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MEMO

TO	Crab Run Solar Project, LLC
FROM	Environmental Resources Management, Inc.
DATE	30 July 2025
REFERENCE	Crab Run Solar Project
SUBJECT	Protected Species Habitat Suitability Assessment

1. INTRODUCTION

Environmental Resources Management, Inc. (ERM) is pleased to provide the following Protected Species Habitat Suitability Assessment report for the proposed Crab Run Solar Project (Project), a proposed solar photovoltaic facility, located in Marion County, Kentucky, for Crab Run Solar Project, LLC. The assessment includes a desktop analysis and a field survey for protected species habitat that may be impacted by developed of the Project. ERM recognizes that the U.S. Fish and Wildlife Service (USFWS) and Kentucky Department of Fish and Wildlife Resources (KDFWR) have responsibility for the protection of various natural resources within the Commonwealth of Kentucky.

The Project is situated on approximately 412 acres in Marion County, Kentucky (Site). The Site is approximately 1.80 miles southeast of the town of Loretto and is located on two Marion County parcels. Access to the Project is available from Arthur Mattingly Road in the south and a potential entrance from the crossing of Ben Daughterty Road and Frogtown Road in the west. Figures 1 and 2 in Attachment A depict the location and a topographic map of the Project.

2. METHODOLOGY

Overall conditions of the Site were assessed utilizing readily available datasets from the U.S. Geological Survey (USGS) National Mapper, aerial orthoimagery, USGS topographic maps, the Multi-Resolution Land Characteristics (MRLC) Consortium National Land Cover Database, and observations during the habitat survey. ERM reviewed published occurrence records of protected species from available online data sources, including the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation Tool (IPaC) and the Kentucky Office of Nature Preserves (OKNP) Biological Assessment Tool (KYBAT). Bald and golden eagles (*Haliaeetus leucocephalus* and *Aquila chrysaetos*) are protected by federal law under the Bald and Golden Eagle Protection Act (BGEPA) which prohibits the "take" of bald or golden eagles, including their parts, nests, or eggs (USFWS 2025a). Protected migratory bird species designated by USFWS are protected by the Migratory Bird Treaty Act (MTBA; USFWS 2025b). This assessment included an analysis of bald and golden eagles, and protected migratory birds designated by USFWS.

Kentucky state statuses for protected species are found in Citation KRS 150.180 of the Kentucky Revised Statutes. Taking or harassing a species designated as state endangered or threatened is a violation of state law.

A habitat survey to further investigate identified habitat from the desktop assessment was conducted July 9 through 11, 2025. The survey included a targeted pedestrian and vehicular field survey for potential habitat for species identified in the KYBAT and USFWS datasets. Photographs from the habitat survey are included in Attachment B.

ERM additionally reviewed wetland and waterbody data obtained from the wetland delineation effort which was completed simultaneously as the habitat survey for potential protected aquatic species habitat. ERM utilized the delineation data in lieu of utilizing USGS National Hydrography Dataset and USFWS National Wetland Inventory in this assessment.

Following the completion of the desktop and field assessments, an analysis and discussion of the identified species, associated habitat, presence/absence of potential habitat, and recommendations for further actions to de-risk the Project's potential impact on protected species is summarized.

3. RESULTS

3.1 EXISTING OVERALL CONDITIONS

The Site is in the Outer Bluegrass Level IV EPA Ecoregion (EPA 2025). Topography consists of rolling terrain containing possible sinkholes, ravines, and floodplains. The main land use in the region consists of agriculture and pastureland with dissected forest area (Woods et. al 2002). Elevation ranges within the Site range from 660 to 750 feet above mean sea level (AMSL). The Project area is located in the Hardin's

Creek watershed (HUC 051401030303; USGS 2025). The Site is irregularly shaped and is mostly surrounded by flat agricultural lands. Manmade structures (barns, silos, residential buildings) were also identified in the Site.

Observations from the Site visit (July 9-11, 2025) and aerial photographs identified the Site as being comprised predominately of pasture/hay and agricultural fields with small sections of forest occurring mostly along the northwestern portions of the Site and along perennial streams within the Site. A GIS analysis of land use utilizing the Multi-Resolution Land Characteristics (MRLC 2025) Consortium National Land Cover Database (NLCD) characterized the majority of the Site as pasture/hay, which comprise 73.8% of the Site (304 acres). The second most common land use type is cultivated crops (23%, 95 acres), followed by developed open space (2%, 8.5 acres). All other land use types – deciduous forest, low intensity development, and open water – each represent less than 1% of the total Site, respectively. Wetlands cover a total of 4.7 acres (1.1% of the Site), consisting of 4 acres of riverine wetland and 0.7 acres of freshwater pond (MLRC 2021). A map of land use on the Site is provided in Attachment A (Figure 3).

The Kentucky Geological Survey Karst Occurrence Map, maintained by the University of Kentucky, was analyzed for potential karst and cave habitat located within the Site. Based on a review of the Karst Occurrence in Kentucky Map, the Site is located in an area underlain by bedrock with moderate potential for Karst development and the presence of Karst features at the Site is possible, albeit unlikely (University of Kentucky Geological Survey 2002).

A Kentucky speleological survey database review was requested for the Site. Currently this data has not been received yet.

A wetland delineation was performed July 9 through 11, 2025. Full results of the delineation are included in the Crab Run wetland delineation report. Features observed during the delineation included 2.27 acres of wetlands, 13,807 linear feet of stream and ditch features, and 3.64 acres of open waterbodies. A map of land use on the Site is included as Figure 3 and 5 in Attachment A. A figure depicting the features identified during the delineation is included as Figure 4.

3.2 PROTECTED SPECIES ASSESSMENT

3.2.1 FEDERAL SPECIES

Reports generated using the IPaC website identified five federally protected species including (USFWS 2025c):

- The gray bat (*Myotis grisescens*)
- The Indiana bat (*Myotis sodalis*)
- The fanshell (*Cyprogenia stegaria*)
- The pink mucket (*Lampsilis abrupta*)

- The snuffbox mussel (*Epioblasma triquetra*)
- The longsolid mussel (*Fusconaia subrotunda)*

Additionally, whooping crane (*Grus americana*), eastern hellbender (*Cryptobranchus alleganiensis alleganiensis),* salamander mussel (*Simpsonaias ambigua*), and monarch butterfly (*Danaus plexippus*) were identified in the IPaC report. These species are listed as experimental population– nonessential, proposed endangered, proposed endangered, and proposed threatened, respectively. These species are not currently protected under the Endangered Species Act of 1973; however, they warrant analysis due to their impending uplisting (USFWS 2025d).

Bird species that are protected by MTBA or BGEPA are identified on the USFWS Birds of Conservation Concern (BCC) list. There are no documented cases of bald or golden eagles being present within the Site. Six BCC are listed within the IPaC report, and include chimney swift (*Chaetura pelagica*), field sparrow (*Spizella pusilla*), grasshopper sparrow *(Ammodramus savannarum perpallidus*), Kentucky warbler *(Geothlypis formosa*), prairie warbler (*Setophaga discolor*), and wood thrush (*Hylocichla mustelina*).

Additionally, no designated USFWS critical habitat was identified within the Site. A copy of the IPaC report is included in Attachment C.

3.2.2 KENTUCKY SPECIES

KYBAT, a web based interactive map, was used to assess potential natural resources and historically occurring protected species within one mile of the Site. The KYBAT report identified the following historically occurring species within the Site and within a 1-mile radius of the Project site: (OKNP 2025):

- The loggerhead shrike (*Lanius ludovicianus*)

A copy of the KYBAT report is included in Attachment D.

3.2.3 SPECIES HABITAT ANALYSIS

An on-site habitat assessment occurred concurrently with the wetland delineation. Table 1 presents a summary of the federal and state listed species, their suitable habitats, and related findings. Species with suitable habitat within the Site are discussed in more detail below the table. A map depicting locations of potential habitat based on desktop and field analysis is included as Figure 5.

TABLE 1. PROTECTED SPECIES POTENTIALLY OCCURRING AT OR IN THE VICINITY OF THE SITE.

Type	Species	Protection Status	Preferred Habitat	Preferred Habitat Observed in Project Site?	Likelihood for Occurrence in Project Site
Mammals	Indiana Bat (*Myotis sodalis*)	FE	Found in mixed, hardwood, and coniferous forests and riparian areas. Hibernation occurs in caves and abandoned mines. Roosts in sloughing bark and small crevices/cracks of dead or dying trees.	Yes	Moderate; all forested areas within the Site provide suitable summer roosting habitat.
	Gray Bat (*Myotis grisescens*)	FE	Roosts in caves with deep vertical shafts that provide a cold air trap during winter and caves with domed ceilings that trap warm air during summer.	No	Moderate; No caves or cave-like features were observed at the Site, however the potential for the species to forage at the Site may exist.
Birds	Whooping Crane (*Grus americana*)	EXPN	Nest in pothole wetlands dominated by emergent aquatic vegetation, winters primarily in Florida, during migration they utilize freshwater wetlands and agricultural fields.	Yes	High; suitable stopover habitat and food sources are present within the Site.
	Field Sparrow (*Spizella pusilla*)	MBTA	Found in open fields with tall grass and brush. They can also be found along forest edges and fencerows. Nesting may occur multiple times during breeding season, with early spring nests being made on the ground and start to be placed higher as the season progresses.	Yes	High; Suitable habitat and food sources are present within the Site.

Type	Species	Protection Status	Preferred Habitat	Preferred Habitat Observed in Project Site?	Likelihood for Occurrence in Project Site
	Grasshopper Sparrow *(Ammodramus savannarum perpallidus*)	MBTA	The Site is within the breeding range for this species. Found in open grasslands, prairies, hayfields and pastures. Avoid areas that have too many shrubs. Nesting occurs on the ground.	Yes	High; Suitable nesting, habitat, and food sources are present within the Site.
	Chimney Swift (*Chaetura pelagica)*	MBTA	The Site is within the breeding range for this species. Found in silos and barns, and other manmade structures such as bridges and old and abandoned dwellings.	Yes	High; Suitable nesting, habitat, and food sources are present within the Site.
	Kentucky Warbler *(Geothlypis formosa*)	MBTA	The Site is within the breeding range for this species. Found in woodlands with lush understory. Nesting occurs near streams and canopy gaps on the ground.	Yes	Moderate; Suitable nesting, habitat, and food sources are present within the Site.
	Prairie Warbler (*Setophaga discolor*)	MBTA	The Site is within the breeding range for this species. Found in overgrown pastures, growing woodlands, pine stands, and powerline cuts. Nesting occurs in shrubs.	Yes	High; Suitable nesting, habitat, and food sources are present within the Site.
	Wood Thrush (*Hylocichla mustelina*)	MBTA	The Site is within the breeding range for this species. Found in deciduous and mixed forests where large trees are present. Nesting occurs in trees.	Yes	High; Suitable nesting, habitat, and food sources are present within the Site.
	Bald Eagle (*Haliaeetus leucocephalus*)	BGEPA	Found near rivers, lakes, and marshes large enough and suitable to provide	No	Low; suitable habitat is not

Type	Species	Protection Status	Preferred Habitat	Preferred Habitat Observed in Project Site?	Likelihood for Occurrence in Project Site
			feeding habitat. Species additionally nests on large trees or artificial structures		present within the Site, and feeding habitat was not identified within the vicinity of the Site.
	Golden Eagle (*Aquila chrysaetos*)	BGEPA	Found within open county in the vicinity of cliffs, bluffs, hills, or other suitable perching habitat. The species is sensitive to human activity and will avoid developed areas	No	Low; suitable habitat is not present within the Site.
Amphibians	Eastern Hellbender (*Cryptobranchus alleganiensis alleganiensis)*	PFE	Prefers medium to large perennial streams and rivers. Prefers swift running, unpolluted and well oxygenated water with large flat rocks.	No	Low; streams found within the Site are not wide enough for suitable habitat.
Mussels	Snuffbox Mussel (*Epioblasma triquetra*)	FE	Prefers small to medium rivers with gravel substrate.	No	Low; suitable habitat is not present within the Site. Substrate within streams consists of soil or medium to large rocks and stream size is not wide enough.
	Longsolid (*Fusconaia subrotunda)*	FT	Prefers small to medium rivers with swiftly moving water and gravel substrate.	No	Moderate; suitable habitat is possible within the Site.

Type	Species	Protection Status	Preferred Habitat	Preferred Habitat Observed in Project Site?	Likelihood for Occurrence in Project Site
					Substrate within streams consists of soil or medium to large rocks.
	Fanshell (*Cyprogenia stegeria*)	FE	Prefers large rivers with sand and gravel substrate.	No	Low; suitable habitat is not present within the Site. Substrate within streams consists of soil or medium to large rocks and stream size is not wide enough.
	Salamander Mussel (*Simpsonaias ambigua)*	PFE	Prefers rivers with swiftly moving water and large rocks or crevices.	No	Low; suitable habitat is not present within the Site. Substrate within streams consists of soil or medium to large rocks and stream size is not wide enough.
	Pink Mucket (*Lampsilis abrupta*)	FE	Prefers large rivers with strong currents and rocky and boulder substrate.	No	Low; suitable habitat is not present within the Site. Substrate within streams consists of soil or

Type	Species	Protection Status	Preferred Habitat	Preferred Habitat Observed in Project Site?	Likelihood for Occurrence in Project Site
					medium to large rocks and stream size is not wide enough.
Insects	Monarch Butterfly (*Danaus plexippus*)	FC	Breeding exclusively occurs on patches of milkweed; otherwise, it may occupy old fields and mixed woodland habitats.	Yes	Moderate; old fields are present, and the Site is within habitat range of milkweed.

Note: FE = Federally Endangered; FC = Federal Candidate; FT = Federally Threatened; PFE = Proposed Federally Endangered, SE = State Endangered, ST = State Threatened, EXPN = Experimental Population, Non-Essential, BGEPA = Bald and Golden Eagle Protection Act, MBTA = Migratory Bird Treaty Act.

Source: USFWS 2025c, OKNP 2025, USFWS 2025e., Cornell Lab of Ornithology 2025

3.2.3.1 BATS

During the summer, Indiana bats roost underneath bark, in cavities, and in crevices of live and dead trees that provide suitable roosting habitat, with access to nearby open areas for foraging opportunities. The gray bat uses caves year-round and forages over open water and medium to large streams when it is not hibernating. No caves were identified within the Site. The Site provides suitable foraging habitats for all listed bat species. Potential summer roosting habitat for the Indiana bat is sparse within the Site and is primarily concentrated along the perennial streams flowing through the Site (Figure 5). If tree clearing is anticipated to occur for this Project, timing restrictions for tree clearing and/or additional bat-specific surveys may be required. The inactive season for bats in Kentucky is from November 16 – March 31.

The gray bat (*Myotis grisescens*) has been proposed for delisting, but is currently still labeled as endangered and is listed on the Endangered Species Act (ESA).

3.2.3.2 BIRDS

Migratory birds migrate annually between breeding grounds and wintering grounds. They use specific areas during breeding and wintering but also use stopover sites during migration to rest and feed. Chimney swift habitat was identified within the Site in the form of suitable trees. Manmade structures (barns, silos, residential buildings) were also identified in the Site.

Field sparrow and grasshopper sparrow typically occur in open fields with grass and herbaceous ground cover. Open grassland areas were fairly dispersed around the Site. Although the KYBAT report identifies that the loggerhead shrike has historically occurred within the Site, the USFWS IPaC does not list it as potentially occurring at the Site.

Kentucky warbler, prairie warbler, and wood thrush typically occur in areas with woodland cover. Habitats that suit each of these species are found on Site, although woodlands are primarily concentrated along the perennial streams of the Site. Suitable nesting habitats are found within the Site.

Whooping cranes have the potential to occur in the vicinity of the Site. This species utilizes marshes, lakes, open ponds, shallow bays, sand or tidal flats, upland swales, wet meadows, rivers, pastures and agricultural fields. Agricultural fields at the Site may provide suitable stopover habitat for the whooping crane (Figure 5). Migratory birds may utilize habitats in the Site. For additional information, further coordination with the KDFWR may be required.

3.2.3.3 AMPHIBIANS

The eastern hellbender is proposed endangered and feeds preferentially on crayfish, small fish, insects, and other small invertebrates. This species requires shallow water stream and river habitats where they forage for their prey. They prefer streams that

have both faster running water and slower runs and pools. These species are the largest salamander in North America and spend their entire life in water. Although unlikely due to eastern hellbenders preferring streams and rivers 16 feet or wider across, the perennial streams within the Site could provide suitable habitat for this species depending on food sources present and how oxygenated and how polluted the water within the perennial streams are (Figure 5).

3.2.3.4 MUSSELS

Three species of federally endangered mussels were identified by the IPaC, as well as one threatened species and one proposed endangered species. These include fanshell, pink mucket, snuffbox mussel, longsolid, and salamander mussel. Although these species may occur within the vicinity of the Site, their life histories require lotic environments of streams and rivers with loose sand and gravel or cobble and boulder substrates. The only species who may have suitable habitat given the size of the perennial streams found within the Site is the longsolid mussel. These species can be found in small, shallow streams and prefer a gravel substrate. Longsolid need a strong flowing current however, so they would likely only be found in areas where the perennial streams has a strong current.

3.2.3.5 BUTTERFLIES

The monarch butterfly can be found in a variety of habitats, such as forests, agricultural fields, and meadows; however, wildflowers for feeding adults and native milkweeds (*Asclepias* spp.) as host plants must be available. Since the monarch butterfly is currently a proposed threatened species, no additional coordination with USFWS is required regarding this species at this time. If the species is listed prior to project completion, additional coordination may be necessary.

4. CONCLUSIONS AND RECOMMENDATIONS

The Site is utilized for pasture and agricultural practices, is moderately disturbed, and is regularly maintained. Though potential habitat exists for multiple federally and state protected species, the current level of disturbance would indicate that the habitat is of low quality for these species. No designated critical habitat is present in the Site. Based on the habitat assessment, considerations of the above-mentioned species, and current design plans, ERM concludes that there is some potential for federally or state listed threatened and endangered species to occur at the Site. Development of the proposed project has the potential to affect species under the jurisdiction of the USFWS and KDFWR.

Consultation with USFWS is advised under Section 7 of the Endangered Species Act (ESA) if the Project has a federal nexus, such as Clean Water Act (CWA) 404 permitting, to determine potential Project impacts to federally listed species and recommended mitigation measures to ensure compliance. Additionally, the MBTA and

Bald and Golden Eagle Protection Act BGEPA prohibit individuals from intentionally taking, possessing, transporting, and selling or purchasing migratory birds and eagles along with their parts, nests, or eggs without a valid permit. Any person or organization who plans activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures.

The Project should incorporate avoidance and minimizations measures for Project activities that may affect wetlands and forested areas to reduce impacts to listed species. If avoidance of habitat impacts cannot be incorporated into the Project design, species specific presence/probable absence surveys may be necessary.

The following summarizes recommendations of next steps:

- Correspond with USFWS and KDFWR for further recommendations regarding protected species impact avoidance and minimization.
- Avoid and/or minimize impacts to suitable wetland habitat and forested areas to the greatest extent practicable.
- If the Project cannot avoid cutting trees, adhere to tree cutting time of year restrictions, potential impacts to suitable wetlands, perform a bat and plant presence/probable absence survey and coordinate with USFWS and KDFWR.
- Perform migratory bird nest sweep if clearing, grubbing, or mowing vegetation during nesting season (March 1 to August 15).

5. REFERENCES

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ATTACHMENT A FIGURES

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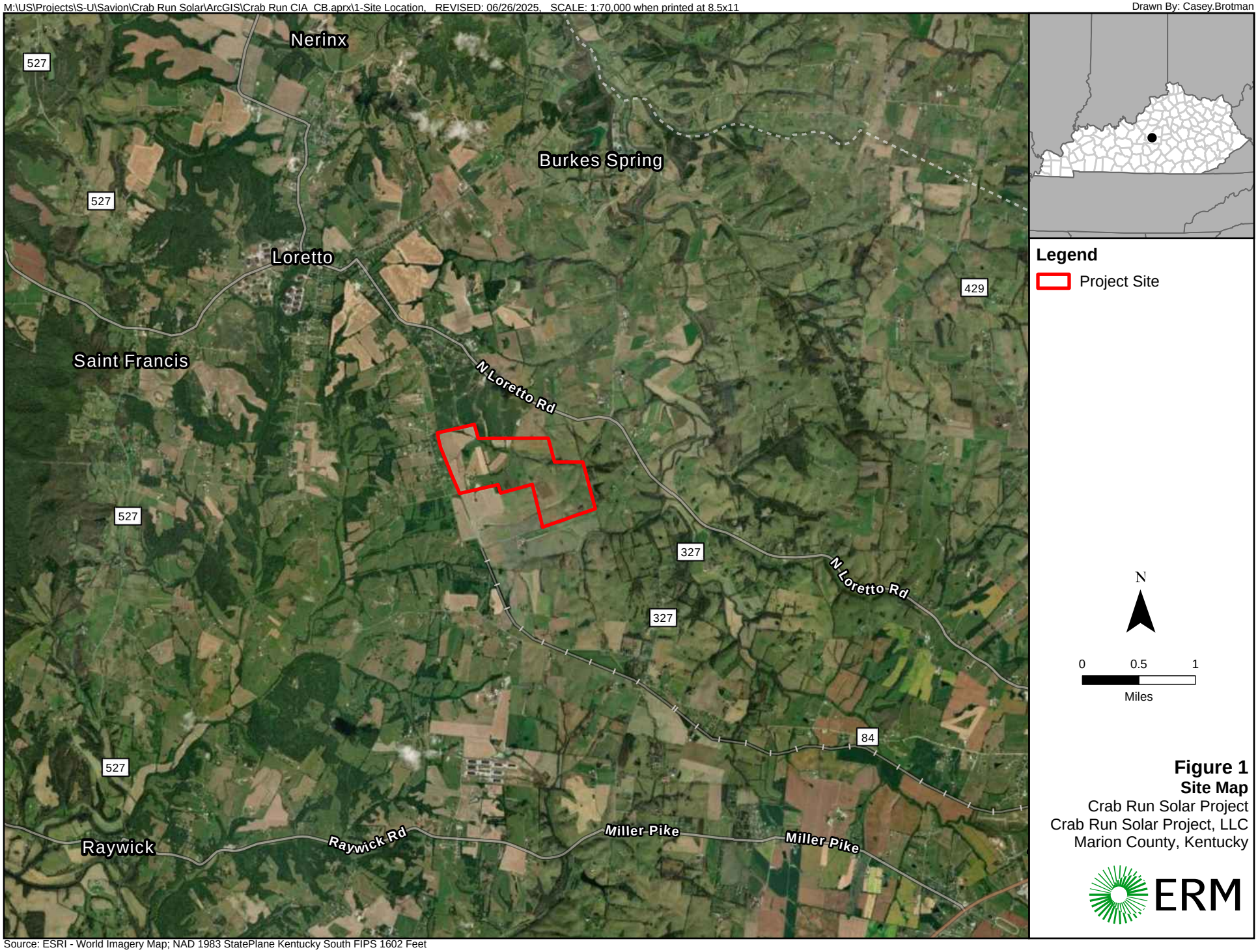

Figure 1
Site Map
Crab Run Solar Project
Crab Run Solar Project, LLC
Marion County, Kentucky

ERM

Source: ESRI - World Imagery Map; NAD 1983 StatePlane Kentucky South FIPS 1602 Feet

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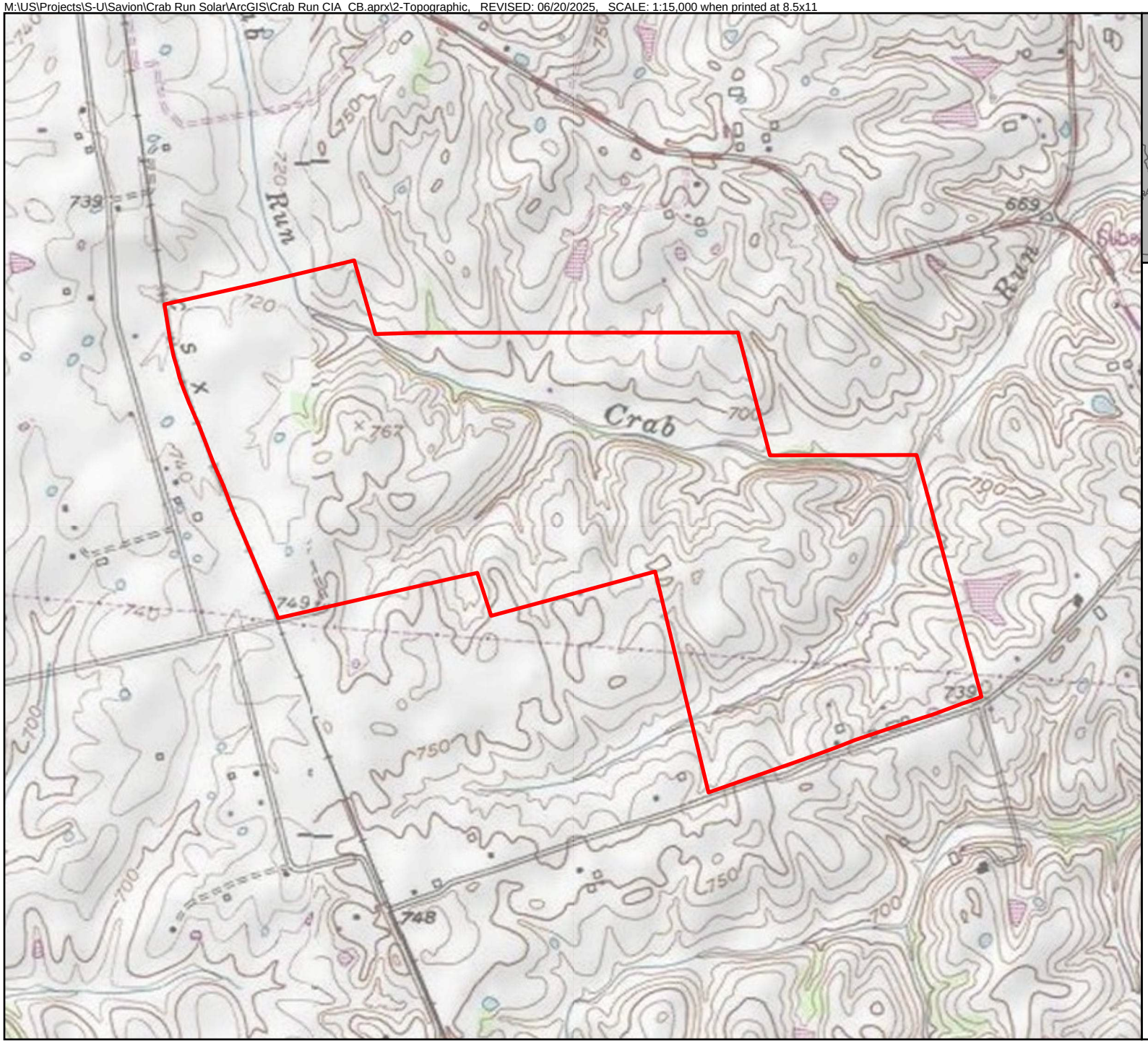

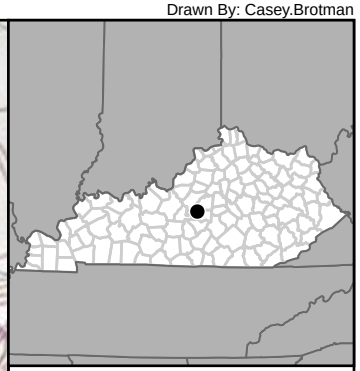

Legend

Project Site

N

0 500 1,000

Feet

Figure 2

USGS Topographic Map

Crab Run Solar Project

Crab Run Solar Project, LLC

Marion County, Kentucky

ERM

Source: USGS Topo Maps (Map Service); NAD 1983 StatePlane Kentucky South FIPS 1602 Feet
Raywick, KY (2022) and Lebanon West, KY (2022)

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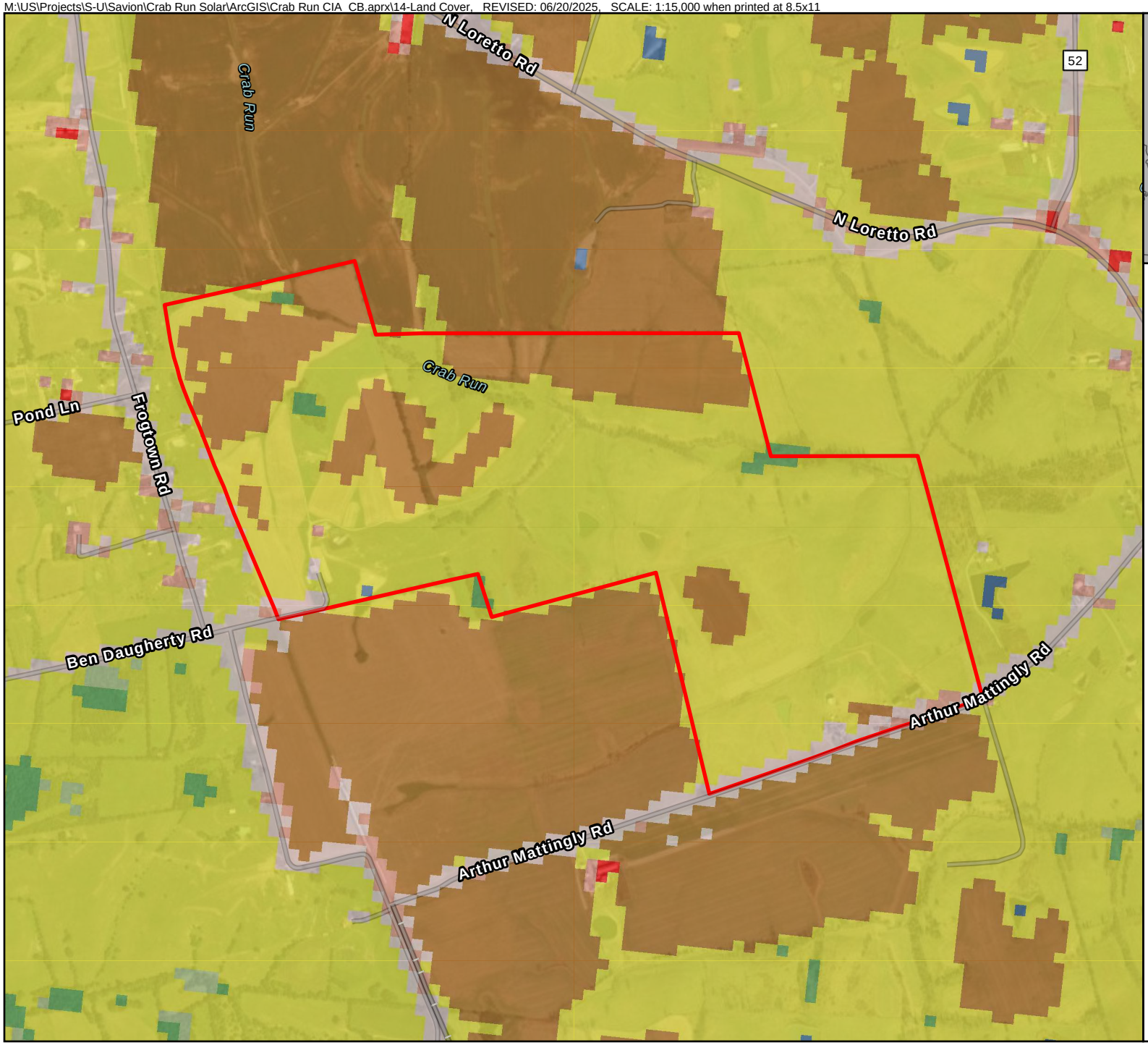

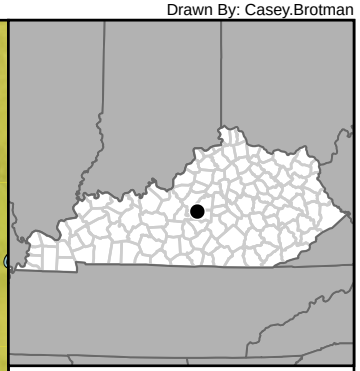

Legend

- Project Site
- Open water
- Developed, open space
- Developed, low intensity
- Developed, medium intensity
- Deciduous forest
- Mixed forest
- Pasture/hay
- Cultivated crops

N

0 500 1,000

Feet

Figure 3
Land Cover Map
Crab Run Solar Project
Crab Run Solar Project, LLC
Marion County, Kentucky

ERM

Source: ESRI - World Imagery Map; NAD 1983 StatePlane Kentucky South FIPS 1602 Feet
USGS National Land Cover Database (2023).

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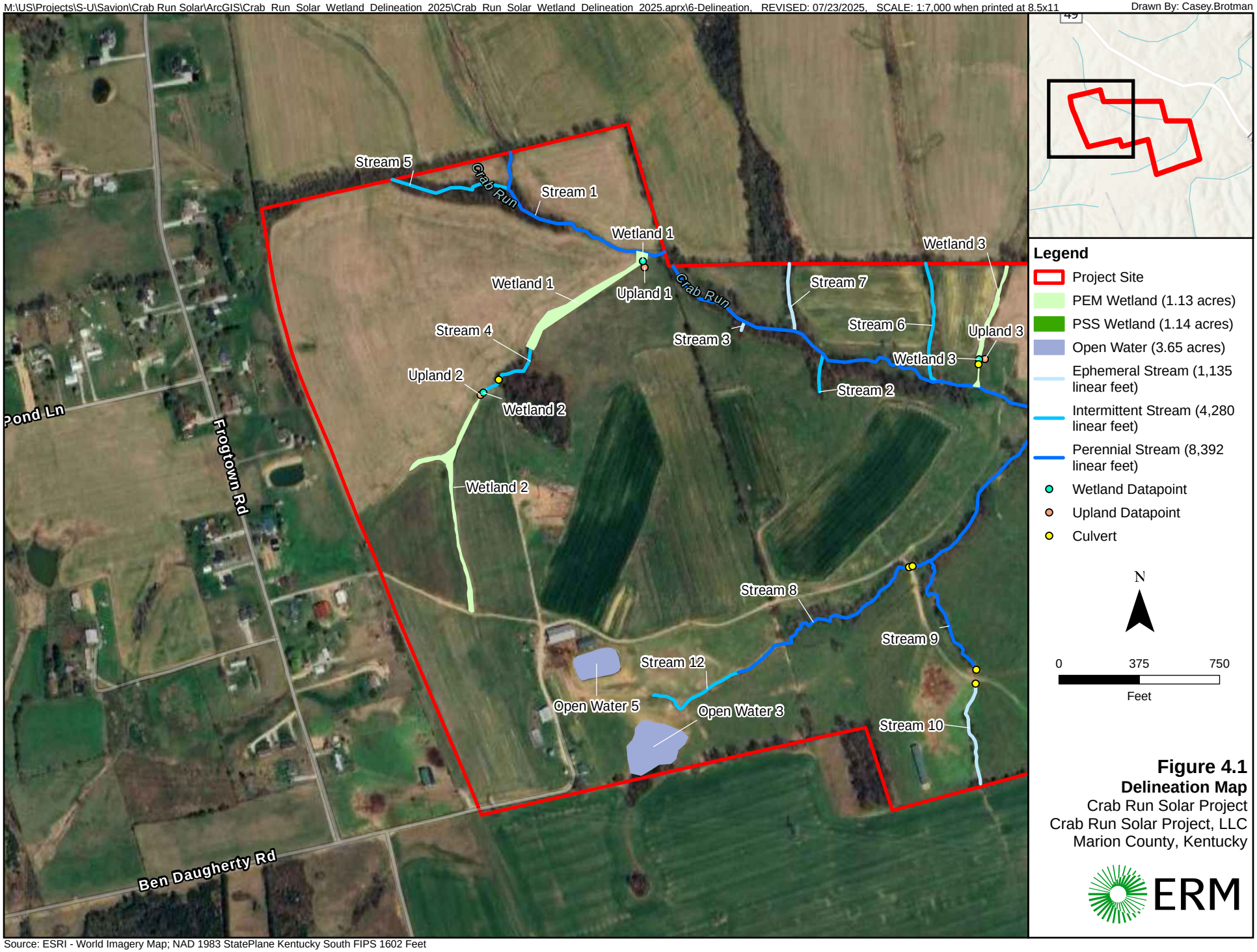

Figure 4.1
Delineation Map
Crab Run Solar Project
Crab Run Solar Project, LLC
Marion County, Kentucky

ERM

Source: ESRI - World Imagery Map; NAD 1983 StatePlane Kentucky South FIPS 1602 Feet

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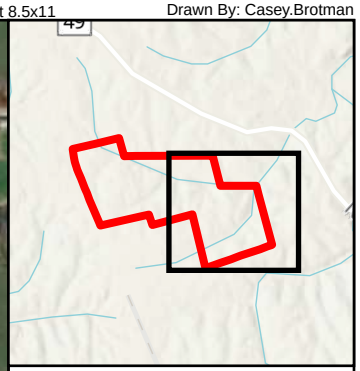

Legend

- Project Site
- PEM Wetland (1.13 acres)
- PSS Wetland (1.14 acres)
- Open Water (3.65 acres)
- Ephemeral Stream (1,135 linear feet)
- Intermittent Stream (4,280 linear feet)
- Perennial Stream (8,392 linear feet)
- Wetland Datapoint
- Upland Datapoint
- Culvert

N

0 375 750

Feet

Figure 4.2
Delineation Map
Crab Run Solar Project
Crab Run Solar Project, LLC
Marion County, Kentucky

ERM

Source: ESRI - World Imagery Map; NAD 1983 StatePlane Kentucky South FIPS 1602 Feet

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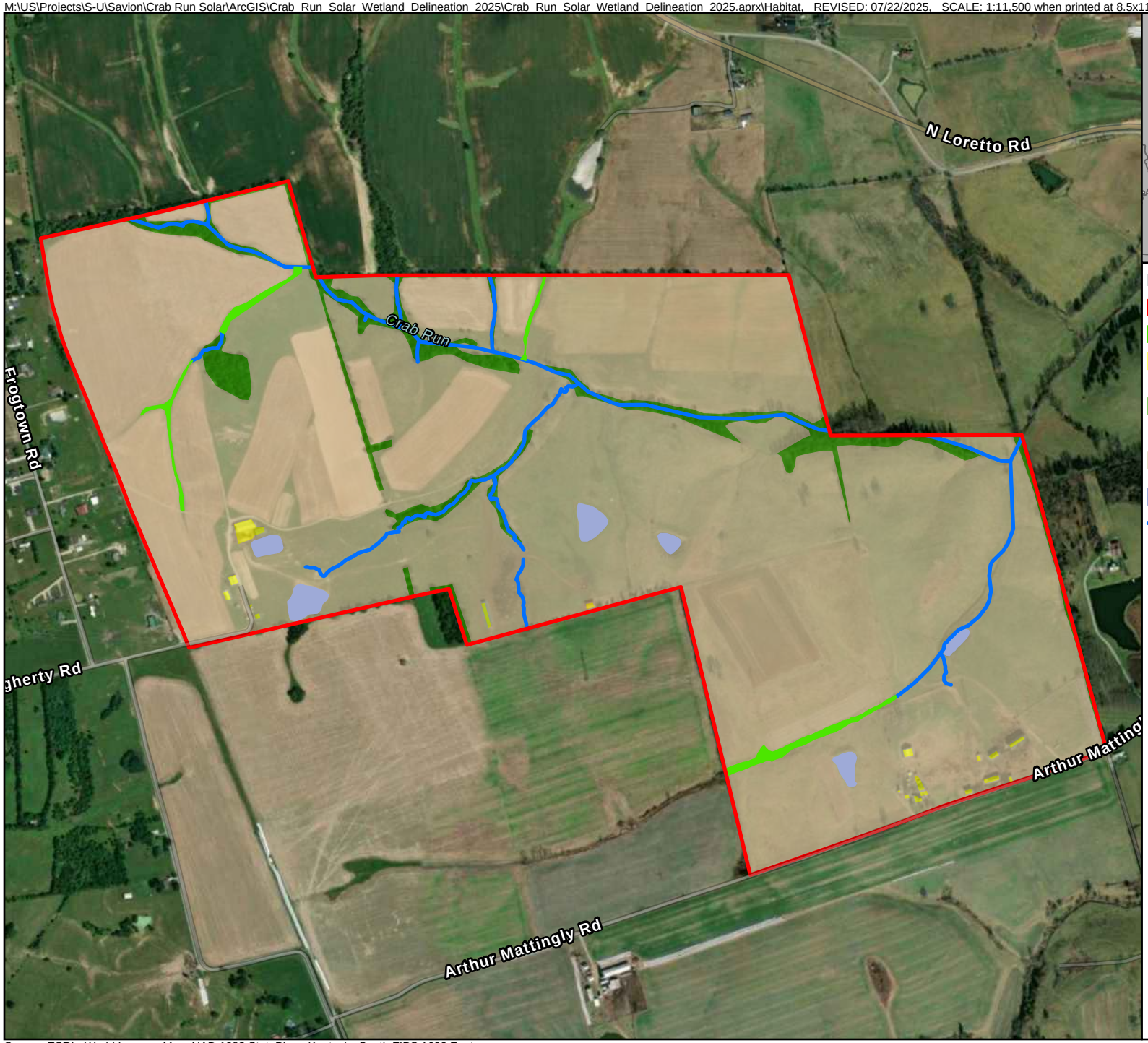
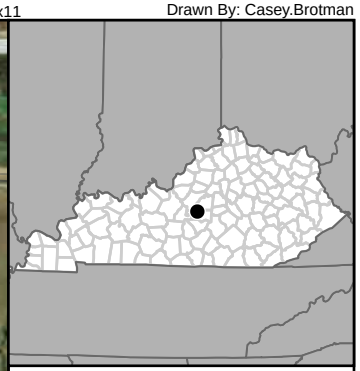
Drawn By: Casey.Brotman





Legend

- Project Site
- Wetland (Whooping crane)
- Developed (Chimney swift)
- Forest (Indiana bat, Kentucky warbler, Prairie warbler, Wood thrush)
- Open Field (Field sparrow, Grasshopper sparrow)
- Open Water
- Stream

N

0 500 1,000

Feet

Figure 4
Protected Species Habitat Map
Crab Run Solar Project
Crab Run Solar Project, LLC
Marion County, Kentucky

ERM

Source: ESRI - World Imagery Map; NAD 1983 StatePlane Kentucky South FIPS 1602 Feet

ATTACHMENT B PHOTOGRAPH LOG

Photographic Log

CLIENT: Crab Run Solar, LLC	SITE LOCATION: Loretto, Kentucky	PROJECT NO.: 0787671

PHOTO NO. 1.	DATE 7/9/25
DIRECTION PHOTO TAKEN Downstream	
DESCRIPTION Stream 1	

PHOTO NO. 2.	DATE 7/9/25
DIRECTION PHOTO TAKEN Downstream	
DESCRIPTION Stream 2	

Photographic Log

CLIENT: Crab Run Solar, LLC	SITE LOCATION: Marion County, Kentucky	PROJECT NO.: 0787671

PHOTO NO. 3.	DATE 7/9/25
DIRECTION PHOTO TAKEN Upstream	
DESCRIPTION Stream 3	

PHOTO NO. 4.	DATE 7/9/25
DIRECTION PHOTO TAKEN Upstream	
DESCRIPTION Stream 4	

Photographic Log

CLIENT: Crab Run Solar, LLC	SITE LOCATION: Loretto, Kentucky	PROJECT NO.: 0787671

PHOTO NO. 5.	DATE 7/9/25
DIRECTION PHOTO TAKEN Downstream	
DESCRIPTION Stream 5	

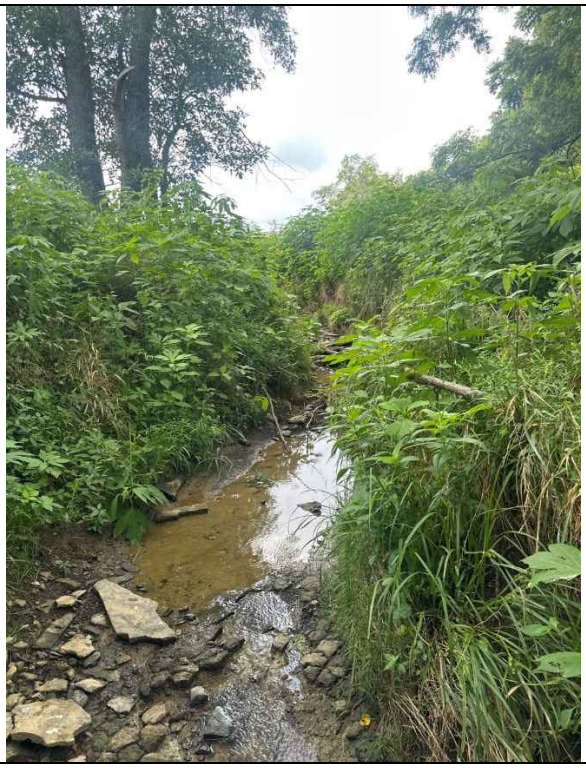
PHOTO NO. 6.	DATE 7/9/25
DIRECTION PHOTO TAKEN Downstream	
DESCRIPTION Stream 6	

Photographic Log

CLIENT: Crab Run Solar, LLC	SITE LOCATION: Loretto, Kentucky	PROJECT NO.: 0787671

PHOTO NO. 7.	DATE 7/9/25
DIRECTION PHOTO TAKEN Downstream	
DESCRIPTION Stream 7	

PHOTO NO. 8.	DATE 7/10/25
DIRECTION PHOTO TAKEN Upstream	
DESCRIPTION Stream 8	



Photographic Log

CLIENT: Crab Run Solar, LLC	SITE LOCATION: Loretto, Kentucky	PROJECT NO.: 0787671

PHOTO NO. 9.	DATE 7/10/25
DIRECTION PHOTO TAKEN Upstream	
DESCRIPTION Stream 9	

PHOTO NO. 10.	DATE 7/10/25
DIRECTION PHOTO TAKEN Upstream	
DESCRIPTION Stream 10	

Photographic Log

CLIENT: Crab Run Solar, LLC	SITE LOCATION: Loretto, Kentucky	PROJECT NO.: 0787671

PHOTO NO.	DATE
11.	7/10/25

DIRECTION PHOTO TAKEN
Downstream

DESCRIPTION
Stream 11

PHOTO NO.	DATE
12.	7/10/25

DIRECTION PHOTO TAKEN
Northeast

DESCRIPTION
Cow pond #1 located in the southeastern portion of the Project Area.

Photographic Log

CLIENT: Crab Run Solar, LLC	SITE LOCATION: Loretto, Kentucky	PROJECT NO.: 0787671

PHOTO NO. 13.	DATE 7/10/25
DIRECTION PHOTO TAKEN Northwest	
DESCRIPTION Cow pond #2 located in the south-central part of the Project Area.	

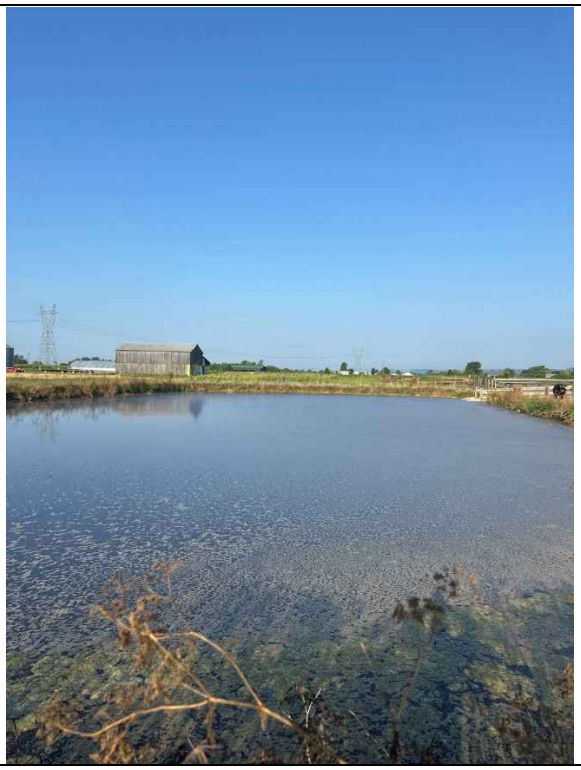
PHOTO NO. 14.	DATE 7/10/25
DIRECTION PHOTO TAKEN West	
DESCRIPTION Cow pond #3 located on the western side of the Project Area	

Photographic Log

CLIENT: Crab Run Solar, LLC	SITE LOCATION: Loretto, Kentucky	PROJECT NO.: 0787671

PHOTO NO. 15.	DATE 7/10/25
DIRECTION PHOTO TAKEN North	
DESCRIPTION Cow pond #4 located in the south-central part of the Project Area.	

PHOTO NO. 16.	DATE 7/11/25
DIRECTION PHOTO TAKEN West	
DESCRIPTION Cow Pond/lagoon #5 located in the south western part of the Project Area, inside the first residential boundary.	



Photographic Log

CLIENT: Crab Run Solar, LLC	SITE LOCATION: Loretto, Kentucky	PROJECT NO.: 0787671

PHOTO NO.	DATE
17.	7/11/25

DIRECTION PHOTO TAKEN
North

DESCRIPTION
Pond #6 located in the south eastern part of the Project Area, inside the second residential boundary.

PHOTO NO.	DATE
18.	7/9/25

DIRECTION PHOTO TAKEN
Northeast

DESCRIPTION
Wetland #1 is a linear wetland located in the Northern part of the Project Area.

Photographic Log

CLIENT: Crab Run Solar, LLC	SITE LOCATION: Loretto, Kentucky	PROJECT NO.: 0787671

PHOTO NO.	DATE
19.	7/9/25

DIRECTION PHOTO TAKEN
West

DESCRIPTION
Wetland #2 is a linear wetland located in the North western part of the Project Area.

PHOTO NO.	DATE
20.	07/9/25

DIRECTION PHOTO TAKEN
Northeast

DESCRIPTION
Wetland #3 is a linear wetland located in the north-central part of the Project Area.

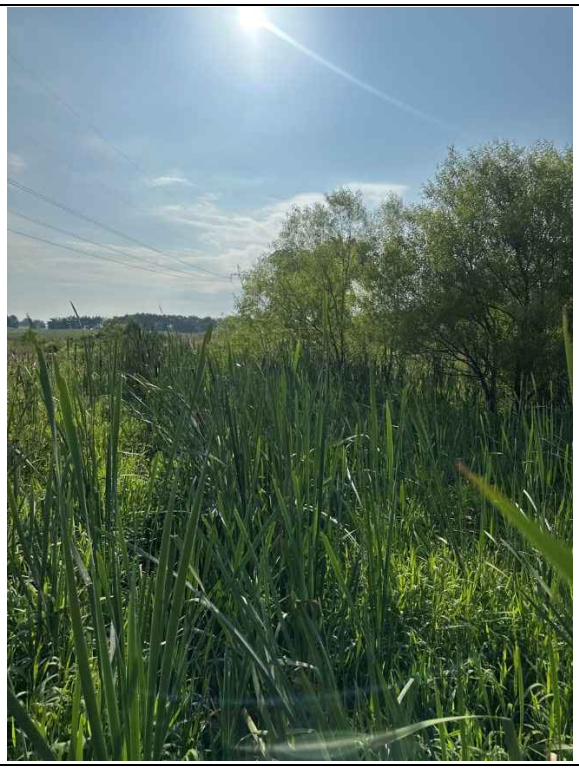
Photographic Log

CLIENT: Crab Run Solar, LLC	SITE LOCATION: Loretto, Kentucky	PROJECT NO.: 0787671

PHOTO NO.	DATE
21.	7/11/25

DIRECTION PHOTO TAKEN
East

DESCRIPTION
Wetland #4 is a linear wetland located in the southern part of the Project Area.



ATTACHMENT C USFWS INFORMATION PLANNING AND CONSULTATION (IPAC)

IPaC resource list

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

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

Location

Marion County, Kentucky

Local office

Kentucky Ecological Services Field Office

(502) 695-0467
(502) 695-1024
kentuckyes@fws.gov

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

Endangered species

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

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

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

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

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

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

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

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

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

Mammals

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

Birds

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

Amphibians

NAME	STATUS
Eastern Hellbender Cryptobranchus alleganiensis alleganiensis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9039	Proposed Endangered

Clams

NAME	STATUS

Fanshell Cyprogenia stegaria — Endangered

Wherever found

No critical habitat has been designated for this species.

https://ecos.fws.gov/ecp/species/4822

Longsolid Fusconaia subrotunda — Threatened

Wherever found

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

https://ecos.fws.gov/ecp/species/9880

Pink Mucket (pearlymussel) Lampsilis abrupta — Endangered

Wherever found

No critical habitat has been designated for this species.

https://ecos.fws.gov/ecp/species/7829

Salamander Mussel Simpsonaias ambigua — Proposed Endangered

Wherever found

There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat.

https://ecos.fws.gov/ecp/species/6208

Snuffbox Mussel Epioblasma triquetra — Endangered

Wherever found

There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat.

https://ecos.fws.gov/ecp/species/4135

Insects

NAME — STATUS

Monarch Butterfly Danaus plexippus — Proposed Threatened

Wherever found

There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat.

https://ecos.fws.gov/ecp/species/9743

Critical habitats

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

There are no critical habitats at this location.

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

Bald & Golden Eagles

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their nests, should follow appropriate regulations and implement required avoidance and minimization measures, as described in the various links on this page.

The data in this location indicates that no eagles have been observed in this area. This does not mean eagles are not present in your project area, especially if the area is difficult to survey. Please review the 'Steps to Take When No Results Are Returned' section of the Supplemental Information on Migratory Birds and Eagles document to determine if your project is in a poorly surveyed area. If it is, you may need to rely on other resources to determine if eagles may be present (e.g. your local FWS field office, state surveys, your own surveys).

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Bald & Golden Eagles FAQs

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

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are an eagle (Bald and Golden Eagle Protection Act requirements may apply).

Proper interpretation and use of your eagle report

On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort line or no data line (red horizontal) means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

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

The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()

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

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

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

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

Migratory birds

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

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

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Measures for Proactively Minimizing Migratory Bird Impacts

Your IPaC Migratory Bird list showcases birds of concern, including Birds of Conservation Concern (BCC), in your project location. This is not a comprehensive list of all birds found in your project area. However, you can help proactively minimize significant impacts to all birds at your project location by implementing the measures in the Nationwide avoidance and minimization measures for birds document, and any other project-specific avoidance and minimization measures suggested at the link Measures for avoiding and minimizing impacts to birds for the birds of concern on your list below.

Ensure Your Migratory Bird List is Accurate and Complete

If your project area is in a poorly surveyed area, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles document, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

Review the FAQs

The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Chimney Swift Chaetura pelagica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Field Sparrow Spizella pusilla This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 1 to Aug 15
Grasshopper Sparrow Ammodramus savannarum perpallidus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20
Kentucky Warbler Geothlypis formosa This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prairie Warbler Setophaga discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental

Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

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

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

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

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

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

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

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

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

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

Migratory Bird FAQs

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

Nationwide Avoidance & Minimization Measures for Birds describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

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

The Migratory Bird Resource List is comprised of Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the Bald and Golden Eagle Protection Act and those species marked as “Vulnerable”. See the FAQ “What are the levels of concern for migratory birds?” for more information on the levels of concern covered in the IPaC migratory bird species list.

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

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, and to verify survey effort when no results present, please visit the Rapid Avian Information Locator (RAIL) Tool.

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for **the species** are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

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

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

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

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

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

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

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

Although it is important to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially BCC species. For more information on avoidance and minimization measures you can implement to help avoid and minimize migratory bird impacts, please see the FAQ “Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds”.

Details about birds that are potentially affected by offshore projects

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

Proper interpretation and use of your migratory bird report

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

Interpreting the Probability of Presence Graphs
Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

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

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

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

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

Facilities

National Wildlife Refuge lands

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

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

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

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

Wetland information is not available at this time

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

Data limitations

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

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

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

Data exclusions

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

Data precautions

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

ATTACHMENT D OFFICE OF KENTUCKY NATURE PRESERVES BIOLOGICAL ASSESSMENT TOOL REPORT

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

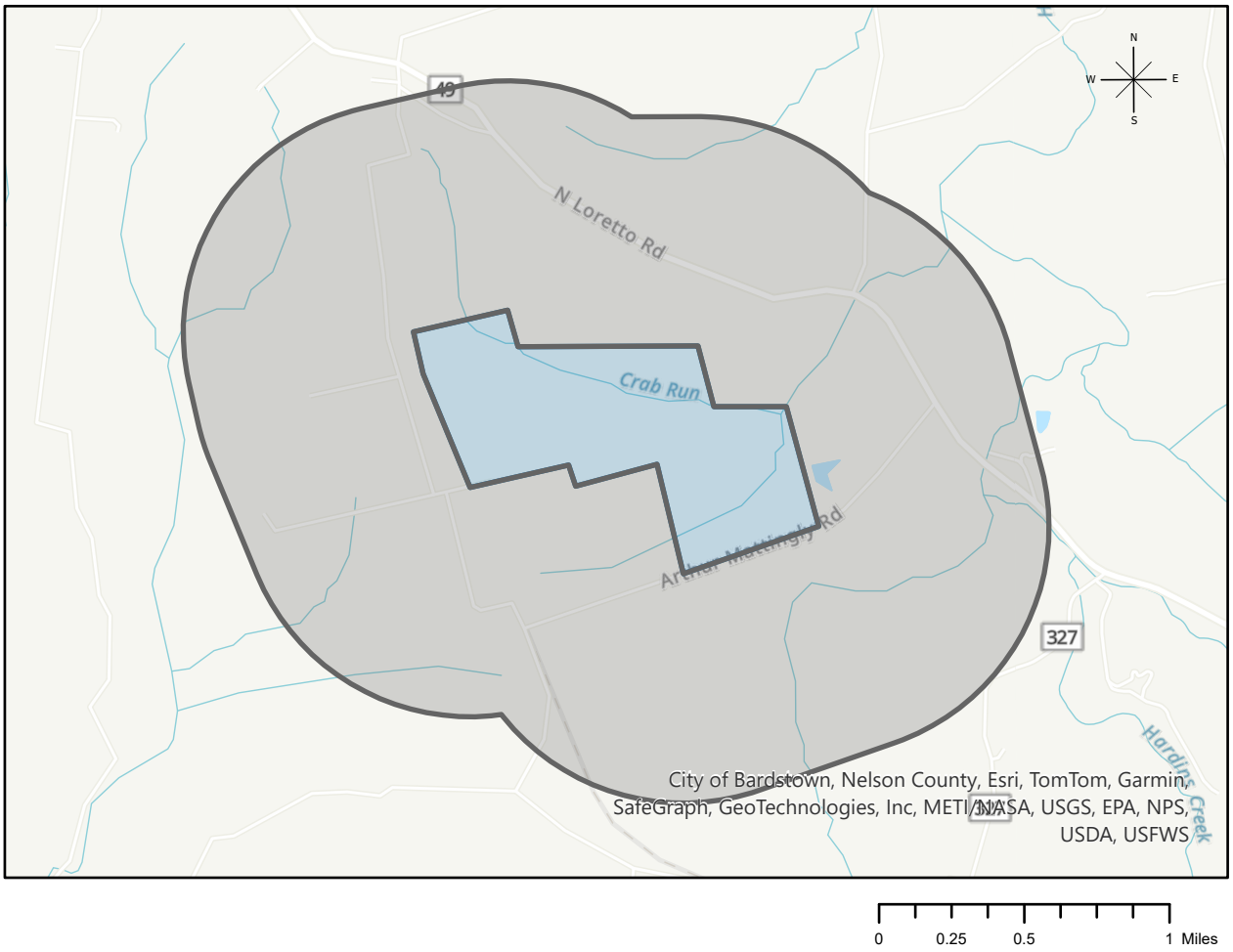
Rebecca W. Goodman
Secretary

Zack Couch
Executive Director

Requested on Monday, June 23, 2025 by *Hayden Wayne Alvey-Knapp, ERM*

Re: Kentucky Biological Assessment Data Request 250623H01
Crab Run - Crab Run KYBAT Report
Scientific Research, 1 mile buffer.
MARION 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.



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Zack Couch
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.

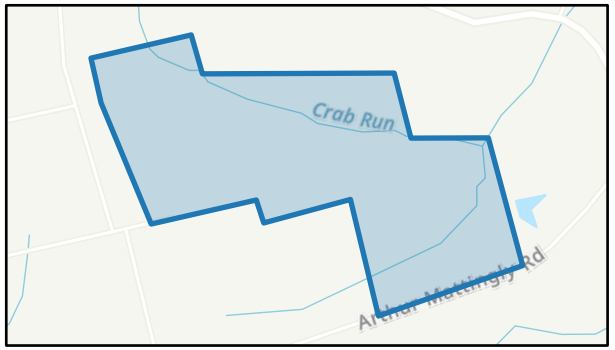
If you have any questions, or if we can be of further assistance, please do not hesitate to contact our office by email at EEC.KYBAT@ky.gov or by phone at 502-782-7828.

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.



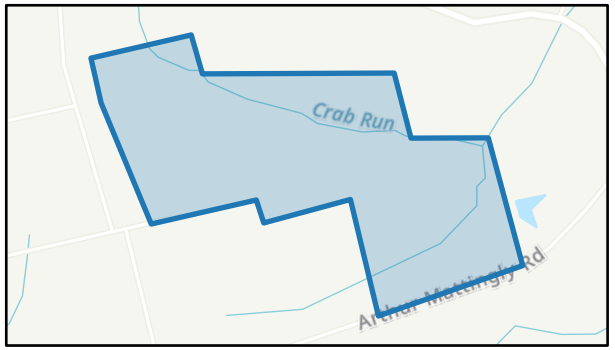
Botanical
Ecological
Zoological

Map Credits: City of Bardstown, Nelson County, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/ NASA, USGS, EPA, NPS, USDA, USFWS

EO ID	Scientific Name	Common Name	G Rank	S Rank	Fed. Status	State Status	SWAP	Precision	Last Obs. Date
15775	*Lanius ludovicianus*	*Loggerhead Shrike*	*G4*	*S3S4B,S4N*	*None*	*S*	*Y*	*Q*	*1990-06-14*

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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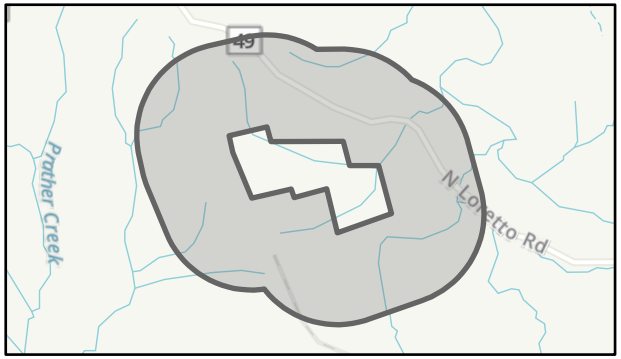
Map Credits: City of Bardstown, Nelson County, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/ NASA, USGS, EPA, NPS, USDA, USFWS

EOID	Scientific Name	Habitat	Location
15775	*Lanius ludovicianus*		*CW block of quadrangle.*

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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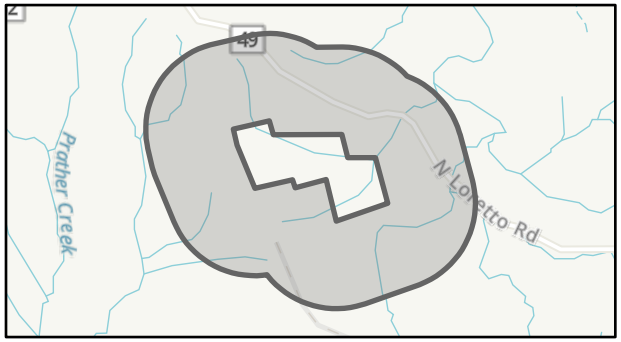
Ecological
Zoological

Map Credits: City of Bardstown, Nelson County, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/ NASA, USGS, EPA, NPS, USDA, USFWS

EO ID	Scientific Name	Common Name	G Rank	S Rank	Fed. Status	State Status	SWAP	Precision	Last Obs. Date
15775	*Lanius ludovicianus*	*Loggerhead Shrike*	G4	S3S4B,S4N	None	S	Y	Q	1990-06-14

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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Map Credits: City of Bardstown, Nelson County, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/ NASA, USGS, EPA, NPS, USDA, USFWS

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.

TEAM KENTUCKY
ENERGY AND ENVIRONMENT CABINET
OFFICE OF KENTUCKY NATURE PRESERVES

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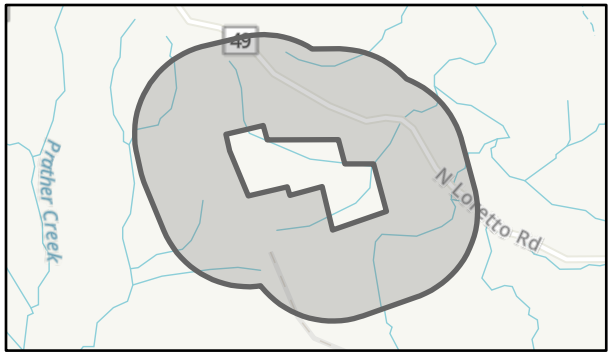

TEAM KENTUCKY®

ENERGY AND ENVIRONMENT CABINET

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.