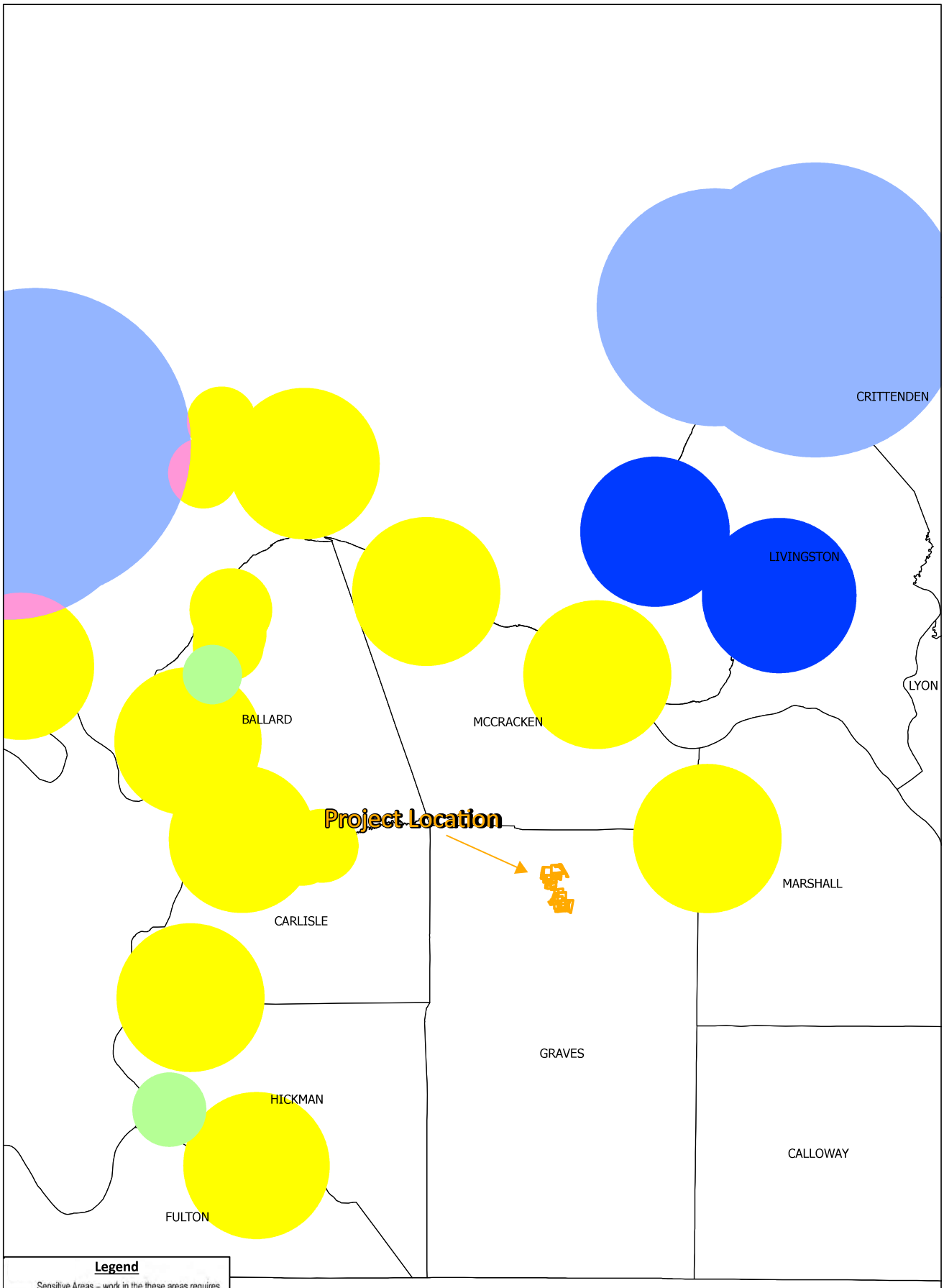
1 inch : 400 feet

Figure 4: Site Habitat Map
Sheet 8/8

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
23694	HK/LD	2025-03-18

BFW SM



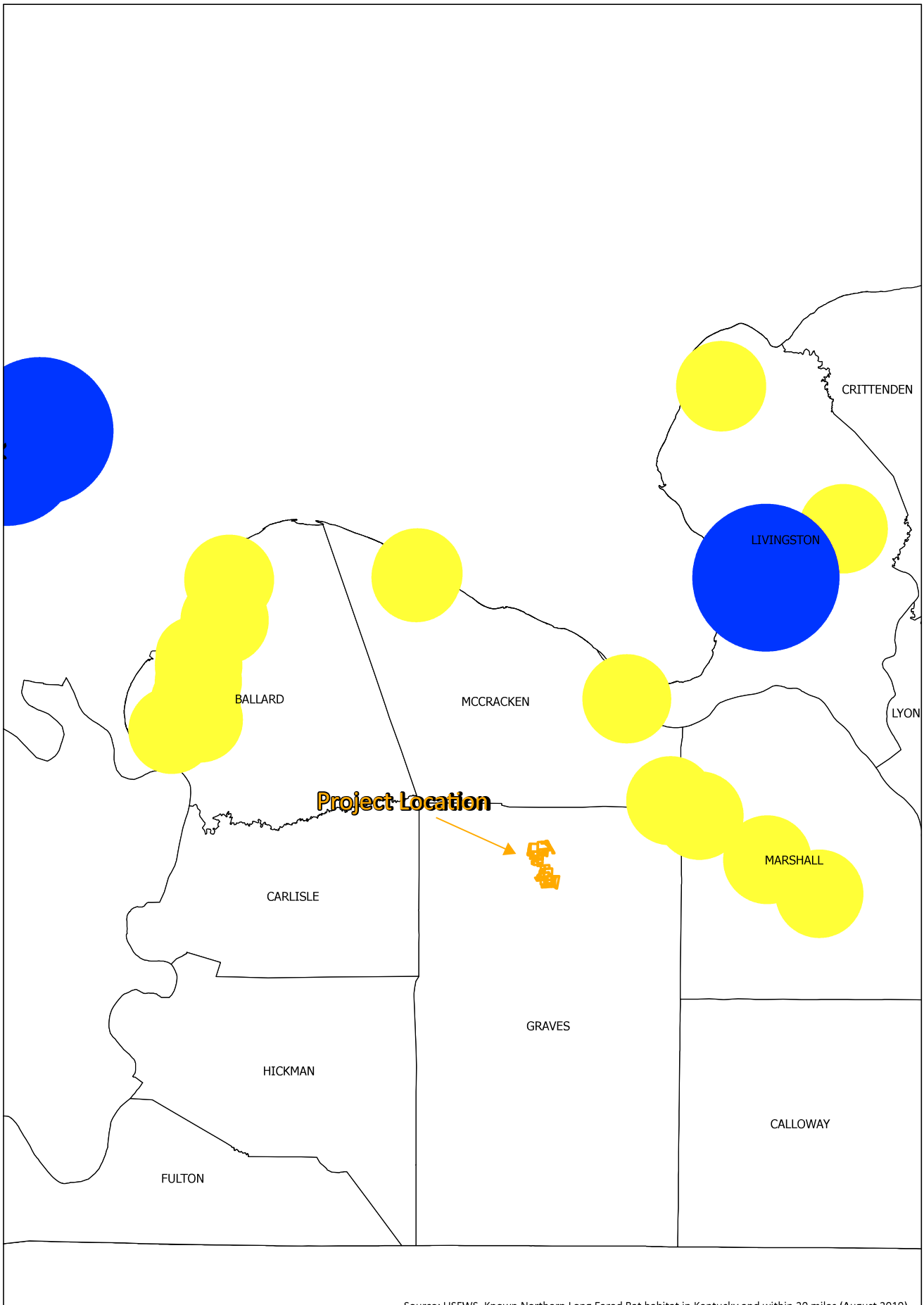
Source: USFWS, Known Indiana Bat habitat in Kentucky and within 20 miles (August 2019)

Figure 5 - Known Indiana Bat Habitat Map

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
23694	GR/LD	3/5/2025

BFW SM



Source: USFWS, Known Northern Long Eared Bat habitat in Kentucky and within 20 miles (August 2019)

Legend

- Sensitive Areas – work in the these areas requires site-specific coordination with the KFO
- Known Summer 1 + Swarming 2 habitat
- Known Swarming 2 habitat
- Known Summer 1 habitat
- Potential habitat

N

IL MO KY AR TN

0 40,000 80,000 ft

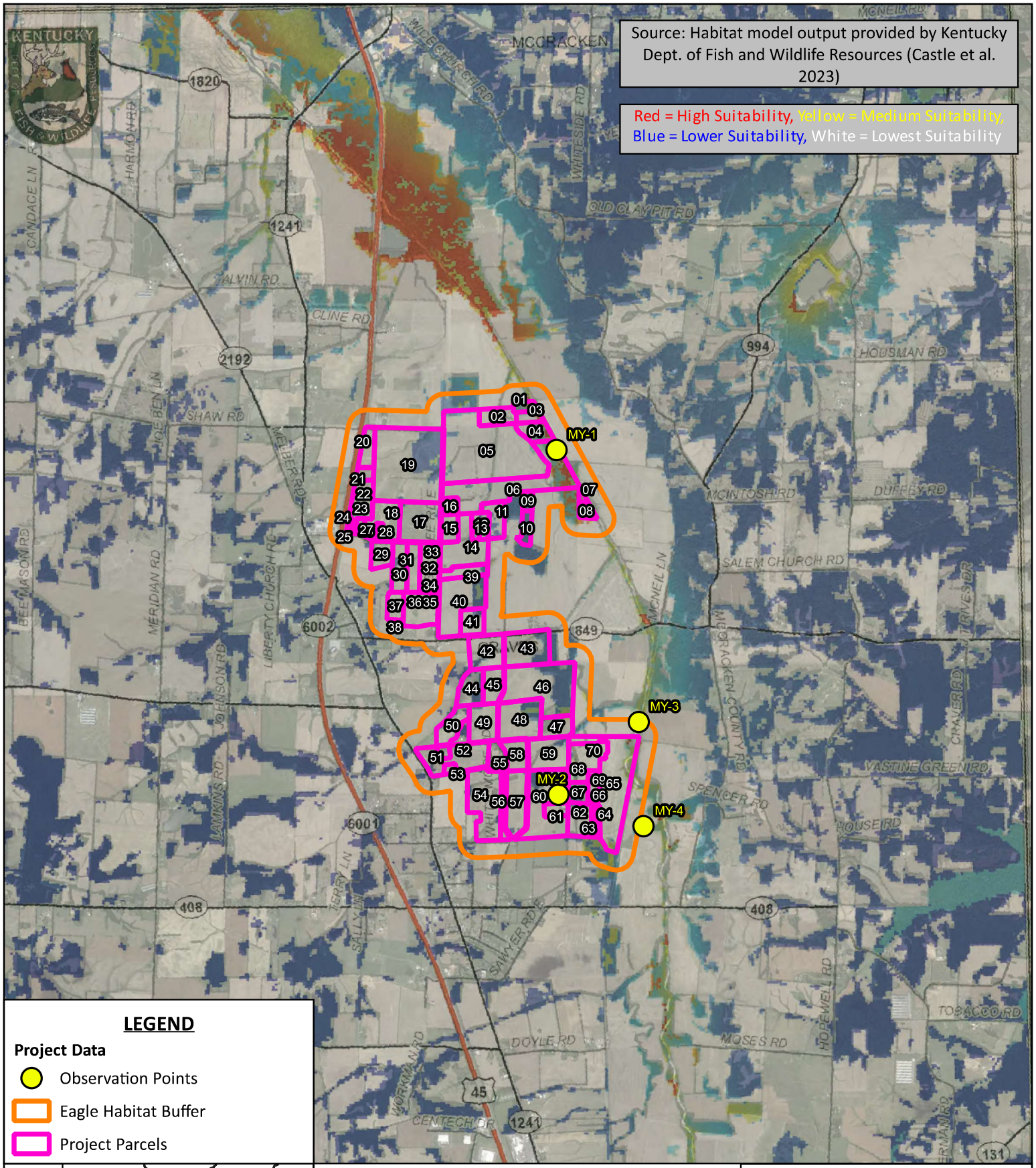
1 inch : 40,000 feet

Figure 6: Known Northern Long Eared Bat Habitat Map

Mayfield Solar Project
Graves County, Kentucky

Project Number:	Drafted/Checked:	Date:
23694	GR/LD	3/5/2025

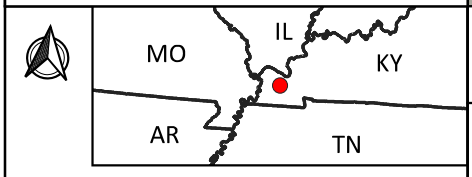
BFW SM



LEGEND

Project Data

- Observation Points
- Eagle Habitat Buffer
- Project Parcels



0 5,000 10,000 ft

1 inch : 5000 feet

Figure 7: Bald Eagle Habitat Suitability Model Results

Mayfield Solar Project
Graves County, KY

Project Number:	Drafted/Checked:	Date:
23694	HK/LD	2025-03-06

BFW SM

Appendix B

Resource Agency Documentation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
J C Watts Federal Building, Room 265
330 West Broadway
Frankfort, KY 40601-8670
Phone: (502) 695-0467 Fax: (502) 695-1024
Email Address: kentuckyes@fws.gov

In Reply Refer To: 02/07/2025 15:23:47 UTC
Project Code: 2024-0056007
Project Name: Mayfield Solar

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the

human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do..

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of

this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Kentucky Ecological Services Field Office
J C Watts Federal Building, Room 265
330 West Broadway
Frankfort, KY 40601-8670
(502) 695-0467

PROJECT SUMMARY

Project Code: 2024-0056007
Project Name: Mayfield Solar
Project Type: Power Gen - Solar
Project Description: The proposed project would involve the construction of a solar energy facility generating up to 200 megawatts (MW) of electricity. The proposed project site consists of several parcels totaling approximately 2,200 acres and is located east of US Highway 45 near Folsomdale in northern Graves County, Kentucky. A proposed transmission line measuring approximately five miles would connect the solar facility to an existing electric substation in southern McCracken County.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.8849946,-88.65747407731662,14z

Counties: Graves and McCracken counties, Kentucky

ENDANGERED SPECIES ACT SPECIES

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. 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.

MAMMALS

NAME	STATUS
Gray Bat *Myotis grisescens* No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: ▪ The project area includes potential gray bat habitat. Species profile: https://ecos.fws.gov/ecp/species/6329 General project design guidelines: https://ipac.ecosphere.fws.gov/project/CXZNPEDDUVAFVLFSMPRNKAXICQ/documents/generated/6422.pdf	Endangered
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. This species only needs to be considered under the following conditions: ▪ The project area includes 'potential' habitat. All activities in this location should consider possible effects to this species. Species profile: https://ecos.fws.gov/ecp/species/5949 General project design guidelines: https://ipac.ecosphere.fws.gov/project/CXZNPEDDUVAFVLFSMPRNKAXICQ/documents/generated/6422.pdf	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045 General project design guidelines: https://ipac.ecosphere.fws.gov/project/CXZNPEDDUVAFVLFSMPRNKAXICQ/documents/generated/6422.pdf	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Whooping Crane *Grus americana* Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/758	Experimental Population, Non-Essential

CLAMS

NAME	STATUS
Pink Mucket (pearlymussel) *Lampsilis abrupta* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7829 General project design guidelines:	Endangered

NAME	STATUS
https://ipac.ecosphere.fws.gov/project/CXZNPEDDUVAFVLFSMPRNKAXICQ/documents/generated/5639.pdf	

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Laura Darnell
Address: 2456 Fortune Drive
Address Line 2: Suite 105
City: Lexington
State: KY
Zip: 40509
Email ldarnell@bfwengineers.com
Phone: 5025263613

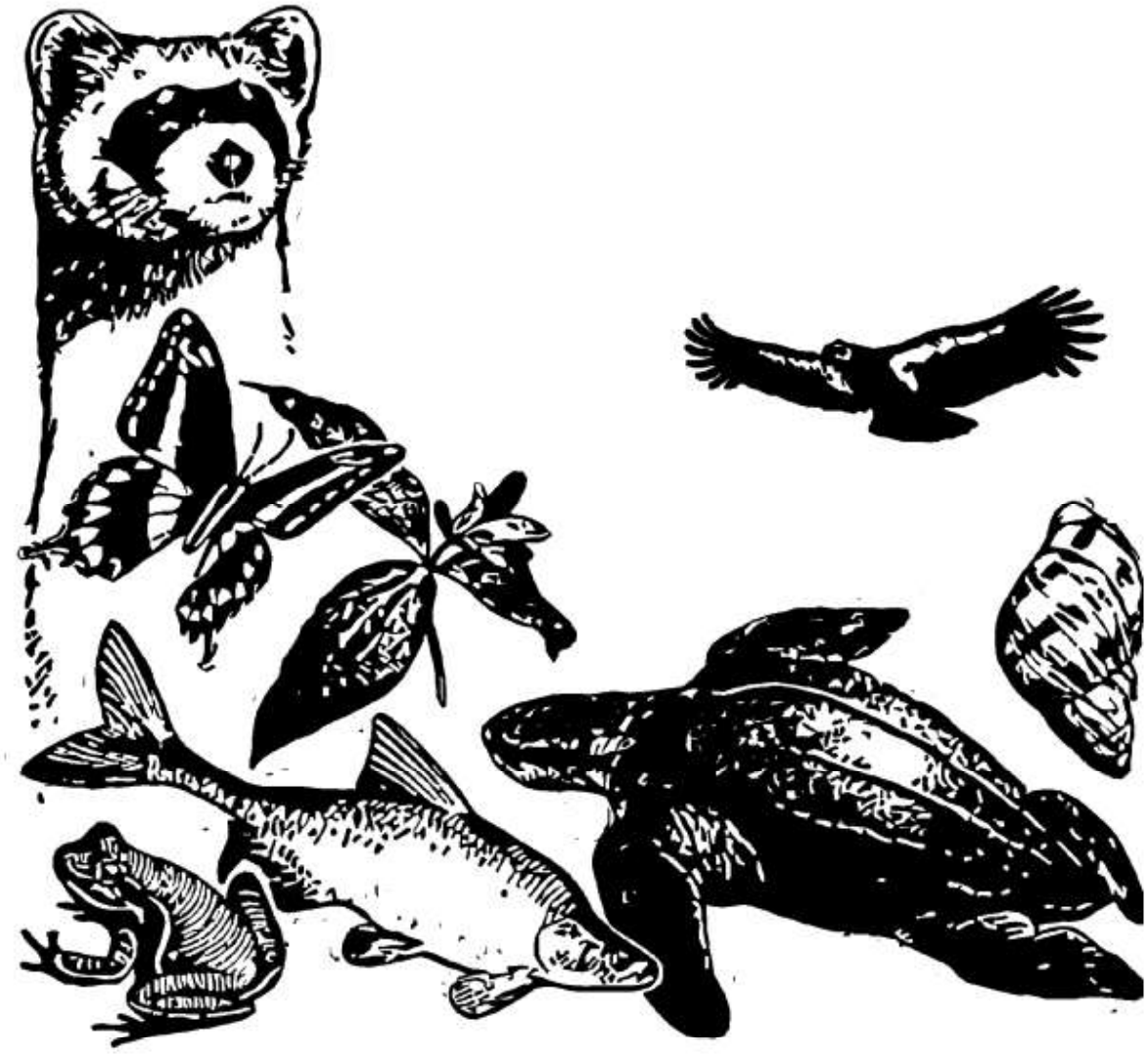
LEAD AGENCY CONTACT INFORMATION

Lead Agency: Department of Defense

U.S. Fish & Wildlife Service

General Project Design Guidelines (4 Species)

Generated March 05, 2025 08:18 PM UTC, IPaC v6.123.0-rc4



IPaC - Information for Planning and Consultation (https://ipac.ecosphere.fws.gov/): A project planning tool to help streamline the U.S. Fish and Wildlife Service environmental review process.

Table of Contents

Species Document Availability

Species with general design guidelines

- Gray Bat *Myotis grisescens*
- Indiana Bat *Myotis sodalis*
- Northern Long-eared Bat *Myotis septentrionalis*
- Pink Mucket (pearlymussel) *Lampsilis abrupta*

Species without general design guidelines available

- Monarch Butterfly *Danaus plexippus*
- Tricolored Bat *Perimyotis subflavus*
- Whooping Crane *Grus americana*

Four of the bat species found in Kentucky are listed under the Endangered Species Act: the Indiana bat (*Myotis sodalis*), the northern long-eared bat (*Myotis septentrionalis*), the gray bat (*Myotis grisescens*), and the Virginia big-eared bat (*Corynorhinus townsendii virginianus*). Records for Indiana bats, northern long-eared bats, and gray bats occur in all areas of the state, and these species are considered potentially present in areas in which they have not been previously documented. Virginia big-eared bat are found in a specific region of eastern Kentucky.

All four species winter in caves, underground mines, or other similar structures. Gray bats and Virginia big-eared bats also use these structures and other structures, such as rockshelters and other karst features, during the summer for roosting and forming maternity colonies. To address the potential for impacts to winter habitat for these four bat species and summer habitat for the gray bat and the Virginia big-eared bat, we recommend conducting habitat assessments to identify any suitable habitat features in the action area of the proposed project. This action area typically includes a buffer around the footprint of the project. This buffer can vary in size depending on the actions associated with the proposed project. Any features identified should be assessed following the process described in the most current survey guidelines for the species at: https://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html. Because these species may also occasionally roost in buildings, bridges, culverts, and other human-made structures, we recommend inspecting these structures for the presence of bats or signs of bat use prior to demolition. If bats are found or suspected to be using a structure, further coordination with the Service may be necessary.

In the summer, Indiana bats and northern long-eared bats utilize a variety of forested habitats, including riparian forests, bottomlands, and uplands, for both summer foraging and roosting. Females give birth and raise their young in trees occupied by maternity colonies. During the fall “swarming" period, these species occupy the forested habitat around the hibernacula where they mate and acquire additional fat reserves prior to hibernation. They also utilize this habitat during spring emergence before migrating to their summering areas. Suitable roost trees for Indiana bats are greater than 5 inches diameter at breast height (DBH), can be living or dead, and exhibit any of the following characteristics: exfoliating bark, broken limbs, broken tops, cracks, and crevices. Suitable habitat for northern long-eared bats include habitat suitable for Indiana bats as well as trees as small as 3 inches DBH and cavities in trees. We recommend the following options to address potential effects to the Indiana bat and northern long-eared bat as a result of impacts to roosting habitat:

- The project proponent can modify the proposed project to avoid impacts to suitable roosting and foraging habitat. A habitat assessment may be useful in determining if suitable summer roosting or foraging habitat is present in the action area of the proposed project.

- The project proponent can conduct a survey (acoustical or mist-net) to determine the presence or likely absence of the species in the project area. These presence/absence surveys must be conducted by a qualified biologist with the appropriate collection permits and in accordance with our most current survey guidance. If any federally-listed bats are captured, we request written notification of such occurrence(s) and further

coordination and consultation. Surveys must be conducted during late spring to early summer between the dates specified in the survey guidance. Results from surveys are valid during the survey season in which they are collected, through the survey season the following year, until the beginning of the survey season of the next following year. Survey results are not recommended to support probable absence of a bat species in an area and during a timeframe in which presence of the species has already been documented ("known" habitat), unless it is "outer-tier maternity" habitat. Survey guidance and distribution of known records can be found at: https://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html.

- The project proponent may provide the Service with additional information through the informal consultation process, prepared by a qualified biologist, that includes site-specific habitat information and a thorough effects analysis (direct, indirect, and cumulative) to support a "not likely to adversely affect" determination. The Service will review this and decide if there is enough supporting information to concur with the determination.

- For federal projects, the federal action agency can request formal section 7 consultation with the submission of a Biological Assessment describing the action and evaluating the effects of the action on the listed species in the project area. After formal consultation is initiated, the Service has 135 days to prepare a Biological Opinion that analyzes the effects of the action on the listed species and identifies actions to minimize those effects.

- For non-federal projects, section 10(a)(1)(B) of the ESA establishes a process for permitting the taking of listed species that is incidental to otherwise lawful non-Federal activities (i.e., an incidental take permit or ITP). Habitat Conservation Plans (HCPs) are planning documents required as part of an application for an incidental take permit. They describe the anticipated effects of the proposed taking, how those impacts will be minimized or mitigated, and how the HCP is to be funded. HCPs can apply to both listed and non-listed species, including those that are candidates or have been proposed for listing. However, the incidental take permit will only cover species listed as endangered or threatened under the ESA. Additional information about HCPs can be found on the Service's website at: http://www.fws.gov/endangered/what-we-do/hcp-overview.html

- In certain areas, potential effects to the northern long-eared bat may be excepted under the Final 4(d) Rule that the Service published for the species on January 14, 2016. This 4(d) Rule identifies certain types of take that is prohibited and establishes specific conservation measures for tree removal activities that, if adhered to, would not result in prohibited incidental take. If the proposed project is in a location where incidental take would not be prohibited, the "official species list" attached to the IPaC-generated letter will include a condition for northern long-eared bat that reads: "The specified area includes areas in which incidental take would not be prohibited under the 4(d) rule." Incidental take in these locations would be covered under the Service's January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule. To use the programmatic BO to address effects to the northern long-eared bat, project proponents should use the "Northern Long-Eared Bat (NLEB) Consultation and 4(d) Rule Consistency" Determination Key in IPaC. This key is accessed by clicking on "Start

Review" under the "What's Next" heading on the right side of the screen on the IPaC "Project Home" page. If there is no condition present for northern long-eared bat in the "official species list," the key cannot be completed. Please contact the Kentucky Field Office for further coordination.

- The project proponent may choose to offset impacts resulting from the removal of Indiana bat and/or northern long-eared bat forested habitat by providing a contribution to the Imperiled Bat Conservation Fund (IBCF). By choosing this option, cooperators gain flexibility with regard to the removal of the habitat. In exchange for this flexibility, the cooperator provides recovery-focused conservation benefits to the species through the implementation of conservation measures that are described in the Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky found at: http://www.fws.gov/frankfort/indiana_bat_procedures.html. More information about the conservation benefits provided by the IBCF can be found at: http://knlt.org/ ibcf/.

Though only Indiana bats and northern long-eared bats roost in trees, forested habitat is important to all four species for foraging and commuting purposes. Indiana bats and gray bats commonly utilize forested corridors along streams, while northern long-eared bats tend to forage more in the interior of forests, and Virginia big-eared bats along forested edges. Forest removal associated with projects can impact bat behavior by eliminating foraging areas and by rendering foraging areas unusable by severing connections between habitat. Modifying or degrading habitat to an extent that results in significant impairment of behavioral patterns could qualify as "take" under the ESA. The effects of forest habitat removal on the landscape should be evaluated for potential impacts to bat foraging and commuting behavior.

All four species of bats forage on insects. Gray bats and Indiana bats, in particular, often forage over strongly intermittent to larger streams, rivers, lakes, and ponds, consuming insects that spend the larval phase of the life cycle in water. These insects can be negatively affected by excessive sediment and contaminants in the water. We recommend using appropriate Best Management Practices (BMPs) to minimize impacts to the water quality within and downstream of the project area to protect these important foraging resources.

In summary, to address potential effects to federally-listed bats in Kentucky, please provide the Service with information about the following potential habitat features in the action area of the proposed project:

- caves, rockshelters, abandoned mine portals, or similar features;
- buildings, bridges, or culverts;
- forested habitat; and
- streams, rivers, lakes, ponds, or wetlands.

Please describe how the proposed project may impact these features and any measures proposed to reduce impacts.

Freshwater mussels are one of the most imperiled groups of animals in North America. Reservoir construction, sedimentation, channelization, runoff from urban areas, and water pollution are all factors that have contributed to the decline of our native mussel populations. As filter feeders, mussels are sensitive to contaminants and function as indicators of water quality.

The mussel species listed in the table below are known to occur or may potentially occur in the specified medium to large rivers in Kentucky. One or more species will appear on an IPaC-generated species list if the project area you delineated is located in or near one of these rivers.

	Rivers in Kentucky in Which the Species is Known to Occur or May Potentially Occur
Clubshell (*Pleurobema clava*)	Barren, Green, Licking, Ohio
Dromedary pearly mussel (*Dromus dromas*)	Big South Fork of the Cumberland
Fanshell (*Cyprogenia stegaria*)	Barren, Green, Licking, Ohio, Rolling Fork, Tennessee
Fat pocketbook (*Potamilus capax*)	Clarks (lower), Cumberland (lower), Green (lower), Mississippi, Ohio (lower), Tennessee, Tradewater (lower)
Northern riffleshell (*Epioblasma torulosa rangiana*) [1]	Green, Licking, Ohio
Orangefoot pimpleback (*Plethobascus cooperianus*)	Green, Ohio, Salt, Tennessee
Oyster mussel (*Epioblasma capsaeformis*)	Big South Fork of the Cumberland
Pink mucket (*Lampsilis abrupta*)	Barren, Green, Licking, Rolling Fork, Salt
Purple catspaw (*Epioblasma o. obliquata*) [2]	Green, Licking, Ohio
Rabbitsfoot (*Quadrula c. cylindrica*) [3]	Barren, Cumberland (below the falls), Green, Ohio, Rolling Fork, South Fork Kentucky, Tennessee
Ring pink (*Obovaria retusa*)	Barren, Cumberland (below the falls), Green, Ohio, Tennessee
Rough pigtoe (*Pleurobema plenum*)	Barren, Green, Licking, Ohio
Sheepnose (*Plethobasus cyphyus*)	Barren, Green, Kentucky, Licking, Ohio, Tennessee
Spectaclecase (*Cumberlandia monodonta*) [4]	Barren, Cumberland (below the falls), Green, Little South Fork of the Cumberland, Ohio, Tennessee

[1] This species has been renamed *Epioblasma walkeri*.
[2] This species has been renamed *Epioblasma obliquata*.
[3] This species has been renamed *Theliderma cylindrica*.
[4] This species has been renamed *Margaritifera monodonta*.

In-channel activities in the rivers listed above may potentially directly or indirectly affect one or more species of mussels. Even projects that do not involve in-channel activities still have the potential to impact listed mussel species and their habitats. Development activities that disturb

uplands in watersheds containing listed mussel species can degrade streams and rivers by increasing siltation/sedimentation, introducing pollutants, and/or altering riparian areas.

If the project area is within one-half to five miles from a river in which one of these mussel species is known to occur or may potentially occur, the IPaC-generated species list will include a condition stating the following: "The species may be affected by projects that significantly impact, directly or indirectly, the following rivers:." The potential for indirect effects to these species should be carefully considered in these project areas.

When practicable, we recommend siting projects to avoid impacting streams and rivers that contain listed mussel species and utilizing methods, such as horizontal directional drilling and clear span bridges, to avoid direct impacts to listed mussel species and their habitats. The following are some general recommendations to minimize indirect impacts to streams and rivers and reduce impacts to federally-listed mussels:

- Utilize Best Management Practices to minimize erosion from work areas;
- Limit vegetation removal to minimize impacts in riparian areas;
- Revegetate disturbed areas with native vegetation;
- Use bioengineering techniques to restore disturbance to stream banks;
- Install upland sediment basins, where appropriate, to minimize sediment input into streams and rivers;
- Install detention structures to manage stormwater runoff into streams and river; and
- Minimize the addition of impervious surfaces in the watershed.

When submitting project information to the U.S. Fish and Wildlife Service's Kentucky Field Office for review, please include information about streams and rivers in the action area of the proposed project. Describe any proposed activities that would occur in the channel or on the banks and include descriptions of measures proposed to reduce impacts to stream and river habitats.

KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES

Rich Storm
Commissioner

#1 Sportsman's Lane
Frankfort, Kentucky 40601
Phone (502) 564-3400
Fax (502) 564-0506

Brian Clark
Deputy Commissioner

Gabe Jenkins
Deputy Commissioner

March 12, 2024

Bacon Farmer Workman Engineering & Testing, Inc.
Attn: Laura Darnell, PWS
2456 Fortune Dr. Suite 105
Lexington, KY 40509

RE: Mayfield Solar Project (Graves and McCracken Counties)

Dear Ms. Darnell:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) has received your request for information regarding the proposed Mayfield Solar Project in Graves and McCracken Counties, KY. The proposed project area has been reviewed for impacts wildlife resources and other sensitive areas. The following comments are provided:

KDFWR Records Review:

Our records indicate the following federally listed and proposed listed species occur within ten (10) miles of the proposed project areas. Be advised that the KDFWR does not have the authority to confirm compliance with the Endangered Species Act. Please coordinate with the U.S. Fish and Wildlife Service for specific recommendations and compliance requirements for these federally listed species.

Scientific Name	Common Name	Class	Federal Status
Theliderma cylindrica	Rabbitsfoot	Bivalvia	T
Fusconaia subrotunda	Longsolid	Bivalvia	T
Plethobasus cooperianus	Orangefoot Pimpleback	Bivalvia	E
Lampsilis abrupta	Pink Mucket	Bivalvia	E
Plethobasus cyphyus	Sheepnose	Bivalvia	E
Potamilus capax	Fat Pocketbook	Bivalvia	E
Macrochelys temminckii	Alligator Snapping Turtle	Chelonia	PT
Perimyotis subflavus	Tricolored Bat	Mammalia	PE
Myotis septentrionalis	Northern Long-Eared Bat	Mammalia	T
Myotis sodalis	Indiana Bat	Mammalia	E

The following state-listed species were recorded within one (1) mile of the proposed project area:

Scientific Name	Common Name	Class	Federal Status	KSNPC Status
Campostoma pullum	Finescale Stoneroller	Actinopterygii	N	S
Hybognathus hayi	Cypress Minnow	Actinopterygii	N	E
Lithobates areolatus circulosus	Northern Crawfish Frog	Amphibia	N	S
Tyto alba	Barn Owl	Aves	N	S
Perimyotis subflavus	Tricolored Bat	Mammalia	PE	T

The KDFWR recently updated the Kentucky State Wildlife Action Plan (SWAP) under a federal grant from the U.S. Fish and Wildlife Service. The updated SWAP is a user-friendly guide for conservation of species of greatest conservation need (SGCN) in the state. The KDFWR invites you to review the updated SWAP on its website (https://app.fw.ky.gov/kyswap/). Species experts from the public and private sectors helped develop the SWAP by determining which species were rare, vulnerable, declining in population, or for which there was not enough information to determine status, and therefore had the greatest need for conservation actions. The SWAP is intended to provide guidance to developers, regulators, resource agencies, the public, and other stakeholders to conserve SGCN by prioritizing threats and recommending conservation actions for each species. The KDFWR is promoting the use of the SWAP to prevent declines in SGCN thereby preventing the need to list them in the Endangered Species Act. SGCN status does not invoke regulatory restrictions or requirements. However, the KDFWR encourages project sponsors to consider actions that provide conservation benefits to these species such as minimization of habitat encroachment, using buffer areas near projects to provide habitat, or other measures. Please refer to the SWAP for specific conservation actions that may benefit the SGCN identified within one (1) mile that may be compatible with the proposed project:

Scientific Name	Common Name	Class	Federal Status	KSNPC Status
Hybognathus hayi	Cypress Minnow	Actinopterygii	N	E
Lithobates areolatus circulosus	Northern Crawfish Frog	Amphibia	N	S
Tyto alba	Barn Owl	Aves	N	S
Perimyotis subflavus	Tricolored Bat	Mammalia	PE	T

No trout streams, fish spawning areas, or sensitive waterways were identified as occurring in the project footprint. It is possible that wetlands occur in the project area based on a desktop review of the National Wetlands Inventory Mapping and soil data. Soil data showed Routon silt loam, which can be associated with wetlands. Additionally, numerous streams are depicted on topographic maps and hydrologic map data. An on-site review of the project footprint is recommended. The KDFWR requests that you coordinate the proposed project with the U. S. Army Corps of Engineers (USACE) and the Kentucky Division of Water (KDOW) prior to any work within the waterways or wetland habitats of Kentucky.

There were no wildlife management areas, natural lands, or other protected areas identified in a review of such records within the footprint of the project or within one (1) mile. However, it should be noted that the proposed project site is located within the Jackson Purchase Conservation Opportunity Area (COA), established in the SWAP. A major conservation focus for this region has been to restore native open land systems, manage bottomland hardwood forest, and maintain natural hydrologic regimes.

KDFWR Comments and Guidance:

The listed mussel species are typically found in flowing waters of medium to large rivers in main channels over firm sand and gravel substrates (with the exception of the Fat Pocketbook—typically found in slack waters of large rivers). No records were found within Mayfield Creek, therefore it is unlikely that the proposed project will significantly affect these species.

The federally listed bat species occur in forests, caves, or mine portals at different times of the year. The Northern Long-Eared Bat and the Tricolored bat typically overwinter in caves or mines and spend the remainder of the year in forested habitats. The Indiana Bat relies on trees for maternity seasons and may use caves or mine portals throughout the year. The KDFWR asks that you coordinate any tree removal activities with the U.S. Fish and Wildlife Service Kentucky Field Office. Due to the presence of federally listed bat species near the project site, the USFWS may have seasonal requirements for removing those trees, especially those greater than 3" diameter-at-breast height (dbh). Removing these trees during the winter months would reduce possible direct impacts to tree-roosting bat species.

Records of the state-listed Finescale Stoneroller are near the project area in Carney Creek. KDFWR recommends that erosion control measures be developed and implemented prior to construction to reduce siltation into waterways located within/near the project area. These measures will also help reduce potential impacts on the other state-listed aquatic species near the proposed project footprint.

Thank you for coordinating with KDFWR. Please contact Emily Lawson at 502-892-4472 or emilym.lawson@ky.gov if you have further questions or require additional information.

Sincerely,

Emily Lawson
Environmental Branch Coordinator

Andy Beshear
Governor

Energy and Environment Cabinet
Office of Kentucky Nature Preserves
300 Sower Boulevard
Frankfort, Kentucky 40601
Telephone: 502-782-7828
EEC.KYBAT@ky.gov

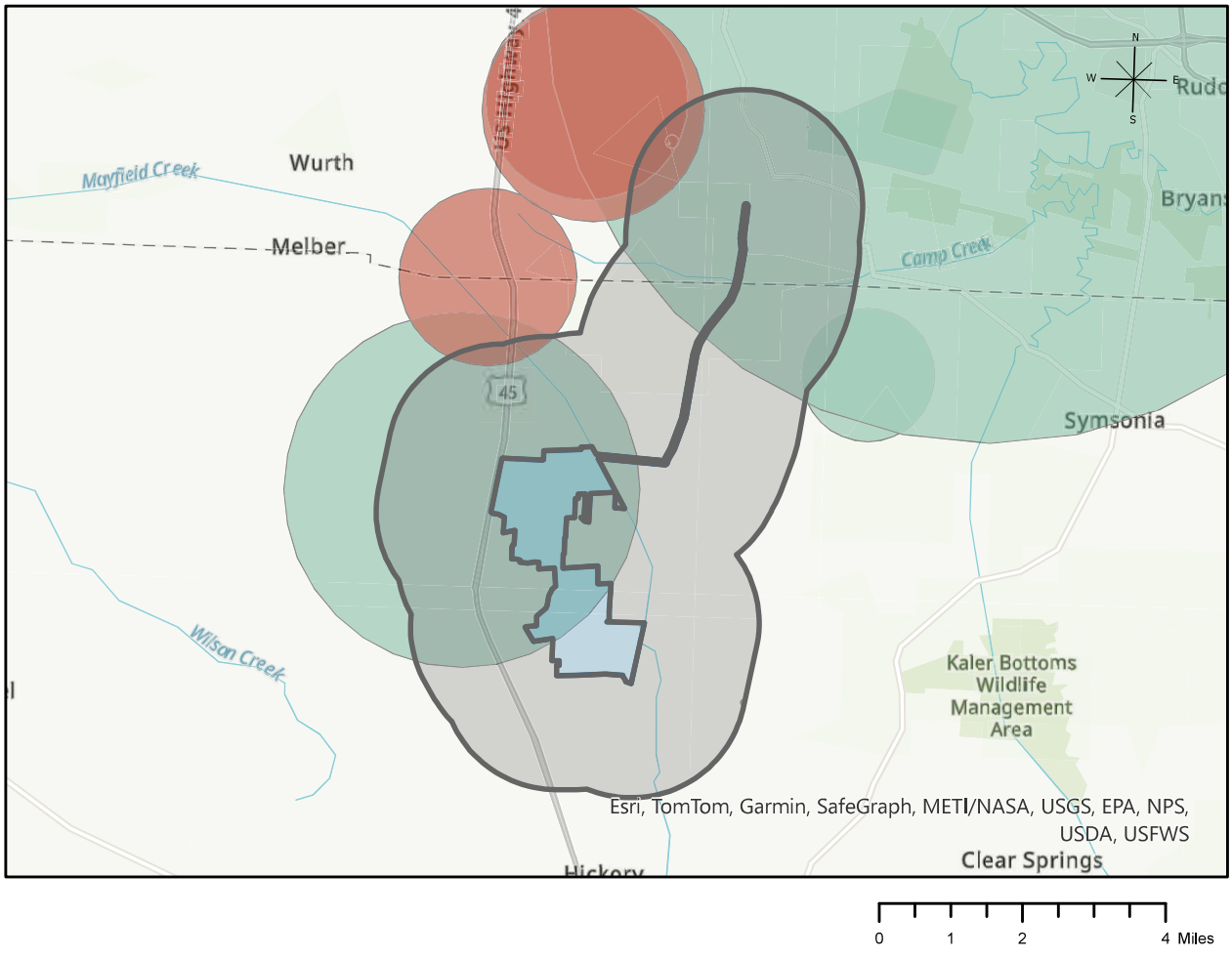
Rebecca W. Goodman
Secretary

Sunni Carr
Executive Director

<FNT style="Italic">Requested on Thursday, February 29, 2024</FNT> by <FNT style="Italic">Laura Darnell, Bacon Farmer Workman Engineering & Testing, Inc.

Re: Kentucky Biological Assessment Data Request 240229L01
MYSO, LLC - Mayfield Solar
Energy Storage - Solar, 2 mile buffer.
GRAVES-MCCRACKEN County, Kentucky

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, animals, features or exemplary natural communities monitored by the Office of Kentucky Nature Preserves are noted within your submitted project area.



Andy Beshear
Governor

Energy and Environment Cabinet
Office of Kentucky Nature Preserves
300 Sower Boulevard
Frankfort, Kentucky 40601
Telephone: 502-782-7828
EEC.KYBAT@ky.gov

Rebecca W. Goodman
Secretary

Sunni Carr
Executive Director

This report includes the following items:
A - A report for occurrences which intersect the project area
B - A report for occurrences which intersect the buffer around the project area
C - A list of best management practices relevant to occurrences near to or within the project area
D - A list of best management practices relevant to the chosen project type

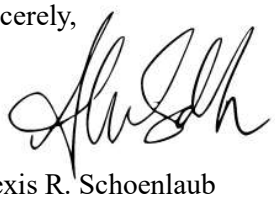
Thank you for using Office of Kentucky Nature Preserves' Biological Assessment Tool.

We 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 Office of Kentucky Nature Preserves 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 occurrences 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 we can be of further assistance, please do not hesitate to contact our office by email at EEC.KYBAT@ky.gov or by phone at 502-782-7828.

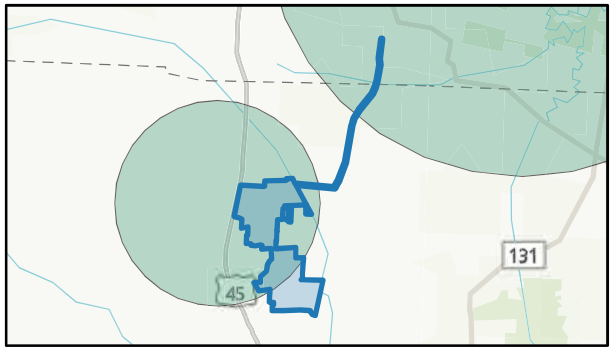
Sincerely,



Alexis R. Schoenlaub
Geoprocessing Specialist
Office of Kentucky Nature Preserves

A.1. Project Area - Occurrence Report

The following table outlines occurrences found within your project footprint (if any). You can find more information about global and state rank status definitions on our Standard Occurrence Report Key . Please note that certain sensitive occurrences found within the buffer area may be listed in this table but are not represented on the map. Please contact the appropriate source as outlined in the “Directions” column should you have further questions related to sensitive occurrences found within the project area.



Botanical
Ecological
Zoological

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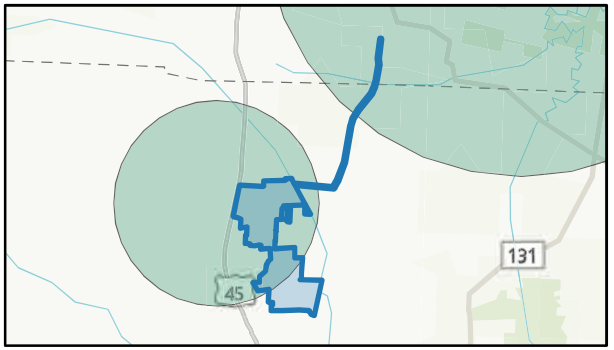
Map Credits: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

EO ID	Scientific Name	Common Name	G Rank	S Rank	Fed. Status	State Status	SWAP	Precision	Last Obs. Date
15883	*Lanius ludovicianus*	*Loggerhead Shrike*	G4	S3S4B,S4N	None	S	Y	Q	1990
15887	*Lanius ludovicianus*	*Loggerhead Shrike*	G4	S3S4B,S4N	None	S	Y	Q	1985
26391	*Lysimachia minima*	*Chaffweed*	G5	S2	None	T		G	1920-06-17
14395	*Phalaris caroliniana*	*May Grass*	G5?	S2?	None	N		S	1971-07-09
16681	*Silphium integrifolium*	*Rosinweed*	G5	S3S4	None	N		G	1968-07-04

A.2. Project Area – Occurrence Habitat and Location

The following table provides supplemental occurrence information found within your project footprint (if any). You can find more information about global and state rank status definitions on our Standard Occurrence Report Key . Please note that certain sensitive occurrences found within the buffer area may be listed in this table but are not represented on the map. Please contact the appropriate source as outlined in the "Directions" column should you have further questions related to sensitive occurrences found within the



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Map Credits: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

EOID	Scientific Name	Habitat	Location
15883	*Lanius ludovicianus*		*CW block of quadrangle*
15887	*Lanius ludovicianus*		*NW block of Quadrangle.*
14395	*Phalaris caroliniana*	*DITCHES AND WET, SANDY, OPEN FIELDS.*	*Ditches and banks of the railroad crossing of Wice Baptist C*
16681	*Silphium integrifolium*		*From Mayfield, KY go north on Hwy 45 for 10 miles. Take left*
26391	*Lysimachia minima*		*Near Paducah (001A).*

B. Buffer Area - Occurrence Report

The following table outlines occurrences found within your buffered project footprint (if any). You can find more information about global and state rank status definitions on our Standard Occurrence Report Key. Please note that certain sensitive occurrences found within the buffer area may be listed in this table but are not represented on the map. Please contact the appropriate source as outlined in the "Directions" column should you have further questions related to sensitive occurrences found within the project area.

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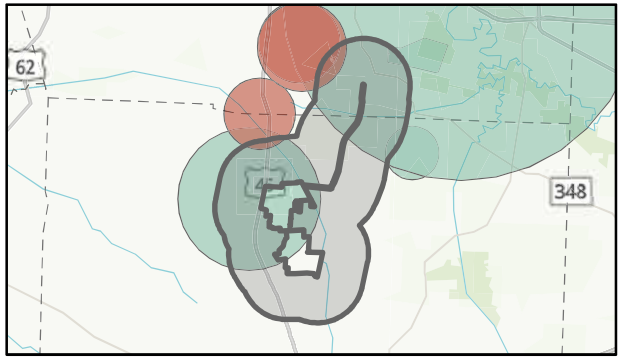
Map Credits: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS



EO ID	Scientific Name	Common Name	G Rank	S Rank	Fed. Status	State Status	SWAP	Precision	Last Obs. Date
5214	*Accipiter striatus*	Sharp-shinned Hawk	G5	S3B,S4N	None	S	Y	M	1985
14430	*Amsonia salicifolia*	Eastern Blue-star	GNR	S2?	None	N		M	1967-04-14
3605	*Cambarellus puer*	Swamp Dwarf Crayfish	G5	S1	None	E		M	1980-02-22
24487	*Hibiscus lasiocarpos*	Crimsoneyed Rosemallow	G5T4	S2?	None	N		S	2022-07-13
13337	*Iris brevicaulis*	Zigzag Iris	G4	S2	None	T		G	1974-06-14
15883	*Lanius ludovicianus*	Loggerhead Shrike	G4	S3S4B,S4N	None	S	Y	Q	1990
15882	*Lanius ludovicianus*	Loggerhead Shrike	G4	S3S4B,S4N	None	S	Y	Q	1988-06-23
15887	*Lanius ludovicianus*	Loggerhead Shrike	G4	S3S4B,S4N	None	S	Y	Q	1985
26391	*Lysimachia minima*	Chaffweed	G5	S2	None	T		G	1920-06-17
24559	*Lythrum lanceolatum*	Lance-leaved Loosestrife	G5T5	S1?	None	N		S	2022-07-15
20	*Rudbeckia subtomentosa*	Sweet Coneflower	G5	S1	None	E		M	1977-09-04
16681	*Silphium integrifolium*	Rosinweed	G5	S3S4	None	N		G	1968-07-04
7505	*Tyto alba*	Barn Owl	G5	S3	None	S	Y	G	1991
11179	*Tyto alba*	Barn Owl	G5	S3	None	S	Y	S	2004-10-11

C. Occurrence References and Recommendations (1 of 1)

OKNP references the following references and recommendations regarding this project's potential impacts to natural resources within or surrounding the project area. Please contact the applicable office should you have further questions with regard to these references and recommendations related to the project area.

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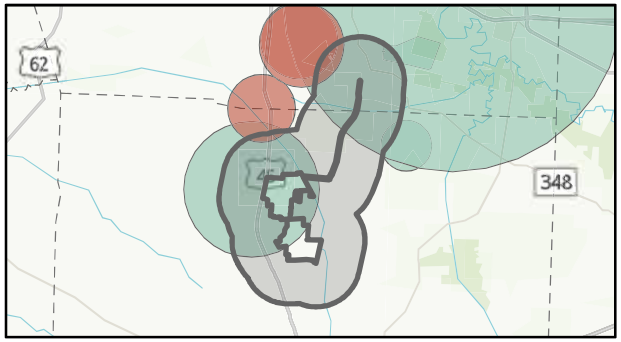

Per the U.S. Fish and Wildlife Service's recommendations: Birds covered under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) should be considered during project reviews. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish & Wildlife Service (50 C.F.R. § 10.12 and 16 U.S.C. § 668(a)). For more information regarding these acts go to: http://www.fws.gov/migratorybirds/RegulationsandPolicies.html.

The MBTA currently has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within a NEPA document (if there is a federal nexus), a Bird- or Eagle-specific Conservation Plan, or both. Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds to the project-related stressors; proponents should also implement a rigorous plan to monitor the effectiveness of conservation measure. For more information on avian stressors and recommended conservation measures go to: http://www.fws.gov/migratorybirds/ CurrentBirdIssues/Hazards/BirdHazards.html.

In addition to MBTA and BGEPA, Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit http://www.fws.gov/migratorybirds/AboutUS.html.

D. Project References and Recommendations (1 of 1)

OKNP references the following references and recommendations regarding this project's potential impacts to natural resources within or surrounding the project area. Please contact the applicable office should you have further questions with regard to these references and recommendations related to the project area.

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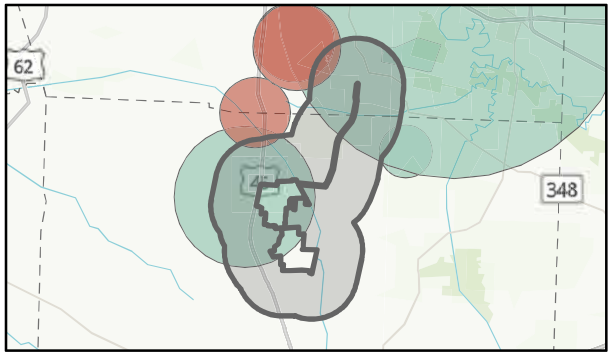

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OFFICE OF KENTUCKY NATURE PRESERVES

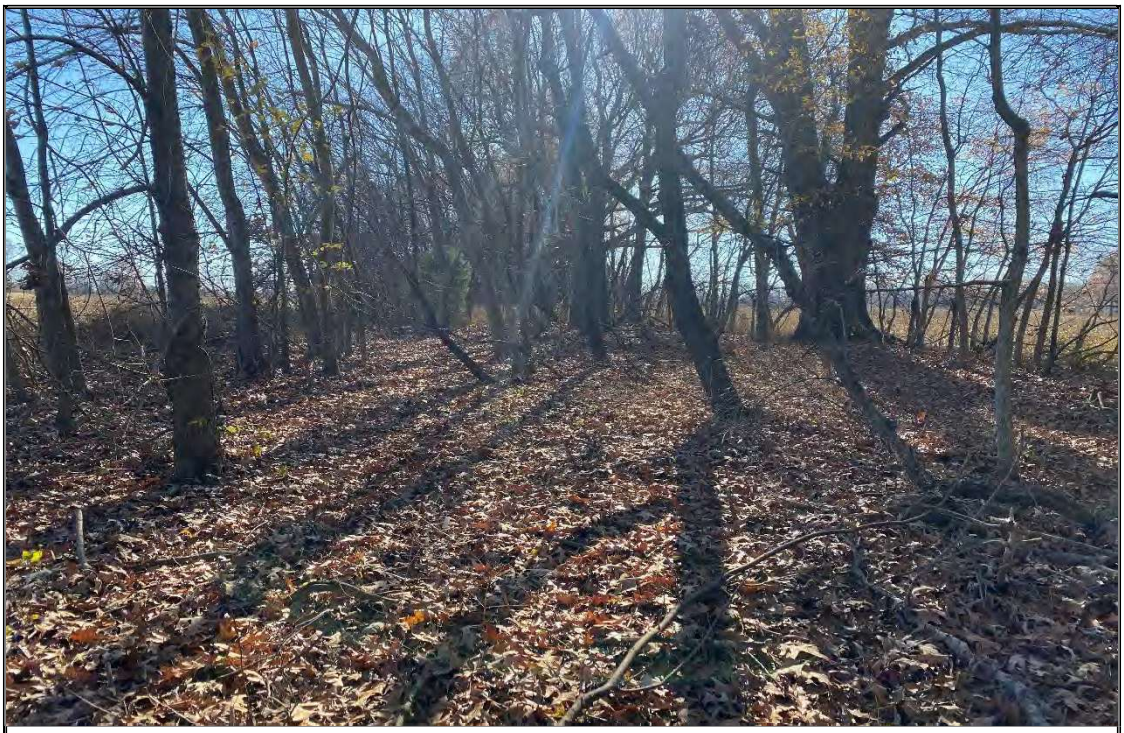
Thank you for using the Office of Kentucky Nature Preserves Biological Assessment Tool.

OKNP's species dataset relies on continuous monitoring and surveying for species of concern throughout the state. Any records of species of concern found within this project area would greatly benefit the quality and comprehensiveness of the statewide dataset for rare, threatened and endangered species. If you would like to contribute any additional species information, please do not hesitate to contact our office by email at EEC.KYBAT@ky.gov or by phone at 502-782-7828.

Appendix C

Site Photographs

Photograph 1: General view of a fallow agricultural field in the northern part of the study area. December 5, 2023.



Photograph 2: General view of upland wooded habitat in fencerows in the northern part of the study area. December 5, 2023.

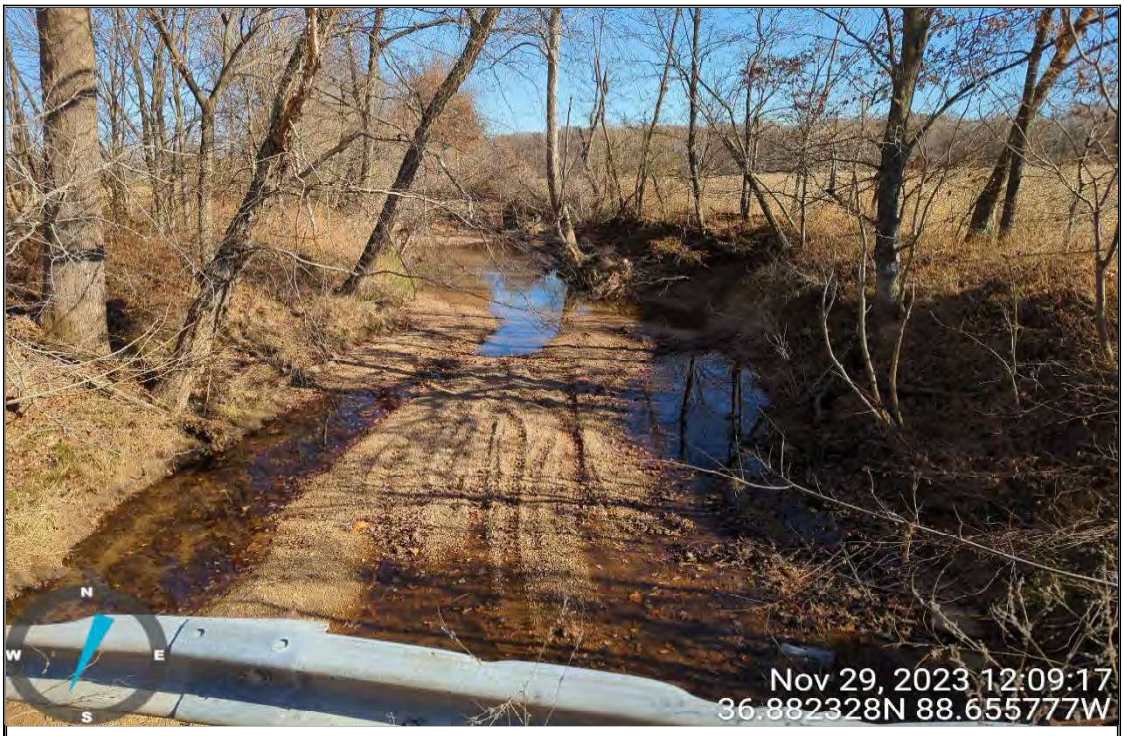
Photograph 3: General view of upland wooded habitat on Parcel 46 in the south-central part of the study area. December 5, 2023.

Photograph 4: General view of a fallow agricultural field on Parcel 65 in the southeastern part of the study area. December 14, 2023.

Photograph 5: View of Mayfield Creek, facing southeast (upstream) on Parcel 6 in the northeastern part of the study area. November 16, 2023.

Photograph 6: View of Mayfield Creek, facing northeast (downstream) on Parcel 65 in the southeastern part of the study area. December 14, 2023.

Photograph 7: View of a perennial stream on Parcel 2 in the northern part of the study area. This stream is the largest stream in the study area after Mayfield Creek. November 20, 2023.



Photograph 8: View of a perennial stream (Carney Creek) at its crossing at Whittemore Road between Parcels 42 and 43. November 29, 2023.

Photograph 9: View of a perennial stream between Parcels 57 and 58 in the southern part of the study area. November 21, 2023.

Photograph 10: View of a perennial stream on Parcel 67 in the southern part of the study area. November 28, 2023.

Photograph 11: View of an intermittent stream at the northern edge of Parcel 19 in the northern part of the study area. November 14, 2023.

Photograph 12: View of an intermittent stream on Parcel 2 in the northern part of the study area. November 20, 2023.

Photograph 13: View of an intermittent stream on Parcel 54 in the southwestern part of the study area. December 5, 2023.

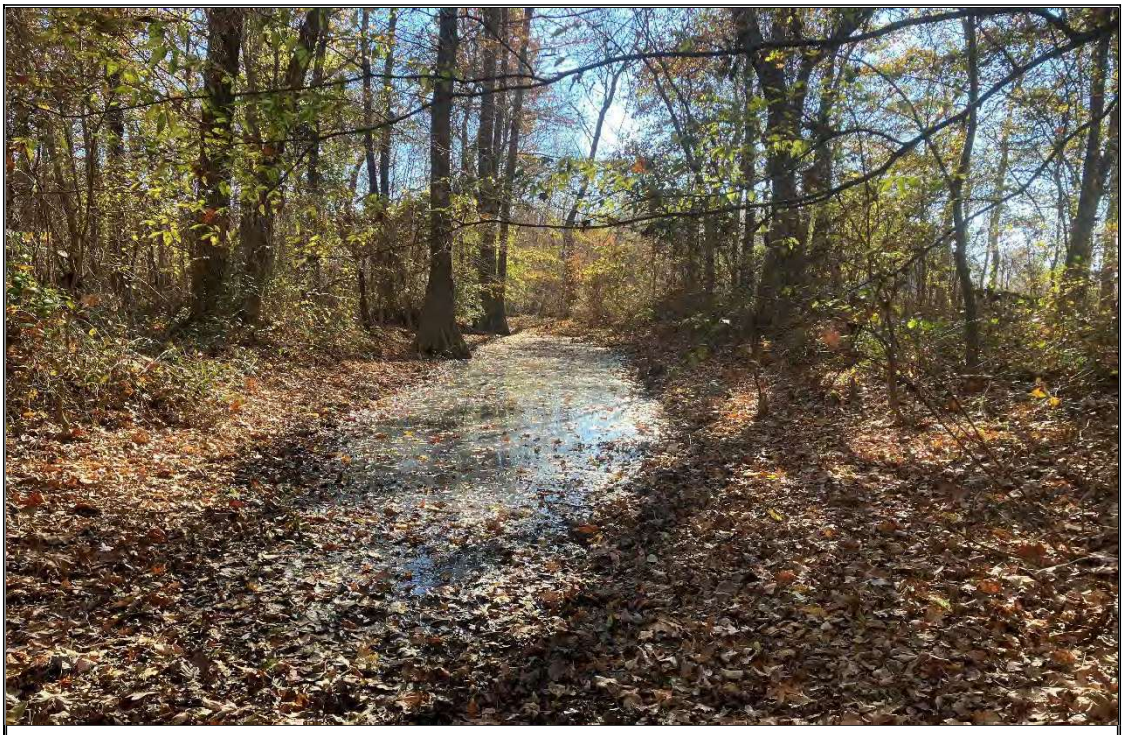
Photograph 14: View of an ephemeral stream between fields on Parcel 18 in the northwestern part of the study area. November 11, 2023.

Photograph 15: View of Ephemeral Stream 6 near Mayfield Creek on Parcel 6 in the northeastern part of the study area. November 16, 2023.

Photograph 16: View of Ephemeral Stream 20, located in the edge of a woodlot on Parcel 48 in the southern part of the study area. November 29, 2023.

Photograph 17: View of a pond on Parcel 32 in the western part of the study area. This pond is typical of ponds on the site. November 13, 2023.

Photograph 18: View of a pond on Parcel 47 in the southern part of the study area. At 0.44 acre in size, this is the largest pond in the study area. November 28, 2023.



Photograph 19: View within a forested wetland on Parcel 1 in the northeastern part of the study area. Part of the wetland contained ponded water and bald cypress trees. November 15, 2023.

Photograph 20: View within a forested wetland in the northeastern part of the study area. November 16, 2023.

Photograph 21: View within a forested wetland on Parcel 9 in the northeastern part of the study area. November 16, 2023.

Photograph 22: View within a wetland beside a crop field on Parcel 6 in the northern part of the study area. November 21, 2023.

Photograph 23: View within a wetland on Parcel 40 in the central part of the study area. November 14, 2023.

Photograph 24: View within a forested wetland on Parcels 44 and 45 in the south-central part of the study area. November 28, 2023.

Photograph 25: View within a forested wetland on Parcel 60 in the southern part of the study area. November 28, 2023.

Photograph 26: View within an emergent wetland on the southern end of Parcel 65 in the southeastern part of the study area. December 13, 2023.

Photograph 27: A barn is present on the southern edge of Parcel 36. November 13, 2023.

Photograph 28: A few abandoned small outbuildings are present within the study area. This shed on Parcel 60 is a typical example. November 28, 2023.