Appendix C – Biological Resources-Related Correspondence and Supporting Information

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Wildlife and Vegetation Assessment

SR Ripley II

Lauderdale County, Tennessee

March 2024

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Contents

Tables

Appendices

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Acronyms and Abbreviations

BCC	Birds of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
DBH	diameter at breast height
ESA	Endangered Species Act
ESI	Environmental Solutions and Innovations, Inc.
HDR	HDR Engineering, Inc.
IPaC	Information for Planning and Consultation
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
NLEB	northern long-eared bat
Project	Ripley II Solar
Project Site	Ripley II Solar Project Site
RNHD	Regional Natural Heritage Database
TDEC	Tennessee Department of Environment and Conservation
TN-QHP	Tennessee Qualified Hydrologic Professional
TN-QHP-IT	Tennessee Qualified Hydrologic Professional in Training
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
USFWS	U.S. Fish and Wildlife Service

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1 Introduction

On behalf of Silicon Ranch Corporation, HDR Engineering, Inc (HDR) conducted a vegetation and wildlife assessment for SR Ripley II (Project), a proposed solar facility located on approximately 490 acres in Lauderdale County, Tennessee (Project Site).

The Project would sell power to Tennessee Valley Authority (TVA) and, therefore, is subject to review under the National Environmental Policy Act (NEPA) and must obtain applicable permitting. To facilitate compliance with NEPA, the Endangered Species Act (ESA) (1973) and Executive Order 13571, and in accordance with TVA's *Guidelines for Conducting Biological and Cultural Surveys and Impact Analyses* (TVA 2023a), HDR mapped vegetation and identified potential habitat for federally and state-listed species within the Project Site; the results of this wildlife and vegetation assessment are presented herein. Supporting documents included as appendices are as follows:

Appendix A – Figures;

Appendix B – Site Photographs

Appendix C –U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) database, the Tennessee Valley Authority Regional Natural Heritage Database (TVA RNHD), and the Tennessee Department of Environment and Conservation database search results;

Appendix D – Federal and State Protected Plant Species and Habitat Report;

Appendix E – Bat Habitat Assessment Data Sheets;

Appendix F – Environmental Solutions & Innovations, Inc. Bat Survey Report

Between September 19-22, 2022, and November 1-3, 2023, HDR conducted field surveys following TVA's Contractor *Guidelines for Conducting Biological and Cultural Surveys and Impact Analyses* (TVA 2023a) to map vegetation and identify potential habitat for federally and state-listed threatened and endangered species on the Project Site. Environmental consultant Dan Spaulding conducted a Federal and State Protected Plant Species and Habitat survey on the Project Site on October 23-24, 2023. Bat mist netting surveys targeting federally listed bat species were conducted by Environmental Solutions and Innovations, Inc. (ESI) by Darwin Brack on June 27-30, 2023. The results of the bat survey are included in Appendix F.

1.1 Project Site

The Project Site is located in Lauderdale County, Tennessee, partially within the city limits of Ripley (Appendix A, Figure 1). The Project Site is located within the Cane Creek Upper Watershed (Hydrologic Unit Code 10: 0801020807). Hyde Creek runs along the southern border of the Project Site, flowing towards the northwest. A transmission line crosses the western portion of the Project Site from northeast to southwest and Highway 19 bisects the Project Site. The Project Site of consists of mostly active agriculture fields of cotton (*Gossypium hirsutum*), corn (*Zea mays*), and soybeans (*Glycine max*) (Appendix A, Figure 2).

1.2 Qualifications

HDR vegetation and wildlife surveys were conducted by environmental scientists Lyranda Thiem (terrestrial zoology and wetlands-qualified; Tennessee Qualified Hydrologic Professional in Training [TN QHP-IT]), Ivan Maldonado (aquatic ecology and wetlands-qualified; Tennessee Qualified Hydrologic Professional [TN-QHP]), Ben Burdette (TN-QHP), and Jake Irvin. These HDR staff have undergone appropriate training and have prior experience in identifying and assessing vegetation communities, as well as endangered animal species and habitat, in the region. Dan Spaulding, a TVA-approved, qualified botanist, conducted all vegetation surveys. ESI conducted the mist netting survey with the terrestrial zoology-qualified, Section 10 permitted bat biologist Darwin Brack.

2 Vegetation Field Survey

2.1 Methods

A portion of the site was surveyed by HDR on September 19-22, 2022. An additional parcel was investigated on November 1-3, 2023. Surveys were conducted to document plant communities and invasive plants and evaluate habitat for rare plant species and other state- and federally listed species on the Project Site. Environmental consultant Dan Spaulding conducted a rare plant species survey on the Project Site on October 23-24, 2023. Following TVA (2023a) guidelines, HDR reviewed the TVA Regional Natural Heritage Database (RNHD) for all state and federally listed plants, including sensitive plant species, within a surrounding five-mile vicinity of the Project Site; the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) database for federally threatened and endangered plants within the Lauderdale County; and the Tennessee Department of Environment and Conservation (TDEC) Rare Species Data Viewer for state-protected species with potential to occur in the Cane Creek Upper Watershed. Species lists compiled for the 2023 site visits are included in Appendix C.

Plant communities observed on the Project Site were classified using the National Vegetation Classification System (Grossman et al. 1998). Plant communities were delineated using ArcMap, aerial imagery, and field notes, and the area of each plant community type was calculated as a percentage of the total Project Site. The general location and abundance of non-native invasive plants present within the Project Site were also noted.

2.2 Results

2.2.1 Vegetation Communities

The majority of the Project Site comprises agricultural fields (87.7 percent) with smaller amounts of forested areas (10.1 percent, total), herbaceous (1.3 percent) and shrubland habitats (0.25 percent) (Table 1). Current land use activities on the Project Site are focused on production of cotton, soybean, and corn. Crop harvesting was underway at the time of the surveys. Photographs of typical agricultural land on the Project Site are provided in Appendix B and denoted on Figure 3 in Appendix A. Vegetation communities across the Project Site are also shown on Figure 4 in Appendix A.

Most of the large, contiguous forest stands are located in the central and southeastern sections of the Project Site with an average diameter at breast height (DBH) of 20-40 inches. Other small, forested areas are located along streams and fields with an average DBH of 15-20 inches. No old growth forest was found on the Project Site. Photographs 3 and 4 are representative of forested areas on the Project Site (Appendix A, Appendix B).

Common overstory and midstory plants found in the forested areas consisted of the following: Willow oak (*Quercus phellos*), cherry-bark oak (*Quercus pagoda*), black walnut (*Juglans nigra*), tulip-poplar (*Liriodendron tulipifera*), black locust (*Robinia pseudoacacia*), mockernut hickory (*Carya tomentosa*), American elm (*Ulmus americana*), green ash (*Fraxinus pennsylvanica*), red cedar (*Juniperus virginiana*), and American sycamore (*Platanus occidentalis*).

Common shrub plants found in the shrub layer included highbush blueberry (*Vaccinium corymbosum*) and sassafras (*Sassafras albidum*).

Common herbaceous plants found in the herb layer includes the following species: cinnamon fern (*Osmundastrum cinnamomeum*), proso millet (*Panicum miliaceum*), royal fern (*Osmunda spectabilis*), valley redstem (*Ammannia coccinea*), nutgrass (*Cyperus rotundus*), and redtop panic grass (*Coleataenia rigidula*).

Common vine plants found in the forested areas include poison ivy (*Toxicodendron radicans*), crossvine (*Bignonia capreolata*), greenbriers (*Smilax* spp.), and Virginia creeper (*Parthenocissus quinquefolia*).

At several locations within forest habitat, the forest surrounds open ponds which support species like black willow (*Salix nigra*) and black alder (*Alnus glutinosa*).

Several emergent wetlands on the Project Site are dominated by herbaceous vegetation, primarily proso millet due to the disturbed nature of the area. Forested wetlands on site include hydrophytic species listed above such as American sycamore, black willow, and American elm.

No federal-noxious weeds as defined by the U.S. Department of Agriculture Natural Resources Conservation Service (2012) were observed. However, many non-native invasive plant species were observed throughout the Project Site. Invasive species noted include autumn-olive (*Elaeagnus umbellata*), Japanese honeysuckle (*Lonicera japonica*), Japanese stiltgrass (*Microstegium vimineum*), Johnson grass (*Sorghum halepens*e), Chinese privet (*Ligustrum sinense*), and multiflora rose (*Rosa multiflora*). These species are most often found in ruderal forested areas, along field edges, and in areas prone to disturbance. Japanese honeysuckle, Japanese stiltgrass, Chinese privet, and multiflora rose were found in some of the forested stands. These species occur on about 15 percent of the Project Site and in both forest and herbaceous vegetation areas.

Table 1. Vegetation Communities in the Study Area

Plant Community	Area (acres)	Percentage of Project Site[1]
Row Crop (corn, soybean, and cotton)	429.9	87.7
Dry Deciduous Forest	30.0	6.1
Mesic Deciduous Forest	15.9	3.2
Herbaceous	6.6	1.3
Wet Deciduous Forest	3.8	0.8
Deciduous Shrubland	1.2	0.25
Total	**487.4**	**99.35**

[1] Table does not include area of open water 2.9 acres

Notable Plant Communities

No notable plant communities were observed on the Project Site.

Listed and Protected Plant Species

No changes to the USFWS IPaC, TVA RNHD, or TDEC species lists were noted between 2022 and 2023 except for the addition of American ginseng (*Panax quinquefolius*), a state species of concern due to commercial exploitation (USFWS 2023; TVA 2022, 2023b; TDEC 2024). Species lists are provided in Appendix C. Listed rare species found in Lauderdale County include featherfoil (*Hottonia inflata*), ovate-leaved arrowhead (*Sagittaria platyphylla*), cedar elm (*Ulmus crassifolia*), tissue sedge (*Carex hyalina*), butternut (*Juglans cinerea*), red starvine (*Schisandra glabra*), and lake cress (*Neobeckia aquatica*) (TDEC 2024).

No listed and protected plant species or suitable habitats for listed and protected plants were observed during the field surveys.

3 Wildlife Survey

3.1 Methods

Pedestrian surveys of the Project Site for terrestrial wildlife were conducted on September 19-22, 2022 and November 1-3, 2023. The surveys were focused on woodlands, forested edges, roadside edges, recently disturbed areas, culverts, and areas of former human use. The Project Site was also traversed by vehicle via roads. Spot checks were performed in forested stands and along streams, drainageways, and the perimeters of crops fields. Isolated pockets of woodlands were inspected, and larger woodland blocks within the Project Site were also traversed for the bat habitat assessment.

Following TVA (2023a) guidelines, HDR reviewed the TVA RNHD (TVA 2023b) for state or federal species of conservation concern with potential to occur on the Project Site and within a three-mile radius of the Project Site. In conjunction with the TVA RNHD, the USFWS IPaC for

federal species of conservation concern was examined for species with potential to occur on the Project Site and Lauderdale County (USFWS 2023). Lastly, the TDEC Rare Species Data Viewer (TDEC 2024) was utilized to generate a list of state-protected species with potential to occur in the Cane Creek Upper watershed. The compiled animal species lists are included in Appendix C.

Bat mist netting surveys were completed to identify bat species, including protected bat species, that may be present on the Project Site. A total of ten net-nights were completed across two mist net sites. Nets were placed in bat flight path areas suitable for travel and foraging. More details regarding methodology and appropriate permits for handling of protected species is provided in the report (ESI 2023; Appendix F).

3.2 Results

3.2.1 Wildlife

Wildlife observed on the Project Site included a variety of common birds, amphibians, reptiles, insects, and mammals (Table 2). Species were either directly observed on the Project Site, or evidence (e.g., tracks, scat, remains) was noted during the field survey.

Table 2. Wildlife Species Observed in Project Site

Species Observed (Common Name)	Notes/Habitat Observed in Study Area
Birds	
Woodpecker species	Flying around a tree and pecking at tree within an upland forested habitat
Northern Cardinal	Flying around low-hanging branches within scrub/shrub habitat
American Crow	Flying overhead
Red-tailed Hawk	Flying overhead
Killdeer	In agricultural fields and roadbeds in open areas
Black Vulture	Flying overhead
Blue Jay	Flying overhead
European Starling	Flying overhead
Carolina Wren	Flying overhead
Amphibians	
Spring Peeper	Heard near pond
Leopard Frog	In multiple streams throughout the site
Green Frog	In multiple streams throughout the site
American Toad	In damper forested areas throughout the site
Cricket Frog	In streams and ponded areas throughout the site
Green Treefrog	Within a small wetland
Unidentified Tadpoles	In many puddles and streams throughout the site.
Reptiles	
Pond Sliders	In pond on site
Five-Lined Skinks	In forested areas
Fish	
Western Mosquito Fish	In Hyde Creek
Insects	
Unidentified Grasshopper	Flying through cotton and soybean fields
Paper wasp	In nest near forested wetland
Macroinvertebrates	
Caddisflies	In many drainages throughout the site
Midges	In many drainages throughout the site

Species Observed (Common Name)	Notes/Habitat Observed in Study Area
Mayflies	In many drainages throughout the site
Scuds	In many drainages throughout the site
Fly Larva Species	In many drainages throughout the site
Mammals	
White-tailed deer	In forested area
Tracks/Scat/Remains	
Turtle Remains	Near a dry pond
Deer Tracks and Scat	In several locations across the site
Raccoon Tracks	In several of the creek beds throughout the site

3.2.2 Migratory Birds

Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) directs federal agencies to take certain actions to further implement the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. §§ 703-712). The MBTA prohibits the "take" of migratory birds. The regulatory definition of "take" as defined by 50 CFR § 10.12, "means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue hunt, shoot, wound, kill, trap, capture, or collect." The following prohibitions apply to migratory bird nests: "possession, sale, purchase, barter, transport, import and export, take, and collect." The MBTA is executed and enforced by USFWS.

Approximately 290 birds have been identified in Lauderdale County (eBird 2023), and additional species may occur regularly. The USFWS maintains a list of migratory birds of conservation concern (USFWS 2021). These species are not listed under the ESA but are a high conservation priority of the USFWS and without additional conservation action are likely to become candidates for listing under the ESA. Thirty-nine species of birds of conservation concern are listed for Bird Conservation Region 27 (BCR 27), Southeastern Coastal Plain, which encompasses the Project Site. Of these 39 species, a habitat survey determined that at least 18 potentially occur with some regularity on or in the immediate vicinity of the Project Site (Table 3).

Table 3. Migratory Bird Species of Conservation Concern Potentially Occurring in the Project Site

Scientific Name	Common name	Season of Occurrence	Likelihood[1] of Presence on Project Site	Habitat Description
Antrostomus vociferus	Eastern Whip-poor-will	Spring through fall	Likely	Inhabits deciduous and mixed forests with open understory and forest edges; reported from vicinity
Antrostomus carolinensis	Chuck-will's-widow	Spring through fall	Possible	Inhabits oak and pine woodlands and edges of swamps
Chaetura pelagica	Chimney Swift	Spring through fall	Likely	Inhabits nests in chimneys and less frequently large, open-topped hollow trees; reported from vicinity and likely forages over Project Site
Tringa flavipes	Lesser Yellowlegs	Spring and fall	Possible	Inhabits extensive emergent wetlands and seasonally flooded agricultural fields with sparse, low vegetation
Melanerpes erythrocephalus	Red-headed Woodpecker	Year-round	Likely	Inhabits open forests and pine savannahs, reported from vicinity
Hylocichla mustelina	Wood Thrush	Spring through fall	Likely	Inhabits deciduous and mixed forests with shrubs in understory; reported from vicinity
Thryomanes bewickii	Bachman's Sparrow	Spring through fall	Possible	Inhabits brushy areas, thickets and scrub in open country, open and riparian woodland, and chaparral; reported from vicinity
Ammodramus savannarum	Grasshopper Sparrow	Spring through fall	Possible	Inhabits grasslands of intermediate height and are often associated with clumped vegetation interspersed with patches of bare ground; reported from vicinity
Centronyx henslowii	Henslow's Sparrow	Spring	Possible	Inhabits open fields and meadows with grass interspersed with weeds or shrubby vegetation, especially in damp or low-lying areas; reported from vicinity

Scientific Name	Common name	Season of Occurrence	Likelihood[1] of Presence on Project Site	Habitat Description
Spizella pusilla	Field Sparrow	Year-round	Likely	Inhabits grasslands with scattered shrubs and saplings, recently clear-cut areas; reported from vicinity
Euphagus carolinus	Rusty Blackbird	Winter	Possible	Inhabits forested wetlands
Protonotaria citrea	Prothonotary Warbler	Spring through fall	Possible	Inhabits forested wetlands with areas of standing water
Geothlypis formosa	Kentucky Warbler	Spring through fall	Possible	Inhabits moist deciduous forest with shrubby understory
Setophaga cerulea	Cerulean Warbler	Spring through fall	Unlikely	Inhabits extensive mature deciduous forest with scattered canopy gaps
Setophaga discolor	Prairie Warbler	Spring through fall	Likely	Inhabits brushy fields and recently harvested, regenerating woodlands
Haliaeetus leucocephalus	Bald Eagle	Year-round	Unlikely	Inhabits coasts, rivers, large lakes; in migration, also mountains, open country. Typically close to water, also locally in open dry country.
Aquila chrysaetos	Golden Eagle	Rare	Unlikely	Inhabits open mountains, foothills, plains, open country.
Pandion haliaetus	Osprey	Spring through fall	Possible	Large, forested areas near large bodies of water, may nest on transmission lines

Source: NatureServe Explorer 2023

[1]"Possible" indicates that species presence is possible due to having habitat on the Project Site, but the species was not observed. "Known" indicates that the species was observed on the Project Site. "Unlikely" indicates that species presence is unlikely due to not having habitat on the Project Site.

A large portion of forested and agricultural habitat on the Project Site provides suitable habitat for some of the birds listed in Table 3. Additional migratory bird species not listed as a BCC may occur on the Project Site. Table 2 lists a few of these species whose presence has been confirmed. Other species likely to be observed include wood ducks and other waterfowl, additional species of hawks and owls, woodpeckers, flycatchers, vireos, thrushes, and warblers. These habitats may also provide habitat for migratory birds with declining populations that are not listed as BCC by the USFWS (2021).

Both bald and golden eagles are protected by the MBTA and the Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668-668d). Under the BGEPA, it is illegal to kill, harass, possess (without a permit), or sell bald and golden eagles and their parts.

Bald eagles typically utilize forested areas adjacent to large bodies of water for nesting habitat. Tall, mature coniferous or deciduous trees that afford a wide view of the surroundings are used as nest and roost trees. Bald eagles typically avoid heavily developed areas. Suitable summer nesting habitat for bald eagles generally consists of prominent trees along riparian corridors on large bodies of water. Winter habitat in Tennessee includes reservoirs and large rivers. Bald eagles are known to nest in Tennessee, with 175 nesting pairs as of 2012 (more recent information is unavailable) (TWRA 2023). The suitability of the Project Site as habitat for the bald eagle is low due to the absence of large water bodies on the Project Site or in the vicinity.

The golden eagle is a rare winter resident in Tennessee and most reports have been in the vicinity of reservoirs. Wintering habitat includes both forest and open habitats for foraging. The golden eagle has been reported in adjacent counties; however, it is unlikely to be present on the Project Site due to the absence of large water bodies on the Project Site or in the vicinity.

Osprey typically inhabit areas along large rivers, lakes, and reservoirs and seven observations were made in Hardeman County (eBird 2023). While osprey are no longer listed as endangered in the state of Tennessee, they are a species of interest to the TVA. In Tennessee, osprey arrive in March to begin their breeding season, building nests and raising young from April through July. Osprey build nests in trees and man-made structures (e.g., transmission structures) near or over water. Forested areas located along streams and open water features may provide suitable habitat for osprey on the Project site. The osprey could occur due to observations of nests along transmission lines within three miles of the Project Site (TVA 2022, 2023). Typically, osprey occur along large rivers, lakes, and reservoirs (TWRA 2022b), however the Project Site provides no foraging habitat and limited potential for nesting habitat (consisting of less than 0.5 mile of transmission line right-of-way along Highway 19). No osprey were observed during the field survey.

3.2.3 Listed and Protected Wildlife Species

“Listed” species are recognized by federal, state, or other agencies in an effort to protect them and their habitat under the federal ESA, as well as under state laws and per local policies. These species are vulnerable to habitat loss and population decline because of their rarity.

3.2.3.1 FEDERALLY AND STATE-LISTED ANIMAL SPECIES

Table 4 provides a summary of the federally and state-listed species that were identified in the USFWS IPaC (USFWS 2023), the TVA RNHD (TVA 2022, 2023b), and the TDEC Rare Species Data Viewer (TDEC 2024) for the Project Site (see Appendix C). State-protected species with a state rank of S1 to S3[1] are included in the table below. No designated critical habitat for federally listed species occurs on or in the vicinity of the Project Site.

[1] State Ranks: S1 = Extremely rare and critically imperiled in the state with five or fewer occurrences, or very few remaining individuals, or because of some special condition where the species is particularly vulnerable to extinction; S2 = Very rare and imperiled within the state, six to twenty occurrences, or few remaining individuals, or because of some factor(s) making it vulnerable to extinction; S3 = Rare and uncommon in the state, from 21 to 100 occurrences.

Table 4. Federally and State-Listed Animal Species in the Cane Creek Upper Watershed, Tennessee, and Likelihood of Occurrence in the Project Site

Scientific Name	Common Name	State Status	Federal Status	Likelihood[1] of Presence on Project Site	Habitat Description
Mammals					
Myotis austroriparius	Southeastern Bat	Rare	--	Possible	Inhabits caves, but especially hollow trees & abandoned buildings, usually near water
Myotis septentrionalis	Northern Long-eared Bat	Threatened	Endangered	Possible	Inhabits a variety of habitats including wet meadows, damp woods, uplands, abandoned structures, and sinkhole fissures/karst features
Myotis sodalis	Indiana Bat	Endangered	Endangered	Possible	Inhabits various habitats including wet meadows, damp woods, and uplands, including abandoned structures
Perimyotis subflavus	Tricolored Bat	Threatened	Proposed Endangered	Possible	Inhabits open-grassy fields, hayfields, shrubby fields, fence rows, and edges of woods
Neotoma floridana illinoensis	Eastern Woodrat	In Need of Management	--	Possible	Inhabits forested areas
Reptiles					
Macrochelys temminckii	Alligator Snapping Turtle	Threatened	Proposed Threatened	Unlikely	Inhabits deep pools in large rivers, lakes and swamps
Fish					
Atractosteus spatula	Alligator Gar	In Need of Management	--	Unlikely	Inhabits sluggish pools of large rivers, oxbows, swamps, and backwaters
Cycleptus elongatus	Blue Sucker	Threatened	--	Unlikely	Inhabits swift waters over firm substrates in big rivers
Hybognathus placitus	Plains Minnow	In Need of Management	--	Unlikely	Inhabits clear to highly turbid rivers and creeks with sandy bottoms
Insects					
Danaus plexippus	Monarch Butterfly	--	Candidate	Possible	Inhabits flowering plants - especially milkweed (*Asclepias* spp.), open areas with little canopy. Milkweed observed onsite and several monarchs observed flying near these large clusters

Scientific Name	Common Name	State Status	Federal Status	Likelihood[1] of Presence on Project Site	Habitat Description
Mollusks					
Obovaria arkansasensis	Southern Hickorynut	Rare	--	Unlikely	Inhabits rivers with medium-sized gravel substrates and low-moderate current
Webbhelix multineata	Striped Whitelip	Rare	--	Possible	Inhabits marshes and floodplains
Villosa vibex	Southern Rainbow	Rare	--	Possible	Inhabits small rivers and creeks with muddy substrates
Birds					
Egretta cerulea	Little Blue Heron	In Need of Management	--	Possible	Forages in wetlands and along shorelines, nests in forest near water bodies
Setophaga cerulea	Cerulean Warbler	In Need of Management	--	Unlikely	Inhabits extensive mature deciduous forest with scattered canopy gaps
Limnothlypis swainsonii	Swainson's Warbler	In Need of Management	--	Unlikely	Inhabits bottomland forests with thick shrub, cane, and/or sapling understory
Pandion haliaetus	Osprey	--	---	Possible	Inhabits areas along large rivers, lakes, and reservoirs; may nest on transmission lines
Haliaeetus leucocephalus	Bald Eagle	Threatened	BGEPA	Unlikely	Inhabits in forested areas near large bodies of water
Aquila chrysaetos	Golden Eagle	In Need of Management	BGEPA	Unlikely	Inhabits open country, open wooded country, and barren areas, especially in hilly or mountainous regions.

Source: USFWS 2023; TDEC 2024; TVA 2022, 2023b. BGEPA-Bald and Golden Eagle Protection Act.

[1]"Possible" indicates that species presence is possible due to having habitat on the Project Site, but the species was not observed. "Known" indicates that the species was observed on the Project Site. "Unlikely" indicates that species presence is unlikely due to not having habitat on the Project Site.

Concurrent to the vegetation and general wildlife surveys, HDR also focused on the general characteristics of the land cover, vegetation communities, and wildlife habitats currently present within and immediately adjacent to the Project Site for potential presence of habitat suitable for state- and federally listed species listed in Table 4.

HDR's desktop database search and pedestrian survey indicate that the Project Site contains potential suitable habitat for three federally listed bats, one insect (federal candidate), and five species of state concern (threatened, in need of management or rare). The remaining species in Table 4 either are unlikely to have suitable habitat on site or are not found in the region of the Project Site.

Mammals

Three species of federally listed mammals potentially occur on the Project Site: the northern long-eared bat (NLEB) (*Myotis septentrionalis*), the Indiana bat (*Myotis sodalis*), and the tricolored bat (*Perimyotis subflavus*). During the winter period, these species are found in habitats such as caves, rock crevices, and mines (Tennessee Wildlife Resources Agency [TWRA] 2022a; USFWS 2006, 2015). No caves were observed on the Project Site and according to the TVA RNHD (2022, 2023a), no caves are within three miles of the Project Site. According to the Tennessee Cave Survey (TCS 2021), there are no caves, "defined as any natural cavity with a horizonal length of 50 feet, total vertical extent of 40 feet or a pit depth of 30 feet", in Lauderdale County or any of the immediately surrounding counties. Therefore, no supportive winter habitat is present for the NLEB, Indiana bat, or tricolored bat.

During summer, the NLEB, Indiana bat, and the tricolored bat roost singly or in colonies underneath bark, in cavities, or crevices of both live and dead trees (snags) of varying size, age, and species (USFWS 2006, 2015). The tricolored bat also roosts in the summer on cliffs and buildings (TWRA 2022a). A total of approximately 42 acres of moderately to highly suitable summer roost habitat has been found on the Project Site (Appendix A, Figure 5). Additional details on potential summer bat roosting habitat are provided in the following section. The southeastern bat, considered rare in Tennessee, could occupy some of the same habitats as the federally listed bats.

Foraging habitat for the NLEB, Indiana bat, and the tricolored bat is present on the Project Site over ponds, wetlands, and streams. Additional foraging habitat for these bat species occurs within forested habitat, forest edges, and tree lines. Water resources for the three bat species include a pond, wetlands, and stream channels located on the site.

Potential Summer Bat Roosting Habitat Assessment

Forested areas were assessed for the presence of live trees that exhibit exfoliating bark and dead trees (snags) with cracks or crevices that could serve as suitable roosting habitat for the NLEB, Indiana bat, and tricolored bat. Buildings on the Project Site were also evaluated for potential as suitable habitat for these three federally listed bat species. Nine forest stands were evaluated on site and photographs were taken to visually document the assessment areas; photographs of the forest stands are provided in Appendix B and denoted on Figure 3 in Appendix A. Habitat data forms are provided in Appendix E. In addition to the forest stands, a large tree, singly located in the southeastern portion of the site, was also noted to provide

potential bat roosting habitat. The tree is a large (60-inch DBH) water oak (*Quercus nigra*) with multiple cavities and large limbs, some of which appear to be dead (see photos 23 and 24 in Appendix B). An intermittent stream/agricultural ditch nearby provides a water source.

Agricultural buildings were found near the center of the Site and in current use at the time of the field survey. Heavy machinery was located around the buildings and was being used to cultivate and manage the corn fields. The buildings and culverts were observed for bat habitat, but none were deemed as suitable habitat due to active use (see photos 25 and 26 in Appendix B).

Table 5. Summary of Forest Stands with Potential Bat Roosting Habitat

Stand Number	Habitat Suitability	Area (acres)
Stand 1	High	3.7
Stand 2	High	2.6
Stand 3	High	13.5
Stand 4	Low/Moderate	6.3
Stand 5	High/Moderate	9.6
Stand 6	Moderate	3.1
Stand 7	High	1.1
Stand 8	Low/Moderate	6.0
Stand 9	Low	6.6

Forest Stand 1

Stand 1 consists of a mixed deciduous tree forest line, separating agriculture fields of corn and cotton to the west and east. Stand 1 is located on the western property line of the Project Site. The dominant canopy and understory include black willow, American sycamore, and chinquapin oak (*Quercus muehlenbergii*). Approximately 20 percent of trees in the stand were small with diameter at breast height (DBH) of 3 to 8 inches, 60 percent of trees were medium in size (DBH 9 to 15 inches), and 20 percent were considered large (greater than 15 inches DBH). At least eight snags were present at the time of survey. Stand 1 was determined to have high habitat quality due to the presence of multiple snags and several large trees with exfoliating bark (see photos 5 and 6 in Appendix B). The surrounding agricultural fields could act as foraging area for a potential bat population and a local connection to an intermittent stream could act as a water source.

Forest Stand 2

Stand 2 consists of a mixed deciduous forested wetland on the northern property boundary north of Highway 19. The dominant canopy and understory include American beech (*Fagus grandifolia*), black maple (*Acer nigrum*), American elm, white oak (*Quercus alba*), mockernut hickory, and sweetgum (*Liquidambar styraciflua*). The stand consisted of 10 percent of small trees, 60 percent of medium trees, and 30 percent of large trees based on DBH. At least two snags were present at the time of survey. Stand 2 was determined to have high habitat quality due the presence of trees with exfoliating bark, tree diversity, and proximity to foraging habitat and water resources (see photos 7 and 8 in Appendix B).

Forest Stand 3

Stand 3 consists of a mixed deciduous tree forest line, separating agriculture fields of corn and cotton to the west and east. Stand 3 is located on the eastern portion of the Project Site. The

dominant canopy and understory include white oak and black oak (*Quercus nigra*). The stand consisted of 20 percent of small trees, 10 percent of medium trees, and 70 percent of large trees based on DBH. Stand 3 was determined to have high habitat quality due to presence of trees with exfoliating bark and tree diversity (see photos 9 and 10 in Appendix B). The surrounding agricultural fields may act as a foraging area and the near intermittent stream could act as a water source.

Forest Stand 4

Stand 4 consists of a riparian mixed deciduous tree forest line, separating agriculture fields of corn and cotton to the southeast and northwest. Stand 4 is located on the southwestern portion of the Project Site. The dominant canopy and understory consist of cottonwood (*Populus deltoides*), mockernut hickory, and white oak. The stand consisted of 20 percent of small trees, 50 percent of medium trees, and 30 percent of large trees based on DBH. At least two snags were present at the time of survey. Stand 4 was determined to have low to moderate habitat quality due to presence of trees with exfoliating bark and proximity to water sources (see photos 11 and 12 in Appendix B). The surrounding agricultural fields could act as a foraging area for a potential bat population and Hyde Creek runs directly through the forest line acting as a steady water source.

Forest Stand 5

Stand 5 consists of a mixed deciduous riparian tree stand surrounding a 3.3-acre pond. Stand 5 is located on the central-western portion of the Project Site. The dominant canopy and understory consist of black willow, sweetgum, American sycamore, and mockernut hickory. The stand consisted of 40 percent of small trees, 40 percent of medium trees, and 20 percent of large trees based on DBH. At least 10 snags were present at the time of survey. Stand 5 was determined to have two sections of bat habitat with different quality. The first on the western property boundary, was determined to have high quality due to presence of several snags, tree diversity, and trees with exfoliating bark. The second portion was determined to have moderate habitat quality due to low diversity, few snags, but a good connection to a water source (see photos 13 and 14 in Appendix B). The surrounding agricultural fields could act as a foraging area for a potential bat population and a 3.3-acre pond with a perennial stream connection serves as a steady water source.

Forest Stand 6

Stand 6 consists of a mixed deciduous tree stand on the southern portion of the Project Site parcel north of Highway 19. The dominant canopy consists of black walnut, black willow, American sycamore, sugar maple (*Acer saccharum*), black cherry (*Prunus serotina*), and osage orange (*Maclura pomifera*). The dominant understory consists of eastern red cedar (*Juniperus virginiana*), winged elm (*Ulmus alata*), sugarberry (*Celtis laevigata*), and *Rubus* sp. The stand consisted of 20 percent of small trees, 40 percent of medium trees, and 40 percent of large trees based on DBH. At least four snags were present at the time of survey. While trees with exfoliating bark, snags, and forest diversity are supportive of bat roosting habitat, Stand 6 was determined to have moderate habitat quality due a lack of connection to a larger, contiguous forested area (see photos 15 and 16 in Appendix B). The surrounding agricultural field may

serve as a foraging habitat for a potential bat population and an intermittent stream running through the stand could serve as a water source.

Forest Stand 7

Stand 7 consists of a mixed deciduous tree stand on the northern portion of the Project Site parcel north of Highway 19. The dominant canopy consists of sugarberry, black walnut, and winged elm. The dominant understory includes sugarberry, black walnut, and winged elm. The stand consisted of 30 percent of small trees, 50 percent of medium trees, and 20 percent of large trees based on DBH. No snags were observed. Stand 7 was determined to have high bat habitat quality due to tree diversity and presence of trees with exfoliating bark (see photos 17 and 18 in Appendix B). The surrounding agriculture field may serve as foraging habitat for a potential bat habitat; however, no water source was found connected to the stand.

Forest Stand 8

Stand 8 consists of a mixed deciduous tree stand on the southeastern portion of the Project Site parcel north of Highway 19. The dominant canopy consists of sugarberry, black walnut, red maple (*Acer rubrum*), red oak (*Quercus rubra*), paper mulberry (*Broussonetia papyrifera*), and winged elm. The stand consisted of 30 percent of small trees, 60 percent of medium trees, and 10 percent of large trees based on DBH. No snags were observed at the time of survey. Stand 8 was determined to have two sections of habitat with different quality. One area was determined to have moderate bat habitat quality due to tree diversity and moderately open canopy. The second area in the southeastern corner of stand was determined to have low quality because of lack of diversity and no snags (see photos 19 and 20 in Appendix B). The surrounding agriculture field may serve as foraging habitat for a potential bat habitat; a small stream found running through the stand just north of Highway 19 could serve as a water source.

Forest Stand 9

Stand 9 consists of a mixed deciduous tree stand on the northern portion of the Project Site but south of Highway 19, adjacent to a transmission line right-of-way. The dominant canopy consists of mostly saplings of honey locust (*Gleditsia triacanthos*), tulip poplar, white ash (*Fraxinus americana*), black walnut, and black maple. The stand consisted of 40 percent of small trees, 40 percent of medium trees, and 20 percent of large trees based on DBH. Stand 9 was considered low bat habitat quality due to low tree diversity, dense understory, and lack of snags (see photos 21 and 22 in Appendix B). The near agriculture field could serve as foraging habitat and streams found in the stand could serve as a water source.

Mist Netting Results

Mist netting surveys were conducted by ESI from June 27-30, 2023. The survey resulted in the capture of eight eastern red bats (*Lasiurus borealis*), a common species found across Tennessee. One adult male and four lactating adult females were captured and three escaped. Of the bats evaluated, none had symptoms of White Nose Syndrome, and none displayed wing damage or injury. No threatened, endangered, or proposed species were captured. Results of the mist netting surveys are included in Appendix F.

Insects

The monarch butterfly (*Danaus plexippus*) is a candidate species for listing under the ESA. This species requires milkweed species as caterpillars but will feed on a variety of wildflowers as adults. Due to the time of year the survey was performed, milkweed was not in bloom and not easily identified. Flowering plants were present throughout the Project Site, specifically in the transmission line. Blooming milkweed was not observed at the time of survey.

Birds

The little blue heron (*Egretta cerulea*) could forage in wetlands on the site. This species forages in wetlands and nests near water bodies. The little blue heron could be possible on the Project Site, but no individuals were observed during surveys.

3.2.4 Results Summary

Approximately 87.7 percent of the Project Site is comprised of agricultural fields and approximately 10.1 percent consists of forest communities. The boundary of the Project Site is made of forested tree lines dividing agricultural fields, along with Hyde Creek along the southernmost border.

Forested areas within the Project Site provide potential bat roosting and foraging habitat for federally listed bat species, as well as other bat species, however no protected bat species were captured during mist netting surveys. The osprey (not listed), the state-listed little blue heron, and a federal candidate species (monarch butterfly) have potential to occur on the Project Site, however areas of potential suitable habitat to support these species is limited. Several migratory bird species were observed or are likely to have suitable habitat on the Project Site.

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A

Appendix A – Figures

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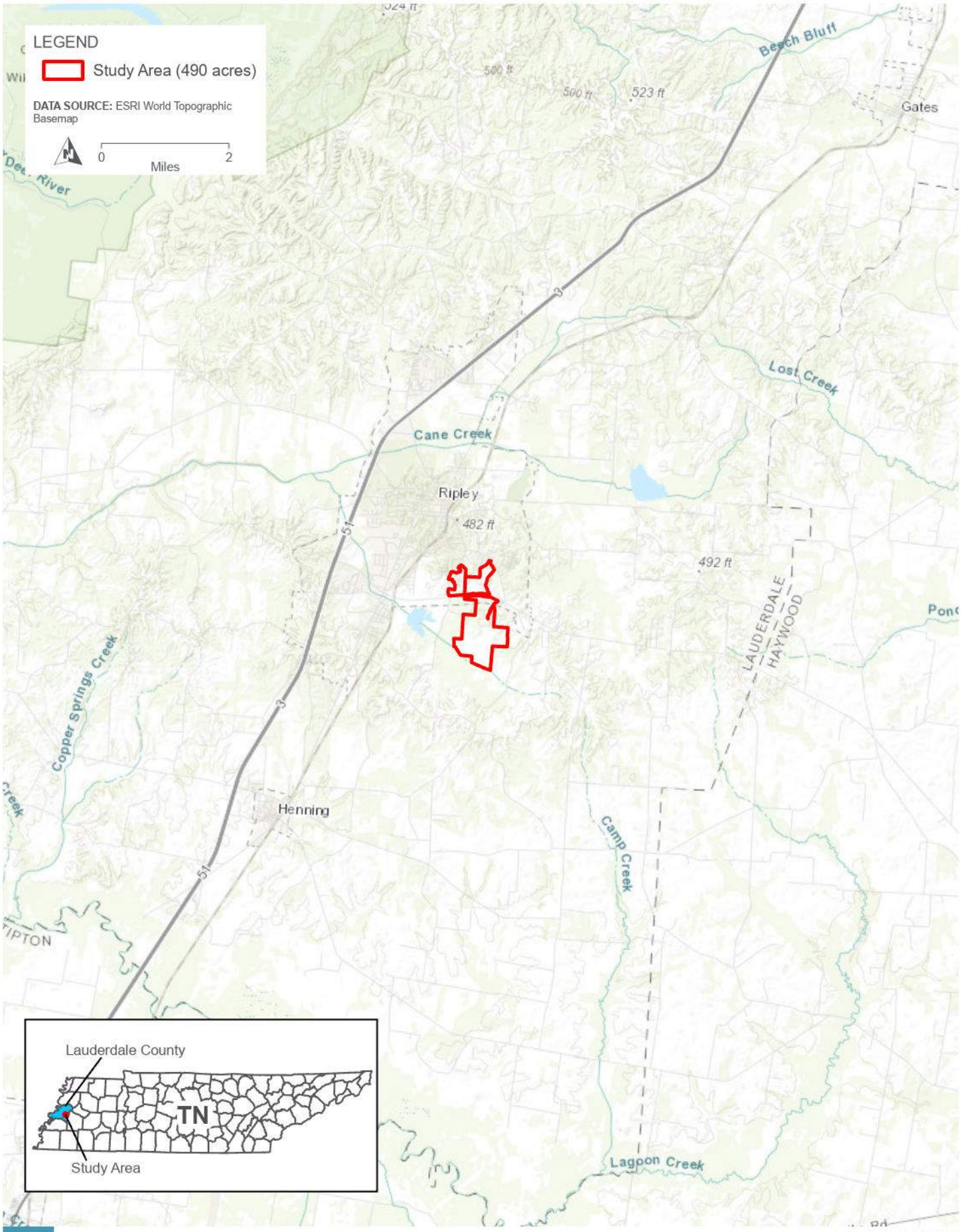
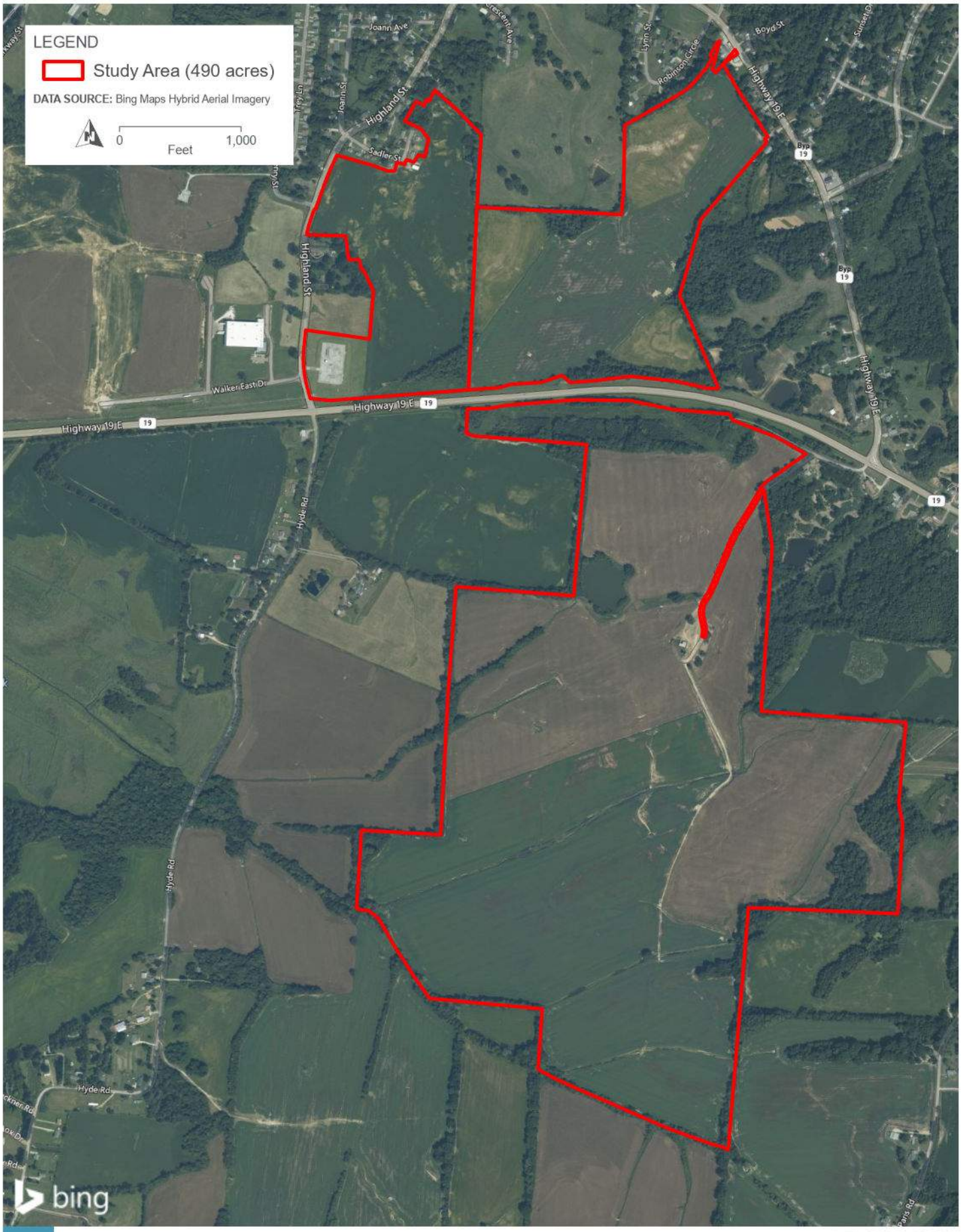


SILICON RANCH

SR RIPLEY II

PROJECT VICINITY

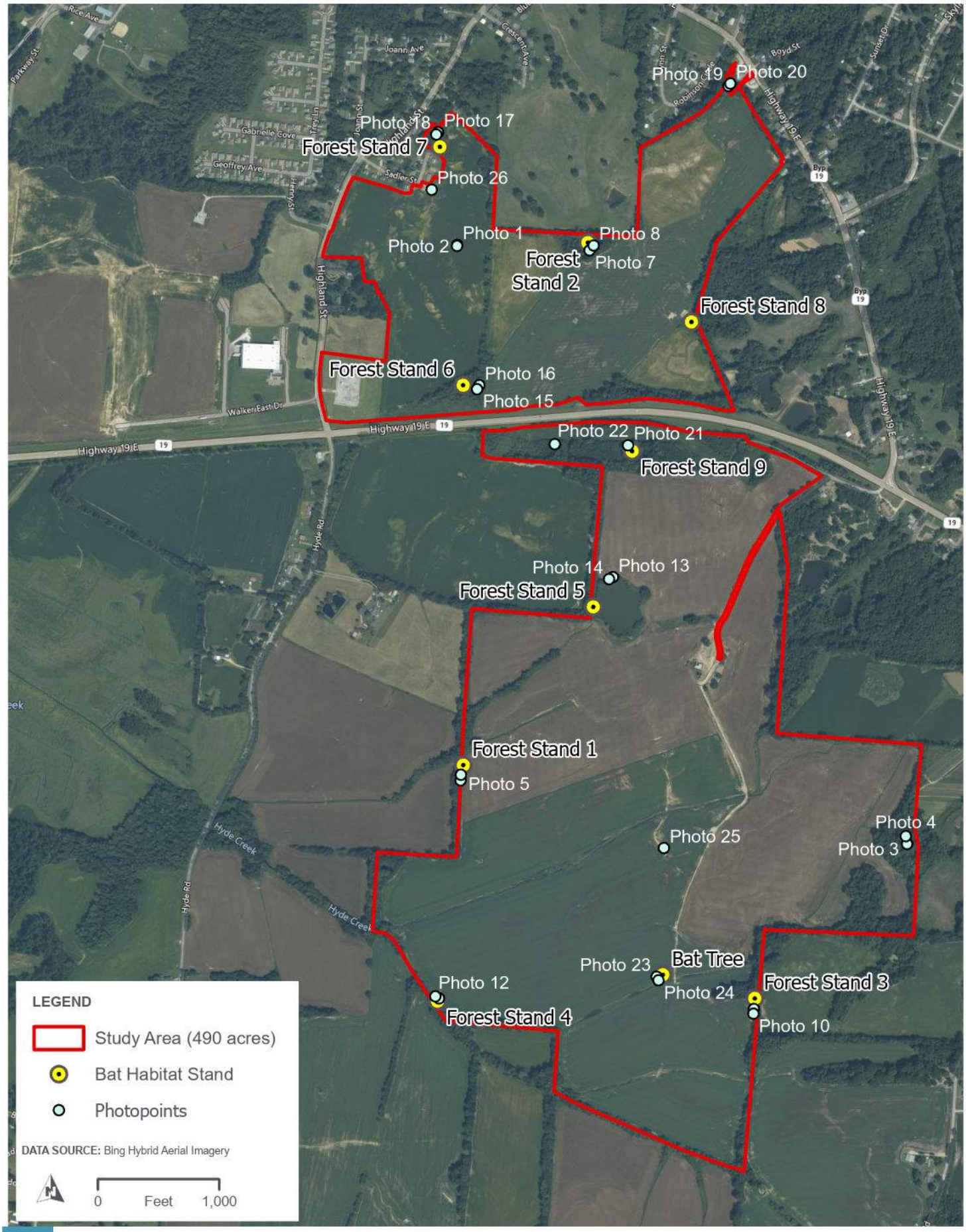
FIGURE 1



SR RIPLEY II

PROJECT AERIAL

FIGURE 2



SR RIPLEY II

PHOTO LOCATIONS

FIGURE 3

WILDLIFE AND VEGETATION ASSESSMENT

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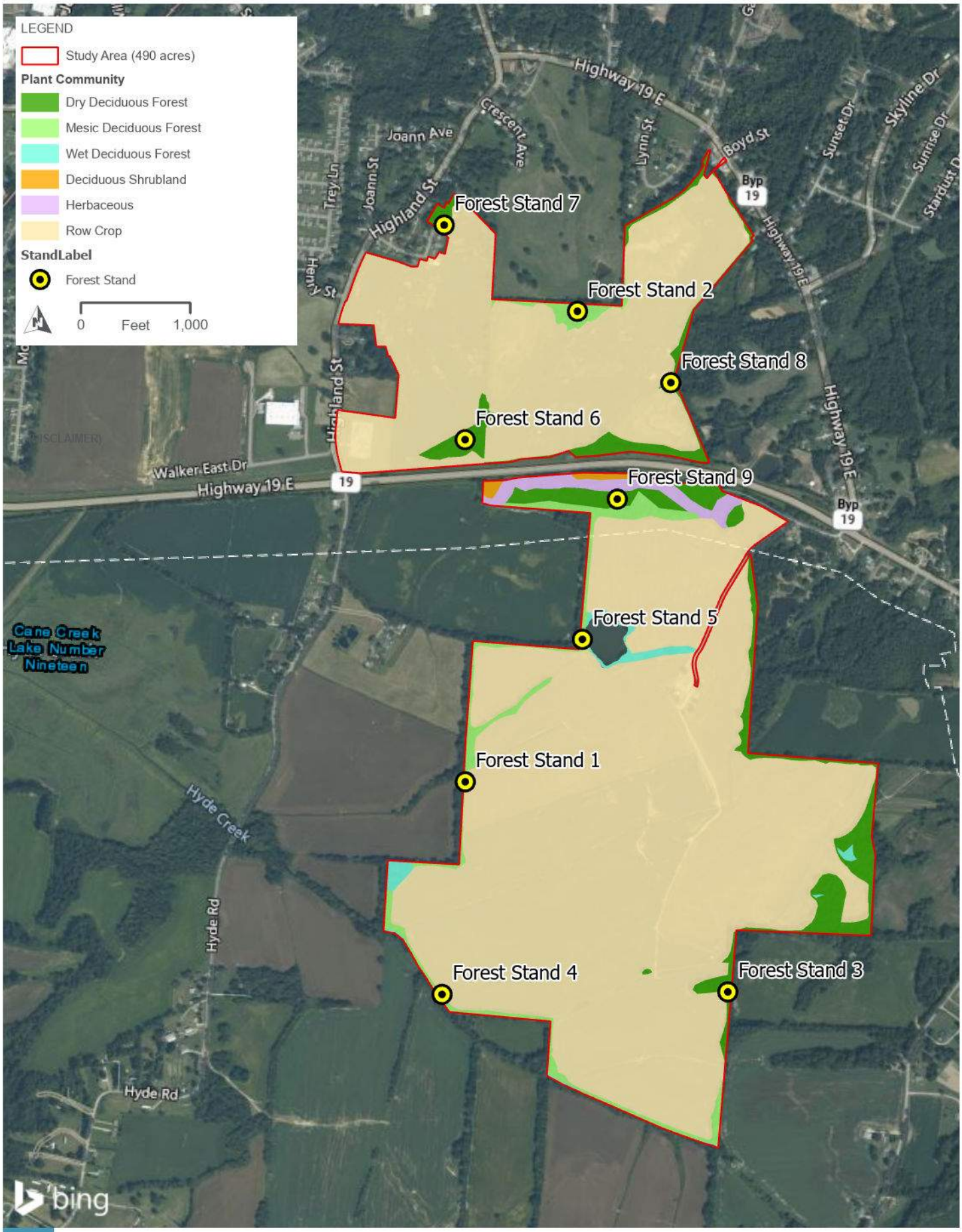

SR RIPLEY II

VEGETATION COMMUNITIES

FIGURE 4

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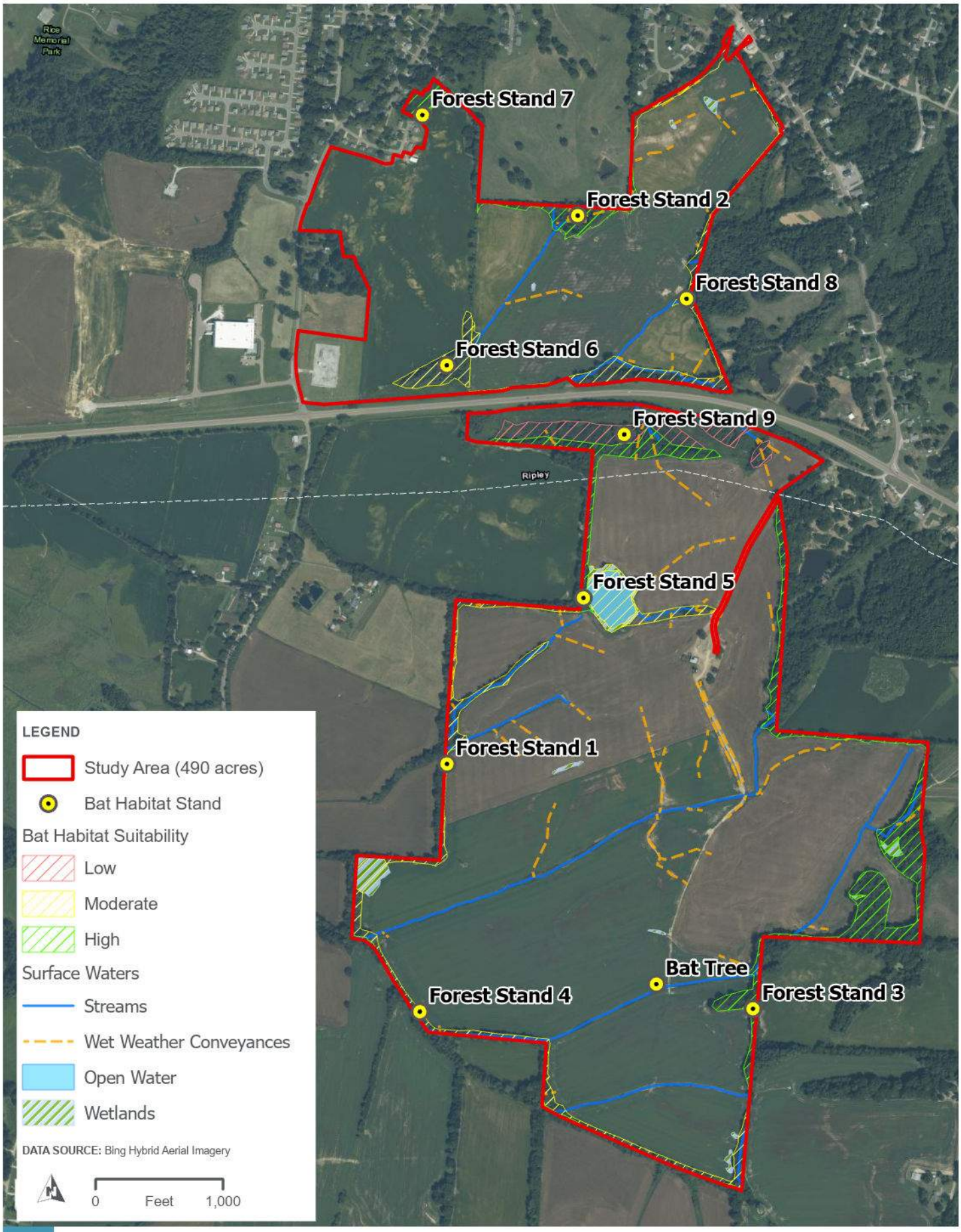
DATE: 3/22/2024



SILICON RANCH

SR RIPLEY II

POTENTIAL BAT HABITAT

FIGURE 5

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B

Appendix B – Site Photographs

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Photo 1: Typical agriculture field.

Photo 2: Typical agriculture field.

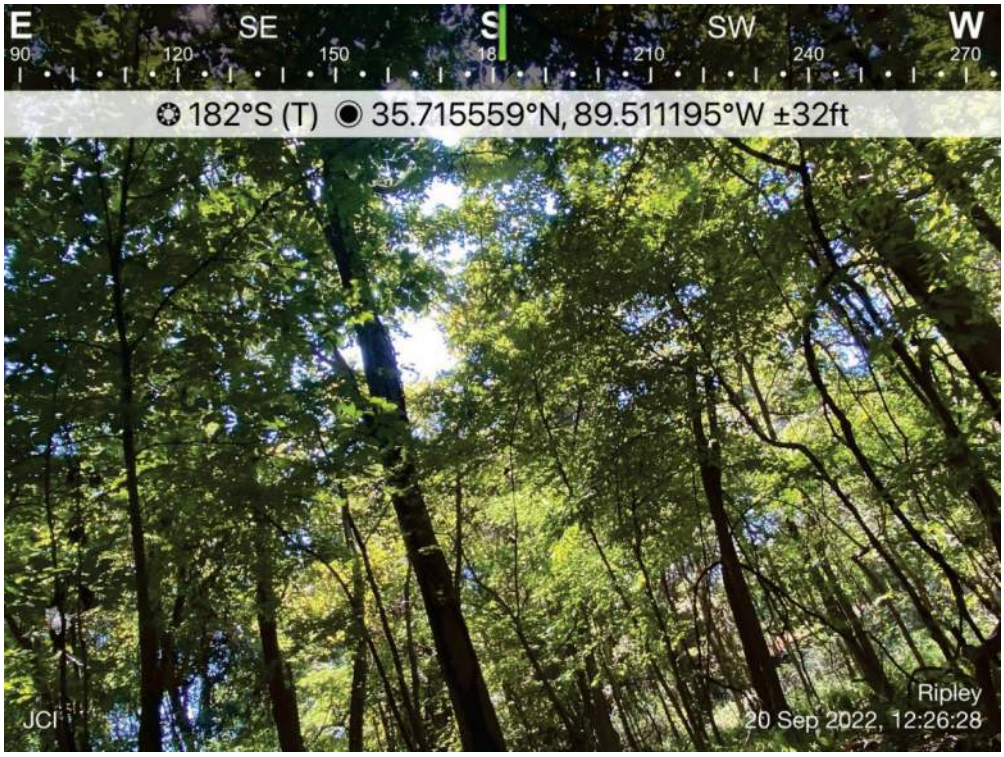

Photo 3: Typical forested area.

Photo 4: Typical forested area.

Photo 5: Forest Stand 1

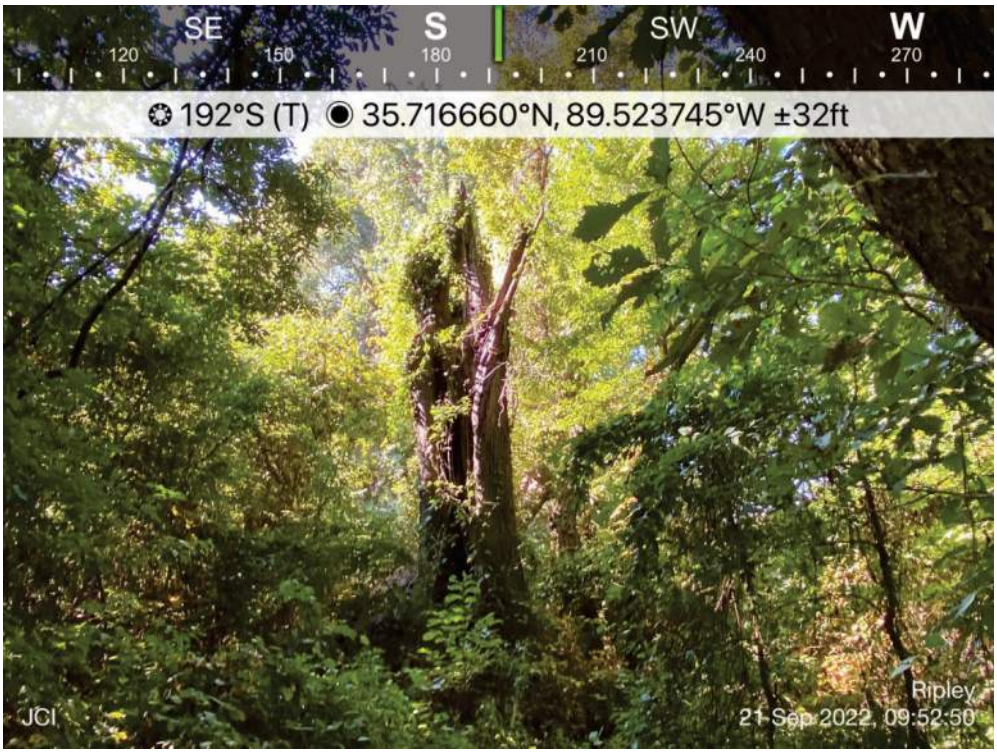

Photo 6: Forest Stand 1

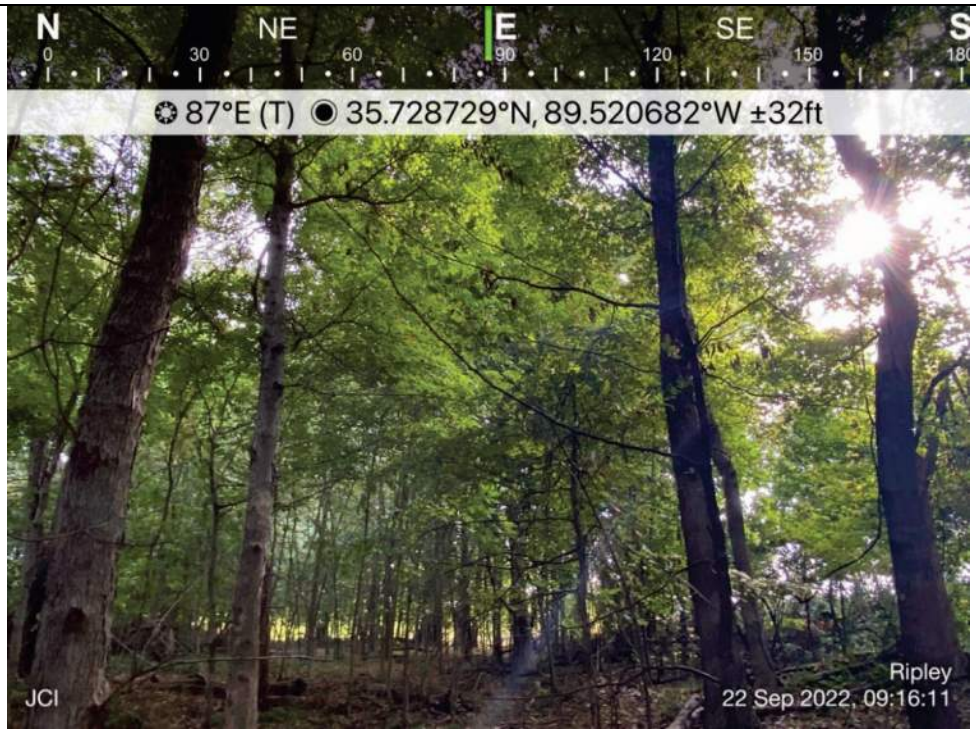

Photo 7: Forest Stand 2

Photo 8: Forest Stand 2

Photo 9: Forest Stand 3

Photo 10: Forest Stand 3

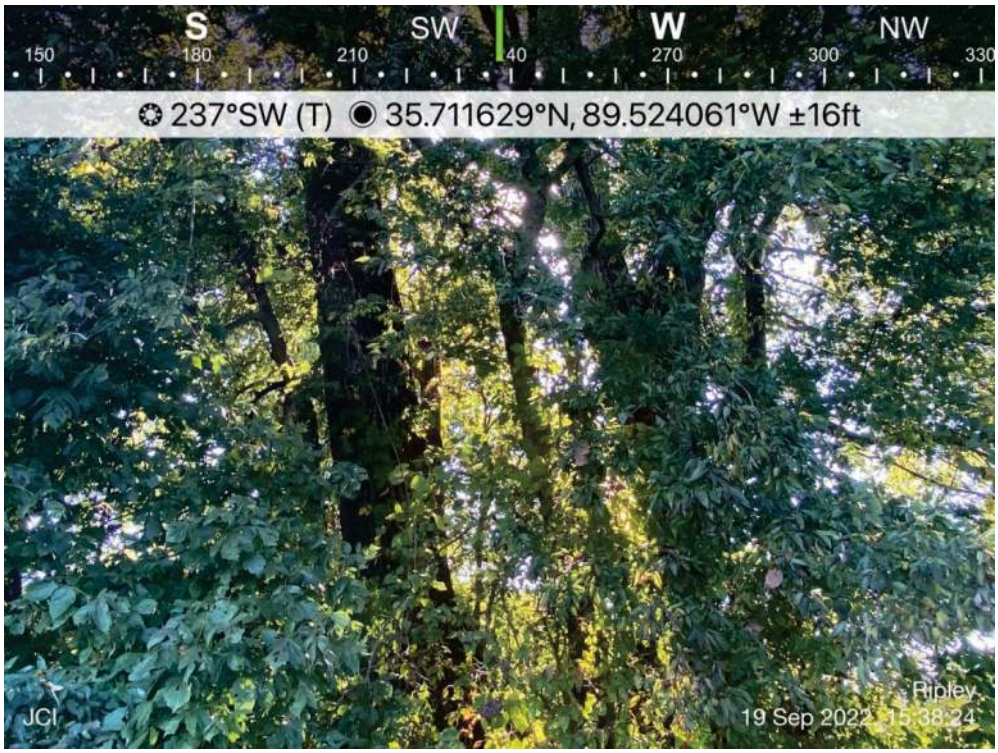

Photo 11: Forest Stand 4

Photo 12: Forest Stand 4

Photo 13: Forest Stand 5

Photo 14: Forest Stand 5

Photo 15: Forest Stand 6

Photo 16: Forest Stand 6

Photo 17: Forest Stand 7

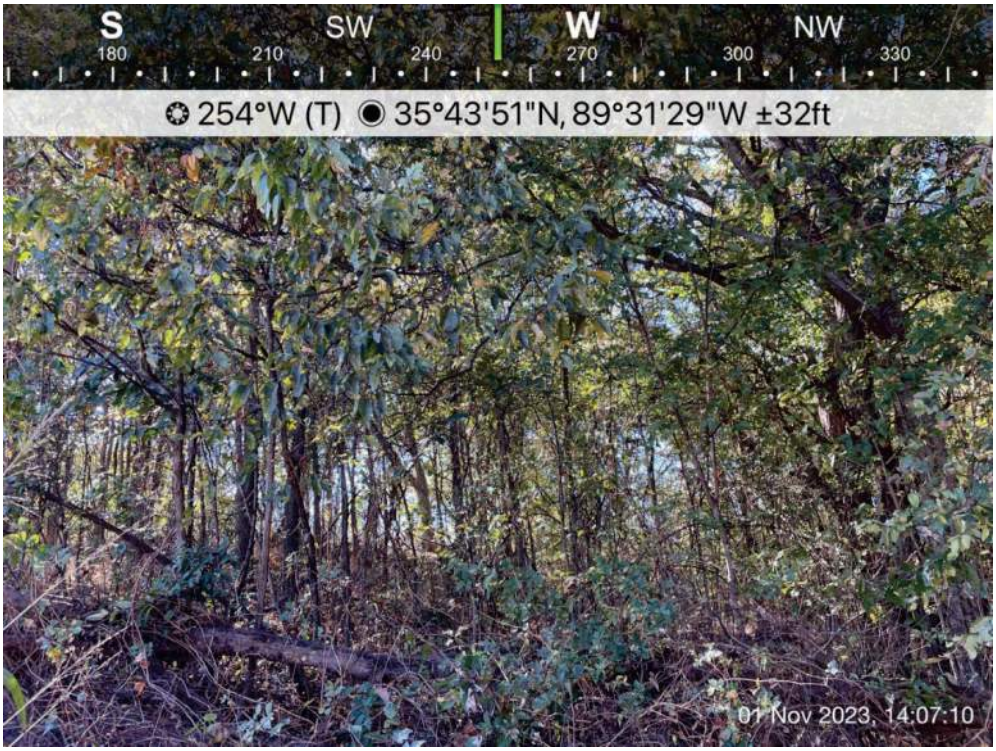

Photo 18: Forest Stand 7

Photo 19: Forest Stand 8

Photo 20: Forest Stand 8

Photo 21: Forest Stand 9

Photo 22: Forest Stand 9

Photo 23: Bat tree, not located within a forest stand.
35.7123441, -89.5178700

Photo 24: Bat tree, not located within a forest stand.
35.7123441, -89.5178700

Photo 25: Typical culvert.

Photo 26: Typical building.

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C

Appendix C – USFWS IPaC, TVA RNHD, TDEC Rare Species Data Viewer Results

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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 a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (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 o ce(s) with jurisdiction in the de ned 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

Lauderdale County, Tennessee

Local office

Tennessee Ecological Services Field O ce

(931) 528-6481
(931) 528-7075

446 Neal Street
Cookeville, TN 38501-4027

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 in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow 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 e ects to species, additional site-speci c and project-speci c 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 o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial 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 sheries 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.

---

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 o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Indiana Bat Myotis sodalis Wherever found There is **nal** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat Perimyotis subflavus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Reptiles

NAME	STATUS
Alligator Snapping Turtle Macrochelys temminckii Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4658	Proposed Threatened

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects 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 e ects on all above listed species.

Bald & Golden Eagles

There are no documented cases of eagles being present at this location. However, if you believe eagles may be using your site, please reach out to the local Fish and Wildlife Service o ce.

Additional information can be found using the following links:

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

What does IPaC use to generate the potential presence of bald and golden eagles in my speci ed 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 ltered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identi ed as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

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

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

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

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

What if I have eagles on my list?

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

Migratory birds

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

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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

Additional information can be found using the following links:

- 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 conservation 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

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this

list is generated, see the FAQ below. This is not a list of every bird you may nd in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur o the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

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

NAME	BREEDING SEASON
American Kestrel Falco sparverius paulus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
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
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

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

Probability of Presence (■)

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

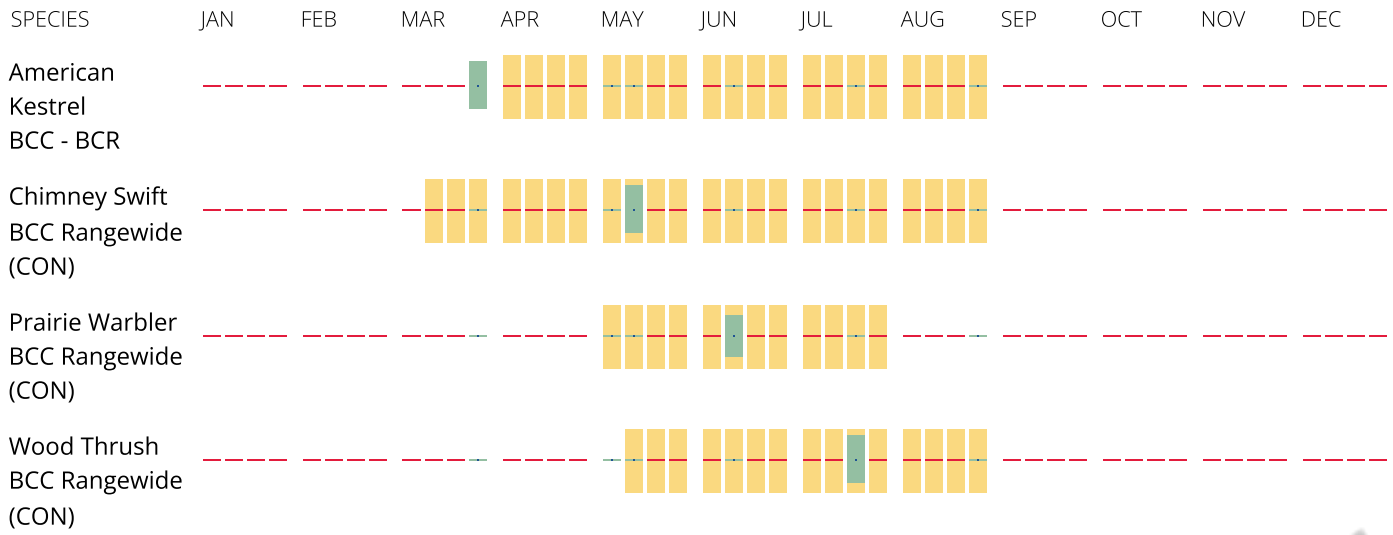
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey e ort 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 o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey e ort – no data



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

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

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

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

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

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

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

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

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

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

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the pro les provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe speci ed. 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 Paci c Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in o shore areas from certain types of development or activities (e.g. o shore energy development or longline shing).

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

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers 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 les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

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

What if I have eagles on my list?

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

Proper Interpretation and Use of Your Migratory Bird Report

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

Facilities

National Wildlife Refuge lands

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

There are no refuge lands at this location.

Fish hatcheries

There are no sh 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 identi ed 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 classi cation 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 veri cation 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 eld work. There may be occasional di erences in polygon boundaries or classi cations 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 tuber cid 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 de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne 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 modi cations within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

TVA Natural Heritage database queried by jhterrel on 07/15/2022 for the heritage review for ESCS 41225 Ripley II HDB Query Feature, Selection Map_Selection, (1*)

Records of state- and federal-listed Aquatic Animals points located within the HUC boundary of ESCS 41225 Ripley II HDB Query Feature, Selection Map_Selection

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)

Records of state- and federal-listed Plants and Champion Trees points located within a 5 Mile radius search of ESCS 41225 Ripley II HDB Query Feature, Selection Map_Selection

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)

Records of state- and federal-listed Caves points located within a 3 Mile radius search of ESCS 41225 Ripley II HDB Query Feature, Selection Map_Selection

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)

Records of state- and federal-listed Terrestrial Animals points located within a 3 Mile radius search of ESCS 41225 Ripley II HDB Query Feature, Selection Map_Selection

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)
Buteo jamaicensis	Red-tailed Hawk	AC - Excellent, good, or fair estimated viability	TN	S5		
Pandion haliaetus	Osprey	Not ranked	TN	S3		
Pandion haliaetus	Osprey	Not ranked	TN	S3		
Pandion haliaetus	Osprey	Not ranked	TN	S3		
Pandion haliaetus	Osprey	Not ranked	TN	S3		
Pandion haliaetus	Osprey	Not ranked	TN	S3		

Records of Heritage Natural Areas points located within a 3 Mile radius search of ESCS 41225 Ripley II HDB Query Feature, Selection

MA Name	MA Type	MA Unit Code	State	Acres	Status	Key ID No

1* Source: TVA Regional Natural Heritage Database; USFWS Information for Planning and Consultation (IPaC) resource list (https://ecos.fws.gov/ipac/) -If Relevant

2* EO = Element Occurrence; Common ranks: A= Excellent est. viability/ecol. Integrity; B= Good est. viability/ecol. Integrity; C= Fair est. viability/ecol. Integrity; E= Verified extant (viability/ecological integrity not assessed); H= Historical; X= Extirpated; NR= Not ranked. See Heritage Data Viewer Handbook for more ranks.

3* State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure; S5 = Secure; SX = Presumed Extirpated. See Heritage Data Viewer Handbook for more ranks.

4* Status Codes: D= Deemed in Need of Management; DM= Delisted, still being monitored; E= Endangered; LE= Listed Endangered; LT= Listed Threatened; C=Candidate; PS= Partial Status; T= Threatened; E-P= Endangered/Possibly Extirp.; E-PT= Endangered/Proposed Threatened; RARE= Rare; SLNS= State listed, no status; S= Special Concern; S-P= Special Concern/Possibly Extirp.; S-CE= Special Concern/Commerc. Exploited; T-CE= Threatened/Commerc. Exploited

5* See Heritage Data Viewer Handbook for full scope of Natural Areas as well as definitions of Natural Area types and units.

TVA Natural Heritage database queried by jhterrel on 10/20/2023 for the HDB Query for TVA ESCS Activity 41215 Ripley II Mod3

Records of state- and federally-listed Aquatic Animals points located within the HUC boundary of RipleyII Mod3, OBJECTID 1

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)

Records of state- and federally-listed Plants and Champion Trees points located within a 5 Mile radius search of RipleyII Mod3, OBJECTID 1

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)

Records of Caves points located within a 3 Mile radius search of RipleyII Mod3, OBJECTID 1

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)

Records of Terrestrial Animals points located within a 3 Mile radius search of RipleyII Mod3, OBJECTID 1

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)
Buteo jamaicensis	Red-tailed Hawk	AC - Excellent, good, or fair estimated viability	TN	S5		
Pandion haliaetus	Osprey	Not ranked	TN	S3B		
Pandion haliaetus	Osprey	Not ranked	TN	S3B		
Pandion haliaetus	Osprey	Not ranked	TN	S3B		
Pandion haliaetus	Osprey	Not ranked	TN	S3B		
Pandion haliaetus	Osprey	Not ranked	TN	S3B		

Records of Heritage Natural Areas points located within a 3 Mile radius search of RipleyII Mod3, OBJECTID 1

MA Name	MA Type	MA Unit Code	State	Acres	Status	Key ID No

1* Source: TVA Regional Natural Heritage Database; USFWS Information for Planning and Consultation (IPaC) resource list (https://ecos.fws.gov/ipac/) -If Relevant

viability/ecol. Integrity; E= Verified extant (viability/ecological integrity not assessed); H= Historical; X= Extirpated; NR= Not ranked. See Heritage Data Viewer Handbook for more ranks.

3* State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure; S5 = Secure; SX = Presumed Extirpated. See Heritage Data Viewer Handbook for more ranks.

4* Status Codes: D= Deemed in Need of Management; DM= Delisted, still being monitored; E= Endangered; LE= Listed Endangered; LT= Listed Threatened; C=Candidate; PS= Partial Status; T= Threatened; E-P= Endangered/Possibly Extirp.; E-PT= Endangered/Proposed Threatened; RARE= Rare; SLNS= State listed, no status; S= Special Concern; S-P= Special Concern/Possibly Extirp.; S-CE= Special Concern/Commerc. Exploited; T-CE= Threatened/Commerc. Exploited

5* See Heritage Data Viewer Handbook for full scope of Natural Areas as well as definitions of Natural Area types and units.

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 a ected by activities in the project area. However, determining the likelihood and extent of e ects a project may have on trust resources typically requires gathering additional site-speci c (e.g., vegetation/species surveys) and project-speci c (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 o ce(s) with jurisdiction in the de ned 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

Lauderdale County, Tennessee

Local office

Tennessee Ecological Services Field O ce

(931) 528-6481
(931) 528-7075

446 Neal Street
Cookeville, TN 38501-4027

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 in uence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly a ected by activities in that area (e.g., placing a dam upstream of a sh population even if that sh does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow 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 e ects to species, additional site-speci c and project-speci c 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 o ce and a species list which ful lls this requirement can **only** be obtained by requesting an o cial species list from either the Regulatory Review section in IPaC (see directions below) or from the local eld o ce directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an o cial 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 sheries 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 o ce of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially a ected by activities in this location:

Mammals

NAME	STATUS
Indiana Bat Myotis sodalis Wherever found There is **nal** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat Perimyotis subflavus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Reptiles

NAME	STATUS
Alligator Snapping Turtle Macrochelys temminckii Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4658	Proposed Threatened

Insects

NAME	STATUS
Monarch Butter y Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential e ects 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 e ects on all above listed species.

Bald & Golden Eagles

There are no documented cases of eagles being present at this location. However, if you believe eagles may be using your site, please reach out to the local Fish and Wildlife Service o ce.

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 conservation measures for birds https://www.fws.gov/sites/default/ les/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

What does IPaC use to generate the potential presence of bald and golden eagles in my speci ed 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 ltered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identi ed as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

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

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

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

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

What if I have eagles on my list?

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

Migratory birds

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

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Speci cally, please review the "Supplemental Information on Migratory Birds and Eagles".

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 conservation measures for birds https://www.fws.gov/sites/default/ les/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

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

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

NAME	BREEDING SEASON
American Kestrel Falco sparverius paulus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
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
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
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.

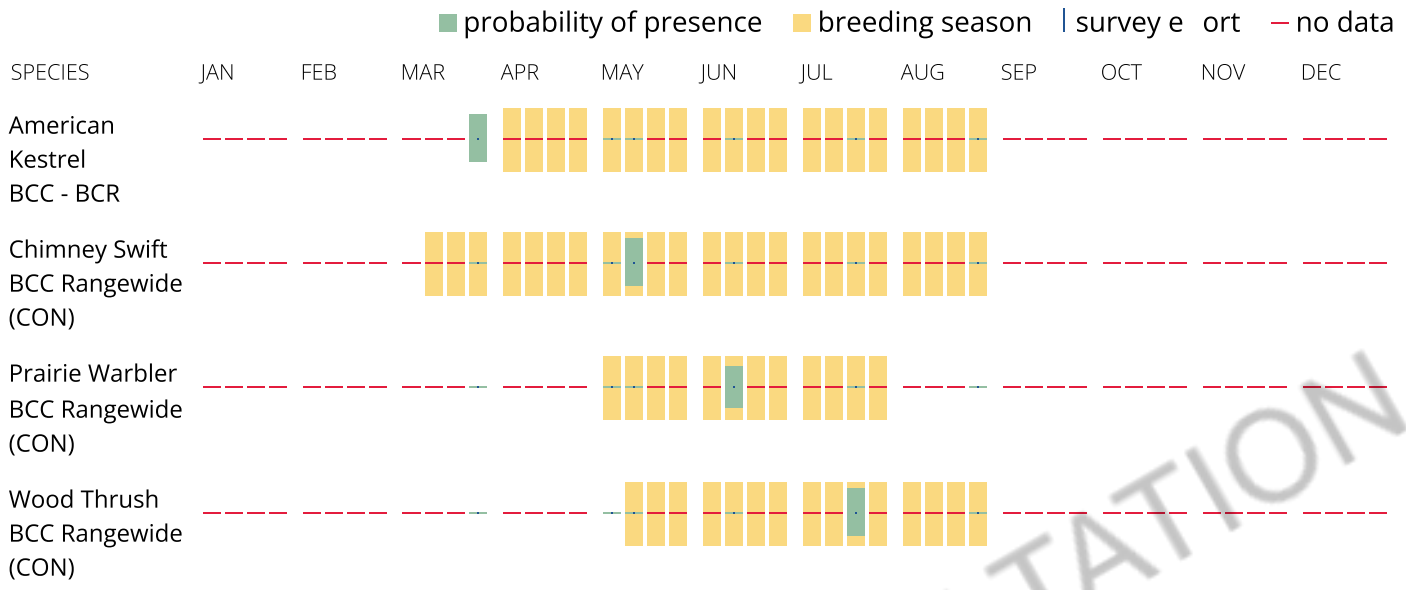
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

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 o the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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

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

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

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

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

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

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

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

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

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

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the pro les provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe speci ed. 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 Paci c Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in o shore areas from certain types of development or activities (e.g. o shore energy development or longline shing).

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

Details about birds that are potentially a ected by o shore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area o the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also o ers 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 les underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

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

Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

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

Proper Interpretation and Use of Your Migratory Bird Report

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

Facilities

National Wildlife Refuge lands

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

There are no refuge lands at this location.

Fish hatcheries

There are no sh 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 identi ed 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 classi cation 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 veri cation 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 eld work. There may be occasional di erences in polygon boundaries or classi cations 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 tuber cid 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 de ne and describe wetlands in a di erent manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to de ne 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 modi cations within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning speci ed agency regulatory programs and proprietary jurisdictions that may a ect such activities.

Help

Key to Status and Ranks

- Download Status and Ranks

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report error:
ORA-00942: table or view does not exist
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Rare Species by County

Data is refreshed on or around January and July each year.

Go | Rows 25 | Actions

Row text contains 'lauderdale'

1 - 19 of 19

County	Type	Category	Scientific Name	Common Name	Global Rank	State Rank	Fed. Status	State Status	Habitat	Wet Habitat Flag
Lauderdale	Vertebrate Animal	Fish	Atractosteus spatula	Alligator Gar	G3G4	S1	--	D	Sluggish pools of large rivers, oxbows, swamps, and backwaters; west Tennessee.	Aquatic
Lauderdale	Invertebrate Animal	Mollusc	Obovaria arkansasensis	Southern Hickorynut	GNR	S1	--	Rare, Not State Listed	Rivers with medium-sized gravel substrates and low-mod current; Wolf & Hatchie rivers; Mississippi River watershed; west Tennessee.	Aquatic
Lauderdale	Vertebrate Animal	Bird	Egretta caerulea	Little Blue Heron	G5	S2B,S3N	--	D	Bodies of calm shallow water; colonial nester.	Possible
Lauderdale	Vascular Plant	Flowering Plant	Hottonia inflata	Featherfoil	G4	S2	--	S	Wet Sloughs And Ditches	Aquatic
Lauderdale	Vertebrate Animal	Fish	Hybognathus placitus	Plains Minnow	G4	S1	--	D	Clear to highly turbid rivers and creeks with sandy bottoms; Mississippi River & imm. environs.	Aquatic
Lauderdale	Vascular Plant	Flowering Plant	Carex hyalina	Tissue Sedge	G4	S1	--	S	Forested Bottomland Swamps	Possible
Lauderdale	Invertebrate Animal	Mollusc	Villosa vibex	Southern Rainbow	G5	S2	--	Rare, Not State Listed	Mud or soft sand in small rivers & creeks in areas with moderate current; Conasauga, Hatchie, and Wolf (Miss. R.) river systems.	Aquatic
Lauderdale	Vertebrate Animal	Bird	Setophaga cerulea	Cerulean Warbler	G4	S3B	--	D	Mature deciduous forest, particularly in floodplains or mesic conditions.	Upland
Lauderdale	Animal Assemblage	No Data	Rookery	Heron Rookery	G5	SNR	--	Rare, Not State Listed	No Data	No Data
Lauderdale	Vascular Plant	Flowering Plant	Ulmus crassifolia	Cedar Elm	G5	S2	--	S	Swamps	Possible
Lauderdale	Vascular Plant	Flowering Plant	Juglans cinerea	Butternut	G3	S3	--	T	Rich Woods And Hollows	Possible
Lauderdale	Vertebrate Animal	Mammal	Neotoma floridana illinoensis	Eastern Woodrat	G5T5	S3	--	D	Forested areas, caves & outcrops; west Tennessee generally.	Upland
Lauderdale	Vertebrate Animal	Mammal	Myotis austroriparius	Southeastern Myotis	G4	S3	--	Rare, Not State Listed	Caves, but especially hollow trees & abandoned buildings, usually near water.	Possible
Lauderdale	Invertebrate Animal	Mollusc	Webbhelix multilineata	Striped Whitelip	G5	S2	--	Rare, Not State Listed	Low wet habitats, marshes, floodplains, meadows; lake margins; under leaf litter or drift; Mississippi River floodplain.	Possible
Lauderdale	Vascular Plant	Flowering Plant	Sagittaria platyphylla	Ovate-leaved Arrowhead	G5	S2S3	--	S	Swamps, Emergent	Possible

Lauderdale	Vascular Plant	Flowering Plant	Schisandra glabra	Red Starvine	G3	S2	--	T	Rich Mesic Woods, Bluffs	Possible
Lauderdale	Vascular Plant	Flowering Plant	Neobeckia aquatica	Lake Cress	G4?	S2	--	S	Gum Or Cypress Swamps	Possible
Lauderdale	Vertebrate Animal	Bird	Limnothlypis swainsonii	Swainson's Warbler	G4	S3	--	D	Mature, rich, damp, deciduous floodplain and swamp forests.	Possible
Lauderdale	Vertebrate Animal	Fish	Cycleptus elongatus	Blue Sucker	G3G4	S2	--	T	Swift waters over firm substrates in big rivers.	Aquatic

1 - 19 of 19

https://dataviewers.tdec.tn.gov/dataviewers/f?p=9014:3:118904174220701::::

Go Rows 25 Actions

Row text contains 'lauderdale'

1 - 19 of 19

County	Type	Category	Scientific Name	Common Name	Global Rank	State Rank	Fed. Status	State Status	Habitat	Wet Habitat Flag
Lauderdale	Vascular Plant	Flowering Plant	Ulmus crassifolia	Cedar Elm	G5	S2	--	S	Swamps	Possible
Lauderdale	Vascular Plant	Flowering Plant	Sagittaria platyphylla	Ovate-leaved Arrowhead	G5	S2S3	--	S	Swamps, Emergent	Possible
Lauderdale	Vertebrate Animal	Fish	Cycleptus elongatus	Blue Sucker	G3G4	S2	--	T	Swift waters over firm substrates in big rivers.	Aquatic
Lauderdale	Vertebrate Animal	Bird	Egretta caerulea	Little Blue Heron	G5	S2B,S3N	--	D	Bodies of calm shallow water; colonial nester.	Possible
Lauderdale	Vertebrate Animal	Fish	Hybognathus placitus	Plains Minnow	G4	S1	--	D	Clear to highly turbid rivers and creeks with sandy bottoms; Mississippi River & imm. environs.	Aquatic
Lauderdale	Vascular Plant	Flowering Plant	Juglans cinerea	Butternut	G3	S3	--	T	Rich Woods And Hollows	Possible
Lauderdale	Vascular Plant	Flowering Plant	Neobeckia aquatica	Lake Cress	G4?	S2	--	S	Gum Or Cypress Swamps	Possible
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Lauderdale	Vertebrate Animal	Fish	Atractosteus spatula	Alligator Gar	G3G4	S1	--	D	Sluggish pools of large rivers, oxbows, swamps, and backwaters; west Tennessee.	Aquatic
Lauderdale	Vertebrate Animal	Mammal	Neotoma floridana illinoensis	Eastern Woodrat	G5T5	S3	--	D	Forested areas, caves & outcrops; west Tennessee generally.	Upland
Lauderdale	Vascular Plant	Flowering Plant	Carex hyalina	Tissue Sedge	G4	S1	--	S	Forested Bottomland Swamps	Possible
Lauderdale	Vascular Plant	Flowering Plant	Schisandra glabra	Red Starvine	G3	S2	--	T	Rich Mesic Woods, Bluffs	Possible
Lauderdale	Vascular Plant	Flowering Plant	Hottonia inflata	Featherfoil	G4	S2	--	S	Wet Sloughs And Ditches	Aquatic
Lauderdale	Vertebrate Animal	Bird	Setophaga cerulea	Cerulean Warbler	G4	S3B	--	D	Mature deciduous forest, particularly in floodplains or mesic conditions.	Upland
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Lauderdale	Animal Assemblage	No Data	Rookery	Heron Rookery	G5	SNR	--	Rare, Not State Listed	No Data	No Data
Lauderdale	Vertebrate Animal	Mammal	Myotis austroriparius	Southeastern Myotis	G4	S3	--	Rare, Not State Listed	Caves, but especially hollow trees & abandoned buildings, usually near water.	Possible
Lauderdale	Vertebrate Animal	Bird	Limnothlypis swainsonii	Swainson's Warbler	G4	S3	--	D	Mature, rich, damp, deciduous floodplain and swamp forests.	Possible

1 - 19 of 19

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D

Appendix D – Federal and State Protected Plant Species and Habitat Report

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DAN SPAULDING Environment Consultant

4566 COUNTY ROAD 13, HEFLIN, ALABAMA 36264
CELL: 256-458-0422 **OFFICE**: 256-237-6766

25 October 2023

Harriet L. Richardson Seacat, M.A.
South Atlantic NEPA/Environmental Planning Lead, Resources Business Group
HDR
440 S. Church Street, Suite 1200
Charlotte, NC 28202-2075

Ms. Harriet:

This letter is my report of findings from a study to determine if any species or habitat for federal or state-protected plants occur on +/- 500 acres in Lauderdale County, Tennessee. TVA proposes to remove overhead ground wire (OHGW) and install OPGW on the Covington-Ripley 161-kV Transmission Line (Line 5061-5) Tap to East Industrial Park Substation. The site is in a rural setting within agricultural and fallow fields in Ripley, Tennessee. The area is bisected by SR-19 and is south of Eastland Avenue. It is in the East Gulf Coastal Plain physiographic province.

As requested, I conducted a habitat survey on October 23–24, 2023, for the following listed species known from the Cane Creek Upper Watershed in Hardeman County (all are state listed except for *Platanthera integrilabia*): **Liverworts**- Ornate Cololejeunea (*Cololejeunea ornata*), Metzgeria (*Metzgeria uncigera*), Spotty Featherwort (*Plagiochila punctata*). **Vascular Plants**- Horse-tail Spike-rush (*Eleocharis equisetoides*), Hairy Fimbristylis (*Fimbristylis puberula*), American Pillwort (*Pilularia americana*), White Fringeless Orchid (*Platanthera integrilabia*), Drooping Bluegrass (*Poa saltuensis*), Nuttall's Pondweed (*Potamogeton epihydrus*), American Water-pennywort (*Hydrocotyle americana*).

Habitat Description

The areas surveyed were primarily agricultural (corn), fallow, and old fields (Row & Close Grain Crop Cultural and Fallow Field & Weed Vegetation formations). There were small

patches of hardwood forests (Southeastern and Eastern Native Ruderal Forest groups). These were upland woods occur along drainages (riparian areas) or bordering agricultural and fallow fields (mostly fence rows). They are classified as the Ruderal Sweetgum-Sugarberry-Water Oak Forest and Ruderal Tuliptree-Black Walnut-Black Locust Forest alliances. These forests often develop after cropping or in areas that were once clear-cut or from old fields. One stagnant farm pond was encountered in the survey, with black willow (*Salix nigra*) being common along the margin. A mowed lawn encircled the 5-acre sub-station.

The dominant plants of the forested areas were water oak (*Quercus nigra*), sweetgum (*Liquidambar styraciflua*), sugarberry (*Celtis laevigata*), black walnut (*Juglans nigra*), tulip-poplar (*Liriodendron tulipifera*), black locust (*Robinia pseudoacacia*), cherry-bark oak (*Quercus pagoda*), mockernut hickory (*Carya tomentosa*), slippery elm (*Ulmus serotina*), green ash (*Fraxinus pensylvanica*), sycamore (*Platanus occidentalis*), black cherry (*Prunus serotina*), red maple (*Acer rubrum*), box-elder (*Acer negundo*), American hornbeam (*Carpinus caroliniana*), Bradford pear (*Pyrus calleryana*), mimosa (*Albizia julibrissin*), smooth sumac (*Rhus glabra*), red cedar (*Juniperus virginiana*), Chinese privet (*Ligustrum sinense*), muscadine grape (*Vitis rotundifolia*), trumpet-creeper (*Campsis radicans*), Virginia creeper (*Parthenocissus quinquefolia*), poison ivy (*Toxicodendron radicans*), greenbriers (*Smilax* spp.) and Japanese honeysuckle (*Lonicera japonica*). The forest ground cover was somewhat sparse under the canopy.

The vegetation of the old fields were dominated by fall panic grass (*Panicum dichotomiflorum*), Johnson grass (*Sorghum halepense*), smartweeds (*Persicaria* spp.), fanpetals (*Sida rhombifolia*), burnweed (*Erechtites hieraciifolia*), cocklebur (*Xanthium strumarium*), common wood-sorrel (*Oxalis dillenii*), beefsteak-plant (*Perilla frutescens*), frost aster (*Symphyotrichum pilosum*), beggar's-lice (*Desmodium* spp.), sicklepod (*Cassia obtusifolia*), white snakeroot (*Ageratina altissima*), liverseed grass (*Urochloa platyphylla*), crab grass (Digitaria ciliaris), morning-glories (*Ipomoea* spp.), wheat (*Triticum aestivum*), ground-cherry (*Physalis angulata*), cut-leaf evening-primrose (*Oenothera laciniata*), broom-sedge (*Andropogon virginicus*), goose grass (*Eleusine indica*), daisy fleabanes (*Erigeron* spp.), three-seeded mercury (Acalypha ostryifolia), common ragweed (*Ambrosia artemisiifolia*), common goldenrod (*Solidago altissima*), curly dock (*Rumex crispus*),

horseweed (*Conyza canadensis*), dog-fennel (*Eupatorium capillifolium*), common bristle grass (*Setaria pumila*), spiny pigweed (*Amaranthus spinosus*), cudweed (*Gamochaeta* spp.), barnyard grass (*Echinochloa crus-galli*), giant ragweed (*Ambrosia trifida*), horse-nettle (*Solanum carolinense*), fall panicgrass (*Panicum anceps*), Bermuda grass (*Cynodon dactylon*), and purple-top grass (*Tridens flavus*).

Threatened and Endangered Species

No threatened or endangered species were observed in the area surveyed, and no viable habitat was available.

Drooping Blue grass inhabits calcareous or ultramafic outcrop woodlands, barrens, and glades. The remainder of the vascular plants all occur in wetlands. The federally threatened White Fringeless Orchid inhabits seeps or bogs. The rest of the wetland species were state-listed. Horse-tail Spikerush is easily identified by its quadrangular stems; it grows along quiet waters of limesink ponds and natural lakes. American Pillwort, a grass-like fern ally, is found in vernal pools and seepage areas on flatrocks and drawdown shores of lakes. Hairy Fimbristylis prefers wet habitats such as pine savannas, pine flatwoods, bogs, meadows, prairie-like areas, and calcareous glades. American Water-pennywort occurs in bogs, marshes, seepages, cliffs, and ledges wet by outflow or spray from waterfalls. Nuttall's or Ribbonleaf Pondweed superficially resembles some species of *Potamogeton*. Still, it can be distinguished from other pondweeds by its flattened stems and linear submersed leaf blades (< 6 mm wide) with prominent lacunar bands on each side of the midrib. It typically inhabits clear, unpolluted ponds, lakes, streams, and rivers.

No species of liverworts were observed, and the preferred haunts of the state-listed plants were absent. *Cololejeunea ornata* is found in high-humidity areas on limestone, such as in sinks; *Metzgeria uncigera* grows on the bark of American Holly (*Ilex americana*), and *Plagiochila punctata* occurs on shaded sandstone cliffs and bluffs.

Additional Studies and Recommendations

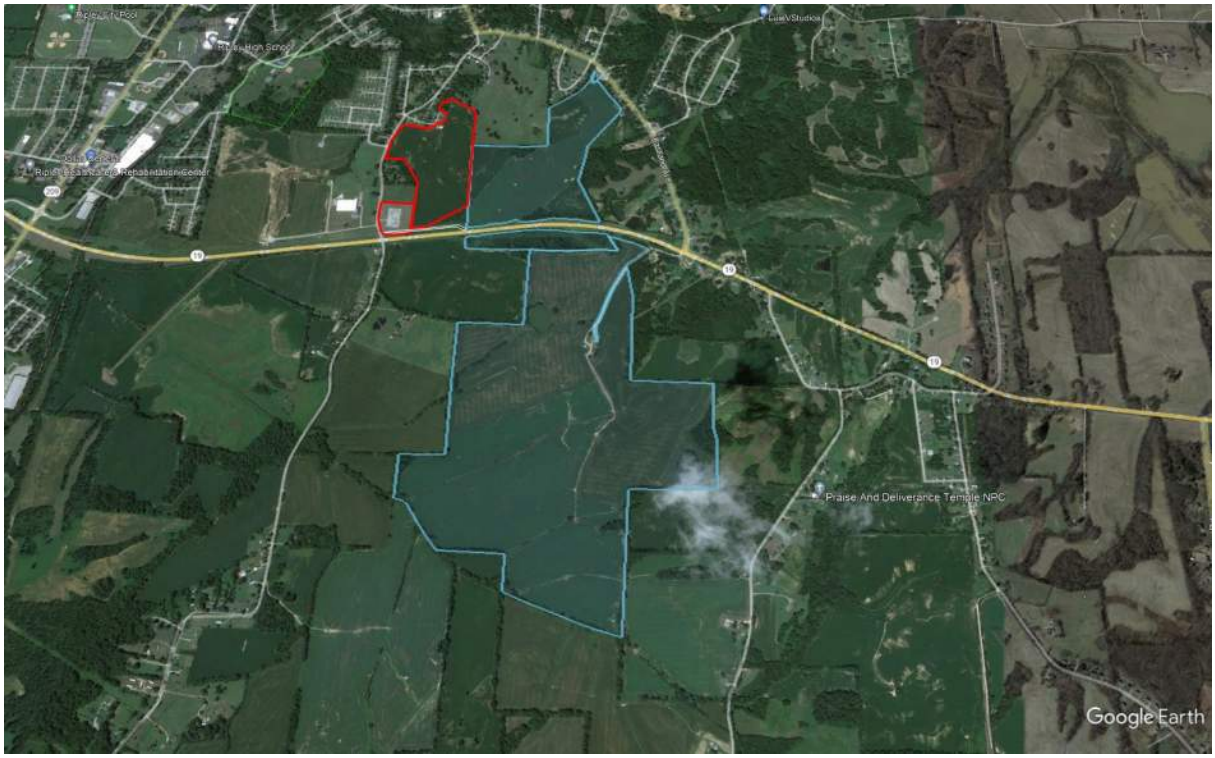
Based on a literature review and a field survey of the project site, no additional studies are required to comply with state and federal endangered species laws associated with project impacts on threatened & endangered species.

Sincerely,

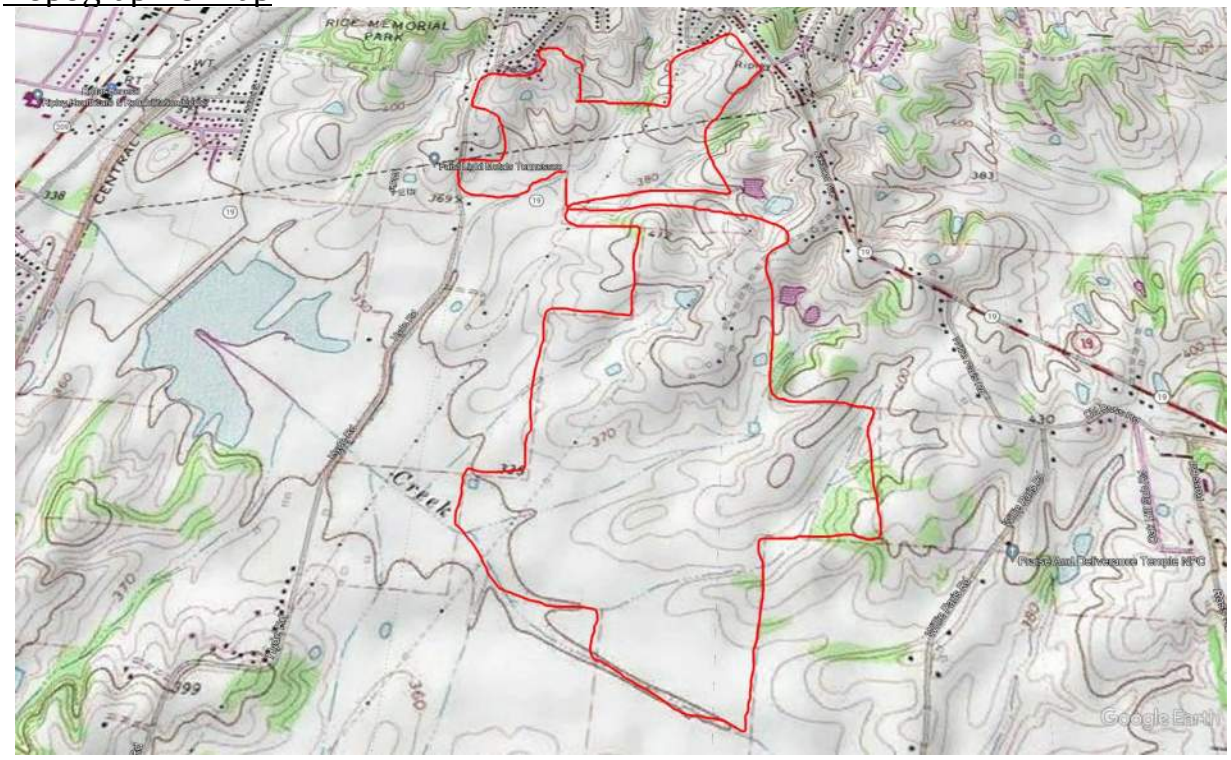
Daniel D. Spaulding
Environmental Consultant
dspaulding@annistonmuseum.org
Attachments

IMAGES OF SITE

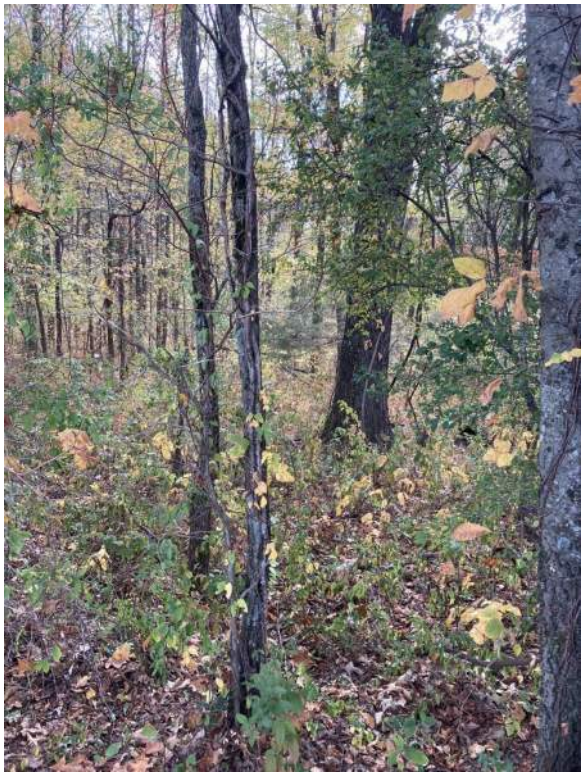
Google Earth Image



Topographic Map



SITE PHOTOS



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E

Appendix E – Bat Habitat Assessment Data Sheets

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INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: SR Ripley Date: 09/18/2022

Township/Range/Section:

Lat Long/UTM/ Zone 35.71234/-89.51790 Surveyor: B. Burdette and J. Irvin

Brief Project Description

SR Ripley is proposed to be a solar site located in Lauderdale County, Tennessee. The site is mostly fields of corn, soy, and cotton.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	435 acres	54 acres	381 acres

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)		TBD	

Vegetation Cover Types

Pre-Project	Post-Project
Agricultural field (Corn/Soy/Cotton) Dry Decidous Wet Decidous Open Water	TBD

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Agricultural fields with riparian decidous forests.

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

Several public parks are located within Ripley Town limits approximately 2 miles to the northeast of the project

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area
A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description	
Sample Site No.(s):	Bat Tree

Water Resources at Sample Site				
Stream Type	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
(# and length)	0	181	0 lf	An intermittent stream/major ditch divides two ag fields. Flowing water was present.
Pools/Ponds	NA	Open and accessible to bats?		
(# and size)				
Wetlands	Permanent	Seasonal		
(approx. ac.)	0	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	0	1	0	
Dominant Species of Mature Trees	One large water oak with approximately 60 dbh.			
% Trees w/ Exfoliating Bark	0	0	0	0
Size Composition of	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
Live Trees (%)	0	0	100	
No. of Suitable Snags		0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes, and NLEB

Additional Comments:
Isolated tree which has been left alongside an intermittent stream/major ditch. The water oak is approximately 60 DBH, has multiple cavities and large limbs, some of which appear to be dead.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: SR Ripley Date: 09/18/2022

Township/Range/Section:

Lat Long/UTM/ Zone: 35.71663/ -89.5237 Surveyor: B. Burdette and J. Irvin

Brief Project Description

SR Ripley is proposed to be a solar site located in Lauderdale County, Tennessee. The site is mostly fields of corn and cotton.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	435 acres	54 acres	381 acres

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)		TBD	

Vegetation Cover Types

Pre-Project	Post-Project
Agricultural field (Corn/Cotton) Dry Decidous Wet Decidous Open Water	TBD

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Agricultural fields with riparian decidous forests.

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

Several public parks are located within Ripley Town limits approximately 2 miles to the northeast of the project

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area
A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description

Sample Site No.(s): 1

Water Resources at Sample Site

Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	111	0	0 lf	
Pools/Ponds (# and size)	NA	Open and accessible to bats?		An ephemeral drainage feature connects a PFO wetland to an intermittent stream located in a corn field.
Wetlands (approx. ac.)	Permanent	Seasonal		
	0.53	0		

Forest Resources at Sample Site

Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	0	5	1	
Dominant Species of Mature Trees	Chinquapin oaks, black willow, sycamore.			
% Trees w/ Exfoliating Bark	0	1	0	0
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	20	60	20	
No. of Suitable Snags		8		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes, and NLEB

Additional Comments:

Forest Stand 1 is a small mixed decidous forested wetland; trees with exfoliating bark; multiple snags. The open agricultural land could act as a foraging area for bats.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: SR Ripley Date: 09/18/2022

Township/Range/Section:

Lat Long/UTM/ Zone: 35.72872/-89.5207 Surveyor: B. Burdette and J. Irvin

Brief Project Description

SR Ripley is proposed to be a solar site located in Lauderdale County, Tennessee. The site is mostly fields of corn and cotton.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	435 acres	54 acres	381 acres

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)		TBD	

Vegetation Cover Types

Pre-Project	Post-Project
Agricultural field (Corn/Cotton) Dry Decidous Wet Decidous Open Water	TBD

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Agricultural fields with riparian decidous forests.

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

Several public parks are located within Ripley Town limits approximately 2 miles to the northeast of the project

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area
A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description

Sample Site No.(s): 2

Water Resources at Sample Site

Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	303	0 lf	
Pools/Ponds (# and size)	NA	Open and accessible to bats?		An intermittent stream feature connects an offsite PEM wetland to a perennial stream located in a corn field.
Wetlands (approx. ac.)	Permanent	Seasonal		
	0	0		

Forest Resources at Sample Site

Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	0	6	1	
Dominant Species of Mature Trees	Am. Beach, black maple, american elm, white oak, mockernut, sweet gum			
% Trees w/ Exfoliating Bark	0	3	0	0
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	60	30	
No. of Suitable Snags		2		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes, and NLEB

Additional Comments:

Forest Stand 2 is a small mixed decidous forested wetland; trees with exfoliating bark such as white oak; fewe snags. The open agricultural land could act as a foraging area for bats. Very little water was present in the stream, however it directly connects to a perennial stream offsite.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: SR Ripley Date: 09/18/2022

Township/Range/Section:

Lat Long/UTM/ Zone 35.71162/-89.5153 Surveyor: B. Burdette and J. Irvin

Brief Project Description

SR Ripley is proposed to be a solar site located in Lauderdale County, Tennessee. The site is mostly fields of corn and cotton.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	435 acres	54 acres	381 acres

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)		TBD	

Vegetation Cover Types

Pre-Project	Post-Project
Agricultural field (Corn/Cotton) Dry Decidous Wet Decidous Open Water	TBD

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Agricultural fields with riparian decidous forests.

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

Several public parks are located within Ripley Town limits approximately 2 miles to the northeast of the project

Use additional sheets to assess discrete habitat types at multiple sites in a project area

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A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description

Sample Site No.(s): 3

Water Resources at Sample Site

Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	1958	0 lf	
Pools/Ponds (# and size)	NA	Open and accessible to bats?		An intermittent stream which follows a forested divide between two agricultural fields.
Wetlands (approx. ac.)	Permanent	Seasonal		
	0	0		

Forest Resources at Sample Site

Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	0	5	0	
Dominant Species of Mature Trees	One large water oak with approximately 60 dbh.			
% Trees w/ Exfoliating Bark	0	60	0	0
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	20	10	70	
No. of Suitable Snags		4		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes, and NLEB

Additional Comments:

Forest Stand 3 is a large riparian stand which follows an intermittent stream nearly 2,000', connecting to a perennial stream which is just off site. Trees consisted primarily of white and black oaks with exfoliating bark.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: SR Ripley Date: 09/18/2022

Township/Range/Section:

Lat Long/UTM/ Zone: 35.71162/-89.52400 Surveyor: B. Burdette and J. Irvin

Brief Project Description

SR Ripley is proposed to be a solar site located in Lauderdale County, Tennessee. The site is mostly fields of corn and cotton.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	435 acres	54 acres	381 acres

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)		TBD	

Vegetation Cover Types

Pre-Project	Post-Project
Agricultural field (Corn/Cotton) Dry Decidous Wet Decidous Open Water	TBD

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Agricultural fields with riparian decidous forests.

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

Several public parks are located within Ripley Town limits approximately 2 miles to the northeast of the project

Use additional sheets to assess discrete habitat types at multiple sites in a project area

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Sample Site Description
Sample Site No.(s): 4

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	0	1305 lf	An intermittent stream which follows a forested divide between two agricultural fields.
Pools/Ponds (# and size)	NA	Open and accessible to bats?		
Wetlands (approx. ac.)	Permanent	Seasonal		
	1	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	0	5	2	
Dominant Species of Mature Trees	Large cottonwoods, mockernut hickory, white oak.			
% Trees w/ Exfoliating Bark	0	50	0	0
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	20	50	30	
No. of Suitable Snags		2		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes, and NLEB

Additional Comments:
Forest Stand 4 is a large riparian stand which follows a perennial stream 1,300' on site which is continues off site. Trees consisted primarially of cottonwoods and mockernut hickory.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: SR Ripley Date: 09/18/2022

Township/Range/Section:

Lat Long/UTM/ Zone 35.720624/ -89.520259 Surveyor: B. Burdette and J. Irvin

Brief Project Description

SR Ripley is proposed to be a solar site located in Lauderdale County, Tennessee. The site is mostly fields of corn and cotton.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	435 acres	54 acres	381 acres

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)		TBD	

Vegetation Cover Types

Pre-Project	Post-Project
Agricultural field (Corn/Cotton) Dry Decidous Wet Decidous Open Water	TBD

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Agricultural fields with riparian decidous forests.

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

Several public parks are located within Ripley Town limits approximately 2 miles to the northeast of the project

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area
A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 5

Water Resources at Sample Site				
Stream Type	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
(# and length)	0	1321 lf	0 lf	
Pools/Ponds	1 pond 3.37 ac	Open and accessible to bats?		A pond which is just over 3.3 acres is connected via a culvert that flows offsite.
(# and size)				
Wetlands	Permanent	Seasonal		
(approx. ac.)	0	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	0	5	2	
Dominant Species of Mature Trees	Black willow, mockernut hickory, sweetgum, sycamore			
% Trees w/ Exfoliating Bark	0	20	0	0
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	40	40	20	
No. of Suitable Snags		10		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes, and NLEB

Additional Comments:
Forest Stand 6 is a large riparian stand which surrounds a 3.3 acre pond and follows an intermittent stream approximately 1,321' on site which is continues off site. Trees consisted primarially of black willow, sweetgum, sycamore and mockernut hickory.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: SR Ripley Date: 11/1/23

Township/Range/Section:

Lat Long/UTM/ Zone: 35.725449, -89.523953 Surveyor: Lyranda Thiem

Brief Project Description

The Project Site is located in Lauderdale County, Tennessee, partially within the city limits of Ripley and is approximately 554.6 acres in extent. Approximate center coordinates of the Project Site are: latitude 35.723829°; longitude -89.517959°. T he Project Site is located within the Upper Cane Creek Watershed (Hydrologic Unit Code [HUC] 12: 080102080701).

Project Area

	Total Acres	Forest Acres	Open Acres
Project	554.6	53.48	open- 429.87 water- 2.90

Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing

Vegetation Cover Types

Pre-Project	Post-Project
Cropland Dry Deciduous Maintained Lawn	TBD

Landscape within 5 mile radius

Flight corridors to other forested areas?

No.

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Agricultural fields for corn, dry deciduous forests with eastern red cedar, black walnut, American sycamore, winged elm, muscadine, rubus maintained lawn areas near the highway areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

Several public parks are located within Ripley Town limits approximately 2 miles to the northeast of the project including Ripley City Park

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area
A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 6

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: 1	Intermittent: 1	Perennial:	Describe existing condition of water sources: 1 intermittent stream and 1 ephemeral stream run through the stand
Pools/Ponds (# and size)	N/A	Open and accessible to bats?		
Wetlands (approx. ac.)	Permanent:	Seasonal:		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 '): 3	Midstory (20-50'): 4	Understory (<20'): 1	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
Dominant Species of Mature Trees	black walnut, black willow, American sycamore, sugar maple, white oak, sugarberry, black cherry, osage orange			
% Trees w/ Exfoliating Bark	0	5	8	
Size Composition of Live Trees (%)	Small (3-8 in): 20	Med (9-15 in): 40	Large (>15 in): 40	
No. of Suitable Snags		4		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Moderate quality

Additional Comments:
Open under story, no connection to larger forested stand, diversity in trees Trees DBH ranged in size from 10 inches DBH to 35 inches DBH

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: SR Ripley Date: 11/1/23

Township/Range/Section:

Lat Long/UTM/ Zone: 35.731100, -89.524855 Surveyor: Lyranda Thiem

Brief Project Description

The Project Site is located in Lauderdale County, Tennessee, partially within the city limits of Ripley and is approximately 554.6 acres in extent. Approximate center coordinates of the Project Site are: latitude 35.723829°; longitude -89.517959°. T he Project Site is located within the Upper Cane Creek Watershed (Hydrologic Unit Code [HUC] 12: 080102080701).

Project Area

	Total Acres	Forest Acres		Open Acres
Project	554.6	53.48		open- 429.87 water- 2.90
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	

Vegetation Cover Types

Pre-Project	Post-Project
Cropland Dry Deciduous Maintained Lawn	TBD

Landscape within 5 mile radius

Flight corridors to other forested areas?

No.

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Agricultural fields for corn, dry deciduous forests with eastern red cedar, black walnut, American sycamore, winged elm, muscadine, rubus maintained lawn areas near the highway areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

Several public parks are located within Ripley Town limits approximately 2 miles to the northeast of the project including Ripley City Park.

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area
A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 7

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	0	0	No water system exists in this stand
Pools/Ponds (# and size)	N/A	Open and accessible to bats?		
Wetlands (approx. ac.)	Permanent	Seasonal		
	0	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	3	4	2	
Dominant Species of Mature Trees	sugarberry, black walnut, winged elm			
% Trees w/ Exfoliating Bark	0	2	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	30	50	20	
No. of Suitable Snags		0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? high quality

Additional Comments:
Trees ranged from 5 inches to 25 inches DBH Tree diversity and presence of trees with exfoliating bark

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: SR Ripley Date: 11/1/23

Township/Range/Section:

Lat Long/UTM/ Zone: 35.731100, -89.524855 Surveyor: Lyranda Thiem

Brief Project Description

The Project Site is located in Lauderdale County, Tennessee, partially within the city limits of Ripley and is approximately 554.6 acres in extent. Approximate center coordinates of the Project Site are: latitude 35.723829°; longitude -89.517959°. T he Project Site is located within the Upper Cane Creek Watershed (Hydrologic Unit Code [HUC] 12: 080102080701).

Project Area

	Total Acres	Forest Acres		Open Acres
Project	554.6	53.48		open- 429.87 water- 2.90
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	

Vegetation Cover Types

Pre-Project	Post-Project
Cropland Dry Deciduous Maintained Lawn	TBD

Landscape within 5 mile radius

Flight corridors to other forested areas?

No.

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Agricultural fields for corn, dry deciduous forests with eastern red cedar, black walnut, American sycamore, winged elm, muscadine, rubus maintained lawn areas near the highway areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

Several public parks are located within Ripley Town limits approximately 2 miles to the northeast of the project including Ripley City Park.

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area
A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description

Sample Site No.(s): 8

Water Resources at Sample Site

Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	1050	2148	0	
Pools/Ponds (# and size)	N/A	Open and accessible to bats?		2 intermittent 5 ephemeral (WWC's) streams run through the stand
Wetlands (approx. ac.)	Permanent	Seasonal		
	0	0		

Forest Resources at Sample Site

Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	3	4	1	
Dominant Species of Mature Trees	sugarberry, black walnut, red maple, red oak, paper mulberry and winged elm			
% Trees w/ Exfoliating Bark	0	2	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	30	60	10	
No. of Suitable Snags		0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? low/moderate quality

Additional Comments:

Trees ranged from approximately 5 inches to 25 inches DBH
One area was determined to have moderate bat habitat quality due to tree diversity and moderately open canopy.
The second area in the southeastern corner of stand was determined to have low quality because of lack of diversity and no snags.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: SR Ripley Date: 11/1/23

Township/Range/Section:

Lat Long/UTM/ Zone: 35.731100, -89.524855 Surveyor: Lyranda Thiem

Brief Project Description

The Project Site is located in Lauderdale County, Tennessee, partially within the city limits of Ripley and is approximately 554.6 acres in extent. Approximate center coordinates of the Project Site are: latitude 35.723829°; longitude -89.517959°. T he Project Site is located within the Upper Cane Creek Watershed (Hydrologic Unit Code [HUC] 12: 080102080701).

Project Area

	Total Acres	Forest Acres	Open Acres
Project	554.6	53.48	open- 429.87 water- 2.90

Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing

Vegetation Cover Types

Pre-Project	Post-Project
Cropland Dry Deciduous Maintained Lawn	TBD

Landscape within 5 mile radius

Flight corridors to other forested areas?

No.

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Agricultural fields for corn, dry deciduous forests with eastern red cedar, black walnut, American sycamore, winged elm, muscadine, rubus maintained lawn areas near the highway areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

Several public parks are located within Ripley Town limits approximately 2 miles to the northeast of the project including Ripley City Park.

Use additional sheets to assess discrete habitat types at multiple sites in a project area

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Sample Site Description

Sample Site No.(s): 9

Water Resources at Sample Site

Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	1133	515	0	
Pools/Ponds (# and size)	N/A	Open and accessible to bats?		2 intermittent and 2 ephemeral (WWC) streams run through the stand
Wetlands (approx. ac.)	Permanent	Seasonal		
	0	0		

Forest Resources at Sample Site

Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	20	60	20	
Dominant Species of Mature Trees	honey locust, tulip poplar, white ash, black walnut, and black maple.			
% Trees w/ Exfoliating Bark	0	2	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	40	40	20	
No. of Suitable Snags		0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? low quality

Additional Comments:

Trees ranged from approximately 5 inches in diameter at breast height (DBH) to 20 inches DBH.
Low tree diversity, thick understory, and lack of snags

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

F

Appendix F – Environmental Solutions & Innovations, Inc. Bat Survey Report

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LISTED BAT SURVEYS ON THE RIPLEY II SOLAR PROJECT IN LAUDERDALE COUNTY, TENNESSEE

29 September 2023

Submitted to:

Mr. Robbie Sykes
U.S. Fish and Wildlife Service,
Tennessee Field Office
446 Neal Street
Cookeville, TN

Mr. Russell Boles
Tennessee Wildlife Resources Agency
312 Rosa L. Parks Ave,
William R. Snodgrass Tower Fl 25
Nashville, TN 37243

Prepared for:

Ms. Nicole Morgan
Project Manager
HDR Inc.
1201 Market Street, Suite C
Chattanooga, TN 37402

Prepared by:

Environmental Solutions & Innovations, Inc.

4525 Este Avenue
Cincinnati, Ohio 45232
Phone: (513) 451-1777
Fax: (513) 451-3321
Ravenna, OH • Indianapolis, IN • Orlando, FL • Pittsburgh, PA • Teays Valley, WV

TABLE OF CONTENTS

Page

LIST OF FIGURES

Figure Page

LIST OF TABLES

Table Page

Appendices

1.0 Introduction

HDR Inc. (HDR) retained Environmental Solutions & Innovations, Inc. (ESI) to conduct mist net surveys to determine presence/absence of listed bats for the proposed Silicon Ranch (SR) and the Tennessee Valley Authority (TVA) Ripley II Solar Project (Project) in Lauderdale County, Tennessee. The proposed Project Area, totaling 513 acres (208 ha), will require 55 acres (22 ha) of tree clearing. On 26 September 2023, SR acquired an additional parcel, totaling 41.6 acres (16.8 ha), of which 0.03 acres (0.01 ha) of additional tree clearing would be required, to the Project Area, for an updated Project Area total of 554.6 acres (224.4 ha), requiring 55.03 acres (22.27 ha) of tree clearing (Figure 1).

The Project occurs within range of the federally endangered Indiana (*Myotis sodalis*), and northern long-eared bats (*Myotis septentrionalis*), the tricolored bat (*Perimyotis subflavus*; recently proposed for listing as federally endangered), and the little brown bat (*Myotis lucifugus*; currently undergoing U.S. Fish and Wildlife Service (USFWS) review for inclusion under the Endangered Species Act [ESA]).

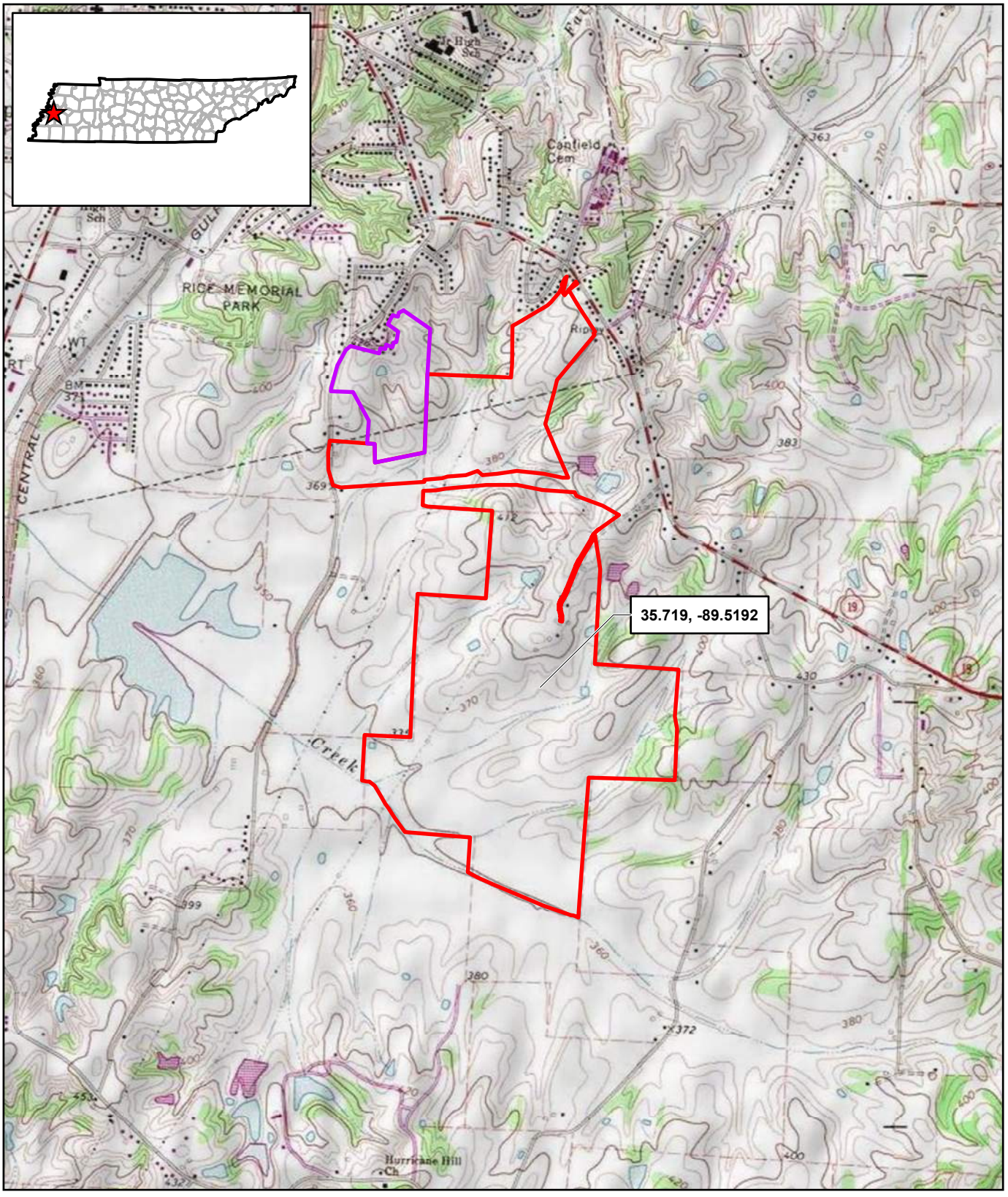
This report details methods and results of mist netting surveys completed 27 through 30 June 2023. Surveys were completed under federal permit number ES02373A-16 and Tennessee Wildlife Resources Agency (TWRA) Special Use Permit Studies-Scientific number 5932.

2.0 Regulatory Setting

2.1 Endangered Species Act

The Federal ESA [16 U.S.C. 1531 et seq.] was codified into law in 1973. This law provides for the listing, conservation, and recovery of endangered and threatened species of plants and wildlife. Under the ESA, the USFWS is mandated to monitor and protect listed species.

Section 9 of the ESA prohibits the “take” of listed species unless otherwise specifically authorized by regulation. “Take” is defined by the ESA as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect” [16 U.S.C. 1532(19)]. ESA further defines “harm” to include significant habitat modification or degradation [50 CFR §17.3]. Section 7(a)(2) of the ESA states that each federal agency shall insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in destruction or adverse modification of designated critical habitat. Federal actions include (1) expenditure of federal funds for



N
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Figure 1. Location of the Ripley II Solar Project in Lauderdale County, Tennessee.

Project No. 2093

0 500 1,000 Meters

Base Map: USGS Topographic Map

ESI ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

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roads, buildings, or other construction projects, and (2) approval of a permit or license, and the activities resulting from such permit or license. Compliance is required regardless of whether involvement is apparent, such as issuance of a federal permit, or less direct, such as federal oversight of a state-operated program. Actions of federal agencies that do not result in jeopardy or adverse modification, but that could result in a take, must also be addressed under Section 7. Take by a federal agency can be authorized through the Section 7 consultation process, culminating in an Incidental Take Statement (ITS) by the USFWS. The take must be incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

In 1982, amendments to the ESA, Congress established a provision in Section 10(a)(1)(B) that authorizes incidental take by nonfederal entities. To obtain an Incidental Take Permit (ITP), an applicant must submit a conservation plan specifying impacts that result in take and measures to minimize and mitigate those impacts.

2.2 Study Plan Submission and Approval

A study plan detailing methods and survey level of effort was submitted to the USFWS Cookeville, TN Field Office on 25 May 2023. USFWS concurred and provided site-specific authorization on 4 June 2023 (Appendix A).

3.0 Methods

3.1 Summer Habitat

Mist net surveys follow the USFWS 2023 *Range-wide Indiana Bat Survey Guidelines* (Guidelines; Table 1) specific to the northern long-eared bat level of effort (LOE) (USFWS 2023).

3.2 Level of Effort

For non-linear projects a minimum sampling effort of ten net nights is completed for every 123 acres (49.8 ha) of impacted suitable habitat (Table 1). Net site locations are provided in Figure 2 and coordinates are provided in Table 2. Habitat and netting datasheets are provided in Appendix B and photographs are provided in Appendix C.

Table 1. USFWS Northern Long-eared Bat Mist Net Survey Guidelines.

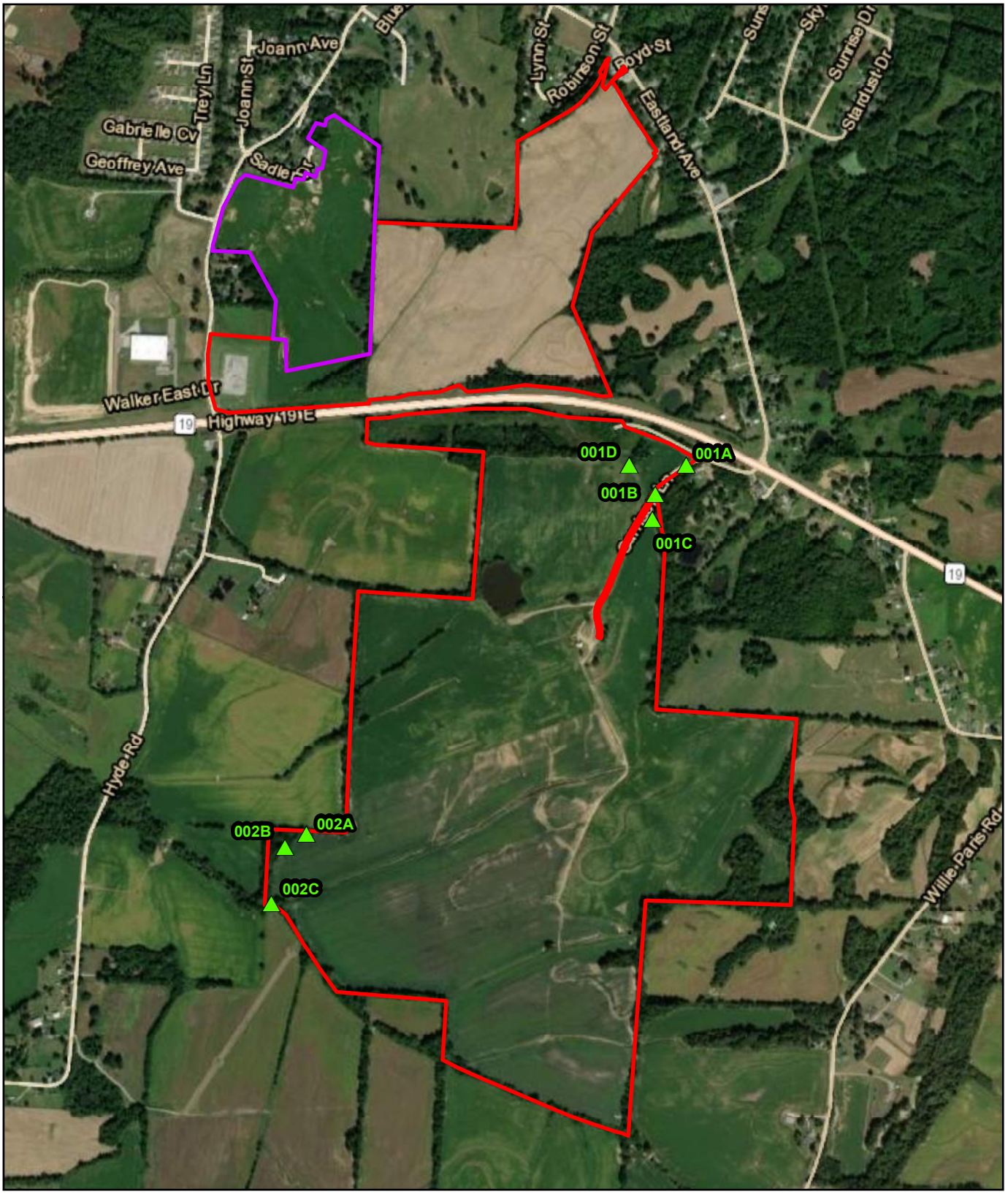
2023 USFWS NLEB MIST NET GUIDELINES

1. Netting Season: 15 May to 15 August.
2. Equipment (Mist Nets): Constructed of the finest, lowest visibility mesh commercially available – monofilament or black nylon – with the mesh size approximately 1½ inch (1¼ –1¾) (38 mm).
3. Net Placement: Mist nets extend approximately from water or ground level to tree canopy and are bounded by foliage on the sides. Net width and height are adjusted for the fullest coverage of the flight corridor at each site. A "typical" net set consists of two (or more) nets "stacked" on top of one another; width may vary up to 60 feet (20 m).
4. Level of Effort:
   - Linear Projects – minimum of 4 net nights per 0.6 mile (1 km); 1 net night = 1 net set deployed for 1 night.
   - Non-linear Projects – minimum of 10 net nights per 123 acres (49.8 ha).
5. Minimum Effort Per Net Site:
   - At least 2 net locations (set) per net site.
   - At least 2 (calendar) nights of netting per net site with maximum of 3 nights of consecutive netting at any given location.
   - After 2 consecutive nights at same location without capture of target species, must change net locations or wait at least 2 calendar nights before resuming netting at same location.
   - Sample Period: begin at sunset and continue for at least 5 hours.
   - Nets are monitored at 10-minute intervals.
   - No disturbance near the nets or between checks.
6. Weather: Negative surveys combined with any of the following conditions throughout all or most of a sampling period are likely to require an additional night of mist-netting:
   - Precipitation (rain and/or heavy fog) lasting >30 minutes or continuing intermittently during the survey period.
   - Temperatures <10°C (50°F).
   - Sustained wind >9 mi/hr (4 m/sec) (3 on Beaufort scale).

Source: U.S. Fish and Wildlife Service 2023

3.2.1 Net Placement

Nets are set to maximize coverage of flight paths used by bats along suitable travel corridors, foraging areas, and/or drinking areas. Riparian corridors are often used for travel or foraging; however, upland corridors (e.g., trails or logging roads) and field edges also provide suitable sites. In upland areas, net sites in the vicinity of road ruts holding water resulted in capture of Indiana and northern long-eared bats. Site selection is based upon the extent of canopy cover, presence of an open flyway, and forest conditions near the site. The actual location and orientation of each net set is determined in the field. Coordinates of each net set are recorded via a combination of available technology including GIS systems (ESRI ArcMap), handheld GPS units, tablet computers, and customized software to ensure a high quality, easily interpreted, and universal standard of mapping for field studies and reporting for all target species.



▲ Mist Net Location Project Area September 2023 Additional Study Area

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Figure 2. Mist Net Locations for the Ripley II Solar Project in Lauderdale County, Tennessee.

Project No. 2093

0 300 600 Meters

Base Map: ESRI World Imagery

ESI ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

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Table 2. Mist Net Site Coordinates on the Ripley II Solar Project in Lauderdale County, Tennessee.

Site	Date (2023)	Net	Latitude	Longitude
1	27, 28 June	A	35.723621	-89.514266
		B	35.722932	-89.515132
		C	35.722344	-89.515192
		D*	35.723547	-89.515938
2	30 June	A	35.714804	-89.524840
		B	35.714495	-89.525446
		C	35.713176	-89.525791

*Surveyed on June 28 only.

3.2.2 Bat Capture

Bats are live caught in mist nets and released unharmed near the point of capture. Captured bats are identified to species, sex, age class, and reproductive condition. Weight and right forearm length of are also recorded. Age is determined by examining the epiphyseal-diaphyseal fusion of long bones in the wing. Reproductive condition of female bats is recorded as pregnant (based on gentle abdominal palpation), lactating, post lactating, or non-reproductive. Time and location/net site of captured bats is recorded. Processing is typically completed within 30 minutes of the time each bat is removed from the net. Listed bat species captured and identified are photographed and recorded on standardized data sheets (Appendix B). USFWS and TWRA contacted within 48 hours if any listed bats are captured.

3.2.3 Protocol for Addressing Covid-19

In response to the U.S. Geological Survey and other non-governmental studies, USFWS recommends all employees and persons conducting activities on lands subject to USFWS oversight follow the Centers for Disease Control's (CDC) guidelines for interacting with wildlife to minimize risks associated with potential COVID-19 transmission while handling bats and other potentially susceptible taxa. As such, ESI employs the CDC's guidelines, currently not requiring use of N95 or equivalent, non-vented facemasks. Single-use nitrile gloves are already used to mitigate spread of WNS and nets are decontaminated using WNS protocols for disinfecting, such as Covid-killing disinfectants and heating porous equipment at 131ºF (55ºC) for at least 20 minutes.

3.2.4 Protocol for Addressing White-Nose Syndrome

In response to the current WNS issue, state and federal guidelines for WNS decontamination, containment, and avoidance are implemented in conjunction with the latest WNS protocols as provided on the USFWS-updated website whitenosesyndrome.org. Wing damage is categorized using the Wing-Damage Index Used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome

(Reichard 2008, Reichard and Kunz 2009), as applied, tested, and evaluated by ESI on similar projects (Francl et al. 2011).

3.3 Habitat Characterization of Sites

Wooded habitat near net sites and immediate surroundings are assessed for quality for Indiana and northern long-eared bat use. Formal habitat evaluations are not completed for tricolored or little brown bats, although both species use similar woodlands. The emphasis of this description is on habitat form and function: size and relative abundance of large trees and snags that potentially serve as roost trees, canopy closure, understory clutter/openness, distance to water, and flight corridors. Habitat form is emphasized because both bat species roost in a variety of tree species.

Habitat characterization identifies components of both the canopy and subcanopy layers. All trees that reach into the canopy are canopy trees, regardless of diameter/size. As defined in the Indiana Bat Habitat Suitability Index Model (3D/Environmental 1995), dominant trees are the large trees in the canopy (16 inches [>40 cm] dbh). Current literature suggests these trees have the greatest likelihood of being used by bat maternity colonies. Many smaller trees are often also found in the canopy, and in some situations, the canopy can be entirely composed of small-diameter trees. ESI's habitat characterization identifies both dominant and subdominant elements of the canopy.

The subcanopy vegetation layer is well defined in classical ecological literature. It is that portion of the forest structure between the ground vegetation (to approximately 0.2 feet [0.6 m]) and the canopy layers, usually beginning at about 25 feet (7.6 m). The amount of vegetation in the understory is termed clutter, and may come from:

- Lower branches of overstory trees;
- Small trees that will grow into the overstory;
- Small trees and shrubs confined to the understory.

Many species of bats, including the Indiana bat, tend to avoid areas of high clutter. Conversely, the northern long-eared bat is more tolerant of clutter. Habitat data are recorded on standardized data sheets (Appendix B).

3.4 Weather and Temperature

Weather conditions are monitored during mist netting to ensure compliance with 2023 USFWS mist netting Guidelines (Table 1). Conditions recorded include temperature, wind speed and direction, precipitation, and percent cloud cover. A standard digital thermometer is used to record temperature; wind speed is determined by use of the Beaufort wind scale; and cloud cover is visually estimated. Information is recorded on standardized data sheets and provided in Appendix B.

4.0 Results

4.1 Mist Netting

Mist netting was conducted at two sites from 27 through 30 June 2023, totaling 10 complete net nights of effort (Table 2). Data sheets are provided in Appendix B, and photos are included in Appendix C.

4.1.1 Bat Capture

Mist netting efforts included 10 complete net nights and capture of 8 eastern red bats (*Lasiurus borealis*). Representative photographs of eastern red bats are provided in Appendix C.

Table 3. Bat Captures on the Ripley II Solar Project in Lauderdale County, Tennessee.

Species	Adult Male	Adult Lactating Female	Escaped Net	Total
Eastern red bat	1	4	**3**	**8**

4.1.2 White Nose Syndrome Scores

No bats displayed signs of wing damage (Wing Index Score = 0) indicating fewer than five small scar spots were present on membranes (Appendix B).

4.2 Habitat Characterization of Net Sites

Nets were primarily placed in gaps in fencerows / tree lines (remnants of a mature lowland forest) in an area now dominated by agriculture. Common dominant canopy tree species included sweetgum (*Liquidambar styraciflua*), southern red oak (*Quercus falcata*), and sugarberry (*Celtis laevigata*). The subdominant canopy was comprised of sugarberry, sweetgum, southern red oak, and shingle oak (*Q. imbricaria*). The understory, or subcanopy, included lower branches of canopy trees and saplings.

Roosting potential for Indiana and northern long-eared bats was rated low for both species at both sites. Habitat assessment datasheets are provided in Appendix B, and photographs of mist net sites are provided in Appendix C.

4.3 Weather

Precipitation on 29 June precluded mist net surveys. All other survey nights between 27 and 30 June 2023 were within acceptable limits based on USFWS Guidelines, resulting in 10 complete survey nights. Survey temperatures ranged from 88° to 69° Fahrenheit (31° to 21° C) (Appendix A).

5.0 Discussion

Mist net surveys for listed bats were completed from 27 to 30 June 2023 following the 2023 Guidelines. Ten net nights were completed across two mist net sites. Eight eastern red bats were captured.

ESI requests results of these mist net surveys remain valid for a period of five complete summer maternity seasons following conclusion of the current maternity season.

6.0 Literature Cited

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USFWS. 2019. 2019 Indiana bat (*Myotis sodalis*) population status update. U.S. Department of the Interior, Fish and Wildlife Service, Indiana Ecological Services Field Office, Bloomington, Indiana. 9 pp.

USFWS. 2023. Range-wide Indiana bat & northern long-eared bat survey guidelines. U.S. Department of the Interior, Fish and Wildlife Service. 67 pp.

APPENDIX A
AGENCY CORRESPONDENCE

John Timpone

From: Sykes, Robbie <robbie_sykes@fws.gov>
Sent: Sunday, June 4, 2023 10:11 PM
To: John Timpone
Cc: Tennessee ES, FWS
Subject: Bat Survey Plan for SR Ripley II in Lauderdale County, TN

John,

We have reviewed the mist net survey proposal for the proposed SR Ripley II Solar Site in Lauderdale County, Tennessee, and the plan appears to be appropriate in terms of documenting presence/probable absence of the Indiana bat, northern long-eared bat, and tricolored bat. We approve the survey plan, and look forward to reviewing the results of the survey.

Sincerely,

Robbie Sykes
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
446 Neal Street
Cookeville, TN 38501
(tele. 931/525-4979)

APPENDIX B
DATA SHEETS

Property of: Environmental Solutions & Innovations, Inc.
4525 Este Avenue. Cincinnati, OH 45232 (Phone: 513-451-1777)

SURVEY YEAR 2023

HABITAT ASSESSMENT

Project #: 2093 **Project Name:** Ripley Solar **State:** TN **County:** Lauderdale
Date: 28 June 2023 **Lead Biologist:** Darwin Brack **Other Staff:** Luca Iacobucci
Site ID: 001 **Federal Permit:** ES02373A **State Permit:** 5932

Net/Trap/ Detector	Net/Trap/ Detector #	Latitude	Longitude	Photographs
Net	A	35.723621	89.514266	
Net	B	35.722932	89.514132	
Net	C	35.722344	89.515192	
Net	D	35.723591	89.515889	

Distance to closest water source (m): 40 Type of water source: Pond
Name of water source: N/A

ESTIMATED WATER SOURCE CHARACTERISTICS (IF UNDER NETS OR DETECTOR):

Bank Height (m): Channel Width (m): Stream Width (m):

Substratum: ☐ Bedrock ☐ Boulder ☐ Cobble ☐ Gravel ☐ Sand ☐ Silt/Clay ☐ Unknown

Still Water Present Y/N): Average Water Depth: m or cm Water Clarity (H,M,L)

VEGETATION:

Dominant Canopy Species (> 40 cm/16" dbh)	Subdominant Canopy Species (< 40 cm/16" dbh)
Quercus pagoda	Quercus pagoda
Celtis laevigata	Celtis laevigata
Liquidambar styraciflua	Liquidambar styraciflua

Estimated dbh range (cm): Lg: 75 Sm: 40 Estimated dbh range (cm): Lg: 39 Sm: 25

Relative abundance of dominant vs. subdominant (ratio): 1:6

Estimated canopy closure: ☐ Closed ☐ Moderate ☑ Open

Roost tree potential consists of: ☐ Hollow ☐ Large Trees ☐ Snags ☑ None

M. sodalis roost tree potential is: ☐ High ☐ Moderate ☑ Low

Roost potential comments: No observed potential roosts

M. septentrionalis roost tree potential is: ☐ High ☐ Moderate ☑ Low

Roost potential comments: Few observed potential roosts

Subcanopy clutter: ☐ Closed ☐ Moderate ☑ Open

Subcanopy consists largely of: ☑ Lower Branches of Canopy Trees ☑ Saplings ☐ Shrubs

Common Subcanopy Species: Quercus pagoda Celtis laevigata Liquidambar styraciflua

Check all that apply:

- ☑ Mature Upland Forest
- ☐ Young Upland Forest
- ☐ Mature Lowland Forest
- ☐ Young Lowland Forest
- ☐ Recently Logged Forest
- ☐ Pine Plantation
- ☑ Woodlot/Forest Edge
- ☐ Old Field
- ☑ Crop/Pasture Land
- ☐ Stream/River
- ☐ Emergent Wetland
- ☐ Forested Swamp
- ☐ Shrub/scrub Swamp
- ☐ Vernal Pool
- ☐ Deepwater Lake/Pond
- ☐ Developed Land
- ☐ Other:

Herbaceous Cover: ☐ Sparse ☑ Moderate ☐ Dense

Property of: Environmental Solutions & Innovations, Inc.
4525 Este Avenue. Cincinnati, OH 45232 (Phone: 513-451-1777)

HABITAT ASSESSMENT (continued)

Project #:	2093	State/County:	TN / Lauderdale	Site Name/#:	001	Initials:	DCB

SKETCH NETS and/or DETECTORS
(use this to illustrate things we cannot see on a photo-map)

LEGEND

Net:

Detector:

DETAILED HABITAT DESCRIPTION & COMMENTS

Centralized Ag field with farm roads throughout and fencerows enclosing property.

A pond is present interior the property, and another present adjacent to the east.

ESI **SURVEY YEAR** 2023

Property of: Environmental Solutions & Innovations, Inc.
4525 Este Avenue. Cincinnati, OH 45232 (Phone: 513-451-1777)

BAT CAPTURE DATA

Project #: 2093 **Date:** 27 June 2023

Project Name: Ripley Solar **Site Name/#:** 001

State: Tennessee **County:** Lauderdale

Device ID #: 458

Permitted Biologist: Darwin Brack (full name)

Other Field Staff: Luca Iacobucci (full name)

State Permit #: 5932

Federal Permit #: ES02373A

WEATHER DATA				
Time (xxxx h)	Temp (°C)	Wind Speed (estimated – see chart)	% Cloud Cover (estimated)	Comments
2020	85	0	50	
2050	83	0	30	
2120	79	0	0	
2150	75	0	0	
2220	74	0	0	
2250	73	0	0	
2320	70	0	0	
2350	68	0	0	
0020	70	0	0	
0050	70	0	0	
0120	69	0	0	

Net/Trap/ Detector	Net/Trap/ Detector #	Latitude	Longitude	Length (m)	Height (m)	Time Up	Time Down	Picture #	Waypoint #
Net	A	35.723621	89.514266	6	6	2020	0120		
Net	B	35.722932	89.515132	18	6	2020	0120		
Net	C	35.722344	89.515192	12	9	2020	0120		

Net Placement/Site Description: Nets A and B over road adjacent fenceline and ag field; Net C over Ag field

Capt #	Net/ Trap	Species	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[1]	Wt (g)	RFA (mm)	Belly[2] (F/M/E)	Wing Index* (0-3)	Comments Picture # /Guano/Hair Sample/Band #
1	B	Lasiurus borealis	2040								Escape
2	B	L. borealis	2328								Escape
3	B	L. borealis	2328	Ad	F	L	13.5	39	M	0	
4	B	L. borealis	2328	Ad	M	Up	10.0	36	M	0	
5	C	L. borealis	2340								Escape
6	B	L. borealis	0009	Ad	F	L	15.5	40	M	0	
7	C	L. borealis	0017	Ad	F	L	12.75	42	M	0	

[1] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓ (NR=Non-reproductive, PG=Pregnant, L=Lactating, PL=Post-Lactating; ↑=Ascended testes, ↓ Descende testes)

2 F=Full, M=Moderate, E=Empty

***** Refer to table on the back

ESI **SURVEY YEAR** 2023

Property of: Environmental Solutions & Innovations, Inc.
4525 Este Avenue. Cincinnati, OH 45232 (Phone: 513-451-1777)

BAT CAPTURE DATA

Project #: 2093 **Date:** 28 June 2023

Project Name: Ripley Solar **Site Name/#:** 001

State: Tennessee **County:** Lauderdale

Device ID #: 458

Permitted Biologist: Darwin Brack **(full name)**

Other Field Staff: Luca Iacobucci **(full name)**

State Permit #: 5932

Federal Permit #: ES02373A

WEATHER DATA				
Time (xxxx h)	Temp (°C)	Wind Speed (estimated – see chart)	% Cloud Cover (estimated)	Comments
2020	84	1-3	20	
2050	82	1-3	0	
2120	81	4-7	0	
2150	80	1-3	0	
2220	79	4-7	0	
2250	79	4-7	0	
2320	79	4-7	0	
2350	79	4-7	0	
0020	78	4-7	0	
0050	79	4-7	0	
0120	78	4-7	0	

Net/Trap/ Detector	Net/Trap/ Detector #	Latitude	Longitude	Length (m)	Height (m)	Time Up	Time Down	Picture #	Waypoint #
Net	A	35.723621	89.514266	6	6	2020	0120		
Net	B	35.722932	89.515132	18	6	2020	0120		
Net	C	35.722344	89.515192	12	9	2020	0120		
Net	D	35.72	89.51	6	6	2020	0120		

Net Placement/Site Description: Nets A and B over road adjacent fenceline and ag field; Net C over Ag field

Capt #	Net/ Trap	Species	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[1]	Wt (g)	RFA (mm)	Belly[2] (F/M/E)	Wing Index* (0-3)	Comments Picture # /Guano/Hair Sample/Band #
1	C	Lasiurus borealis	2227	Ad	F	L	16.0	42	M	0	-

[1] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓ (NR=Non-reproductive, PG=Pregnant, L=Lactating, PL=Post-Lactating; ↑=Ascended testes, ↓ Descende testes)

2 F=Full, M=Moderate, E=Empty

***** Refer to table on the back

Property of: Environmental Solutions & Innovations, Inc.
4525 Este Avenue. Cincinnati, OH 45232 (Phone: 513-451-1777)

SURVEY YEAR 2023

HABITAT ASSESSMENT

Project #: 2093 **Project Name:** Ripley Solar **State:** TN **County:** Lauderdale
Date: 30 June 2023 **Lead Biologist:** Darwin Brack **Other Staff:** Luca Iacobucci
Site ID: 002 **Federal Permit:** ES02373A **State Permit:** 5932

Net/Trap/ Detector	Net/Trap/ Detector #	Latitude	Longitude	Photographs
Net	A	35.714804	89.524840	
Net	B	35.714495	89.525446	
Net	C	35.713176	89.525791	

Distance to closest water source (m): 1 Type of water source: Pond
Name of water source: N/A

ESTIMATED WATER SOURCE CHARACTERISTICS (IF UNDER NETS OR DETECTOR):

Bank Height (m): Channel Width (m): Stream Width (m):

Substratum: ☐ Bedrock ☐ Boulder ☐ Cobble ☐ Gravel ☐ Sand ☐ Silt/Clay ☐ Unknown

Still Water Present Y/N): Average Water Depth: m or cm Water Clarity (H,M,L)

VEGETATION:

Dominant Canopy Species (> 40 cm/16" dbh)	Subdominant Canopy Species (< 40 cm/16" dbh)
Quercus falcata	Liquidambar styraciflua
Liquidambar styraciflua	Celtis laevigata
-	Quercus imbricaria

Estimated dbh range (cm): Lg: 55 Sm: 40 Estimated dbh range (cm): Lg: 39 Sm: 22

Relative abundance of dominant vs. subdominant (ratio): 1:10

Estimated canopy closure: ☐ Closed ☐ Moderate ☑ Open

Roost tree potential consists of: ☐ Hollow ☐ Large Trees ☐ Snags ☑ None

M. sodalis roost tree potential is: ☐ High ☐ Moderate ☑ Low

Roost potential comments: No potential roosts observed

M. septentrionalis roost tree potential is: ☐ High ☐ Moderate ☑ Low

Roost potential comments: No potential roosts observed

Subcanopy clutter: ☐ Closed ☐ Moderate ☑ Open

Subcanopy consists largely of: ☑ Lower Branches of Canopy Trees ☑ Saplings ☐ Shrubs

Common Subcanopy Species: Liquidambar styraciflua Celtis laevigata Quercus imbricaria

Check all that apply:

- ☑ Mature Upland Forest
- ☐ Young Upland Forest
- ☐ Mature Lowland Forest
- ☐ Young Lowland Forest
- ☐ Recently Logged Forest
- ☐ Pine Plantation
- ☑ Woodlot/Forest Edge
- ☐ Old Field
- ☑ Crop/Pasture Land
- ☐ Stream/River
- ☐ Emergent Wetland
- ☐ Forested Swamp
- ☐ Shrub/scrub Swamp
- ☐ Vernal Pool
- ☐ Deepwater Lake/Pond
- ☐ Developed Land
- ☐ Other:

Herbaceous Cover: ☐ Sparse ☐ Moderate ☑ Dense

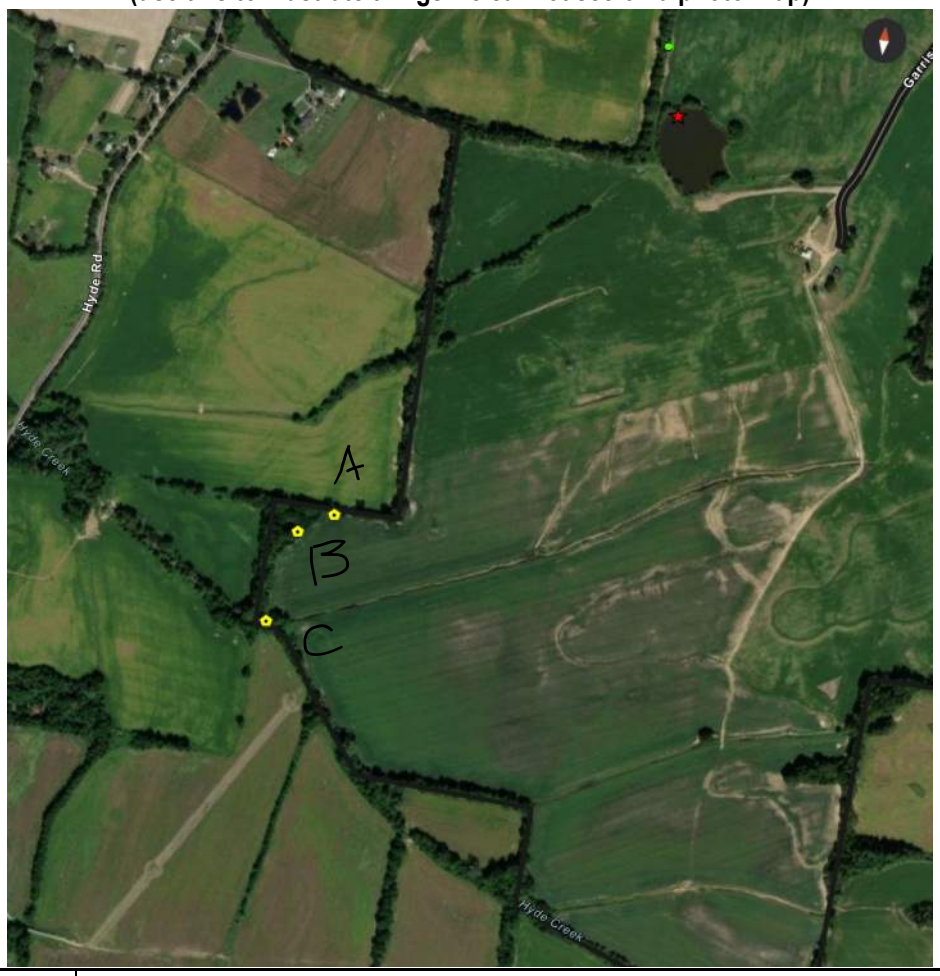
Property of: Environmental Solutions & Innovations, Inc.
4525 Este Avenue. Cincinnati, OH 45232 (Phone: 513-451-1777)

HABITAT ASSESSMENT (continued)

Project #:	2093	State/County:	TN / Lauderdale	Site Name/#:	002	Initials:	DCB

N

SKETCH NETS and/or DETECTORS
(use this to illustrate things we cannot see on a photo-map)



LEGEND

Net:

Detector:

DETAILED HABITAT DESCRIPTION & COMMENTS

Ag fields with mostly mature treeline between them and a drainage ditch and small creek

Nearby. Area occasionally floods. Forested portion is likely a lowland, although not a wetland.

ESI **SURVEY YEAR** 2023

Property of: Environmental Solutions & Innovations, Inc.
4525 Este Avenue. Cincinnati, OH 45232 (Phone: 513-451-1777)

BAT CAPTURE DATA

Project #: 2093 **Date:** 30 June 2023

Project Name: Ripley Solar **Site Name/#:** 002

State: Tennessee **County:** Lauderdale

Device ID #: 458

Permitted Biologist: Darwin Brack (full name)

Other Field Staff: Luca Iacobucci (full name)

State Permit #: 5932

Federal Permit #: ES02373A

WEATHER DATA				
Time (xxxx h)	Temp (°C)	Wind Speed (estimated – see chart)	% Cloud Cover (estimated)	Comments
2020	88	1-3	0	
2050	86	0	0	
2120	85	0	0	
2150	85	0	0	
2220	84	0	0	
2250	83	0	0	
2320	82	0	0	
2350	82	0	0	
0020	81	0	0	
0050	81	0	0	
0120	81	0	0	

Net/Trap/ Detector	Net/Trap/ Detector #	Latitude	Longitude	Length (m)	Height (m)	Time Up	Time Down	Picture #	Waypoint #
Net	A	35.714804	89.524840	9	6	2020	0120		
Net	B	35.714495	89.525446	4	3	2020	0120		
Net	C	35.713176	89.525791	9	6	2020	0120		

Net Placement/Site Description: Nets A and C placed over cut between Ag fields. Net B placed over trail connecting ag field/forest edge to small forested pond.

Capt #	Net/ Trap	Species	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[1]	Wt (g)	RFA (mm)	Belly[2] (F/M/E)	Wing Index* (0-3)	Comments Picture # /Guano/Hair Sample/Band #
		No Bat Captures									

[1] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓ (NR=Non-reproductive, PG=Pregnant, L=Lactating, PL=Post-Lactating; ↑=Ascended testes, ↓ Descende testes)

2 F=Full, M=Moderate, E=Empty

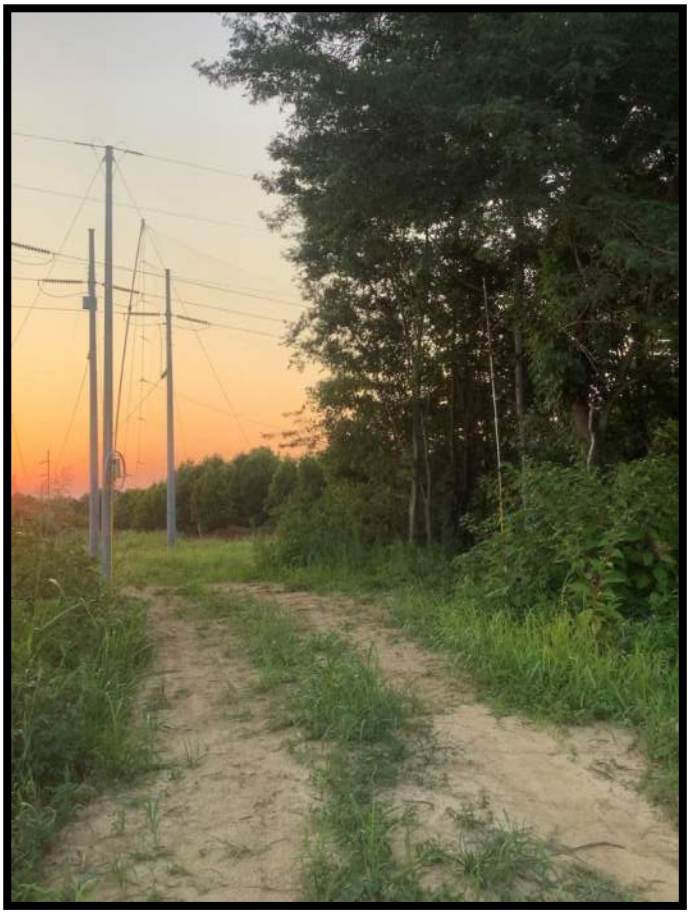
***** Refer to table on the back

APPENDIX C
PHOTOGRAPHS

Site 1 Net A

Site 1-Net B

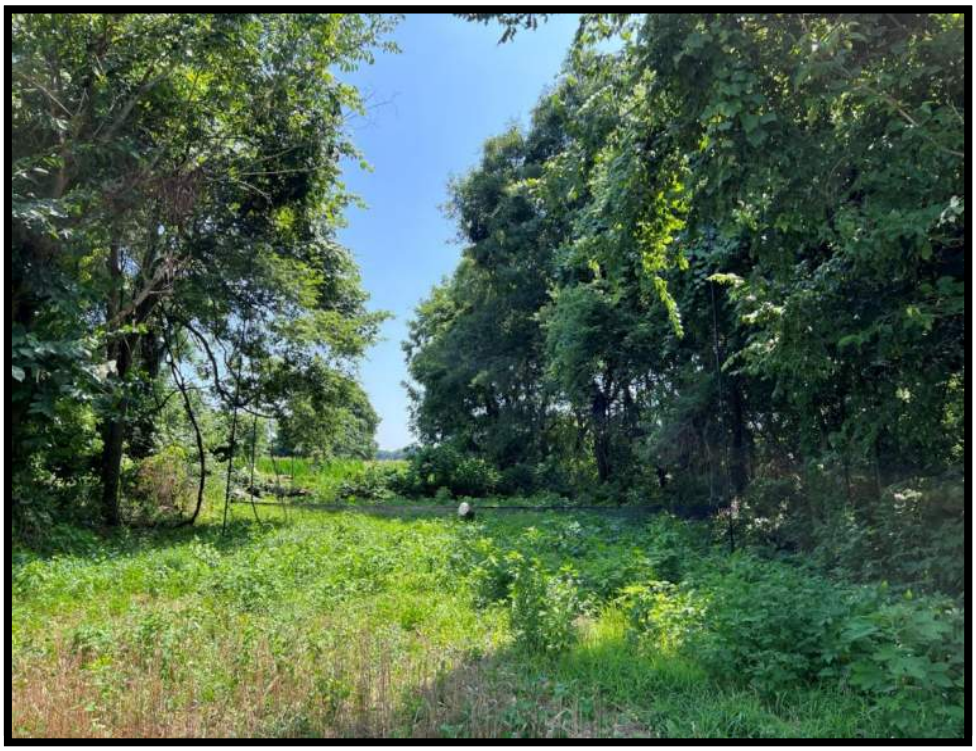
Site 1 Net C



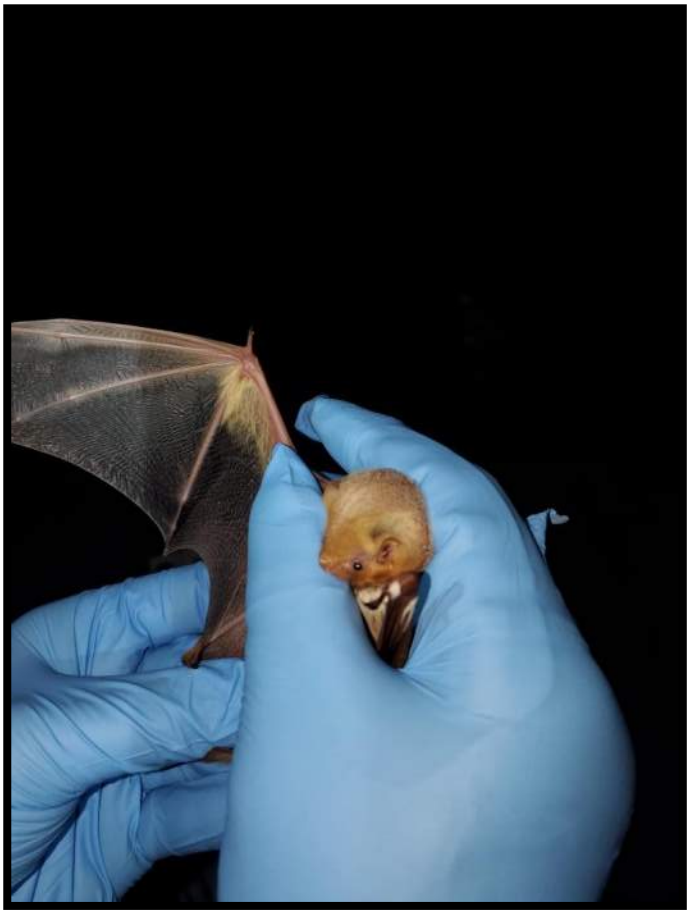
Site 1 Net D

Site 2 Net A

Site 2 Net B



Site 2 Net C



Eastern red bat (*Lasiurus borealis*)

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1201 Market Street, Suite C
Chattanooga, TN 37402-2714
423.414.3551

hdrinc.com

Appendix D – Cultural Resources-Related Correspondence and Supporting Information

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PHASE I ARCHITECTURAL SURVEY OF RIPLEY II SOLAR PROJECT LAUDERDALE COUNTY, TENNESSEE

Prepared by
TerraXplorations, Inc.

Prepared for
HDR Engineering, Inc. and the Silicon Ranch Corporation

Helping our clients through the cultural resource process

Doing the best job in every situation

Advancing our employees

April 2024

TerraXplorations, Inc.
1096 16th Ave. N
St. Petersburg, Florida 33704
TerraXplorations.com

HDR Engineering, Inc.
120 Bentwood Commons Way Suite 525
Bentwood, Tennessee 37207

Silicon Ranch Corporation
222 Second Ave S., Suite 1900
Nashville, Tennessee 37201

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PHASE I ARCHITECTURAL RESOURCES SURVEY OF RIPLEY II SOLAR PROJECT LAUDERDALE COUNTY, TENNESSEE

BY

Briane Shane, Terry Barbour, Elizabeth Southard,
David Dobbs, Samuel Johnson, and Margaret Schultz

Prepared by
TerraXplorations, Inc.
1096 16th Ave. N.
St. Petersburg, Florida 33704

Prepared for
HDR Engineering, Inc.
120 Bentwood Commons Way
Suite 525, Bentwood Tennessee 37027

And
The Silicon Ranch Corporation
222 Second Ave. S.
Suite 1900, Nashville, Tennessee 37201

Principal Investigator

Briane Shane

TerraX Project Number
23200

APRIL 2024
FINAL Report

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PHASE I ARCHAEOLOGICAL SURVEY OF RIPLEY II SOLAR PROJECT LAUDERDALE COUNTY, TENNESSEE

Prepared by
TerraXplorations, Inc.

Prepared for
HDR Engineering, Inc.
and
Silicon Ranch Corporation

March 2024

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Tuscaloosa, Alabama 35404
www.terraxplorations.com

HDR Engineering, Inc.
120 Brentwood Commons Way
Suite 525, Brentwood, Tennessee, 37207

Silicon Ranch Corporation
222 Second Ave S.
Suite 1900, Nashville, Tennessee, 37201

A PHASE I ARCHAEOLOGICAL SURVEY OF RIPLEY II SOLAR PROJECT, LAUDERDALE COUNTY, TENNESSEE

BY

Terry Barbour
Elizabeth Southard

Prepared by
TerraXplorations, Inc.
3523 18th Avenue Northeast
Tuscaloosa, Alabama 35406

Prepared for
HDR Engineering, Inc.
120 Brentwood Commons Way
Suite 525, Brentwood, Tennessee, 37207

and

Silicon Ranch Corporation
222 Second Ave S.
Suite 1900, Nashville, Tennessee, 37201

Co-Principal Investigators
Terry Barbour

Elizabeth Southard

TerraX Report No. 2022.153

March 2024

Final Report

MANAGEMENT SUMMARY

TerraXplorations, Inc. (TerraX) of Tuscaloosa, Alabama was contracted by HDR Engineering, Inc. (HDR) of Chattanooga, Tennessee to conduct a Phase I archaeological survey ahead of the Ripley II solar energy array project. The survey area is located in a rural setting southeast of Ripley, Tennessee. The primary purpose of the Phase I archaeological resources survey was to locate and evaluate the eligibility of any archaeological resources (artifacts or features ≥50 years old) within the survey area for nomination to the National Register of Historic Places (NRHP). The Area of Potential Effects (APE) is defined by Title 36 Code of Federal Regulations (CFR) § 800.16(d) as the geographic area or areas within which a project may directly or indirectly cause alterations in the character or use of historic properties. To encompass all potential improvements, the APE was defined to include the project footprint and a buffer of 0.5 mile. The project footprint, where potential direct impacts from the project would occur, includes the proposed 434.6 acres (ac) (175.87 hectares [ha]) solar facility footprint known as the Ripley II Site.

The archaeological survey was conducted between November 14 and December 23, 2022. The survey was directed by Principal Investigators Elizabeth Southard, RPA, and Terry Barbour, RPA. The survey crew included Wade Tidwell, RPA (Field Director), Christopher Rivers, Kevin Rowland, Michael Gonzalez, Cory Rice, Vincent Barbaretta, and Todd Cote. The field survey was completed with a total of approximately 984 person-hours. A search of the records maintained by the Tennessee Division of Archaeology (TDOA) conducted prior to fieldwork revealed three previously identified sites were within the project footprint (40LA216, 40LA217, and 40LA218). Each site is classified as a historic-rural domestic artifact scatter.

There were two components to the archaeological survey of the project footprint. The first consisted of a shovel testing regime at locations where GeoTech coring was to occur. The second was a visual inspection and systematic shovel testing regime of the project footprint. An archaeological survey of the proposed GeoTech bore hole locations was conducted on December 1st–2nd, 2022. The survey of bore hole locations was completed in approximately 24 person-hours. In coordination with the TDOA, a records search was conducted prior to fieldwork. The background research revealed no previously recorded archaeological sites intersected the 20 bore hole locations and no previously conducted cultural resource surveys intersected these locations. Each of the bore hole locations were investigated via a combination of visual inspection, shovel testing, and auger testing. Of the 20 investigated bore hole location areas, all were negative for cultural material. Furthermore, no cultural material was recovered during shovel testing or identified on the surface in the immediate area of each proposed bore hole location.

The entire project footprint was surveyed via pedestrian walk-over and shovel testing. Shovel testing consisted of 965 shovel tests, with an additional 189 delineation tests. Shovel tests produced 949 negative tests, 11 positives, and five no digs. No digs occurred in areas of standing water, roadbeds, and slopes greater than 15 percent rise where a 5-meter (m) offset was not possible. The delineation tests produced 156 negative tests, 22 positives, and 11 no digs. As a result of the survey, a total of three archaeological sites (40LA232, 40LA233, and 40LA231), five isolated finds (IF) (IF-1, IF-2, IF-3, IF-4, and IF-5), and three field loci (Field Locus [FL]-1, FL-6, and FL-15) were recorded within the survey area. Additionally, three previously recorded sites (40LA216, 40LA217, and 40LA218) within the project footprint were relocated by the current survey efforts. The historic artifacts from relocated sites during the current investigation are consistent with the historic artifact assemblages from the previous investigation (see Bradley and Mohr 2015). As a result, the findings from this investigation were incorporated into those previously identified sites. The site boundaries of 40LA217 and 40LA218 were slightly expanded through delineation efforts. TerraX recommends no change to the NRHP status of not eligible for these three resources. Sites 40LA216, 40LA217, and 40LA218 will be directly impacted physically by the Ripley II project. However, no further work is recommended at these sites since all lack integrity and significant data potential.

Of the three newly identified sites, 40LA232 and 40LA233 are multi-component artifact scatters. The historic components date to 1930 for 40LA232 and 1947 for 40LA233, based on the historic topographic map and aerial review, and artifactual analysis. Until the late-twentieth century, several structures were located within the 40LA232 and 40LA233 site areas. The Precontact components associated with these sites consist of

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TENNESSEE VALLEY AUTHORITY

400 West Summit Hill Drive, Knoxville, Tennessee 37902

May 25, 2023

Mr. E. Patrick McIntyre, Jr.
Executive Director
and Historic Preservation Officer
Tennessee Historical Commission
2941 Lebanon Pike
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA), RIPLEY SOLAR, PHASE I ARCHAEOLOGICAL SURVEY, LAUDERDALE COUNTY, TENNESSEE (35.7219600 -89.4849059) (TVA TRACKING - CRMS 32898998595)

In September 2022, TVA consulted with your office regarding the proposal to enter into a Power Purchase Agreement with SR Ripley II, LLC. for an approximately 30-megawatt solar photovoltaic (PV) generating facility in Lauderdale County, Tennessee. TVA considers the area of potential effects (APE) to be the footprint where the solar array is to be constructed, any associated infrastructure and access roads as well as a 0.5-mile radius surrounding the solar arrays footprint with unobstructed view to the project area. In order to provide flexibility in design, the survey area encompasses approximately 507 acres.

SR Ripley II, LLC contracted HDR Engineering, Inc. (HDR) to conduct an archaeological survey. Attached is the resulting report titled *Phase I Archaeological Survey of Ripley II Solar Project, Lauderdale County, Tennessee*. A separate report and letter will be to your office regarding the results of the architectural survey.

HDR identified six new archaeological sites (Field Site [FS]-1, 40LA232, 40LA233, FS-6, 40LA231, and FS-15) and five isolated finds within the APE. Of the six newly identified sites, three were assigned state site numbers from the Tennessee Department of Archaeology (Sites 40LA232, 40LA233, and 40LA231). Sites not given a state trinomial site number are referred to by their alpha-numeric field site (FS) designation. Additionally, three previously recorded sites (40LA216, 40LA217, and 40LA218), were revisited. HDR recommends two of the six newly identified archaeological sites, FS-1 and FS-6, and all five of the isolated finds are not eligible for the National Register of Historic Places (NRHP) due to lack of integrity and/or limited data potential. The surveyed portions of sites 40LA232 and 40LA233 lack sufficient integrity and research potential for NRHP eligibility as they have been extensively disturbed by construction and demolition episodes, as well as agricultural activities. Given that each site was not able to be fully delineated due to survey area constraints, HDR recommends these sites' eligibility be listed as unknown/unassessed for NRHP inclusion under Criterion D, however, the proposed undertaking would have no adverse effects to the portion of the sites within the APE. HDR

recommends no change to the NRHP status of not eligible for the three previously recorded resources.

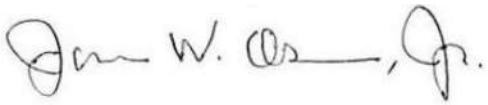
Site 40LA231 and the Wood Family Cemetery (FS-15) have been determined to possibly retain significant data potential and integrity to warrant eligibility for NRHP inclusion. Therefore, HDR has recommended that sites 40LA231 and the Wood Family Cemetery (FS-15) be avoided. TVA has read the enclosed report and agrees with the authors' recommendations. The boundaries of sites 40LA231 and FS-15, along with a 20-meter buffer, have been added to the "exclusion area" within the project boundary (see attached map). SR would avoid these exclusion areas and would not allow any development, disturbance, or other construction activities associated with the development of the project or future activities associated with the operation and maintenance of the solar array. In order to ensure avoidance of the site during the life of the project, SR and TVA would sign the attached draft legal agreement. TVA finds that, with the proposed avoidance plan, the undertaking would have no adverse effects to historic properties.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the NRHP.

Pursuant to 36 CFR Part 800.5(b) we are notifying you of TVA's finding of no adverse effect, providing the documentation specified in § 800.11(e); and inviting you to review the finding. Also, we are seeking your agreement with TVA's eligibility determinations and finding that the undertaking as currently planned will have no adverse effects on historic properties.

Please contact Michaelyn Harle by telephone (865) 632-2248 or by email, mharle@tva.gov with your comments.

Sincerely,



James W. Osborne, Jr.
Manager
Cultural Compliance

MSH:ERB
Enclosures
cc (Enclosures):
Ms. Jennifer Barnett
Tennessee Division of Archaeology
1216 Foster Avenue, Cole Bldg. #3
Nashville, Tennessee 37210

TENNESSEE VALLEY AUTHORITY

400 West Summit Hill Drive, Knoxville, Tennessee 37902

May 30, 2023

Mr. E. Patrick McIntyre, Jr.
Executive Director
And Historic Preservation Officer
Tennessee Historical Commission
2941 Lebanon Pike
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA), RIPLEY SOLAR, PHASE I ARCHITECTURAL SURVEY, LAUDERDALE COUNTY, TENNESSEE (35.7219600 -89.4849059)(TVA TRACKING - CRMS 32898998595)

In September 2022, TVA consulted with your office regarding the proposal to enter into a Power Purchase Agreement with SR Ripley II, LLC. for an approximately 30-megawatt solar photovoltaic (PV) generating facility in Lauderdale County, Tennessee. TVA recommends that the area of potential effects (APE) be considered as the area of proposed ground-disturbance, where physical effects could occur, as well as areas within a half-mile radius of the project within which the project would be visible, where visual effects on above-ground resources could occur.

SR Ripley II, LLC. (SR) contracted TerraXplorations, Inc. (TerraX) to conduct an architectural survey. Attached is the resulting report titled *Phase I Architectural Resources Survey of Ripley II Solar Project, Lauderdale County, Tennessee.* A separate consultation letter was previously sent to your office regarding the results of the Phase I archaeological survey.

TerraX identified 114 primary historic-age architectural resources within the APE, all of which are newly recorded and include 111 individual buildings (HS-1 – HS-111), two historic districts (HS-113 and HS-114), and one cemetery (HS-112). TerraX recommends that HS-112 – HS-114 are eligible for listing in the National Register of Historic Places (NRHP). The Crescent Heights Historic District (HS-113), consisting of 18 contributing resources (HS-26 – HS-43), is recommended under Criteria A and C as it reflects the growth of public-funded housing in Ripley during the mid-century. The Robinson Subdivision Historic District (HS-114), with 22 contributing resources (HS-55 – HS-76), is recommended eligible under Criteria A and C as it reflects the growth and expansion of Ripley, specifically postwar suburban development design. As part of the undertaking, no property will be acquired from either of the historic districts and no historic fabric associated with the resources will be removed or altered by the project. Crescent Heights is located 0.23 mile to the southeast of the historic district with a line of trees between the proposed project area and the historic district creating a visual buffer between the proposed project area. Regarding the Robinson Subdivision, there is a visual buffer of trees along the southeast edge of the district and the northwest edge of the proposed project minimizing

viewshed effects. TerraX recommends that the proposed undertaking will have no adverse effect on the Crescent Heights or Robinson Subdivision Historic Districts.

TerraX determined the Wood Family Cemetery (FS-15) eligible for NRHP inclusion. In a previous letter regarding the results of the archaeological survey, TVA stated that SR will avoid the cemetery with a 20-meter buffer. This is exclusion area would not allow any development, disturbance, or other construction activities associated with the development of the project or future activities associated with the operation and maintenance of the solar array. In our previous letter, TVA provided the draft legal agreement for avoidance of historic properties within the project footprint. TVA finds that, with the proposed avoidance plan, the undertaking would have no adverse effects to FS-15.

TerraX recommends the remaining 71 historic structures not eligible due to lack the historical significance and architectural distinction. TVA has read the enclosed report and agrees with the recommendations of the authors that HS-112 and HS-113 are eligible for the NRHP.
TVA does not agree with TerraX that HS-114 (The Robinson Subdivision Historic District) is eligible for listing under Criteria A and C. The report did not provide enough information to conclusively state that the Robinson Subdivision was a planned development that met the Federal Housing Association (FHA) requirements. The Robinson Subdivision lacks features required by the FHA in a planned development. FHA developed subdivisions had detailed requirements that must be met. The guidelines set forth by the FHA created a subdivision with a sense of enclosure or a sequestered street system from existing roads by the means of one or at the most three ingress/egress for the purpose of a sense of security. FHA standards included a main entrance route, side streets that led off the main street, loop streets, curvilinear streets, and cul-de-sacs with consistent setbacks. The Robinson Subdivision features one loop street that carries two names, Robinson Drive and Lynn Street that merge. There are not side streets that merge unto the main entrance street in the Robinson Subdivision. Additionally, setbacks are not consistent. FHA required all subdivisions to have deed restrictions and covenants. Research has not confirmed this is an FHA planned subdivision or if the plat for the Robinson Subdivision references the required deed restrictions and covenants required by FHA. Thus, TVA finds the Robinson Subdivision is not meet the requirements for Criterion A, as it is not associated with significant events or patterns in the community history or a group of residents who have made significant contributions to the history of the town or county. The Robinson Subdivision is not significant for its architecture as a planned subdivision under Criterion C. There is no evidence to support the residential houses were designed by architects or developers which would lend the design significance in relation to a local context. Furthermore, for architecture to be significant as part of a planned subdivision the organization of space must be expressed as it is an essential element in subdivision planning. TVA finds Robinson Subdivision lacks historical and architectural integrity. The architectural changes to the residential houses occurred after the subdivision was fully developed and has a direct effect on the historical integrity. The cumulative effect of multiple dwelling alterations detracts from the overall integrity of the Robinson Subdivision.

TVA does agree with TerraX that the proposed undertaking would not adversely affect HS-113 (or HS-114 should it be considered eligible) due to the vegetation buffer that would minimize viewshed effects and that the proposed undertaking would not affect the location, design, materials, and workmanship conveyance of the property's significance under Criterion C.

Pursuant to 36 CFR Part 800.5(c) we are notifying you of TVA's finding of no adverse effect; providing the documentation specified in § 800.11(e); and inviting you to review the finding. Also, we are seeking your agreement with TVA's eligibility determinations and finding that the undertaking as currently planned will have no adverse effects on historic properties. TVA agrees that the proposed undertaking would have no effect to historic properties. Please contact Michaelyn Harle by telephone (865) 632-2248 or by email, mharle@tva.gov with your comments.

Sincerely,

Michaelyn Harle
Supervisor, Cultural Projects Reviews
Cultural Compliance

MSH:ERB
Enclosures
cc (Enclosures):
Ms. Jennifer Barnett
Tennessee Division of Archaeology
1216 Foster Avenue, Cole Bldg. #3
Nashville, Tennessee 37210

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From: TN Help <tnhelp@service-now.com>
Sent: Friday, June 16, 2023 1:49 PM
To: Beliles, Emily <ebeliles@tva.gov>
Cc: Harle, Michaelyn S <mharle@tva.gov>
Subject: Ripley Solar Project, CRMS 32898998595 - Project # SHPO0001869

TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

2023-06-16 07:43:49 CDT

Michaelyn Harle
TVA

RE: Tennessee Valley Authority (TVA), Ripley Solar Project, CRMS 32898998595,

Project#: SHPO0001869, Lauderdale County, TN

Dear Michaelyn Harle:

Pursuant to your request, this office has reviewed the architectural survey report for the above-referenced undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicants for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

Based on the information provided, we concur that the Crescent Heights Historic District (HS 113) is eligible for listing in the National Register of Historic Places. We further concur that the Robinson Subdivision (HS 114) is not eligible for listing in the National Register of Historic Places. Our office did not have enough information to make eligibility determinations on Forerunner Baptist Church (HS 99 and HS 100) or the Wood Family Cemetery (HS 112). The two properties associated with Forerunner Baptist Church should be more fully evaluated for potential significance under Criterion A. If this is an African American church, then the property should also be evaluated for National Register eligibility under the "Historic Rural African-American Churches in Tennessee, 1850-1970)" Multiple Property Documentation Form. More context on the settlement history of this area and the family are needed to evaluate the eligibility of the Wood Family Cemetery.

To help assess effects please resubmit the avoidance area for the Wood Family Cemetery that shows both the buffer area and cemetery boundary. It would also be helpful to submit additional information about the solar project (ie. height of solar arrays and confirmation that no taller structures are planned for the project area and if there are, where they will be located and how tall they will be) since many of the historic resources or potential historic resources are close to the project boundary.

Include the Project # if you need to submit any additional information regarding this undertaking. Questions and comments may be directed to Casey Lee, who drafted this response, at Casey.Lee@tn.gov, +16152533163. We appreciate your cooperation.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

From:	TN Help
To:	Beliles, Emily
Cc:	Harle, Michaelyn S
Subject:	Ripley Solar Project, CRMS 32898998595 - Project # SHPO0001869
Date:	Tuesday, February 6, 2024 10:21:40 AM
Attachments:	State Seal for TDEC.pngx patricksignature.pngx

TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

2024-02-05 13:25:02 CST

Micahelyn Harle

RE: Tennessee Valley Authority (TVA), Architecture Review, Ripley Solar Project, CRMS 32898998595, Project#: SHPO0001869, , Lauderdale County, TN

Dear Micahelyn Harle:

We have reviewed the revised architectural survey report you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act.

We still require additional information before we can concur with the effects assessment for the Wood Family Cemetery. As previously requested, we require a map that shows the cemetery boundary as well as the 20 meter buffer. The map provided on page 525 of the report only shows an avoidance area. We require this additional information as the TVA is assuming the Wood Family Cemetery is eligible under Criterion A for settlement. Therefore, setting is an important aspect of integrity to consider when assessing effects. Our office needs to know how much vegetation cover is between the cemetery and the proposed undertaking.

Our office concurs that the Crescent Heights Historic District, Forerunner Baptist

Church, and Rice Park Office Building are eligible and will not be adversely affected by the proposed undertaking.

Upon receipt of this additional documentation, we will continue our review of this undertaking as quickly as possible. Please be advised that until this office has provided you a final written comment on this undertaking, you have not met your Section 106 obligation under federal law. Include the Project # when submitting additional information regarding this undertaking. Questions and comments may be directed to Casey Lee, who drafted this response, at , + . We appreciate your cooperation.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

Ref:MSG12187456_6ufxJMuI715tTTNQR8p

From: Harle, Michaelyn S
To: McLamb, Erica S; Nichols, Kristi
Subject: FW: Ripley Solar Project, CRMS 32898998595 - Project # SHPO0001869
Date: Friday, March 1, 2024 1:22:06 PM
Attachments: State Seal for TDEC.pngx
patricksignature.pngx

FYI

From: TN Help
Sent: Friday, March 1, 2024 11:03 AM
To: Beliles, Emily
Cc: Harle, Michaelyn S
Subject: Ripley Solar Project, CRMS 32898998595 - Project # SHPO0001869

TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

03-01-2024 10:02:12 CST

Micahelyn Harle
TVA

RE: Tennessee Valley Authority (TVA), Ripley Solar Project, CRMS 32898998595, Project#: SHPO0001869, Lauderdale County, TN

Dear Micahelyn Harle:

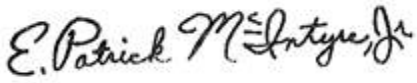
In response to your request, we have reviewed the archaeological report of investigations and accompanying documentation submitted by you regarding the

above-referenced undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicants for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

Considering the information provided, we concur that no archaeological resources eligible for listing in the National Register of Historic Places will be affected by this undertaking. If project plans are changed or archaeological remains are discovered during project construction, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act. Complete and/or updated Tennessee Site Survey Forms should be submitted to the Tennessee Division of Archaeology for all sites recorded and/or revisited during the current investigation. Please provide your Project # when submitting any additional information regarding this undertaking. Questions or comments may be directed to Jennifer Barnett, who drafted this response, at _____ .

Your cooperation is appreciated.

Sincerely,



E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

Ref:MSG12675132_NtHgknjthWIi2IMoK1Z

TENNESSEE VALLEY AUTHORITY
400 West Summit Hill Drive, Knoxville, Tennessee 37902

March 26, 2024

Mr. E. Patrick McIntyre, Jr.
Executive Director
And Historic Preservation Officer
Tennessee Historical Commission
2941 Lebanon Pike
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

REPLY: TENNESSEE VALLEY AUTHORITY (TVA), RIPLEY II SOLAR, WOOD FAMILY CEMETERY, LAUDERDALE COUNTY, TENNESSEE (35.7219600 -89.4849059) (TVA TRACKING - CRMS 32898998595) (Project#: SHPO0001869)

By this letter, TVA is responding to your February 5th, 2024, letter regarding TVA's finding that no historic architectural properties would be affected by TVA's proposal to enter into a Power Purchase Agreement with SR Ripley II, LLC. for an approximately 30-megawatt solar photovoltaic generating facility in Lauderdale County, Tennessee. In your letter you concurred that the Crescent Heights Historic District, Forerunner Baptist Church, and Rice Park Office Building are eligible and will not be adversely affected by the proposed undertaking. You also requested additional information regarding the effects assessment for the Wood Family Cemetery, specifically effects to the setting of the cemetery. In your letter, you state, "We require this additional information as the TVA is assuming the Wood Family Cemetery is eligible under Criterion A for settlement. Therefore, setting is an important aspect of integrity to consider when assessing effects. Our office needs to know how much vegetation cover is between the cemetery and the proposed undertaking."

TerraX originally recommended Wood Family Cemetery eligible under Criteria A and D, which TVA agreed. Based on further discussion with your office, it is TVA's opinion that the Wood Family Cemetery does not retain sufficient integrity to be eligible under Criterion A. Although background research found that the Wood Family Cemetery is one of the oldest cemeteries established within the Ripley area and some of the first Euro-American settlers of Lauderdale County may be interred within the cemetery boundaries, additional research would be required to determine the burial location of Sabret and Mary Wood, as well as various other family members. As no markers are retained, the location of their interment is unknown within the cemetery boundaries. In addition, background research suggests that the family did not have a significant impact on settlement patterns, exploration, or development of Lauderdale County or Ripley. Therefore, it is TVA's opinion that the Wood Family Cemetery does not rise to the level of significance to make the resource eligible under Criteria A or B. Further, the cemetery lacks its integrity of setting, design, materials, workmanship, and feeling. No grave markers or cemetery boundaries are extant on the property and property has not been maintained. The internal setting of the cemetery has been diminished due to the lack of maintenance resulting in

the apparent total loss of boundary features, above-grade grave markers, or other distinguishing features of a cemetery. Currently there is a dense stand of trees on the eastern half of the cemetery that first appears in the 1947 aerial. While TVA finds that the cemetery is not associated with significant events or retains integrity to warrant an eligibility determination under Criterion A, TVA still maintains that the resource could be eligible under Criteria Consideration D as an archaeological resource, for the potential research value into early-settler burial patterns. Given the 20-meter ground disturbance buffer, the proposed undertaking would not effect the Wood Cemetery should it be eligible under Criterion D.

With this additional information in place, TVA maintains the proposed undertaking would not adversely affect historic properties.

Pursuant to 36 CFR Part 800.5(c) we are notifying you of TVA's finding of no adverse effect, providing the documentation specified in § 800.11(e); and inviting you to review the finding. Also, we are seeking your agreement with TVA's revised eligibility determination for Wood Cemetery and finding that the undertaking as currently planned would have no effect to the Wood Cemetery should it be eligible under Criterion D.

If you have any questions, please contact Michaelyn Harle by email, mharle@tva.gov.

Sincerely,

Michaelyn Harle
Manager, Cultural Projects Reviews
Cultural Compliance

MSH:ERB

From: McLamb, Erica S
To: Williams, Karsen
Cc: RichardsonSeacat, Harriet
Subject: FW: Ripley Solar Project, CRMS 32898998595 - Project # SHPO0001869
Date: Thursday, March 28, 2024 6:58:05 AM
Attachments: State Seal for TDEC.pngx
patricksignature.pngx

From: TN Help
Sent: Wednesday, March 27, 2024 12:09 PM
To: Beliles, Emily
Cc: Harle, Michaelyn S
Subject: Ripley Solar Project, CRMS 32898998595 - Project # SHPO0001869

TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

2024-03-27 11:04:42 CDT

Michaelyn Harle
TVA

RE: Tennessee Valley Authority (TVA), Architecture Review, Ripley Solar Project, CRMS 32898998595, Project#: SHPO0001869, , Lauderdale County, TN

Dear Michaelyn Harle:

Pursuant to your request, this office has reviewed documentation concerning the above-referenced undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicants for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

Based on the additional information provided, we concur that the Wood Family Cemetery is not eligible under Criteria A and B as due to lack of significance. We still concur that the Crescent Heights Historic District, Forerunner Baptist Church, and Rice Park Office Building will not be adversely affected by the undertaking.

This office has no objection to the implementation of this project as currently planned. If project plans are changed, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act. Include the Project # if you need to submit any additional information regarding this undertaking. Questions and comments may be directed to Casey Lee, who drafted this response, at , +1 . We appreciate your cooperation.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

Ref:MSG13121543_afQYJjFoN9CVGohPuLd

TENNESSEE VALLEY AUTHORITY

400 West Summit Hill Drive, Knoxville, Tennessee 37902

April 29, 2024

Mr. E. Patrick McIntyre, Jr.
Executive Director
and State Historic Preservation Officer
Tennessee Historical Commission
2941 Lebanon Pike
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA), RIPLEY SOLAR, FINAL REPORT, LAUDERDALE COUNTY, TENNESSEE (35.7219600 -89.4849059)(TVA TRACKING - CRMS 32898998595) * SHPO0001869)

Please find enclosed the final report titled *Phase I Archaeological Survey of Ripley II Solar Project, Lauderdale County, Tennessee.* An electronic version has also been submitted to your office. TVA received concurrence from your office for this undertaking in a letter dated March 27, 2024.

This fulfills TVA's obligations under section 106 for this project. If project plans are altered or there are inadvertent discoveries during construction, TVA will consult with your office. If you have any questions or comments, please contact Michaelyn Harle at mharle@tva.gov.

Sincerely,

Michaelyn Harle
Manager, Cultural Projects Reviews
Cultural Compliance

MSH:ERB

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Appendix E – Public Notice

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TENNESSEE VALLEY AUTHORITY

YOU'RE INVITED

TVA Wants Your Comments on the Ripley II Solar Project

As a neighbor of the area for the proposed Ripley II Solar Project, Tennessee Valley Authority (TVA) would like to hear from you. TVA is conducting a public comment period on the Draft Environmental Assessment (EA) for the purchase of electricity generated by the proposed Ripley II Solar Project in Lauderdale County, TN. The EA will assess the potential environmental effects of constructing, operating and maintaining the proposed 30-megawatt (MW) alternating current (ac) solar facility.

The Solar Facility would be constructed and operated by SR Ripley II, LLC, a wholly-owned subsidiary of Silicon Ranch Corporation. The project would occupy approximately 194 acres on a 490-acre tract of land currently zoned for High Density/Mobile Home and General Business and is comprised mostly of agricultural fields. Public comments are invited beginning July 15 through August 16, 2024.

Comments may be submitted online at tva.com/NEPA, or by email at nepa@tva.gov.

24-1038 0724

Tennessee Valley Authority
1101 Market Street
Chattanooga, TN 37402

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The 30-day public comment period begins July 15, 2024 and will end on August 16, 2024. To be considered, mailed comments must be postmarked, or emailed comments timestamped, by August 15, 2024.

Comments may be emailed or mailed to:
nepa@tva.gov

Erica McLamb

Tennessee Valley Authority

1101 Market St. Chattanooga, TN

37402

Please note that any comments received, including names and addresses, will become part of the project administrative record and will be available for public inspection.