

Appendix F – Biological Resources

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Appendix F.1 – USFWS Consultation Documentation

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Tennessee Ecological Services Field Office

FWS Log No: 2023-0135535

The Service concurs with your effect determination(s) for resources protected by the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). This finding fulfills the requirements of the Act. If project design changes are made or new information becomes available, please submit new plans for review.

NICOLE SIKULA

Digitally signed by NICOLE SIKULA
Date: 2023.12.27 12:18:40 -06 00'

Acting Field Supervisor

Date



400 West Summit Hill Drive, Knoxville, Tennessee 37902

November 28, 2023

Mr. Daniel Elbert
U.S. Fish and Wildlife Service
Tennessee Field Office
446 Neal Street
Cookeville, Tennessee 38501

Dear Mr. Elbert:

TENNESSEE VALLEY AUTHORITY (TVA) – KINGSTON FOSSIL PLANT (KIF)
RETIREMENT– REQUEST FOR CONCURRENCE – 2023-0135535

In order to address the performance challenges that come with an aging Coal Fleet, TVA is proposing to retire and demolish KIF. To adapt to a changing generation portfolio, TVA is considering constructing and operating a Combined Cycle gas (CC) plant on the existing KIF Reservation. TVA proposes to pair the CC plant with a dual-fuel Aero CT Plant and new switchyard, a 3 to 4 MW solar site, a 100 MW Battery Energy Storage System (BESS), new transmission line (TL) infrastructure and connections on the Kingston Reservation, and upgrades to TLs on and off the KIF site. TVA proposes to install fiber-optic ground wire along approximately 1 mile of existing TVA TL originating within the existing TL corridor on the KIF Reservation as well as to upgrade TLs along approximately 43.7 miles of Rights of Ways (ROWs) in Anderson, Roane, and Cumberland Counties, Tennessee. More details about the scope and potential impacts of this project and the other alternatives considered can be found in the draft Environmental Impact Statement (EIS) available online at:

<https://www.tva.com/environment/environmental-stewardship/environmental-reviews/nepa-detail/kingston-fossil-plant-retirement>. In the Draft EIS, TVA has identified the CC Plant/Aeroderivative CT alternative as its preferred alternative and is initiating the Section 7 consultation for that alternative. Updated maps and select biological reports of the “action areas” for TVA’s preferred alternative are attached. Additional reports and maps are available upon request.

TVA is initiating this consultation for its proposed actions at the existing KIF plant site and the proposed transmission upgrades. Comprehensive field surveys have been conducted across the entire action area. Additional presence/absence surveys for federally listed bats were performed on the KIF Site. A review of the TVA Regional Natural Heritage database and the U.S. Fish and Wildlife Service Information for Planning and Consultation (IPaC) website identified 38 species listed as federally endangered, threatened, candidate for listing under the Endangered Species Act (ESA), or delisted and monitored under the Act, that have the potential to occur within the counties in which TVA has proposed actions: Roane, Cumberland and Anderson Counties, Tennessee. These species include four plants (Cumberland rosemary, Hart’s-tongue fern, Virginia spirea, and white fringeless orchid), twenty-three mussels (Alabama lampmussel, birdwing pearlymussel, cracking pearlymussel, Cumberland bean, dromedary

pearlymussel, fanshell, finereyed pigtoe, green blossom pearly mussel, orangefoot pimpleback, pink mucket, purple bean, ring pink, rough pigtoe, rough rabbitsfoot, sheepsnose mussel, shiny pigtoe, spectaclecase, tan riffleshell, Tennessee bean, turgid blossom pearlymussel, white wartyback), one snail (Anthony's riversnail), five fish (Laurel dace, sickle darter, slender chub, spotfin chub, and yellowfin madtom), two birds (bald eagle and whooping crane), four mammals (gray bat, Indiana bat, northern long-eared (NLEB), and tricolored bat), and one insect (monarch butterfly) that have the potential to occur within Roane, Cumberland and Anderson counties, based on historic range, proximity to known occurrence records, biological characteristics, and/or physiographic characteristics. Federally designated critical habitat for spotfin chub also exists within the project area.

Comprehensive site surveys were conducted by TVA biologists in Summer 2019, Spring 2022, and Winter 2023 for plants and animals to determine whether suitable habitat for federally listed species occurs on the KIF reservation. Wetlands and stream surveys were performed on the KIF Reservation by TVA in March 2022. Aquatic resources on Kingston Reservation include three perennial streams, four intermittent streams, seven ephemeral channels, 19 other wet weather conveyances (WWC; such as ditches and swales), seven ponds, and 19 wetlands totaling approximately 4.6 acres. Site design aims to avoid and minimize impacts to aquatic resources to the extent practicable. Due to the location of these features and consideration of other site constraints, complete avoidance may not be achievable. It is anticipated that up to 3,015 linear feet of WWC, one detention pond, and 0.17 acre of wetland could be permanently altered, but actual linear footage/acreage of impact is dependent on final site design. Treatment pond(s) for holding and treating process and stormwater flow would also be constructed; discharges from the operation of the proposed CC/Aero CT Plant would require compliance with a site-specific NPDES permit and compliance with all applicable regulations and conditions.

Botanical surveys conducted on the KIF Reservation in Roane County by TVA in summer of 2019 did not reveal the presence of any Hart's-tongue fern, Virginia spiraea, or white fringeless orchid or any suitable habitat that would support this species. ***TVA has determined that the proposed actions on the KIF reservation would have No Effect on Hart's-tongue fern, Virginia spiraea, or white fringeless orchid.*** Botanical surveys along the off-site TLs in Anderson, Roane, and Cumberland Counties, Tennessee occurred in summer of 2022 and 2023 by TVA and/or HDR to determine presence of the federally listed plants Cumberland rosemary, Hart's-tongue fern, Virginia spiraea, and white fringeless orchid or their habitats. Limited riverbank and river bar habitat for Virginia spiraea was present in project areas along the large rivers, the Emory River, and Poplar Creek. This type of habitat is also suitable for Cumberland rosemary; however, this species only occurs in Cumberland County and none of this habitat was present in the action areas in that county. Suitable habitat for white fringeless orchid, including boggy headwater streams, does not occur in the project area. Similarly, sinks or pit caves where Hart's-tongue fern is found also is not present in the project area. Due to lack of suitable habitat in proposed action areas, ***TVA has determined that the proposed actions in the off-site transmission line upgrade areas would have No Effect on Cumberland rosemary, Hart's-tongue fern, Virginia spiraea or white fringeless orchid.***

None of the federally listed aquatic species are considered to have suitable habitat on the KIF Reservation. No federally or state-listed mollusks were found during the 2005 survey of the Clinch River/Watts Bar Reservoir in the vicinity of the KIF Reservation (Yokley 2005). River substrates were noted as degraded (“sub-optimal”) and clay as the dominant substrates, overlain by varying thicknesses of mud. Green blossom pearlymussel and turgid blossom pearlymussel were delisted due to extinction in Tennessee. ***TVA has determined that the proposed actions on the KIF reservation would have No Effect on the following federally listed species: Alabama lampmussel, birdwing pearlymussel, cracking pearlymussel, Cumberland bean, dromedary pearlymussel, fanshell, finerayed pigtoe, green blossom pearlymussel, orangefoot pimpleback, pink mucket, purple bean, ring pink, rough pigtoe, rough rabbitsfoot, sheepsnose mussel, shiny pigtoe, spectaclecase, tan riffleshell, Tennessee bean, turgid blossom pearlymussel, white wartyback, Anthony’s riversnail, Laurel dace, sickle darter, slender chub, spotfin chub, and yellowfin madtom.***

Field surveys of the proposed off-site transmission line upgrades were performed during the summer of 2022 and 2023 by HDR biologists in Cumberland, Anderson, and Roane Counties, Tennessee. Approximately 8,280 LF of perennial streams, 9,098 LF of intermittent streams, 14,155 LF of WWC, 11 ponds, 46.8 acres of wetlands, and 24.08 acres of large creeks and rivers (consisting of the Obed River, Rocky Branch, Poplar Creek, East Poplar Creek, Bear Creek, Brushy Fork, and the Clinch River) were documented during field surveys. Upgrades to existing transmission lines have the potential to require conversion of forested wetlands during regular vegetative maintenance and indirectly impact bodies of water. Indirect, temporary impacts could occur in areas where streams are adjacent to or near existing structures or access roads. TL upgrades would be sited to avoid surface waters and wetlands, to the extent practicable, and any surface water and wetland impacts would be permitted as required. Where practicable, structures would not be placed within surface waters or wetlands, and impacts would be minimized by crossing surface waters at a perpendicular angle. Primary impacts to streams would be from temporary crossings to access existing structures requiring work, which would not result in any permanent impacts or loss of stream habitat for aquatic species. Where necessary, wetlands may be converted from forested to scrub-shrub or herbaceous to maintain the transmission line corridor. Approximately 5.75 acres of wetlands were classified as forested during wetlands surveys which may be permanently converted to scrub-shrub or emergent wetlands if necessary to assure the safe and reliable operation of the transmission facilities. Stumps, root wads, and root systems of trees in wetland areas cleared for the transmission line would be left in place. With the use of proper Best Management Practices (BMPs), Clean Water Act (CWA) Sections 404 and 401 permitting, and compliance with all federal, state, and local regulations, surface water and wetland impacts are expected to be temporary and minor. As mentioned above, green blossom pearlymussel and turgid blossom pearlymussel were delisted due to extinction in Tennessee. ***TVA has determined that the proposed actions in the off-site transmission line upgrade areas would have No Effect on the following federally listed species: Alabama lampmussel, birdwing pearlymussel, cracking pearlymussel, Cumberland bean, dromedary pearlymussel, fanshell, finerayed pigtoe, green blossom pearly mussel, orangefoot pimpleback, pink mucket, purple bean, ring pink, rough pigtoe, rough rabbitsfoot, sheepsnose mussel, shiny pigtoe, spectaclecase, tan riffleshell,***

Tennessee bean, turgid blossom pearl mussel, white wartyback, Anthony's riversnail, Laurel dace, sickle darter, slender chub, spotfin chub, and yellowfin madtom.

Federally Designated Critical Habitat for spotfin chub occurs within the mainstem Obed River, which is crossed by one of the transmission upgrade areas in Cumberland County. However, no impacts are proposed to the mainstem Obed River; therefore, there would be no impacts to Designated Critical Habitat. ***The proposed transmission upgrades would therefore not result in any adverse modifications to designated critical habitat for the spotfin chub.***

For several decades, adult and juvenile bald eagles have been observed perched in shoreline trees and structures at the KIF and flying over the Clinch and Emory Rivers by TVA Terrestrial Zoologists and KIF staff. The closest bald eagle nest on record to the KIF Reservation is approximately two miles away; however, this nest was inactive at the time of observation in 2021. The closest known active bald eagle nest to the KIF is located approximately four miles away on the Tennessee River, observed in February 2023 by TVA Terrestrial Zoologists. Due to the distance away, proposed actions would not impact any known bald eagle nests. The Clinch and Emory Rivers provide suitable foraging habitat for bald eagles. Neither bald eagles nor their nests were sighted during field surveys of the off-site transmission line corridors. The closest known bald eagle nesting record to an off-site transmission line corridor is approximately 2.38 miles away in Roane County. ***Bald eagle would not be impacted by the proposed actions on the KIF Reservation or actions in the off-site transmission line upgrade areas.***

The whooping crane is listed as Endangered in the Southwest (USFWS Region 2). Outside of this region (including Tennessee), the whooping crane is categorized as a non-essential experimental population. For the purposes of consultation, non-essential experimental populations are treated as threatened species on National Wildlife Refuge and National Park land (require consultation under 7(a)(2) of the ESA) and otherwise as a proposed species. There are no section 7(a)(2) requirements for proposed species, but Federal agencies must not jeopardize their existence (section 7(a)(4)). Migration habitat does not exist within the project area at the KIF Reservation or in proposed action areas of the off-site transmission line upgrades. ***Whooping crane would not be impacted by the proposed project actions on the KIF Reservation and actions in the off-site transmission line upgrade areas. The proposed action is not likely to jeopardize the continued existence of the species and, therefore, conference is not required.***

In proximity to the KIF Reservation, two hibernacula for gray bats are known from Roane County, the closest of which is approximately 5.78 miles away (Smith Cave). Smith Cave is also the closest known hibernacula for tricolored bats. Two hibernacula for northern long-eared bats are also known from Roane County, the closest of which is approximately 7.7 miles away (Cave Creek Cave). No hibernacula for Indiana bats are known from Roane County, Tennessee. The closest known summer records of gray and tricolored bats in Roane County are from 2019 and 2011 when TVA performed mist net surveys on TVA and DOE properties along the Clinch River, approximately 5.9 miles away. Northern long-eared bat was also captured at the TVA Clinch River property during the same 2011 surveys but was not captured in 2019 (6.2 mi away). The closest known Indiana bat record is from Anderson County, Indiana

bats were captured there during a 2013 survey on DOE property approximately 15.8 miles away.

Based on the ArcGIS Online Endangered Bats of Tennessee map created by Cookeville Field Office, the KIF site is situated entirely in an area where gray bats and Indiana bats are considered likely to occur. The very eastern edge of the KIF Site (end of the peninsula) is also considered an area where northern long-eared bat is likely to occur.

Phase 1 Bat Habitat Assessments and Phase 2 Presence/Absence Mist Net Surveys were conducted at the KIF Reservation using the 2020 and 2023 Range-Wide Indiana Bat and Northern Long-eared Bat Survey Guidelines (respectively) for determining presence/absence of Indiana bat, NLEB, and tricolored bat habitat and to determine probable presence/absence of each species on the KIF Reservation. No caves or mines were observed on the KIF Reservation. Buildings proposed for demolition at the KIF Reservation may offer suitable roosting habitat if left abandoned for several years; however, none have roosting bats at this time. Forest removal is primarily proposed for battery sites, a laydown area, and transmission corridors. The roosting quality of this forest ranges moderate to high in these areas for tricolored bat, Indiana bat, and NLEB. More disturbed areas include small-diameter sweet gum, loblolly pine, and poplars. Higher quality roosting habitats are mature deciduous forests with canopy trees ranging from 18-24" in diameter and tree species including white oaks, hickories, poplar, sweet gum, and sycamores. Some trees have suitable roosting characteristics for Indiana and northern long-eared bats (exfoliating bark, cracks, or crevices). Quality of habitat was determined by diversity of forest structure, size of trees, clutter in the understory, and presence of snags and other suitable roosting trees. Of the 117.6 acres of forest proposed for removal under alternative A, approximately 102.8 acres of this was high-quality roosting habitat and 11.6 acres was moderate-quality roosting habitat for tricolored bat, Indiana bat, and NLEB. Suitable foraging habitat for gray bat, Indiana bat, NLEB, and tricolored bat exists over bodies of water on the industrial portion of plant property, over wetlands and streams in the undeveloped areas, and over the Clinch and Emory Rivers. Additional foraging habitat for tricolored bat, Indiana bat, and NLEB exists over, along, and through forested areas. Phase 2 Presence/Absence Surveys were conducted on May 15, 17, and 18, 2023, with plans approved by the Cookeville Field Office. Twenty-seven bats were captured of the following species: big brown (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), and evening bat (*Nycticeius humeralis*). All individuals captured were adults. Three of the big brown bats were pregnant and another three were lactating. Two of the red bats were pregnant. No federally listed or federally proposed listed species of bats were captured. See attached Bat Survey Report. The mist-net survey efforts (30 net nights over three calendar days) performed for this project met the level of effort required by the 2023 US Fish and Wildlife Indiana bat and Northern long-eared Bat Survey Guidelines to determine probable absence of Indiana, northern long-eared, and tricolored bat. No federally listed bat species were captured indicating that these species are likely not present in the action area.

Prior to demolition, internal surveys of the buildings proposed for demolition would occur to ensure no colonies of any species of bats have been established while buildings are inactive. Should bats be observed, avoidance and minimization measures (such as seasonal restrictions)

would be put in place and the appropriate state and federal agencies (e.g., USFWS and Tennessee Wildlife Resources Agency) would be contacted to ensure compliance.

Proposed transmission upgrades would occur in Anderson, Cumberland, and Roane Counties, Tennessee. As mentioned above, gray bats, northern long-eared bats, and tricolored bats are known from Roane County, Tennessee; however, there are no known records of Indiana bats from this county. All four bat species are known from both Cumberland and Anderson Counties. The closest summer bat records to any off-site transmission lines are mist net captures of gray bats and northern long-eared bats from 2011 approximately 1.8 and 1.9 miles away in Cumberland and Roane Counties. The closest summer Indiana bat records are from 2013 approximately 2.8 miles away in Anderson County. The closest known gray bat (and presumably tricolored bat) hibernaculum is approximately one mile away in Anderson County. The closest Indiana bat hibernacula is approximately 10.7 miles away in Cumberland County. The closest known tricolored bat hibernacula are 0.27-0.35 miles from proposed transmission upgrades. Based on the Endangered Bats of Tennessee map established by Cookeville Field Office, the off-site transmission upgrade areas are all in areas where gray bats and Indiana bats are considered likely to occur. Some of the action areas in Roane and Anderson Counties are also considered areas where northern long-eared bat is likely to occur.

Ten caves are known within three miles of the transmission upgrades. The closest of these is approximately 0.27 miles away. Small numbers of tricolored bats (one to three bats per cave) are known from three caves 0.27 - 0.35 miles away from proposed upgrade areas in Roane County. No blasting would occur in association with the proposed upgrades; however, pole replacement required for upgrades could require drilling. Field review of the transmission line ROWs determined that 159.8 acres of moderate or high-quality summer roosting habitat for Indiana bat, northern long-eared bat, and tricolored bat exists along ROW associated with the transmission upgrades. Approximately 93.7 additional acres provide low-quality roosting habitat along the transmission line ROWs. No tree removal along existing ROWs is anticipated. The only anticipated impacts to trees in association with TL upgrades is the potential for limbing or trimming of some trees along existing access roads. Should existing access roads need to be upgraded and trimming of potential suitable bat trees needs to occur, a conservative, worst-case estimate indicates that up to 3 acres of suitable summer roosting bat habitat could be removed. Foraging habitat and sources of drinking water for gray bat, Indiana bat, northern long-eared bat, and tricolored bat exists in rivers, streams, and potentially wetlands along the ROW with proposed transmission upgrades.

The following avoidance and minimization measures would be implemented during transmission upgrades to minimize affects to federally listed bat species:

- Best management practices would be put in place around all water bodies to minimize impacts to hydrology and water quality.
- When practicable, suitable summer roosting habitat for Indiana bat and northern long-eared bat would be removed between November 15 and March 31 when bats are not likely to be roosting out on the landscape.

- Drilling or any other activity that involves continuous noise (i.e., longer than 24 hours) disturbances greater than 75 decibels measured on the A scale (e.g., loud machinery) within a 0.5 mile radius of documented winter and/or summer roosts (caves, trees, unconventional roosts) will be conducted when bats are absent from roost sites.
- Drilling within a 0.5 mile radius of documented cave would be conducted in a manner that would not compromise the structural integrity or alter the karst hydrology of the cave.

Up to 114.4 acres of moderate to high quality summer roosting habitat for Indiana bat, northern long-eared, and tricolored bat would be removed on the KIF Reservation as a result of TVA's proposed activities. No tree removal would need to occur within existing TVA off-site ROWs for proposed upgrades; however, limbing and trimming of trees along existing access roads may be required. Should these access road improvements need to occur, a conservative estimate would be that up to 3 acres of suitable summer roosting bat habitat could be removed for limbing and trimming. Tree removal would occur in winter (November 15 – March 31), when practicable, to avoid direct impacts to federally listed tree roosting bats.

Most activities associated with the project (including tree removal, building demolition, drilling, and transmission line work) were addressed in TVA's programmatic consultation with the U.S. Fish and Wildlife Service on routine actions and federally listed bats in accordance with Endangered Species Act Section 7(a)(2), completed in April 2018 and updated in May 2023. For those activities previously addressed with potential to affect bats, TVA committed to implement specific conservation measures when impacts to federally listed bat species are expected. Relevant conservation measures to this project are listed in the bat strategy form and would be implemented as part of the project. ***Up to 3 acres of "Take" for suitable bat habitat tree removal along off-site transmission line access roads will be used from TVA's programmatic consultation with USFWS in association with this project. See attached Completed_KIF_Retirement_EIS_PwrPlants_TVA-Bat-Strategy_11.17.2023***

Construction of a 3- to 4-MW solar site and a 100-MW battery energy storage system (BESS) at the KIF site were not addressed in TVA's programmatic consultation with the USFWS on routine actions and federally listed bats. ***Based on negative results of Presence/Absence surveys at the KIF site TVA has determined that proposed actions on the KIF Reservation May affect but are not likely to adversely affect (NLAA) gray bat, Indiana bat, and northern long-eared bat. Based on the same negative findings for tricolored bats, TVA has also determined that the proposed actions are not likely to jeopardize the continued existence of the tricolored bat (a proposed species) and, therefore, conference is not required.***

While there are no Section 7 requirements for monarch butterfly as a candidate species, it is identified in IPaC as a species that could occur within the Project Site. Monarch butterflies were not noted during field surveys. The majority of the action area at the KIF Reservation is comprised of recently graded and seeded fields with common species including Johnson grass, sericea lespedeza, and other common native and non-native herbaceous species. Areas with

proposed transmission construction and upgrades contain existing TVA ROWs which provide a wider variety of herbaceous species, several of which provide suitable foraging habitat for monarchs. Milkweed were not a dominant species observed or recorded on the KIF Reservation. Off-site existing ROWs would not be impacted by proposed actions except at discrete locations where new structures may be placed. Forest conversion to herbaceous habitats for new transmission ROWs would be seeded with native grasses and/or noninvasive vegetation which would provide more flowering plants than previously occurred in these areas. ***Proposed actions would not jeopardize the continued existence of the monarch butterfly. There are no Section 7 requirements for a candidate species.***

In addition to TVA's proposed work on the KIF reservation, the new CC plant would be associated with the expansion of a portion of East Tennessee Natural Gas (ETNG)'s existing pipeline system and constructing a new pipeline lateral to the Kingston Reservation. ETNG's proposed new pipeline project, referred to as the Ridgeline Expansion Project, would consist of the construction of approximately 111 miles of new 30-inch natural gas pipeline largely adjacent to an existing natural gas pipeline ROW, four miles of 30-inch diameter header pipeline (mainline), seven miles of 30-inch diameter pipeline lateral to connect to the proposed CC/Aero CT Plant (lateral), a 12,000-horsepower electric motor drive compressor station, and other gas system infrastructure to connect the plant to the new gas pipeline. The approximate route of the proposed new natural gas line would be built largely within or adjacent to the existing ETNG 3100 pipeline ROW in Smith, Jackson, Putnam, Overton, Fentress, Morgan, and Roane counties, Tennessee. The Ridgeline Expansion Project requires approval by Federal Energy Regulatory Commission (FERC) through issuance of a Certificate of Public Convenience and Necessity under Section 7 of the Natural Gas Act. An application must be submitted by ETNG to FERC for approval, which is evaluated by FERC's engineering, environmental, legal, and economic staff in an EA or EIS issued for public comment before a decision is made by FERC. ETNG submitted draft Resource Reports to FERC under Docket No. PF22-7-200 in June 2022 followed by revised Resource Reports in December 2022. ETNG filed their application for a certificate of public convenience and necessity with FERC in July 2023 under Docket No. CP23-516-000. Detailed analysis of the proposed pipeline has been provided by ENTG as part of the FERC pre-filing process and application process. Environmental Reports can be found under FERC's Docket No. CP23-516-000 and PF22-7-000. Subject to the completion of FERC's environmental reviews for the pipeline and its issuance of a certificate for the pipeline project, construction of the pipeline by ETNG is anticipated to begin in September 2025, and the pipeline is anticipated to be operational by November 2026. TVA has proposed to begin removing trees in winter of 2024 and to commence construction of the new CC plant in Fall of 2024, pending the completion of its NEPA, ESA Section 7, and other environmental reviews for this proposal.

We respectfully request concurrence with TVA's "not likely to adversely affect" determinations for federally listed bats. We also respectfully request acknowledgement of the "no effect" findings and use of "Take" from TVA's updated 2023 programmatic consultation with the Service

Mr. Daniel Elbert
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regarding impacts of routine actions on federally listed bats. Should you have any questions or wish to discuss the proposed project in more detail, please contact Elizabeth Hamrick by email, ecburton@tva.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "W. Douglas White", written over a light gray rectangular background.

W. Douglas White
Manager
Biological Compliance



400 West Summit Hill Drive, Knoxville, Tennessee 37902

November 28, 2023

Mr. Daniel Elbert
U.S. Fish and Wildlife Service
Tennessee Field Office
446 Neal Street
Cookeville, Tennessee 38501

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Comprehensive site surveys were conducted by TVA biologists in Summer 2019, Spring 2022, and Winter 2023 for plants and animals to determine whether suitable habitat for federally listed species occurs on the KIF reservation. Wetlands and stream surveys were performed on the KIF Reservation by TVA in March 2022. Aquatic resources on Kingston Reservation include three perennial streams, four intermittent streams, seven ephemeral channels, 19 other wet weather conveyances (WWC; such as ditches and swales), seven ponds, and 19 wetlands totaling approximately 4.6 acres. Site design aims to avoid and minimize impacts to aquatic resources to the extent practicable. Due to the location of these features and consideration of other site constraints, complete avoidance may not be achievable. It is anticipated that up to 3,015 linear feet of WWC, one detention pond, and 0.17 acre of wetland could be permanently altered, but actual linear footage/acreage of impact is dependent on final site design. Treatment pond(s) for holding and treating process and stormwater flow would also be constructed; discharges from the operation of the proposed CC/Aero CT Plant would require compliance with a site-specific NPDES permit and compliance with all applicable regulations and conditions.

Botanical surveys conducted on the KIF Reservation in Roane County by TVA in summer of 2019 did not reveal the presence of any Hart's-tongue fern, Virginia spiraea, or white fringeless orchid or any suitable habitat that would support this species. ***TVA has determined that the proposed actions on the KIF reservation would have No Effect on Hart's-tongue fern, Virginia spiraea, or white fringeless orchid.*** Botanical surveys along the off-site TLs in Anderson, Roane, and Cumberland Counties, Tennessee occurred in summer of 2022 and 2023 by TVA and/or HDR to determine presence of the federally listed plants Cumberland rosemary, Hart's-tongue fern, Virginia spiraea, and white fringeless orchid or their habitats. Limited riverbank and river bar habitat for Virginia spiraea was present in project areas along the large rivers, the Emory River, and Poplar Creek. This type of habitat is also suitable for Cumberland rosemary; however, this species only occurs in Cumberland County and none of this habitat was present in the action areas in that county. Suitable habitat for white fringeless orchid, including boggy headwater streams, does not occur in the project area. Similarly, sinks or pit caves where Hart's-tongue fern is found also is not present in the project area. Due to lack of suitable habitat in proposed action areas, ***TVA has determined that the proposed actions in the off-site transmission line upgrade areas would have No Effect on Cumberland rosemary, Hart's-tongue fern, Virginia spiraea or white fringeless orchid.***

None of the federally listed aquatic species are considered to have suitable habitat on the KIF Reservation. No federally or state-listed mollusks were found during the 2005 survey of the Clinch River/Watts Bar Reservoir in the vicinity of the KIF Reservation (Yokley 2005). River substrates were noted as degraded (“sub-optimal”) and clay as the dominant substrates, overlain by varying thicknesses of mud. Green blossom pearl mussel and turgid blossom pearl mussel were delisted due to extinction in Tennessee. ***TVA has determined that the proposed actions on the KIF reservation would have No Effect on the following federally listed species: Alabama lampmussel, birdwing pearl mussel, cracking pearl mussel, Cumberland bean, dromedary pearl mussel, fanshell, finerayed pigtoe, green blossom pearl mussel, orangefoot pimpleback, pink mucket, purple bean, ring pink, rough pigtoe, rough rabbitsfoot, sheepsnose mussel, shiny pigtoe, spectaclecase, tan riffleshell, Tennessee bean, turgid blossom pearl mussel, white wartyback, Anthony’s riversnail, Laurel dace, sickle darter, slender chub, spotfin chub, and yellowfin madtom.***

Field surveys of the proposed off-site transmission line upgrades were performed during the summer of 2022 and 2023 by HDR biologists in Cumberland, Anderson, and Roane Counties, Tennessee. Approximately 8,280 LF of perennial streams, 9,098 LF of intermittent streams, 14,155 LF of WWC, 11 ponds, 46.8 acres of wetlands, and 24.08 acres of large creeks and rivers (consisting of the Obed River, Rocky Branch, Poplar Creek, East Poplar Creek, Bear Creek, Brushy Fork, and the Clinch River) were documented during field surveys. Upgrades to existing transmission lines have the potential to require conversion of forested wetlands during regular vegetative maintenance and indirectly impact bodies of water. Indirect, temporary impacts could occur in areas where streams are adjacent to or near existing structures or access roads. TL upgrades would be sited to avoid surface waters and wetlands, to the extent practicable, and any surface water and wetland impacts would be permitted as required. Where practicable, structures would not be placed within surface waters or wetlands, and impacts would be minimized by crossing surface waters at a perpendicular angle. Primary impacts to streams would be from temporary crossings to access existing structures requiring work, which would not result in any permanent impacts or loss of stream habitat for aquatic species. Where necessary, wetlands may be converted from forested to scrub-shrub or herbaceous to maintain the transmission line corridor. Approximately 5.75 acres of wetlands were classified as forested during wetlands surveys which may be permanently converted to scrub-shrub or emergent wetlands if necessary to assure the safe and reliable operation of the transmission facilities. Stumps, root wads, and root systems of trees in wetland areas cleared for the transmission line would be left in place. With the use of proper Best Management Practices (BMPs), Clean Water Act (CWA) Sections 404 and 401 permitting, and compliance with all federal, state, and local regulations, surface water and wetland impacts are expected to be temporary and minor. As mentioned above, green blossom pearl mussel and turgid blossom pearl mussel were delisted due to extinction in Tennessee. ***TVA has determined that the proposed actions in the off-site transmission line upgrade areas would have No Effect on the following federally listed species: Alabama lampmussel, birdwing pearl mussel, cracking pearl mussel, Cumberland bean, dromedary pearl mussel, fanshell, finerayed pigtoe, green blossom pearl mussel, orangefoot pimpleback, pink mucket, purple bean, ring pink, rough pigtoe, rough rabbitsfoot, sheepsnose mussel, shiny pigtoe, spectaclecase, tan riffleshell,***

Tennessee bean, turgid blossom pearl mussel, white wartyback, Anthony's riversnail, Laurel dace, sickle darter, slender chub, spotfin chub, and yellowfin madtom.

Federally Designated Critical Habitat for spotfin chub occurs within the mainstem Obed River, which is crossed by one of the transmission upgrade areas in Cumberland County. However, no impacts are proposed to the mainstem Obed River; therefore, there would be no impacts to Designated Critical Habitat. ***The proposed transmission upgrades would therefore not result in any adverse modifications to designated critical habitat for the spotfin chub.***

For several decades, adult and juvenile bald eagles have been observed perched in shoreline trees and structures at the KIF and flying over the Clinch and Emory Rivers by TVA Terrestrial Zoologists and KIF staff. The closest bald eagle nest on record to the KIF Reservation is approximately two miles away; however, this nest was inactive at the time of observation in 2021. The closest known active bald eagle nest to the KIF is located approximately four miles away on the Tennessee River, observed in February 2023 by TVA Terrestrial Zoologists. Due to the distance away, proposed actions would not impact any known bald eagle nests. The Clinch and Emory Rivers provide suitable foraging habitat for bald eagles. Neither bald eagles nor their nests were sighted during field surveys of the off-site transmission line corridors. The closest known bald eagle nesting record to an off-site transmission line corridor is approximately 2.38 miles away in Roane County. ***Bald eagle would not be impacted by the proposed actions on the KIF Reservation or actions in the off-site transmission line upgrade areas.***

The whooping crane is listed as Endangered in the Southwest (USFWS Region 2). Outside of this region (including Tennessee), the whooping crane is categorized as a non-essential experimental population. For the purposes of consultation, non-essential experimental populations are treated as threatened species on National Wildlife Refuge and National Park land (require consultation under 7(a)(2) of the ESA) and otherwise as a proposed species. There are no section 7(a)(2) requirements for proposed species, but Federal agencies must not jeopardize their existence (section 7(a)(4)). Migration habitat does not exist within the project area at the KIF Reservation or in proposed action areas of the off-site transmission line upgrades. ***Whooping crane would not be impacted by the proposed project actions on the KIF Reservation and actions in the off-site transmission line upgrade areas. The proposed action is not likely to jeopardize the continued existence of the species and, therefore, conference is not required.***

In proximity to the KIF Reservation, two hibernacula for gray bats are known from Roane County, the closest of which is approximately 5.78 miles away (Smith Cave). Smith Cave is also the closest known hibernacula for tricolored bats. Two hibernacula for northern long-eared bats are also known from Roane County, the closest of which is approximately 7.7 miles away (Cave Creek Cave). No hibernacula for Indiana bats are known from Roane County, Tennessee. The closest known summer records of gray and tricolored bats in Roane County are from 2019 and 2011 when TVA performed mist net surveys on TVA and DOE properties along the Clinch River, approximately 5.9 miles away. Northern long-eared bat was also captured at the TVA Clinch River property during the same 2011 surveys but was not captured in 2019 (6.2 mi away). The closest known Indiana bat record is from Anderson County, Indiana

bats were captured there during a 2013 survey on DOE property approximately 15.8 miles away.

Based on the ArcGIS Online Endangered Bats of Tennessee map created by Cookeville Field Office, the KIF site is situated entirely in an area where gray bats and Indiana bats are considered likely to occur. The very eastern edge of the KIF Site (end of the peninsula) is also considered an area where northern long-eared bat is likely to occur.

Phase 1 Bat Habitat Assessments and Phase 2 Presence/Absence Mist Net Surveys were conducted at the KIF Reservation using the 2020 and 2023 Range-Wide Indiana Bat and Northern Long-eared Bat Survey Guidelines (respectively) for determining presence/absence of Indiana bat, NLEB, and tricolored bat habitat and to determine probable presence/absence of each species on the KIF Reservation. No caves or mines were observed on the KIF Reservation. Buildings proposed for demolition at the KIF Reservation may offer suitable roosting habitat if left abandoned for several years; however, none have roosting bats at this time. Forest removal is primarily proposed for battery sites, a laydown area, and transmission corridors. The roosting quality of this forest ranges moderate to high in these areas for tricolored bat, Indiana bat, and NLEB. More disturbed areas include small-diameter sweet gum, loblolly pine, and poplars. Higher quality roosting habitats are mature deciduous forests with canopy trees ranging from 18-24" in diameter and tree species including white oaks, hickories, poplar, sweet gum, and sycamores. Some trees have suitable roosting characteristics for Indiana and northern long-eared bats (exfoliating bark, cracks, or crevices). Quality of habitat was determined by diversity of forest structure, size of trees, clutter in the understory, and presence of snags and other suitable roosting trees. Of the 117.6 acres of forest proposed for removal under alternative A, approximately 102.8 acres of this was high-quality roosting habitat and 11.6 acres was moderate-quality roosting habitat for tricolored bat, Indiana bat, and NLEB. Suitable foraging habitat for gray bat, Indiana bat, NLEB, and tricolored bat exists over bodies of water on the industrial portion of plant property, over wetlands and streams in the undeveloped areas, and over the Clinch and Emory Rivers. Additional foraging habitat for tricolored bat, Indiana bat, and NLEB exists over, along, and through forested areas. Phase 2 Presence/Absence Surveys were conducted on May 15, 17, and 18, 2023, with plans approved by the Cookeville Field Office. Twenty-seven bats were captured of the following species: big brown (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), and evening bat (*Nycticeius humeralis*). All individuals captured were adults. Three of the big brown bats were pregnant and another three were lactating. Two of the red bats were pregnant. No federally listed or federally proposed listed species of bats were captured. See attached Bat Survey Report. The mist-net survey efforts (30 net nights over three calendar days) performed for this project met the level of effort required by the 2023 US Fish and Wildlife Indiana bat and Northern long-eared Bat Survey Guidelines to determine probable absence of Indiana, northern long-eared, and tricolored bat. No federally listed bat species were captured indicating that these species are likely not present in the action area.

Prior to demolition, internal surveys of the buildings proposed for demolition would occur to ensure no colonies of any species of bats have been established while buildings are inactive. Should bats be observed, avoidance and minimization measures (such as seasonal restrictions)

would be put in place and the appropriate state and federal agencies (e.g., USFWS and Tennessee Wildlife Resources Agency) would be contacted to ensure compliance.

Proposed transmission upgrades would occur in Anderson, Cumberland, and Roane Counties, Tennessee. As mentioned above, gray bats, northern long-eared bats, and tricolored bats are known from Roane County, Tennessee; however, there are no known records of Indiana bats from this county. All four bat species are known from both Cumberland and Anderson Counties. The closest summer bat records to any off-site transmission lines are mist net captures of gray bats and northern long-eared bats from 2011 approximately 1.8 and 1.9 miles away in Cumberland and Roane Counties. The closest summer Indiana bat records are from 2013 approximately 2.8 miles away in Anderson County. The closest known gray bat (and presumably tricolored bat) hibernaculum is approximately one mile away in Anderson County. The closest Indiana bat hibernacula is approximately 10.7 miles away in Cumberland County. The closest known tricolored bat hibernacula are 0.27-0.35 miles from proposed transmission upgrades. Based on the Endangered Bats of Tennessee map established by Cookeville Field Office, the off-site transmission upgrade areas are all in areas where gray bats and Indiana bats are considered likely to occur. Some of the action areas in Roane and Anderson Counties are also considered areas where northern long-eared bat is likely to occur.

Ten caves are known within three miles of the transmission upgrades. The closest of these is approximately 0.27 miles away. Small numbers of tricolored bats (one to three bats per cave) are known from three caves 0.27 - 0.35 miles away from proposed upgrade areas in Roane County. No blasting would occur in association with the proposed upgrades; however, pole replacement required for upgrades could require drilling. Field review of the transmission line ROWs determined that 159.8 acres of moderate or high-quality summer roosting habitat for Indiana bat, northern long-eared bat, and tricolored bat exists along ROW associated with the transmission upgrades. Approximately 93.7 additional acres provide low-quality roosting habitat along the transmission line ROWs. No tree removal along existing ROWs is anticipated. The only anticipated impacts to trees in association with TL upgrades is the potential for limbing or trimming of some trees along existing access roads. Should existing access roads need to be upgraded and trimming of potential suitable bat trees needs to occur, a conservative, worst-case estimate indicates that up to 3 acres of suitable summer roosting bat habitat could be removed. Foraging habitat and sources of drinking water for gray bat, Indiana bat, northern long-eared bat, and tricolored bat exists in rivers, streams, and potentially wetlands along the ROW with proposed transmission upgrades.

The following avoidance and minimization measures would be implemented during transmission upgrades to minimize affects to federally listed bat species:

- Best management practices would be put in place around all water bodies to minimize impacts to hydrology and water quality.
- When practicable, suitable summer roosting habitat for Indiana bat and northern long-eared bat would be removed between November 15 and March 31 when bats are not likely to be roosting out on the landscape.

- Drilling or any other activity that involves continuous noise (i.e., longer than 24 hours) disturbances greater than 75 decibels measured on the A scale (e.g., loud machinery) within a 0.5 mile radius of documented winter and/or summer roosts (caves, trees, unconventional roosts) will be conducted when bats are absent from roost sites.
- Drilling within a 0.5 mile radius of documented cave would be conducted in a manner that would not compromise the structural integrity or alter the karst hydrology of the cave.

Up to 114.4 acres of moderate to high quality summer roosting habitat for Indiana bat, northern long-eared, and tricolored bat would be removed on the KIF Reservation as a result of TVA's proposed activities. No tree removal would need to occur within existing TVA off-site ROWs for proposed upgrades; however, limbing and trimming of trees along existing access roads may be required. Should these access road improvements need to occur, a conservative estimate would be that up to 3 acres of suitable summer roosting bat habitat could be removed for limbing and trimming. Tree removal would occur in winter (November 15 – March 31), when practicable, to avoid direct impacts to federally listed tree roosting bats.

Most activities associated with the project (including tree removal, building demolition, drilling, and transmission line work) were addressed in TVA's programmatic consultation with the U.S. Fish and Wildlife Service on routine actions and federally listed bats in accordance with Endangered Species Act Section 7(a)(2), completed in April 2018 and updated in May 2023. For those activities previously addressed with potential to affect bats, TVA committed to implement specific conservation measures when impacts to federally listed bat species are expected. Relevant conservation measures to this project are listed in the bat strategy form and would be implemented as part of the project. ***Up to 3 acres of "Take" for suitable bat habitat tree removal along off-site transmission line access roads will be used from TVA's programmatic consultation with USFWS in association with this project. See attached Completed_KIF_Retirement_EIS_PwrPlants_TVA-Bat-Strategy_11.17.2023***

Construction of a 3- to 4-MW solar site and a 100-MW battery energy storage system (BESS) at the KIF site were not addressed in TVA's programmatic consultation with the USFWS on routine actions and federally listed bats. ***Based on negative results of Presence/Absence surveys at the KIF site TVA has determined that proposed actions on the KIF Reservation May affect but are not likely to adversely affect (NLAA) gray bat, Indiana bat, and northern long-eared bat. Based on the same negative findings for tricolored bats, TVA has also determined that the proposed actions are not likely to jeopardize the continued existence of the tricolored bat (a proposed species) and, therefore, conference is not required.***

While there are no Section 7 requirements for monarch butterfly as a candidate species, it is identified in IPaC as a species that could occur within the Project Site. Monarch butterflies were not noted during field surveys. The majority of the action area at the KIF Reservation is comprised of recently graded and seeded fields with common species including Johnson grass, sericea lespedeza, and other common native and non-native herbaceous species. Areas with

proposed transmission construction and upgrades contain existing TVA ROWs which provide a wider variety of herbaceous species, several of which provide suitable foraging habitat for monarchs. Milkweed were not a dominant species observed or recorded on the KIF Reservation. Off-site existing ROWs would not be impacted by proposed actions except at discrete locations where new structures may be placed. Forest conversion to herbaceous habitats for new transmission ROWs would be seeded with native grasses and/or noninvasive vegetation which would provide more flowering plants than previously occurred in these areas. ***Proposed actions would not jeopardize the continued existence of the monarch butterfly. There are no Section 7 requirements for a candidate species.***

In addition to TVA's proposed work on the KIF reservation, the new CC plant would be associated with the expansion of a portion of East Tennessee Natural Gas (ETNG)'s existing pipeline system and constructing a new pipeline lateral to the Kingston Reservation. ETNG's proposed new pipeline project, referred to as the Ridgeline Expansion Project, would consist of the construction of approximately 111 miles of new 30-inch natural gas pipeline largely adjacent to an existing natural gas pipeline ROW, four miles of 30-inch diameter header pipeline (mainline), seven miles of 30-inch diameter pipeline lateral to connect to the proposed CC/Aero CT Plant (lateral), a 12,000-horsepower electric motor drive compressor station, and other gas system infrastructure to connect the plant to the new gas pipeline. The approximate route of the proposed new natural gas line would be built largely within or adjacent to the existing ETNG 3100 pipeline ROW in Smith, Jackson, Putnam, Overton, Fentress, Morgan, and Roane counties, Tennessee. The Ridgeline Expansion Project requires approval by Federal Energy Regulatory Commission (FERC) through issuance of a Certificate of Public Convenience and Necessity under Section 7 of the Natural Gas Act. An application must be submitted by ETNG to FERC for approval, which is evaluated by FERC's engineering, environmental, legal, and economic staff in an EA or EIS issued for public comment before a decision is made by FERC. ETNG submitted draft Resource Reports to FERC under Docket No. PF22-7-200 in June 2022 followed by revised Resource Reports in December 2022. ETNG filed their application for a certificate of public convenience and necessity with FERC in July 2023 under Docket No. CP23-516-000. Detailed analysis of the proposed pipeline has been provided by ENTG as part of the FERC pre-filing process and application process. Environmental Reports can be found under FERC's Docket No. CP23-516-000 and PF22-7-000. Subject to the completion of FERC's environmental reviews for the pipeline and its issuance of a certificate for the pipeline project, construction of the pipeline by ETNG is anticipated to begin in September 2025, and the pipeline is anticipated to be operational by November 2026. TVA has proposed to begin removing trees in winter of 2024 and to commence construction of the new CC plant in Fall of 2024, pending the completion of its NEPA, ESA Section 7, and other environmental reviews for this proposal.

We respectfully request concurrence with TVA's "not likely to adversely affect" determinations for federally listed bats. We also respectfully request acknowledgement of the "no effect" findings and use of "Take" from TVA's updated 2023 programmatic consultation with the Service

Mr. Daniel Elbert
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November 28, 2023

regarding impacts of routine actions on federally listed bats. Should you have any questions or wish to discuss the proposed project in more detail, please contact Elizabeth Hamrick by email, ecburton@tva.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "W. Douglas White", is written over a light gray rectangular background.

W. Douglas White
Manager
Biological Compliance

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United States Department of the Interior



FISH AND WILDLIFE SERVICE
Tennessee Ecological Services Field Office
446 Neal Street
Cookeville, TN 38501-4027
Phone: (931) 528-6481 Fax: (931) 528-7075

In Reply Refer To:
Project Code: 2023-0135535
Project Name: Kingston Fossil Plant Retirement

September 29, 2023

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

To Whom It May Concern:

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

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

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

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

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

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

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

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

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

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

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

This species list is provided by:

Tennessee Ecological Services Field Office

446 Neal Street

Cookeville, TN 38501-4027

(931) 528-6481

PROJECT SUMMARY

Project Code: 2023-0135535
Project Name: Kingston Fossil Plant Retirement
Project Type: Power Gen - Natural Gas
Project Description: In order to address the performance challenges that come with an aging Coal Fleet, the Tennessee Valley Authority (TVA) is proposing to retire and demolish the Kingston Fossil Plant (KIF). To replace the lost generation capacity from one unit and to adapt to a changing generation portfolio, TVA is considering constructing and operating a Combined Cycle gas (CC) plant on the existing KIF Reservation. TVA proposes to pair the CC plant with a dual-fuel Aero CT Plant and new switchyard, a 3 to 4 MW solar site, a 100 MW Battery Energy Storage System (BESS), new transmission line (TL) infrastructure and connections on the Kingston Reservation and install fiber-optic ground wire along existing TVA TLs.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@36.0037436,-85.01757348487448,14z>



Counties: Anderson , Cumberland , and Roane counties, Tennessee

ENDANGERED SPECIES ACT SPECIES

There is a total of 30 threatened, endangered, or candidate species on this species list.

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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

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

MAMMALS

NAME	STATUS
Gray Bat <i>Myotis grisescens</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

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

FISHES

NAME	STATUS
<p>Sickle Darter <i>Percina williamsi</i></p> <p>There is proposed critical habitat for this species. Your location does not overlap the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/9866</p>	Threatened
<p>Slender Chub <i>Erimystax cahni</i></p> <p>There is final critical habitat for this species. Your location does not overlap the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/6637</p>	Threatened
<p>Spotfin Chub <i>Erimonax monachus</i></p> <p>Population: Wherever found, except where listed as an experimental population</p> <p>There is final critical habitat for this species. Your location overlaps the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/1521</p>	Threatened
<p>Yellowfin Madtom <i>Noturus flavipinnis</i></p> <p>Population: Wherever found, except where listed as an experimental population</p> <p>There is final critical habitat for this species. Your location does not overlap the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/8565</p>	Threatened

CLAMS

NAME	STATUS
Alabama Lampmussel <i>Lampsilis virescens</i> Population: Wherever found; Except where listed as Experimental Populations No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/916	Endangered
Birdwing Pearlymussel <i>Lemiox rimosus</i> Population: U.S.A. (TN - specified portions of the French Broad and Holston Rivers; see 17.85(b) 1) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6636	Experimental Population, Non-Essential
Cracking Pearlymussel <i>Hemistena lata</i> Population: Wherever found; Except where listed as Experimental Populations No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4130	Endangered
Dromedary Pearlymussel <i>Dromus dromas</i> Population: Wherever found; Except where listed as Experimental Populations No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6377	Endangered
Fanshell <i>Cyprogenia stegaria</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4822	Endangered
Finerayed Pigtoe <i>Fusconaia cuneolus</i> Population: Wherever found; Except where listed as Experimental Populations No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3038	Endangered
Orangefoot Pimpleback (pearlymussel) <i>Plethobasus cooperianus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1132	Endangered
Pink Mucket (pearlymussel) <i>Lampsilis abrupta</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7829	Endangered
Purple Bean <i>Villosa perpurpurea</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4125	Endangered
Ring Pink (mussel) <i>Obovaria retusa</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4128	Endangered
Rough Pigtoe <i>Pleurobema plenum</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6894	Endangered
Rough Rabbitsfoot <i>Quadrula cylindrica strigillata</i>	Endangered

NAME	STATUS
There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5629	
Shiny Pigtoe <i>Fusconaia cor</i> Population: Wherever found; Except where listed as Experimental Populations No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2573	Endangered
Spectaclecase (mussel) <i>Cumberlandia monodonta</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7867	Endangered
Turgid Blossom (pearlymussel) <i>Epioblasma turgidula</i> Population: Wherever found; Except where listed as Experimental Populations No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7659	Endangered

SNAILS

NAME	STATUS
Anthony's Riversnail <i>Athearnia anthonyi</i> Population: U.S.A. (TN - specified portions of the French Broad and Holston Rivers; see 17.85(b) 1) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4827	Experimental Population, Non-Essential
Anthony's Riversnail <i>Athearnia anthonyi</i> Population: Wherever found; Except where listed as Experimental Populations No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4827	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Cumberland Rosemary <i>Conradina verticillata</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3677	Threatened
Virginia Spiraea <i>Spiraea virginiana</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1728	Threatened
White Fringeless Orchid <i>Platanthera integrilabia</i> Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1889	Threatened

CRITICAL HABITATS

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Spotfin Chub <i>Erimonax monachus</i> https://ecos.fws.gov/ecp/species/1521#crithab	Final

BALD GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act¹ and the Migratory Bird Treaty Act².

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats³, should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

-
1. The [Bald and Golden Eagle Protection Act](#) of 1940.
 2. The [Migratory Birds Treaty Act](#) of 1918.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

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

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

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to 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 the supplemental information and specifically the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

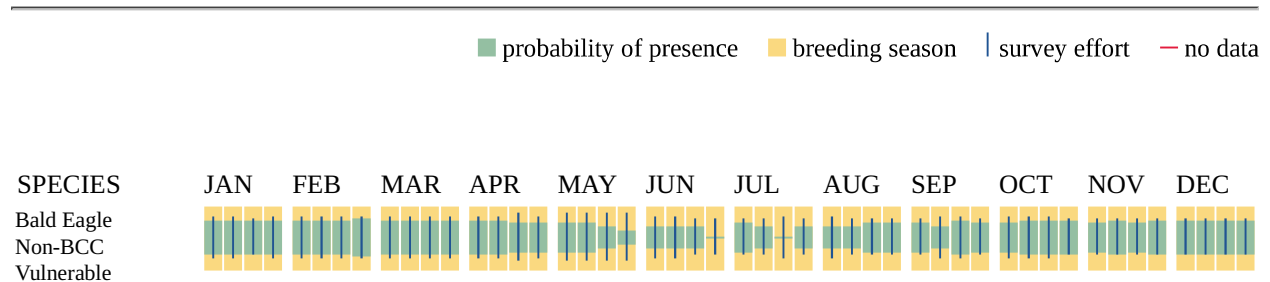
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell s) your project area overlaps.

No Data (—)

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



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-incident-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>

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats³ 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.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

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

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Aug 31
Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink <i>Dolichonyx oryzivorus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler <i>Cardellina canadensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Cerulean Warbler <i>Dendroica cerulea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 27 to Jul 20

NAME	BREEDING SEASON
Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will <i>Antrastomus vociferus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Golden-winged Warbler <i>Vermivora chrysoptera</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Kentucky Warbler <i>Oporornis formosus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prairie Warbler <i>Dendroica discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler <i>Protonotaria citrea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

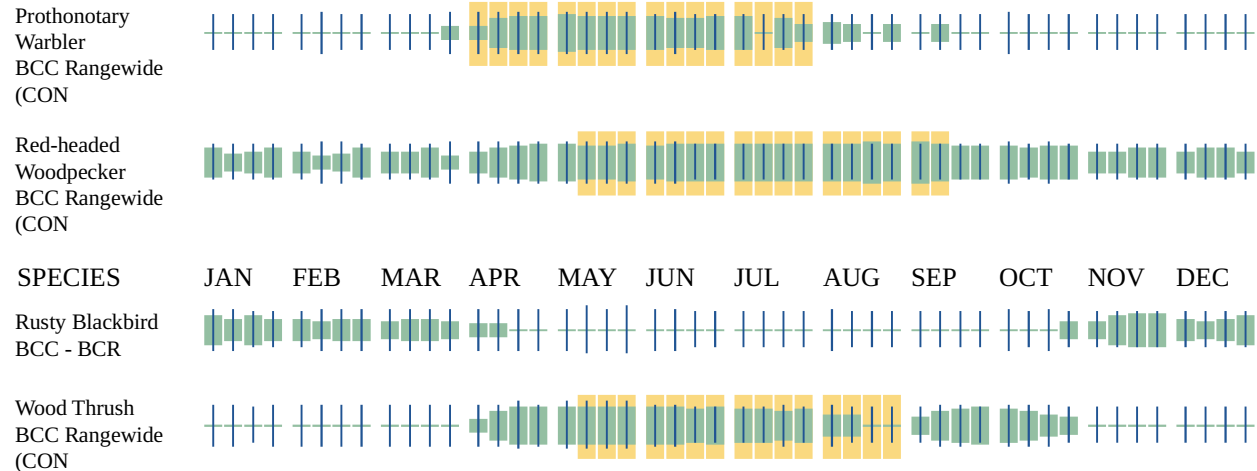
PROBABILITY OF PRESENCE SUMMARY

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 the supplemental information and specifically the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)



Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
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- 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>

WETLANDS

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](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER POND

- [PUBHx](#)
- [PUBHh](#)

LAKE

- [L2UBHh](#)
- [L2AB3Hh](#)
- [L2UBK](#)

- [L1UBHh](#)

FRESHWATER FORESTED/SHRUB WETLAND

- [PFO1A](#)
- [PSS1A](#)
- [PFO1/4A](#)

FRESHWATER EMERGENT WETLAND

- [PEM1Ch](#)

RIVERINE

- [R4SBC](#)
 - [R3UBH](#)
 - [R2UB3H](#)
 - [R4SBA](#)
 - [R5UBH](#)
-

IPAC USER CONTACT INFORMATION

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Kingston Fossil Plant (KIF) Botanical Survey Memo

Roane, Cumberland, and Anderson Counties, TN
November 30, 2022



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Attachments

Attachment A- List of Botanical Species Observed during Kingston TL Botanical Field Survey

Attachment B- Photographs of Botanical Survey

Project Background

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units, and construction and operation of approximately 1,500 megawatts (MW) of replacement generation requiring extensive regional transmission system upgrades to be completed and operational prior to coal unit retirement. Upgrades may include upgrading, reconductoring, or rebuilding transmission lines (TLs) as well as replacing terminal equipment, bus work, or jumpers.

HDR Engineering, Inc (HDR) conducted an environmental site assessment of the Project Area which consisted of three TLs: (1) the Eastern Segment TLs (L5108 and L5302) located north of the city of Kingston and west of the city of Oak Ridge, in Anderson and Roane Counties, Tennessee; and (2) the Western Segment TL (L5383) located north of the city of Crossville, in Cumberland County, Tennessee, and associated access roads (Project Area) proposed for upgrades under Alternative A of the KIF Retirement EIS Project. Under Alternative A, TVA would make improvements to existing transmission lines within the Kingston Reservation, including new TL connections to the proposed combined cycle gas facilities and switch station. As part of the environmental site assessment, HDR was tasked with surveying the Project for threatened and endangered plant species. From August 15 to 18, 2022, the Project Area was surveyed for the presence of federally and state-listed threatened or endangered plant species throughout the various habitat types within the Project limits.

Habitat Overview

The Project Area lies within the Central Plateau (CU) – Cumberland Co. and Ridge and Valley (RV), in Roane, Cumberland, and Anderson Counties, Tennessee. A variety of vegetative communities are known to exist within these physiographic regions and were divided into 10 habitat type categories through a desktop review for the purposes of this study.

Category 1. Wetlands (i.e., swamps and floodplains, acidic wetlands and swamps, acidic seeps wet meadows, marshes, emergent herbaceous wetlands, bogs, acidic open wetlands)

Category 2. Acidic and calcareous seeps

Category 3. Wet and dry barrens (i.e., limestone glades and barrens, wet acidic barrens)

Category 4. Outcrops (i.e., dry sandstone, granite outcrops, sandstone outcrops)

Category 5. Stream, ponds, and lakes (i.e., lakes (margins), streams (margins), ponds (margins), slow acidic streams, stream bars and ledges, stream heads, sandy/rocky river bars, Rocky sand stream sides)

Category 6. Rocky woods, rock slopes, riverbanks, and river bars

Category 7. Bluffs, cliffs, and mountain balds (i.e., calcareous bluffs/seepy limestone cliffs/bluffs/shale bluffs, dolomite bluffs, wet bluffs, moist shaded cliffs, rocky bluffs)

Category 8. Wooded areas (i.e., rich woods/hollows, rich oak woods, dry woods, wooded mt. slopes and mt. thickets, dry sandy woods, Mesic woods and seepage slopes, mesic woods and seepage slopes, oak woods and edges [maintained row], alluvial/moist ravines in dry ridges, bottomland hardwoods [*could include wetlands])

Category 9. Sinks

Category 10. Dry openings, powerlines

The species on the targeted threatened and endangered list can all be categorized as being found in one (or more) of these ten generalized habitat types. A list of state and federal protected species with potential to exist within the various broad habitat types in the Project Area is provided in the Kingston Wetlands and Streams Survey Report and is based on resources provided in Appendix B of that report.

Methodology

A desktop review was performed to identify general vegetation communities and habitat types with potential to occur within the Project survey area. In June 2022, HDR field biologists then performed a field verification of the information compiled during the desktop assessment. Based on the results of desktop review and field habitat and vegetation characterizations, approximately 30 botanical survey locations were identified for follow-up with a focused field assessment. The objective of the survey was to determine the suitability of the Project Area habitat for any threatened or endangered species and document the presence/absence of federal and state listed species during the field assessment. At the time of the survey, there were 70 state-listed protected species, three of which were also listed as federally threatened: white fringeless orchid (*Platanthera integrilabia*), Cumberland rosemary (*Conradina verticillata*), and Virginia spirea (*Spirea virginiana*). HDR staff, including a botanist, surveyed for federal and state listed species at approximately 30 locations along the TL alignment and associated access roads in the Project Area that were previously identified as having habitat conditions potentially supportive of the listed species.

Observational Data

Areas surveyed along the western Project alignment near Crossville, Tennessee (L5383), contained higher diversity than the more urbanized eastern Project TLs (L5108 and L5302). Land use along the western alignment was primarily agricultural land with some scattered pond/open water wetlands, where most of the increased biodiversity was observed during the botanical survey. Invasive and opportunistic species were more abundant along the eastern alignment near Oak Ridge, Tennessee, which can be correlated to the high density of urbanization.

The federally listed white fringeless orchid flowers from June to September in Tennessee and generally prefers wet, flat, boggy areas in acidic muck or sand, and partially shaded areas at the head of streams or seepage slopes. Although several locations with potentially suitable habitat were identified along the Project alignment during the June 2022 field botany survey, no individuals of white fringeless orchid were found to be present at the time of the survey.

The federally listed Virginia spirea and Cumberland Rosemary prefer stream bars and stream ledges, as well as gravel bars, sandy riverbanks, and riparian areas with seasonal flooding. Riverbank and river bar habitat were present along the Obed River, Clinch River, Poplar Creek, East Fork Poplar Creek, and several unnamed tributaries; however, no state or federally listed species were observed to be present. Boat surveys were not implemented at these locations due to time and budget constraints and on the premise that the Project would not be associated with any riverbank or stream bar activity.

Remnants of sandstone, shallow bedrock, glade and barren like habitat, and chert rock habitat were observed throughout the Project Area. These rocky habitat types have the potential to support state listed species including (but not limited to) branching whitlow-grass (*Draba ramosissima*), mountain bush-honeysuckle (*Diervilla sessilifolia* var. *rivularis*), myurella moss (*Myurella julacea*), naked-stem sunflower (*Helianthus occidentalis*), prairie goldenrod (*Oligoneuron album*), roundleaf shadbush (*Amelanchier sanguinea*), Sharp's homaliadelphus (*Homaliadelphus sharpi*), Sharp's lejeunea (*Lejeunea sharpii*), silverling (*Paronychia agryrocoma*), slender blazing-star (*Liatris cylindracea*), Small's stonecrop (*Diamorphia smallii*), tall larkspur (*Delphinium exaltatum*), Torrey's mountain-mint (*Pycnanthemum torrei*), western wallflower (*Erysimum capitatum*), and zigzag bladderwort (*Utricularia subulate*); however, none of these species were observed during the field botanical survey.

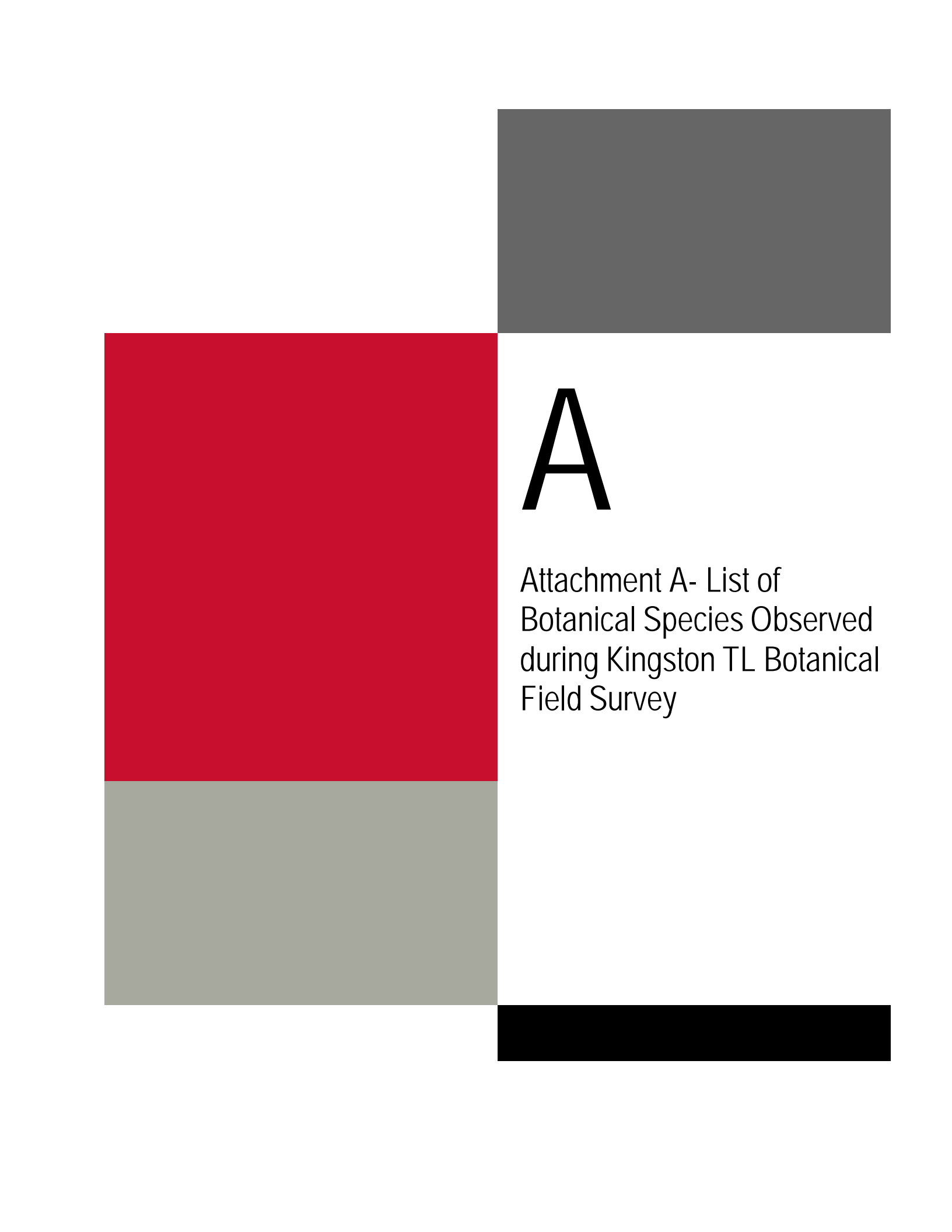
Dry powerline openings, bog and wet meadows, and disturbed prairie habitat were found throughout the Project alignment. State listed species with the potential to occur in these habitats include (but are not limited to) early St. John's wort (*Hypericum nudiflorum*), Muhlenberg's nutrush (*Scleria muehlenbergii*), ovate-leaved arrowhead (*Sagittaria platyphylla*), spoonleaf sundew (*Drosera intermedia*), sticky hedge-hyssop (*Gratiola brevifolia*), swamp lousewort (*Pedicularis lanceolata*), tawny cotton-grass (*Eriophorum virginicum*), tubercled rein-orchid (*Platanthera flava* var. *herbioloa*), and wood lily (*Lilium philadelphicum*). Several forested areas associated with planned access roads were also surveyed and included both younger successional woodlands of old fencerows and abandoned agricultural lots, and mature, upland, oak-hardwood communities. These forested areas were comprised largely of common and abundant woody species and no state or federally listed species were observed during the time of the field botanical survey.

Agricultural fields and ponds, and urbanized locations where invasives were plentiful were surveyed but deemed as areas of low ecological value with no suitable habitat for any of the state or federally listed species identified during the desktop review. Invasive species such as kudzu (*Pueraria montana*) and Johnson grass (*Sorghum halepense*) were plentiful in the Project area near Oak Ridge, and herbicide use was evident at many of the locations in the western alignment. A list of notable, but unlisted/protected plants observed during the survey can be found in Attachment A. Photos taken during the botanical survey are provided in Attachment B.

Survey Results

In June 2022 a field botanical survey of 30 areas identified as having potentially suitable habitat for federal and state listed species was evaluated by HDR biologists and botanist. Although

potentially suitable habitat was identified within the Kingston TL Project area, no federal or state listed botanical species were observed occupying those habitats at the time of the survey.



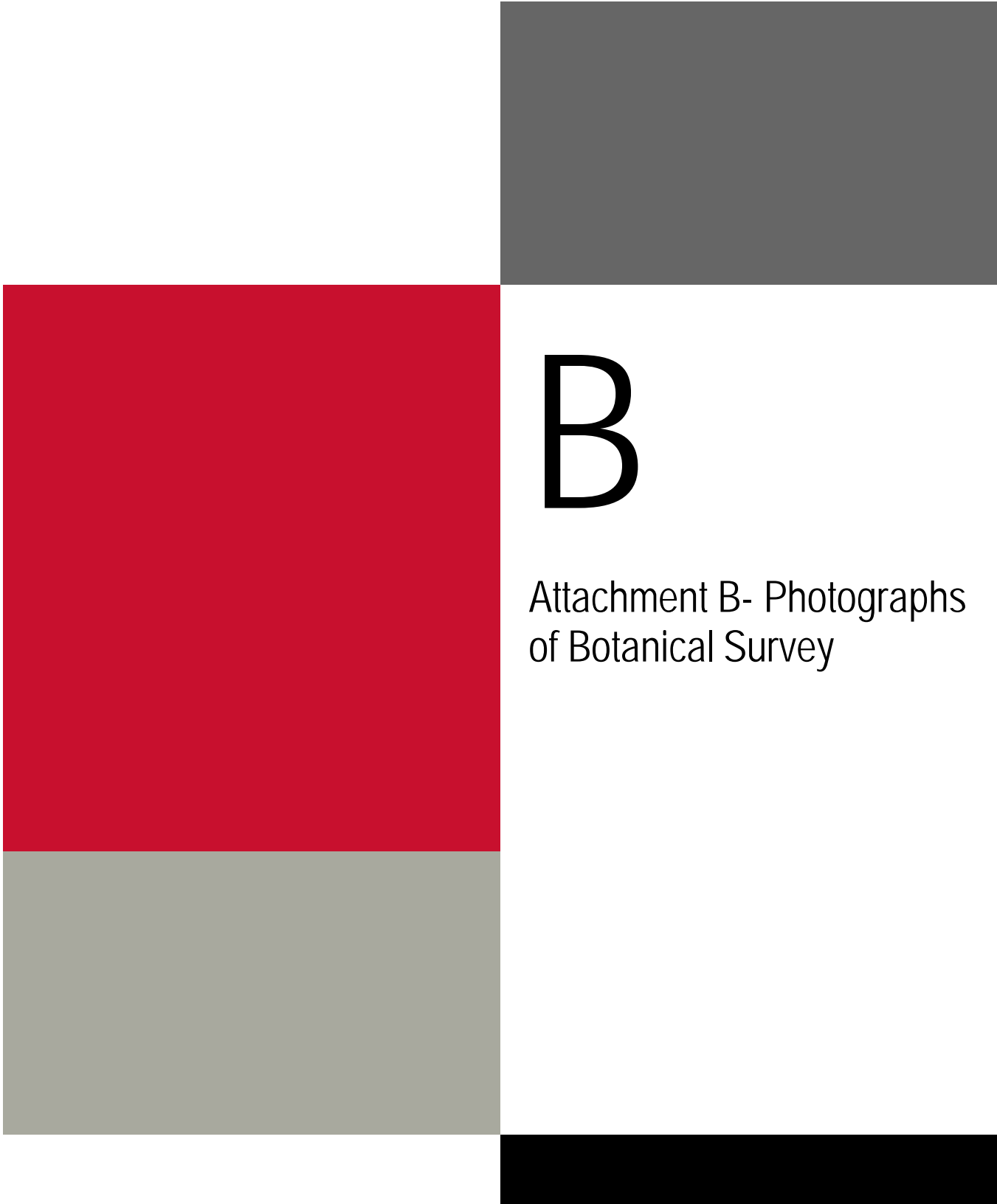
A

Attachment A- List of
Botanical Species Observed
during Kingston TL Botanical
Field Survey

Scientific Name	Common Name
<i>Agave virginica</i>	false aloe
<i>Agrimonia parviflora</i>	harvestlice
<i>Alisma plantago-aquatica</i>	common water plantain
<i>Apocynum cannabinum</i>	Indian hemp
<i>Arisaema dracontium</i>	green dragon
<i>Aronia arbutifolia</i>	red chokeberry
<i>Asclepias tuberosa</i>	butterfly milkweed
<i>Asclepias verticillata</i>	whorled milkweed
<i>Bidens aristosa</i>	bearded beggarticks
<i>Bignonia capreolata</i>	crossvine
<i>Boehmeria cylindrica</i>	false nettle
<i>Carex crinita</i>	fringed sedge
<i>Cichorium intybus</i>	chicory
<i>Cirsium discolor</i>	field thistle
<i>Clinopodium vulgare</i>	wild basil
<i>Conocephallum conicum</i>	great scented liverwort
<i>Conoclinium coelestinum</i>	blue mistflower
<i>Coreopsis major</i>	greater Tickseed
<i>Cryptotaenia canadensis</i>	honestwort
<i>Dichanthelium clandestinum</i>	deertongue
<i>Dichanthelium oligosanthes</i>	Heller's rosette grass
<i>Diodia teres</i>	rough buttonweed
<i>Dulichium arundinaceum</i>	threeway sedge
<i>Elymus virginicus</i>	Virginia wild-rye
<i>Erigeron strigosus</i>	prairie fleabane
<i>Euonymus fortunei</i>	winter creeper euonymus
<i>Eupatorium altissimum</i>	tall boneset
<i>Frangula caroliniana</i>	Carolina buckthorn
<i>Gaylussacia baccata</i>	black huckleberry
<i>Lactuca floridana</i>	woodland lettuce
<i>Lespedez hirta</i>	hairy lespedeza
<i>Lindernia dubia</i>	yellowseed false pimpernel
<i>Lobelia spicata</i>	pale spiked lobelia
<i>Lonicera maackii</i>	Amur honeysuckle
<i>Ludwigia alternifolia</i>	seedbox
<i>Lycopus americanus</i>	American bugleweed

Scientific Name	Common Name
<i>Mimulus alatus</i>	sharpwing moonkeyflower
<i>Mimulus ringens</i>	Allegheny monkeyflower
<i>Monarda fistulosa</i>	wild bergamot
<i>Nabalus albus</i>	white lettuce
<i>Nabalus albus</i>	white rattlesnakeroot
<i>Oenothera biennis</i>	evening-primrose
<i>Oenothera guara</i>	biennial gaura
<i>Panicum oligosanthos</i>	Fewanther obscuregrass
<i>Parthenium integrifolium</i>	wild quinine
<i>Penthorum sedoides</i>	ditch stonecrop
<i>Phlox maculata</i>	wild sweetwilliam
<i>Phlox paniculata</i>	garden phlox
<i>Phyla lanceolata</i>	fogfruit
<i>Pinus virginiana</i>	Virginia pine
<i>Platanther ciliaris</i>	orange-fringed orchid
<i>Polygala curtissii</i>	Curtis's milkwort
<i>Polygala sanguinea</i>	purple milkwort
<i>Potamogeton natans</i>	floating pondweed
<i>Prunella vulgaris</i>	common selfheal
<i>Pycnanthemum albescens</i>	whiteleaf mountainmint
<i>Pycnanthemum muticum</i>	blunt mountainmint
<i>Pycnanthemum tenuifolium</i>	narrow-leaf mountainmint
<i>Ranunculus hispidus</i>	bristly buttercup
<i>Ratibida pinnata</i>	praria coneflower
<i>Rudbeckia laciniata</i>	cutleaf coneflower
<i>Rudbeckia trilobia</i>	brown-eyed susan
<i>Sabata stellans</i>	marsh pink
<i>Sagittaria latifolia</i>	broadleaf arrowhead
<i>Salvia lyrata</i>	lyreleaf sage
<i>Scutellaria incana</i>	hoary skullcap
<i>Scutellaria integrifolia</i>	helmet skullcap
<i>Sedum ternatum</i>	woodland stonecrop
<i>Senna marylandica</i>	Maryland sena
<i>Silphium integrifolium</i>	wholeleaf rosinweed
<i>Silphium perfoliatum</i>	cup plant
<i>Sparganium americanum</i>	American bur-reed

Scientific Name	Common Name
<i>Spiraea tomentosa</i>	steeplebush
<i>Tripsacum dactyloides</i>	Eastern gamagrass
<i>Verbesena alternifolia</i>	common wingstem
<i>Verbesena virginica</i>	frostweed
<i>Vernonia noveboracensis</i>	ironweed
<i>Vitis labrusca</i>	fox grape



B

Attachment B- Photographs
of Botanical Survey



Photo 1. Wet opening with *Boehmeria cylindrica*.



Photo 2. Sprayed portion along Clinch River with *Solidago* spp. and *Rubus* spp.



Photo 3. *Hypericum* spp. determined not to be state listed.



Photo 4. Upland transitional edge with *Solidago* spp.



Photo 5. Orange crested orchid, a non-listed species.



Photo 6. Nabalus spp, a non-listed species.



Photo 7. Dry powerline opening with Solidago spp.



Photo 8. Lillium spp. determined not to be state-listed.



Photo 9. River bar surveyed and had no listed species.



Photo 10. Rocky cliff surveyed and had no state-listed species.

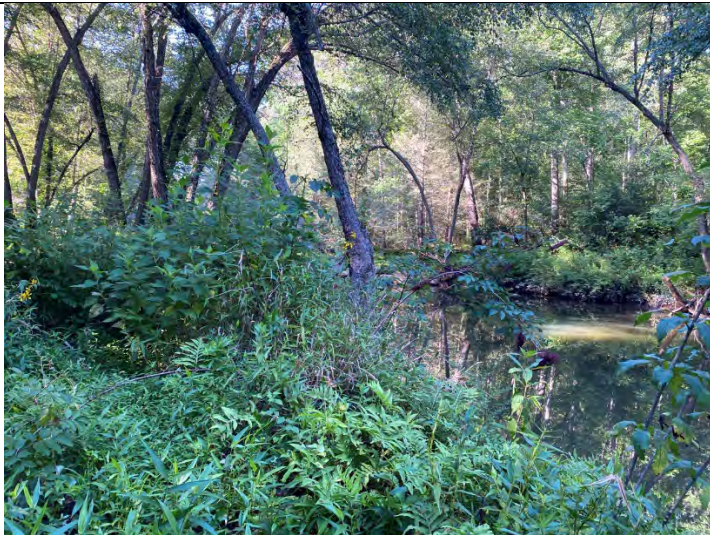


Photo 11. Riparian area with wingstem and other non-listed species.



Photo 12. Small mudflat lacking vegetation.



Photo 13. Survey site with submerged aquatic vegetation (SAV).



Photo 14. SAVs present but no listed species observed.



Photo 15. Dry ridge with small seep containing woolgrass.



Photo 16. Pond on Oak ridge property with mostly Rubus spp. on banks.



Photo 17. Pond on Oak Ridge property. No visual observance of any listed species.



Photo 18. A dry opening containing *Rubus* spp., *Solidago* spp., and other non-listed species.



Photo 19. Pond with emergent edge containing woolgrass and *Boehmeria cylindrica*.



Photo 20. Mature forested area along access road with oaks and other non-listed hardwoods



Photo 21. An agricultural pond containing *Wolffia* spp. Emergent fringe containing *Ludwigia* spp.



Photo 22. An abandoned agricultural field containing an assortment of non-listed grasses and weedy species.



Photo 23. Regularly mowed section of the transmission line.



Photo 24. A Dry opening containing *Solidago* spp. and other non-listed species.



Photo 25. Stream draining off-site pond with emergent wetland edge. No observance of listed species.



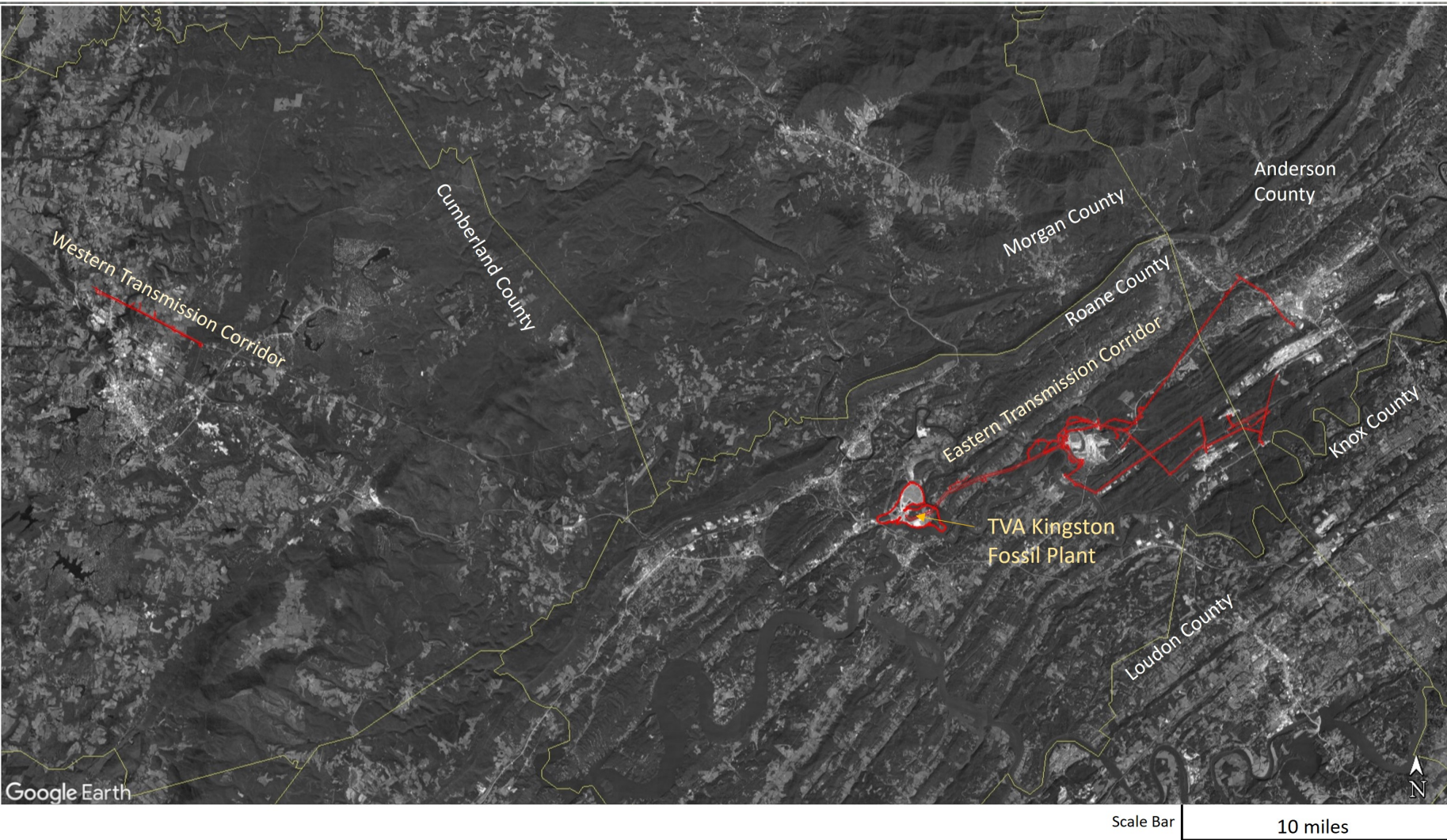
Photo 26. Large patch of Rubus spp. and Smilax spp.




Photo 27. Close-up of SAV, determined not to be state listed species.



Photo 28. Johnsongrass and pokeweed growing along powerline.















KINGSTON TRANSMISSION LINE

LEGEND
 Study Area

Scale Bar 10 miles

LEGEND









-  Kingston Reservation (2,254 ac)
-  Parking and Laydown Areas
-  Gas Pipeline Corridor
-  3-4 MW Solar Site (35 ac)
-  Battery Site 1 (30 ac)
-  Battery Site 2 (35 ac)
-  Battery Site 3 (40 ac)
-  Battery TL Connects (41 ac)
-  CC/Aero CT (55 ac)
-  Existing KIF Substation (3.85 ac)
-  Switchyard (8.5 ac)
-  TL Corridor (128 ac)*

DATA SOURCE: Bing Hybrid Aerial Imagery

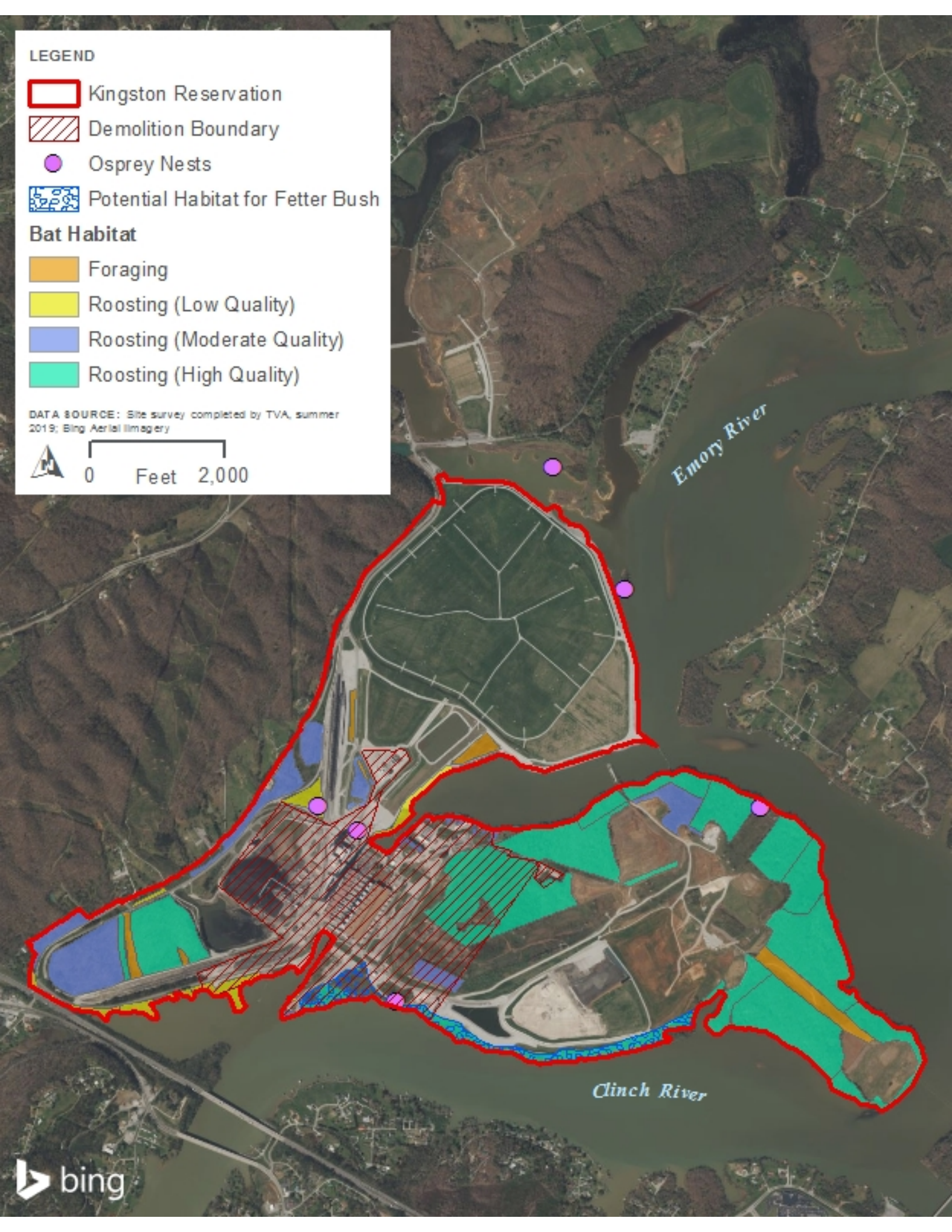
*NOTE: Includes proposed fiber line

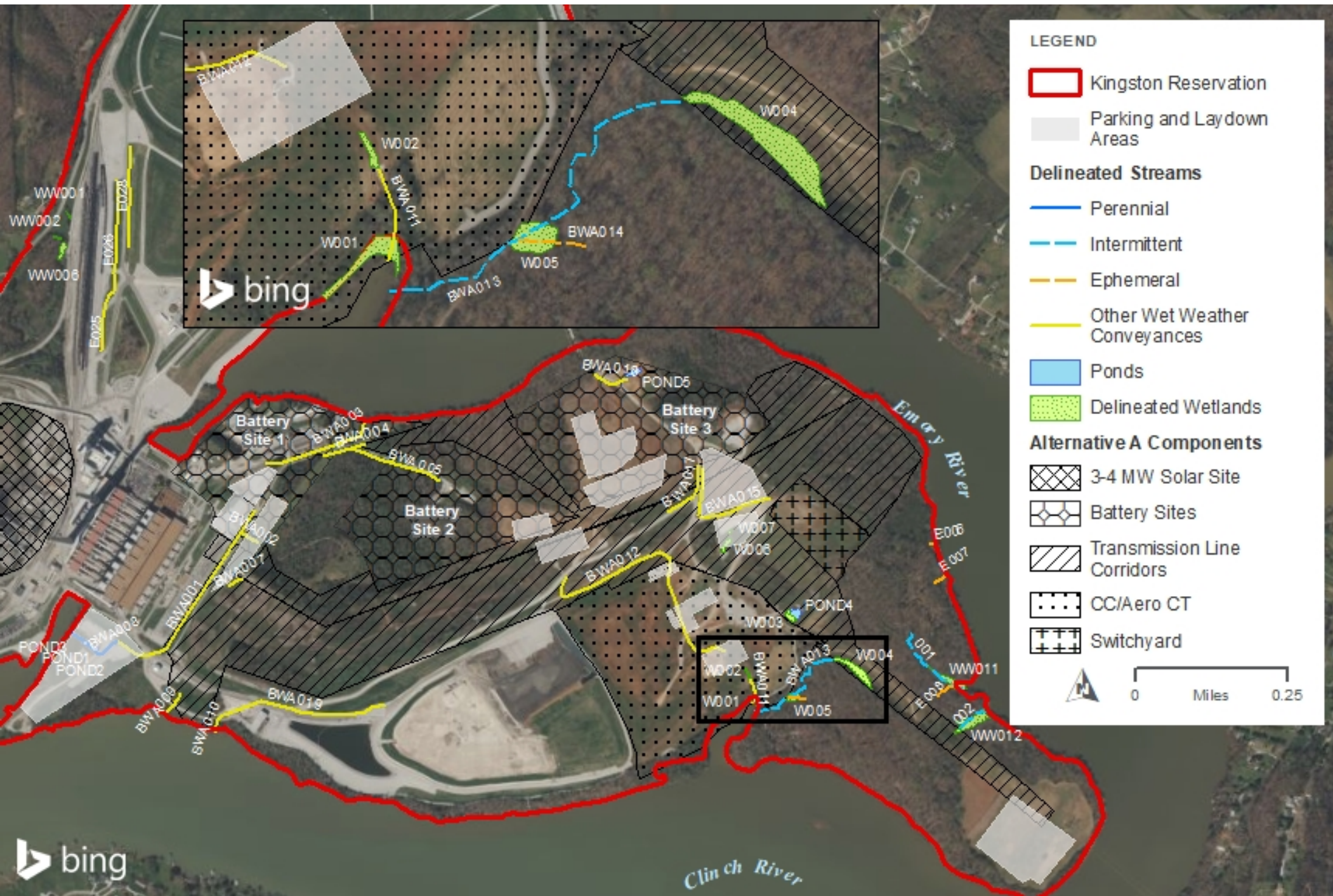


LEGEND

-  Kingston Reservation
-  Demolition Boundary
-  Osprey Nests
-  Potential Habitat for Fetter Bush
- Bat Habitat**
 -  Foraging
 -  Roosting (Low Quality)
 -  Roosting (Moderate Quality)
 -  Roosting (High Quality)

DATA SOURCE: Site survey completed by TVA, summer 2019; Bing Aerial Imagery





LEGEND

- Kingston Reservation
- Parking and Laydown Areas

Delineated Streams

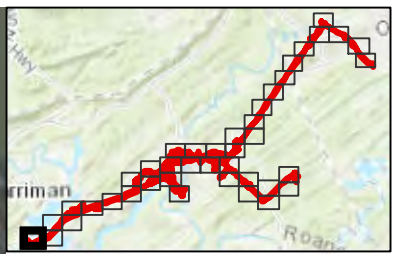
- Perennial
- Intermittent
- Ephemeral
- Other Wet Weather Conveyances

- Ponds
- Delineated Wetlands

Alternative A Components



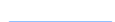






- 3-4 MW Solar Site
- Battery Sites
- Transmission Line Corridors
- CC/Aero CT
- Switchyard

0 Miles 0.25



**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

-  Study Area
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery

Emory River

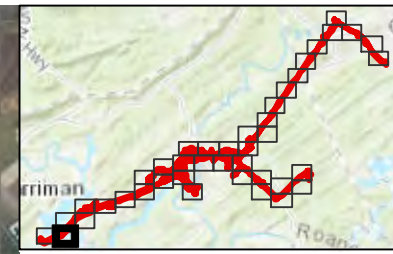
S014 (Clinch River)
Perennial
317 linear feet

Emory River

Emory River







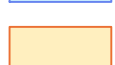
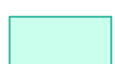

Mahoney Cemetery

Emory River



KLINGSTON TRANSMISSION
LINE - EAST

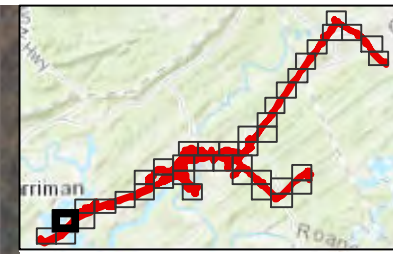
LEGEND

-  Study Area
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland












DATA SOURCE: Bing Hybrid Aerial Imagery





KIINGSTON TRANSMISSION LINE - EAST

LEGEND

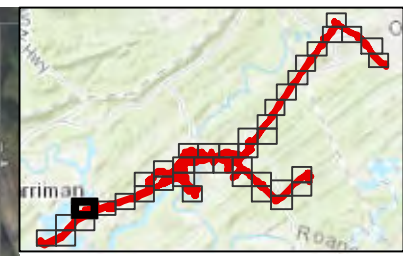
-  Study Area
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery












S014 (Clinch River)
Perennial
317 linear feet



**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

-  Study Area
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland

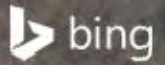
P004
0.02 acre

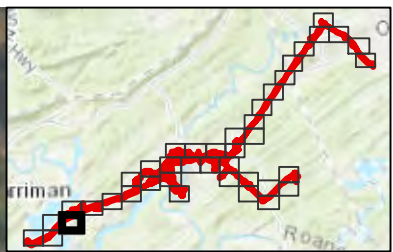
E005
WWC
775 linear feet

W017
Emergent
0.02 acre



DATA SOURCE: Bing Hybrid Aerial Imagery





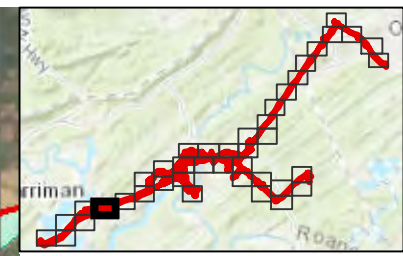
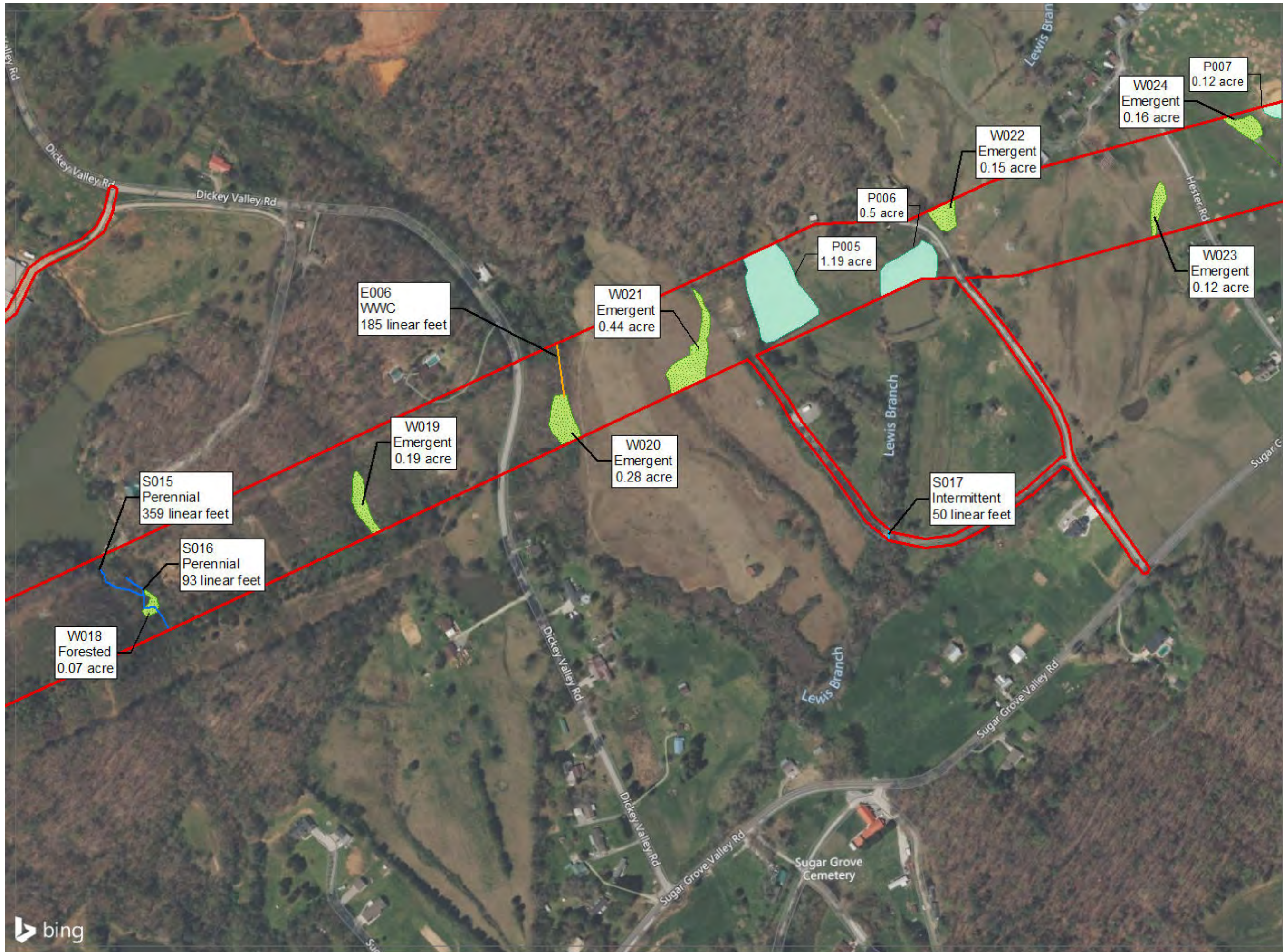
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery

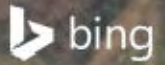


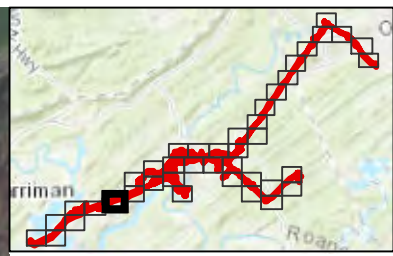
KIINGSTON TRANSMISSION LINE - EAST

- LEGEND**
- Study Area
 - Culvert
 - Delineated Perennial Stream
 - Delineated Intermittent Streams
 - Wet Weather Conveyance
 - Delineated Perennial Stream
 - Wet Weather Conveyance
 - HDR Delineated Open Water
 - HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery





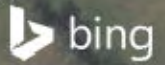
KIINGSTON TRANSMISSION LINE - EAST

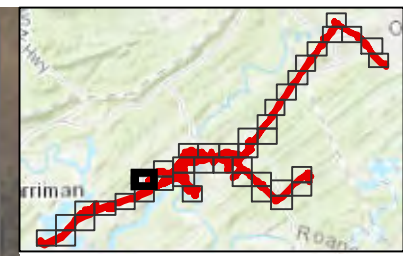
LEGEND

- Study Area
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland












DATA SOURCE: Bing Hybrid Aerial Imagery





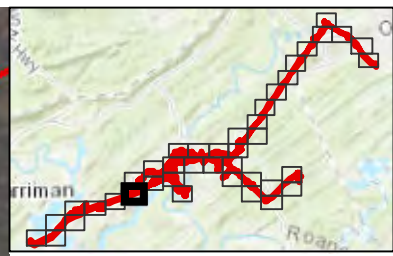
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

-  Study Area
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



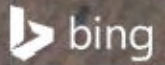
KIINGSTON TRANSMISSION LINE - EAST

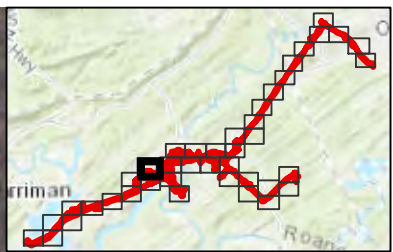
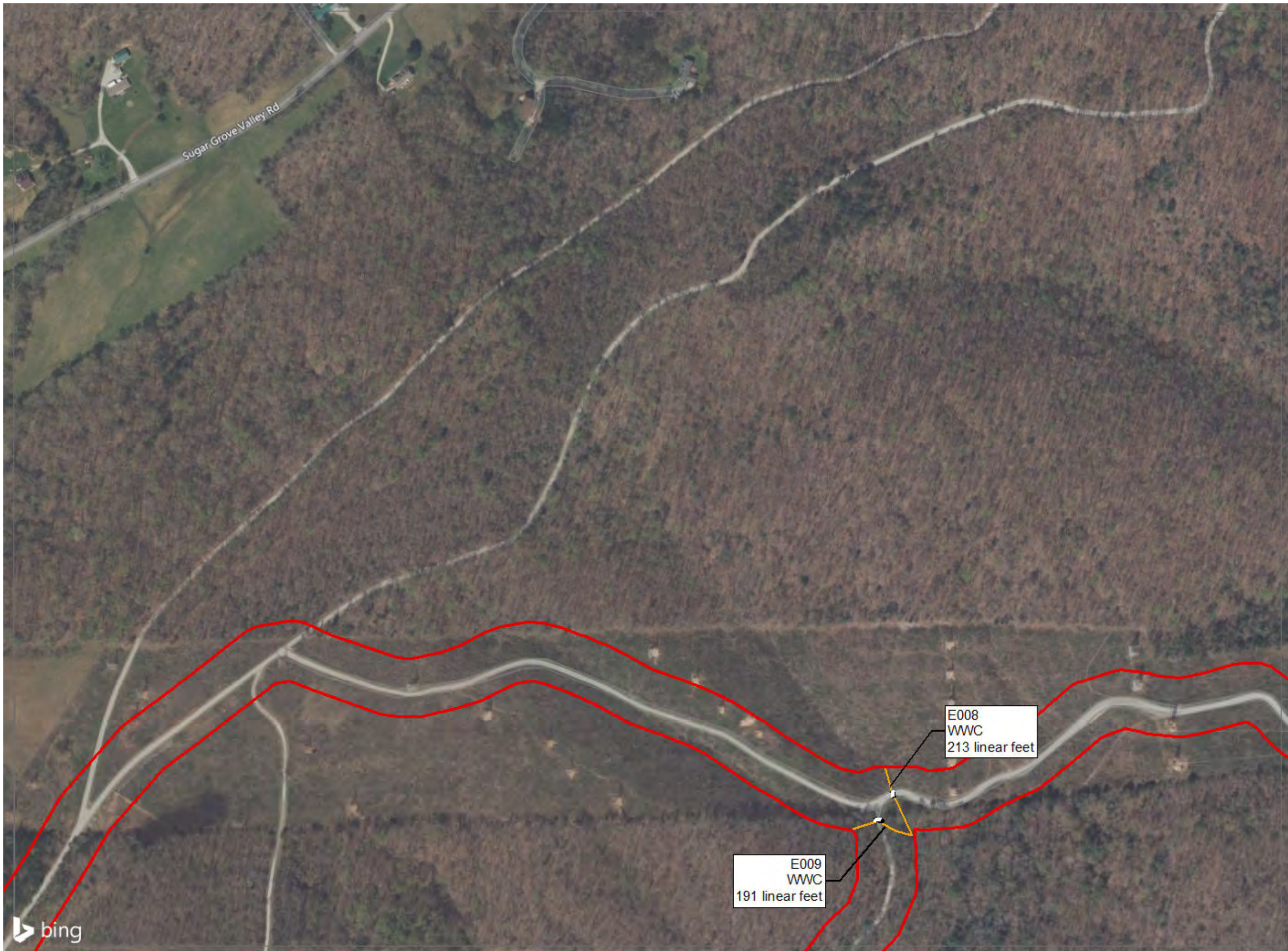
LEGEND

- Study Area
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery





**KIINGSTON TRANSMISSION
LINE - EAST**

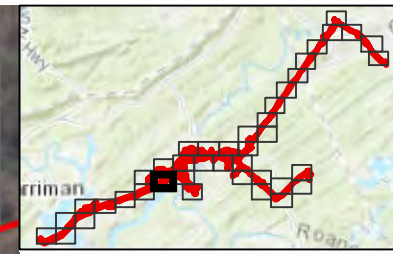
LEGEND

- Study Area
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

E008
WWC
213 linear feet

E009
WWC
191 linear feet





**KIINGSTON TRANSMISSION
LINE - EAST**









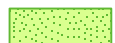
E010
WWC
226 linear feet

W027
Emergent
0.09 acre

S019
Perennial
220 linear feet

S020 (Clinch River Channel)
Perennial
243 linear feet

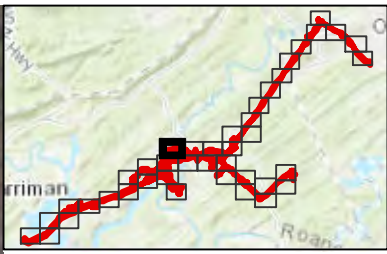
LEGEND

-  Study Area
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland












DATA SOURCE: Bing Hybrid Aerial Imagery





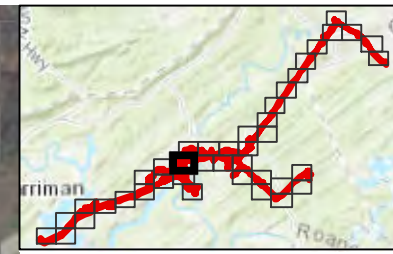
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

-  Study Area
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



KIINGSTON TRANSMISSION LINE - EAST

S023 (Poplar Creek)
Perennial
1,165 linear feet

W031
Emergent
0.16 acre










E013
WWC
1020 linear feet

S022
Intermittent
210 linear feet

E012
WWC
275 linear feet

E011
WWC
308 linear feet

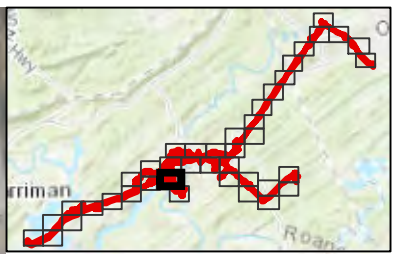
LEGEND

-  Study Area
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland









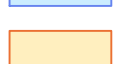
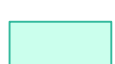

DATA SOURCE: Bing Hybrid Aerial Imagery





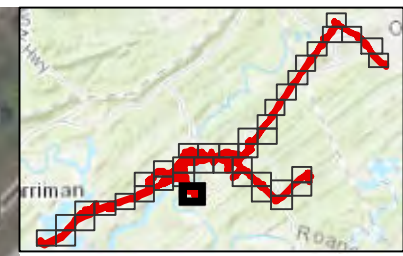
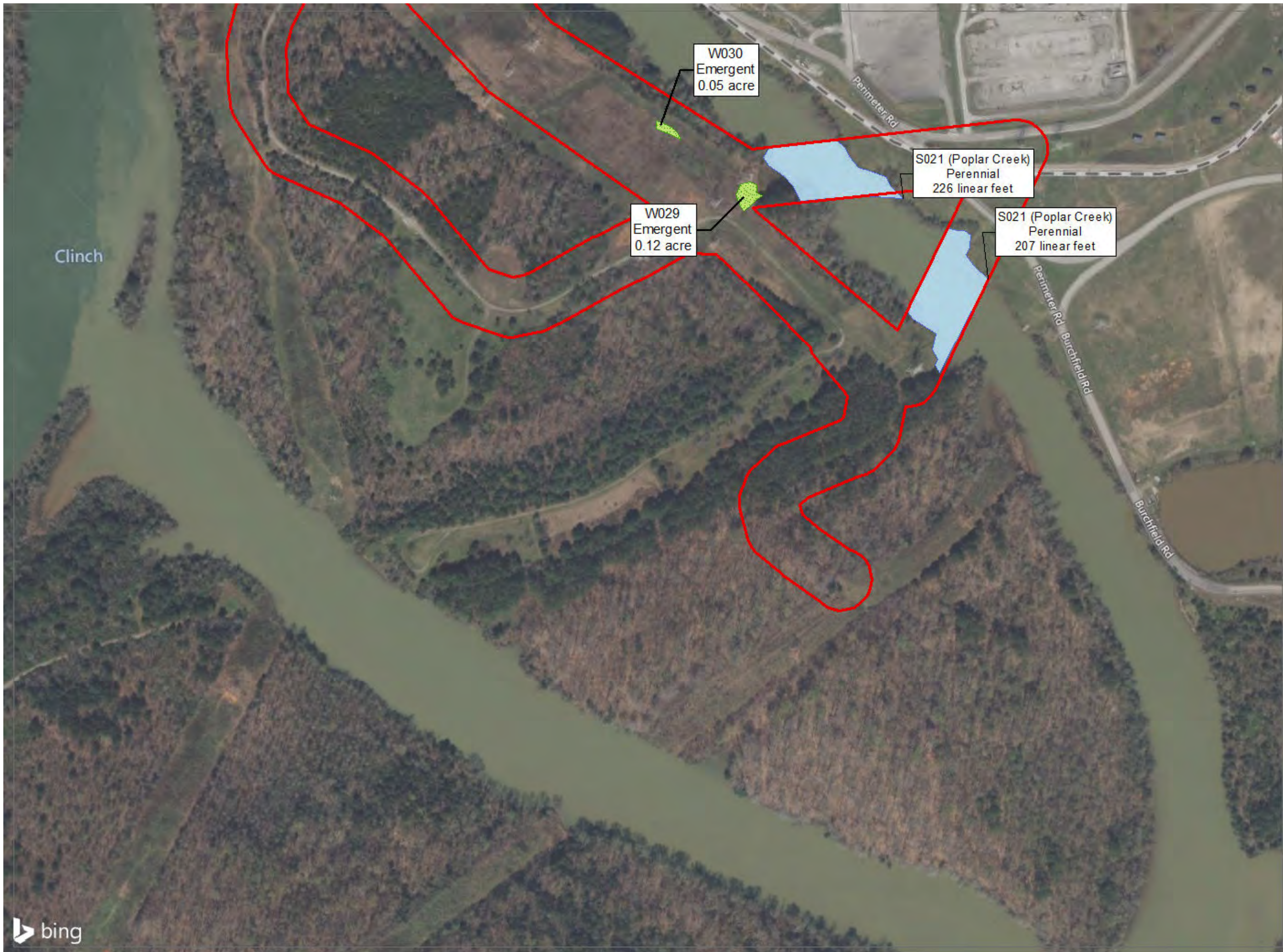
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

-  Study Area
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery

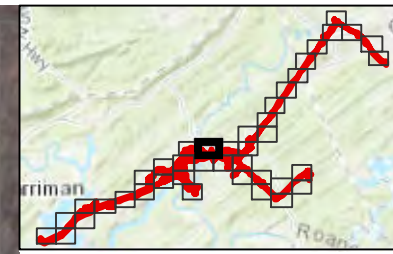


KIINGSTON TRANSMISSION LINE - EAST

- LEGEND**
- Study Area
 - Culvert
 - Delineated Perennial Stream
 - Delineated Intermittent Streams
 - Wet Weather Conveyance
 - Delineated Perennial Stream
 - Wet Weather Conveyance
 - HDR Delineated Open Water
 - HDR Delineated Wetland












DATA SOURCE: Bing Hybrid Aerial Imagery



KIINGSTON TRANSMISSION LINE - EAST

LEGEND

-  Study Area
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland



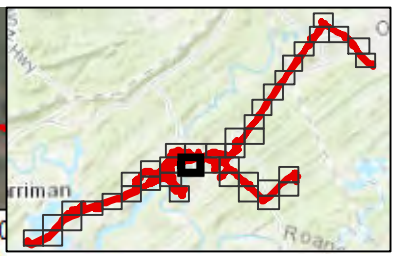
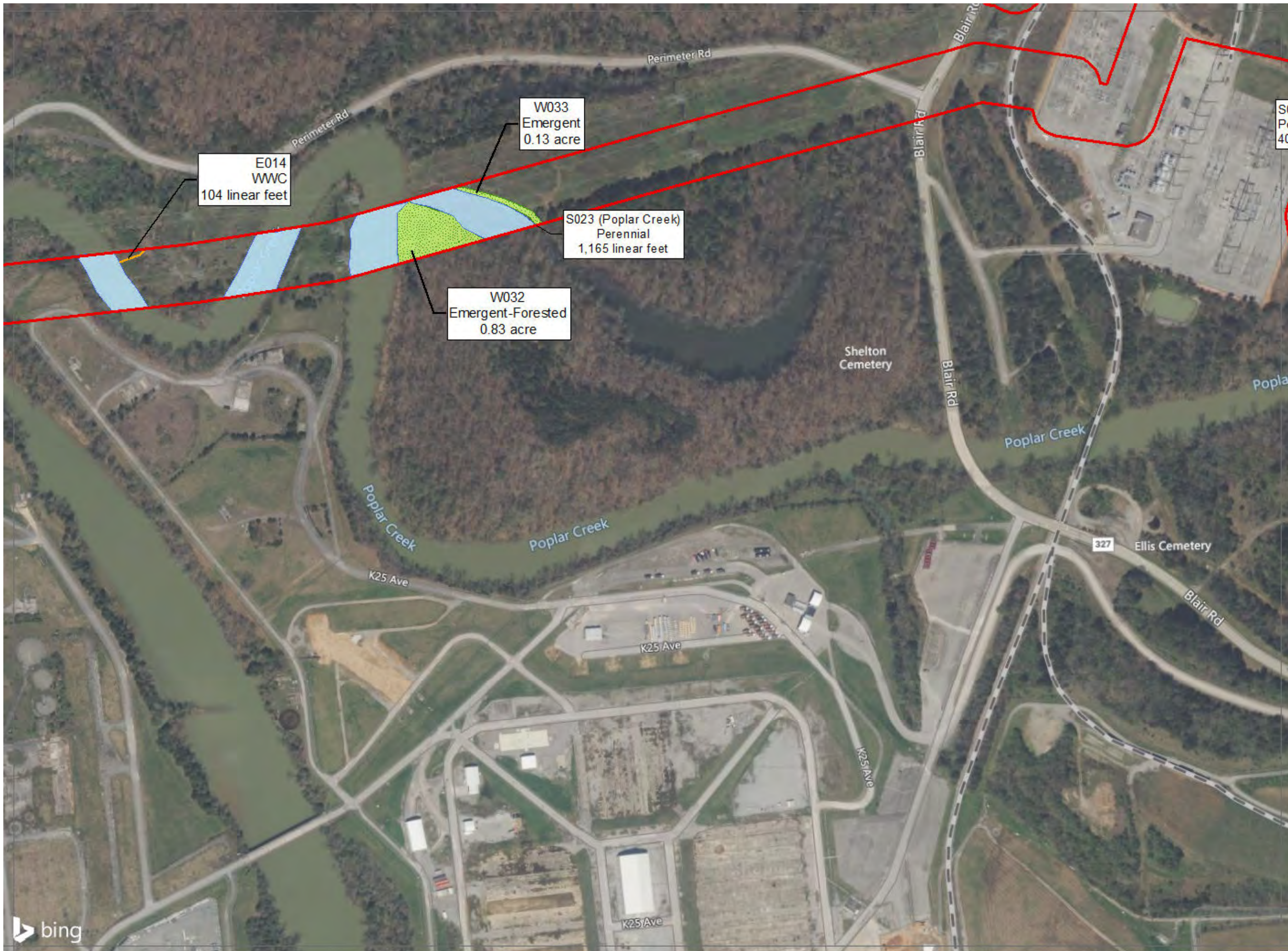
DATA SOURCE: Bing Hybrid Aerial Imagery



S024
Perennial 7 LF
Intermittent 8 LF

W034
Emergent
0.01 acre

S025 (Poplar Creek)
Perennial
406 linear feet



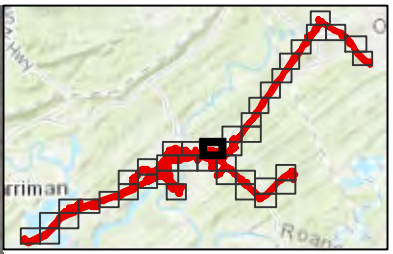
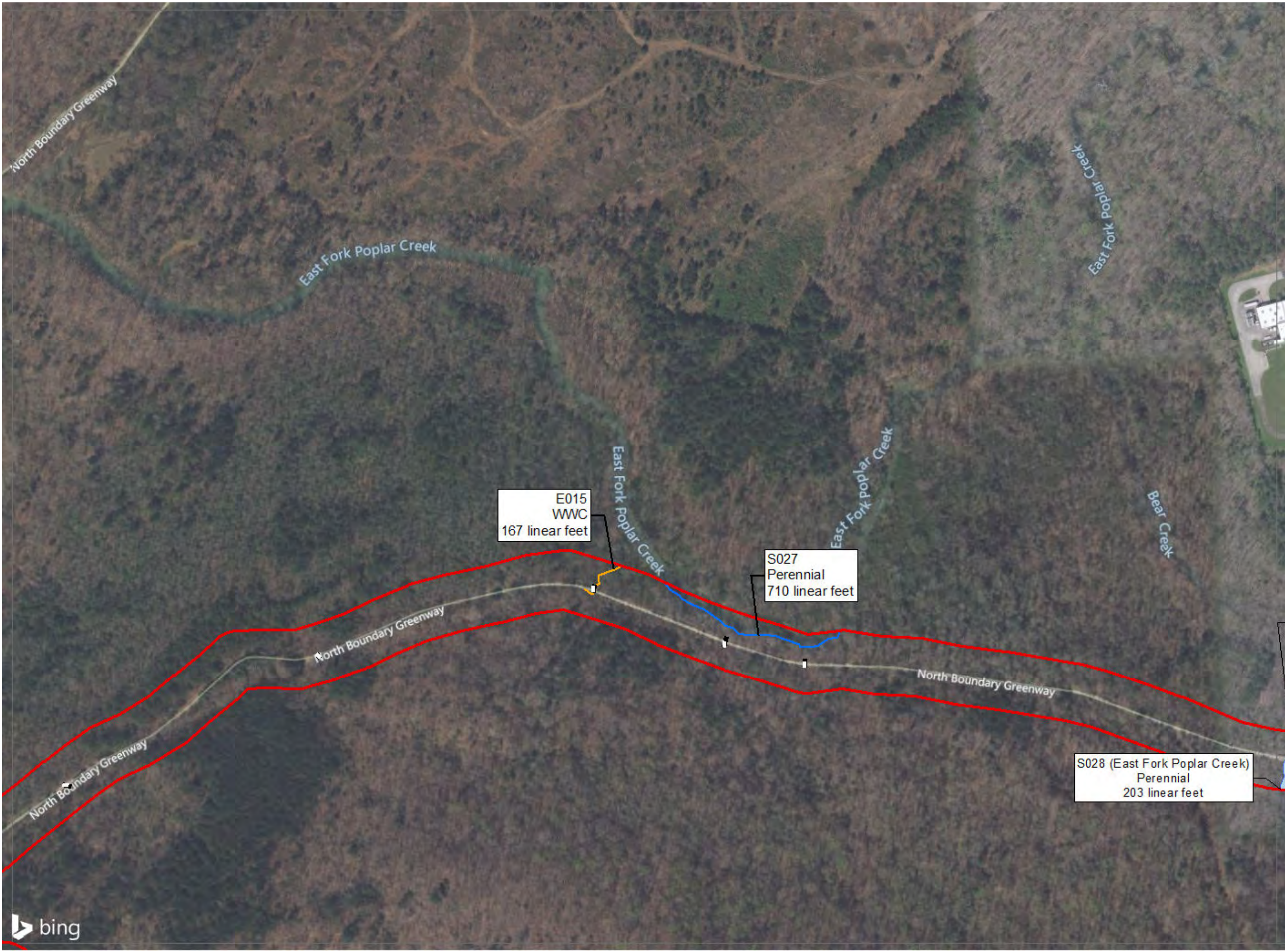
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



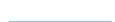








DATA SOURCE: Bing Hybrid Aerial Imagery



KIINGSTON TRANSMISSION LINE - EAST

LEGEND

-  Study Area
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland

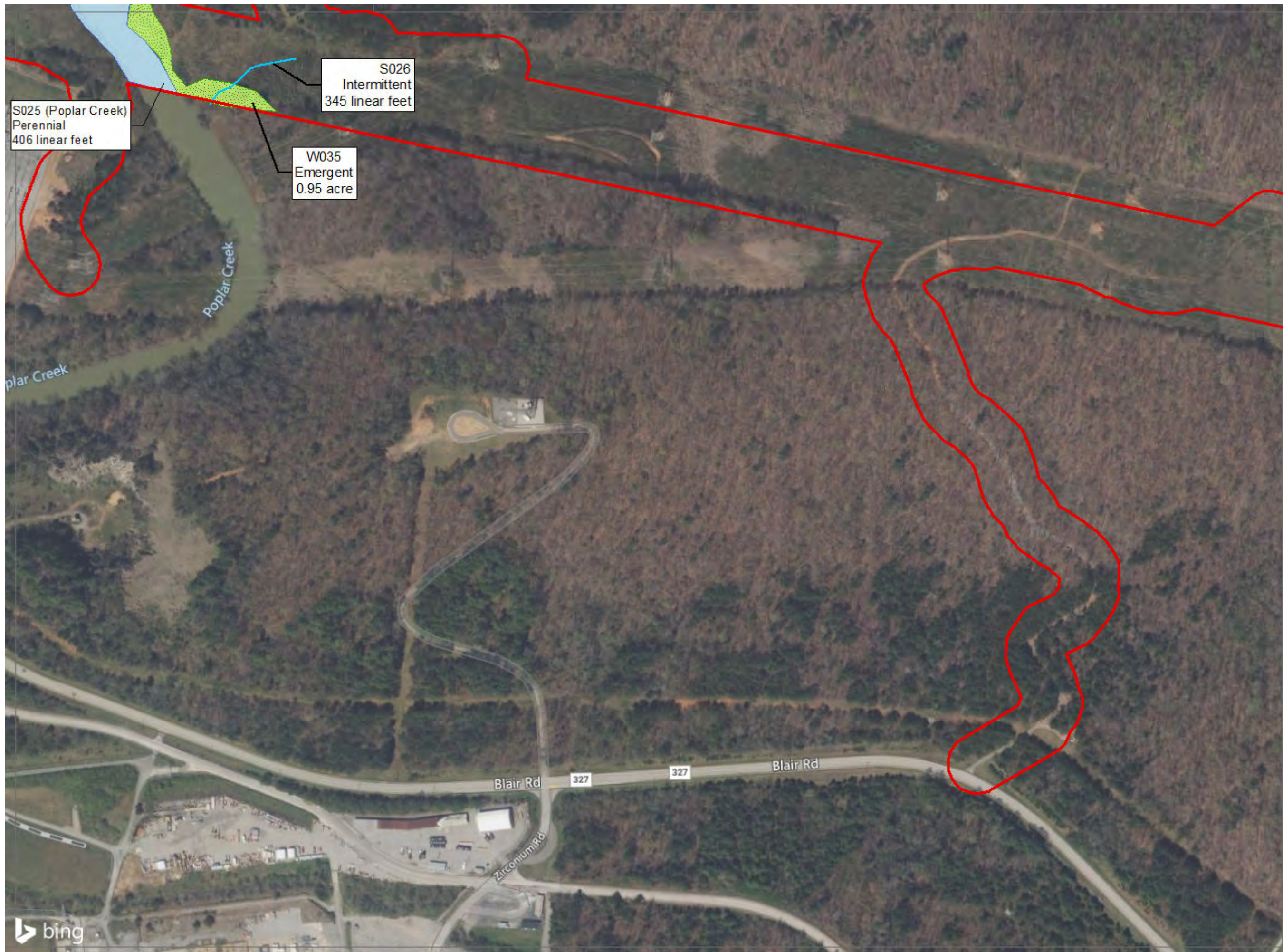
E015
WWC
167 linear feet

S027
Perennial
710 linear feet

S028 (East Fork Poplar Creek)
Perennial
203 linear feet



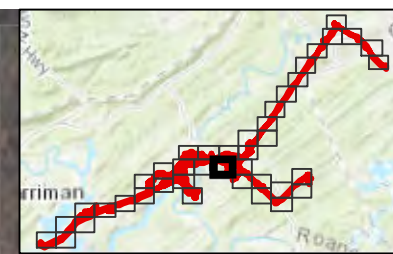
DATA SOURCE: Bing Hybrid Aerial Imagery



S025 (Poplar Creek)
Perennial
406 linear feet

S026
Intermittent
345 linear feet

W035
Emergent
0.95 acre

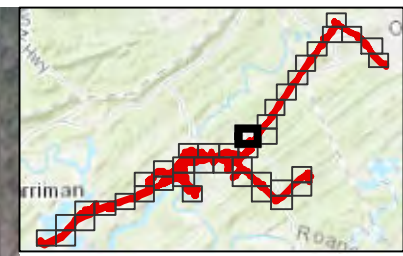


**KIINGSTON TRANSMISSION
LINE - EAST**

- LEGEND**
- Study Area
 - Culvert
 - Delineated Perennial Stream
 - Delineated Intermittent Streams
 - Wet Weather Conveyance
 - Delineated Perennial Stream
 - Wet Weather Conveyance
 - HDR Delineated Open Water
 - HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

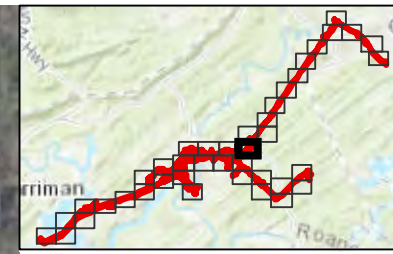
S033
Perennial
235 linear feet

S034
Intermittent
107 linear feet

E017
WWC
216 linear feet



DATA SOURCE: Bing Hybrid Aerial Imagery



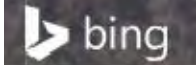
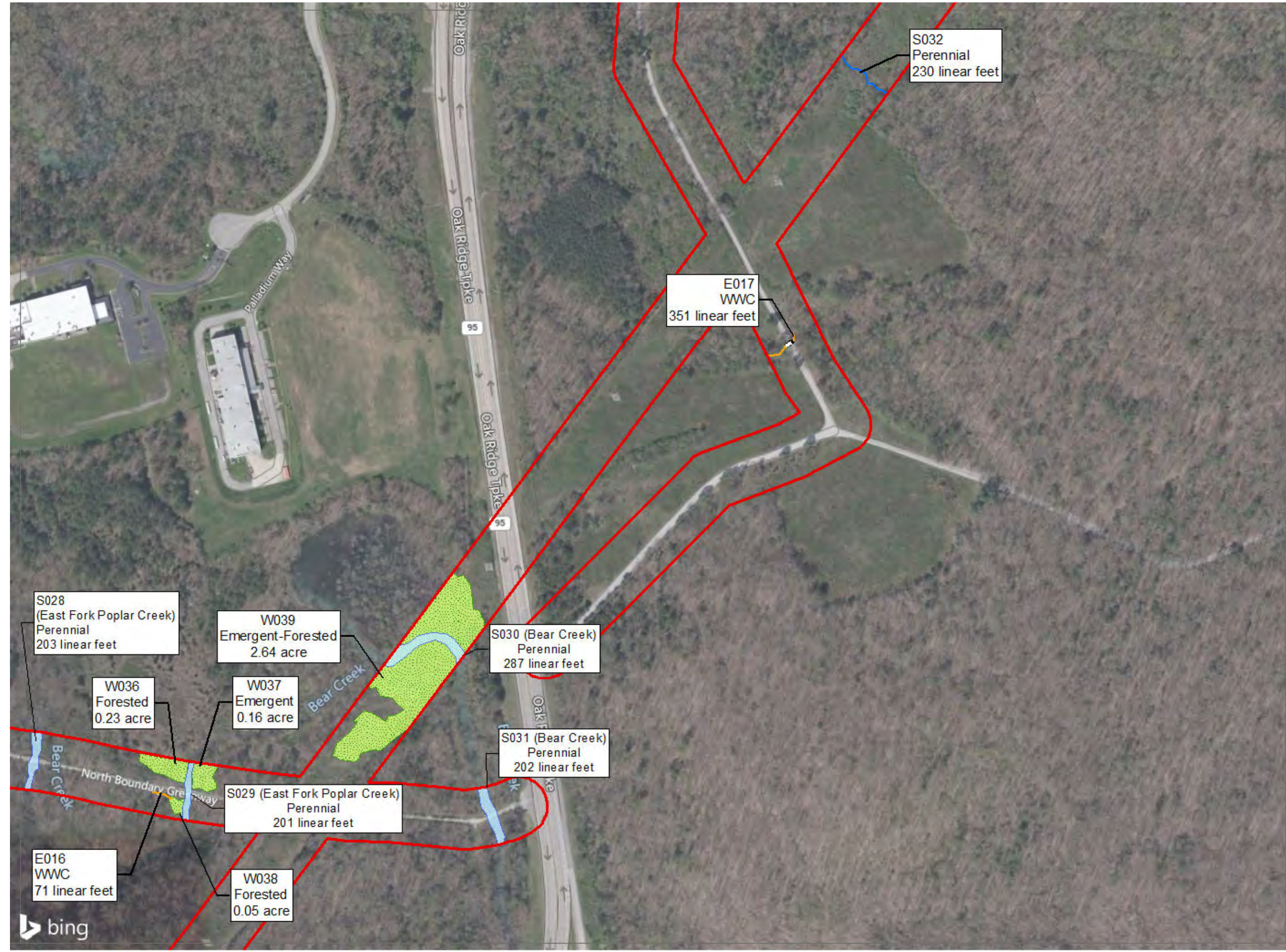
KIINGSTON TRANSMISSION LINE - EAST

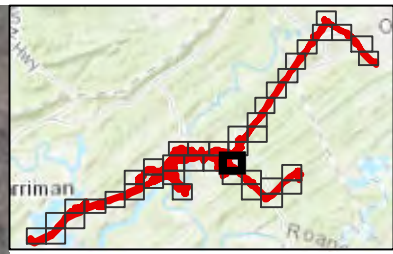
LEGEND

- Study Area
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland





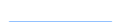






DATA SOURCE: Bing Hybrid Aerial Imagery





**KIINGSTON TRANSMISSION
LINE - EAST**

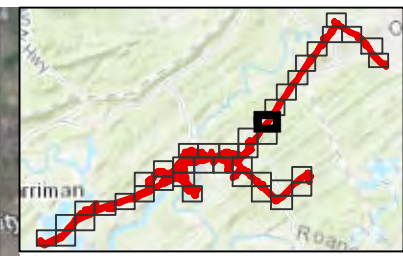
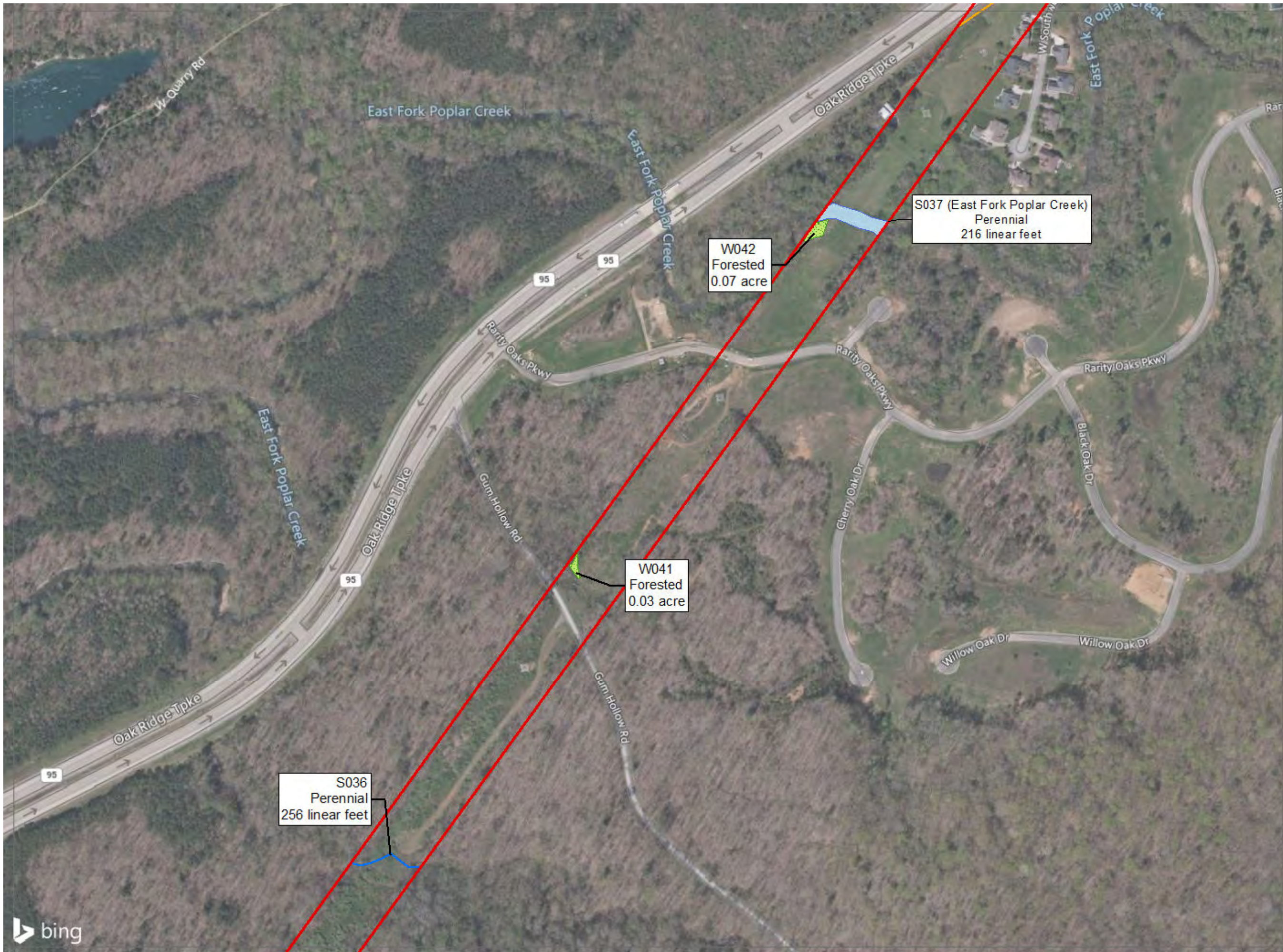
LEGEND

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-  Culvert
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-  Delineated Perennial Stream
-  Wet Weather Conveyance
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DATA SOURCE: Bing Hybrid Aerial Imagery



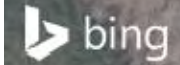


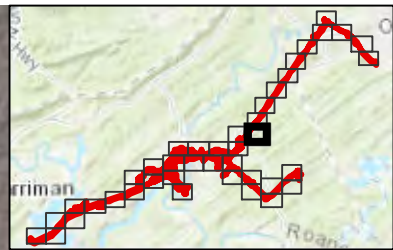
KIINGSTON TRANSMISSION LINE - EAST

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 - Culvert
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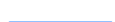





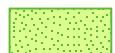
DATA SOURCE: Bing Hybrid Aerial Imagery





**KIINGSTON TRANSMISSION
LINE - EAST**

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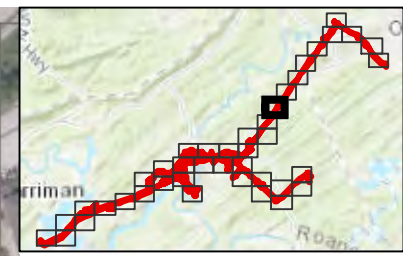


S035
Intermittent
175 linear feet

W040
Emergent
0.12 acre

Gum Hollow Rd

Gum Hollow Rd

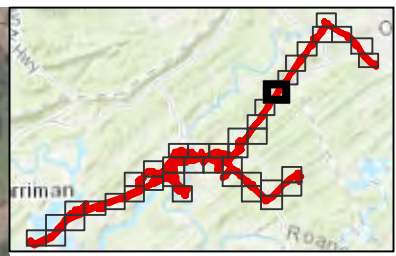


KIINGSTON TRANSMISSION LINE - EAST

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 - Delineated Perennial Stream
 - Wet Weather Conveyance
 - HDR Delineated Open Water
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DATA SOURCE: Bing Hybrid Aerial Imagery



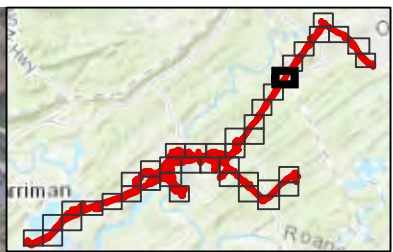
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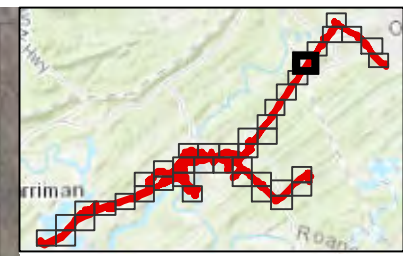
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DATA SOURCE: Bing Hybrid Aerial Imagery

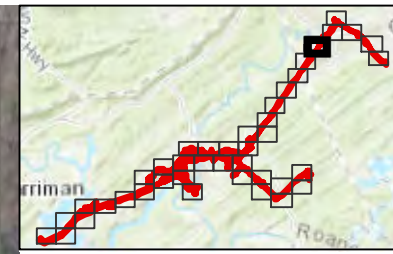


KIINGSTON TRANSMISSION LINE - EAST

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








DATA SOURCE: Bing Hybrid Aerial Imagery



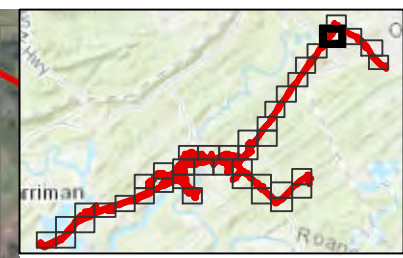
**KIINGSTON TRANSMISSION
LINE - EAST**

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DATA SOURCE: Bing Hybrid Aerial Imagery



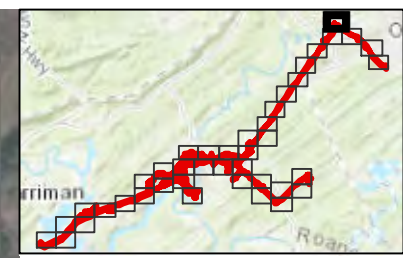
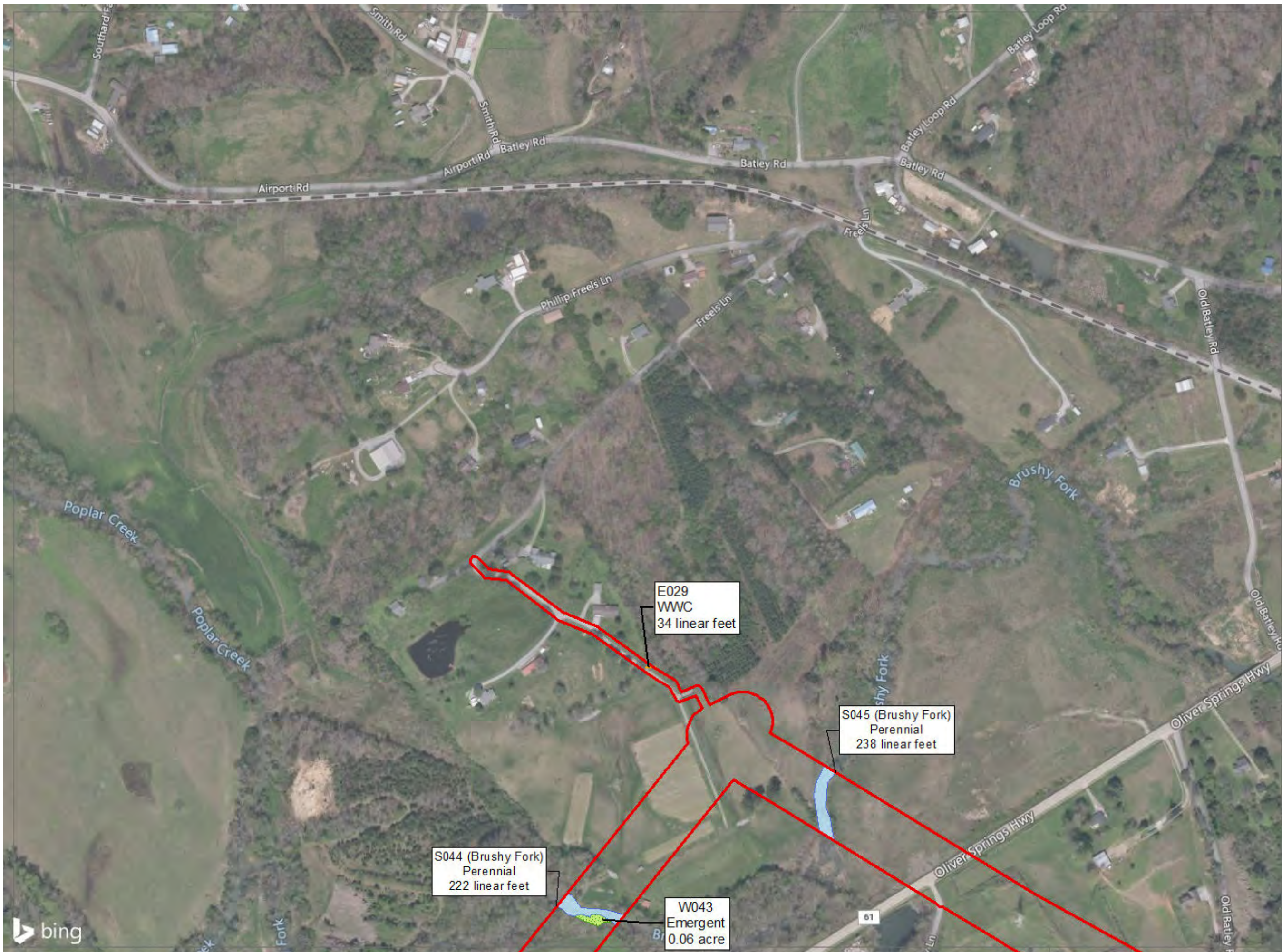
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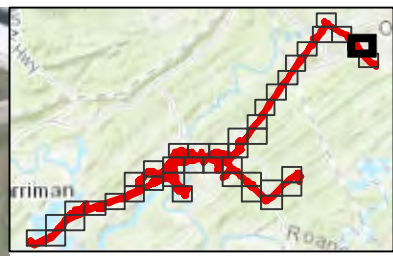
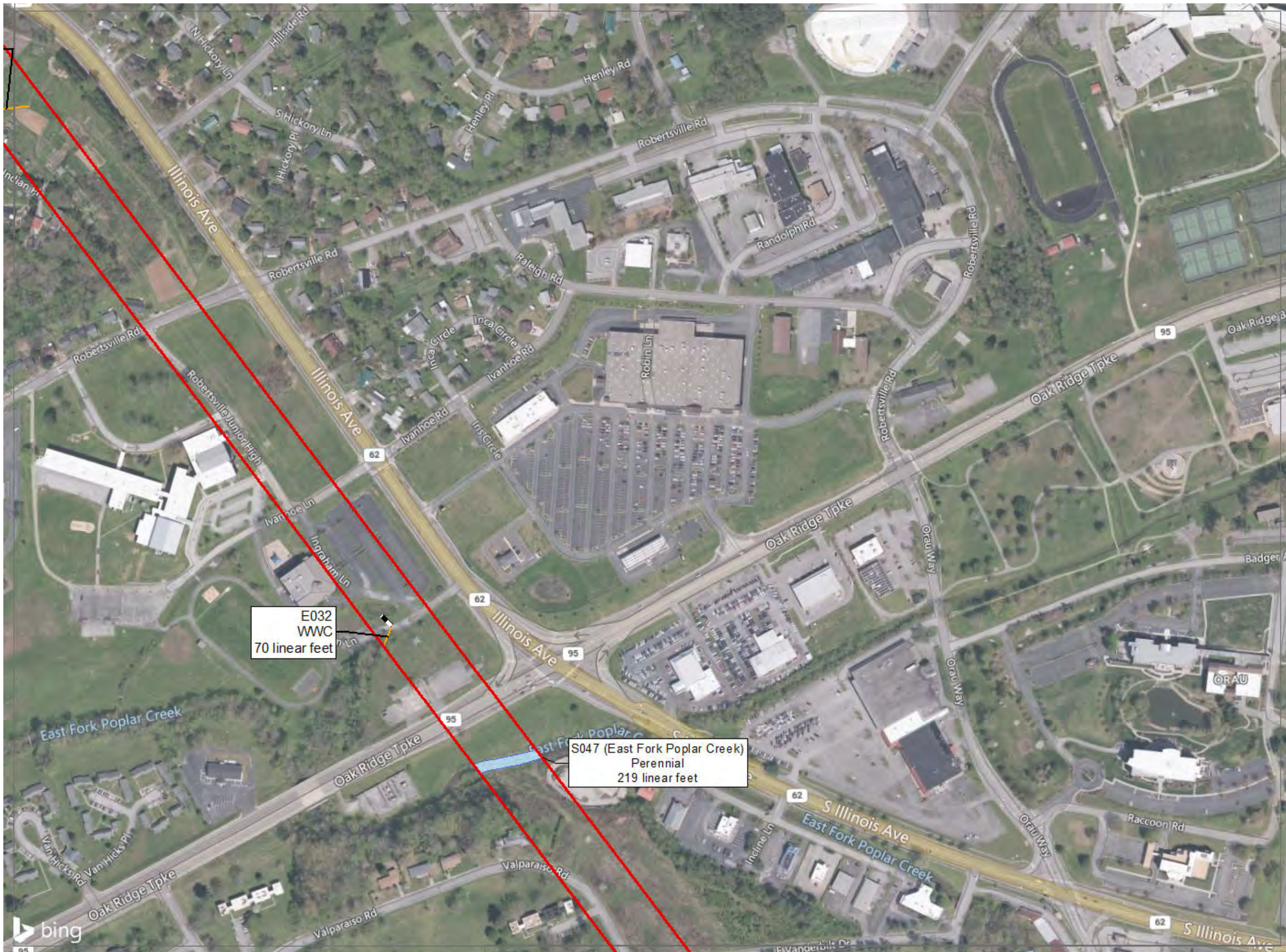


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








DATA SOURCE: Bing Hybrid Aerial Imagery



KIINGSTON TRANSMISSION LINE - EAST

LEGEND

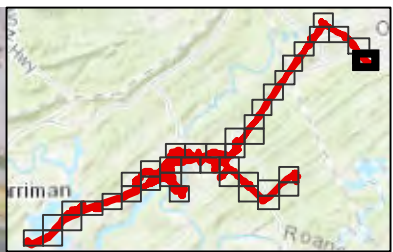
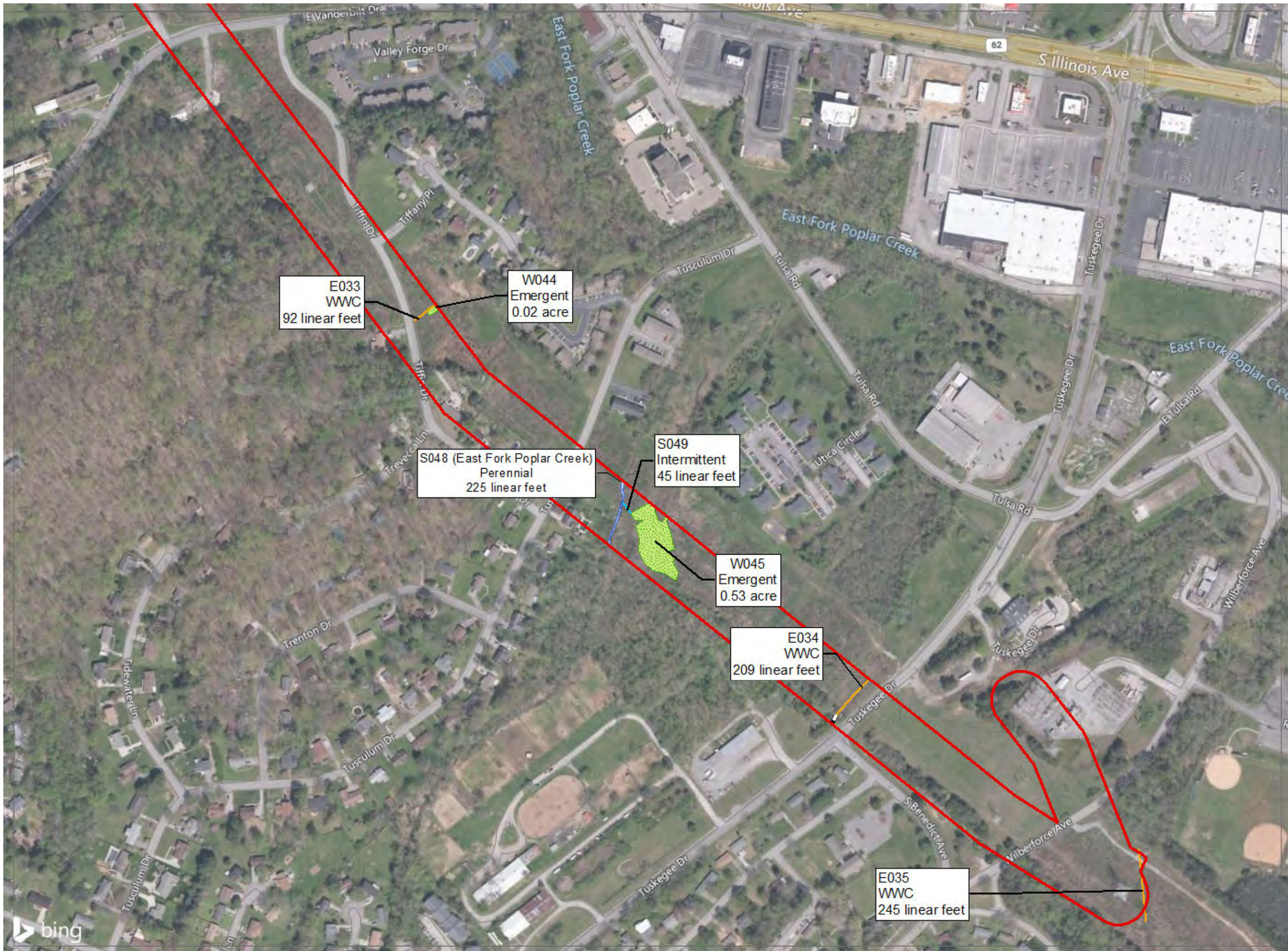
-  Study Area
-  Culvert
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E032
WWC
70 linear feet

S047 (East Fork Poplar Creek)
Perennial
219 linear feet







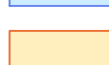
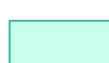



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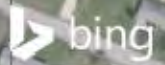
KIINGSTON TRANSMISSION LINE - EAST

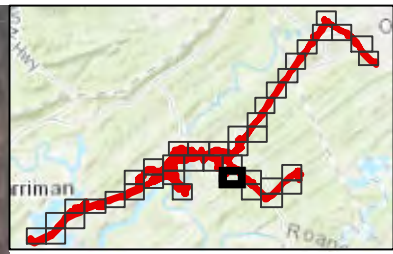
LEGEND

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-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
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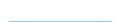





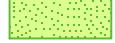
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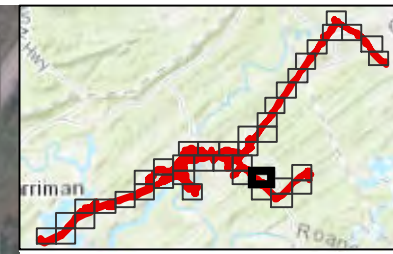
**KIINGSTON TRANSMISSION
LINE - EAST**

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








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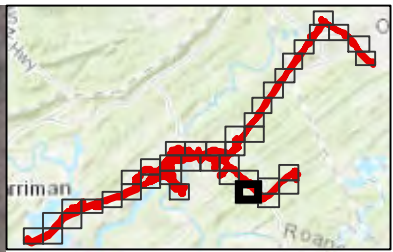
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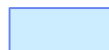

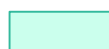



DATA SOURCE: Bing Hybrid Aerial Imagery



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-  Delineated Perennial Stream
-  Wet Weather Conveyance
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-  HDR Delineated Wetland

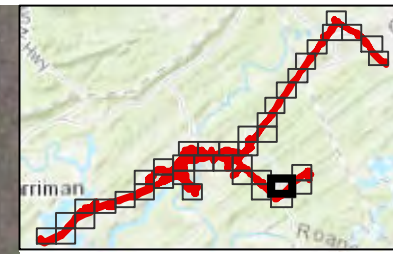
W046
Emergent
0.07 acre

E036
WWC
202 linear feet

Bear Creek Rd












DATA SOURCE: Bing Hybrid Aerial Imagery



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LINE - EAST**

LEGEND

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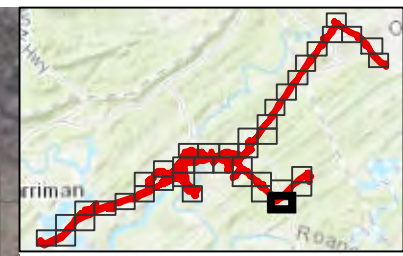
E038
WWC
185 linear feet

E037
WWC
230 linear feet



DATA SOURCE: Bing Hybrid Aerial Imagery



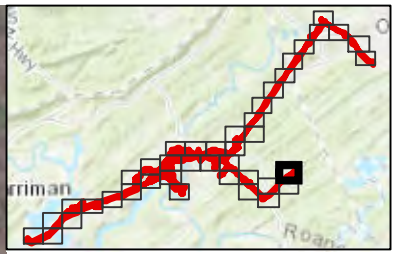


KIINGSTON TRANSMISSION LINE - EAST

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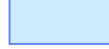





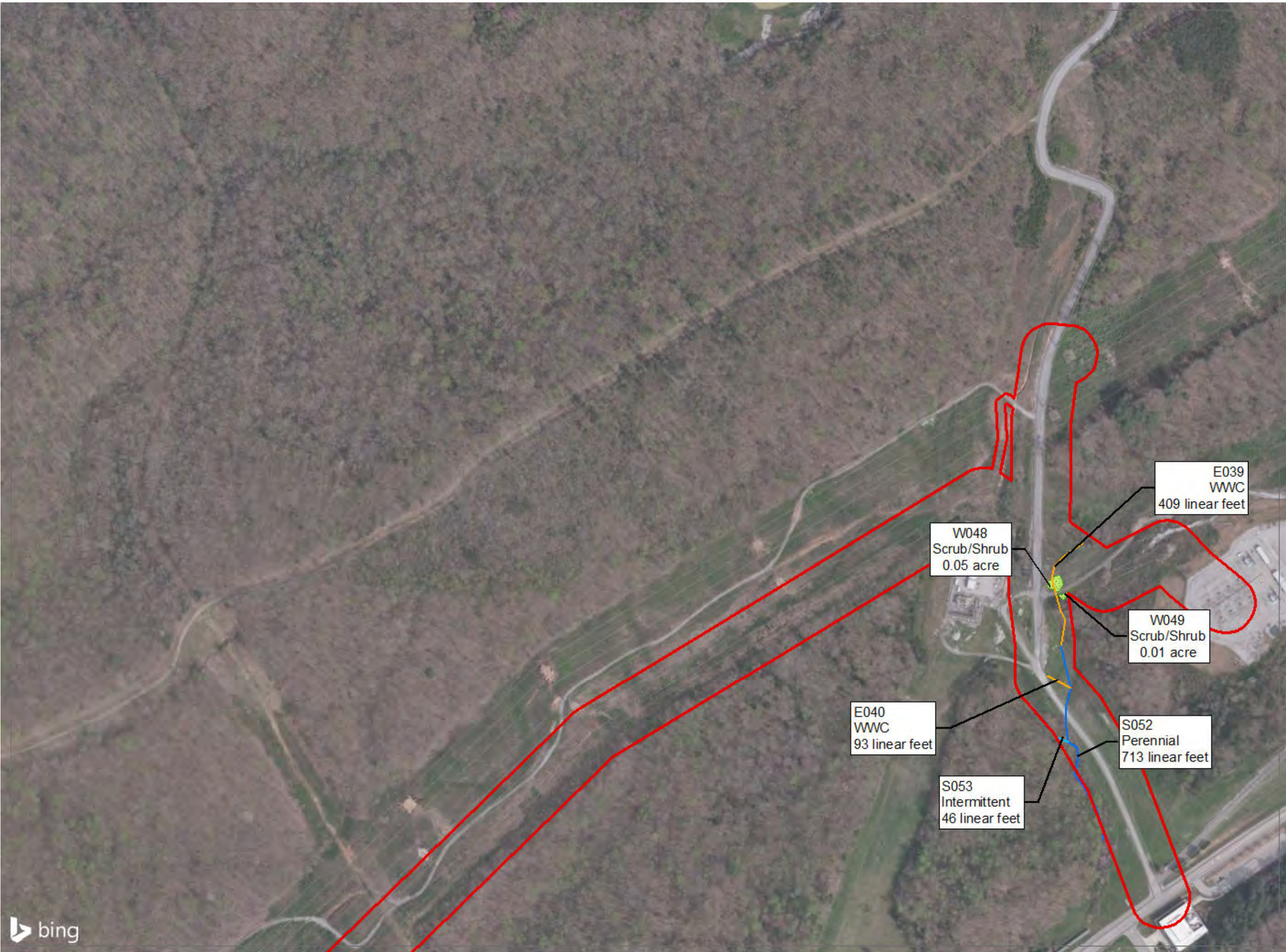
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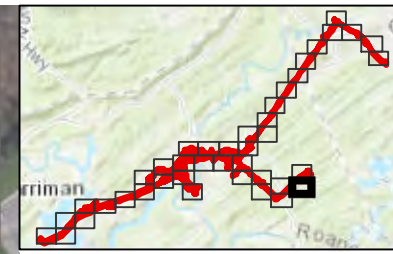
**KIINGSTON TRANSMISSION
LINE - EAST**

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S051
Intermittent
247 linear feet



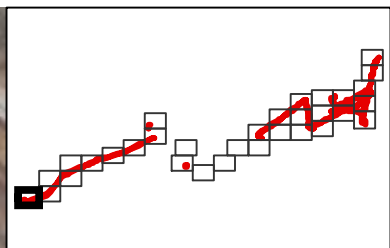
KIINGSTON TRANSMISSION
LINE - EAST

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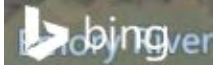
KINGSTON TRANSMISSION LINES

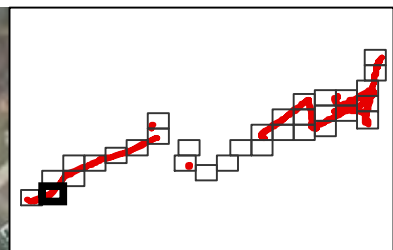
LEGEND

- Study Area
- Wetland Data Point
- Upland Data Point
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Delineated Ephemeral Stream
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
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DATA SOURCE: Bing Hybrid Aerial Imagery





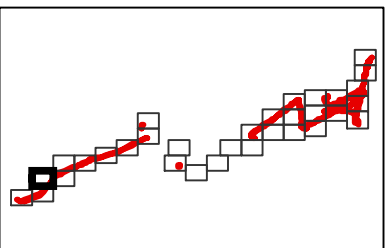
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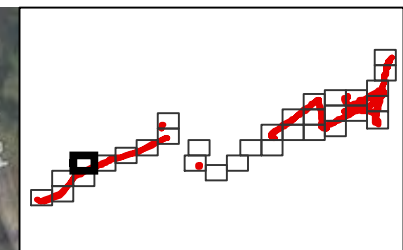
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KINGSTON TRANSMISSION LINES

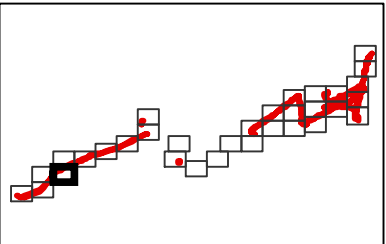
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E113
WWC
104 linear feet

E112
WWC/Erosional Gully
35 linear feet



DATA SOURCE: Bing Hybrid Aerial Imagery



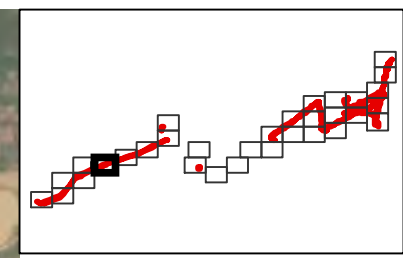
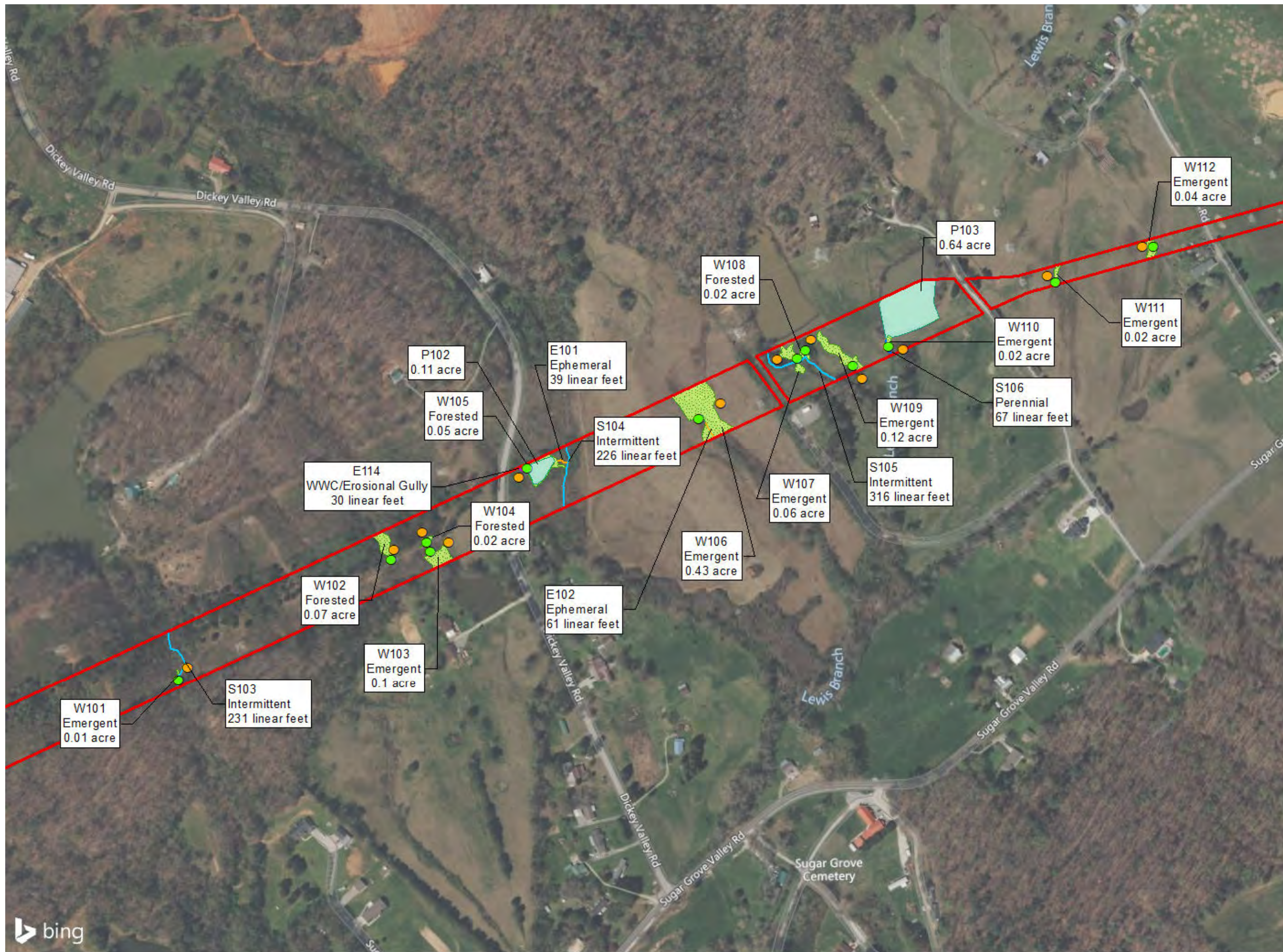
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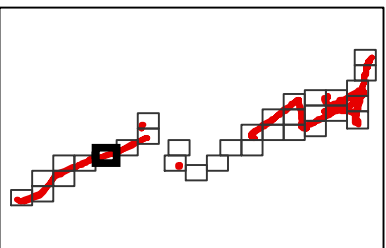


KINGSTON TRANSMISSION LINES

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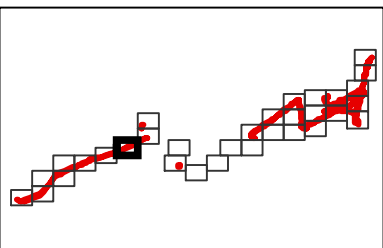
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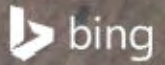
KINGSTON TRANSMISSION LINES

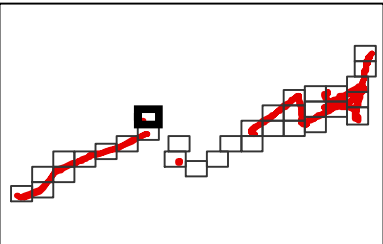
LEGEND

- Study Area
- Wetland Data Point
- Upland Data Point
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Delineated Ephemeral Stream
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland












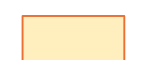
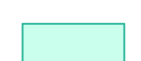

DATA SOURCE: Bing Hybrid Aerial Imagery





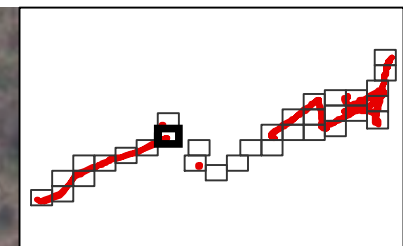
KINGSTON TRANSMISSION LINES

LEGEND













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-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
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DATA SOURCE: Bing Hybrid Aerial Imagery

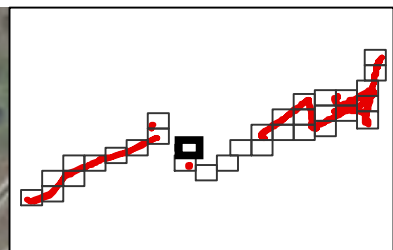


KINGSTON TRANSMISSION LINES

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DATA SOURCE: Bing Hybrid Aerial Imagery

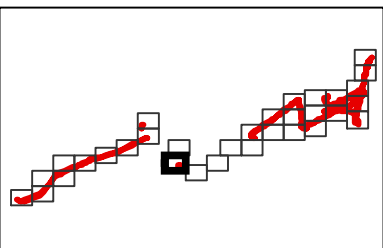


KINGSTON TRANSMISSION LINES

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DATA SOURCE: Bing Hybrid Aerial Imagery

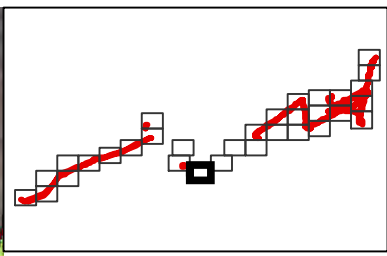


KINGSTON TRANSMISSION LINES

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DATA SOURCE: Bing Hybrid Aerial Imagery

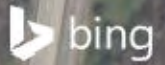


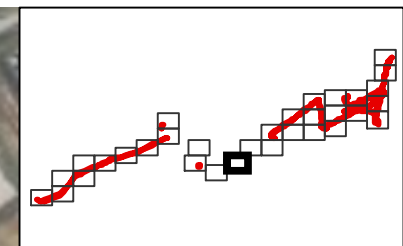
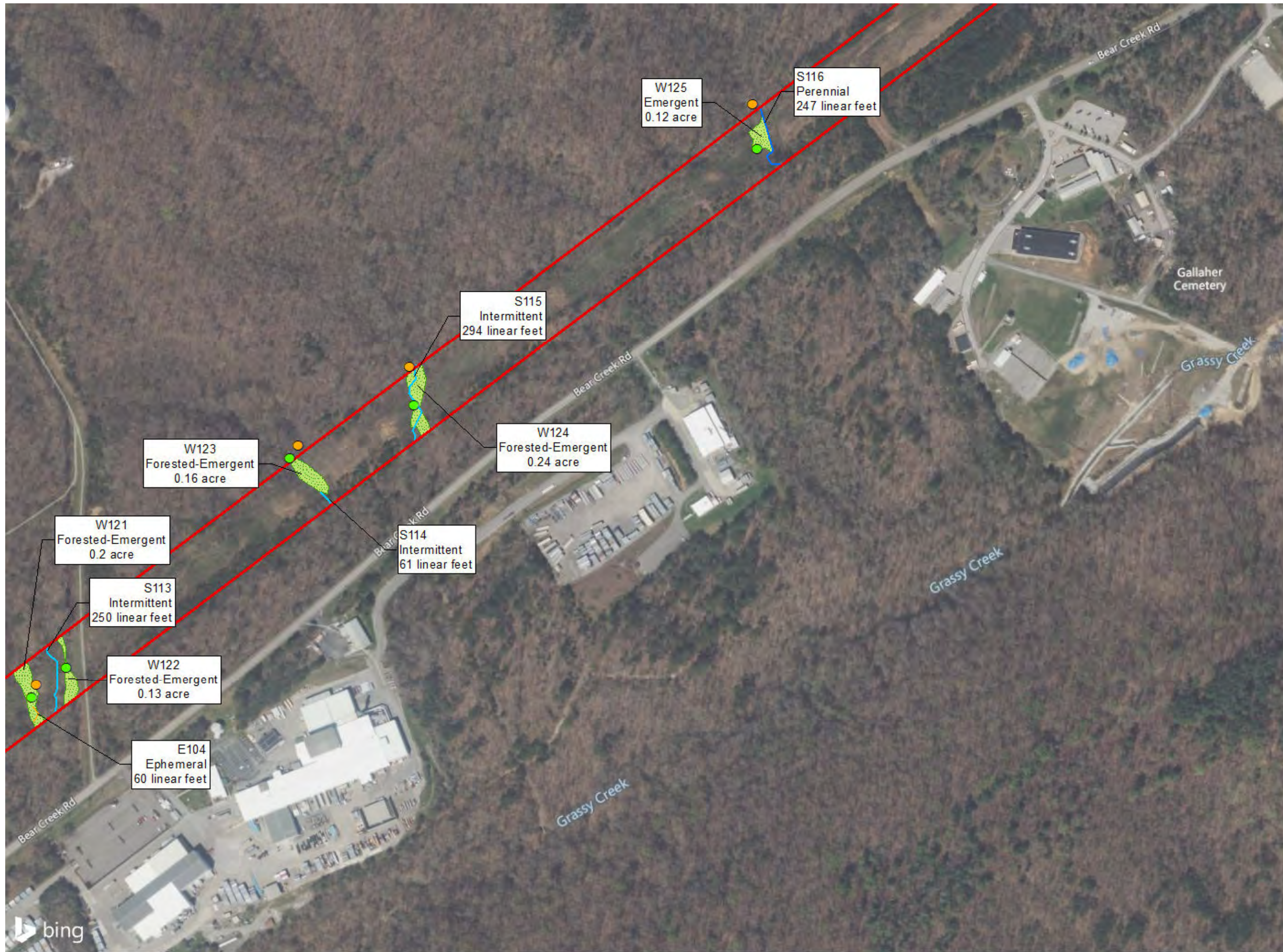
KINGSTON TRANSMISSION LINES

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DATA SOURCE: Bing Hybrid Aerial Imagery



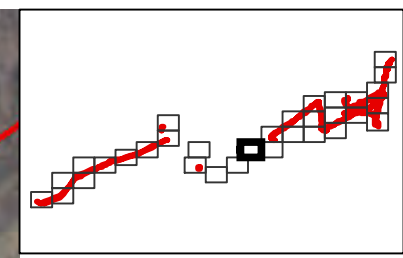


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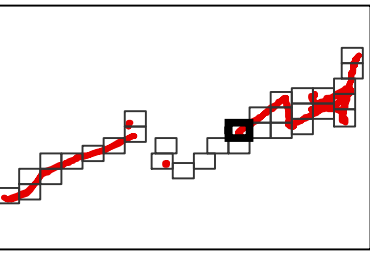
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DATA SOURCE: Bing Hybrid Aerial Imagery

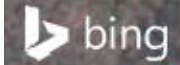
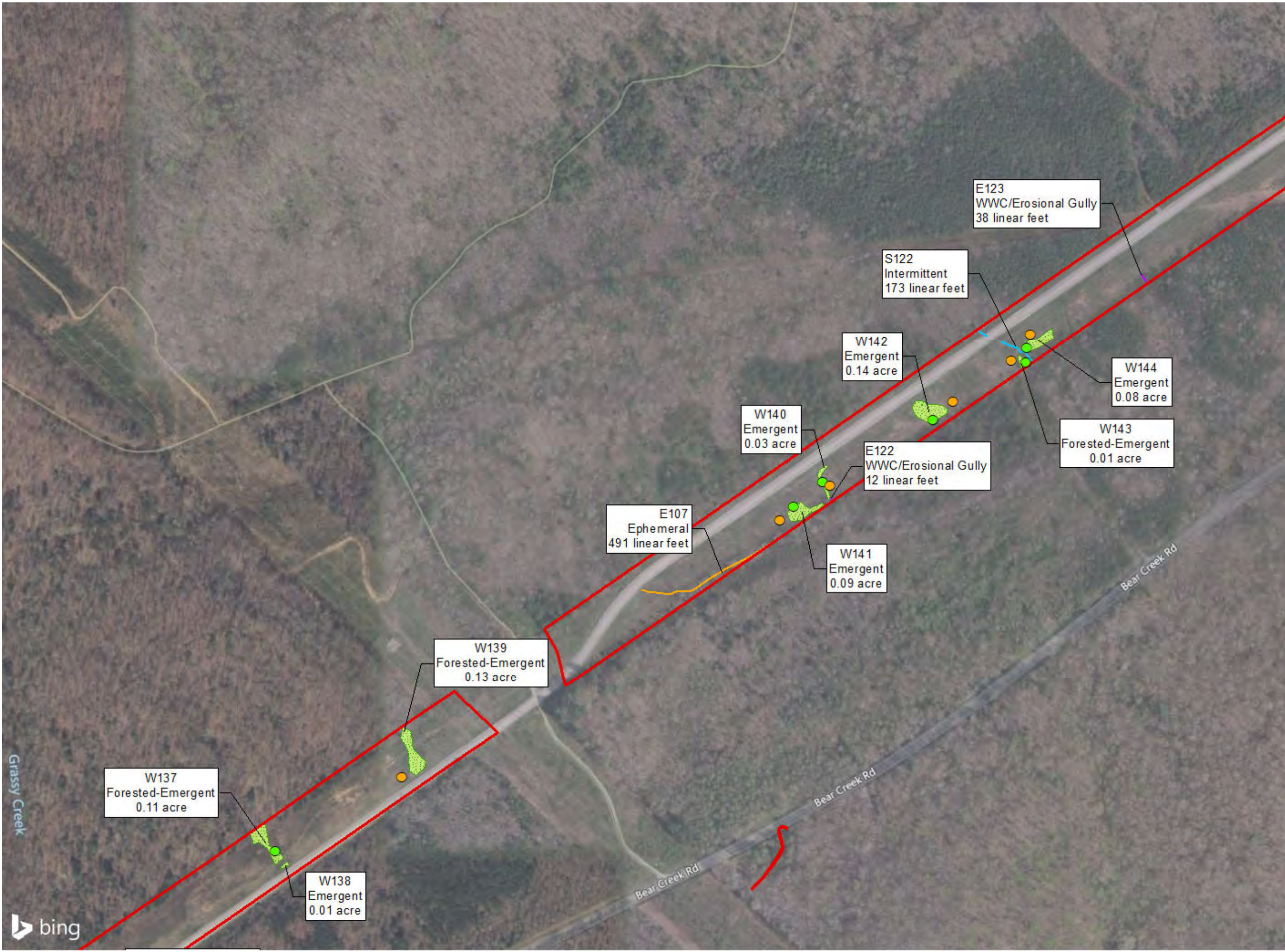




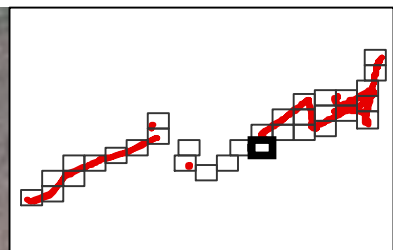
KINGSTON TRANSMISSION LINES

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DATA SOURCE: Bing Hybrid Aerial Imagery



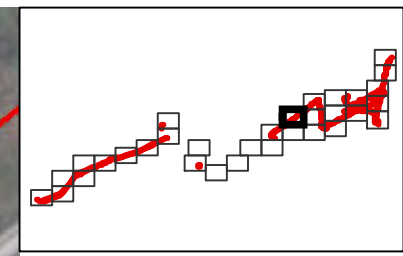
KINGSTON TRANSMISSION LINES

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DATA SOURCE: Bing Hybrid Aerial Imagery

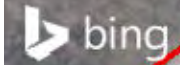


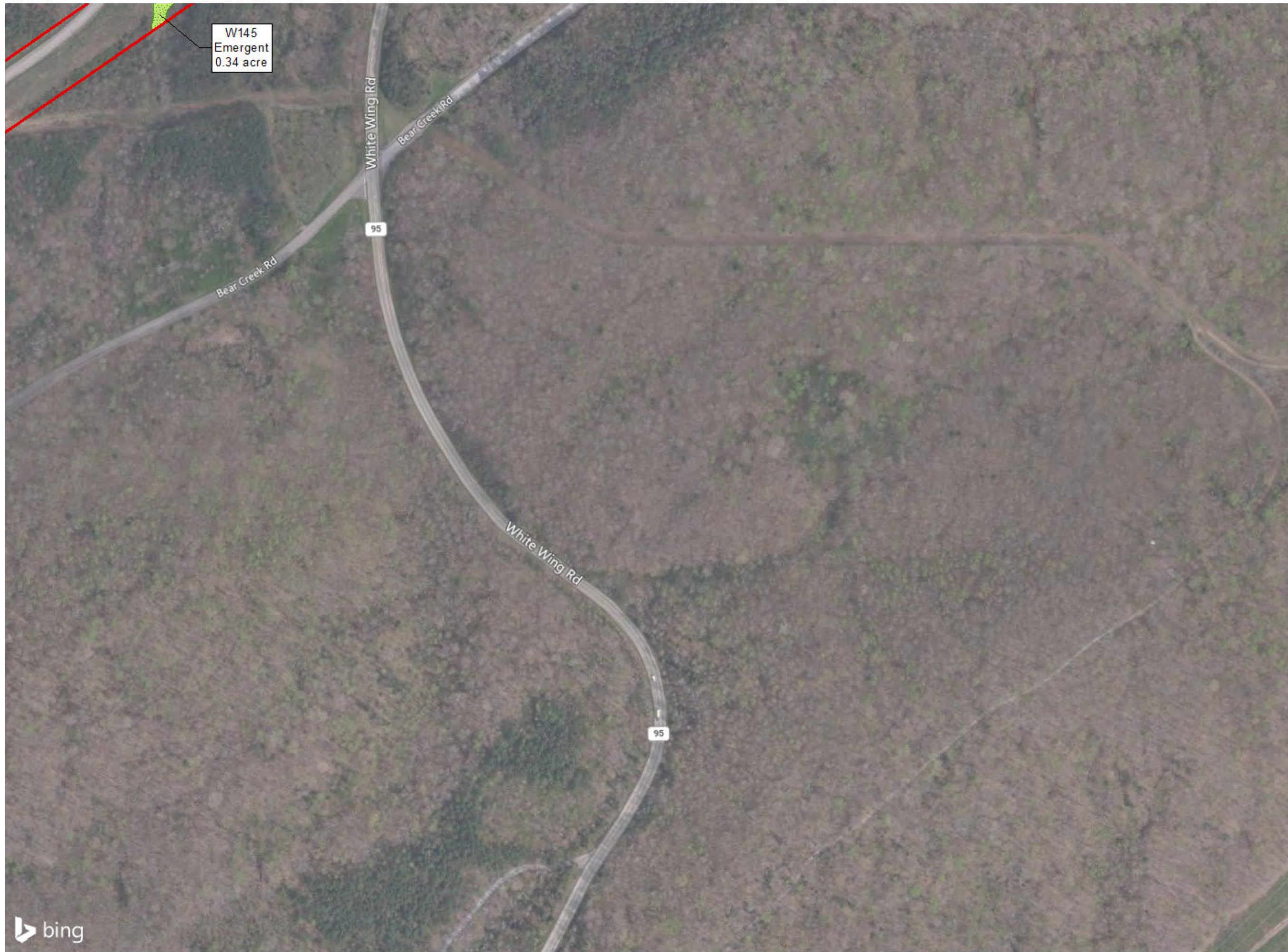
KINGSTON TRANSMISSION LINES

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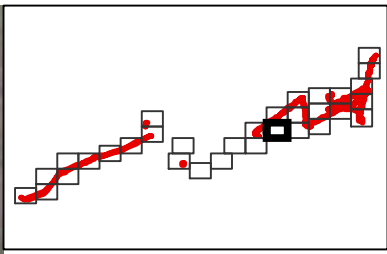


DATA SOURCE: Bing Hybrid Aerial Imagery





W145
Emergent
0.34 acre



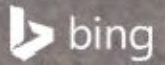
KINGSTON TRANSMISSION LINES

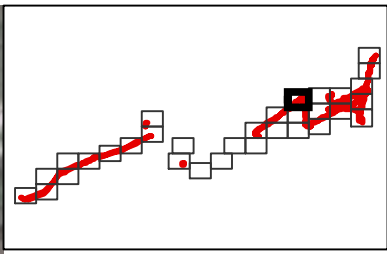
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DATA SOURCE: Bing Hybrid Aerial Imagery





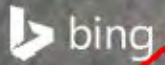
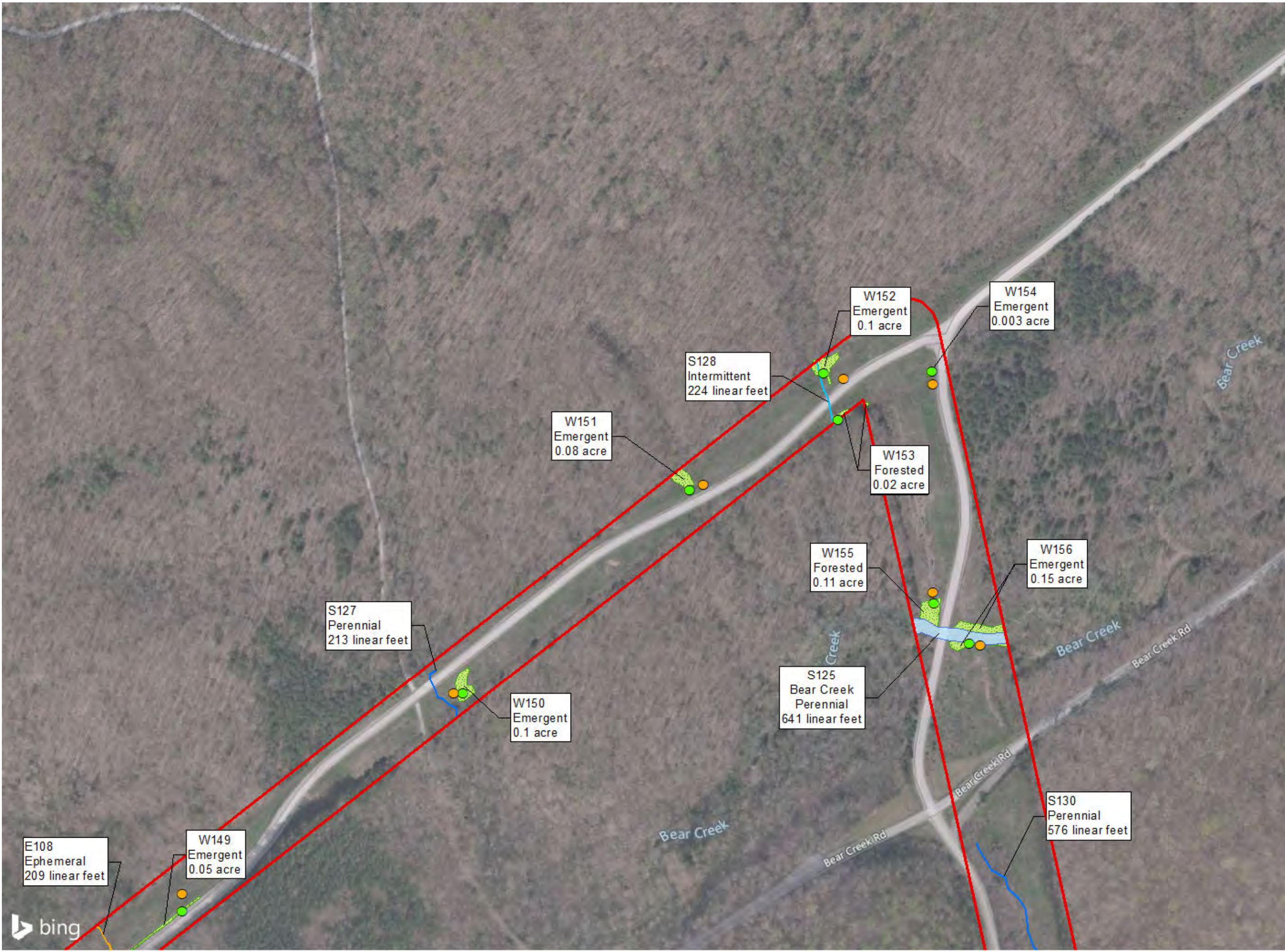
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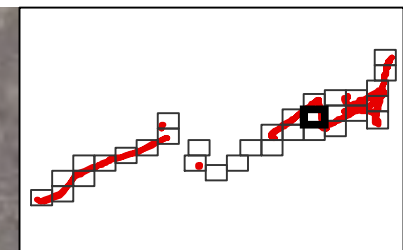
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DATA SOURCE: Bing Hybrid Aerial Imagery



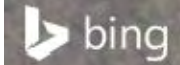


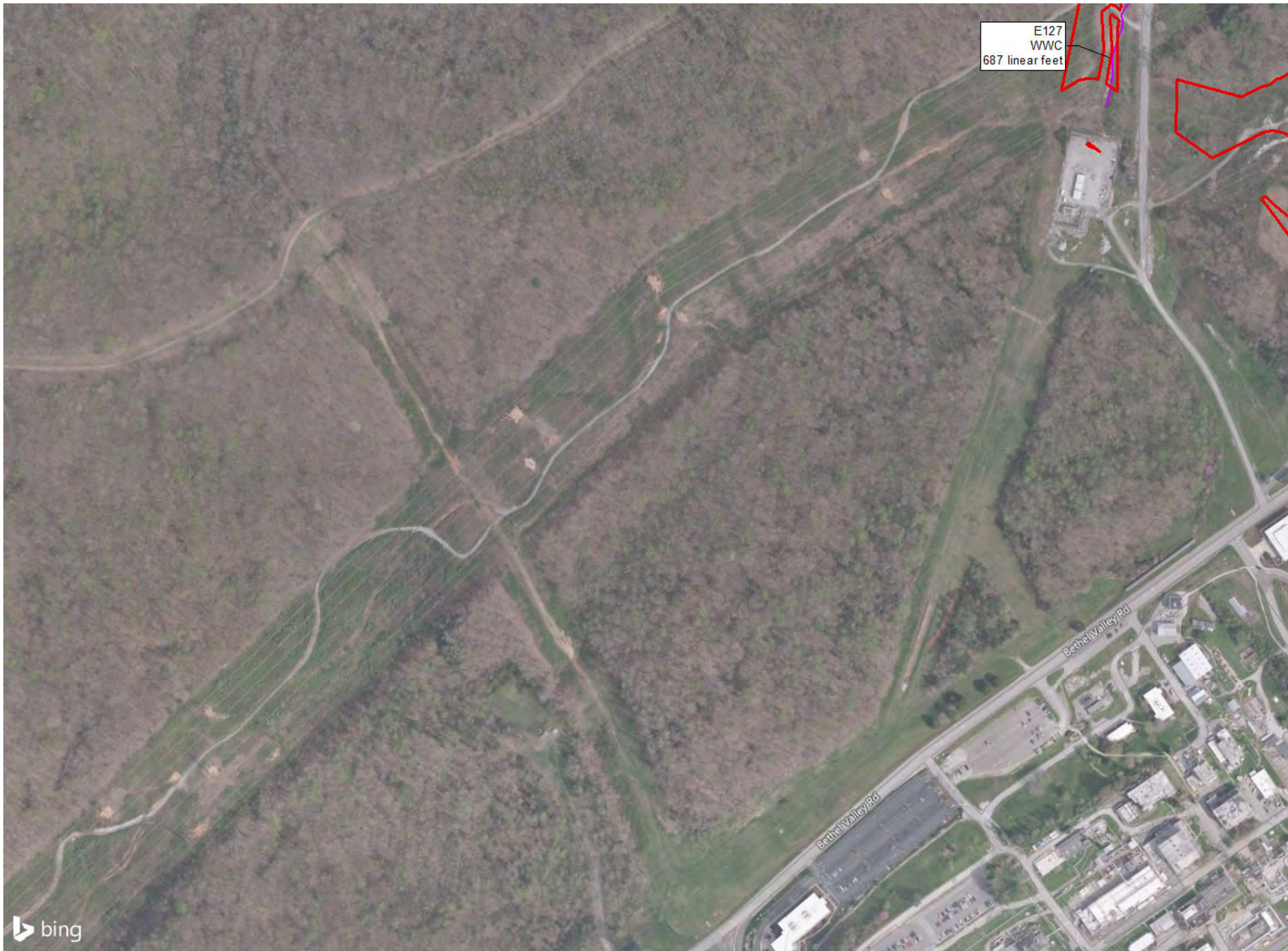
KINGSTON TRANSMISSION LINES

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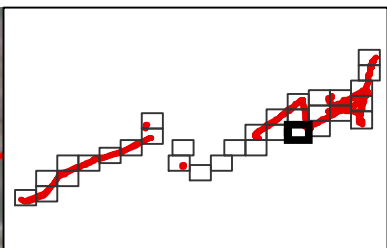


DATA SOURCE: Bing Hybrid Aerial Imagery





E127
WWC
687 linear feet



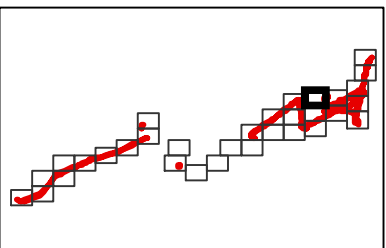
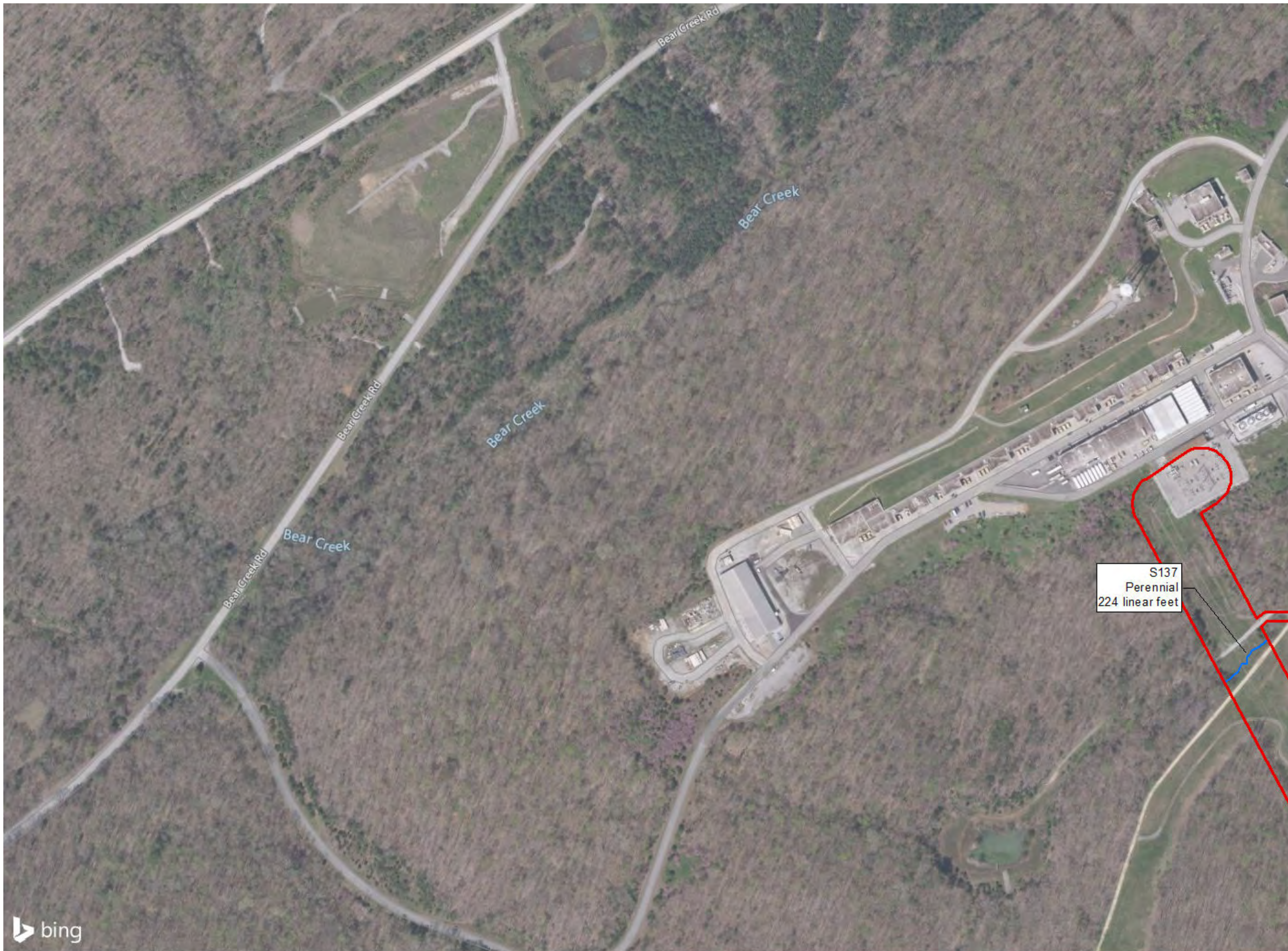
KINGSTON TRANSMISSION LINES

LEGEND

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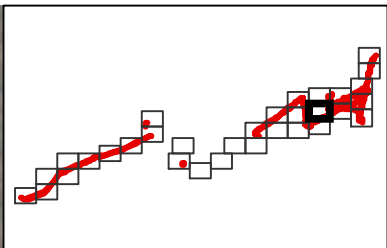
KINGSTON TRANSMISSION LINES

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S137
Perennial
224 linear feet










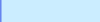

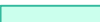


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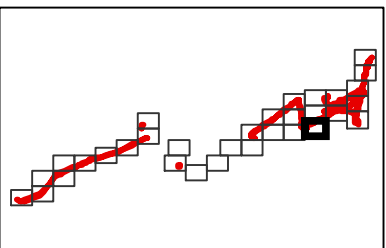
KINGSTON TRANSMISSION LINES

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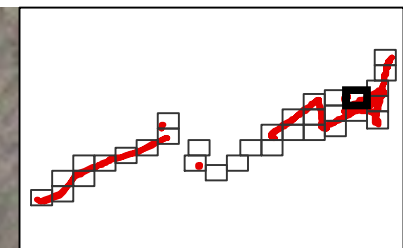
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KINGSTON TRANSMISSION LINES

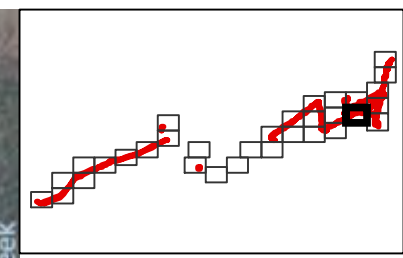
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S135
Intermittent
483 linear feet

W168
Emergent
0.03 acre



DATA SOURCE: Bing Hybrid Aerial Imagery

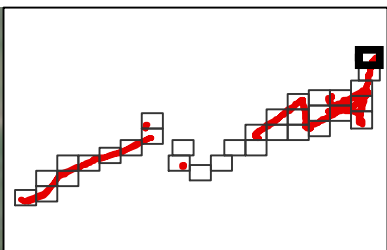


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DATA SOURCE: Bing Hybrid Aerial Imagery



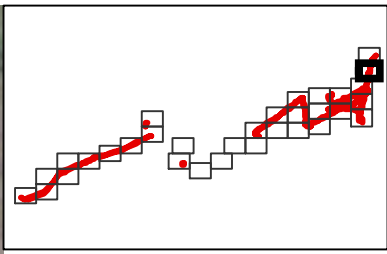
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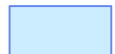

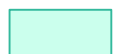



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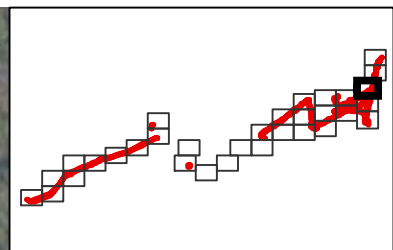
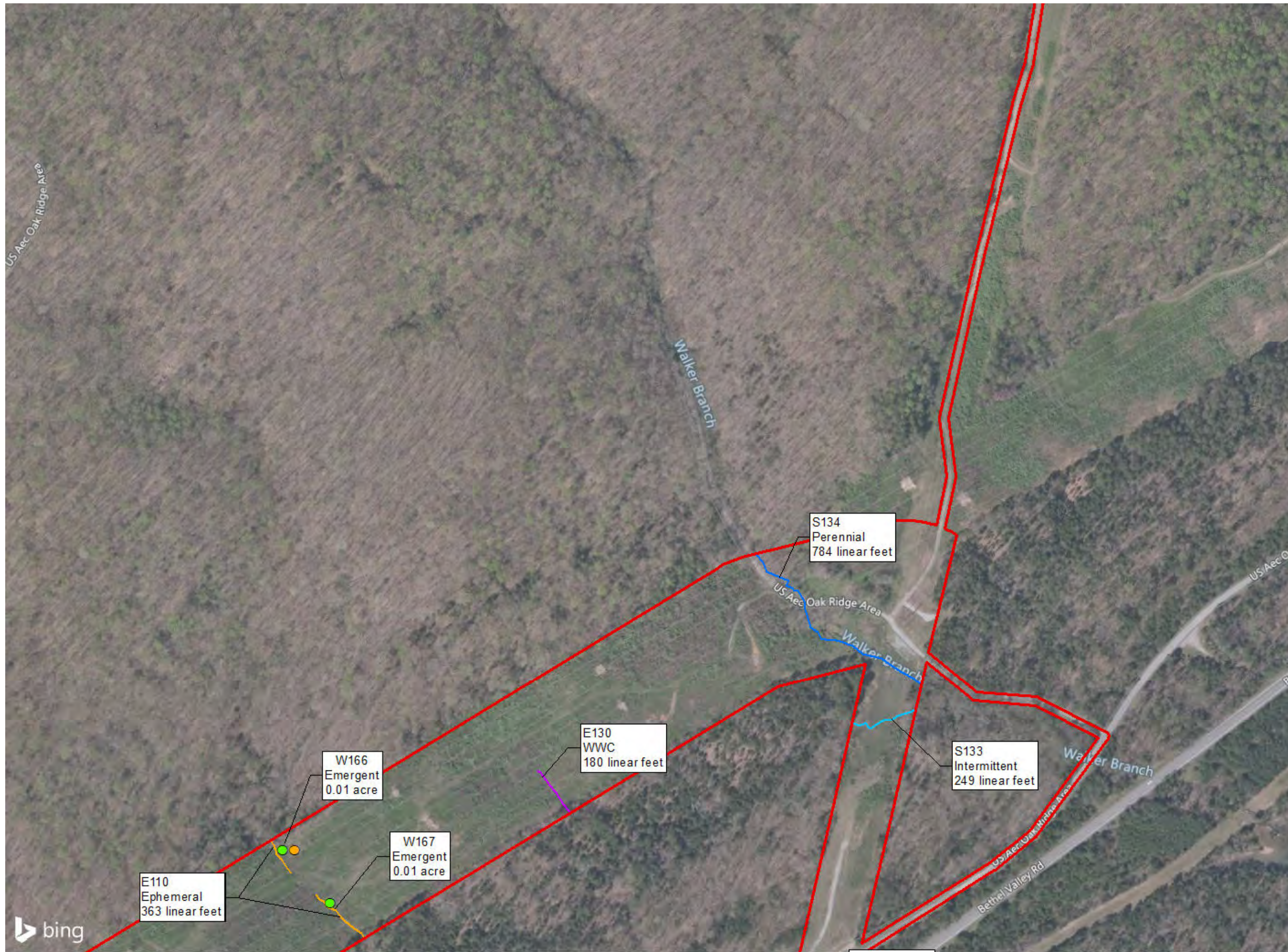
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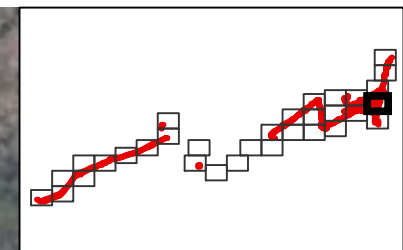


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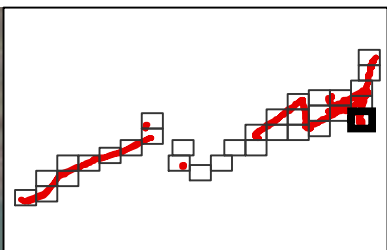


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




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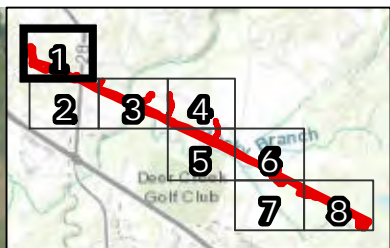
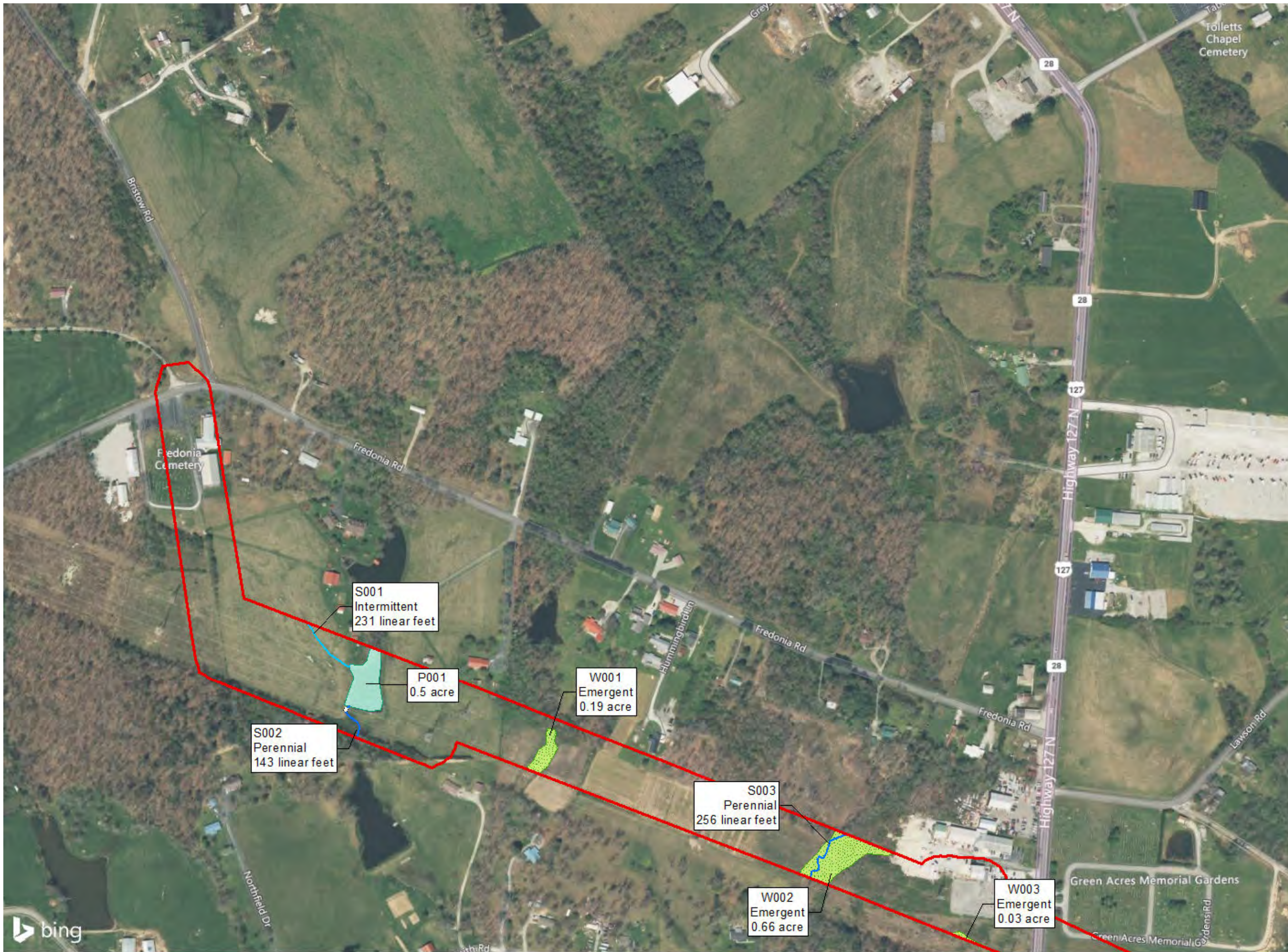
KINGSTON TRANSMISSION LINES

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DATA SOURCE: Bing Hybrid Aerial Imagery



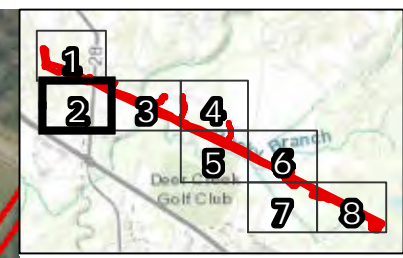
KIINGSTON TRANSMISSION LINE - WEST

LEGEND

- Field Verified Study Area
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- HDR Delineated Stream
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DATA SOURCE: Bing Hybrid Aerial Imagery

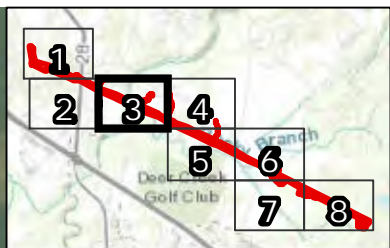
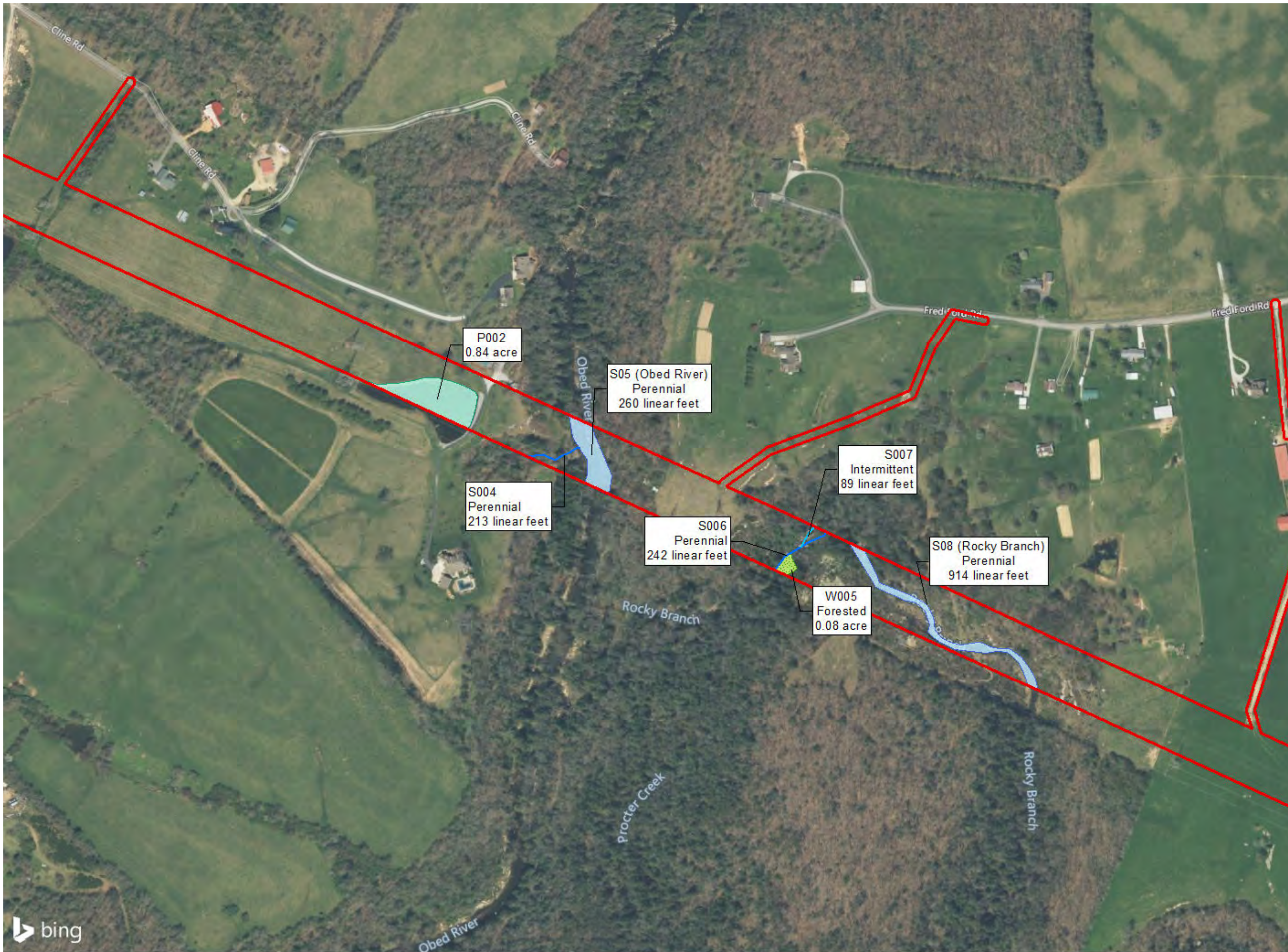


KIINGSTON TRANSMISSION LINE - WEST

- LEGEND**
- Field Verified Study Area
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 - HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



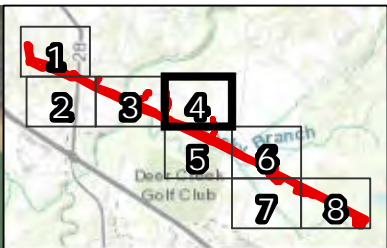
KIINGSTON TRANSMISSION LINE - WEST

LEGEND

- Field Verified Study Area
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- HDR Delineated Stream
- HDR Delineated Open Water
- HDR Delineated Wetland






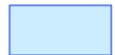




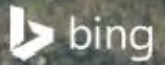
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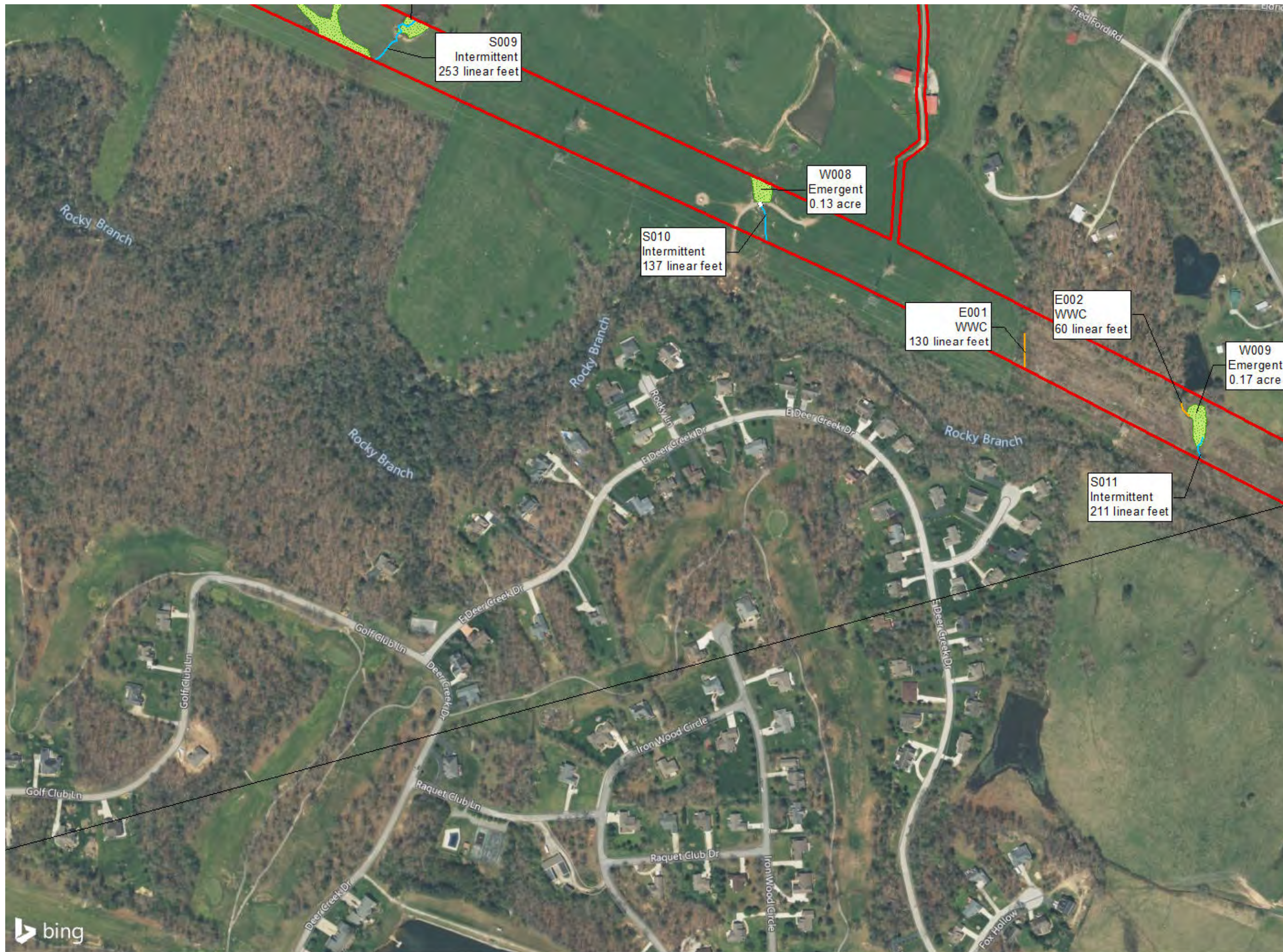
**KIINGSTON TRANSMISSION
LINE - WEST**

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DATA SOURCE: Bing Hybrid Aerial Imagery

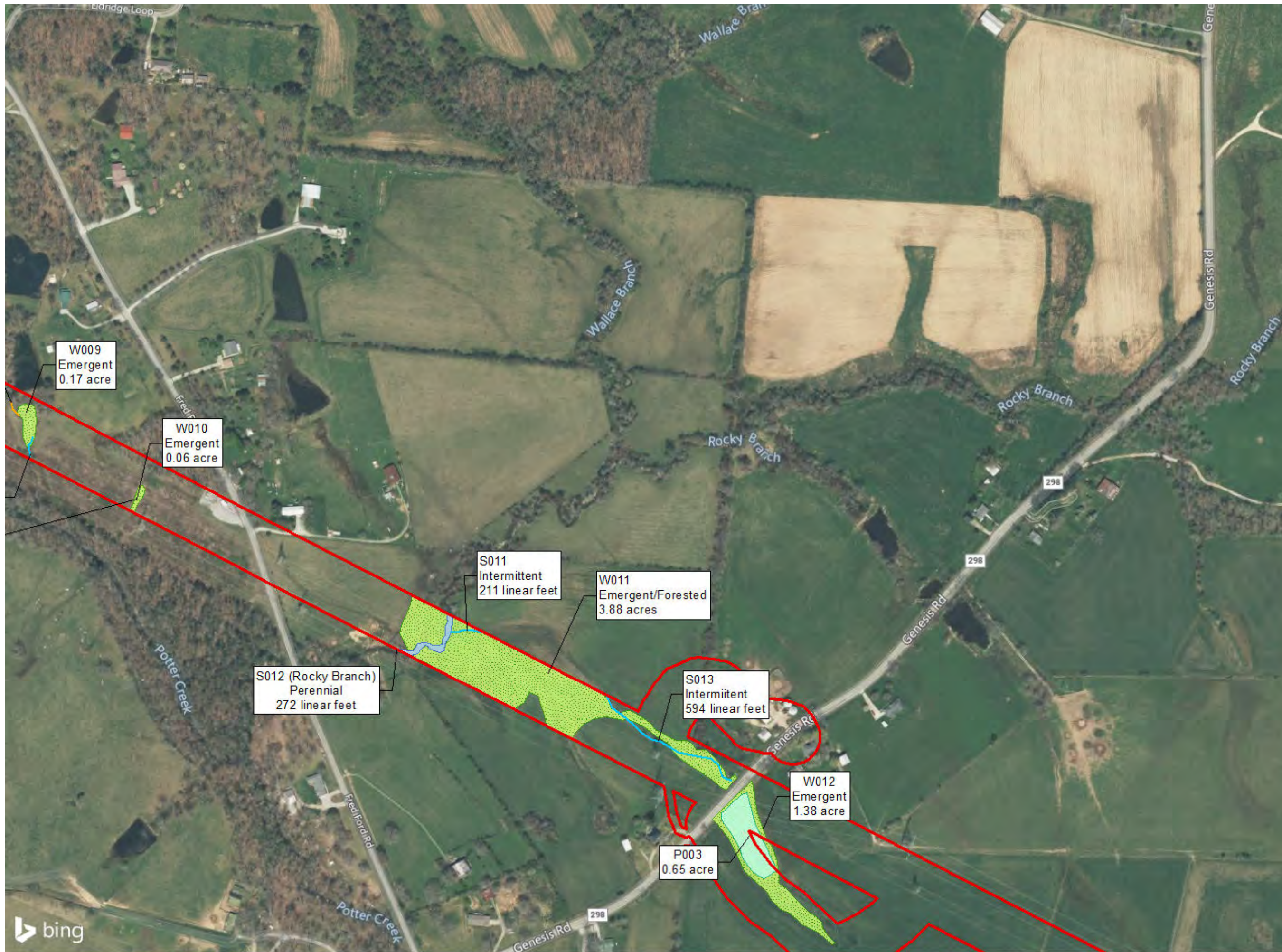


KIINGSTON TRANSMISSION LINE - WEST

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




DATA SOURCE: Bing Hybrid Aerial Imagery



KIINGSTON TRANSMISSION LINE - WEST

LEGEND

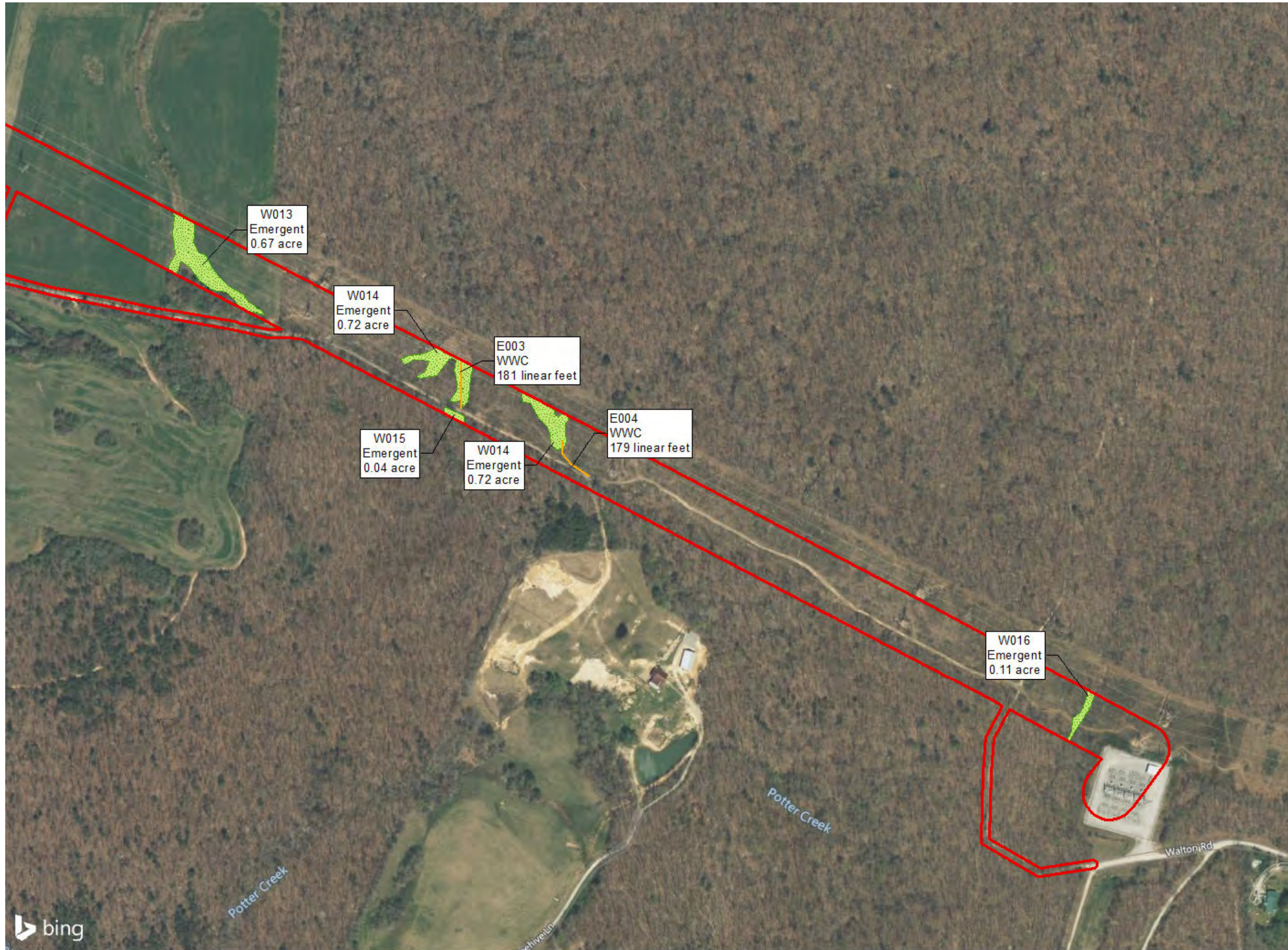
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


DATA SOURCE: Bing Hybrid Aerial Imagery



**KIINGSTON TRANSMISSION
LINE - WEST**



LEGEND

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DATA SOURCE: Bing Hybrid Aerial Imagery

Project Review Form - TVA Bat Strategy (06/2019)

This form should **only** be completed if project includes activities in Tables 2 or 3 (STEP 2 below). This form is not required if project activities are limited to Table 1 (STEP 2) or otherwise determined to have no effect on federally listed bats. If so, include the following statement in your environmental compliance document (e.g., add as a comment in the project CEC): "Project activities limited to Bat Strategy Table 1 or otherwise determined to have no effect on federally listed bats. Bat Strategy Project Review Form NOT required." This form is to assist in determining required conservation measures per TVA's ESA Section 7 programmatic consultation for routine actions and federally listed bats.¹

Project Name: Kingston Retirement Environmental Impact Statement (EIS) **Date:** Nov 10, 2023
Contact(s): Chevy Williams/Emily Willard **CEC#:** _____ **Project ID:** ESCS39170
Project Location (City, County, State): Roane County, Tennessee

Project Description:

Retirement and Decommissioning, Deconstruction, and Demolition of KIF, and proposed replacement generation of a CC gas plant with a solar facility at the KIF location. Upgrades to Transmission Lines needed as well.

SECTION 1: PROJECT INFORMATION - ACTION AND ACTIVITIES

STEP 1) Select TVA Action. If none are applicable, contact environmental support staff, Environmental Project Lead, or Terrestrial Zoologist to discuss whether form (i.e., application of Bat Programmatic Consultation) is appropriate for project:

- | | |
|---|--|
| <input type="checkbox"/> 1 Manage Biological Resources for Biodiversity and Public Use on TVA Reservoir Lands | <input type="checkbox"/> 6 Maintain Existing Electric Transmission Assets |
| <input type="checkbox"/> 2 Protect Cultural Resources on TVA-Retained Land | <input type="checkbox"/> 7 Convey Property associated with Electric Transmission |
| <input type="checkbox"/> 3 Manage Land Use and Disposal of TVA-Retained Land | <input type="checkbox"/> 8 Expand or Construct New Electric Transmission Assets |
| <input type="checkbox"/> 4 Manage Permitting under Section 26a of the TVA Act | <input type="checkbox"/> 9 Promote Economic Development |
| <input checked="" type="checkbox"/> 5 Operate, Maintain, Retire, Expand, Construct Power Plants | <input type="checkbox"/> 10 Promote Mid-Scale Solar Generation |

STEP 2) Select all activities from Tables 1, 2, and 3 below that are included in the proposed project.

TABLE 1. Activities with no effect to bats. Conservation measures & completion of bat strategy project review form NOT required.

<input type="checkbox"/> 1. Loans and/or grant awards	<input type="checkbox"/> 8. Sale of TVA property	<input type="checkbox"/> 19. Site-specific enhancements in streams and reservoirs for aquatic animals
<input type="checkbox"/> 2. Purchase of property	<input type="checkbox"/> 9. Lease of TVA property	<input type="checkbox"/> 20. Nesting platforms
<input type="checkbox"/> 3. Purchase of equipment for industrial facilities	<input type="checkbox"/> 10. Deed modification associated with TVA rights or TVA property	<input type="checkbox"/> 41. Minor water-based structures (this does not include boat docks, boat slips or piers)
<input type="checkbox"/> 4. Environmental education	<input type="checkbox"/> 11. Abandonment of TVA retained rights	<input type="checkbox"/> 42. Internal renovation or internal expansion of an existing facility
<input type="checkbox"/> 5. Transfer of ROW easement and/or ROW equipment	<input type="checkbox"/> 12. Sufferance agreement	<input checked="" type="checkbox"/> 43. Replacement or removal of TL poles
<input type="checkbox"/> 6. Property and/or equipment transfer	<input type="checkbox"/> 13. Engineering or environmental planning or studies	<input type="checkbox"/> 44. Conductor and overhead ground wire installation and replacement
<input type="checkbox"/> 7. Easement on TVA property	<input type="checkbox"/> 14. Harbor limits delineation	<input type="checkbox"/> 49. Non-navigable houseboats

TABLE 2. Activities not likely to adversely affect bats with implementation of conservation measures. Conservation measures and completion of bat strategy project review form REQUIRED; review of bat records in proximity to project NOT required.

<input checked="" type="checkbox"/> 18. Erosion control, minor	<input type="checkbox"/> 57. Water intake - non-industrial	<input type="checkbox"/> 79. Swimming pools/associated equipment
<input type="checkbox"/> 24. Tree planting	<input type="checkbox"/> 58. Wastewater outfalls	<input type="checkbox"/> 81. Water intakes – industrial
<input type="checkbox"/> 30. Dredging and excavation; recessed harbor areas	<input type="checkbox"/> 59. Marine fueling facilities	<input checked="" type="checkbox"/> 84. On-site/off-site public utility relocation or construction or extension
<input type="checkbox"/> 39. Berm development	<input type="checkbox"/> 60. Commercial water-use facilities (e.g., marinas)	<input type="checkbox"/> 85. Playground equipment - land-based
<input type="checkbox"/> 40. Closed loop heat exchangers (heat pumps)	<input type="checkbox"/> 61. Septic fields	<input type="checkbox"/> 87. Aboveground storage tanks
<input type="checkbox"/> 45. Stream monitoring equipment - placement and use	<input type="checkbox"/> 66. Private, residential docks, piers, boathouses	<input type="checkbox"/> 88. Underground storage tanks
<input type="checkbox"/> 46. Floating boat slips within approved harbor limits	<input checked="" type="checkbox"/> 67. Siting of temporary office trailers	<input type="checkbox"/> 90. Pond closure
<input checked="" type="checkbox"/> 48. Laydown areas	<input type="checkbox"/> 68. Financing for speculative building construction	<input type="checkbox"/> 93. Standard License
<input type="checkbox"/> 50. Minor land based structures	<input type="checkbox"/> 72. Ferry landings/service operations	<input type="checkbox"/> 94. Special Use License
<input type="checkbox"/> 51. Signage installation	<input type="checkbox"/> 74. Recreational vehicle campsites	<input type="checkbox"/> 95. Recreation License
<input type="checkbox"/> 53. Mooring buoys or posts	<input checked="" type="checkbox"/> 75. Utility lines/light poles	<input type="checkbox"/> 96. Land Use Permit
<input type="checkbox"/> 56. Culverts	<input type="checkbox"/> 76. Concrete sidewalks	

Table 3: Activities that may adversely affect federally listed bats. Conservation measures AND completion of bat strategy project review form REQUIRED; review of bat records in proximity of project REQUIRED by OSAR/Heritage eMap reviewer or Terrestrial Zoologist.

<input type="checkbox"/> 15. Windshield and ground surveys for archaeological resources	<input checked="" type="checkbox"/> 34. Mechanical vegetation removal, includes trees or tree branches > 3 inches in diameter	<input type="checkbox"/> 69. Renovation of existing structures
<input type="checkbox"/> 16. Drilling	<input type="checkbox"/> 35. Stabilization (major erosion control)	<input type="checkbox"/> 70. Lock maintenance/ construction
<input checked="" type="checkbox"/> 17. Mechanical vegetation removal, does not include trees or branches > 3" in diameter (in Table 3 due to potential for woody burn piles)	<input checked="" type="checkbox"/> 36. Grading	<input type="checkbox"/> 71. Concrete dam modification
<input checked="" type="checkbox"/> 21. Herbicide use	<input type="checkbox"/> 37. Installation of soil improvements	<input type="checkbox"/> 73. Boat launching ramps
<input type="checkbox"/> 22. Grubbing	<input type="checkbox"/> 38. Drain installations for ponds	<input checked="" type="checkbox"/> 77. Construction or expansion of land-based buildings
<input type="checkbox"/> 23. Prescribed burns	<input type="checkbox"/> 47. Conduit installation	<input type="checkbox"/> 78. Wastewater treatment plants
<input type="checkbox"/> 25. Maintenance, improvement or construction of pedestrian or vehicular access corridors	<input type="checkbox"/> 52. Floating buildings	<input type="checkbox"/> 80. Barge fleeting areas
<input type="checkbox"/> 26. Maintenance/construction of access control measures	<input type="checkbox"/> 54. Maintenance of water control structures (dewatering units, spillways, levees)	<input type="checkbox"/> 82. Construction of dam/weirs/ levees
<input checked="" type="checkbox"/> 27. Restoration of sites following human use and abuse	<input type="checkbox"/> 55. Solar panels	<input type="checkbox"/> 83. Submarine pipeline, directional boring operations
<input checked="" type="checkbox"/> 28. Removal of debris (e.g., dump sites, hazardous material, unauthorized structures)	<input checked="" type="checkbox"/> 62. Blasting	<input type="checkbox"/> 86. Landfill construction
<input type="checkbox"/> 29. Acquisition and use of fill/borrow material	<input checked="" type="checkbox"/> 63. Foundation installation for transmission support	<input checked="" type="checkbox"/> 89. Structure demolition
<input checked="" type="checkbox"/> 31. Stream/wetland crossings	<input checked="" type="checkbox"/> 64. Installation of steel structure, overhead bus, equipment, etc.	<input type="checkbox"/> 91. Bridge replacement
<input type="checkbox"/> 32. Clean-up following storm damage	<input checked="" type="checkbox"/> 65. Pole and/or tower installation and/or extension	<input type="checkbox"/> 92. Return of archaeological remains to former burial sites
<input type="checkbox"/> 33. Removal of hazardous trees/tree branches		

STEP 3) Project includes one or more activities in Table 3?

YES (Go to Step 4)

NO (Go to Step 13)

STEP 4) Answer questions a through e below (applies to projects with activities from Table 3 ONLY)

- a) Will project involve continuous noise (i.e., ≥ 24 hrs) that is greater than 75 decibels measured on the A scale (e.g., loud machinery)? **NO** (NV2 does not apply) **YES** (NV2 applies, subject to records review)
- b) Will project involve entry into/survey of cave? **NO** (HP1/HP2 do not apply) **YES** (HP1/HP2 applies, subject to review of bat records)
- c) If conducting **prescribed burning (activity 23)**, estimated acreage: and timeframe(s) below; **N/A**

<input type="checkbox"/>	Oct 15 - Nov 14	<input type="checkbox"/>	Nov 15 - Mar 31	<input type="checkbox"/>	Apr 1 - May 31, Aug 1 - Oct 14	<input type="checkbox"/>	Jun 1 - Jul 31
<input type="checkbox"/>	Sep 16 - Nov 15	<input type="checkbox"/>	Nov 16 - Apr 14	<input type="checkbox"/>	Apr 15 - May 31, Aug 1 - Sept 15	<input type="checkbox"/>	Jun 1 - Jul 31
<input type="checkbox"/>	Oct 15 - Nov 14	<input type="checkbox"/>	Nov 15 - Mar 15	<input type="checkbox"/>	Mar 16 - May 31, Aug 1 - Oct 14	<input type="checkbox"/>	Jun 1 - Jul 31
<input type="checkbox"/>	Oct 15 - Nov 14	<input type="checkbox"/>	Nov 15 - Apr 15	<input type="checkbox"/>	Apr 16 - May 31, Aug 1 - Oct 14	<input type="checkbox"/>	Jun 1 - Jul 31
<input type="checkbox"/>	Oct 1 - Nov 14	<input type="checkbox"/>	Nov 15 - Apr 14	<input type="checkbox"/>	Apr 15 - May 31, Aug 1 - Sept 30	<input type="checkbox"/>	Jun 1 - Jul 31

- d) Will the project involve vegetation piling/burning? **NO** (SSPC4/SHF7/SHF8 do not apply) **YES** (SSPC4/SHF7/SHF8 applies, subject to review of bat records)

- e) If **tree removal (activity 33 or 34)**, estimated amount: **ac** **trees** **N/A**

<input checked="" type="checkbox"/>	Oct 15 - Nov 14	<input checked="" type="checkbox"/>	Nov 15 - Mar 31	<input checked="" type="checkbox"/>	Apr 1 - May 31, Aug 1 - Oct 14	<input type="checkbox"/>	Jun 1 - Jul 31
<input type="checkbox"/>	Sep 16 - Nov 15	<input type="checkbox"/>	Nov 16 - Apr 14	<input type="checkbox"/>	Apr 15 - May 31, Aug 1 - Sept 15	<input type="checkbox"/>	Jun 1 - Jul 31
<input type="checkbox"/>	Oct 15 - Nov 14	<input type="checkbox"/>	Nov 15 - Mar 15	<input type="checkbox"/>	Mar 16 - May 31, Aug 1 - Oct 14	<input type="checkbox"/>	Jun 1 - Jul 31
<input type="checkbox"/>	Oct 15 - Nov 14	<input type="checkbox"/>	Nov 15 - Apr 15	<input type="checkbox"/>	Apr 16 - May 31, Aug 1 - Oct 14	<input type="checkbox"/>	Jun 1 - Jul 31
<input type="checkbox"/>	Oct 1 - Nov 14	<input type="checkbox"/>	Nov 15 - Apr 14	<input type="checkbox"/>	Apr 15 - May 31, Aug 1 - Sept 30	<input type="checkbox"/>	Jun 1 - Jul 31

- If warranted, does project have flexibility for bat surveys (May 15-Aug 15): **MAYBE** **YES** **NO**

*** For **PROJECT LEADS** whose projects will be reviewed by a Heritage Reviewer (Natural Resources Organization only), **STOP HERE**. Click File/Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date", and submit with project information. Otherwise continue to Step 5. ***

SECTION 2: REVIEW OF BAT RECORDS (applies to projects with activities from Table 3 ONLY)

STEP 5) Review of bat/cave records conducted by Heritage/OSAR reviewer?

- YES** **NO** (Go to Step 13)

Info below completed by: **Heritage Reviewer** (name) Date

OSAR Reviewer (name) Date

Terrestrial Zoologist (name) Elizabeth Hamrick Date May 11, 2023

- Gray bat records: None Within 3 miles* Within a cave* Within the County
- Indiana bat records: None Within 10 miles* Within a cave* Capture/roost tree* Within the County
- Northern long-eared bat records: None Within 5 miles* Within a cave* Capture/roost tree* Within the County
- Virginia big-eared bat records: None Within 6 miles* Within the County
- Caves: None within 3 mi Within 3 miles but > 0.5 mi Within 0.5 mi but > 0.25 mi* Within 0.25 mi but > 200 feet* Within 200 feet*

- Bat Habitat Inspection Sheet completed?** **NO** **YES**

Amount of SUITABLE habitat to be removed/burned (may differ from STEP 4e): (**ac** **trees**)* **N/A**

STEP 6) Provide any additional notes resulting from Heritage Reviewer records review in Notes box below then Go to Step 13

Notes from Bat Records Review (e.g., historic record; bats not on landscape during action; DOT bridge survey with negative results):

Bat Mist-Net Surveys were performed at the KIF in May 2023 in accordance with 2023 USFWS Guidance. No federally protected bats were captured (no gray, Indiana, NLEB, VABEB, or tricolored bat). No little brown bats captured either. No mist net surveys were performed along TLs where a total of 3 acres of limbing may need to occur along access roads when scope is finalized.

STEPS 7-12 To be Completed by Terrestrial Zoologist (if warranted):

STEP 7) Project will involve:

- Removal of suitable trees within 0.5 mile of P1-P2 Indiana bat hibernacula or 0.25 mile of P3-P4 Indiana bat hibernacula or any NLEB hibernacula.
- Removal of suitable trees within 10 miles of documented Indiana bat (or within 5 miles of NLEB) hibernacula.
- Removal of suitable trees > 10 miles from documented Indiana bat (> 5 miles from NLEB) hibernacula.
- Removal of trees within 150 feet of a documented Indiana bat or northern long-eared bat maternity roost tree.
- Removal of suitable trees within 2.5 miles of Indiana bat roost trees or within 5 miles of Indiana bat capture sites.
- Removal of suitable trees > 2.5 miles from Indiana bat roost trees or > 5 miles from Indiana bat capture sites.
- Removal of documented Indiana bat or NLEB roost tree, if still suitable.
- N/A

STEP 8) Presence/absence surveys were/will be conducted: YES NO TBD

STEP 9) Presence/absence survey results, on NEGATIVE POSITIVE N/A

STEP 10) Project WILL WILL NOT require use of Incidental Take in the amount of acres or trees proposed to be used during the WINTER VOLANT SEASON NON-VOLANT SEASON N/A

STEP 11) Available Incidental Take (prior to accounting for this project) as of

TVA Action	Total 20-year	Winter	Volant Season	Non-Volant Season
6 Maintain Existing Electric Transmission Line Assets	7,024.6	4,359.54	1,284.23	1,380.83

STEP 12) Amount contributed to TVA's Bat Conservation Fund upon activity completion: \$ OR N/A

TERRESTRIAL ZOOLOGISTS, after completing SECTION 2, review Table 4, modify as needed, and then complete section for Terrestrial Zoologists at end of form.

SECTION 3: REQUIRED CONSERVATION MEASURES

STEP 13) Review Conservation Measures in Table 4 and ensure those selected are relevant to the project. If not, manually override and uncheck irrelevant measures, and explain why in ADDITIONAL NOTES below Table 4.

Did review of Table 4 result in ANY remaining Conservation Measures in **RED**?

- NO (Go to Step 14)
- YES (STOP HERE; Submit for Terrestrial Zoology Review. Click File/Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date", and submit with project information).

Table 4. TVA's ESA Section 7 Programmatic Bat Consultation Required Conservation Measures

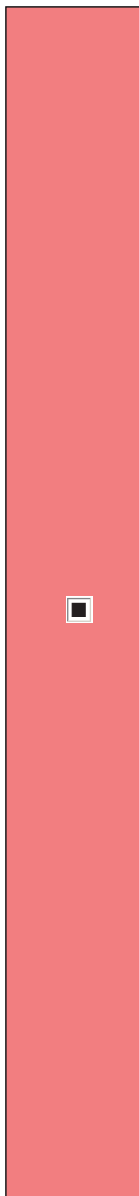

The Conservation Measures in Table 4 are automatically selected based on your choices in Tables 2 and 3 but can be manually overridden, if necessary. To Manually override, press the button and enter your name.

Manual Override

Name: Elizabeth Hamrick

Check if Applies to Project	Activities Subject To Conservation Measure	Conservation Measure Description
<input type="checkbox"/>	15, 16, 17, 18, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 45, 47, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 90, 91, 92, 93, 94, 95, 96	NV1 - Noise will be short-term, transient, and not significantly different from urban interface or natural events (i.e., thunderstorms) that bats are frequently exposed to when present on the landscape.
<input type="checkbox"/>	16, 25, 26, 37, 47, 52, 62, 63, 64, 65, 70, 71, 73, 78, 80, 82, 83, 86, 91	NV2 - Drilling, blasting, or any other activity that involves continuous noise (i.e., longer than 24 hours) disturbances greater than 75 decibels measured on the A scale (e.g., loud machinery) within a 0.5 mile radius of documented winter and/or summer roosts (caves, trees, unconventional roosts) will be conducted when bats are absent from roost sites.
<input type="checkbox"/>	16, 26, 62	NV3 - Drilling or blasting within a 0.5 mile radius of documented cave (or unconventional) roosts will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of the roost site.
<input type="checkbox"/>	33, 34	TR3* - Removal of suitable summer roosting habitat within documented bat habitat (i.e., within 10 miles of documented Indiana bat hibernacula, within 5 miles of documented northern long-eared bat hibernacula, within 2.5 miles of documented Indiana bat summer roost trees, within 5 miles of Indiana bat capture sites, within 1 mile of documented northern long-eared bat summer roost trees, within 3 miles of northern long-eared bat capture sites) will be tracked, documented, and included in annual reporting. Project will therefore communicate completion of tree removal to appropriate TVA staff.
<input type="checkbox"/>	33, 34	TR4* - Removal of suitable summer roosting habitat within potential habitat for Indiana bat or northern long-eared bat will be tracked, documented, and included in annual reporting. Project will therefore communicate completion of tree removal to appropriate TVA staff.

Project Review Form - TVA Bat Strategy (06/2019)

	<p>69, 77, 89, 91</p>	<p>AR1 - Projects that involve structural modification or demolition of buildings, bridges, and potentially suitable box culverts, will require assessment to determine if structure has characteristics that make it a potentially suitable unconventional bat roost. If so a survey to determine if bats may be present will be conducted. Structural assessment will include:</p> <ul style="list-style-type: none"> ○ Visual check that includes an exhaustive internal/external inspection of building to look for evidence of bats (e.g., bat droppings, roost entrance/exit holes); this can be done at any time of year, preferably when bats are active. ○ Where accessible and health and safety considerations allow, a survey of roof space for evidence of bats (e.g., droppings, scratch marks, staining, sightings), noting relevant characteristics of internal features that provide potential access points and roosting opportunities. Suitable characteristic may include: gaps between tiles and roof lining, access points via eaves, gaps between timbers or around mortise joints, gaps around top and gable end walls, gaps within roof walling or around tops of chimney breasts, and clean ridge beams. ○ Features with high-medium likelihood of harboring bats but cannot be checked visually include soffits, cavity walls, space between roof covering and roof lining. ○ Applies to box culverts that are at least 5 feet (1.5 meters) tall and with one or more of the following characteristics. Suitable culverts for bat day roosts have the following characteristics: <ul style="list-style-type: none"> ● Location in relatively warm areas ● Between 5-10 feet (1.5-3 meters) tall and 300 ft (100 m) or more long ● Openings protected from high winds ● Not susceptible to flooding ● Inner areas relatively dark with roughened walls or ceilings ● Crevices, imperfections, or swallow nests ○ Bridge survey protocols will be adapted from the Programmatic Biological Opinion for the Federal Highway Administration (Appendix D of USFWS 2016c, which includes a Bridge Structure Assessment Guidance and a Bridge Structure Assessment Form). ○ Bat surveys usually are NOT needed in the following circumstances: <ul style="list-style-type: none"> ● Domestic garages /sheds with no enclosed roof space (with no ceiling) ● Modern flat-roofed buildings ● Metal framed and roofed buildings ● Buildings where roof space is regularly used (e.g., attic space converted to living space, living space open to rafters) or where all roof space is lit from skylights or windows. Large/tall roof spaces may be dark enough at apex to provide roost space
	<p>69, 77, 89, 91</p>	<p>AR2 - Additional bat P/A surveys (e.g., emergence counts) conducted if warranted (i.e., when AR1 indicates that bats may be present).</p>

Project Review Form - TVA Bat Strategy (06/2019)

<p align="center">■</p>	<p>16, 17, 18, 21, 22, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 56, 61, 62, 63, 64, 65, 67, 69, 84, 89</p>	<p>SSPC1 (Transmission only) - Transmission actions and activities will continue to Implement A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities. This focuses on control of sediment and pollutants, including herbicides. Following are key measures:</p> <ul style="list-style-type: none"> ○ BMPs minimize erosion and prevent/control water pollution in accordance with state-specific construction storm water permits. BMPs are designed to keep soil in place and aid in reducing risk of other pollutants reaching surface waters, wetlands and ground water. BMPs will undertake the following principles: <ul style="list-style-type: none"> ● Plan clearing, grading, and construction to minimize area and duration of soil exposure. ● Maintain existing vegetation wherever and whenever possible. ● Minimize disturbance of natural contours and drains. ● As much as practicable, operate on dry soils when they are least susceptible to structural damage and erosion. ● Limit vehicular and equipment traffic in disturbed areas. Keep equipment paths dispersed or designate single traffic flow paths with appropriate road BMPs to manage runoff. ● Divert runoff away from disturbed areas. ● Provide for dispersal of surface flow that carries sediment into undisturbed surface zones with high infiltration capacity and ground cover conditions. ● Prepare drainage ways and outlets to handle concentrated/increased runoff. ● Minimize length and steepness of slopes. Interrupt long slopes frequently. ● Keep runoff velocities low and/or check flows. ● Trap sediment on-site. ● Inspect/maintain control measures regularly & after significant rain. ● Re-vegetate and mulch disturbed areas as soon as practical. ○ Specific guidelines regarding sensitive resources and buffer zones: <ul style="list-style-type: none"> ● Extra precaution (wider buffers) within SMZs is taken to protect stream banks and water quality for streams, springs, sinkholes, and surrounding habitat. ● BMPs are implemented to protect and enhance wetlands. Select use of equipment and seasonal clearing is conducted when needed for rare plants; construction activities are restricted in areas with identified rare plants. ● Standard requirements exist to avoid adverse impacts to caves, protected animals, unique/ important habitat (e.g., cave buffers, restricted herbicide use, seasonal clearing of suitable habitat).
<p align="center">■</p>	<p>16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 52, 53, 54, 55, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 70, 71, 73, 76, 77, 78, 80, 81, 82, 83, 86, 87, 88, 89, 90</p>	<p>SSPC2 - Operations involving chemical/fuel storage or resupply and vehicle servicing will be handled outside of riparian zones (streamside management zones) in a manner to prevent these items from reaching a watercourse. Earthen berms or other effective means are installed to protect stream channel from direct surface runoff. Servicing will be done with care to avoid leakage, spillage, and subsequent stream, wetland, or ground water contamination. Oil waste, filters, other litter will be collected and disposed of properly. Equipment servicing and chemical/fuel storage will be limited to locations greater than 300-ft from sinkholes, fissures, or areas draining into known sinkholes, fissures, or other karst features.</p>

Project Review Form - TVA Bat Strategy (06/2019)

<p>16, 17, 18, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 61, 62, 63, 64, 65, 66, 67, 69, 70, 71, 73, 76, 77, 80, 81, 82, 83, 84, 86, 87, 88, 89, 90, 91</p>	<p>SSPC3 (Power Plants only) - Power Plant actions and activities will continue to implement standard environmental practices. These include:</p> <ul style="list-style-type: none"> ○ Best Management Practices (BMPs) in accordance with regulations: <ul style="list-style-type: none"> ● Ensure proper disposal of waste, ex: used rags, used oil, empty containers, general trash, dependent on plant policy ● Maintain every site with well-equipped spill response kits, included in some heavy equipment ● Conduct Quarterly Internal Environmental Field Assessments at each sight ● Every project must have an approved work package that contains an environmental checklist that is approved by sight Environmental Health & Safety consultant. ● When refueling, vehicle is positioned as close to pump as possible to prevent drips, and overfilling of tank. Hose and nozzle are held in a vertical position to prevent spillage ○ Construction Site Protection Methods <ul style="list-style-type: none"> ● Sediment basin for runoff - used to trap sediments and temporarily detain runoff on larger construction sites ● Storm drain protection device ● Check dam to help slow down silt flow ● Silt fencing to reduce sediment movement ○ Storm Water Pollution Prevention (SWPP) Pollution Control Strategies <ul style="list-style-type: none"> ● Minimize storm water contact with disturbed soils at construction site ● Protect disturbed soil areas from erosion ● Minimize sediment in storm water before discharge ● Prevent storm water contact with other pollutants ● Construction sites also may be required to have a storm water permit, depending on size of land disturbance (>1ac) ○ Every site has a Spill Prevention and Control Countermeasures (SPCC) Plan and requires training. Several hundred pieces of equipment often managed at the same time on power generation properties. Goal is to <ul style="list-style-type: none"> ● Minimize fuel and chemical use ● Ensure proper disposal of waste, ex: used rags, used oil, empty containers, general trash, dependent on plant policy ● Maintain every site with well-equipped spill response kits, included in some heavy equipment ● Conduct Quarterly Internal Environmental Field Assessments at each sight ● Every project must have an approved work package that contains an environmental checklist that is approved by sight Environmental Health & Safety consultant. ● When refueling, vehicle is positioned as close to pump as possible to prevent drips, and overfilling of tank. Hose and nozzle are held in a vertical position to prevent spillage ○ Construction Site Protection Methods <ul style="list-style-type: none"> ● Sediment basin for runoff - used to trap sediments and temporarily detain runoff on larger construction sites ● Storm drain protection device ● Check dam to help slow down silt flow ● Silt fencing to reduce sediment movement ○ Storm Water Pollution Prevention (SWPP) Pollution Control Strategies <ul style="list-style-type: none"> ● Minimize storm water contact with disturbed soils at construction site ● Protect disturbed soil areas from erosion ● Minimize sediment in storm water before discharge ● Prevent storm water contact with other pollutants ● Construction sites also may be required to have a storm water permit, depending on size of land disturbance (>1ac) ○ Every site has a Spill Prevention and Control Countermeasures (SPCC) Plan and requires training. Several hundred pieces of equipment often managed at the same time on power generation properties. Goal is to minimize fuel and chemical use 	<p>SSPC3 (Power Plants only) - Power Plant actions and activities will continue to implement standard environmental practices. These include:</p> <ul style="list-style-type: none"> ○ Best Management Practices (BMPs) in accordance with regulations: <ul style="list-style-type: none"> ● Ensure proper disposal of waste, ex: used rags, used oil, empty containers, general trash, dependent on plant policy ● Maintain every site with well-equipped spill response kits, included in some heavy equipment ● Conduct Quarterly Internal Environmental Field Assessments at each sight ● Every project must have an approved work package that contains an environmental checklist that is approved by sight Environmental Health & Safety consultant. ● When refueling, vehicle is positioned as close to pump as possible to prevent drips, and overfilling of tank. Hose and nozzle are held in a vertical position to prevent spillage ○ Construction Site Protection Methods <ul style="list-style-type: none"> ● Sediment basin for runoff - used to trap sediments and temporarily detain runoff on larger construction sites ● Storm drain protection device ● Check dam to help slow down silt flow ● Silt fencing to reduce sediment movement ○ Storm Water Pollution Prevention (SWPP) Pollution Control Strategies <ul style="list-style-type: none"> ● Minimize storm water contact with disturbed soils at construction site ● Protect disturbed soil areas from erosion ● Minimize sediment in storm water before discharge ● Prevent storm water contact with other pollutants ● Construction sites also may be required to have a storm water permit, depending on size of land disturbance (>1ac) ○ Every site has a Spill Prevention and Control Countermeasures (SPCC) Plan and requires training. Several hundred pieces of equipment often managed at the same time on power generation properties. Goal is to minimize fuel and chemical use
<p>16, 26, 36, 37, 38, 39, 48, 50, 52, 59, 60, 62, 66, 67, 69, 72, 75, 77, 78, 79, 86</p>	<p>L1 - Direct temporary lighting away from suitable habitat during the active season.</p>	<p>L1 - Direct temporary lighting away from suitable habitat during the active season.</p>
<p>16, 26, 36, 37, 38, 39, 48, 50, 52, 59, 60, 62, 66, 67, 69, 72, 75, 77, 78, 79, 86</p>	<p>L2 - Evaluate the use of outdoor lighting during the active season and seek to minimize light pollution when installing new or replacing existing permanent lights by angling lights downward or via other light minimization measures (e.g., dimming, directed lighting, motion-sensitive lighting).</p>	<p>L2 - Evaluate the use of outdoor lighting during the active season and seek to minimize light pollution when installing new or replacing existing permanent lights by angling lights downward or via other light minimization measures (e.g., dimming, directed lighting, motion-sensitive lighting).</p>

¹Bats addressed in consultation (02/2018), which includes gray bat (listed in 1976), Indiana bat (listed in 1967), northern long-eared bat (listed in 2015), and Virginia big-eared bat (listed in 1979).

Hide All Unchecked Conservation Measures

- HIDE
- UNHIDE

Hide Table 4 Columns 1 and 2 to Facilitate Clean Copy and Paste

- HIDE
- UNHIDE

NOTES (additional info from field review, explanation of no impact or removal of conservation measures).

Up to 114.4 ac suitable bat habitat could be removed at KIF. However mist net surveys performed there determined probable absence of federally listed bats. Therefore no Take will be used for actions on KIF Site. Trees on KIF will be removed in winter when practicable. Up to 3 acres of trees may need to be limbed to improve access roads along the TL. Limbing along TLs would occur in winter.

STEP 14) Save completed form (Click File/Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date") in project environmental documentation (e.g. CEC, Appendix to EA) AND send a copy of form to batstrategy@tva.gov
Submission of this form indicates that Project Lead/Applicant:

(name) is (or will be made) aware of the requirements below.

- Implementation of conservation measures identified in Table 4 is required to comply with TVA's Endangered Species Act programmatic bat consultation.
- TVA may conduct post-project monitoring to determine if conservation measures were effective in minimizing or avoiding impacts to federally listed bats.

For Use by Terrestrial Zoologist Only

Terrestrial Zoologist acknowledges that Project Lead/Contact (name) has been informed of any relevant conservation measures and/or provided a copy of this form.

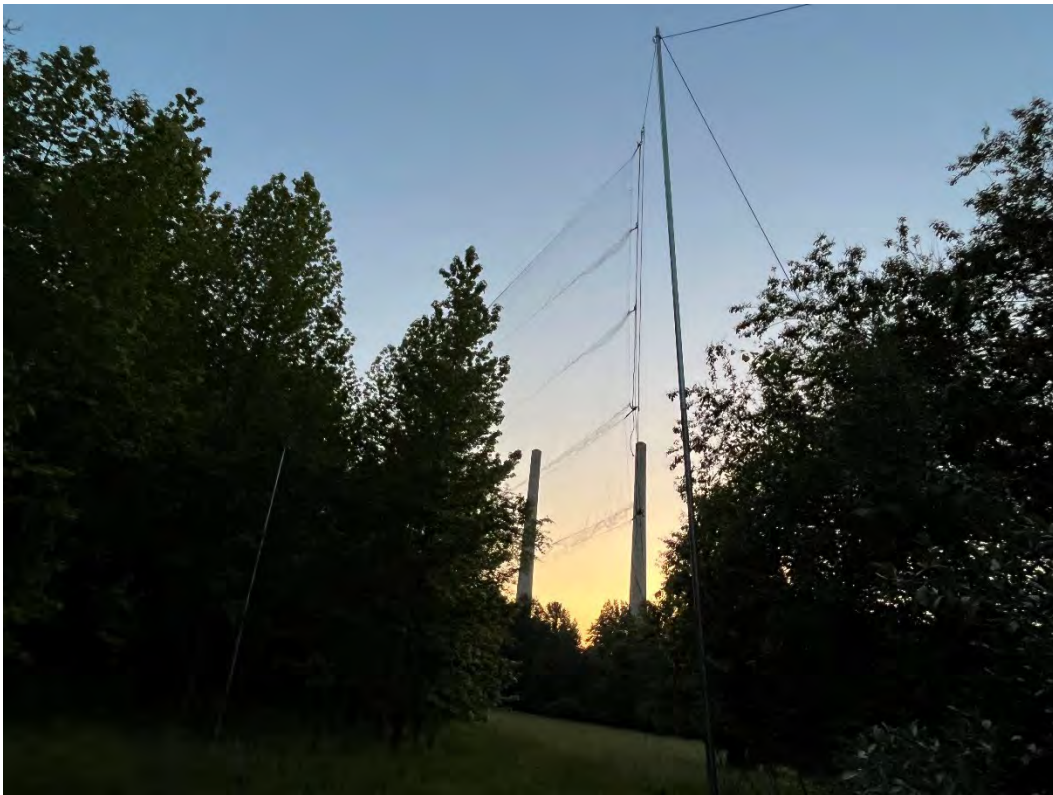
For projects that require use of Take and/or contribution to TVA's Bat Conservation Fund, Terrestrial Zoologist acknowledges that Project Lead/Contact has been informed that project will result in use of Incidental Take ac trees and that use of Take will require \$ contribution to TVA's Conservation Fund upon completion of activity (amount entered should be \$0 if cleared in winter).

For Terrestrial Zoology Use Only. Finalize and Print to Noneditable PDF.

THE TENNESSEE VALLEY AUTHORITY



Kingston Fossil Plant Retirement Bat Presence/Absence Survey Report



Prepared by: Elizabeth Hamrick

09/13/2023

Introduction

TVA is proposing to shut down the Kingston Fossil Plant and replace it with an alternative source of generation. Comprehensive survey to document the terrestrial animal resources present within the Kingston Fossil Plant Boundary (KIF Site) were conducted in Summer 2019, Spring 2022, and Spring 2023. As a part of these surveys Phase 1 Habitat assessments for federally listed bats were performed according to the most recent US Fish and Wildlife Indiana bat and Northern long-eared Bat Survey Guidelines. In May 2023, Phase 2 Presence/Absence Mist Net surveys were performed according to the 2023 US Fish and Wildlife Indiana bat and Northern long-eared Bat Survey Guidelines. These guidelines state that the level of effort standards outlined in the guidelines are also suitable for tricolored bat surveys. The study plan for proposed mist net surveys was approved by Dave Pelren of the USFWS Cookeville Field Office on May 9, 2023.

Methods

Phase 1 Habitat assessments for federally listed bats evaluated habitat suitability for the federally endangered Indiana bat and northern long-eared bat, and the federally proposed endangered tricolored bat indicated there was approximately 295.3 acres of potentially suitable habitat for these species. Therefore 30 net nights were required in order to meeting level of effort standards set forth in Phase 2 Presence/Absence survey guidelines. Five net sites were selected across the site to appropriately across the KIF Site to maximize the potential to capture bats. Net locations were selected based on presence of an open flyway and forested conditions near the site. Sites were netting over 3 nights with 3-5 nets per site. Surveys were performed May 15, 17-18, 2023. Thunderstorms prevented surveys from occurring on May 16, 2023. No fewer than 2 personnel were present at each site. Nets were deployed at sunset each night, left open for at least 5 hours, checked every 10 minutes, and disturbance near the nets was kept to a minimum. Biological and Morphometric data (e.g., species, sex, age class, reproductive condition, mass, and forearm length) were collected for each bat captured. Bats were released unharmed near the point of capture within 30 min of capture time. [MAP] [Photos]

Table 1. Net Site Locations

Site	Description	Dates	# of Net Nights	Latitude	Longitude
1	Embayment off Emory River	5/15/2023	3	35.8944	-84.5104
2	Forested hill NE of substation	5/15&17/2023	8	35.89788	-84.51194
3	South side of peninsula	5/15&17/2023	6	35.8944615	-84.4993140
4	East pond and stream	5/17&18/2023	8	35.8957	-84.5299
5	Peninsula access road	5/18/2023	5	35.894103	84.495427

White-nose syndrome minimization measures were taken according to the most recent guidelines produced by USFWS. All non-porous equipment was decontaminated with Isopropyl alcohol and all other equipment was submersed in hot water (131 degrees F) for at least 5 minutes after each night. Similarly, outer layers of clothing and footwear were decontaminated after each night. Disposable latex gloves were changed or sanitized with isopropyl alcohol between each bat. All scales, rules, and non-disposable equipment that came in contact with a bat was sanitized between use. In addition, all personnel wore KN95 masks, disposable gloves, and an additional outer layer of clothing in order to address the potential spread of Covid-19 per

TVA Kingston Fossil Plant Bat Mist Netting Report

the Guidelines for Researchers and Permit Holders Conducting Wildlife Research, Including Bat Related Activities, in Tennessee (Tennessee Wildlife Resources Agency 2021).

Results

Twenty-seven bats were captured of the following species: Big brown (*Eptesicus fuscus*), Eastern red bat (*Lasiurus borealis*), and evening bat (*Nycticeius humeralis*). All individuals captured were adults. Three of the big browns were pregnant and another three were lactating. Two of the red bats were pregnant. No federally listed or federally proposed listed species of bats were captured.

Table 2. Summary of bat captures by species.

Species	Adult Male		Adult Female				Juvenile		Unknown	Total
	NR	TD	P	L	PL	NR	Male	Female		
<i>Lasiurus borealis</i> (LABO)	6	-	2	-	-	2	-	-	2	12
<i>Eptesicus fuscus</i> (EPFU)	4	-	3	3	-	1	-	-	-	11
<i>Nycticeius humeralis</i> (NYHU)	1	3	-	-	-	-	-	-	-	4
Total	11	3	5	3	0	3	0	0	2	27

Table 3. Summary of bat captures by site.

Species	Bat Captures				
	Site 1	Site 2	Site 3	Site 4	Site 5
<i>Lasiurus borealis</i> (LABO)	0	4	3	4	1
<i>Eptesicus fuscus</i> (EPFU)	0	0	5	0	6
<i>Nycticeius humeralis</i> (NYHU)	0	0	2	0	2
Total	0	4	10	4	9

Conclusions

The mist-net survey efforts (30 net nights over 3 calendar days) performed for this project met the level of effort required by the 2023 US Fish and Wildlife Indiana bat and Northern long-eared Bat Survey Guidelines to determine probable absence of Indiana, northern long-eared and tricolored bat. No federally listed bat species were captured indicating that these species are likely not present during the action area at this time of year or are in numbers too low to be detected.

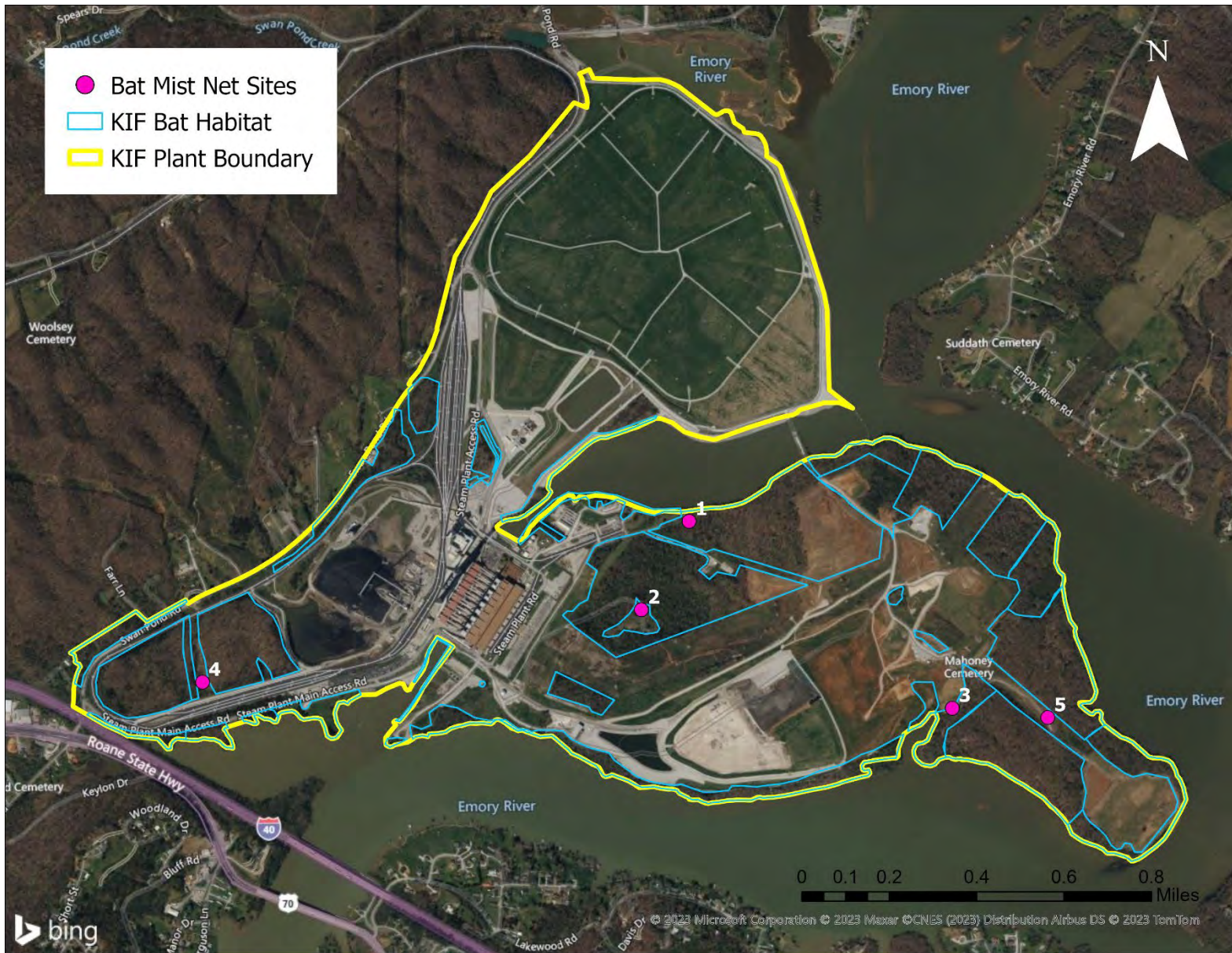


Figure 1. Map of Suitable Summer Bat Roosting Habitat and Mist Net Locations.

Representative photos of Mist Net Sites



Net Site 2 Net A



Net Site 2 Net B

TVA Kingston Fossil Plant Bat Mist Netting Report



Net Site 2 Net C



Net Site 2 Net D

TVA Kingston Fossil Plant Bat Mist Netting Report



Net Site 3 Net A



Net Site 3 Net B

TVA Kingston Fossil Plant Bat Mist Netting Report



Net Site 3 Net C

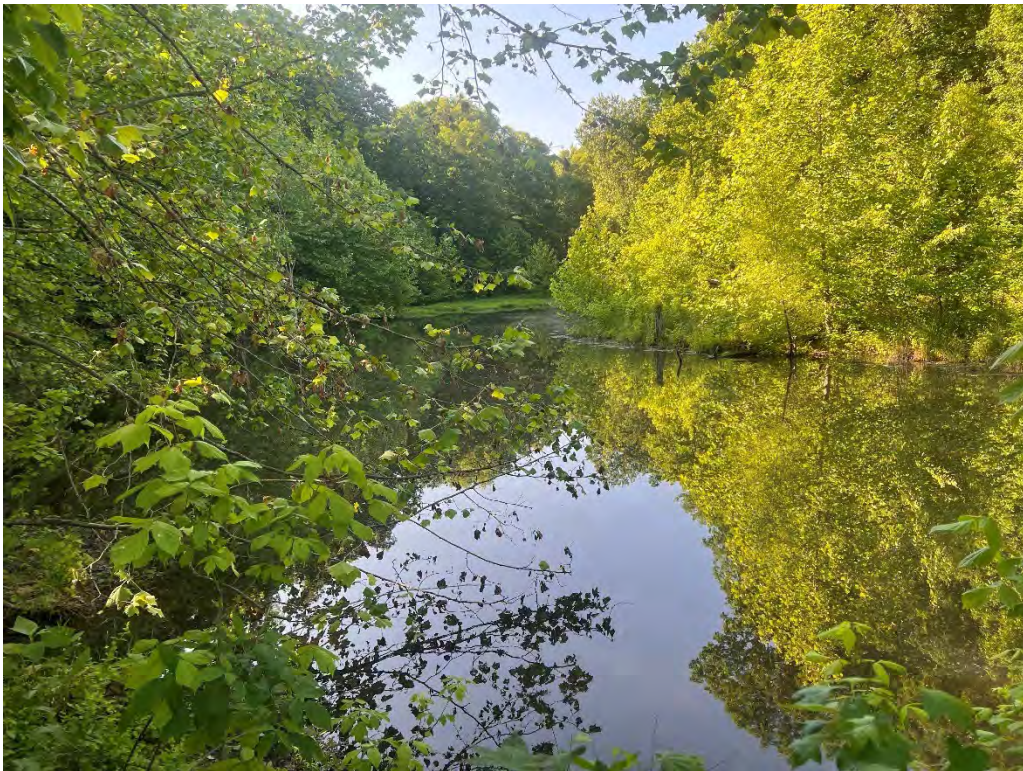


Net Site 4 Net A

TVA Kingston Fossil Plant Bat Mist Netting Report



Net Site 4 Net B



Net Site 4 Looking towards Nets C & D

TVA Kingston Fossil Plant Bat Mist Netting Report



Net Site 5 Net A



Net Site 5 Net B

TVA Kingston Fossil Plant Bat Mist Netting Report



Net Site 5 Net C

Photos of each Bat Species Captured



Eastern Red Bat



Evening Bat

TVA Kingston Fossil Plant Bat Mist Netting Report



Pregnant Big Brown Bat



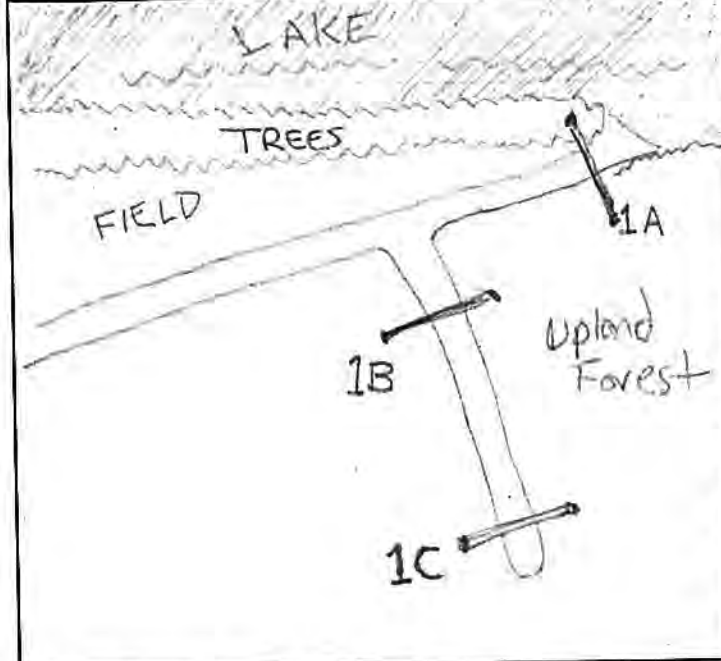
Lactating Big Brown Bat

TVA Kingston Fossil Plant Bat Mist Netting Report



Site No. 1 Project Phase# _____ Project Name KIF EIS Dates 5/15 -

Net Site Diagram



Net height x net length (m)		Dates
A =	12 x 5.2 double	5/15
B =	6 x 5.2 "	5/15
C =	9 x 5.2 "	5/15
D =	_____ x _____	_____
E =	_____ x _____	_____
F =	_____ x _____	_____

Transmitters	
Band# _____	Band# _____
Freq. _____	Freq. _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____

Band# _____	Band# _____
Freq. _____	Freq. _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor		✓	✓			
Road Rut						
Creek						
River	✓					
Pond						
Forest Gap						
Cave						
Mine						
Tree						
Other: list						

Dominant Vegetation	
1. <u>Sycamore</u>	5. <u>e. red cedar</u>
2. <u>sweet gum</u>	6. <u>tulip poplar</u>
3. <u>sugar maple</u>	7. _____
4. <u>olive</u>	8. _____

Potential listed bat habitat at site:

- 3 Roost habitat:** 1. **Poor:** No or few snags \geq 5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present $>$ 15 inch DBH within 1000 feet of forested areas.
- 3 Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.
- 3 Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees $>$ 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
- 3 Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Mist Netting Data Form 2017

5/15 + 5/17 Sheet 1 of 1

Site No. 2 Project Phase# _____ Project Name KIF Dates 5/15 + 5/17/23
 Site Location Forest Hill NE of Substation Habitat Type* _____
 County Roane State TN Permittee Holly Hamrick Technician(s) Maria Aguiar, Anne Hatfield
 Lat/Lon or UTM (circle one): N/Easting 35.89788 W/Northing 84.51194 UTM Zone _____ Datum _____

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments
1	5/15	21:32	LABO	-	-	-	-	-	B	2	-	-	-	Escaped from net
* 2	5/15	21:50	LABO	A	M	NR	-	-	A	4	1	-	-	Very stuck in net. Had a hole in its
2	5/17	22:50	LABO	A	M	NR	12.5	41	B	3	1	-	-	
3	5/17	23:16	LABO	A	M	NR	11.5	38	B	2	0	-	-	

Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
5/15	14.7	04:20	16:37	6:32	20:36
5/17	19.16	3:52	15:24	6:31	20:38

Date	Time	Temp (°F)	Sky	Wind	Comments
5/15	21:00	72	3	0	N/A
5/15	22:40	69	1	1	N/A
5/17	22:09	69	0	1	N/A
5/17	01:01	61	1	1	N/A

Sky Code

0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Beaufort Wind Scale

0	Calm: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

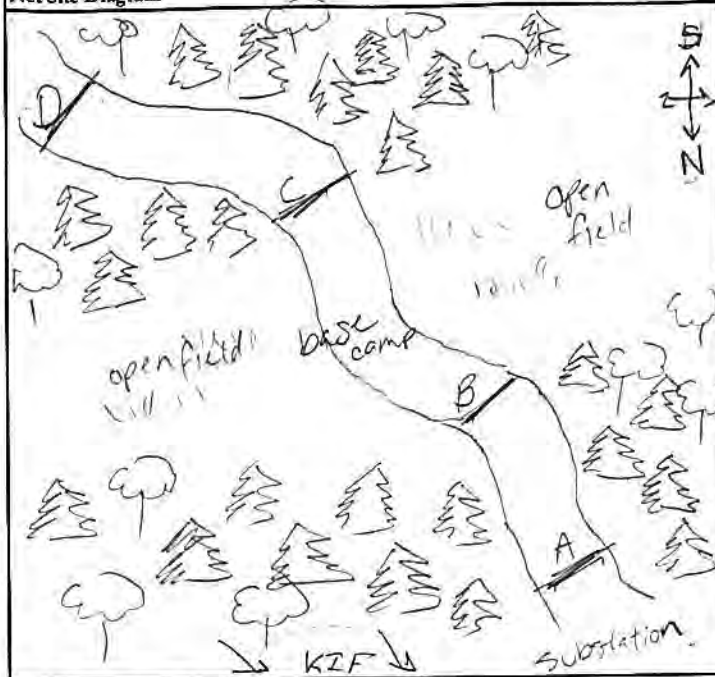
Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U
 * Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

* Bat #2 was very stuck in net. due to stress we released it without taking biometrics. had a hole on its right wing (fresh + bleeding).

Site No. 2 Project Phase# _____ Project Name KZF Dates 5/15 + 5/17

Net Site Diagram



Net height x net length (m)		Dates
A =	6 x 6	5/15 + 5/17
B =	6 x 9	"
C =	6 x 12	"
D =	6 x 9	"
E =	_____ x _____	_____
F =	_____ x _____	_____

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor		X	X	X		
Road Rut	X					
Creek						
River						
Pond						
Forest Gap						
Cave						
Mine						
Tree						
Other: list						

Transmitters	
Band# _____	Band# _____
Freq. _____	Freq. _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____
Band# _____	Band# _____
Freq. _____	Freq. _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____

Dominant Vegetation	
1. Sweet gum	5. _____
2. Pine	6. _____
3. Maples	7. _____
4. Hickory	8. _____

Potential listed bat habitat at site:

- Z Roost habitat:** 1. **Poor:** No or few snags \geq ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present $>$ ~15 inch DBH within 1000 feet of forested areas.
- Z Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.
- Z Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees $>$ 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
- Z Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: A - 35.8942231 B - 35.8982231 C - (35.8971973, -84.5118708) D - (35.8971550, -84.5113447)

Site No. Three Project Phase# _____ Project Name KIF EIS Dates 5/15/03
 Site Location Penninsula South Side Habitat Type* Upland Forest
 County Roane State TN Permittee Hamrick, E Technician(s) Stinson, R
 Lat/Lon or UTM (circle one): N/Easting 35 8944615 W/Northing 41 4993140 UTM Zone _____ Datum _____

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments	Date	Moon%	Moon rise	Moon set	Sunrise	Sunset	
1	5/15	9:25	EPFU	A	F	P	27.5	49	A	2.5	0				5-16-2	1.7	4:42	17:48	6:32	20:32	
2		9:25	EPFU	A	F	P	29	48	A	1.5	0				5/17	2.8	5:14	18:50	6:31	20:38	
3		9:45	EPFU	A	M	NR	16	45	C	2	1										
4		9:45	LABO	(1)										escaped							
5		11:20 ^{pm}	NYHU	A	M	TD	9.5	36	A	2	1										
6		12:30 ^{pm}	NYHU	A	M	NR	9	36	A	4.5	1										
1	5/17	21:53	LABO	A	F	NR	14	39	A	U	0				5/15	20:30	70	2	0	—	
2	5/17	22:25	LABO	A	F	NR	8	38	C	2.5	1					21:30	69	1	0	—	
* 3		22:42	EPFU	A	F	L	29.5	49	A	3	0			very pregnant		22:30	68	1	0	—	
4		23:16	EPFU	A	F	L	24g	47	A	3.5	0			11		23:30	68	0	0	—	
																00:30	68	3	0	—	
																01:30				—	
																5/17	20:38	71	0	1	—
																	21:38	67	0	0	—
																	23:00	64	0	0	—
																	24:00	62	0	0	—
																	1:00	62	2	0	—
Sky Code																					
0															Clear						
1															Few Clouds						
2															Partly Cloudy						
3															Cloudy or overcast						
4															Fog or smoke						
5															Drizzle or light rain						
6															Heavy rain - thunder storm						
Beaufort Wind Scale																					
0															Calm: <1 mph						
1															Light air: 1-3 mph						
2															Light breeze: 4-6 mph						
3															Gentle breeze: 7-10 mph						
4															Moderate breeze: 11-16 mph						

Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

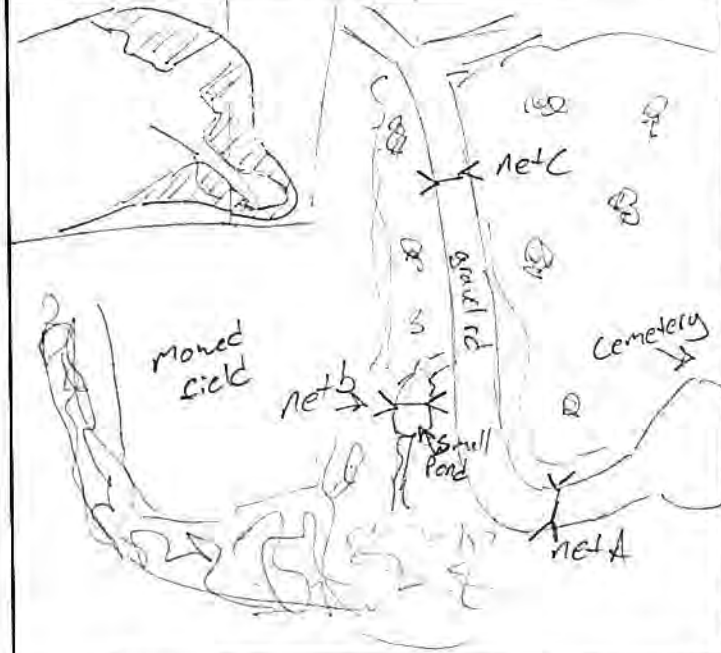
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

* Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

* Nipples looked chewed on. Very pregnant ready to pop.

Site No. Three Project Phase# _____ Project Name Kingston Dates 5-15-23

Net Site Diagram



Net height x net length (m)	Dates
A = 2 x 6	
B = 2 x 6	
C = 2 x 9	
D = _____ x _____	
E = _____ x _____	
F = _____ x _____	

Transmitters	
Band# _____	Band# _____
Freq. _____	Freq. _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____
Band# _____	Band# _____
Freq. _____	Freq. _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor	X		X			
Road Rut		X				
Creek						
River						
Pond						
Forest Gap						
Cave						
Mine						
Tree						
Other: list						

Dominant Vegetation	
1. <u>Liquidambar styraciflua</u>	5. _____
2. <u>Liriodendron tulipifera</u>	6. _____
3. <u>Alnus incana</u>	7. _____
4. _____	8. _____

Potential listed bat habitat at site:

2 **Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

2 **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

2.5 **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

2 **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: A 35.89343 -84.49958, B 35.89425, -84.49958, C, 35.894689, -84.498945

Site No. 4 Project Phase# _____ Project Name KIF EIS Dates 5/17/23 - 5/18/23
 Site Location Pond & riparian Corridor W of KIF Habitat Type* Creek / pond / upland forest
 County Roane State TN Permittee J. Troxler Technician(s) J. Argo, C. Swada, J. Thompson
 Lat/Lon or UTM (circle one): N/Easting 35.8957 W/Northing -84.5299 UTM Zone _____ Datum _____

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments	Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
1	5/17/23	21:28	LABO	A	M	N	8.0	38	4B	3	1	N/A	N/A	Head sticker	5/17	5%	0514	1851	0630	2038
2	5/18/23	00:45	LABO	A	F	P	16.1	43	4B	3	0	N/A	N/A	P-twins						
1	5/18/23	21:20	LABO	A	M	N	12.5	40	4D	1.5	1	N/A	N/A	Wing hole	5/18	2%	0544	1957	0630	2039
2	5/18/23	22:20	LABO	A	F	P	18.5	43	4D	2	0	N/A	N/A							
/															Date	Time	Temp (°F)	Sky	Wind	Comments
/															5/17	2050	70	0	0	
/															5/18	0138	61	0	0	
/															5/18	2120	69	3	1	
/															5/19	0140	65	2	0	
/															Sky Code					
/															0	Clear				
/															1	Few Clouds				
/															2	Partly Cloudy				
/															3	Cloudy or overcast				
/															4	Fog or smoke				
/															5	Drizzle or light rain				
/															6	Heavy rain - thunder storm				
/															Beaufort Wind Scale					
/															0	Calm: <1 mph				
/															1	Light air: 1-3 mph				
/															2	Light breeze: 4-6 mph				
/															3	Gentle breeze: 7-10 mph				
/															4	Moderate breeze: 11-16 mph				

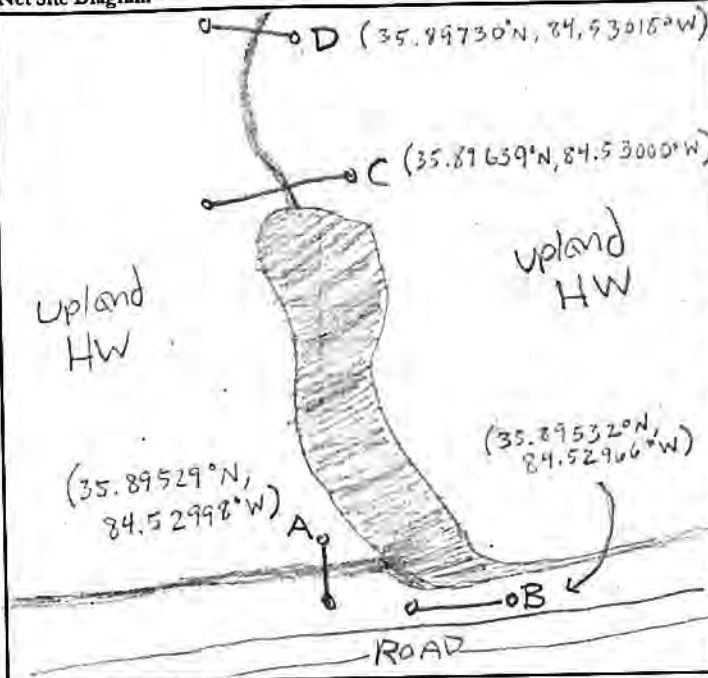
Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

* Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. 4 Project Phase# _____ Project Name KIF EIS Dates 5/17/23 - 5/18/23

Net Site Diagram



Net height x net length (m)		Dates
A =	6m x	double
B =	9 x	triple
C =	12 x	double
D =	6 x	single
E =	_____ x	_____
F =	_____ x	_____

Transmitters	
Band# _____	Band# _____
Freq. _____	Freq. _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor						
Road Rut						
Creek	X			X		
River						
Pond		X	X	X		
Forest Gap			X			
Cave						
Mine						
Tree						
Other list						

Dominant Vegetation	
1. Sweetgum	5. black willow
2. Sycamore	6. e red cedar
3. beech	7. white oak
4. Shagbark hickory	8. _____

Potential listed bat habitat at site:

- 3 Roost habitat:** 1. **Poor:** No or few snags \geq 5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present $>$ 15 inch DBH within 1000 feet of forested areas.
- 3 Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.
- 3 Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees $>$ 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
- 3 Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. 15 Project Phase# _____ Project Name KIFEIS Dates 5/18/23
 Site Location Peninsula Access Road Habitat Type* Upland Forest
 County Roane State TN Permittee Elizabeth burton-norrick Technician(s) Mariangela, Rob Stinson, Anne Hatfield
 Lat/Lon or UTM (circle one): N/Easting 35 894103 W/Northing -84,495427 UTM Zone _____ Datum NAD83

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments
1	5/18	21:00	LABO	A	M	NR	11.0	40 mm	B	3	1	-	-	
2	5/18	21:51	NYHU	A	M	NO	9.0	37 mm	D	2.5	1	-	-	
3	5/18	21:51	EPPU	A	F	L	29.0	48 mm	B	3	0	-	-	very preg
4	5/18	21:51	EPPU	A	M	NR	16.0	48 mm	B	2	0	-	-	
5	5/18	21:51	EPPU	A	M	NR	15	49 mm	B	2.5	0	-	-	
6	5/18	22:35	EPPU	A	F	P	29.75	50 mm	B	4	0	-	-	very preg
7	5/18	22:40	EPPU	A	M	NR	17	49	E	2	1	-	-	
8	5/18	23:30	EPPU	A	F	NR	18	45	E	3	1	-	-	
9	5/18	00:08	NYHU	A	M	TD	8	36	B	2	0	-	-	
/														

Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
5/18	0.7%	5:44	19:57	6:30	20:39

Date	Time	Temp (°F)	Sky	Wind	Comments
5/18	20:49	67	3	0	---
	21:49	66	3	2	---
	22:49	65	3	1	---
	23:49	63	4	0	---
	00:49	62	3	1	---
	01:49	61	1	0	---

Sky Code

0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Beaufort Wind Scale

0	Calm: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

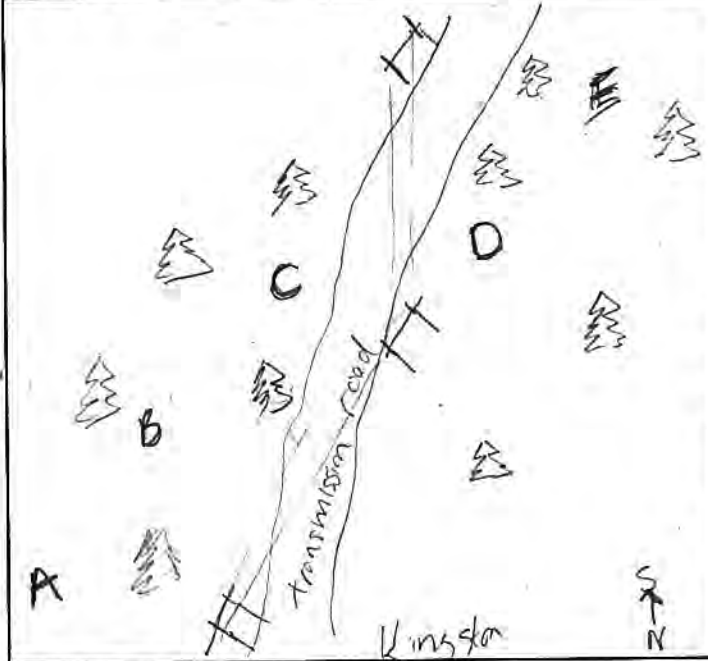
Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPPU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

*Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. 5 Project Phase# _____ Project Name Kingston EIS Dates 5/15, 5/17, 5/18

Net Site Diagram



Net height x net length (m)	Dates
A = 6 x 6	5/18
B = 6 x 12	5/18
C = 6 x 12	5/18
D = 6 x 9	5/18
E = 6 x 12	5/18
F = _____ x _____	

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor	X	X	X	X	X	
Road Rut						
Creek						
River						
Pond						
Forest Gap						
Cave						
Mine						
Tree						
Other: list						

Transmitters	
Band# _____	Band# _____
Freq. _____	Freq. _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____
Band# _____	Band# _____
Freq. _____	Freq. _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____

Dominant Vegetation	
1. <u>Acer rubrum</u>	5. <u>Fagus grandifolia</u>
2. <u>Quercus alba</u>	6. <u>Juniperus virginiana</u>
3. <u>Liquidambar styraciflua</u>	7. <u>Carya ovata</u>
4. <u>Asimina triloba</u>	8. <u>Quercus stellata</u>

Potential listed bat habitat at site:

- 2 **Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.
- 1 **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.
- 2 **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
- 2 **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: A. 35.89588, -84.49598 B. 35.89540, -84.49578 C. 35.89481, -84.49560 D. 35.8930814, -84.4949722
E. 35.8928959, -84.4948458

**Appendix F.2 – TVA's Kingston Fossil Plant Natural Resources
Survey**

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Environmental Records Processing Form

Title of File

Kingston Fossil Plant Natural Resources Survey

Site/Plant/Project Name

KIF/Natural Resources Survey

Accession Number (optional)

Work Order Number (optional)

Your Name

Amy McCampbell

Date Submitted (YYYYMMDD)

20200922

Document Date (YYYYMMDD)

20200420

Show Instructions

For assistance, please contact the Facility or Site Environmental Contact for your site/project, the Environmental Media Specialists (See Contacts on [Environment InsideNet Page](#)), or your Administrative Support Person.

Document Type

COMPREHENSIVE SITE SURVEYS

Record Type

Biological Compliance

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Kingston Fossil Plant Natural Resources Survey



Biological Compliance

ENVIRONMENTAL COMPLIANCE & OPERATIONS

2020

Table of Contents

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1.0 Introduction

1.1 Purpose of reviews

The Tennessee Valley Authority's (TVA) Kingston Fossil Plant (KIF) is a 1.7-gigawatt coal burning power plant with nine generating units located in Roane County, Tennessee, at the confluence of the Clinch and Emory Rivers on the shore of Watts Bar Reservoir. While portions of the plant property are heavily impacted by development of the plant infrastructure, large portions of the plant remain in some form of natural or mowed/maintained vegetation.

To facilitate project planning at KIF, comprehensive environmental surveys were performed for the entire KIF plant site in the summer of 2019. Resources identified consist of surface water features including streams, ponds, and wetlands; vegetation communities; terrestrial zoology habitats; and potential habitat for federal and state threatened and endangered species.

The locations of streams, wetlands, protected species themselves or habitat for protected species were mapped in the field using a Trimble Geo 7x handheld GPS receiver and shapefiles created in ArcMap 10.5.

1.2 Limitations of Reviews/Data

This data is a snapshot in time and reflects conditions at the time of the survey. The data presented in this report is intended for use in project siting and planning. All projects will still require formal NEPA review, but field data collected during the comprehensive site survey will be used to support that process and will, in many cases, preclude the need for additional surveys.

Table 1.2.1 - Expiration Dates for Resource Data

Resource	Data Expiration Date ¹	Comments
Aquatics	2024	Data collected is good for 5 years as per USACE guidelines
Wetlands	2024	Data collected is good for 5 years as per USACE guidelines
Botany/Vegetation	2029	10 year window to account for new species listings and changes in habitat
Terrestrial Zoology	January 2021	Periodic resurveys to document changes in habitat usage & new species listings

1.3 Study Area description

TVA owns and manages approximately 2000 acres of property in the vicinity of the KIF plant site. For the purposes of this comprehensive site survey, the survey boundary included only the 1255-acre plant property directly associated with power production (TVA Tract ID XWBR-190PT, Parcel Number 190, Zone 2 Project Operations).

The survey does not include any of the land held for recreational or natural resource management.

2.0 Resource Areas

2.1 Aquatic Features

Aquatic features such as streams, wet-weather conveyances/ephemeral streams, intermittent streams, and ponds at KIF are protected under the federal Clean Water Act (CWA) and state Tennessee Department of Environment and Conservation (TDEC) regulations. Identification and mapping of these features on the KIF property was conducted using the Tennessee Division of Water Pollution Control (Version 1.4) field forms by a Tennessee qualified hydrologic professional (Craig Phillips 1036-TN11).

Results

A total of 35 aquatic features occur within the KIF plant boundary (Table 2.1.1.) Of those, two are perennial and four are intermittent streams, two are ponds, and 27 are wet-weather conveyances/ephemeral streams.

Table 2.1.1 Aquatic Features

Sequence ID	Stream Type	Latitude	Longitude
1	Intermittent	35.89446	-84.49409
2	Intermittent	35.89393	-84.49321
3	Intermittent	35.89446	-84.50005
4	Intermittent	35.89694	-84.53374
5	Perennial	35.89627	-84.53016
6	Perennial	35.89402	-84.5331
e001	WWC/Ephemeral	35.90289	-84.50306
e002	WWC/Ephemeral	35.90301	-84.50001
e003	WWC/Ephemeral	35.90113	-84.49983
e004	WWC/Ephemeral	35.90112	-84.50136
e005	WWC/Ephemeral	35.89986	-84.4977
e006	WWC/Ephemeral	35.89791	-84.49484
e007	WWC/Ephemeral	35.89696	-84.49471
e008	WWC/Ephemeral	35.8945	-84.49419
e009	WWC/Ephemeral	35.89697	-84.51158
e010	WWC/Ephemeral	35.90118	-84.5095
e011	WWC/Ephemeral	35.89494	-84.53176
e012	WWC/Ephemeral	35.89486	-84.50423
e013	WWC/Ephemeral	35.89661	-84.52771
e014	WWC/Ephemeral	35.89622	-84.5055
e015	WWC/Ephemeral	35.89752	-84.50511
e016	WWC/Ephemeral	35.89895	-84.50174
e017	WWC/Ephemeral	35.89995	-84.50038
e018	WWC/Ephemeral	35.89855	-84.50125
e019	WWC/Ephemeral	35.8952	-84.50267
e020	WWC/Ephemeral	35.89682	-84.50238
e021	WWC/Ephemeral	35.89681	-84.50258
e022	WWC/Ephemeral	35.89413	-84.50352
e023	WWC/Ephemeral	35.89566	-84.50408

Sequence ID	Stream Type	Latitude	Longitude
e024	WWC/Ephemeral	35.89771	-84.50408
e025	WWC/Ephemeral	35.9036	-84.51908
e026	WWC/Ephemeral	35.90437	-84.51872
e027	WWC/Ephemeral	35.89681	-84.53514
P01	Other	35.89624	-84.49887
P02	Other	35.89729	-84.53353

The perennial streams on site consisted of cobble/ bedrock substrate with riffle-pool habitat. Intermittent streams typically flow during late winter and early spring, but dry later in the year once trees have leafed-out and transport enough water from the water table to limit year-round flow in these drainage features.

Wet Weather Conveyances (WWCs) are man-made or natural, and flow only in direct response to precipitation runoff in their immediate locality. Ephemeral/ WWC channels documented during the comprehensive site survey represent features observed at the time of the survey. These features can disappear or new ones appear as a response to surface runoff from precipitation events. If WWCs are discovered that were not originally documented, a TDEC Hydrologic Determination should be conducted and the location of these features updated to the Comprehensive Site Survey.

Three classes were used to indicate the current condition of streamside vegetation across the length of the stream, as defined below, and listed in Table 2.1.2.

- Forested - Riparian area is fully vegetated with trees, shrubs, and herbaceous plants. Vegetative disruption from mowing or grazing is minimal or not evident. Riparian width extends more than 60 feet on either side of the stream.
- Partially forested - Although not forested, sparse trees and/or scrub-shrub vegetation is present within a wider band of riparian vegetation (20 to 60 feet). Disturbance of the riparian zone is apparent.
- Non-forested - No or few trees are present within the riparian zone. Significant clearing has occurred, usually associated with pasture or cropland.

All streams mapped on site contained forested riparian habitat. This intact forested buffer provides benefits to water quality as well as reduces stream bank erosion and maintains stable stream channels.

Table 2.1.2 - Riparian Condition of Perennial and Intermittent Streams Located Within the KIF Plant Boundary

Riparian Condition	# Perennial Streams	# Intermittent Streams	TOTAL
Forested	2	4	6
Partially forested			
Nonforested			

Limitations of Data

Aquatic features are typically fairly static on the landscape, and associated with topographic gradients and low-lying areas. The data presented is useful for project planning, infrastructure siting, and emergency response purposes. The data collected for this report will be valid for permitting purposes until 2024.

2.2 Wetlands

Wetlands are areas inundated by surface water or groundwater such that vegetation adapted to saturated soil conditions are prevalent. Wetlands generally include swamps, marshes, bogs, wet meadows, shoreline fringes, and similar areas.

As with aquatic features, wetlands present on KIF property are protected under the federal Clean Water Act (CWA), Executive Order (EO) 11990, and the Tennessee Department of Environment and Conservation (TDEC) regulations.

Wetland features were primarily identified along reservoir shorelines, riparian flats of drainage features, depressional features, and low-lying poorly drained areas. These wetlands exhibit a range of functions within the watershed, including water quality and flood abatement, fish and wildlife habitat, groundwater recharge, and shoreline stabilization.

Results

Fifteen wetland areas were mapped on the KIF site (Table 2.2.1). Wetland determinations were performed according to USACE standards, which require documentation of wetland (hydrophytic) vegetation, hydric soil, and wetland hydrology (Environmental Laboratory, 1987; Reed, 1997). Broader definitions of wetlands, such as that used by the U.S. Fish and Wildlife Service (Cowardin et al., 1979), the Tennessee definition (Tennessee Code 11-14-401), and the TVA Environmental Review Procedures definition (TVA, 1983), were also considered in this review. In addition, the TVA Rapid Assessment Method (TVARAM) was used to assess wetland condition and identify wetlands with special ecological significance (Mack, 2001).

Table 2.2.1 – Wetlands Present on KIF Site

Field ID	Cowardin Classification¹	Field Notes	Acres
W001	PSS1A	Scrub-shrub wetland associated with drainage feature	0.01
W002	PFO1A	Forested wetland in low-lying area	0.03
W003	PEM1A	Emergent/scrub-shrub wetland along shoreline	0.09
W004	PFO1A	Forested wetland at head of wet-weather conveyance to Watts Bar Reservoir	0.1
W005	PFO1A	Forested wetland at head of wet-weather conveyance to Watts Bar Reservoir	0.1
W006	PFO1A	Forested wetland associated with low-lying forested area	0.13
W007	PSS/PEM1A	Emergent/scrub-shrub wetland associated with runoff feature	0.14
W008	PEM1A	Emergent/scrub-shrub wetland along shoreline	0.15
W009	PFO1A	Forested wetland associated with low-lying wet-weather conveyance	0.19
W010	PEM/PSS1A	Emergent/scrub-shrub wetland in roadside drainage area	0.3
W011	PFO/PSS/PEM1E/PSS1C	Emergent/scrub-shrub/forested wetland associated with low-lying wet-weather conveyance along shoreline	0.4

Field ID	Cowardin Classification ¹	Field Notes	Acres
W012	PFO/PSS/PEM1E/PSS1C	Emergent/scrub-shrub/forested wetland associated with low-lying wet-weather conveyance along shoreline	0.53
W013	PEM1E/PSS	Emergent/scrub shrub wetland associated with stream	0.67
W014	PFO1A	Forested wetland associated with embayment of Watts Bar Lake	1.1
W015	PEM1E/PSS	Emergent/scrub shrub wetland associated with stream	1.72
TOTAL			5.66

¹PFO1A = palustrine forested, broad-leaved deciduous, temporarily flooded;
PSS1A = palustrine scrub-shrub, broad-leaved deciduous;
PEM1A = palustrine emergent, persistent vegetation

Limitations of Data

Wetlands are dynamic habitats, and their boundaries may shrink or expand both seasonally, and over a period of years, based on changes in hydrology. The data presented is useful for project planning, infrastructure siting, and emergency response purposes. The data as presented is not intended for use in specific NEPA reviews though it can be used to support individual NEPA reviews.

2.3 Botany/Vegetation

The vegetation found within the KIF site is largely a function of the land use history of the site; a large proportion of the KIF site has been heavily disturbed by the construction, operation, and maintenance of the generation and transmission infrastructure present there. In general, the most heavily disturbed and most degraded habitats are currently covered with herbaceous vegetation. Many areas support highly altered early successional plant habitats, with scattered areas of forest. Field surveys also took into account the habitat requirements of state and federally-listed threatened and endangered species.

Results

The vast majority of herbaceous vegetation on the KIF site is dominated by non-native plant species and possesses little conservation value. Some areas of herbaceous vegetation, principally along transmission line ROW, contain significant populations of native plants, but these areas still only constitute marginally intact habitat. Several forested tracts throughout KIF contain large overstory trees, but even these areas have a depauperate herbaceous layer. At least an equal proportion of forest on KIF is heavily fragmented, degraded by non-native species infestations, and contains small diameter trees indicative of the previous disturbance on-site.

Field surveys of the KIF site, along with interpretation of aerial photos, resulted in 73 discrete areas of vegetation (Table 2.3.1 – Appendix). The vast majority of these polygons have no potential to support state or federally listed plant species, or unique plant communities, and would not require additional field surveys if a project is proposed there. Brief summaries of the vegetation composition and structure within each polygon are listed in Table 2.3.1.

Threatened and Endangered Species

No areas were found to contain habitat that would support federally-listed plant species. Two polygons (Botany 067 & Botany 044) were found to contain patches of intact, higher quality habitat that could support specific state-listed species.

Limitations of Data

Assuming areas remain undisturbed, the various vegetation communities will remain fairly stable with little change in species composition and habitat value over a 10-20 year time period. The full site survey is good for ten years, unless new species are listed that could be found on the KIF site.

2.4 Terrestrial Zoology

The types of terrestrial wildlife that are found on a site are directly related to the habitats present on the site. Located within the Blue Ridge ecoregion, the KIF site supports a variety of common wildlife species. Field surveys also took into account the habitat requirements of state and federally-listed threatened and endangered species.

Results

Herbaceous fields and forest fragments provide habitat for a variety of wildlife species across the KIF site. In herbaceous fields dominated by Johnson grass, Eastern meadowlarks, grasshopper sparrows, and savannah sparrows are common. Red-tailed and red-shouldered hawks use the open areas for hunting. Edge habitat occurs where fields meet with forests. This edge habitat creates a diverse bird community. Birds inhabiting edges include northern bobwhite, eastern phoebe, Carolina wren, brown thrasher, white-eyed vireo, northern cardinal, indigo bunting, eastern towhee, field and song sparrows, and others. Small mammals and larger mammals such as white-tailed deer and coyotes use these edges.

Forests on the peninsula range from dry oak-hickory and dry mesic oak-hickory forests to bottomland forests. Oak-hickory forests provide habitat for wild turkey, yellow-billed cuckoos, woodpeckers, eastern wood pewees, blue jays, American crows, Carolina chickadees, eastern tufted titmice, white-breasted nuthatches, and many Neotropical migrants. Mammals occurring in oak-hickory forests include deer mice, white-tailed deer, gray fox, gray squirrel, eastern chipmunk, and others. Reptiles include rat snakes, five-lined skinks, eastern box turtles, and others.

Narrow bands of bottomland forests are found on the peninsula along the river margin and within wet sloughs. Birds observed in these areas include green and great blue herons, wood ducks, spotted sandpipers, belted kingfishers, and eastern kingbirds. Mammals specific to bottomland forests in the area include the beaver and muskrat. Because these areas typically stay wet, amphibians may be abundant. Amphibians include the American toad, eastern newt, spring peeper, and others. Water snakes are also typically abundant. Fringe wetlands along the Clinch River provide habitat for red eared sliders, painted turtles, and other turtle species.

Field surveys of the KIF site, along with interpretation of aerial photos, resulted in 57 discrete habitat areas (Table 2.4.1 – Appendix). The vast majority of these polygons have no potential to support state or federally listed animal species communities, and would not require additional

field surveys if a project is proposed there. Brief summaries of these areas and their potential to support T&E species are listed in Table 2.4.1.

Threatened & Endangered Species

Beyond the common wildlife species found on the KIF site, there are specific findings that identify potential habitat for federal and state threatened and endangered wildlife species. Field surveys of the KIF site, along with interpretation of aerial photos, resulted in 57 discrete habitat areas (habitat polygons). The majority of these polygons have no potential to support state or federally listed wildlife species.

Osprey are protected under the Migratory Bird Treaty Act and the Executive Order for Migratory Birds 13186. It is illegal to hurt, harm, or harass these birds without a federal permit. Osprey build nests on trees (live and dead), and man-made structures such as lighting towers, utility poles, buildings and channel markers near lakes and rivers. They build nests by repeatedly dropping large sticks from the air until enough sticks have accumulated and a shallow bowl-shape can be fashioned in the middle of the sticks to form a nest. Shortly after making the nest 1-4 eggs (typically 3 eggs) will be laid. At this point the nest is deemed “active” and the behavior of the adult osprey changes. The female sits on the eggs to incubate them for 5-6 weeks. She rarely leaves the nest and relies on her partner to bring her food. After the eggs hatch, both mother and father will spend most of their time foraging for food to feed the young. Adults can be observed perching on the edge of the nest peering into the center. Young learn to fly at 50-60 days old but are still dependent on their parents for several additional weeks and often stay close to the nest. Young look almost identical to their parents at this point but can be seen begging for food from parents. When the young have left the nest, the nest is deemed “inactive”. These birds have very high site fidelity, meaning they will come back to the same nest or nesting location year after year.

- Five osprey nests were observed on KIF in May 2019. Two are on Transmission line structures, one is in a lighting structure near the coal pile, one is on a nesting platform in the Emory River, and one is on an island adjacent to KIF in the Emory River. At the time of survey, all nests were active. 660 foot buffers were placed around each of these nests on the attached map.
- While the osprey nest is active (typically between March 1st and July 31), activities within 660ft of the nest are limited to vegetation maintenance (bushhogs, mowers, and selective herbicide application only). Proposed reconductoring, slides, structure installations, earth moving machinery, and other loud disturbances are not allowed. Removal or disturbance of an active nest would require use of a permit held by the US Department of Agriculture. A field survey by Terrestrial Zoology or Natural Resources staff can be requested at any time to determine if the nest is active.
- Inactive nests can be removed but this removal must be documented. Please note, if nests are removed the same birds will likely try to renest in the same location or location that is even more inconvenient for projects. It is recommended that nests built in a tolerable location be left in place. Inactive nests that must be removed should be removed in winter (October – February) and nesting deterrents installed on the structure promptly thereafter.

- If potentially disturbing work must occur within 660 feet of an osprey nest when it is active, if activity of a nest is uncertain, or if you would like to remove an inactive nest, contact Liz Hamrick (865-632-4011) or RJ Moore (865-632-3440-office; 423-661-6336-mobile) for guidance to ensure compliance with federal law and to ensure proper documentation.
 - If disturbance cannot be avoided, Moore or Hamrick will contact USDA for guidance/ to request permit use. Please do not contact USDA directly.

At least three species of state and/or federally protected bats may occur on KIF property (**Indiana bat, northern long-eared bat (NLEB), and gray bat**).

- Federally listed Indiana bats and northern long-eared bats roost in trees in spring, fall, and summer. Females of these species roost in groups and have their live young underneath the bark of dead, dying, or damaged trees in summer. They can use trees as small as 3 inches in diameter. These bats roost in any species of trees as long as it has the right physical characteristics. Larger white oaks, shag bark hickories, and dead trees with sloughing bark or hollow trunks are thought to be the most ideal. Forested habitat for bats is ephemeral and roosts selection changes as trees mature, die, and decay. As a result, habitat for this species changes and forested areas that were previously not suitable for bats may become suitable as forests mature. Similarly, forested areas with suitable roosts may become unsuitable if all potential roosting trees die/fall. Therefore habitat surveys for these species are only good for a few years (expiration date given below). Removal of suitable roosting trees (occupied or not) can be considered a violation of the Endangered Species Act. TVA has consulted with the US Fish and Wildlife Service to allow for removal of suitable bat roosting habitat under TVA's Bat Strategy, but only with proper documentation, notification, and minimization of impacts.
- Gray bats roost in caves year-round. They will travel up to 50 miles per night to forage. No caves are known on KIF property but there is a known maternity cave for gray bats in Roane County approximately 9 miles away. Gray bats have also been documented on the Oak Ridge Reservation approximately 5.8 miles away from KIF. Gray bats have been documented foraging over the Clinch River.
- All three bat species forage for insects either over open fields, forested areas, and/or bodies of water such as wetlands, streams, and the Clinch and Emory Rivers.
- All three species have been documented roosting in buildings. All buildings must be surveyed by Terrestrial Zoology before demolition to ensure no bats would be impacted.
- All projects must comply with TVA's Bat Strategy. For most that means filling out a Bat Strategy Form, sending it to an email address, and attaching it to your NEPA document. Many routine actions (as detailed on the form) do not require the form to be filled out at all. Other actions, such as tree removal, require review by Terrestrial Zoology in the Biological Compliance group. Contact Liz Hamrick (ecburton@tva.gov or 865-632-4011) for assistance.

Limitations of Data

By their nature, terrestrial animals move across the landscape and may or may not use the same habitat features year after year. In addition, habitat for some species such as Indiana bat and northern long-eared bat is ephemeral. For these reasons mapped Terrestrial Zoology resources are not permanent and will need to be revisited periodically. New Terrestrial Zoology resources may also appear on site as birds shift nesting locations and vegetation grows/dies. In addition, new species may be listed that could be found on the KIF site.

3.0 Literature Cited

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Appendix

Table 2.3.1 – Botany Table

Botany Polygon	Descriptor	Field Notes
Botany 001	Herbaceous Vegetation	Vegetation in the ash disposal area is comprised of weedy species indicative of disturbed habitats. The area has no potential to support state or federally listed plants.
Botany 002	Herbaceous Vegetation	Vegetation in the ash disposal area is comprised of weedy species indicative of disturbed habitats. The area has no potential to support state or federally listed plants.
Botany 003	Deciduous Forest	The deciduous forest in this area occupies areas that have been heavily disturbed by operations at KIF. The forest strip is comprised of small diameter trees and weedy herbaceous species. The area has no potential to support state or federally listed plants.
Botany 004	Sparsely Vegetated	This sparsely vegetated waste area has been, and continues to be, heavily disturbed by plant operations at KIF. Herbaceous vegetation occurs sporadically throughout this area and is weedy and dominated by non-native plants. This area has no potential to support state or federally listed plants.
Botany 005	Herbaceous Vegetation	Vegetation in the ash disposal area is comprised of weedy species indicative of disturbed habitats. The area has no potential to support state or federally listed plants.
Botany 006	Herbaceous Vegetation	Vegetation in the ash disposal area is comprised of weedy species indicative of disturbed habitats. The area has no potential to support state or federally listed plants.
Botany 007	Herbaceous Vegetation	Vegetation in the ash disposal area is comprised of weedy species indicative of disturbed habitats. The area has no potential to support state or federally listed plants.
Botany 008	Herbaceous Vegetation	Vegetation in the ash disposal area is comprised of weedy species indicative of disturbed habitats. The area has no potential to support state or federally listed plants.
Botany 009	Herbaceous Vegetation	Vegetation in the ash disposal area is comprised of weedy species indicative of disturbed habitats. The area has no potential to support state or federally listed plants.
Botany 010	Herbaceous Vegetation	Vegetation in the ash disposal area is comprised of weedy species indicative of disturbed habitats. The area has no potential to support state or federally listed plants.
Botany 011	Herbaceous Vegetation	Vegetation in this area comprised of weedy species indicative of disturbed habitats. The area has no potential to support state or federally listed plants.
Botany 012	Mixed Evergreen Deciduous Forest	This small patch of mixed forest contains trees indicative of upland habitats. The area has no potential to support state or federally listed plants.

Botany Polygon	Descriptor	Field Notes
Botany 013	Open Water	This area is not vegetated.
Botany 014	Deciduous Forest	This small patch of early successional deciduous forest is dominated by small diameter trees and other weedy vegetation. The forest strip is comprised of small diameter trees and weedy herbaceous species. The area has no potential to support state or federally listed plants.
Botany 015	Herbaceous Vegetation	Mowed grass. This area has no potential to support state or federally listed plants.
Botany 016	Sparsely Vegetated	This sparsely vegetated waste area has been, and continues to be, heavily disturbed by plant operations at KIF. Herbaceous vegetation occurs sporadically throughout this area and is weedy and dominated by non-native plants. This area has no potential to support state or federally listed plants
Botany 017	Sparsely Vegetated	This sparsely vegetated waster area has been, and continues to be, heavily disturbed by plant operations at KIF. Herbaceous vegetation occurs sporadically throughout this area and is weedy and dominated by non-native plants. This area has no potential to support state or federally listed plants.
Botany 018	Deciduous Forest	Common overstory species include sweetgum (<i>Liquidambar styraciflua</i>), yellow-poplar (<i>Liriodendron tulipifera</i>), black cherry (<i>Prunus serotina</i>) red maple (<i>Acer rubrum</i>), and American beech (<i>Fagus grandifolia</i>). This area has no potential to support state or federally listed plants.
Botany 019	Mixed Evergreen Deciduous Forest	This small patch of mixed forest contains trees indicative of upland habitats. The area has no potential to support state or federally listed plants.
Botany 020	Herbaceous Vegetation	This transmission line ROW is populated with a large proportion of non-native vegetation that is indicative of weedy, early-successional habitats. This area has no potential to support state or federally listed plants
Botany 021	Herbaceous Vegetation	This area along the edge of the KIF property is mostly comprised of regularly mowed areas that have no potential to support state or federally listed plants
Botany 022	Herbaceous Vegetation	This area along the edge of the KIF property is mostly comprised of regularly mowed areas that have no potential to support state or federally listed plants.
Botany 023	Herbaceous Vegetation	This area along the edge of the KIF property supports a few clumps of trees, but is mostly comprised of regularly mowed areas that have no potential to support state or federally listed plants.
Botany 024	Deciduous Forest	This small patch of mixed forest contains trees indicative of upland habitats. The area has no potential to support state or federally listed plants.

Botany Polygon	Descriptor	Field Notes
Botany 025	Deciduous Forest	This small patch of early successional deciduous forest is dominated by small diameter trees and other weedy vegetation. The forest strip is comprised of small diameter trees and weedy herbaceous species and has no potential to support state or federally listed plants.
Botany 026	Deciduous Forest	The riparian forest in this area supports trees that are approximately 12" in diameter. The narrow strip of habitat is weedy in the understory and is not indicative of high quality plant habitat. The area has no potential to support state or federally listed plants.
Botany 027	Herbaceous Vegetation	This area along the edge of the KIF property supports a few clumps of trees, but is mostly comprised of regularly mowed areas that have no potential to support state or federally listed plants.
Botany 028	Deciduous Forest	This narrow strip of forest is dominated by early successional tree species and non-native plants in the understory. This area has no potential to support state or federally listed plants.
Botany 029	Deciduous Forest	This narrow strip of forest is dominated by early successional tree species and non-native plants in the understory. This area has no potential to support state or federally listed plants.
Botany 030	Sparsely Vegetated	This area comprises the core of the KIF generating infrastructure. The area is mostly devoid of vegetation. The area does contain some small areas that are landscaped and regularly mowed. This area has no potential to support state or federally listed plants.
Botany 031	Mixed Evergreen Deciduous Forest	This area is comprised of a mosaic of habitat types that are determined by the ongoing disturbance resulting from operations at KIF. Some of the area is comprised of disturbed open areas dominated by non-native herbaceous vegetation. The majority of the area is covered with small diameter, mixed evergreen deciduous forest. This area has no potential to support state or federally listed plants.
Botany 032	Herbaceous Vegetation	This area is comprised of regularly mowed areas that have no potential to support state or federally listed plants.
Botany 033	Herbaceous Vegetation	This area is comprised of regularly mowed areas that have no potential to support state or federally listed plants.
Botany 034	Herbaceous Vegetation	This area is comprised of regularly mowed areas that have potential to support state or federally listed plants.
Botany 035	Herbaceous Vegetation	This area is comprised of regularly mowed areas that have no potential to support state or federally listed plants.
Botany 036	Deciduous Forest	This small patch of forest contains trees indicative of upland habitats. The area has no potential to support state or federally listed plants.
Botany 037	Herbaceous Vegetation	This area is comprised of regularly mowed areas that have no potential to support state or federally listed plants.

Botany Polygon	Descriptor	Field Notes
Botany 038	Deciduous Forest	This small patch of mixed forest contains trees indicative of upland habitats. The area has no potential to support state or federally listed plants.
Botany 039	Herbaceous Vegetation	This area is comprised of regularly mowed areas that have no potential to support state or federally listed plants.
Botany 040	Sparsely Vegetated	The deciduous forest strip situated between the entrance road and the railroad yard is dominated by early successional trees in the overstory and is dominated by non-native species like Chinese privet (<i>Ligusticum sinense</i>) in the understory. This area has no potential to support state or federally listed plants.
Botany 041	Deciduous Forest	The deciduous forest strip situated between the entrance road and the railroad yard is dominated by early successional trees in the overstory and is dominated by non-native species like Chinese privet (<i>Ligusticum sinense</i>) in the understory. This area has no potential to support state or federally listed plants.
Botany 042	Sparsely Vegetated	This sparsely vegetated waste area has been, and continues to be, heavily disturbed by plant operations at KIF. Herbaceous vegetation occurs sporadically throughout this area and is weedy and dominated by non-native plants. This area has no potential to support state or federally listed plants.
Botany 043	Deciduous Forest	This tiny patch of deciduous forest has a broken canopy and does not support intact native plant habitat. This area has no potential to support state or federally listed plants.
Botany 044	Deciduous Forest	This strip of forest along Watts Bar Reservoir ranges from more disturbed, early successional habitats to mature hardwood forest with trees from 12-24" dbh. The state-listed plant fetter-bush (<i>Leucothoe racemosa</i>) was documented from this area in 1984, but has not been seen since then. The area still contains some patches of intact, higher quality deciduous forest.
Botany 045	Herbaceous Vegetation	This area is comprised of regularly mowed areas that have no potential to support state or federally listed plants.
Botany 046	Open Water	This area is not vegetated.
Botany 047	Herbaceous Vegetation	This area is mostly open and comprised of areas that are regularly mowed. In addition, there are small areas with deciduous trees. The plant habitats are very disturbed and do not support intact native plant communities. This area has no potential to support state or federally listed plants.

Botany Polygon	Descriptor	Field Notes
Botany 048	Mixed Evergreen Deciduous Forest	Much of this unit, particularly in the western portions, is heavily disturbed and comprised of overstory trees from 4-8" dbh. Common trees include sweetgum (<i>Liquidambar styraciflua</i>), loblolly pine (<i>Pinus taeda</i>), yellow-poplar (<i>Liriodendron tulipifera</i>), tree-of-heaven (<i>Ailanthus altissima</i>), and sugarberry (<i>Celtis laevigata</i>). The invasive plants multiflora rose (<i>Rosa multiflora</i>) and Japanese stiltgrass (<i>Microstegium vimineum</i>) are common in the understory. This area has no potential to support state or federally listed plants.
Botany 049	Herbaceous Vegetation	This small area of herbaceous vegetation is populated almost entirely with invasive species including tall fescue (<i>Schedonorus arundinaceus</i>) and sericea lespedeza (<i>Lespedeza cuneata</i>). White wingstem (<i>Verbesina virginica</i>) is also common. This area has no potential to support state or federally listed plants.
Botany 050	Deciduous Forest	This sparsely vegetated waste area has been, and continues to be, heavily disturbed by plant operations at KIF. Herbaceous vegetation occurs sporadically throughout this area and is weedy and dominated by non-native plants. This area has no potential to support state or federally listed plants.
Botany 051	Herbaceous Vegetation	This small ROW corridor is similar to other larger ROW in the area in that it is dominated by non-native plants including <i>Bromus</i> spp., autumn olive (<i>Elaeagnus umbellata</i>), and Johnson grass (<i>Sorghum halepense</i>). This area has no potential to support state or federally listed plants.
Botany 052	Deciduous Forest	Average diameter of overstory trees in this area ranged from 18-24" dbh and the stands appeared relatively undisturbed, particularly in the interior. Sweetgum (<i>Liquidambar styraciflua</i>), yellow-poplar (<i>Liriodendron tulipifera</i>), and white ash (<i>Fraxinus americana</i>) are the most prevalent trees on lower slopes, along with redbud (<i>Cercis canadensis</i>), dogwood (<i>Cornus florida</i>), pawpaw (<i>Asimina triloba</i>), and buckeye (<i>Aesculus pavia</i>) in the shrub layer. The species composition shifts moving upslope and includes white oak (<i>Quercus alba</i>), hickories (<i>Carya tomentosa</i> , <i>C. glabra</i> , <i>C. cordiformis</i>), American beech (<i>Fagus grandifolia</i>), and basswood (<i>Tilia americana</i>). Scattered pine occurs in the uplands. The herbaceous layer was not rich. No plants of conservation concern occur on site.
Botany 053	Herbaceous Vegetation	This area is mostly open and comprised of areas that are regularly mowed. In addition, there are small area with deciduous trees. The plant habitats are very disturbed and do not support intact native plant communities. This area has no potential to support state or federally listed plants.
Botany 054	Deciduous Forest	This narrow block of forest is dominated by early successional tree species and non-native plants in the understory. This area has no potential to support state or federally listed plants.

Botany Polygon	Descriptor	Field Notes
Botany 055	Herbaceous Vegetation	These ROW are dominated by non-native species throughout. Prominent plants include <i>Bromus</i> spp., autumn olive (<i>Elaeagnus umbellata</i>), Johnson grass (<i>Sorghum halepense</i>), tall fescue (<i>Schedonorus arundinaceus</i>), and sericea lespedeza (<i>Lespedeza cuneata</i>). This area has no potential to support state or federally listed plants.
Botany 056	Herbaceous Vegetation	This ROW is dominated by non-native species throughout. Prominent plants include <i>Bromus</i> spp., autumn olive (<i>Elaeagnus umbellata</i>), Johnson grass (<i>Sorghum halepense</i>), tall fescue (<i>Schedonorus arundinaceus</i>), and sericea lespedeza (<i>Lespedeza cuneata</i>). Some native plants observed include dogbane (<i>Apocynum cannabinum</i>), common milkweed (<i>Asclepias syriaca</i>), blackberry (<i>Rubus argutus</i>), yellow wingstem (<i>Verbesina alternifolia</i>), white wingstem (<i>Verbesina virginica</i>), and poverty oatgrass (<i>Danthonia spicata</i>). This area has no potential to support state or federally listed plants.
Botany 057	Herbaceous Vegetation	This area has sporadic clusters of trees, but is mostly herbaceous vegetation. All parts of this area have been heavily disturbed and contain few native species. This area has no potential to support state or federally listed plants.
Botany 058	Herbaceous Vegetation	This area has been previously disturbed by the construction and operation of the existing transmission line. This site is currently dominated by species indicative of early successional, weedy habitats. This area has no potential to support state or federally listed plants.
Botany 059	Herbaceous Vegetation	This area is comprised of regularly mowed herbaceous vegetation that closely resembles similar habitats found in pastures and old agricultural fields across east Tennessee. Some species include <i>Bromus</i> spp., clovers (<i>Trifolium campestre</i> , <i>T. pretense</i> , <i>T. repens</i>), ryegrass (<i>Lolium perenne</i>), Johnson grass (<i>Sorghum halepense</i>) and tall fescue (<i>Schedonorus arundinaceus</i>). This area has no potential to support state or federally listed plants.
Botany 060	Deciduous Forest	The deciduous forest ranged from more disturbed to relatively intact, mature stands. Diameter of overstory trees ranged from less than 10" to 24"+. Common tree species include yellow-poplar (<i>Liriodendron tulipifera</i>), white ash (<i>Fraxinus americana</i>), hickory (<i>Carya tomentosa</i> , <i>C. glabra</i> , <i>C. cordiformis</i>), oak (<i>Quercus falcata</i> , <i>Q. alba</i> , <i>Q. rubra</i>) in the overstory, winged elm (<i>Ulmus alata</i>), sugar maple (<i>Acer saccharum</i>), ironwood (<i>Carpinus caroliniana</i>) in the midstory. Pawpaw (<i>Asimina triloba</i>) is a common understory shrub. No plants of conservation concern were observed.
Botany 061	Deciduous Forest	This patch of wet forest has not been recently disturbed, but is small and fragmented. This area does not support state or federally listed plants.

Botany Polygon	Descriptor	Field Notes
Botany 062	Mixed Evergreen Deciduous Forest	Smaller diameter trees (6-10" dbh) occur here compared to forested areas directly to the north. This even age stand is dominated sweetgum (<i>Liquidambar styraciflua</i>), yellow-poplar (<i>Liriodendron tulipifera</i>), and Virginia pine (<i>Pinus virginiana</i>) in the overstory and Japanese stiltgrass (<i>Microstegium vimineum</i>) in the herb layer. The site is heavily disturbed by previous landuse. This area has no potential to support state or federally listed plants.
Botany 063	Deciduous Forest	Average diameter of overstory trees in this area ranged from 18-24" dbh and the stands appeared relatively undisturbed. Sweetgum (<i>Liquidambar styraciflua</i>), yellow-poplar (<i>Liriodendron tulipifera</i>), and white ash (<i>Fraxinus americana</i>) are the most prevalent trees on lower slopes, along with redbud (<i>Cercis canadensis</i>), dogwood (<i>Cornus florida</i>), pawpaw (<i>Asimina triloba</i>), and buckeye (<i>Aesculus pavia</i>) in the shrub layer. The species composition shifts moving upslope and includes white oak (<i>Quercus alba</i>), hickories (<i>Carya tomentosa</i> , <i>C. glabra</i> , <i>C. cordiformis</i>), American beech (<i>Fagus grandifolia</i>), and basswood (<i>Tilia americana</i>). Scattered hemlock (<i>Tsuga canadensis</i>) and white pine (<i>Pinus strobus</i>) occur sporadically in the eastern portion of this polygon. The herbaceous layer was not rich. No plants of conservation concern were observed.
Botany 064	Deciduous Forest	This stand is even aged, highly disturbed, and generally contains few trees over 12-16" dbh. This site apparently supported Virginia pine in the past, but now the overstory is comprised mainly of small sweetgum (<i>Liquidambar styraciflua</i>) and yellow-poplar (<i>Liriodendron tulipifera</i>) in the overstory and Japanese stiltgrass (<i>Microstegium vimineum</i>) in the herb layer. A few larger trees do occur closer to the open ROW to the east. This area has no potential to support state or federally listed plants.
Botany 065	Deciduous Forest	Common overstory trees in this stand include Sweetgum (<i>Liquidambar styraciflua</i>), yellow-poplar (<i>Liriodendron tulipifera</i>), and black cherry (<i>Prunus serotina</i>), sugar maple (<i>Acer saccharum</i>) and American beech (<i>Fagus grandifolia</i>) in the midstory, and Chinese privet (<i>Ligusticum sinense</i>) in the shrub layer. Common herbs include Japanese stiltgrass (<i>Microstegium vimineum</i>), wild comfrey (<i>Cynoglossum virginianum</i>), Virginia creeper (<i>Parthenocissus quiquefolia</i>), and Christmas fern (<i>Polystichum acrostichoides</i>). This area has no potential to support state or federally listed plants.
Botany 066	Deciduous Forest	This stand is similar to 065, but more disturbed. Kudzu (<i>Pueraria lobata</i>) covers several acres in the middle of this stand. This area has no potential to support state or federally listed plants.
Botany 067	Deciduous Forest	Comparable to Botany 063 in uplands. Small wetlands in drainages; possible state-listed plant southern rein orchid (<i>Platanthera flava</i> var. <i>herbiola</i>) present in eastern wetland. Seasonal survey needed to confirm.

Botany Polygon	Descriptor	Field Notes
Botany 068	Deciduous Forest	Sweetgum (<i>Liquidambar styraciflua</i>), yellow-poplar (<i>Liriodendron tulipifera</i>), white ash (<i>Fraxinus americana</i>), black cherry (<i>Prunus serotina</i>), sugar maple (<i>Acer saccharum</i>), and sycamore (<i>Platanus occidentalis</i>) common in overstory. Some trees up to 24" dbh. Pawpaw (<i>Asimina triloba</i>) prevalent in shrub layer. Herb layer with <i>Carex</i> sp., IThe interior of the forest is characterized by large canopy trees that often reach 24-30" dbh. Common overstory species include blackgum (<i>Nyssa sylvatica</i>), red oak (<i>Quercus rubra</i>), southern red (<i>Quercus falcata</i>), sweetgum (<i>Liquidambar styraciflua</i>), and white oak (<i>Quercus alba</i>) with the occasional white pine (<i>Pinus strobus</i>). Midstory trees include dogwood (<i>Cornus florida</i>), red maple (<i>Acer rubrum</i>), and sourwood (<i>Oxydendrum arboreum</i>) with pawpaw (<i>Asimina triloba</i>) and muscadine (<i>Vitis rotundifolia</i>), often thick, in the shrub layer. The herbaceous layer is depauperate and contains few species, including licorice bedstraw (<i>Galium circaezans</i>), and false nettle (<i>Boehmeria cylindrica</i>). This area has no potential to support state or federally listed plants.
Botany 069	Deciduous Forest	The interior of the forest is characterized by large canopy trees that often reach 24-30" dbh. Common overstory species include blackgum (<i>Nyssa sylvatica</i>), red oak (<i>Quercus rubra</i>), southern red (<i>Quercus falcata</i>), sweetgum (<i>Liquidambar styraciflua</i>), and white oak (<i>Quercus alba</i>) with the occasional white pine (<i>Pinus strobus</i>). Midstory trees include dogwood (<i>Cornus florida</i>), red maple (<i>Acer rubrum</i>), and sourwood (<i>Oxydendrum arboreum</i>) with pawpaw (<i>Asimina triloba</i>) and muscadine (<i>Vitis rotundifolia</i>), often thick, in the shrub layer. The herbaceous layer is depauperate and contains few species. This area has no potential to support state or federally listed plants.
Botany 070	Deciduous Forest	This area is relatively disturbed, most trees are <12" dbh. Common overstory species include sweetgum (<i>Liquidambar styraciflua</i>), yellow-poplar (<i>Liriodendron tulipifera</i>), black cherry (<i>Prunus serotina</i>) red maple (<i>Acer rubrum</i>), and American beech (<i>Fagus grandifolia</i>). The non-native shrubs bush honeysuckle (<i>Lonicera maackii</i>) and Chinese privet (<i>Ligusticum sinense</i>) are prevalent throughout. This area has no potential to support state or federally listed plants.
Botany 071	Deciduous Forest	Very large trees in this forest to 30" dbh. Common trees include southern red (<i>Quercus falcata</i>), red oak (<i>Quercus rubra</i>), and American beech (<i>Fagus grandifolia</i>). The herbaceous layer is depauperate and contains few species. This area has no potential to support state or federally listed plants.

Botany Polygon	Descriptor	Field Notes
Botany 072	Deciduous Forest	Some large shortleaf pine (<i>Pinus echinata</i>) to 28" dbh in this stand. Otherwise similar to other mature oak-hickory stands elsewhere on the property; 24-30" trees common. Small draw is more mesic than the rest of the stand. Southern red oak (<i>Quercus falcata</i>) white oak (<i>Q. alba</i>) and northern red oak (<i>Q. rubra</i>) common in overstory along with sugar maple (<i>Acer saccharum</i>) and mockernut hickory (<i>Carya tomentosa</i>) in slightly more mesic areas. Few species in herb layer. This area has no potential to support state or federally listed plants.
Botany 073	Herbaceous Vegetation	Emergent wetland with <i>Carex</i> spp., spotted ladythumb (<i>Polygonum persicaria</i>), brookweed (<i>Samolus parviflorus</i>), <i>Scirpus</i> sp. and <i>Rumex</i> sp. This area has no potential to support state or federally listed plants.

Table 2.4.1 – KIF Habitat Types & Potential Threatened and Endangered (T&E) Species

Habitat ID	Habitat	T & E Species with potential to use habitat ¹		
		Indiana bat/ NLEB roosting ²	Bat Foraging	Osprey
1	Scattered Trees with Wetlands		X	
2	Deciduous Forest	X	X	
3	Herbaceous Vegetation with water		X	
4	Deciduous Forest	X	X	
5	Open Water		X	
6	Herbaceous habitat			
7	Sparsley vegetated	X	X	
8	Deciduous Forest with osprey nest in tree	X	X	X
9	Wooden Nesting Platform in Reservoir			X
10	Deciduous Forest	X	X	
11	Herbaceous Vegetation	X	X	
12	Deciduous Forest	X	X	
13	Mixed Evergreen and Deciduous Forest		X	
14	Lighting Tower			X
15	Deciduous Forest	X	X	
16	Deciduous Forest		X	
17	Deciduous Forest	X	X	
18	Deciduous Forest		X	
19	Deciduous Forest		X	
20	Deciduous Forest	X	X	
21	Deciduous Forest	X	X	

Habitat ID	Habitat	T & E Species with potential to use habitat ¹		
22	Herbaceous vegetation with scattered trees	X	X	
23	Deciduous Forest		X	
24	Deciduous Forest	X	X	
25	Deciduous Forest	X	X	
26	Deciduous Forest	X	X	
27	Wetland surrounded by forest		X	
28	Herbaceous wetland		X	
29	Scattered Trees along grassy/riprap shoreline		X	
30	Deciduous Forest	X	X	
31	Deciduous Forest	X	X	
32	Deciduous Forest		X	
33	Transmission tower			X
34	Herbaceous vegetation			
35	Deciduous Forest	X	X	
36	Herbaceous vegetation			X
37	Herbaceous vegetation			X
38	Transmission tower			X
39	Herbaceous vegetation			
40	Herbaceous vegetation with wetland		X	
41	Herbaceous vegetation			
42	Deciduous Forest	X	X	
43	Deciduous Forest with wetlands	X	X	
44	Mixed Evergreen and Deciduous Forest	X	X	
45	Deciduous Forest	X	X	
46	Deciduous Forest	X	X	
47	Deciduous Forest	X	X	
48	Deciduous Forest	X	X	
49	Deciduous Forest	X	X	
50	Deciduous Forest	X	X	
51	Deciduous Forest	X	X	
52	Deciduous Forest	X	X	
53	Deciduous Forest	X	X	
54	Deciduous Forest	X	X	
55	Deciduous Forest	X	X	
56	Large Red Oak	X	X	
57	Mixed Evergreen and Deciduous Forest	X	X	

¹ T&E = Threatened and Endangered

² Surveys expire in January 2021

**Appendix F.3 – Wildlife and Vegetation Assessment Kingston
Transmission Line. Kingston Fossil Plant. December 2022**

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**Wildlife and Vegetation
Assessment - *Final***

Kingston Transmission Line

Kingston Fossil Plant

Roane, Cumberland, and Anderson Counties, Tennessee

December 2022





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Appendix D – Botany Report
Appendix E – Bat Habitat Assessment Data Sheets

1 Introduction

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units, and construction and operation of approximately 1,500 megawatts (MW) of replacement generation requiring extensive regional transmission system upgrades to be completed and operational prior to coal unit retirement. To recover the generation capacity lost from retirement of the KIF coal units, upgrades are planned for three existing transmission lines (TLs): (1) the easternmost TLs (L5108 and L5302) located north of the city of Kingston and west of the city of Oak Ridge, in Anderson and Roane Counties, Tennessee; and (2) the westernmost TL (L5383) located north of the city of Crossville, in Cumberland County, Tennessee. Upgrades may include upgrading, reconductoring, or rebuilding TLs as well as replacing terminal equipment, bus work, or jumpers.

2 Vegetation Field Survey

2.1 Methods

For the purposes of this field survey, the Project Area of Potential Effect (Project Area) encompasses existing TVA TL right-of-way (ROW) and associated access routes necessary for crew and equipment access. The Project Area generally consists of maintained TVA ROW and unimproved and improved access roads with some forested edges.

Between June 6 and 10, June 13 and 17, and June 20 and 24, 2022, HDR conducted field surveys following TVA's *Guidelines for Conducting Biological and Cultural Surveys and Impact Analysis* (TVA 2020) to map vegetation and identify potential habitat for federally and state-listed threatened and endangered species within the Project Area. HDR conducted habitat assessments for rare plants in the Project Area between August 15 and 19, 2022. This report documents the results of these field surveys; see Appendix A for field maps and figures.

Following TVA (2020) guidelines, HDR reviewed the TVA Regional Natural Heritage Database (RNHD) for state-listed plants potentially occurring in the Project Area or the surrounding five-mile vicinity; the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) for federally threatened and endangered plants; and the Tennessee Department of Environment and Conservation (TDEC) Rare Species Data Viewer (TDEC 2022) for federally and state-protected species. The resulting compiled species lists are included in Appendix B.

The HDR surveys were conducted by environmental scientists Jessica Tisdale, Jake Irvin, Lyrandia Thiem, Johnathon Calderon-Brandt, Braxton Eden, Josh Mace, and Lindsey Hues to document plant communities and invasive plants and conduct habitat assessments for rare plant species and all other state- and federally listed species in the Project Area. Jessica Tisdale, HDR Senior Environmental Scientist, and Jake Irvin led surveys for rare plants species within the Project Area during the month of August 2022.

Biologists conducted pedestrian survey of the Project Area at a casual pace and plant communities observed were classified by type using the Grossman classification system (Table



1; Grossman et al. 1998). Plant communities were delineated using ArcMap and field notes, and the acreage occupied by each plant community type was calculated as a percentage of the total acreage of the Project Area. The general location and abundance of non-native invasive plants present within the Project Area was also noted.

2.2 Results

2.2.1 Vegetation Communities

The majority of the Project Area consists of maintained TVA ROW surrounded by a few agricultural fields and mixed deciduous forested areas outside of the TVA ROW. Current agricultural activities within the Project Area are focused on cultivating hay as well as providing pastureland for cows. Photograph 1 depicts typical agricultural land within the Project Area. Using the National Vegetation Classification System (Grossman et al. 1998), vegetation types found with the Project Area can be classified as a combination of herbaceous vegetation and mixed deciduous forest. The diversity of community types identified within the Project Area is a result of topography, landscape position, soil types, and current and previous land uses.

Both dry and wet types of deciduous forest are present within the Project Area. Forested areas comprise approximately 16.3 percent of the Project Area. The majority of large contiguous forest stands are located along streams, while smaller forested stands occur along the TVA ROW (Appendix A). Table 1 provides a summary of the vegetation community types as defined by Grossman et al. (1988).

Table 1. Vegetation Communities in the Project Area

Vegetation Community	Area (acres)	Percentage of Project Area
Pasture/Hay	119.5	10.3%
Lawn, Garden, and Recreational Vegetation	84.5	7.3%
Dry Deciduous	179.0	15.5%
Wet Deciduous	9.0	0.78%
Wet Herbaceous (TVA ROW)	77.4	6.7%
Dry Herbaceous (TVA ROW)	674.2	58.3%
Kudzu Infestation	12.1	1.05%

The western TL (L5383) and associated access roads exhibited the most botanical diversity, and includes areas of agricultural pastureland and open water ponds scattered throughout. The eastern TLs (L5108 and L5302) and access roads located near the City of Oak Ridge contained a higher density of invasive and opportunistic species which can be correlated to the high density urbanization of the area. The majority of herbaceous vegetation in the Project Area, defined as communities where herbaceous species account for greater than 70 percent of total cover, occurs in areas heavily disturbed by previous and current land uses (TVA ROW and agricultural fields). The agricultural fields are currently used for cultivating hay or as pastureland for cattle. Typical herbaceous species observed in this vegetation community include Johnson grass (*Sorghum halepense*), fescue species (*Festuca* spp.), grass species (*Poaceae* spp.), white clover (*Trifolium repens*), buttercup species (*Ranunculus* spp.), and dandelion species (*Taraxacum* spp.); see Appendix C, Photograph 1.

Vegetation throughout the TVA ROW (dry herbaceous and wet herbaceous communities) is routinely cleared to maintain the reliability of the transmission system. The purpose of periodic mowing and the use of herbicide is to remove tree species from the ROW, although these management actions can also foster grassland habitat. Weedy and early successional species like sericea lespedeza (*Lespedeza cuneata*) are distributed throughout the TL ROW. Other species observed distributed throughout the TVA ROW include tall goldenrod (*Solidago altissima*), mountain mint (*Pycnanthemum muticum*), velvet panicum (*Dichanthelium scoparium*), raspberry species (*Rubus* spp.), bladder sedge (*Carex lurida*), soft rush (*Juncus effusus*), Japanese stiltgrass (*Microstegium vimineum*), grass species, field thistle (*Cirsium discolor*), butterfly milkweed (*Asclepias tuberosa*), deer tongue (*Dichanthelium clandestinum*), American bur-reed (*Sparganium americanum*), ironweed (*Vernonia noveboracensis*), greater tickseed (*Coreopsis major*), multiflora rose (*Rosa multiflora*), seedbox (*Ludwigia alternifolia*), false nettle (*Boehmeria cylindrica*), fogfruit (*Phyla lanceolata*), fescue species, and cinquefoil (*Potentilla simplex*); see Appendix C, Photograph 4 and 5. Additional species found throughout this community can be found in the Botany Report (Appendix D).

Comprising approximately 15 percent, dry deciduous forests are found on the edges of the Project Area. These larger stands have the potential to support forest dwelling species such as box turtles, woodpeckers, and other small mammals. Common overstory trees include southern red oak (*Quercus falcata*), white oak (*Quercus alba*), and other oak species (*Quercus* spp.) along with occasional mockernut hickory (*Carya tomentosa*), common hackberry (*Celtis occidentalis*), tulip poplar (*Liriodendron tulipifera*), Virginia pine (*Pinus virginiana*), and eastern red cedar (*Juniperus virginiana*). The shrub layer varies from dense to relatively open and contains hickory species (*Carya* spp.), white oak, red oak, and eastern red cedar. The herbaceous layer in this forest type includes greenbrier (*Smilax rotundifolia*), and a variety of grass species (Appendix C, Photograph 2).

Wet deciduous forests occupy approximately 0.78 percent of the Project Area and occur in bands along streams and other small drainages, as well as in association with very flat areas over a perched water table. Streamside riparian forest stands are typically narrow. Areas with this forest type had overstory trees up to 25" diameter at breast height (DBH). Typical canopy species observed in this vegetation community included red maple (*Acer rubrum*), Virginia pine, American sycamore (*Platanus occidentalis*), box elder (*Acer negundo*), tulip poplar, black cherry (*Prunus serotina*), and sweet gum (*Liquidambar styraciflua*). Understory shrubs, woody vines, and sapling species include, red maple, poison ivy (*Toxicodendron radicans*), greenbriers (*Smilax* spp.), spicebush (*Lindera benzoin*), and Chinese privet (*Ligustrum sinense*). Herbaceous cover in this vegetation community typically includes greenbriers, panic grass, fox sedge (*Carex vulpinodea*), bladder sedge, soft rush, and other grass species (Appendix C, Photograph 3).

Kudzu (*Pueraria montana*), a federal-noxious weed as defined by the U.S. Department of Agriculture, Natural Resources Conservation Service (2012), was observed throughout the eastern TLs (L5108 and L5302) and access road portions of the Project Area. Further, many non-native invasive plant species were observed throughout the Study Area. Invasive species observed include Japanese honeysuckle (*Lonicera japonica*), Japanese stiltgrass, Johnson



grass, Chinese privet, and multiflora rose. 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 also found in some of the forested stands. Where present, these species occur on less than 15 percent of the Project Area. Invasive plants were found in both forested and herbaceous vegetation areas.

2.2.2 Listed and Protected Plant Species

Table 2 identifies federally listed and state-listed endangered and threatened plant species that may occur within Roane, Anderson and Cumberland Counties based on the TVA RNHD (TVA 2021) and the TDEC Rare Species Data Viewer (TDEC 2022). Specific locations of the documented occurrence of these plants are not available from TVA RNHD or TDEC, but likelihood of species occurrence can be estimated by matching species habitat requirements with land cover types.

Table 2. Listed or Protected Plant Species in Roane, Anderson, and Cumberland Counties, Tennessee, and Likelihood of Occurrence in the Project Area

Scientific Name	Common Name	Federal and State Protected Status ¹	Habitat Requirements ²	Species Observed In Project Area ²
<i>Agalinis auriculata</i>	Earleaved False-foxglove	SE	Barrens	No
<i>Amelanchier sanguinea</i>	Roundleaf Shadbush	ST	Rocky slopes and riverbanks	No
<i>Asplenium scolopendrium var. americanum</i>	Hart's-tongue Fern	SE	Sinks	No
<i>Aureolaria patula</i>	Spreading False-foxglove	SSSC	Oak woods and edges	No
<i>Berberis canadensis</i>	American Barberry	SSSC	Rocky woods and river bars	No
<i>Bolboschoenus fluviatilis</i>	River Bulrush	SSSC	Marshes, openings in swamps, edges of ponds and streams, fresh tidal marshes, and inland salt marshes and ponds	No
<i>Campanula aparinoides</i>	Marsh Bellflower	SSSC	Bogs	No
<i>Carex buxbaumii</i>	Brown Bog Sedge	SE	Swamps	No
<i>Conradina verticillata</i>	Cumberland Rosemary	FT, ST	Sandy, rocky riverbanks and bars	No
<i>Danthonia epilis</i>	Bog Oat-grass	SSSC	Acidic seeps	No
<i>Delphinium exaltatum</i>	Tall Larkspur	SE	Glades and barrens	No
<i>Diamorpha smallii</i>	Small's Stonecrop	SE	Sandstone outcrops	No



Scientific Name	Common Name	Federal and State Protected Status ¹	Habitat Requirements ²	Species Observed In Project Area ²
<i>Diervilla lonicera</i>	Northern Bush-honeysuckle	ST	Rooky woodlands and bluffs	No
<i>Diervilla sessilifolia</i> var. <i>rivularis</i>	Mountain Bush-honeysuckle	ST	Dry cliffs and bluffs	No
<i>Draba ramosissima</i>	Branching Whitlow-grass	SSSC	Calcareous bluffs	No
<i>Drosera intermedia</i>	Spoonleaf Sundew	SSSC	Acidic wetlands	No
<i>Elodea nuttallii</i>	Nuttall's Waterweed	SSSC	Streams and ponds	No
<i>Epilobium ciliatum</i>	Hairy Willow-herb	ST	Mountain balds	No
<i>Eriophorum virginicum</i>	Tawny Cotton-grass	SE	Bogs	No
<i>Erysimum capitatum</i>	Western Wallflower	SE	Rocky bluffs	No
<i>Eupatorium godfreyanum</i>	Godfrey's Thoroughwort	SSSC	Dry woods	No
<i>Eurybia schreberi</i>	Schreber's Aster	SSSC	Mesic woods and seepage slopes	No
<i>Fothergilla major</i>	Mountain Witch-alder	ST	Rocky slopes and river banks	No
<i>Gratiola brevifolia</i>	Sticky Hedge-hyssop	SSSC	Wet barrens and marshes	No
<i>Helenium brevifolium</i>	Shortleaf Sneezeweed	SE	Rocky, sandy streamsides	No
<i>Helianthus occidentalis</i>	Naked-stem Sunflower	SSSC	Limestone glades and barrens	No
<i>Homaliadelphus sharpii</i>	Sharp's Homaliadelphus	SE	Calcareous or dolomite bluffs	No
<i>Hypericum nudiflorum</i>	Early St. Johnswort	SSSC	Acidic wet and/or open areas	No
<i>Iris fulva</i>	Copper Iris	ST	Bottomlands	No
<i>Juglans cinerea</i>	Butternut	ST	Rich woods and hollows	No
<i>Juncus brachycephalus</i>	Small-headed Rush	SSSC	Seeps and wet bluffs	No
<i>Lachnocaulon anceps</i>	Bog-buttons	SSSC	Acidic open wetlands	No
<i>Lejeunea sharpii</i>	Sharp's Lejeunea	SE	Calcareous bluffs, rocks and logs of wet sinks	No

Scientific Name	Common Name	Federal and State Protected Status ¹	Habitat Requirements ²	Species Observed In Project Area ²
<i>Leucothoe racemose</i>	Fetter-bush	ST	Acidic wetlands and swamps	No
<i>Liatris cylindracea</i>	Slender Blazing Star	ST	Barrens and powerlines	No
<i>Lilium philadelphicum</i>	Wood Lily	SE	Dry openings, powerlines	No
<i>Liparis loeselii</i>	Fen Orchis	ST	Calcareous seeps	No
<i>Lonicera dioica</i>	Mountain Honeysuckle	SSSC	Mountain woods and thickets	No
<i>Marshallia grandiflora</i>	Large-fl. Barbara's-buttons	SE	Rocky river bars	No
<i>Meehanian cordata</i>	Heartleaf Meehanian	ST	Wooded mountain slopes	No
<i>Myurella julacea</i>	Myurella moss	SSSC	Shale bluffs	No
<i>Oligoneuron album</i>	Prairie Goldenrod	SE	Barrens	No
<i>Panax quinquefolius</i>	American Ginseng	SSSC	Rich woods; identified during 2021 field surveys in dry deciduous woods	No
<i>Paronychia agryrocoma</i>	Silverling	ST	Dry sandstone, granite outcrops	No
<i>Parnassia grandifolia</i>	Large-leaved Grass-of-Parnassus	SSSC	Swampy open meadows	No
<i>Pedicularis lanceolata</i>	Swamp Lousewort	SSSC	Wet acidic barrens and seeps	No
<i>Platanthera flava var. herbiola</i>	Tubercled Rein-orchid	ST	Swamps and floodplains	No
<i>Platanthera integrilabia</i>	White Fringeless Orchid	FT, SE	Acidic seeps and stream heads	No
<i>Poa saltuensis</i>	Drooping Bluegrass	ST	Rich oak woods	No
<i>Pogonia ophioglossoides</i>	Rose Pogonia	SE	Wet acidic barrens	No
<i>Potamogeton amplifolius</i>	Large-leaf Pondweed	ST	Lakes and streams	No
<i>Potamogeton epihydrus</i>	Nuttall's Pondweed	SSSC	Lakes and streams	No
<i>Potamogeton tennesseensis</i>	Tennessee Pondweed	ST	Slow acidic streams	No
<i>Preissia quadrata</i>	Liverwort	ST	Seepy limestone cliffs and bluffs	No
<i>Pseudognaphalium helleri</i>	Heller's Catfoot	SSSC	Dry sandy woods	No



Scientific Name	Common Name	Federal and State Protected Status ¹	Habitat Requirements ²	Species Observed In Project Area ²
<i>Pycnanthemum torrei</i>	Torrey's Mountain-mint	SE	Barrens	No
<i>Oligoneuron album</i>	Prairie Goldenrod	SE	Barrens and powerlines	No
<i>Ribes curvatum</i>	Granite Gooseberry	ST	Rocky woods	No
<i>Ribes missouriense</i>	Missouri Gooseberry	SSSC	Rocky woods	No
<i>Sagittaria platyphylla</i>	Ovate-leaved Arrowhead	SSSC	Swamps, emergent	No
<i>Schoenoplectus subterminalis</i>	Water Bulrush	SE	Ponds and stream margins	No
<i>Scleria muehlenbergii</i>	Muhlenberg's Nutrush	ST	Wet meadows	No
<i>Spiraea virginiana</i>	Virginia Spiraea	FT, ST	Openings in the floodplain woodlands, swamps, marshes, low areas along ponds, rivers, and ditches. This grass also prefers disturbed open fields.	No
<i>Spiranthes lucida</i>	Shining Ladies'-tresses	ST	Alluvial woods and moist slopes	No
<i>Spiranthes ochroleuca</i>	Yellow Nodding Ladies'-tresses	SE	Moist mountain woods	No
<i>Sporobolus arcuatus</i>	Cumberland Sand-grass	ST	Rocky and sandy river bars	No
<i>Sullivantia sullivantii</i>	Sullivantia	SE	Moist shaded cliffs	No
<i>Symphyotrichum pratense</i>	Barrens Silky Aster	SE	Barrens	No
<i>Trillium pusillum</i>	Least Trillium	SE	Alluvial/moist ravines in dry ridges	No
<i>Utricularia subulata</i>	Zigzag Bladderwort	ST	Wet barrens, ecotones	No

Source: TDEC 2022; TVA 2022.

1) Federal Status: FE- federal endangered, FT – federal threatened; State Status: SE – state endangered, ST – state threatened, SSSC – state species of special concern.

2) Habitat requirements described and species presence confirmed in Appendix D for all plant species.

During the field surveys, no federal and/or state listed plant species were observed within the Project Area; however, habitat exists throughout Project Area for several of the state listed species as described in the table above (Appendix D).

3 Wildlife Survey

3.1 Methods

Following TVA (2020) guidelines, HDR reviewed the TVA RNHD for state-listed wildlife within the Study Area and a three-mile radius, the USFWS IPaC for federally threatened and endangered wildlife in Anderson, Cumberland, and Roane Counties, and the TDEC Rare Species Data Viewer for a list of federally and state-protected species within Anderson, Cumberland, and Roane Counties. The resulting compiled species list is included in Appendix B.

Pedestrian surveys of the Project Area for terrestrial wildlife were conducted by HDR environmental scientists Lyranda Thiem, Braxton Eden, Jonathan Calderon-Brandt, Josh Mace, Lindsey Hue and Blake Hartshorn on June 6 and 10, June 13 and 17, and June 20 and 24, 2022. The pedestrian surveys were focused on forested edges, roadside edges, recently disturbed areas, and areas of former human use. The Project Area was also traversed by vehicle via roads. Transects were walked across forested stands and along streams, drainageways, and the perimeters of crops fields. A bat habitat assessment was performed in forested edges along the TL ROW.

3.2 Results

3.2.1 Observed Wildlife

Table 3 presents a list of species that were either directly observed within the Project Area, or whose evidence (e.g., tracks, scat, remains) was noted during the field survey.

Table 3. Wildlife Species Observed in the Project Area

Species Observed (Common Name)	Notes/Habitat Observed in Project Area
Birds	
Woodpecker spp.	Flying around a tree and pecking at tree within an upland forested habitat
Wild Turkey	Multiple times at forest edges and at the bottom of forested areas
Northern Cardinal	Flying around low hanging branches within scrub shrub habitat
American Crow	Flying overhead
Red-tailed Hawk	Flying overhead
Killdeer	In agricultural field on the western section of the TL and along roadbeds
Barred Owl	Heard within forested areas near ponds/wetlands
Black Vulture	Flying overhead along multiple areas of the TL
Blue Jay	Flying overhead within the TL
Osprey Nest	Observed on TL pole
Amphibians	
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
Unidentified Tadpoles	In many puddles and streams throughout the site.

Species Observed (Common Name)	Notes/Habitat Observed in Project Area
Reptiles	
Eastern Box Turtle	In forests near streams multiple times throughout the site
Smooth Soft Shell	Found within East Fork Poplar Creek
Rat Snake	Within a forest edge along the TL
Pond Sliders	In multiple ponds across the site
Five-Lined Skinks	Along forested edges with downed trees near the TL
Insects	
Unidentified Damselfly	Flying over some of the smaller creek beds
Macroinvertebrates	
Caddisflies	In many drainages throughout the site
Midges	In many drainages throughout the site
Mayflies	In many drainages throughout the site
Scuds	In many drainages throughout the site
Mammals	
Armadillo	In forested area
Raccoon	In forested wetland
Tracks/Scat/Remains	
Deer Track and Scat	In several locations across the site
Raccoon Track	In several of the creek beds throughout the site

3.2.2 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 Endangered Species Act (ESA) (1973), as well as under state laws and per local policies. These species are vulnerable to habitat loss and population decline because of their rarity. HDR’s assessment also considered wildlife protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. §§ 703-712), Executive Order for Migratory Birds (E.O. 13186 of January 10, 2001), and the Bald and Golden Eagle Protection Act of 1940 (BGEPA; 16 U.S.C. 668-668d).

3.2.2.1 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 2022), the TVA RNHD (TVA 2021), and the TDEC Rare Species Data Viewer (TDEC 2022) as potentially occurring on or within the vicinity of the Project Area. No designated critical habitat for federally listed species occurs on or in the vicinity of the Project Area.



Table 4. Federally and State-Listed Animal Species in Anderson, Cumberland, and Roane County, Tennessee

Scientific Name	Common Name	Protected Status ¹	Habitat Requirements	Suitable Habitat Observed	Species Observed
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-eared Bat	SDNM	Caves, hollow trees, abandoned buildings; often associated with forested areas	Yes – roosting, foraging	No
<i>Myotis leibii</i>	Eastern Small-footed Bat	SDNM	Hibernates in caves and mines; also uses abandoned buildings, bridges, and barns seasonally	Yes – roosting, foraging	No
<i>Myotis septentrionalis</i>	Northern Long-eared Bat (NLEB)	FT*, ST	Various habitats including wet meadows, damp woods, and uplands, including abandoned structures, sinkhole/karst features; statewide.	Yes – roosting, foraging	No
<i>Neotoma magister</i>	Allegheny Woodrat	SDNM	Rock outcrops, cliffs, talus slopes, crevices not present	No	No
<i>Sorex dispar</i>	Long-tailed Shrew	SDNM	Mountainous, forested areas with loose talus	Yes	No
Fish					
<i>Chrosomus saylora</i>	Laurel Dace	SE	Inhabits cool 1st-2nd order streams with slabrock and rubble substrate; Tennessee River watershed	Yes	No
<i>Chrosomus tennesseensis</i>	Tennessee Dace	SDNM	Inhabits first order spring-fed streams of woodlands in Ridge and Valley limestone region; Tennessee River watershed	Yes	No



Scientific Name	Common Name	Protected Status ¹	Habitat Requirements	Suitable Habitat Observed	Species Observed
<i>Erimonax monachus</i>	Spotfin Chub	FT, ST	Inhabits clear upland rivers with swift currents and boulder substrates; portions of the Tennessee River watershed	Yes	No
<i>Etheostoma baileyi</i>	Emerald Darter	SDNM	Inhabits creeks and small rivers with riffles containing gravel or rubble; upper Cumberland drainage	Yes	No
<i>Hemitremia flammea</i>	Flame Chub	SDNM	Inhabits springs and spring-fed streams with lush aquatic vegetation; Tennessee and middle Cumberland watersheds	Yes	No
<i>Percina aurantiaca</i>	Tangerine Darter	SDNM	Inhabits large-moderate size headwater tributaries to Tennessee River, in clear, fairly deep, rocky pools, usually below riffles	No	No
Mollusks					
<i>Athearnia anthonyi</i>	Anthony's Riversnail	FE, SE	Inhabits large-medium rivers with moderate-high gradient, or riffles of larger creeks with cobble/boulder substrate	Yes	No
<i>Cumberlandia monodonta</i>	Spectaclecase	FE, SE	Inhabits large rivers where they live in areas sheltered from the main force of the river current	Yes	No



Scientific Name	Common Name	Protected Status ¹	Habitat Requirements	Suitable Habitat Observed	Species Observed
<i>Cyprogenia stegaria</i>	Fanshell	FE, SE	Inhabits medium to large rivers in gravel riffles	Yes	No
<i>Dromus dromas</i>	Dromedary Pearlymussel	FE, SE	Inhabits small to medium, low turbidity, high to moderate gradient streams	Yes	No
<i>Epioblasma turgidula</i>	Turgid Blossom (pearlymussel)	FE, SE	Species is proposed for delisting due to extinction	No	No
<i>Fusconaia cor</i>	Shiny Pigtoe	FE, SE	Inhabits relatively silt-free substrates of sand, gravel, and cobble in good flows of smaller streams.	Yes	No
<i>Fusconaia cuneolus</i>	Fine-rayed Pigtoe	FE, SE	Inhabits Sand and gravel shoals of streams and rivers	Yes	No
<i>Hemistena lata</i>	Cracking Pearlymussel	FE, SE	Inhabits medium to large rivers in mud, sand, or gravel	Yes	No
<i>Lampsilis abrupta</i>	Pink Mucket	FE, SE	Inhabits larger tributaries in gravel or sand	Yes	No
<i>Lampsilis virescens</i>	Alabama Lampmussel	FE, SE	Inhabits smaller, upstream creeks or in downstream areas of large rivers	Yes	No
<i>Lemiox rimosus</i>	Birdwing Pearlymussel	FE, SE	Inhabits riffles with stable, sand and gravel substrates in moderate to fast currents in small to medium sized rivers	Yes	No
<i>Obovaria retusa</i>	Ring Pink	FE, SE	Inhabits the sandy but silt-free bottoms of large rivers.	Yes	No
<i>Plethobasus cooperianus</i>	Orangefoot pimpleback	FE, SE	Inhabits large rivers in gravel or mixed sand and gravel	Yes	No
<i>Plethobasus cyphus</i>	Sheepnose Mussel	FE, SE	Inhabits larger rivers and streams where they are usually found in shallow areas with moderate to swift currents that flow over coarse sand and gravel.	Yes	No



Scientific Name	Common Name	Protected Status ¹	Habitat Requirements	Suitable Habitat Observed	Species Observed
<i>Pleurobema plenum</i>	Rough Pigtoe	FE, SE	Inhabits medium to large rivers (20 m wide or greater) in sand, gravel, and cobble substrates in shoals	Yes	No
<i>Quadrula cylindrica strigillata</i>	Rough Rabbitsfoot	FE, SE	Inhabits small to medium-sized streams and some larger rivers. Bottom substrates generally include a mixture of sand and gravel	Yes	No
<i>Venustaconcha troostensis</i> (formerly <i>Villosa perpurpurea</i> in Cumberland River Watershed)	Cumberland Bean	FE, SE	Inhabits riffle areas of small rivers and streams in sand, gravel, and cobble substrates with swift current	Yes	No
Crustaceans					
<i>Cambarus deweesae</i>	Valley Flame Crayfish	SE	Primary burrower; open areas with high water tables	Yes	No
<i>Cambarus obeyensis</i>	Obey Crayfish	SE	Inhabits small-medium sized streams; headwaters of East Fork Obey River; northern Cumberland	No	No
Amphibians					
<i>Cryptobranchus alleganiensis</i>	Hellbender	SE	Inhabits clean and flowing water with plenty of oxygen in large streams and creeks. Areas with gravel bottoms and an abundance of rocks and submerged logs are necessary	Yes	No
<i>Desmognathus abditus</i>	Cumberland Dusky Salamander	SDNM	Inhabits streams of Cumberland Plateau; under rocks along small streams or adjacent cover	Yes	No

Scientific Name	Common Name	Protected Status ¹	Habitat Requirements	Suitable Habitat Observed	Species Observed
<i>Desmognathus walteri</i>	Black Mountain Salamander	SDNM	Inhabits spring runs and permanent streams in wooded mountainous terrain	Yes	No
<i>Gyrinophilus gulolineatus</i>	Berry Cave Salamander	FCS, ST	Inhabits aquatic cave obligate	No	No
Reptiles					
<i>Ophisaurus attenuates longicaudus</i>	Eastern Slender Glass Lizard	SDNM	Inhabits dry upland areas including brush, cut-over woodlands and grassy fields	Yes	No
<i>Pituophis melanoleucus</i>	Northern Pinesnake	ST	Inhabits well-drained sandy soils in pine/pine-oak woods; dry mountain ridges	No	No
Birds					
<i>Limnothlypis swainsonii</i>	Swainson's Warbler	SDNM	Inhabits mature, rich, damp, deciduous floodplain and swamp forests with thick understory	Yes	No
<i>Peucaea aestivalis</i>	Bachman's Sparrow	SE	Inhabits dry open pine or oak woods; nests on the ground in dense cover	Yes	No
<i>Setophaga cerulea</i>	Cerulean Warbler	SDNM	Inhabits mature, deciduous forest, particularly in floodplains or mesic conditions	Yes	No
<i>Thryomanes bewickii</i>	Bewick's Wren	SDNM	Inhabits brushy areas, thickets and scrub in open country	Yes	No
<i>Vermivora chrysoptera</i>	Golden-winged Warbler	ST	Inhabits early successional habitats in foothills regions of Appalachians.	Yes	No
Insects					
<i>Danaus plexippus</i>	Monarch butterfly	FCS	Milkweeds and flowering plants	Yes	No

Source: USFWS 2022; TDEC Rare Species Data Viewer 2022; TVA 2022.

1) Federal Status: FE- federal endangered, FT – federal threatened, FCS – federal candidate species; State Status: SE – state endangered, ST – state threatened, SDNM – state deemed in need of management.

*Note: On November 29, 2022, USFWS published a final rule to reclassify the northern long-eared bat as endangered under the Endangered Species Act. The rule will take effect on January 30, 2023, and will nullify the prior 4(d) rule. Additional information is available from the USFWS site: <https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>.

HDR also conducted a field pedestrian survey to identify the types of habitats present within the Project Area, including habitats that could potentially support the species listed in Table 4. The survey focused on the general characteristics of the land cover, vegetation communities, and wildlife habitats currently present within and immediately adjacent to the Project Area.

HDR's desktop database search and pedestrian survey indicated that the Project Area contains suitable habitat for three federally listed bats, three federally listed fish, and sixteen federally and state-listed mollusks as described in the sections below.

Mammals

Three species of federally listed mammals may potentially occur in the Project Area: the gray bat, the NLEB, and the Indiana Bat. In addition, four state listed bat species may potentially occur in the Project Area: eastern small-footed bat, little brown bat, Rafinesque big-eared bat, and the tricolored bat. The gray bat prefers cave habitat year-round. Winter habitat for this species includes deep vertical caves with domed halls, and summer habitat includes warm caves scattered along rivers (USFWS 1997). The Indiana bat and NLEB prefer winter habitats that include caves and mines (USFWS 2006, 2015). Although no caves were observed within the Project Area, caves utilized by bats occur elsewhere in Roane County. These caves may provide habitat to Indiana and/or gray bats.

During the summer, the Indiana bat and NLEB roost singly or in colonies underneath bark, in cavities, or crevices of both live and dead trees of varying size, age, and species (USFWS 2006, 2015). Suitable summer roost habitat for the listed bat species consisting of trees of varying ages, including dead snags, is present in the Project Area, including a total of 218.8 acres of moderately to highly suitable summer roost habitat.

Foraging habitat for all listed bat species is present in the Project Area over ponds, wetlands, streams, and open agricultural fields. Additional foraging habitat for Indiana bat and NLEB occurs within forested habitat, forest edges, and tree lines. Water resources for all bat species include ponds primarily fed by rainwater and stream channels located on the site. A more detailed description of potential habitat for listed bats in the Project Area is presented below.

Three other state listed mammals potentially occur in the Project Area: the Allegheny woodrat, the long-tailed shrew, and the southern bog lemming. The Allegheny woodrat prefers steep rocky cliffs or crevices in exposed rock (ADW 2022). The long-tailed shrew prefers mountainous, forested areas with loose talus (TN Wildlife Mammals 2022a). The southern bog lemming prefers marshy meadows, wet balds, and rich upland forests (TN Wildlife Mammals 2022b). Suitable habitat was observed for the long-tailed shrew and southern bog lemmings within the forested areas along the TVA ROW. No suitable habitat was observed for the Allegheny woodrat as no rocky cliff edges were observed within the Project Area.

Potential Summer Bat Roost 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 roost habitat for the NLEB and Indiana Bat. Buildings on the Project Area were also evaluated for their potential as suitable habitat for these two federally listed bat species. Photographs were taken to visually document the assessment areas (Appendix C). A total of 40 forest stands totaling 228.64 acres (see figures in Appendix A) were determined to provide potential summer roost and foraging habitat for the bat species listed above (Table 4). Of the 228.64 acres, 4.3 percent (9.89 acres) was assessed as providing high-quality habitat, 61.5 percent (140.7 acres) provide moderate-quality habitat, and 34.2 percent (78.09 acres) provide poor-quality habitat. The boundaries of



potentially suitable habitat were mapped using a combination of aerial photography, GIS, and sub-meter GPS field mapping. Several large snags occurred in many of the larger forested stands throughout the Project Area. Refer to Appendix E for bat habitat assessment data sheets completed by HDR as part of this study.

Table 5. Potential Bat Roost Forest Stands Summary

Stand Number	Habitat Suitability	Area (acres)
Stand 1	High	2.13
Stand 2	Moderate	1.67
Stand 3	Moderate	6.11
Stand 4	Low	1.36
Stand 5	Moderate	5.17
Stand 6	Low	1.05
Stand 7	Moderate	9.34
Stand 8	Moderate	15.61
Stand 9	Moderate	8.02
Stand 10	Moderate	15.54
Stand 11	Low	2.51
Stand 12	Low	1.48
Stand 13	Low	5.05
Stand 14	Low	6.08
Stand 15	Moderate	4.92
Stand 16	Low	4.86
Stand 17	Moderate	2.09
Stand 18	Moderate	29.82
Stand 19	Low	2.02
Stand 20	Low	8.73
Stand 21	Moderate	9.45
Stand 22	Low	2.00
Stand 23	Moderate	9.25
Stand 24	Low	8.13
Stand 25	Low	9.98
Stand 26	Moderate	1.17
Stand 27	Moderate	2.83
Stand 28	Low	1.05
Stand 29	Moderate	0.50
Stand 30	Low	0.58
Stand 31	Low	0.58
Stand 32	Moderate	3.03
Stand 33	Moderate	0.81
Stand 34	Low	3.10
Stand 35	Moderate	0.95
Stand 36	Moderate	1.56
Stand 37	Low	4.72



Stand Number	Habitat Suitability	Area (acres)
Stand 38	Low	5.38
Stand 39	Low	2.56
Stand 40	Low	0.15

Forest Stand 1

Forest Stand 1 consists of an upland deciduous forest located within the western portion of the Project Area. Dominant canopy and understory trees include sweet gum, tulip poplar, southern red oak, maple species, loblolly pine, and eastern red cedar. Stand 1 was determined to have high habitat quality due to some diversity in age of trees, connection to adjacent forested area, and the Obed River and agricultural fields for foraging. The Obed River and agricultural farm ponds provide a water source for these bats. Photographs 7 and 8 are representative of Forest Stand 1 (Appendix C).

Forest Stand 2

Forest Stand 2 consists of an upland mixed deciduous forest located within the western portion of the Project Area. Dominant canopy and understory trees include sweet gum, tulip poplar, southern red oak, maple species, loblolly pine, and eastern red cedar. Stand 2 was determined to have moderate habitat quality due to having some diversity in age of trees, connection to adjacent forested areas, and having a thicker understory. Rocky Branch Creek occurs as a water resource within Forest Stand 2. Photographs 9 and 10 are representative of Forest Stand 2 (Appendix C).

Forest Stand 3

Forest Stand 3 consists of an upland mixed deciduous forest located within the western portion of the Project Area. Dominant canopy and understory trees include white oak, red oak species, sweet gum, loblolly pine, red maple, pignut hickory, common hackberry, and sugar maple. Forest Stand 3 was determined to have moderate quality habitat due to lacking snags, trees with exfoliating bark, connection to adjacent forested areas, and lack of a water source. Photograph 11 is representative of Forest Stand 3.

Forest Stand 4

Forest Stand 4 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. Dominant canopy and understory include eastern red cedar, bush honeysuckle, common hackberry, and some oak species. Forest Stand 4 was determined to have low quality habitat due to lack of snags and trees with exfoliating bark, little diversity in tree species, dense understory, lack of connection to adjacent forested areas, and lack of a water source. Photograph 12 is representative of Forest Stand 4.

Forest Stand 5

Forest Stand 5 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. Dominant canopy and understory include common hackberry, mimosa tree, white oak, southern red oak, pignut hickory, and some eastern red cedar. Forest Stand 5 was determined to have moderate quality habitat due to lack of snags, some diversity in ages of

trees, connection to adjacent forested areas, and presence of a water source and agricultural fields for foraging. A freshwater pond occurs as a water source just north of the stand as well. Photographs 13 and 14 are representative of Forest Stand 5.

Forest Stand 6

Forest Stand 6 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A graveled trail leads through the middle of the forested stand that occurs within the Project Area. Dominant canopy and understory include pignut hickory, white oak, southern red oak, common hackberry, red cherry, and some Chinese privet. Forest Stand 6 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, and lack of a water source. Photograph 15 is representative of Forest Stand 6.

Forest Stand 7

Forest Stand 7 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. Dominant canopy and understory include common hackberry, white oak, black walnut, pignut hickory, and some eastern red cedar. Forest Stand 7 was determined to have moderate quality habitat due to lack of snags, some diversity in ages of trees, connection to adjacent forested areas, and presence of a water source and agricultural fields for foraging. Clinch River also occurs as a water source just south of the stand. Photographs 16 and 17 are representative of Forest Stand 7.

Forest Stand 8

Forest Stand 8 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A graveled trail leads through the middle of the forested stand that occurs within the Project Area. Dominant canopy and understory include pignut hickory, white oak, southern red oak, common hackberry, red cherry, and some Chinese privet. Forest Stand 8 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, and lack of a water source. Photographs 18 and 19 are representative of Forest Stand 8.

Forest Stand 9

Forest Stand 9 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A graveled trail leads through the middle of the forested stand that occurs within the Project Area. Dominant canopy and understory include pignut hickory, white oak, southern red oak, common hackberry, red cherry, and some Chinese privet. Forest Stand 9 was determined to have low quality habitat due to lack of snags and dense understory in some locations within the stand. The Clinch River and ephemerals act as a water source for Forest Stand 9. Photographs 19 and 20 are representative of Forest Stand 9.

Forest Stand 10

Forest Stand 10 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A graveled trail leads through the middle of the forested stand that occurs within the Project Area. Dominant canopy and understory include pignut hickory, white oak, southern red oak, common hackberry, red cherry, and some Chinese privet. Forest Stand 10

was determined to have moderate quality habitat due to lack of snags, dense understory in some locations within the stand, and lack of a water source. Photographs 21 and 22 are representative of Forest Stand 10.

Forest Stand 11

Forest Stand 11 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A gravel roadway exists within the middle of the stand. Dominant canopy and understory include eastern red cedar, bush honeysuckle, common hackberry, and some oak species. Stand 11 was determined to have low quality habitat due to lack of snags and trees with exfoliating bark, little diversity in tree species, dense understory, lack of connection to adjacent forested areas, and lack of a water source. Photograph 23 is representative of Forest Stand 11.

Forest Stand 12

Forest Stand 12 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A gravel roadway exists within the middle of the stand. Dominant canopy and understory include eastern red cedar, bush honeysuckle, common hackberry, and some oak species. Forest Stand 12 was determined to have low quality habitat due to lack of snags and trees with exfoliating bark, little diversity in tree species, dense understory, lack of connection to adjacent forested areas, and lack of a water source. Photograph 24 is representative of Forest Stand 12.

Forest Stand 13

Forest Stand 13 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A gravel roadway exists within the middle of the stand. Dominant canopy and understory include eastern red cedar, bush honeysuckle, common hackberry, and some oak species. Forest Stand 13 was determined to have low quality habitat due to lack of snags and trees with exfoliating bark, little diversity in tree species, dense understory, and lack of connection to adjacent forested areas. Poplar Creek acts as a water source for Forest Stand 13. Photographs 25 and 26 are representative of Forest Stand 13.

Forest Stand 14

Forest Stand 14 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A graveled trail leads through the middle of the forested stand that occurs within the Project Area. Dominant canopy and understory include pignut hickory, white oak, sweet gum, common hackberry, and red cherry. Forest Stand 14 was determined to have low quality habitat due to lack of snags and dense understory in some locations within the stand. The Clinch River and Poplar Creek act as a water source for Forest Stand 14. Photographs 26 and 27 are representative of Forest Stand 14.

Forest Stand 15

Forest Stand 15 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. An unpaved trail leads through the middle of the forested stand that occurs within the Project Area. Dominant canopy and understory include pignut hickory, white oak, southern red oak, common hackberry, Virginia pine, red cherry, and some Chinese privet.

Forest Stand 15 was determined to have moderate quality habitat due to lack of snags, diversity among trees within stand, and multiple water sources nearby. Photographs 26 and 28 are representative of Forest Stand 15.

Forest Stand 16

Forest Stand 16 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A graveled trail leads through the middle of the forested stand that occurs within the Project Area. Dominant canopy and understory include pignut hickory, white oak, sweet gum, common hackberry, Virginia pine, basswood, and red cherry. Forest Stand 16 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, and lack of a water source within the stand. Photograph 29 is representative of Forest Stand 16.

Forest Stand 17

Forest Stand 17 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. This stand lies south of TVA open ROW. Dominant canopy and understory include pignut hickory, white oak, sweet gum, common hackberry, Virginia pine, basswood, and red cherry. Forest Stand 17 was determined to have moderate quality habitat due to lack of snags, access to a larger forested stand, diversity in trees within stand, and having a water source near the stand. Poplar Creek acts as a water source for this stand. Photograph 30 is representative of Forest Stand 17.

Forest Stand 18

Forest Stand 18 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. An unpaved trail leads through the middle of the forested stand that occurs within the Project Area. Dominant canopy and understory include shagbark hickory, white oak, ironwood-muscle wood, tulip poplar, sugar maple, common hackberry, Virginia pine, and black cherry. Forest Stand 18 was determined to have moderate quality habitat due to lack of snags, diversity among trees within stand, and having a water source within the stand. East Fork Poplar Creek acts as a water source within this stand. A bat box was observed within this stand. Photographs 31 and 32 are representative of Forest Stand 18.

Forest Stand 19

Forest Stand 19 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. Dominant canopy and understory include pignut hickory, white oak, Virginia pine, common hackberry, and black cherry. Forest Stand 19 was determined to have low quality habitat due to lack of snags and dense understory in some locations within the stand. Poplar Creek act as a nearby water source for Stand 19. Photographs 33 and 34 are representative of Forest Stand 19.

Forest Stand 20

Forest Stand 20 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A graveled trail leads through the middle of the forested stand that occurs within the Project Area. Dominant canopy and understory include white oak, sweet gum, eastern

red cedar, common hackberry, Virginia pine, and black cherry. A box culvert was observed within the stand; however, no evidence of bat use was observed. Forest Stand 20 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, and lack of a water source within the stand. Photographs 35 and 36 are representative of Forest Stand 20.

Forest Stand 21

Forest Stand 21 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. An unpaved trail leads through the middle of the forested stand that occurs within the Project Area. Dominant canopy and understory include pignut hickory, white oak, common hackberry, Virginia pine, red cherry, and sugar maple. Forest Stand 21 was determined to have moderate quality habitat due to lack of snags, diversity among trees within stand, access to larger forested stands, and lack of a water source. Photograph 37 is representative of Forest Stand 21.

Forest Stand 22

Forest Stand 22 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A road occurs northwest of the stand. Dominant canopy and understory include white oak, sweet gum, common hackberry, Virginia pine, and eastern red cedar. Forest Stand 22 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, and lack of a water source within the stand. Photographs 38 is representative of Forest Stand 22.

Forest Stand 23

Forest Stand 23 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A graveled trail runs through a small section of this stand along with the TVA ROW. Dominant canopy and understory include ironwood-muscle wood, box elder, American sycamore, black walnut, common hackberry, and black cherry. Forest Stand 23 was determined to have moderate quality habitat due to lack of snags, access to a larger forested stand, diversity in trees within stand, and having a water source near the stand. Unnamed tributaries and wetlands act as a water source within this stand. Photographs 39 and 40 are representative of Forest Stand 23.

Forest Stand 24

Forest Stand 24 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A road occurs southwest of the stand. Dominant canopy and understory include white oak, sweet gum, common hackberry, Virginia pine, and eastern red cedar. Forest Stand 24 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, and lack of a water source within the stand. Photograph 41 is representative of Forest Stand 24.

Forest Stand 25

Forest Stand 25 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. A road occurs southwest of the stand. Dominant canopy and understory

include white oak, sweet gum, common hackberry, Virginia pine, and eastern red cedar. Forest Stand 25 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, and lack of a water source within the stand. Photograph 42 is representative of Forest Stand 25.

Forest Stand 26

Forest Stand 26 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area and near residential neighborhoods. Dominant canopy and understory include white oak, sweet gum, common hackberry, Virginia pine, red maple, and eastern red cedar. Forest Stand 26 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, and lack of a water source within the stand. Photograph 43 is representative of Forest Stand 26.

Forest Stand 27

Forest Stand 27 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. Dominant canopy and understory include ironwood- muscle wood, box elder, white oak, black walnut, common hackberry, and black cherry. Forest Stand 27 was determined to have moderate quality habitat due to lack of snags, access to a larger forested stand, diversity in trees within stand, and having a water source nearby the stand. Unnamed tributaries act as a water source within this stand. Photographs 44 and 45 are representative of Forest Stand 27.

Forest Stand 28

Forest Stand 28 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area and near residential neighborhoods. Dominant canopy and understory include white oak, sweet gum, common hackberry, Virginia pine, red maple, and eastern red cedar. Forest Stand 28 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, and lack of a water source within the stand. Photograph 46 is representative of Forest Stand 28.

Forest Stand 29

Forest Stand 29 consists of an upland mixed deciduous forest located within the eastern portion of the Project Area. Dominant canopy and understory include ironwood- muscle wood, oak species, sugar maple, black walnut, common hackberry, and black cherry. Forest Stand 29 was determined to have moderate quality habitat due containing one snag, access to a larger forested stand, diversity in trees within stand, and an intermittent stream acting as a water source within the stand. Photographs 47 and 48 are representative of Forest Stand 29.

Forest Stand 30

Forest Stand 30 consists of an upland mixed deciduous forest located within the Eastern Project Area and near residential neighborhoods. Dominant canopy and understory include white oak, sweet gum, common hackberry, Virginia pine, red maple, and eastern red cedar. Forest Stand 30 was determined to have low quality habitat due to lack of snags, dense understory in some

locations within the stand, and lack of a water source within the stand. Photographs 49 is representative of Forest Stand 30.

Forest Stand 31

Forest Stand 31 consists of an upland mixed deciduous forest located within the Eastern Project Area and near residential neighborhoods. Dominant canopy and understory include white oak, sweet gum, common hackberry, Virginia pine, red maple, and eastern red cedar. Forest Stand 31 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, and lack of a water source within the stand. Photographs 49 is representative of Forest Stand 31.

Forest Stand 32

Forest Stand 32 consists of an upland mixed deciduous forest located within the Eastern Project Area. Dominant canopy and understory include ironwood- muscle wood, oak species, sugar maple, black walnut, common hackberry, and shagbark hickory. Forest Stand 32 was determined to have moderate quality habitat due containing several snags, access to a larger forested stand, diversity in trees within stand, and no water source within the stand. Photographs 50 and 51 are representative of Forest Stand 32.

Forest Stand 33

Forest Stand 33 consists of an upland mixed deciduous forest located within the Eastern Project Area. Dominant canopy and understory include ironwood- muscle wood, oak species, sugar maple, black walnut, common hackberry, and shagbark hickory. Forest Stand 33 was determined to have moderate quality habitat due containing several snags, access to a larger forested stand, diversity in trees within stand, and no water source within the stand. Photograph 50 is representative of Forest Stand 33.

Forest Stand 34

Forest Stand 34 consists of an upland mixed deciduous forest located within the Eastern Project Area and near residential neighborhoods. Dominant canopy and understory include white oak, sweet gum, common hackberry, Virginia pine, sugar maple, and some eastern red cedar. Forest Stand 34 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, and lack of a water source within the stand. Photograph 52 is representative of Forest Stand 34.

Forest Stand 35

Forest Stand 35 consists of an upland mixed deciduous forest located within the Eastern Project Area. This stand surrounds a large stream system and open maintained lawn/ agricultural fields. Dominant canopy and understory include ironwood- muscle wood, oak species, sugar maple, black walnut, common hackberry, and shagbark hickory. Forest Stand 35 was determined to have moderate quality habitat due to lack of snags, access to a larger forested stand, diversity in trees within stand, and having a water source within the stand. Photograph 53 is representative of Forest Stand 35.

Forest Stand 36

Forest Stand 36 consists of an upland mixed deciduous forest located within the Eastern Project. The top half of this stand near the stream system is surrounded by kudzu. Dominant canopy and understory include pignut hickory, oak species, sugar maple, common hackberry, and shagbark hickory. Forest Stand 36 was determined to have moderate quality habitat due to lack of snags, access to a larger forested stand, diversity in trees within stand, and having a water source within the stand. Photographs 54 and 55 are representative of Forest Stand 36.

Forest Stand 37

Forest Stand 37 consists of an upland mixed deciduous forest located within the Eastern Project Area. Dominant canopy and understory include white oak, common hackberry, Virginia pine, sugar maple, and some eastern red cedar. Forest Stand 37 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, lack of diversity in ages of trees within the stand and lack of a water source within the stand. Photograph 56 is representative of Forest Stand 37.

Forest Stand 38

Forest Stand 38 consists of an upland mixed deciduous forest located within the Eastern Project Area. Dominant canopy and understory include white oak, common hackberry, Virginia pine, sugar maple, and some eastern red cedar. Forest Stand 38 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, and lack of diversity in ages of trees within the stand Project Area. An intermittent stream acts as a water source within Stand 38. Photographs 57 and 58 are representative of Forest Stand 38.

Forest Stand 39

Forest Stand 39 consists of an upland mixed deciduous forest located within the Eastern Project Area. Dominant canopy and understory include white oak, common hackberry, Virginia pine, sugar maple, and some eastern red cedar. Forest Stand 39 was determined to have low quality habitat due to lack of snags, dense understory in some locations within the stand, lack of diversity in ages of trees within the stand and no water source available within the stand. Photograph 59 is representative of Forest Stand 39.

Forest Stand 40

Forest Stand 40 consists of an upland mixed deciduous forest located within the Eastern Project Area. Dominant canopy and understory include chestnut oak, white oak, common hackberry, Virginia pine, sugar maple, and some eastern red cedar. Forest Stand 40 was determined to have low quality habitat due to dense understory in some locations within the stand, lack of diversity in ages of trees within the stand and no water source available within the stand. Photograph 60 is representative of Forest Stand 40.

Fish

Based on the review of the species databases, eleven state listed or protected fish species potentially occur in the Project Area: yellowfin madtom, blue sucker, emerald darter, flame chub, olive darter, redlips darter, slender chub, spotfin chub, tangerine darter, and Tennessee dace.

The yellowfin madtom prefers small-to-medium size streams with a moderate current, warm water, good water quality, and little siltation (Biological Diversity 2022). The blue sucker inhabits the mainstem of major rivers and lower sections of main tributaries where they can be found in strong currents, riffles or rapidly flowing chutes, and over gravel and rock substrates (ADW 2022). The slender chub prefers bars and shoals in runs and riffles of medium to large rivers with clear, warm water (NatureServe 2022). The spotfin chub prefers clear, large creeks or medium sized rivers of moderate gradient, in upland and montane areas with moderate and swift currents over bedrock (NatureServe 2022). The flame chub prefers habitat with springs, shallow seepage waters, and spring-fed streams usually with mud, gravel, or bedrock substrates (NatureServe 2022). The emerald darter inhabits creeks and small rivers with riffles containing gravel or rubble in the upper Cumberland drainage. The laurel dace inhabits cool streams with slabrock and rubble substrates. The olive darter prefers small-medium sized rivers with strong flowing chutes with rubble/boulders in high gradient streams. The redlips darter inhabits slow-moving large creeks and rivers in pools along the banks strewn with boulders and woody debris (NatureServe 2022). The tangerine darter inhabits large-moderate sized headwater tributaries to Tennessee River in clear, fairly deep, rocky pools. The Tennessee dace inhabits first order spring-fed streams of woodlands. Potentially suitable habitat was observed in streams located within the Project Area for the yellowfin madtom, slender chub, spotfin chub, flame chub, emerald darter, and the Tennessee dace, but no individuals were observed during the field surveys.

Mollusks and Crustaceans

There are nineteen federally and/or state-listed mollusk species that may occur in the Project Area. The federally listed turgid blossom is not expected to be present within the Project Area as they are believed extinct and are currently proposed to be delisted due to extinction.

The federally listed shiny pigtoe, Tennessee bean (formerly the purple bean), Cumberland bean, and the Alabama lampmussel require relatively silt free substrates of sand, gravel, and cobble in good flows of smaller streams (NatureServe 2022). Habitat exists for these species within the Project Area; however, no individuals were observed during the field surveys.

The federally listed rough rabbitsfoot, dromedary pearlymussel, and birdwing pearlymussel inhabit small to medium sized streams with sand and gravel substrates (NatureServe 2022). Potentially suitable habitat was identified on-site for these species, but no individuals were observed during the field surveys.

The federally listed rough pigtoe, fine-rayed pigtoe, fanshell, cracking pearlymussel, and Anthony's riversnail inhabit medium to large rivers in sand, gravel, and cobble substrates. Potentially suitable habitat was documented on-site for these species, but no individuals were observed during the field surveys.

The federally listed spectaclecase, sheepnose mussel, ring pink, pink mucket, and the orangefoot pimpleback inhabit large rivers with sand and gravel substrates (NatureServe 2022). Potentially suitable habitat exists within the Project Area for these species, but no individuals were observed during the field surveys.

There are four state listed crustacean species that may occur in the Project Area; Obey crayfish, prickly cave crayfish, pristine crayfish, and valley flame crayfish. The Obey crayfish and the pristine crayfish inhabit headwaters of East Fork Obey River and headwaters of the Caney Fork River, respectively. No suitable habitat exists onsite for these crayfish because these rivers do not flow within the Project Area. No suitable habitat was found for the prickly cave crayfish since no caves were observed within the Project Area. The valley flame crayfish prefers open areas with high water tables in order to burrow. Suitable habitat exists onsite for this species, but no individuals were observed during the field survey.

Amphibians

There are five state listed amphibian species that may occur within the Project Area: berry cave salamander, black mountain salamander, Cumberland dusky salamander, four-toed salamander, and the hellbender.

The berry cave salamander inhabits caves year-round; no suitable habitat exists onsite for this species. The four-toed salamander inhabits woodland swamps, shallow depressions, and sphagnum mats on acidic soils. No suitable habitat exists onsite for this species.

The black mountain salamander inhabits spring runs and permanent streams in wooded mountainous terrain (NatureServe 2022). The Cumberland dusky salamander inhabits streams of the Cumberland Plateau under rocks along small streams or adjacent cover. The Hellbender inhabits clean and flowing water with plenty of oxygen in large streams and creeks with areas with an abundance of rocks (NatureServe 2022). Suitable habitat exists onsite for these species; however, no individuals were observed at the time of the field survey.

Reptiles

There are two state listed reptile species that may occur in the Project Area: the eastern slender glass lizard and the northern pine snake. The northern pine snake inhabits well-drained sandy soils in pine/pine-oak woods and dry mountain ridges. No suitable habitat exists onsite for this species. The slender glass lizard inhabits dry upland areas including brush, cut-over woodlands, and grassy fields. Potentially suitable habitat exists for this species; however, no individuals were observed in the habitat at the time of the field survey.

Insects

The monarch butterfly is the only federally listed candidate insect species that may occur in the Project Area. The monarch butterfly prefers habitats that provide milkweed and flowering plants such as roadside areas, open areas, wet areas, or urban gardens (NatureServe 2022). No monarch butterflies were observed during the field survey; however, milkweed was observed in multiple areas throughout the Project Area; therefore, potentially suitable habitat for the monarch butterfly exists in the Project Area.

Birds

There are five state listed bird species that may potentially occur in the Project Area: Bachman's sparrow, Bewick's wren, cerulean warbler, golden-winged warbler, and Swainson's warbler.



Bachman’s sparrow inhabits dry open pine or oak woods (NatureServe 2022). Bewick’s wren prefers brushy areas, thickets, and scrub in open country, open and riparian woodland, and chaparral. Cerulean warblers inhabit deciduous forests (Audubon 2022). The golden-winged warbler inhabits upland sites on abandoned farmland in early successional habitats, powerline ROWs, dry and shrubby fields, woodland clearings, and wet areas covered by felled trees (NatureServe 2022). Swainson’s warbler inhabits swamps and river floodplain forests, with dense understory and sparse ground cover (Audubon 2022). Potentially suitable habitat exists onsite for these species; however, no individuals were observed at the time of the field survey.

3.2.2.2 MIGRATORY BIRDS AND EAGLES

E.O. 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) directs federal agencies to take certain actions to further implement the MBTA. 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 276 species of migratory birds have been identified in Roane, Anderson, and Cumberland counties (eBird 2022), and additional species likely occur regularly. The USFWS maintains a list of migratory birds of conservation concern (USFWS 2021c). 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. Twenty-three species of birds of conservation concern are listed for Bird Conservation Region 28 (BCR 28), Appalachian Mountains, which contains the Project Area. Of these 20 species, at least 15 potentially occur with some regularity on or in the immediate vicinity of the Project Area (Table 6).

Table 6. Migratory Bird Species of Conservation Concern Potentially Occurring in the Project Area.

Scientific Name	Common name	Season of Occurrence	Likelihood of Presence/Habitat
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo (Eastern)	Spring through fall	Possible , occurs in wooded habitat with dense cover and water nearby, including woodlands with low, scrubby, vegetation, overgrown orchards, abandoned farmland and dense thickets along streams and marshes;
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	Spring through fall	Possible , occurs along wood edges, groves, thickets. Breeds mostly in deciduous thickets and shrubby places, often on the edges of woodland or around marshes.
<i>Caprimulgus carolinensis</i>	Chuck-will's Widow	Spring and fall	Likely , open dry woodlands
<i>Caprimulgus vociferus</i>	Eastern Whip-poor-will	Year-round	Likely ; deciduous and or mixed woods
<i>Chaetura pelagica</i>	Chimney Swift	Spring through fall	Likely , nests in chimneys and less frequently large, open-topped hollow trees; reported from vicinity and likely forages over TL Upgrade Area



Scientific Name	Common name	Season of Occurrence	Likelihood of Presence/Habitat
<i>Aegolius acadicus</i>	Northern Saw-whet Owl	Year-round	Possible , occurs in forest with an open understory for foraging, deciduous trees for nesting, dense conifers for roosting, and riverside habitat nearby. But they nest in a wide range of wooded habitats, including coniferous swamps, disturbed deciduous woods, savannahs, riverside forest, and shrub-steppe habitat
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	Year-round	Likely ; inhabits open forests and pine savannahs, reported from vicinity
<i>Poecile atricapillus</i>	Black-capped Chickadee (Appalachian)	Spring through fall	Likely , occurs in deciduous and mixed forests, open woods, parks, willow thickets, cottonwood groves, and disturbed areas.
<i>Hylocichla mustelina</i>	Wood Thrush	Spring through fall	Likely , deciduous and mixed forests with shrubs in understory; reported from vicinity
<i>Dolichonyx oryzivorus</i>	Bobolink	Spring through fall	Likely , open country with a preference for large hayfields, moist meadows and weedy fields dominated by a mixture of tall grasses
<i>Euphagus carolinus</i>	Rusty Blackbird	Winter	Possible , occurs in forested wetlands
<i>Protonotaria citrea</i>	Prothonotary Warbler	Spring through fall	Possible , forested wetlands with areas of standing water
<i>Oporornis formosus</i>	Kentucky Warbler	Spring through fall	Likely , moist deciduous forest with shrubby understory
<i>Dendroica cerulea</i>	Cerulean Warbler	Spring through fall	Possible , mature deciduous forest with scattered canopy gaps
<i>Dendroica discolor</i>	Prairie Warbler	Spring through fall	Likely , brushy fields and recently harvested, regenerating woodlands

1) BCC: Bird of Conservation Concern

A large portion of the currently forested portions of the Project Area, as well as the recently clear-cut areas, provide suitable habitat for one or more of the birds listed in Table 6. Many additional species of migratory birds not listed as a conservation concern in USFWS (2021c) likely also occur on the Project Area. Table 3 lists a few of these species whose presence was confirmed. The other species likely present include wood ducks and other waterfowl, additional species of hawks and owls, woodpeckers, flycatchers, vireos, thrushes, and warblers. The deciduous forests and regenerating clear-cut areas also provide habitat for migratory birds with declining populations that are not currently protected under the Endangered Species Act (USFWS 2021c).

Both bald and golden eagles are protected by the MBTA and the BGEPA. 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 trees 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 (TWRA 2021). The suitability of the Project Area as habitat for the bald eagle is generally low due to the absence of large water bodies throughout much of the Project Area; however, potentially suitable habitat does occur on the eastern TLs where they cross the Emory River, near the Kingston reservation..

The golden eagle is a rare winter resident in Tennessee and most reports of it have been in the vicinity of reservoirs. Wintering habitat includes a mix of forest and open habitats for foraging. The Project Area encompasses suitable winter roosting and foraging habitat, and the golden eagle has been reported from adjacent counties; therefore, the golden eagle could potentially occur in the Project Area, although none were observed during the field survey.

4 Summary

A large portion of the Project Area is dry herbaceous powerline ROW, with some agricultural lands and mixed deciduous forests intermixed. Potential suitable habitat was identified and evaluated during field surveys for the presence of the federal and state protected plant species listed in Table 4; no federal or state protected plant species were observed within the Project Area during the time of the field survey.

Forested areas within the Project Area provide potential bat roosting and foraging habitat for federally listed bat species, as well as several other bat species. Several migratory birds considered to be of conservation concern, as well as many other bird species, some with declining populations, likely occur in the Project Area.

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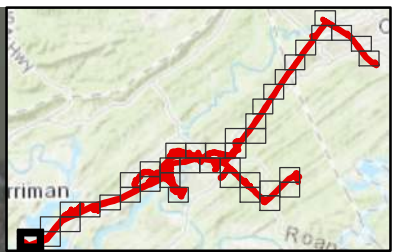


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Appendix A – Figures



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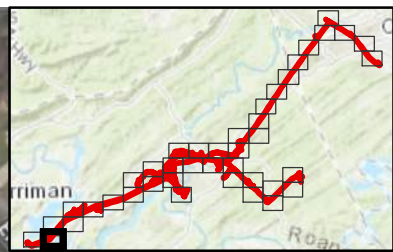
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



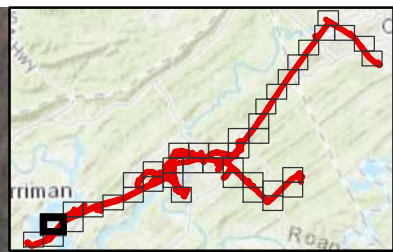
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



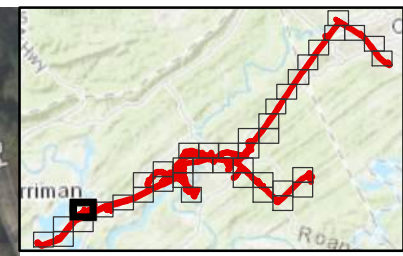
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINE - EAST

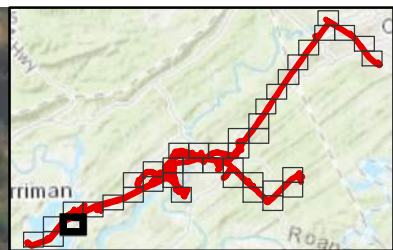
LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery





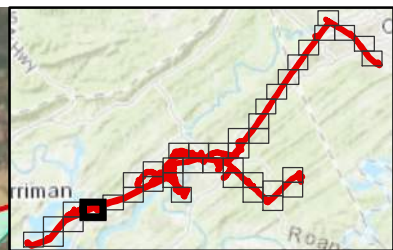
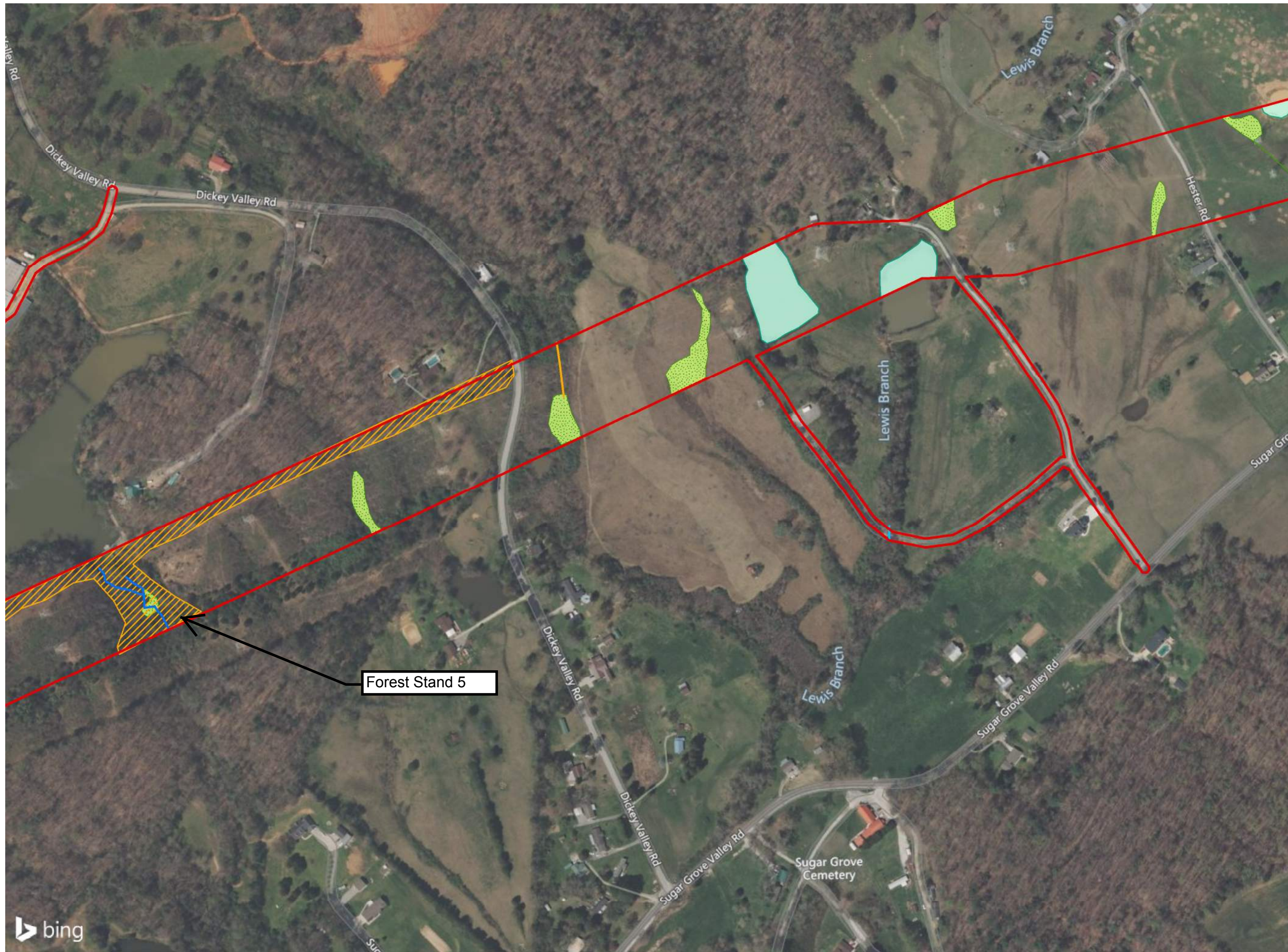
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



KIINGSTON TRANSMISSION LINE - EAST

LEGEND

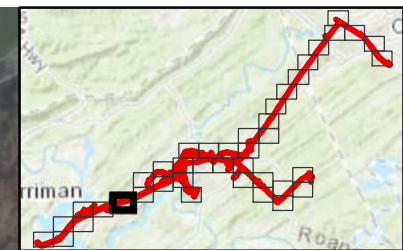
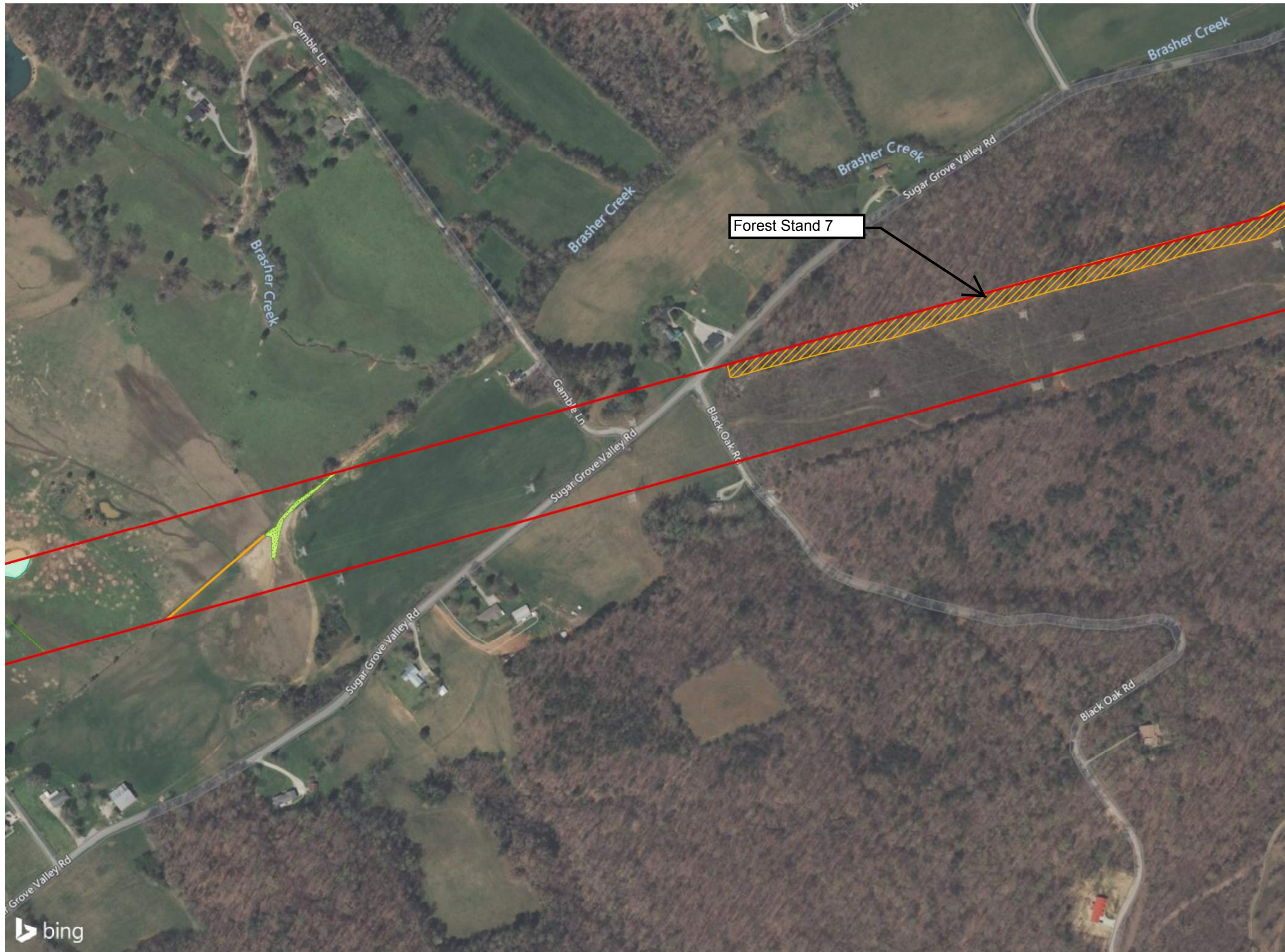
- Study Area
- Osprey
- Milkweed Patch
- Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

Forest Stand 5



DATA SOURCE: Bing Hybrid Aerial Imagery





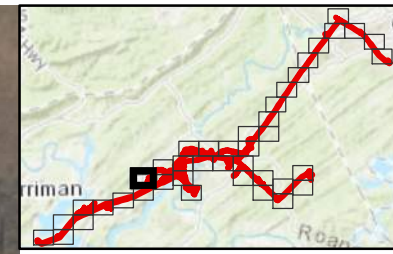
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



KIINGSTON TRANSMISSION LINE - EAST

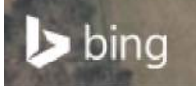
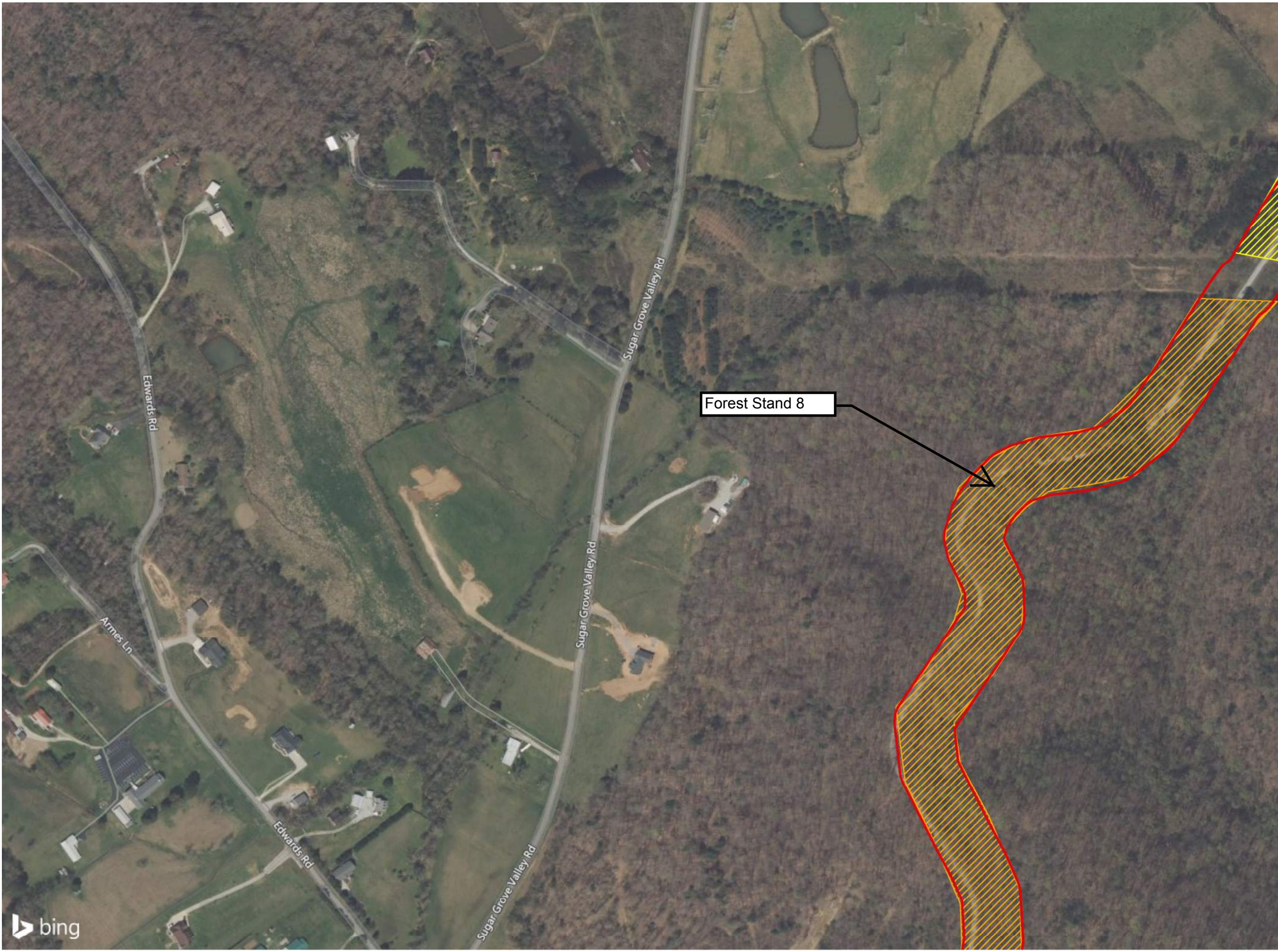
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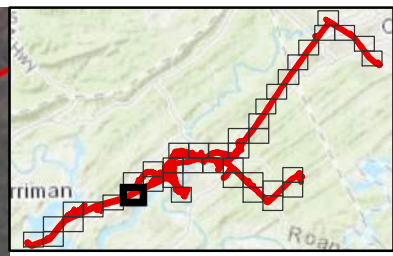
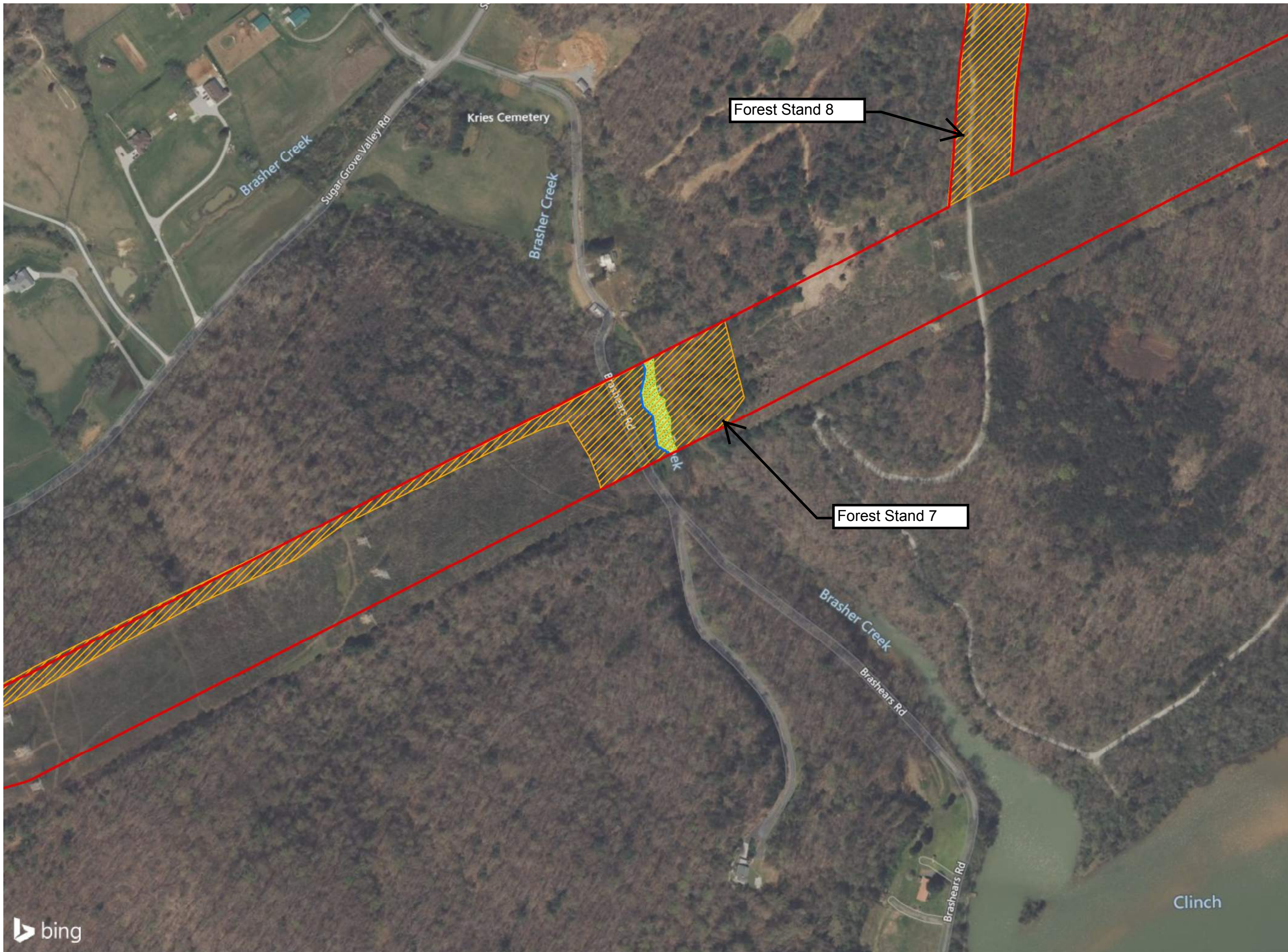
- Study Area
- Osprey
- Milkweed Patch
- Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

Forest Stand 8



DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

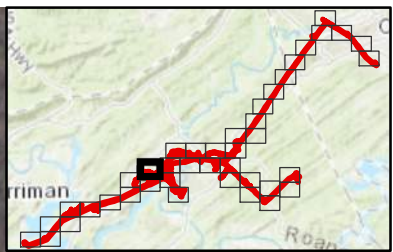
Forest Stand 8

Forest Stand 7

Clinch



DATA SOURCE: Bing Hybrid Aerial Imagery



**KIINGSTON TRANSMISSION
LINE - EAST**

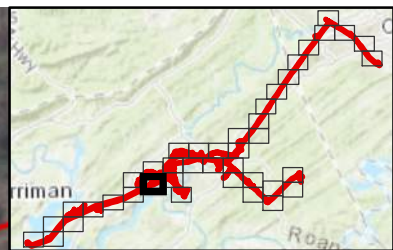
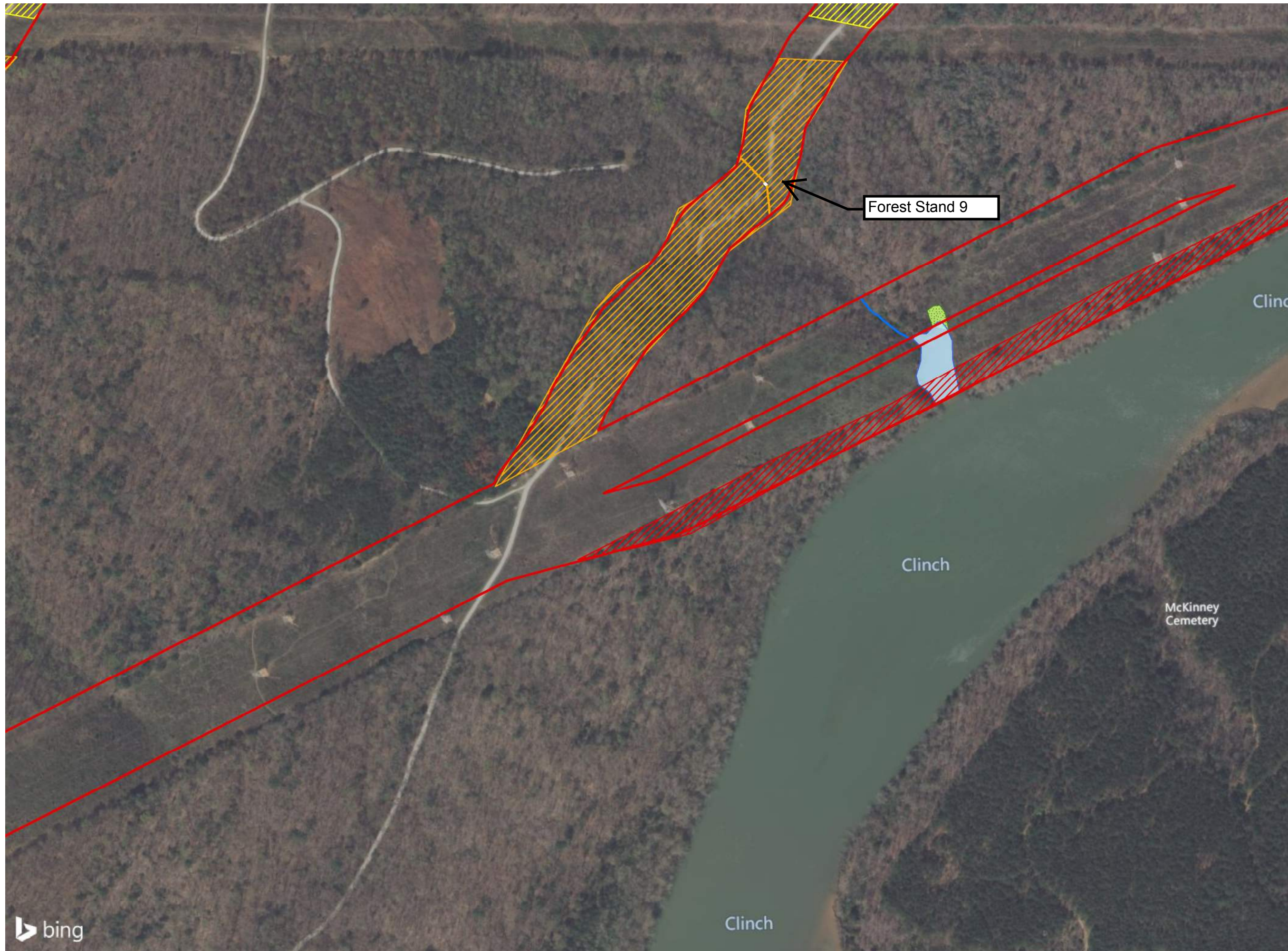
LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

Forest Stand 8

Forest Stand 9





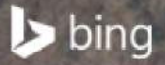
KINGSTON TRANSMISSION LINE - EAST

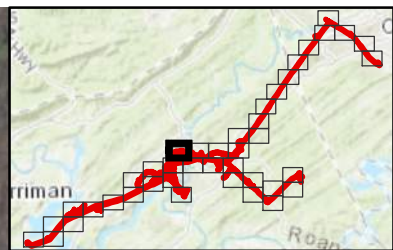
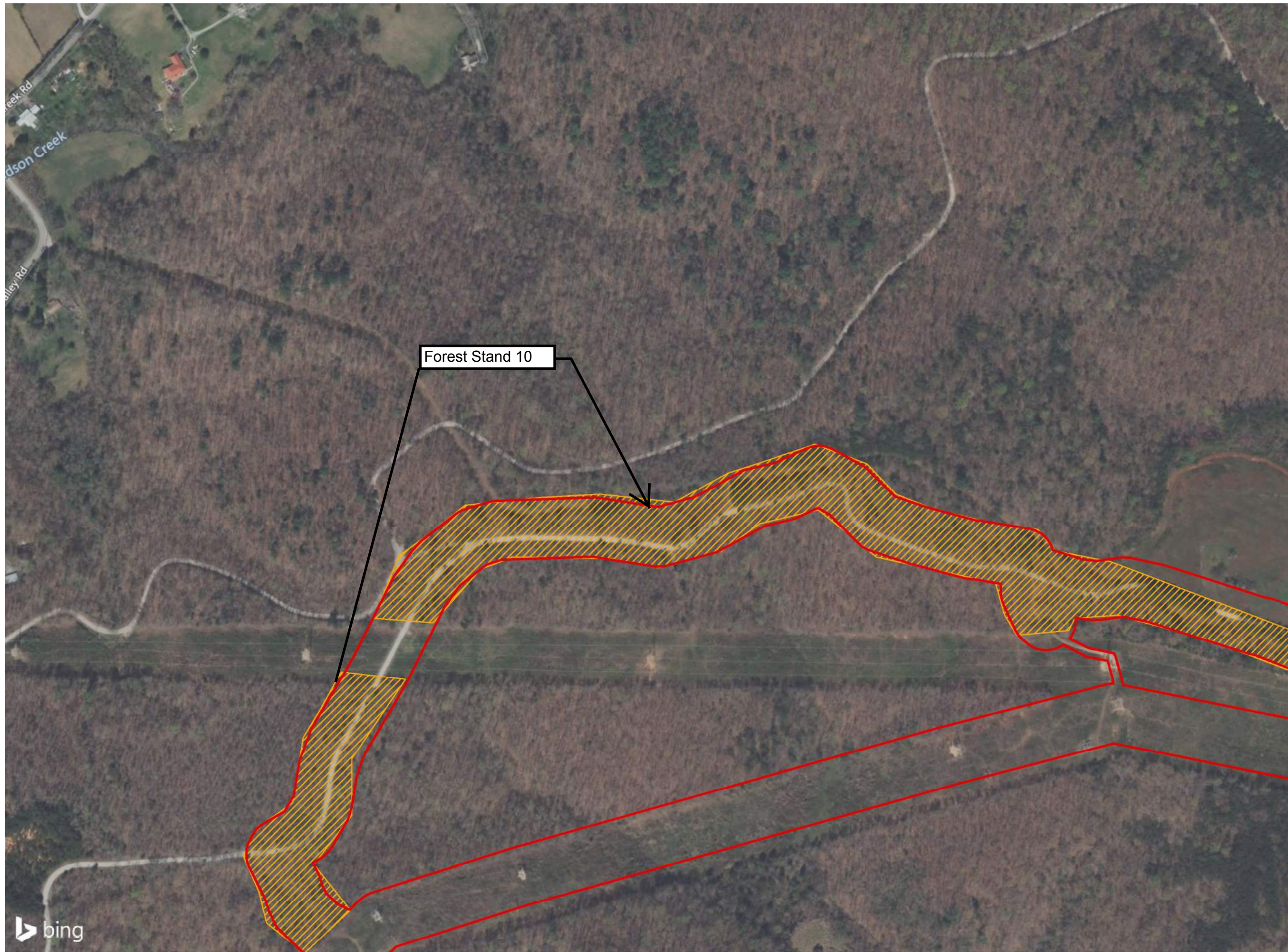
LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery





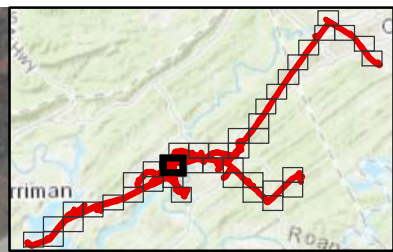
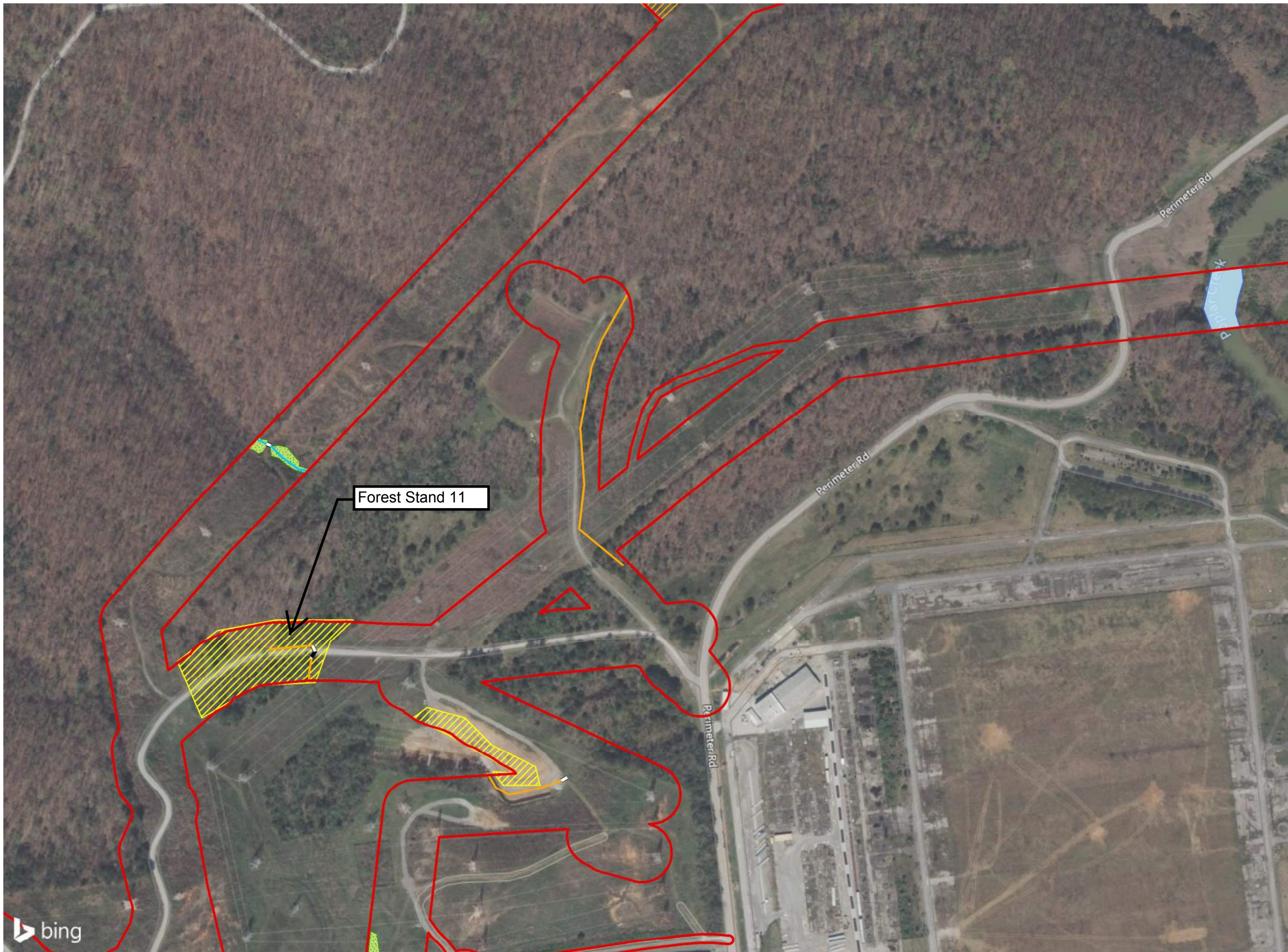
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

Forest Stand 10





**KINGSTON TRANSMISSION
LINE - EAST**

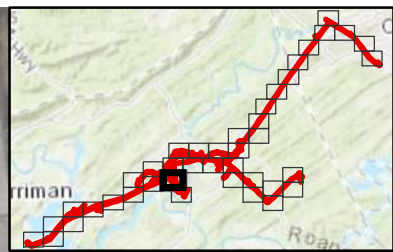
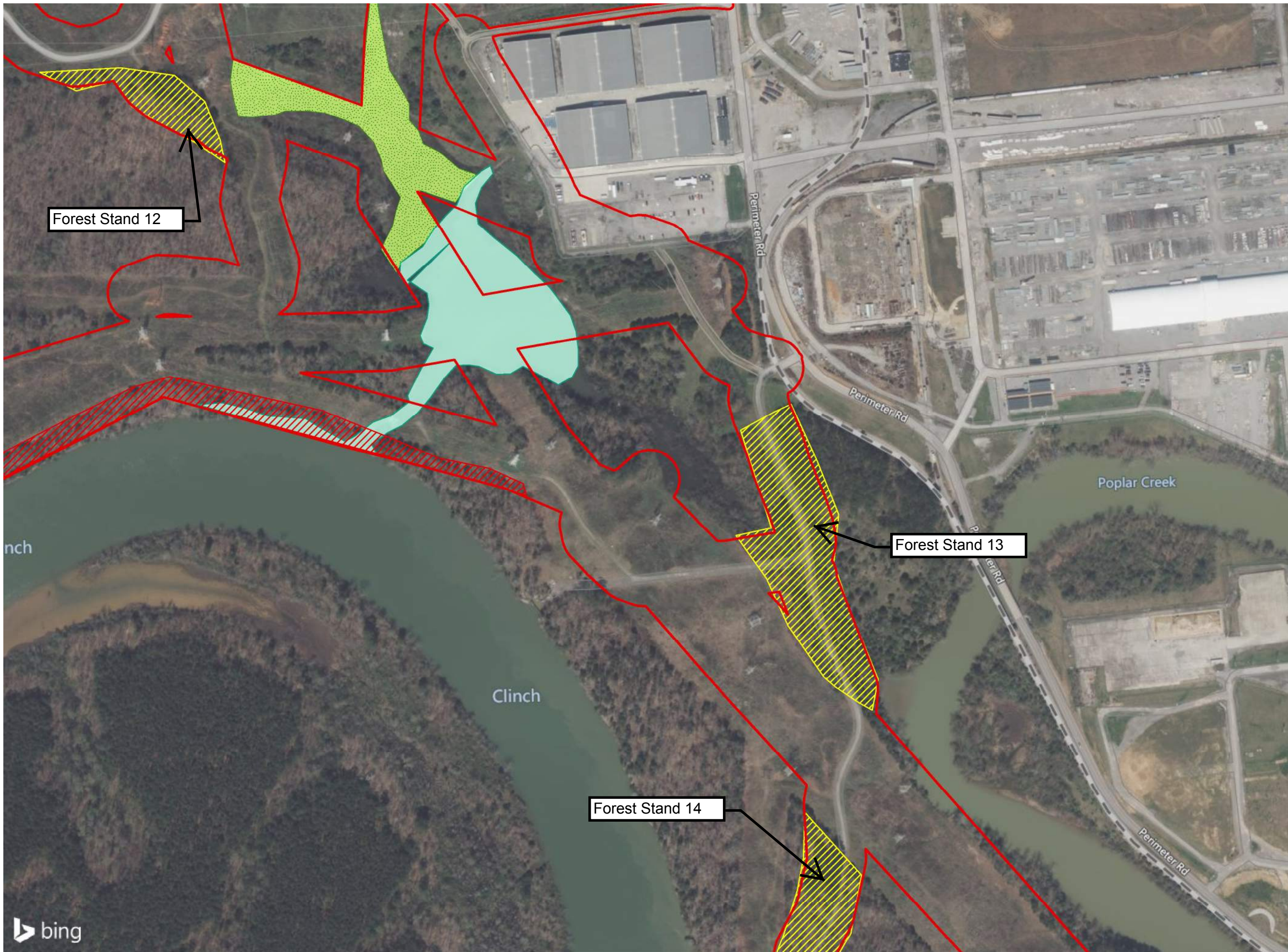
LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

Forest Stand 11



DATA SOURCE: Bing Hybrid Aerial Imagery



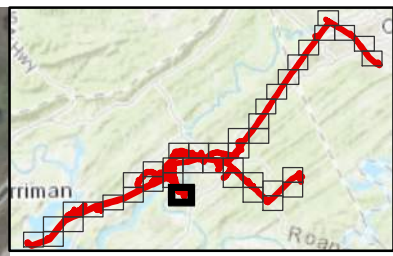
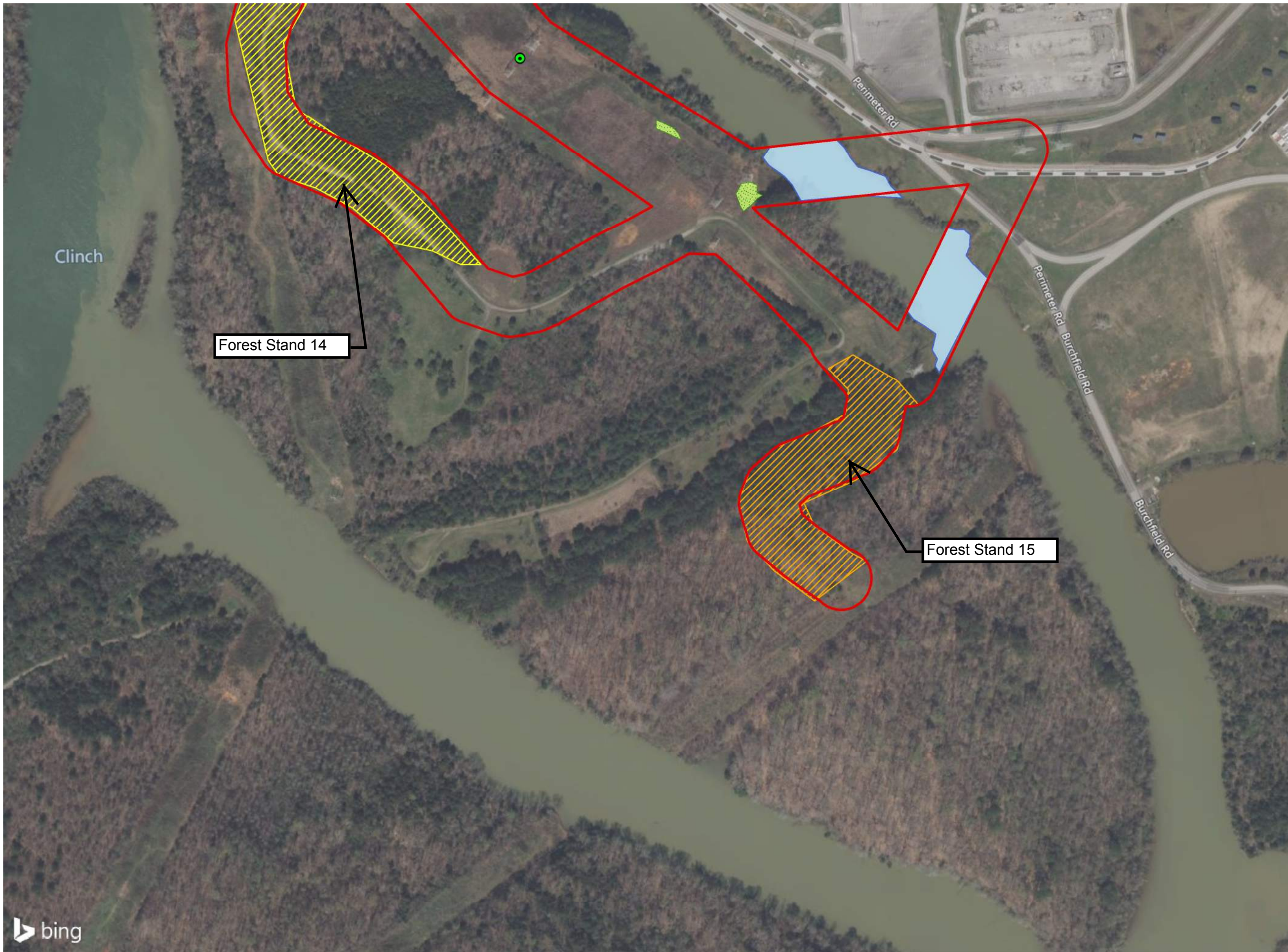
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

Forest Stand 14

Forest Stand 15

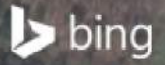
Clinch

Perimeter Rd

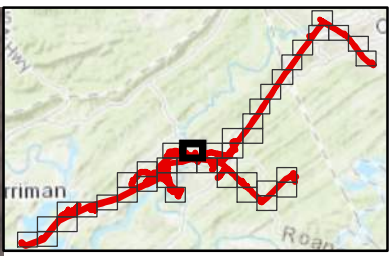
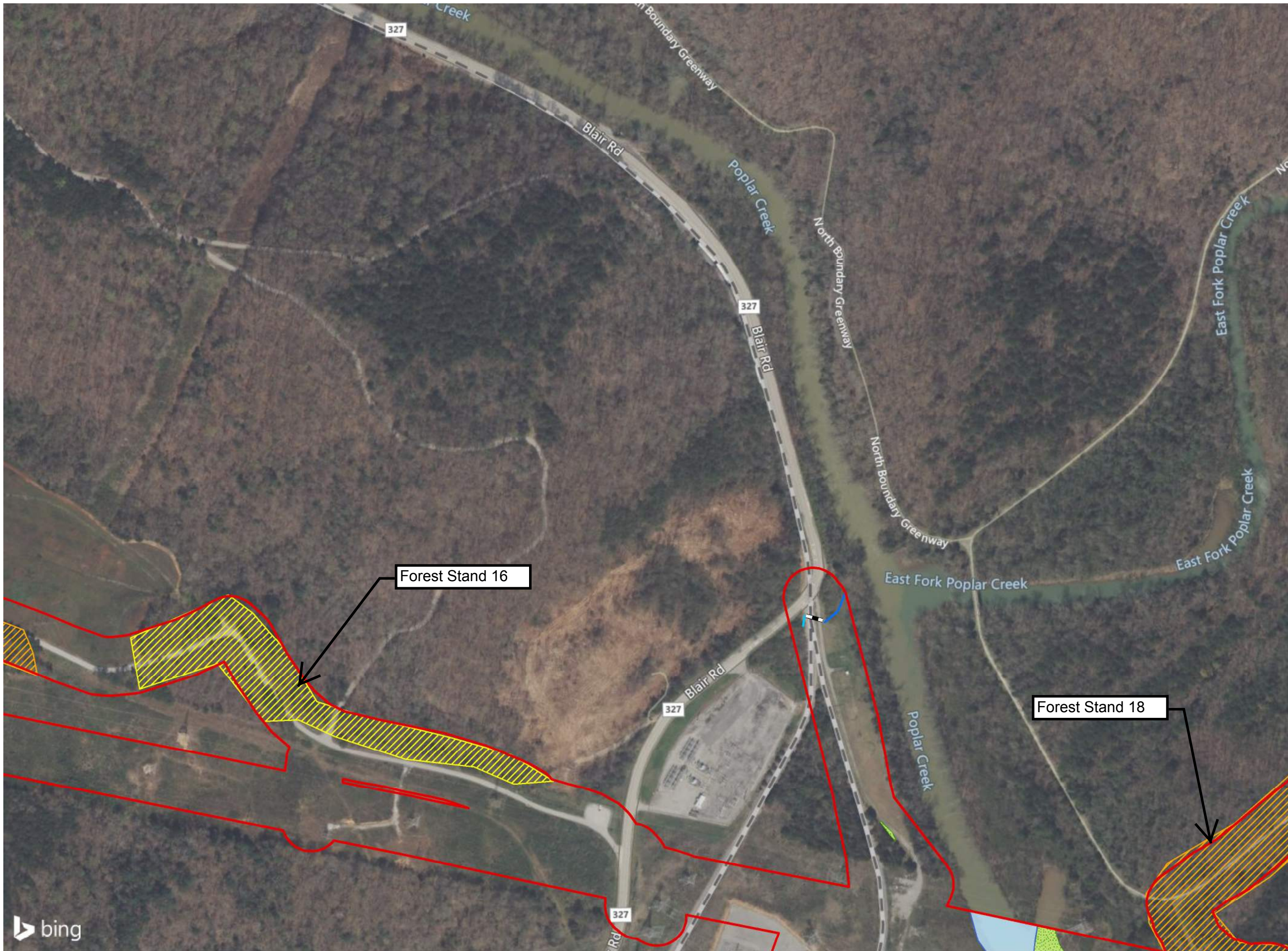
Perimeter Rd

Burchfield Rd

Burchfield Rd



DATA SOURCE: Bing Hybrid Aerial Imagery



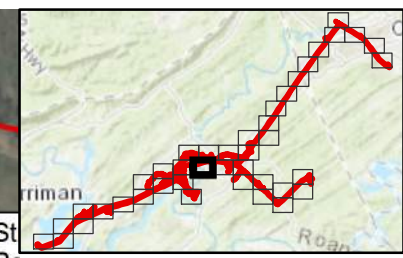
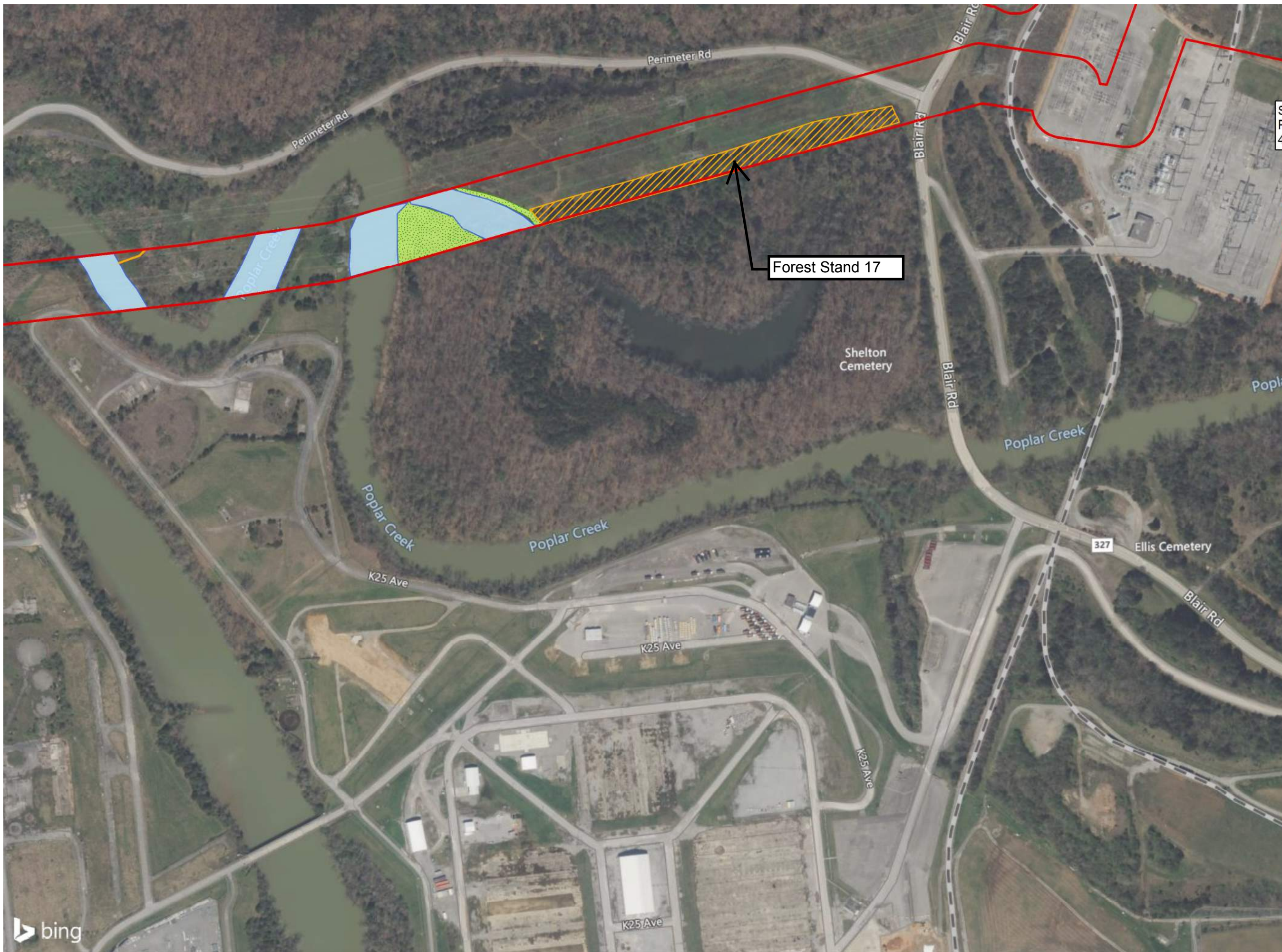
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



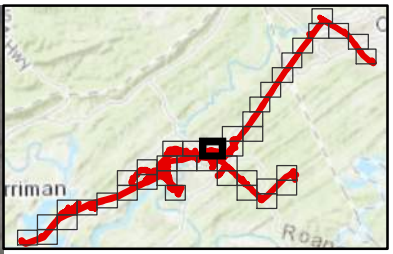
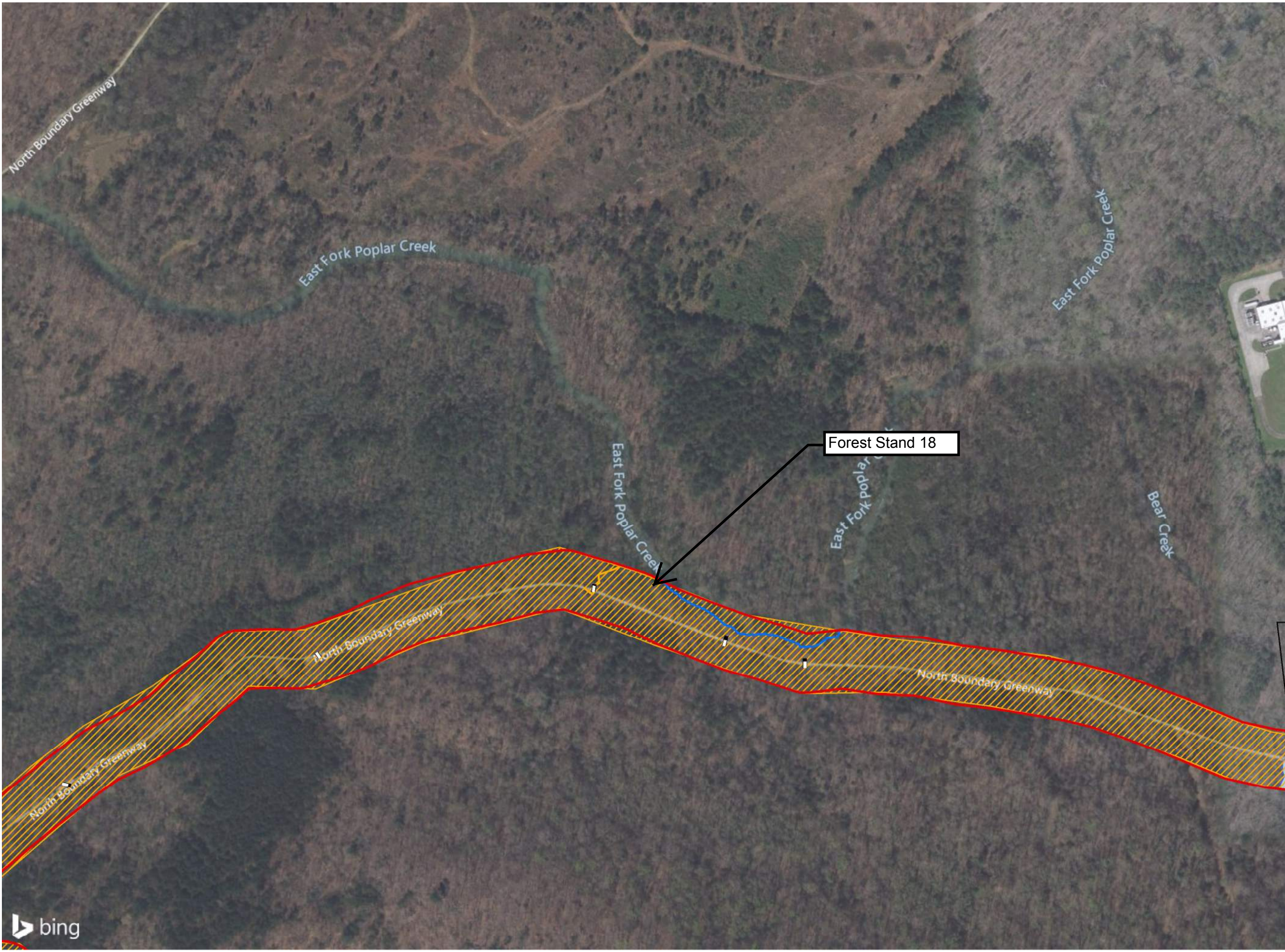
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



KIINGSTON TRANSMISSION LINE - EAST

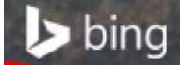
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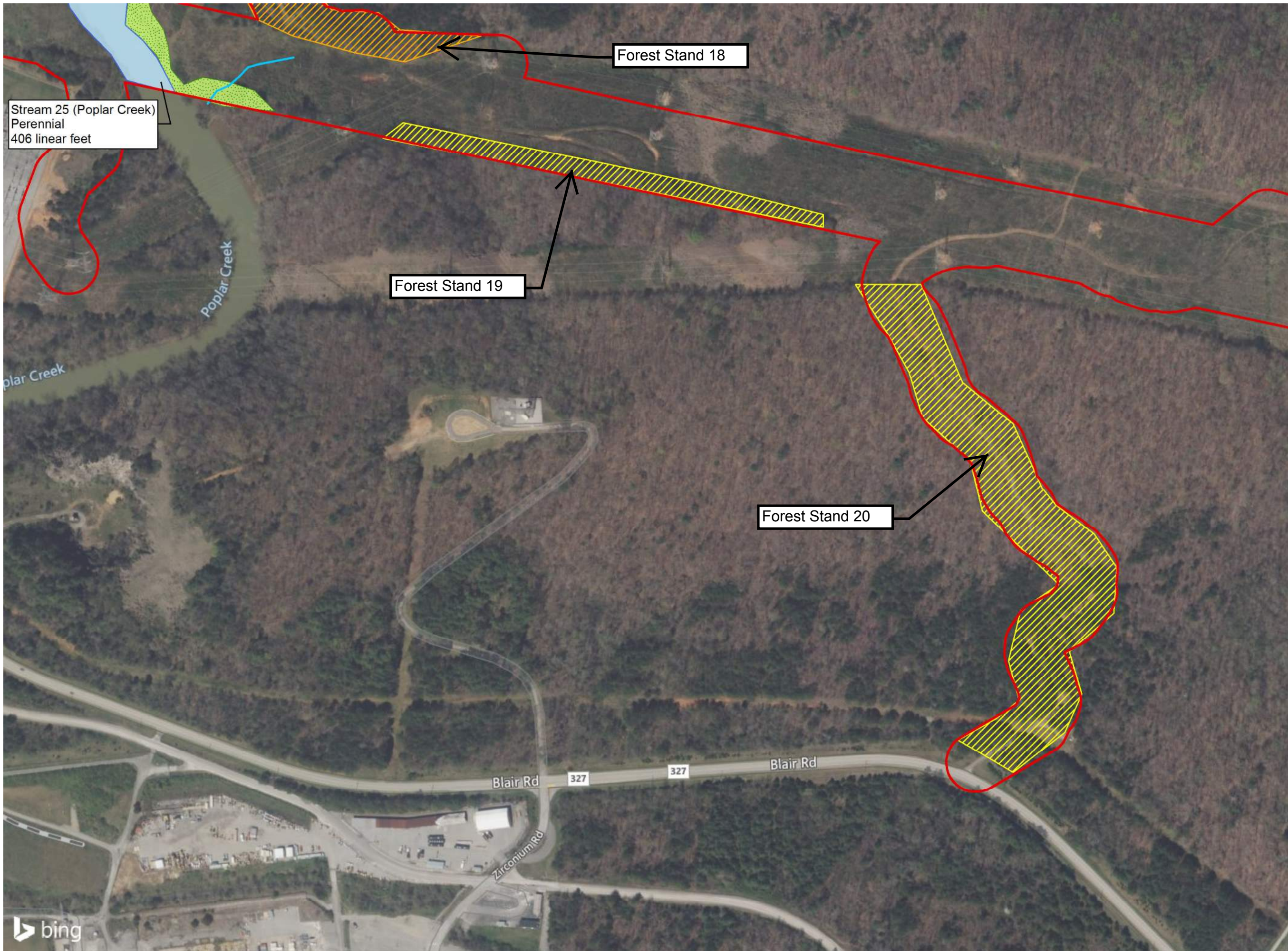
- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

Forest Stand 18



DATA SOURCE: Bing Hybrid Aerial Imagery



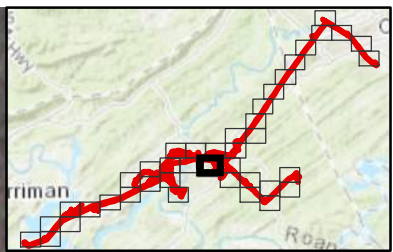


Stream 25 (Poplar Creek)
Perennial
406 linear feet

Forest Stand 18
















Forest Stand 19

Forest Stand 20



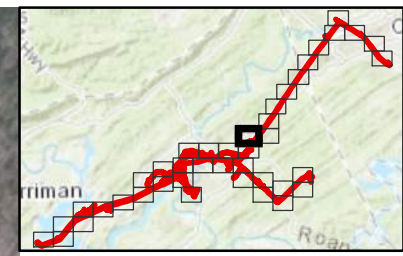
KINGSTON TRANSMISSION LINE - EAST

LEGEND

-  Study Area
-  Osprey
-  Milkweed Patch
-  Snags
-  High Quality Bat Habitat
-  Moderate Quality Bat Habitat
-  Low Quality Bat Habitat
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

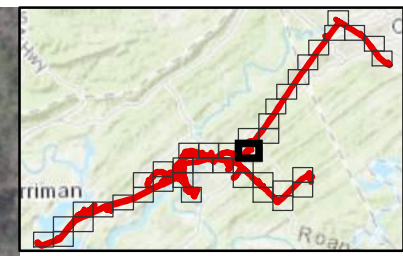
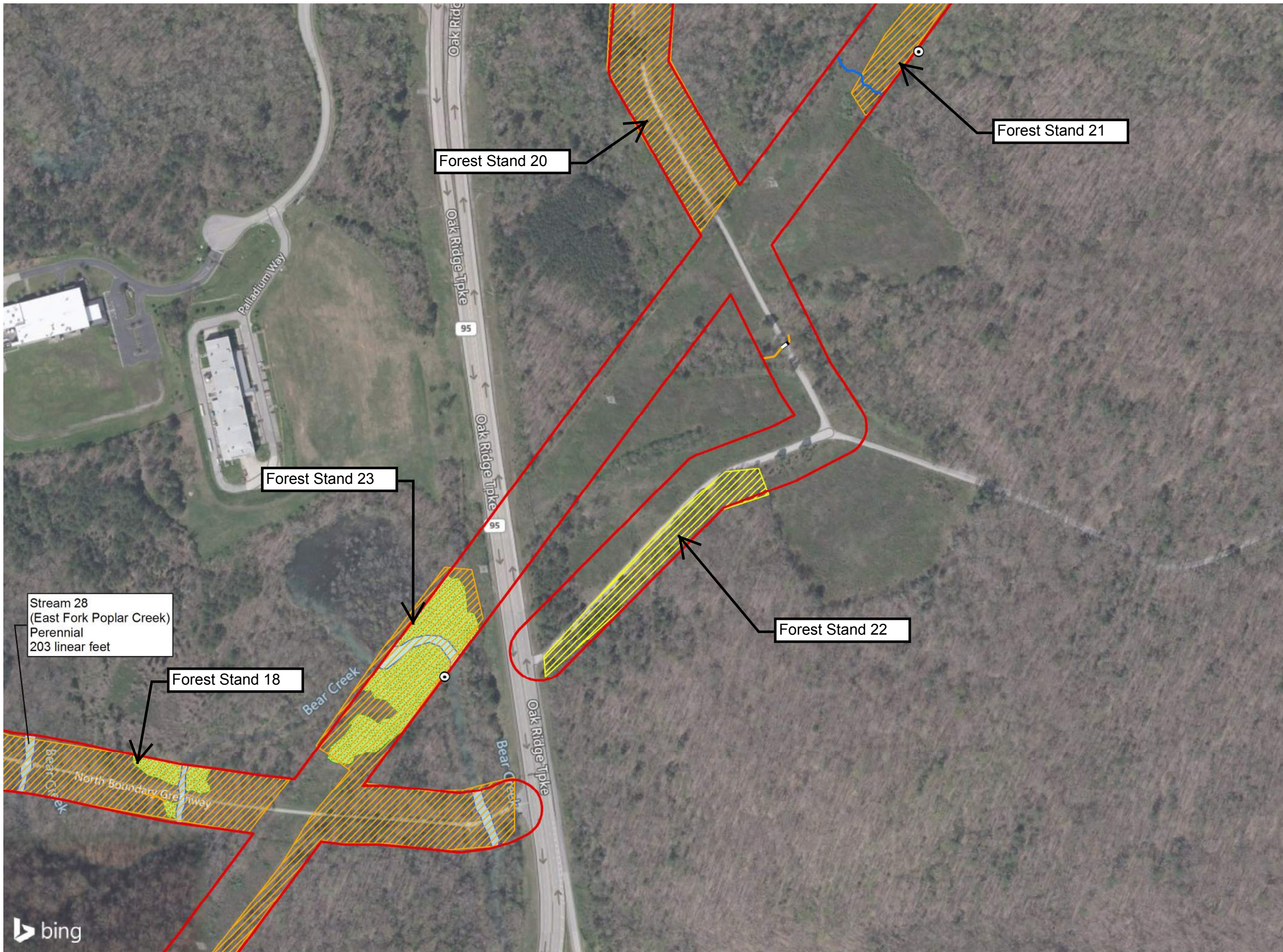
Forest Stand 22

Forest Stand 21



DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINE - EAST

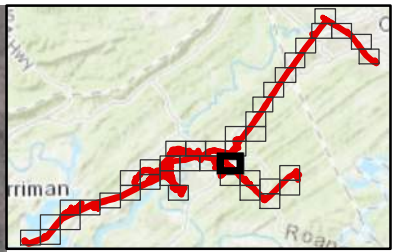
LEGEND

- Study Area
- Osprey
- Milkweed Patch
- Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland









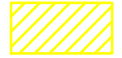





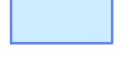


DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINE - EAST

LEGEND

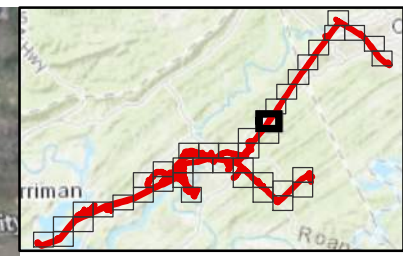
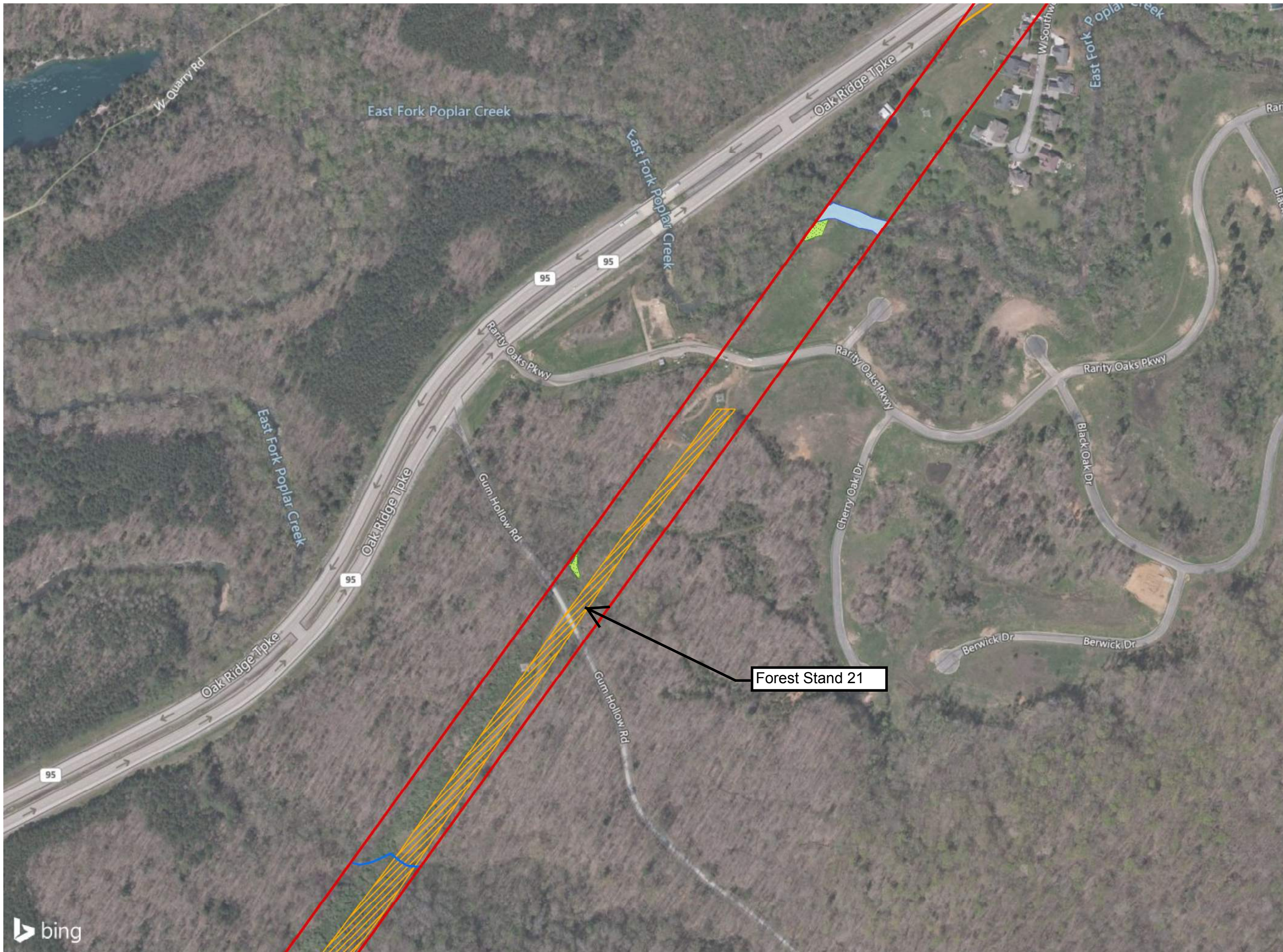
-  Study Area
-  Osprey
-  Milkweed Patch
-  Snags
-  High Quality Bat Habitat
-  Moderate Quality Bat Habitat
-  Low Quality Bat Habitat
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland

Forest Stand 21

Forest Stand 25

Forest Stand 24





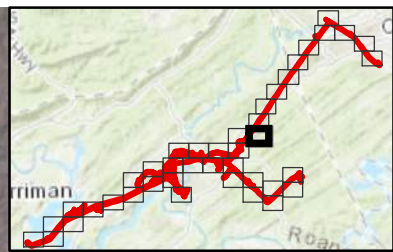
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



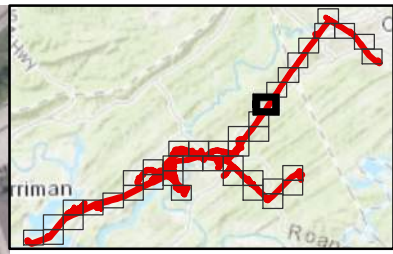
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland













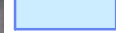

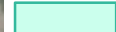


DATA SOURCE: Bing Hybrid Aerial Imagery



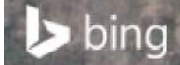
KIINGSTON TRANSMISSION LINE - EAST

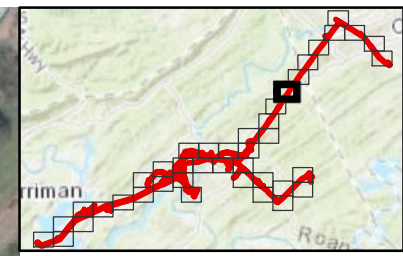
LEGEND

-  Study Area
-  Osprey
-  Milkweed Patch
-  Snags
-  High Quality Bat Habitat
-  Moderate Quality Bat Habitat
-  Low Quality Bat Habitat
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINE - EAST

LEGEND

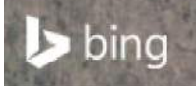
- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

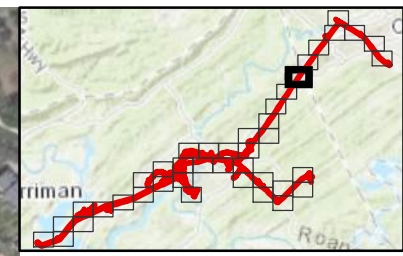
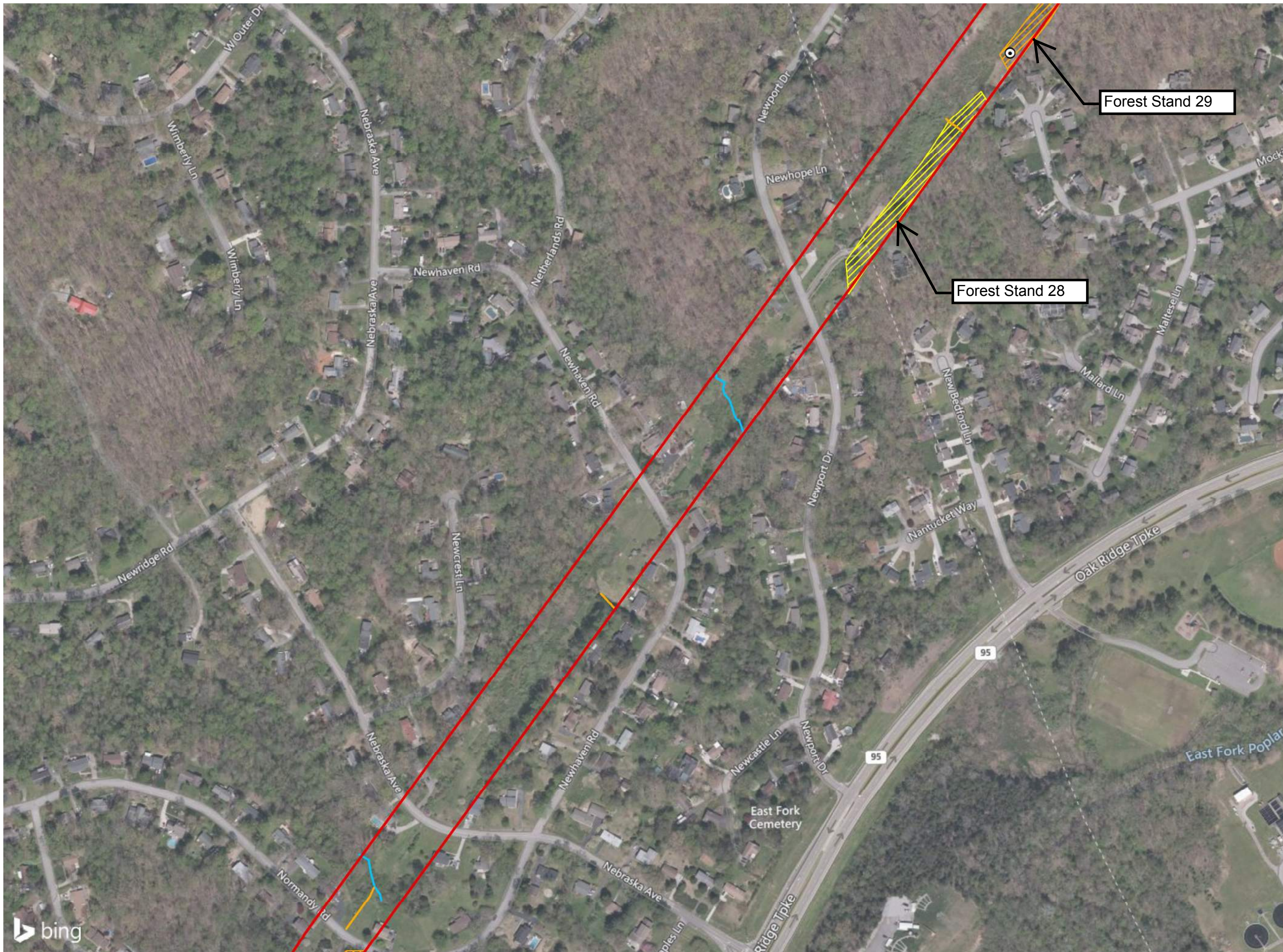
Forest Stand 27

Forest Stand 26



DATA SOURCE: Bing Hybrid Aerial Imagery





KIINGSTON TRANSMISSION LINE - EAST

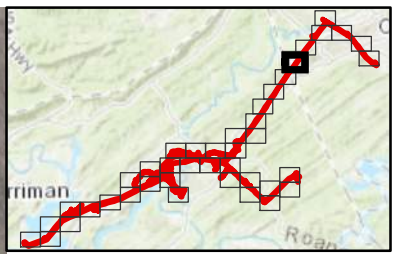
LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery





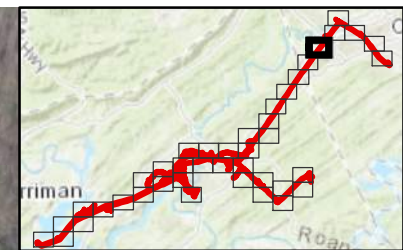
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



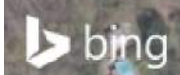
KIINGSTON TRANSMISSION LINE - EAST

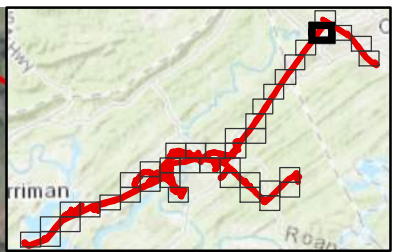
LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery





KIINGSTON TRANSMISSION LINE - EAST

LEGEND

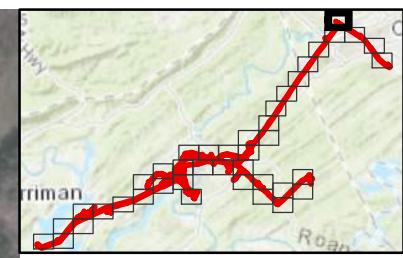
- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

Forest Stand 34



DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINE - EAST

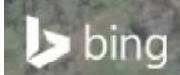
LEGEND

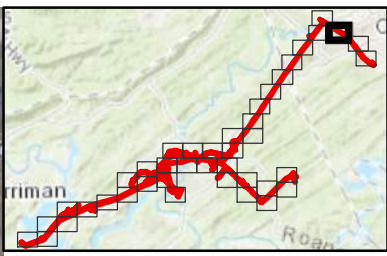
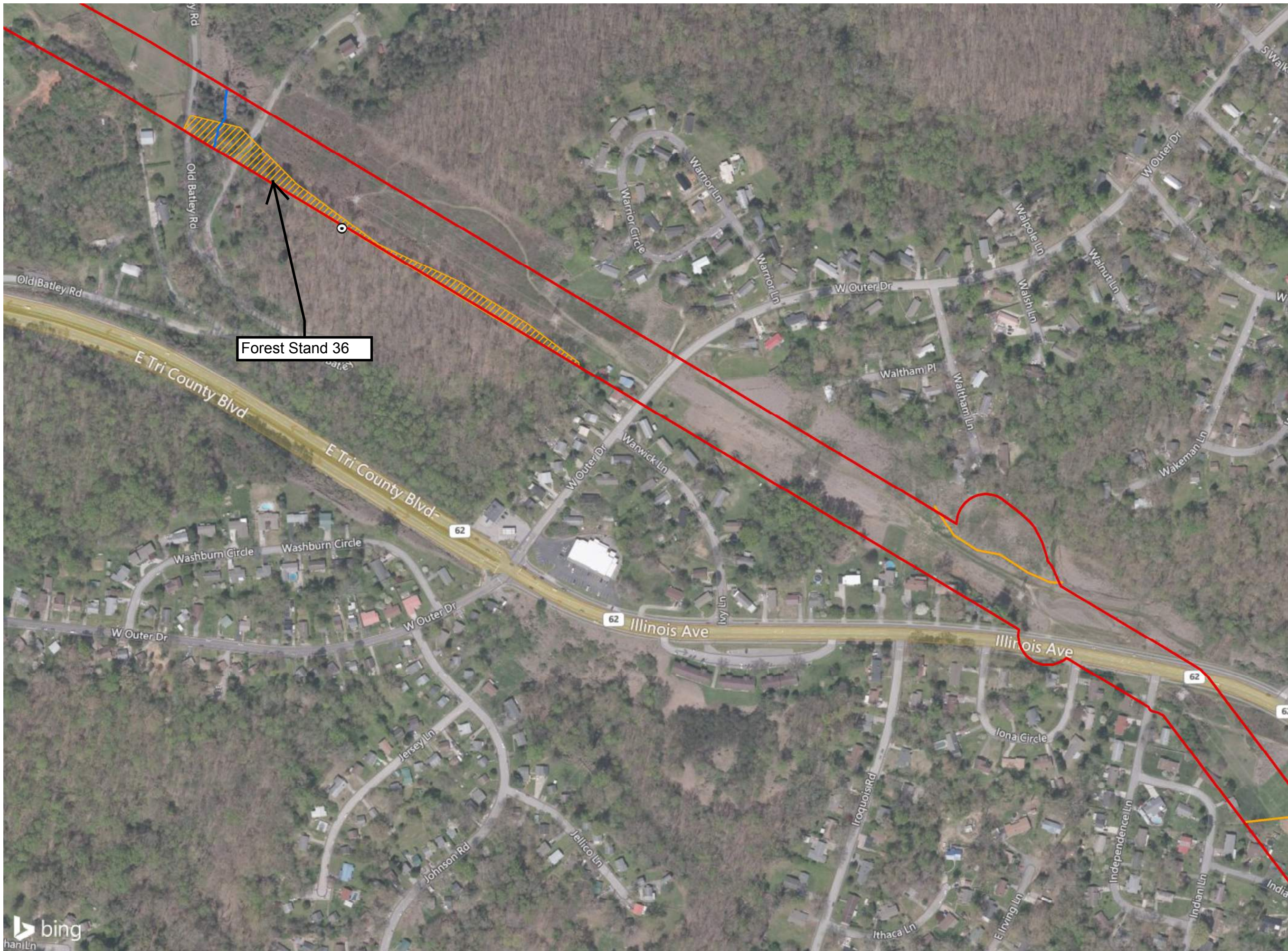
- Study Area
- Osprey
- Milkweed Patch
- Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

Forest Stand 35



DATA SOURCE: Bing Hybrid Aerial Imagery





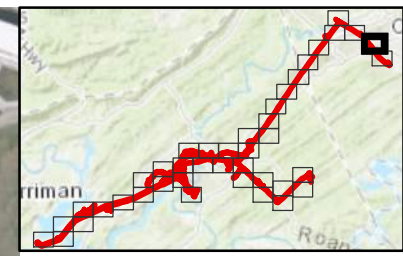
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



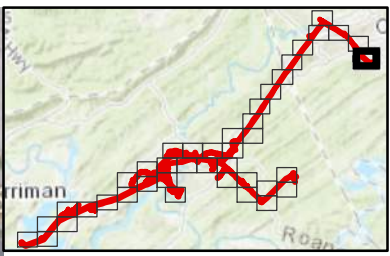
KINGSTON TRANSMISSION LINE - EAST

LEGEND

-  Study Area
-  Osprey
-  Milkweed Patch
-  Snags
-  High Quality Bat Habitat
-  Moderate Quality Bat Habitat
-  Low Quality Bat Habitat
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINE - EAST

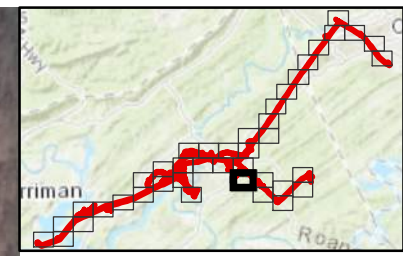
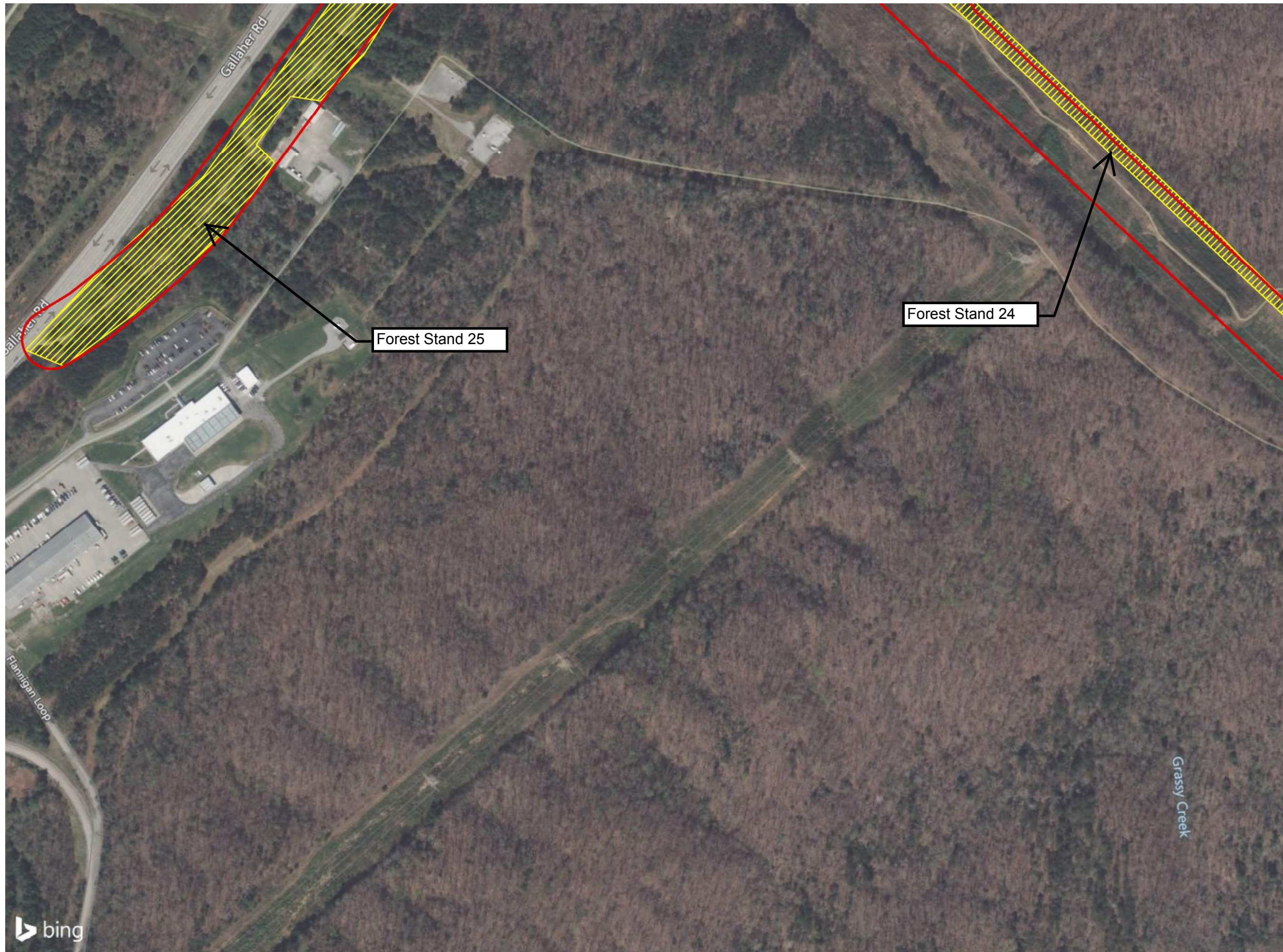
LEGEND

- Study Area
- Osprey
- Milkweed Patch
- Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

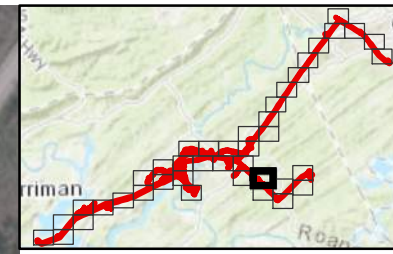
Forest Stand 24

Forest Stand 25



DATA SOURCE: Bing Hybrid Aerial Imagery





KIINGSTON TRANSMISSION LINE - EAST

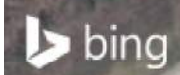
LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

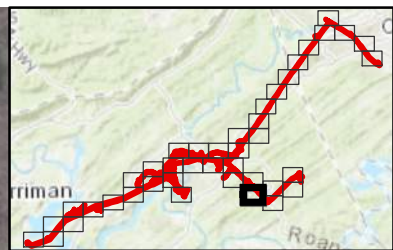
Forest Stand 24

Forest Stand 37

Bear Creek Rd



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINE - EAST

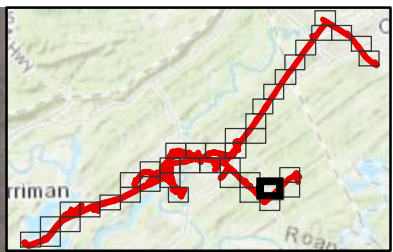
LEGEND

- Study Area
- Osprey
- Milkweed Patch
- Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

Forest Stand 37



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINE - EAST

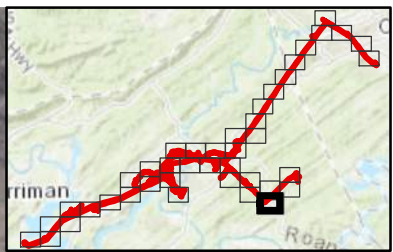
LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland

Forest Stand 38



DATA SOURCE: Bing Hybrid Aerial Imagery



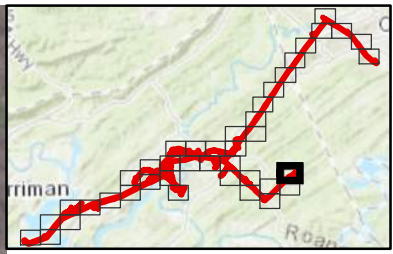
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Opsprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland













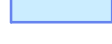




DATA SOURCE: Bing Hybrid Aerial Imagery



**KIINGSTON TRANSMISSION
LINE - EAST**

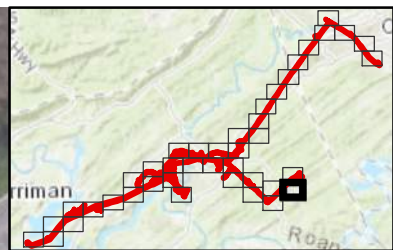
LEGEND

-  Study Area
-  Osprey
-  Milkweed Patch
-  Snags
-  High Quality Bat Habitat
-  Moderate Quality Bat Habitat
-  Low Quality Bat Habitat
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland

Forest Stand 40

Forest Stand 39





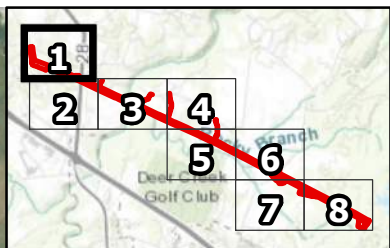
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



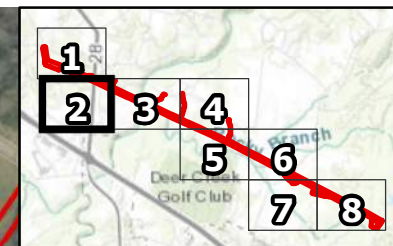
KINGSTON TRANSMISSION LINE - WEST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- HDR Delineated Stream
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



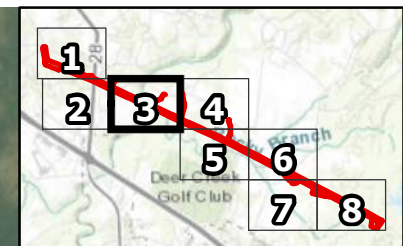
KIINGSTON TRANSMISSION LINE - WEST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- HDR Delineated Stream
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery

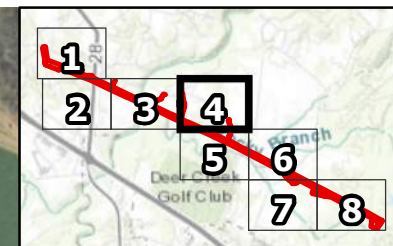


KINGSTON TRANSMISSION LINE - WEST

- LEGEND**
- Study Area
 - Osprey
 - Milkweed Patch
 - ⊙ Snags
 - High Quality Bat Habitat
 - Moderate Quality Bat Habitat
 - Low Quality Bat Habitat
 - Culvert
 - Delineated Perennial Stream
 - Delineated Intermittent Streams
 - Wet Weather Conveyance
 - HDR Delineated Stream
 - HDR Delineated Open Water
 - HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



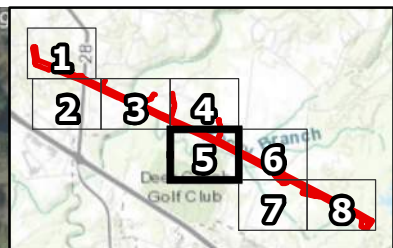
KINGSTON TRANSMISSION LINE - WEST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- HDR Delineated Stream
- HDR Delineated Open Water
- HDR Delineated Wetland

















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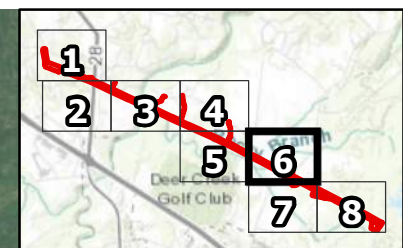
KIINGSTON TRANSMISSION LINE - WEST

LEGEND

-  Study Area
-  Osprey
-  Milkweed Patch
-  Snags
-  High Quality Bat Habitat
-  Moderate Quality Bat Habitat
-  Low Quality Bat Habitat
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  HDR Delineated Stream
-  HDR Delineated Open Water
-  HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



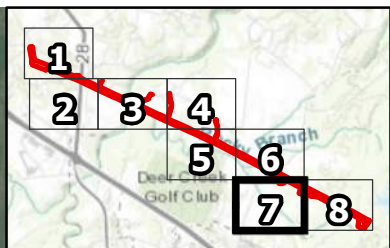
KIINGSTON TRANSMISSION LINE - WEST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- HDR Delineated Stream
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



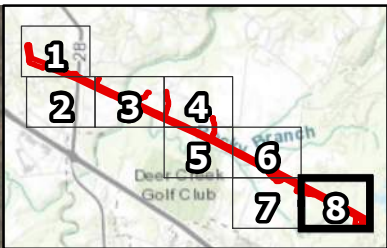
KINGSTON TRANSMISSION LINE - WEST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- HDR Delineated Stream
- HDR Delineated Open Water
- HDR Delineated Wetland



DATA SOURCE: Bing Hybrid Aerial Imagery



KIINGSTON TRANSMISSION LINE - WEST

LEGEND

- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- HDR Delineated Stream
- HDR Delineated Open Water
- HDR Delineated Wetland

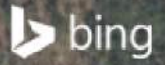
Forest Stand 3



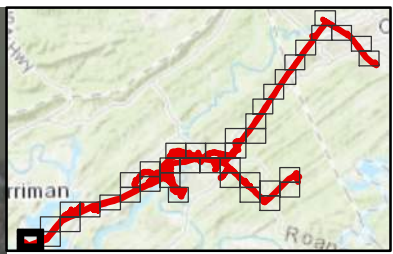
Potter Creek

Potter Creek

Walton Rd



DATA SOURCE: Bing Hybrid Aerial Imagery



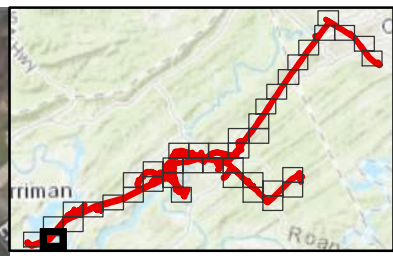
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



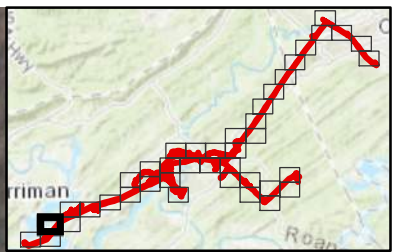
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



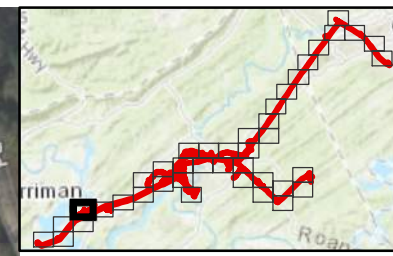
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



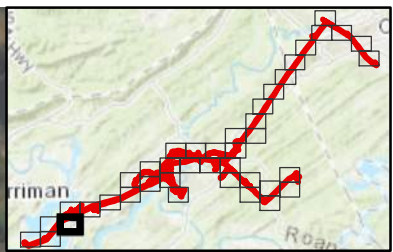
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



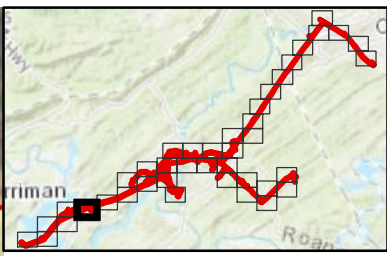
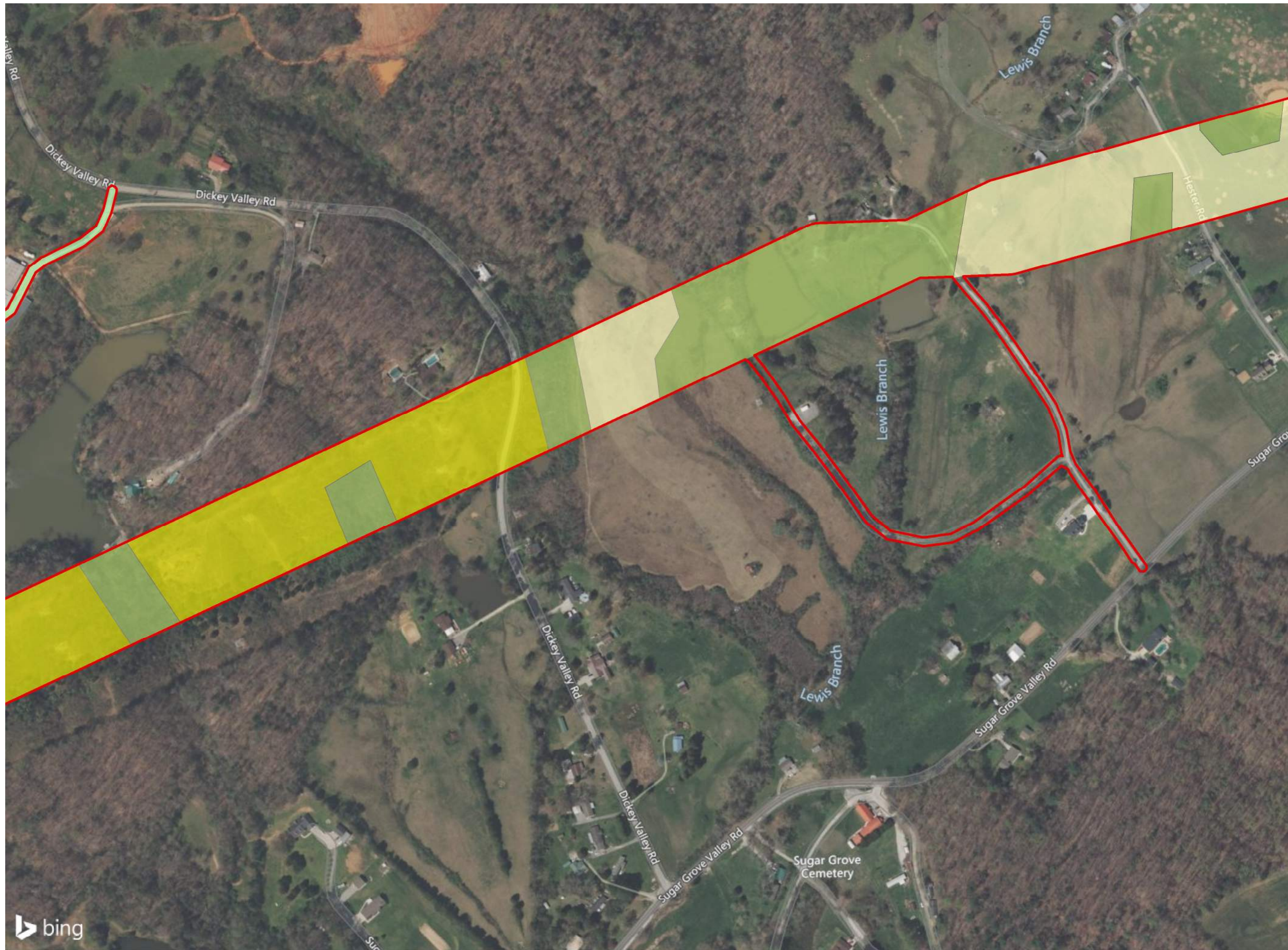
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



KIINGSTON TRANSMISSION LINE - EAST

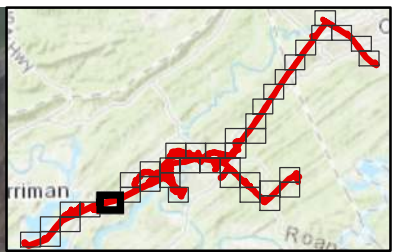
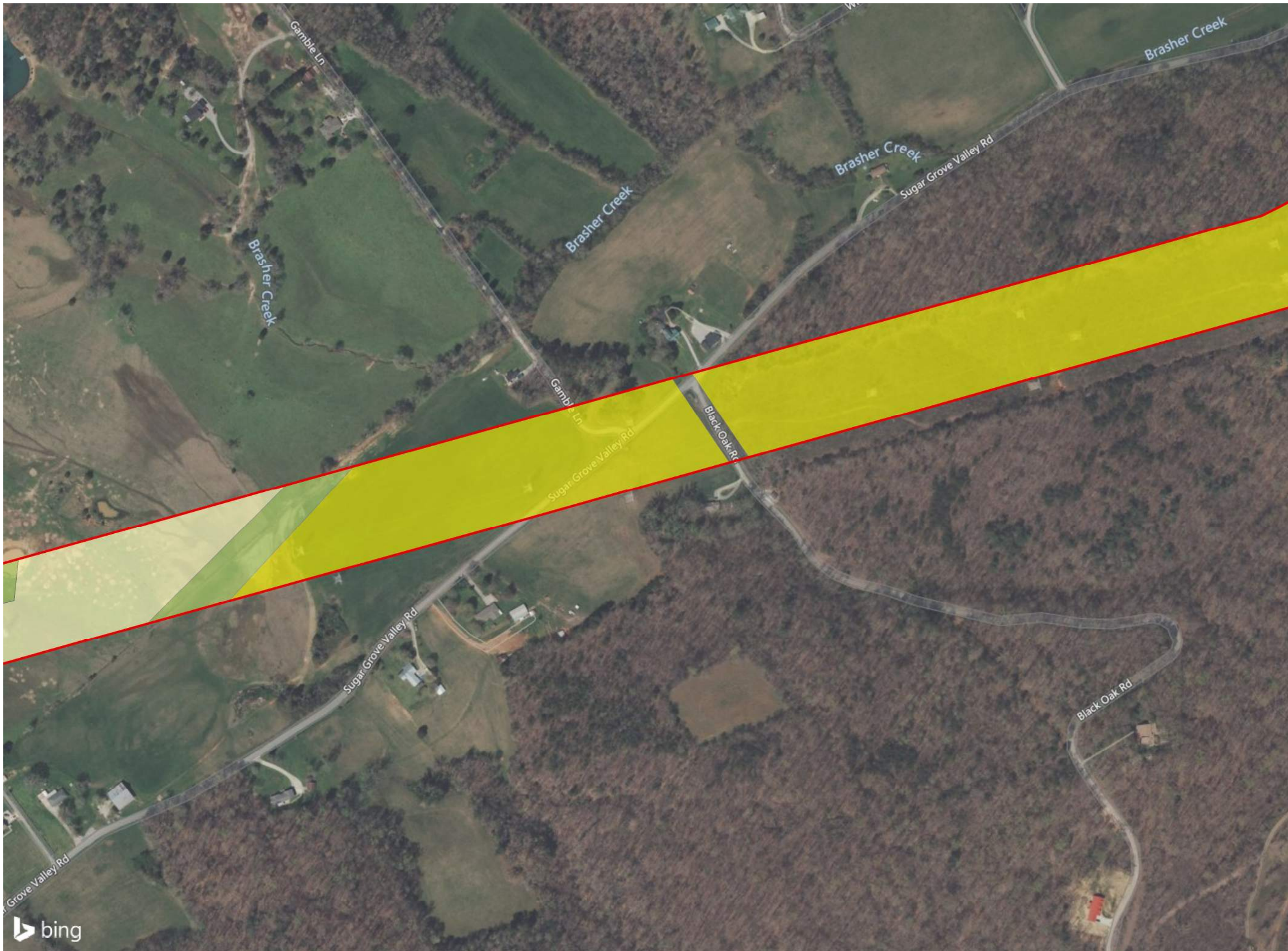
LEGEND

- Study Area
- Vegetation Community
 - Dry Deciduous
 - Dry Herbaceous
 - Kudzu Infested
 - Maintained Access Road
 - Maintained Lawn
 - Open Water
 - Pasture/Hay
 - Pasture/Maintained Lawn
 - Wet Deciduous
 - Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery





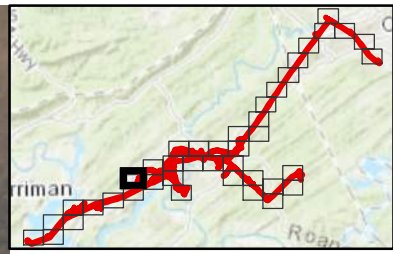
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



**KIINGSTON TRANSMISSION
LINE - EAST**

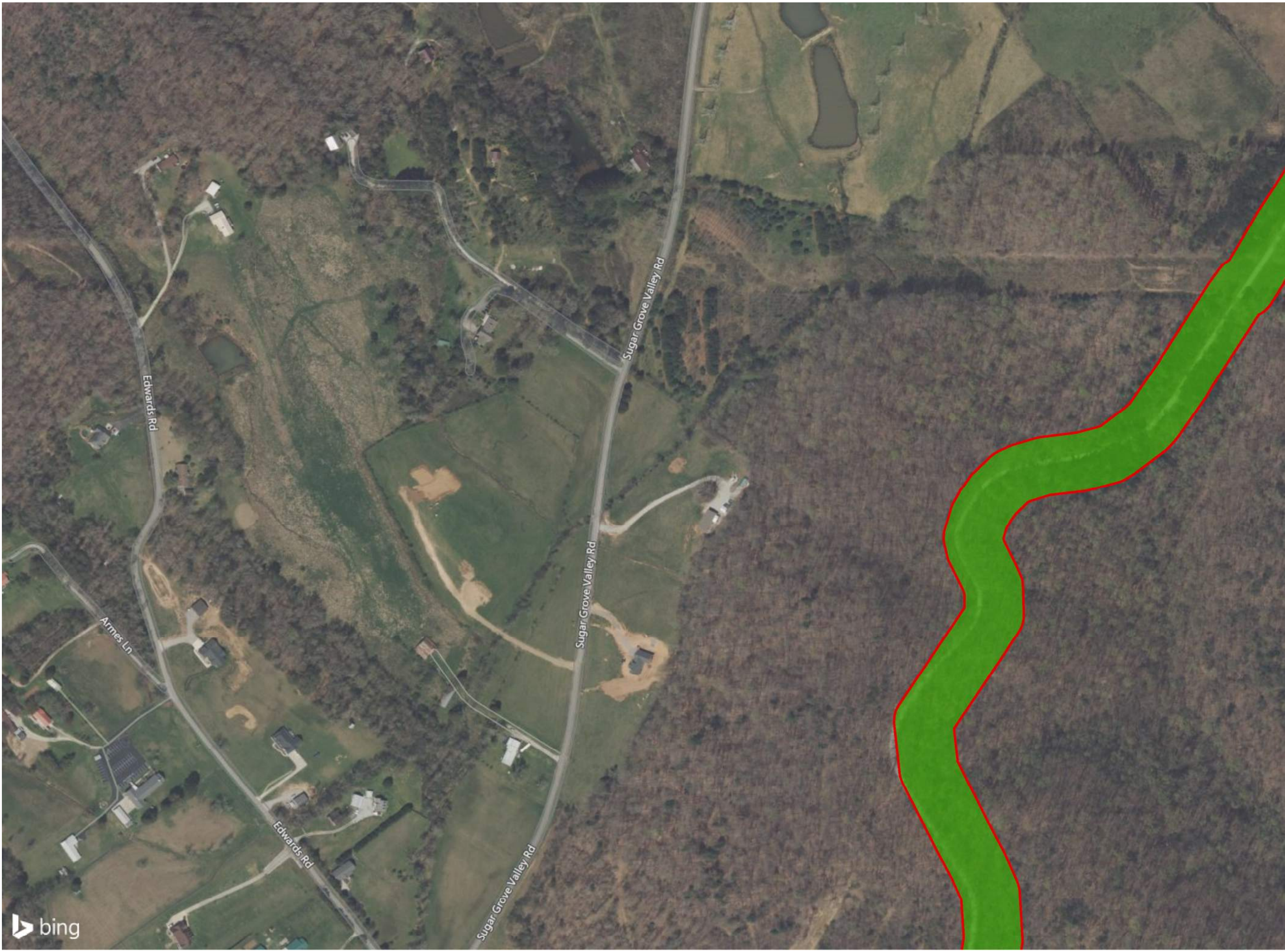
LEGEND

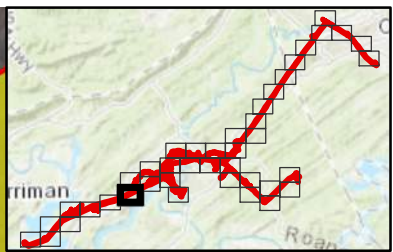
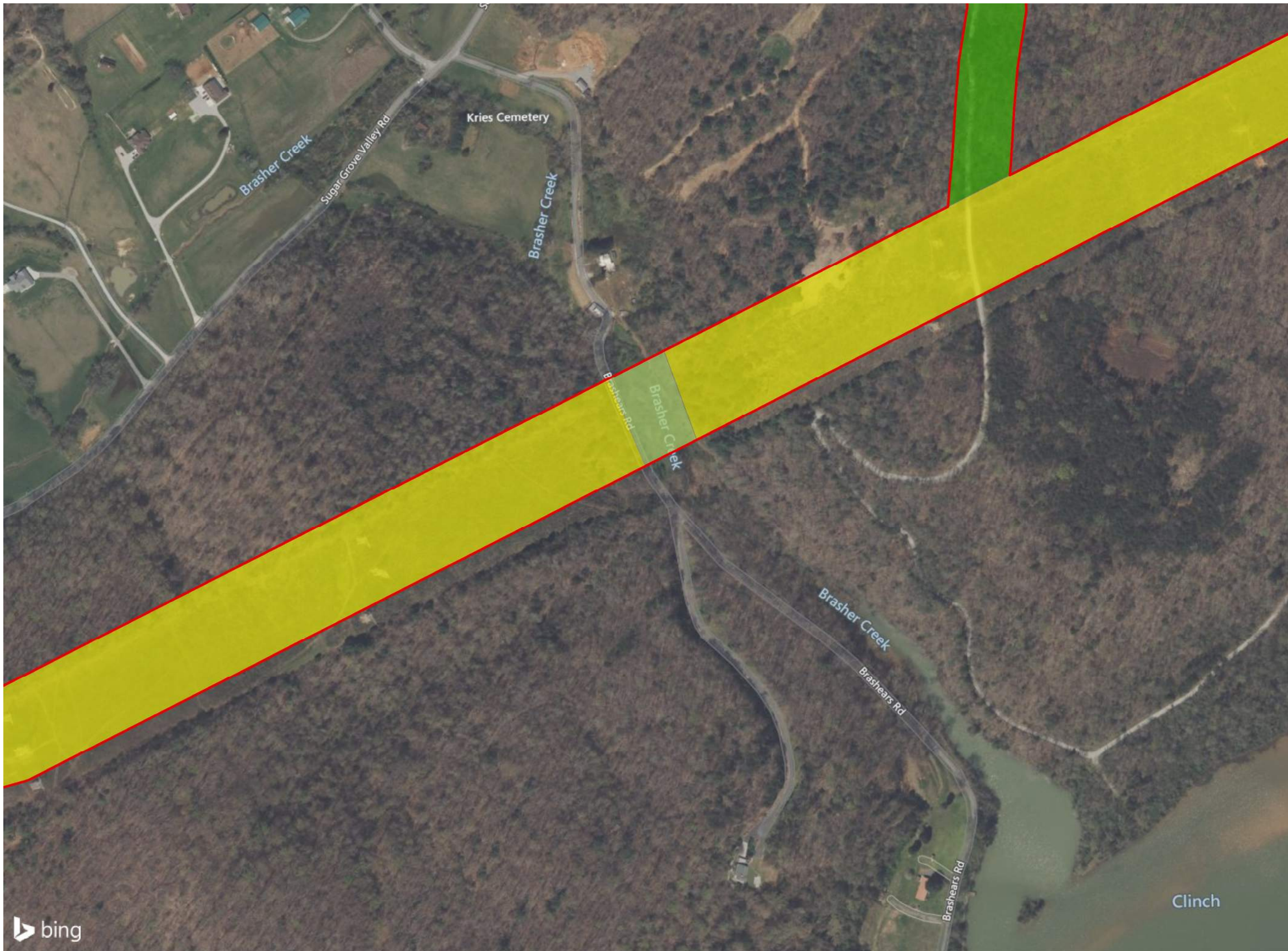
- Study Area

- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery





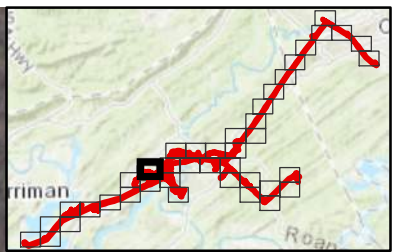
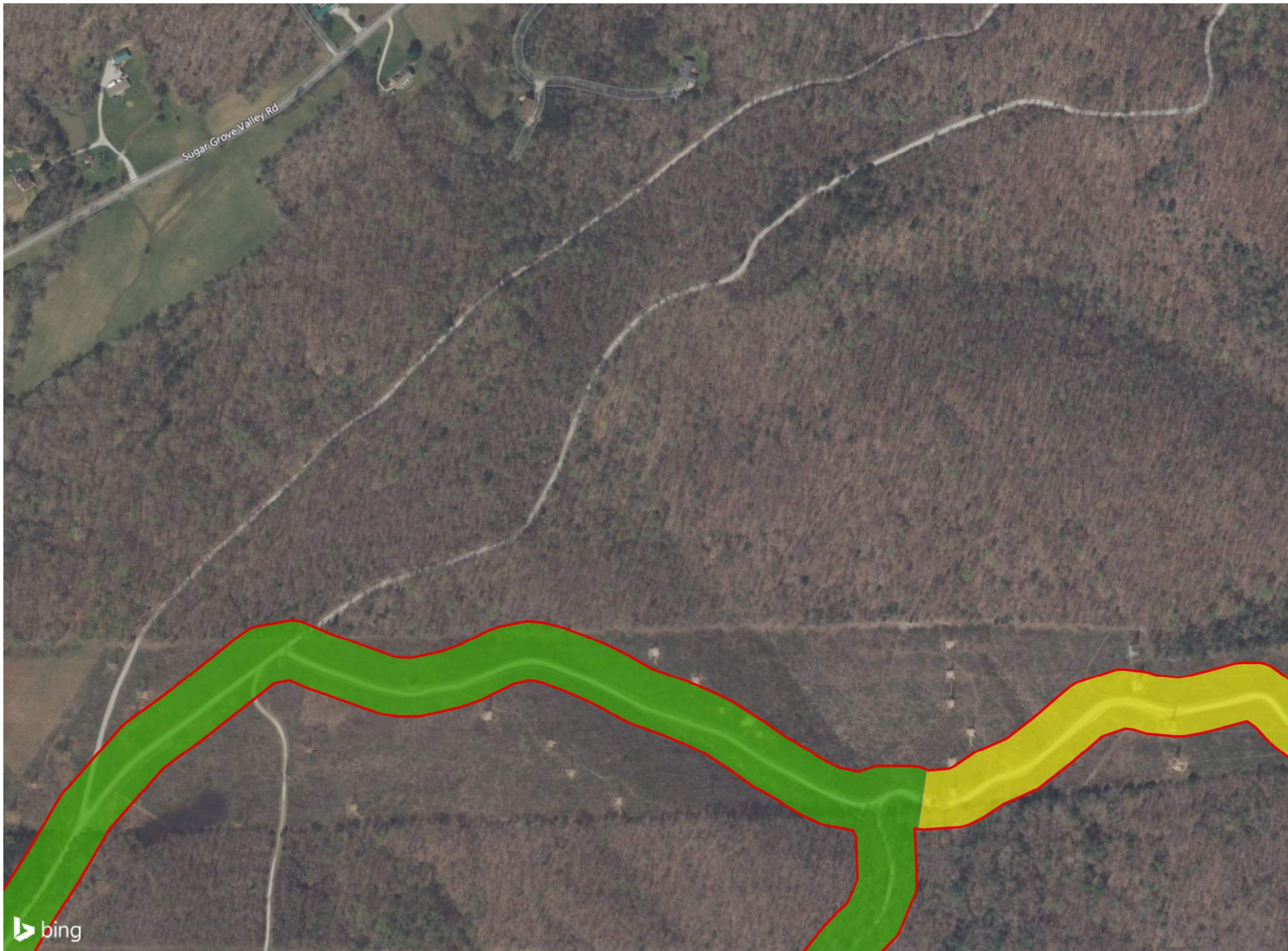
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



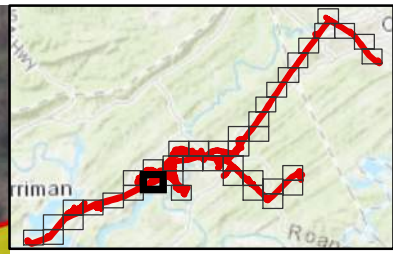
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



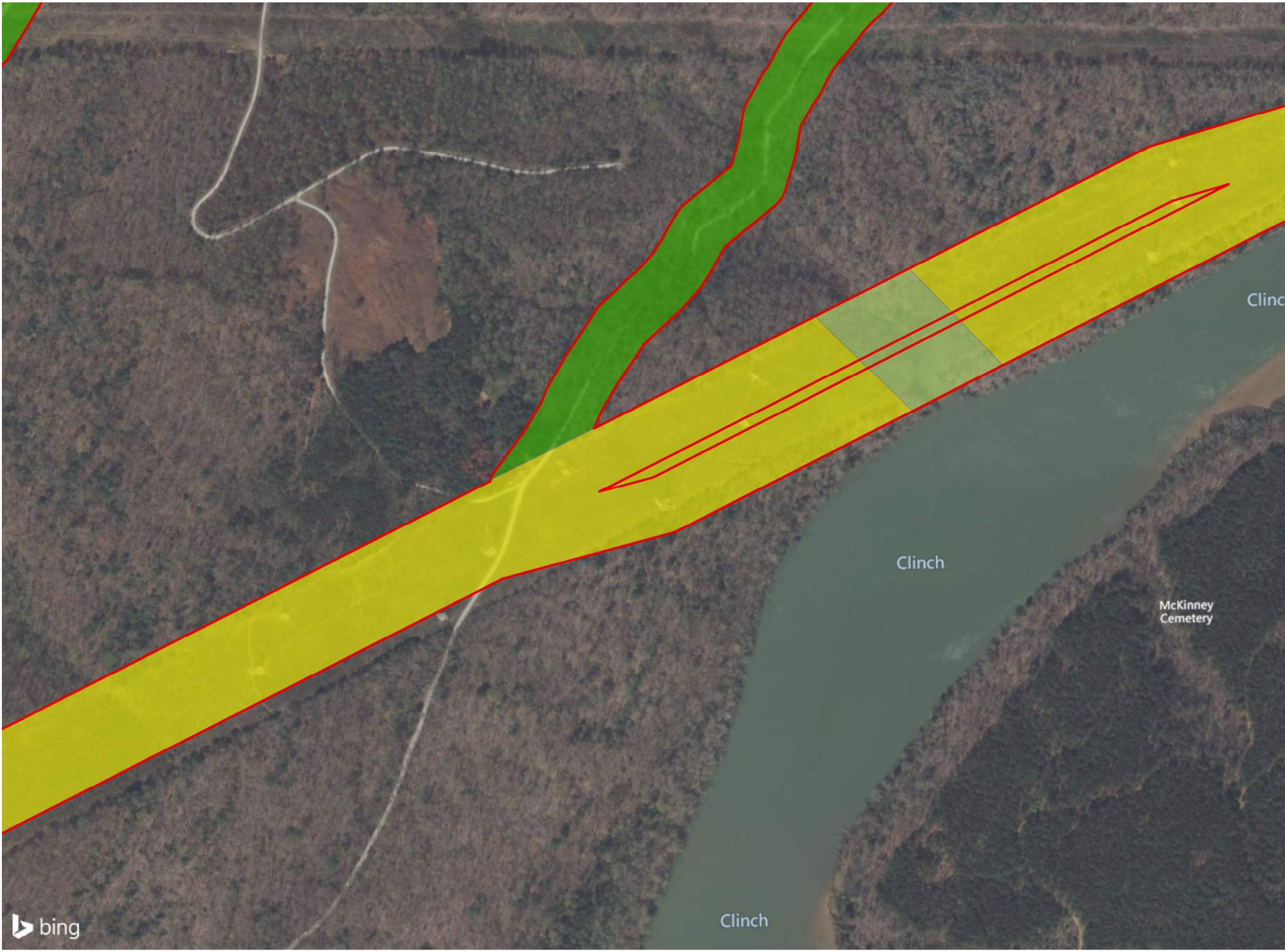
DATA SOURCE: Bing Hybrid Aerial Imagery



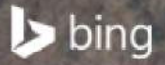
**KIINGSTON TRANSMISSION
LINE - EAST**

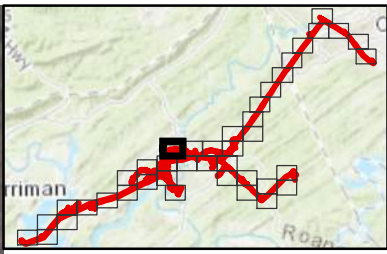
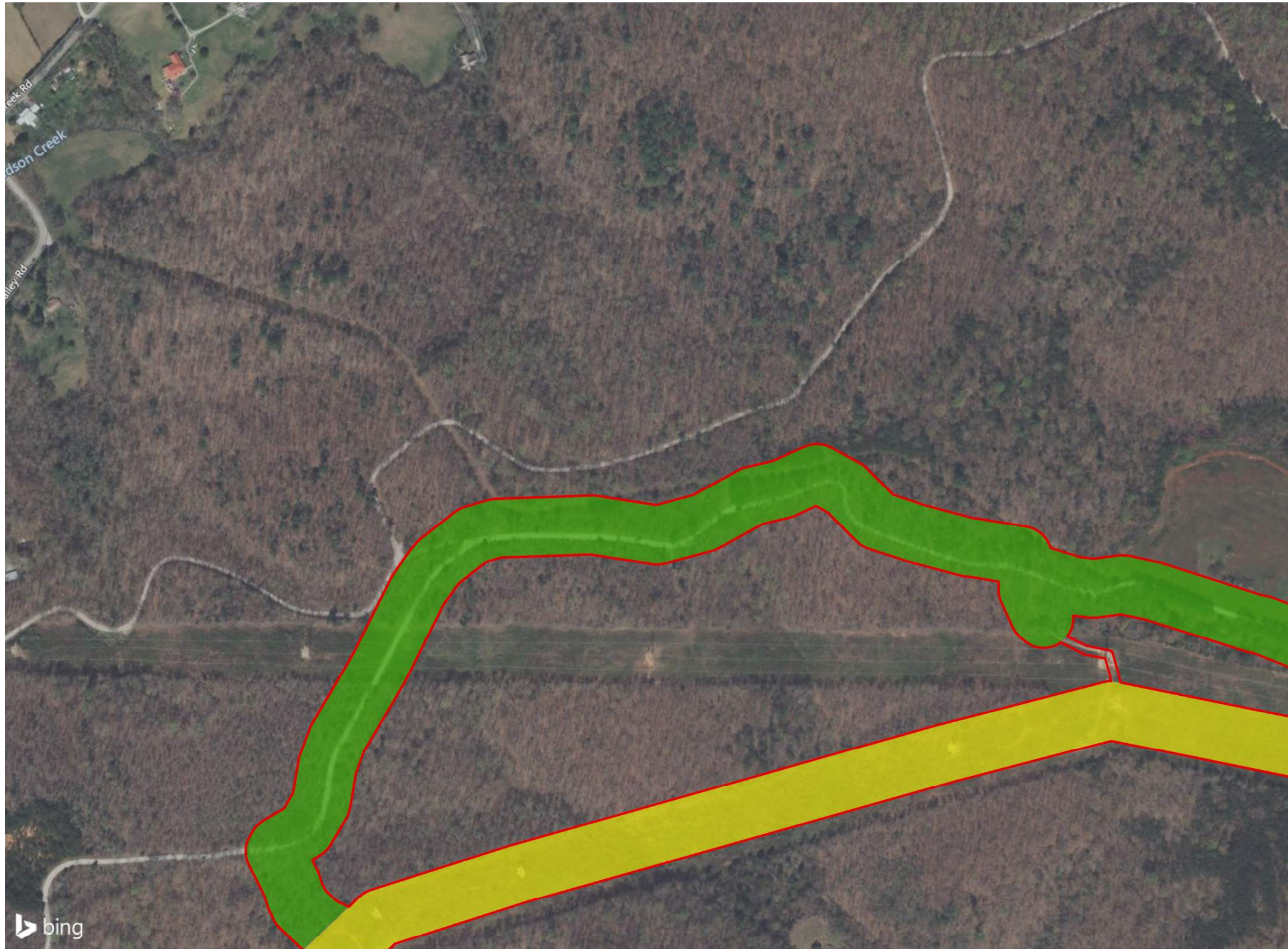
LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery





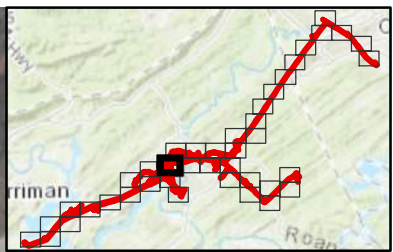
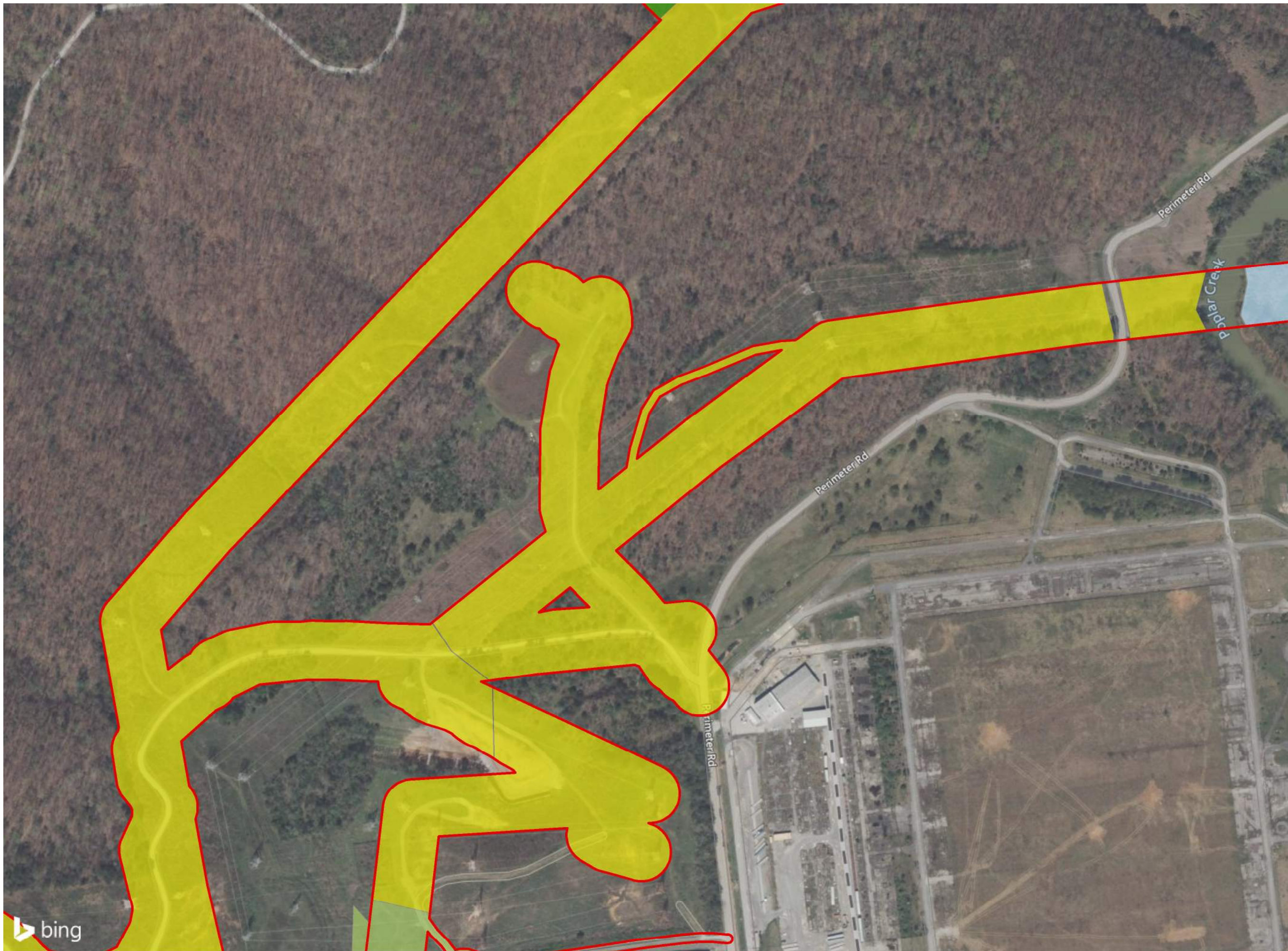
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



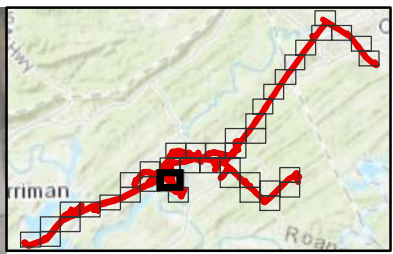
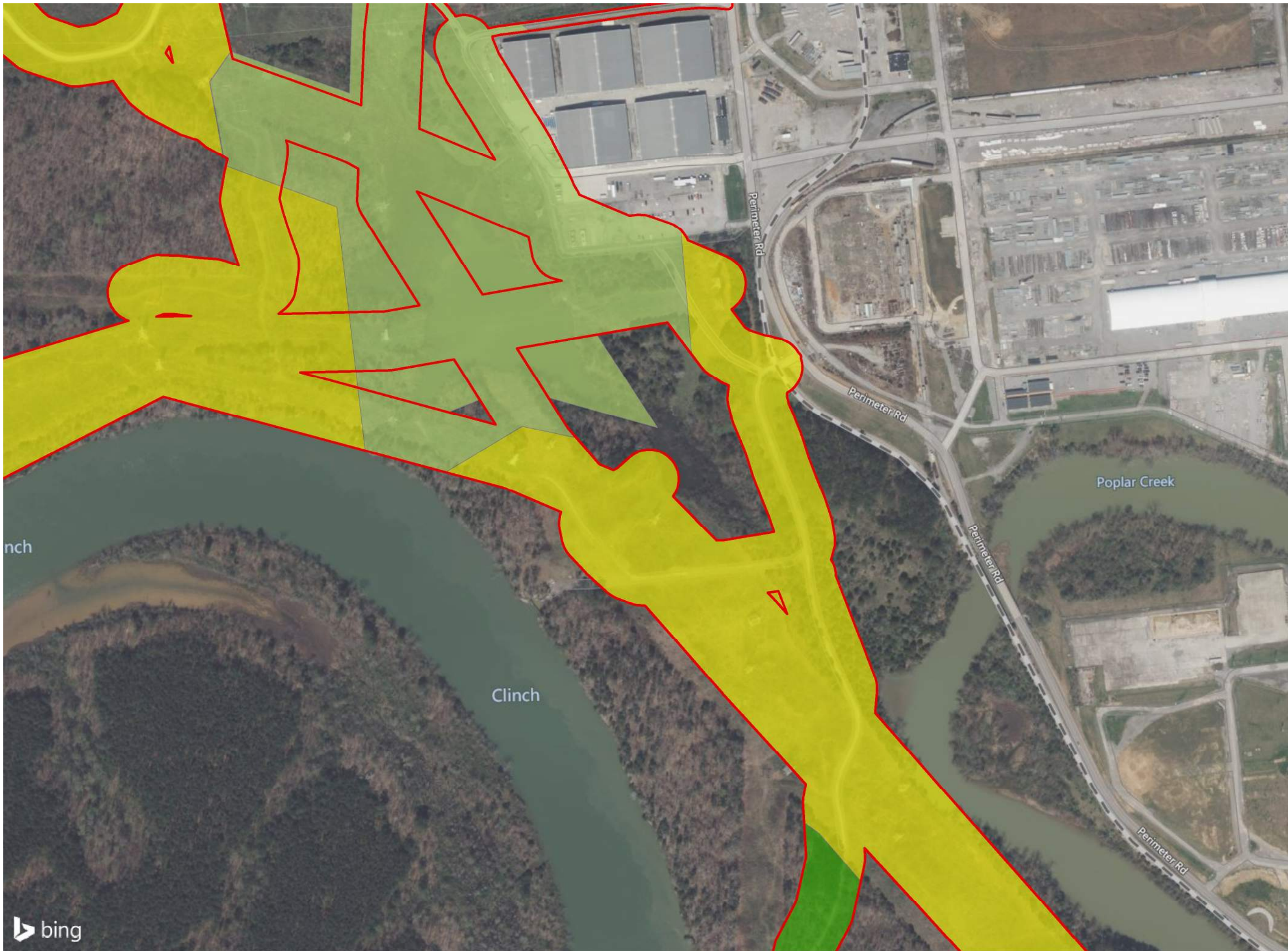
**KINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



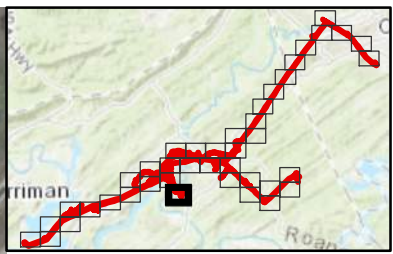
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



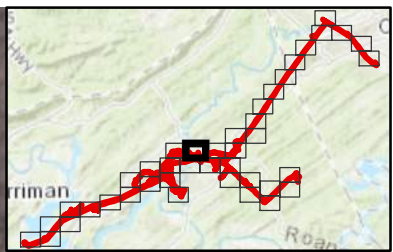
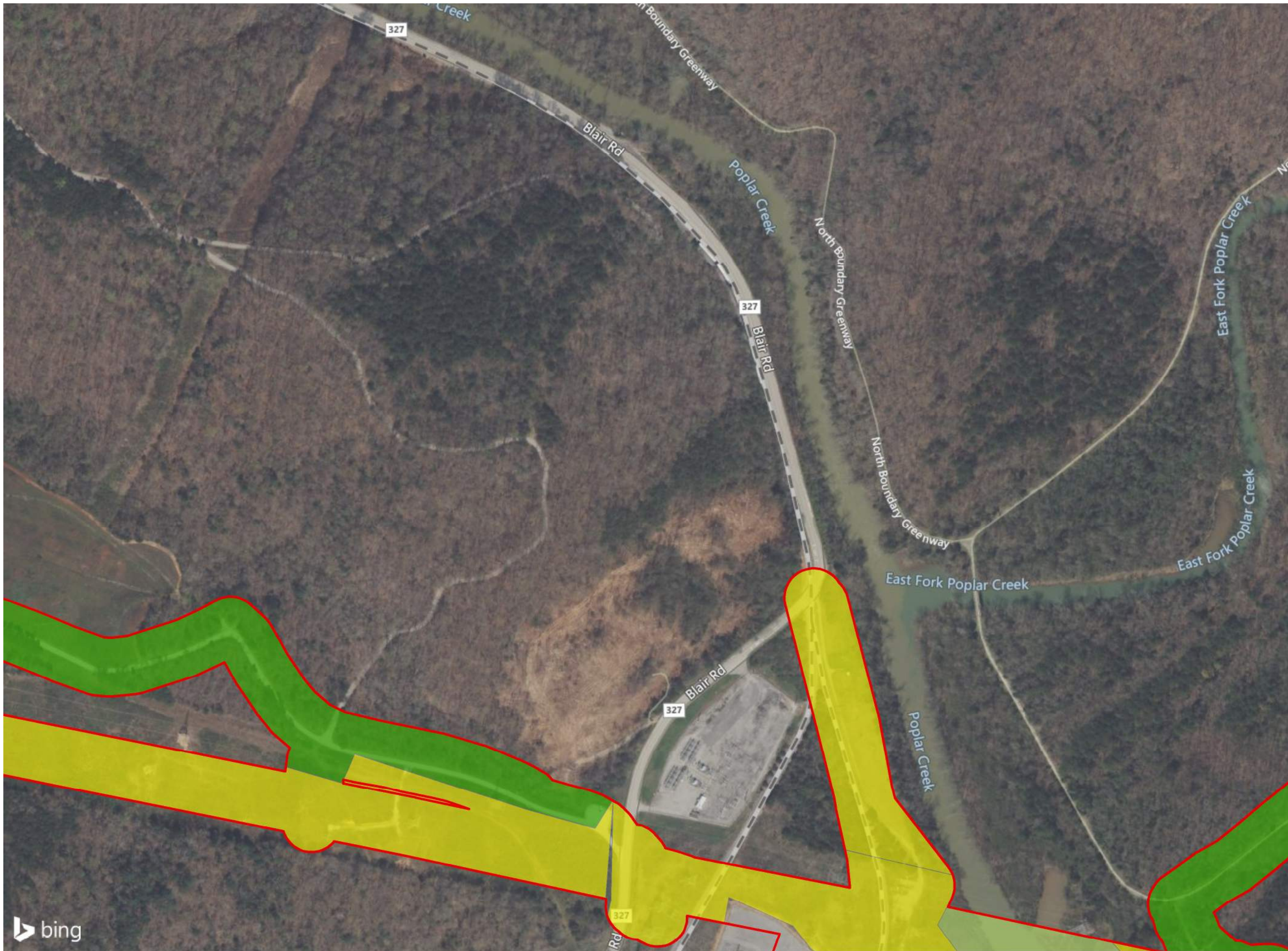
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



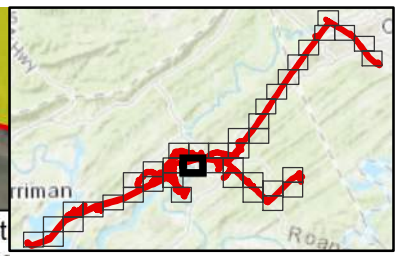
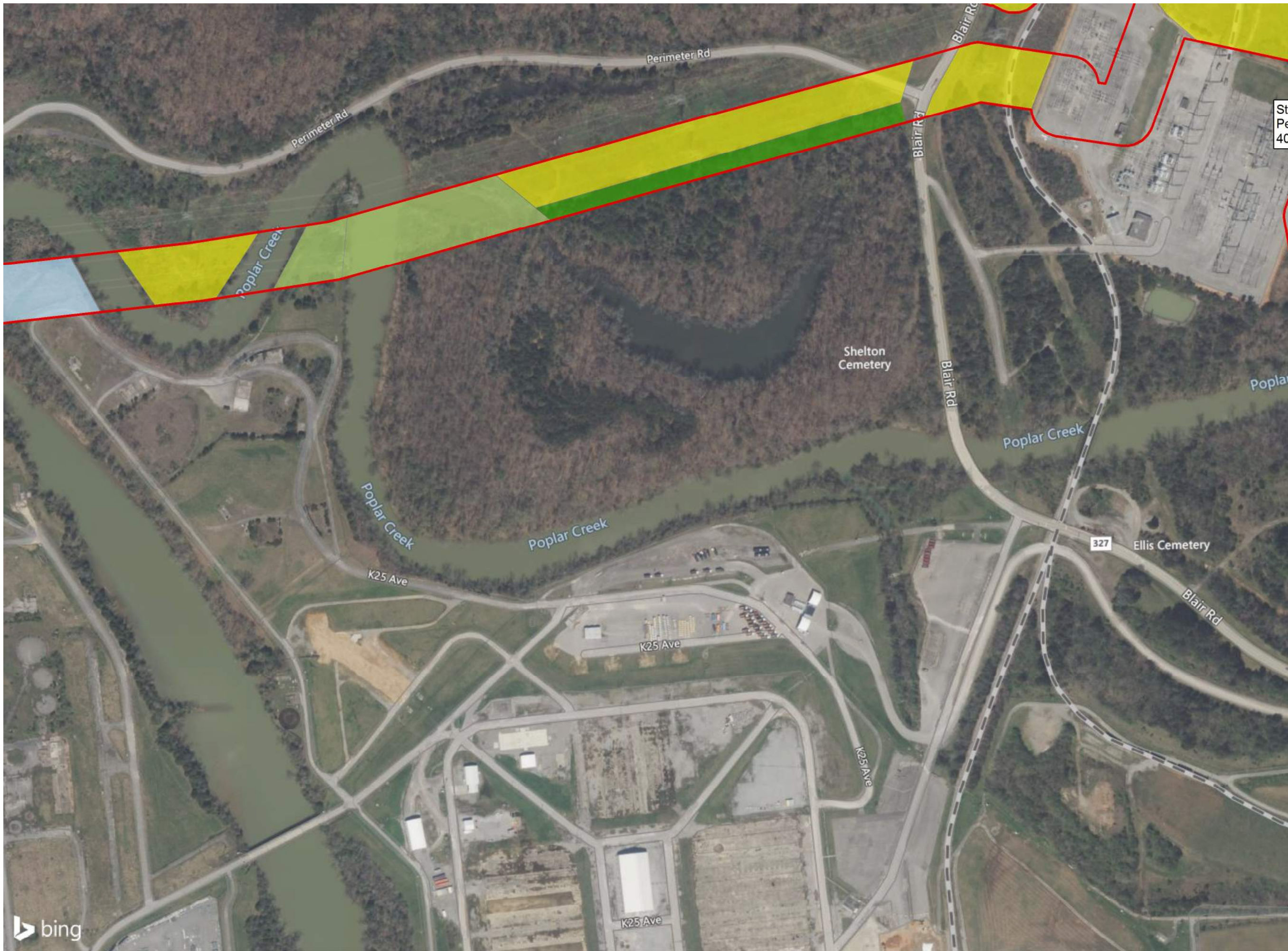
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



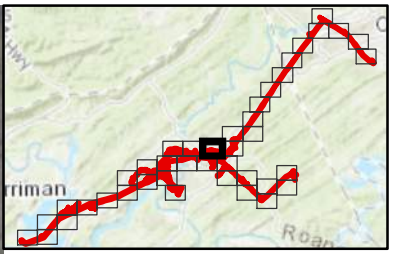
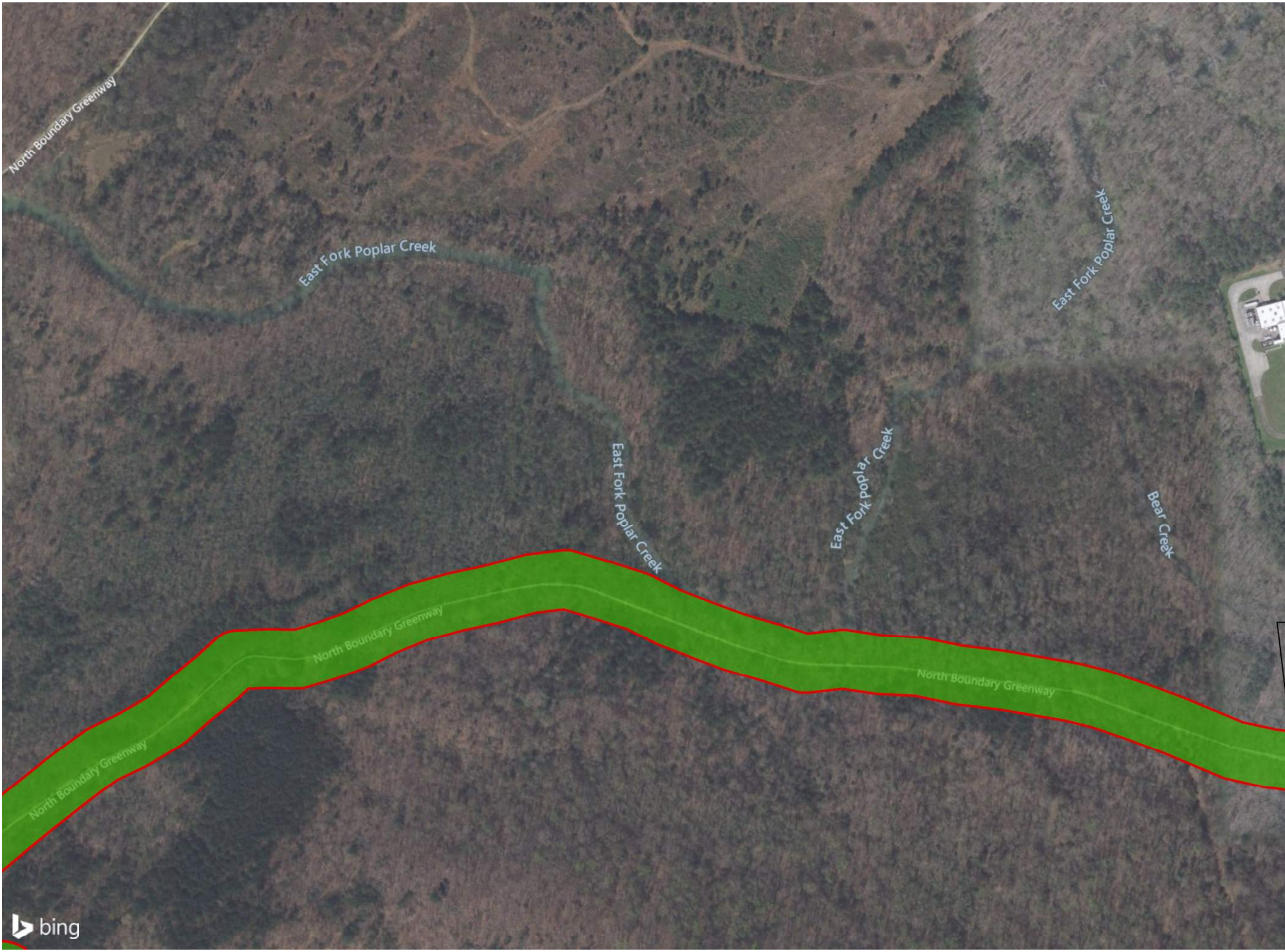
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery

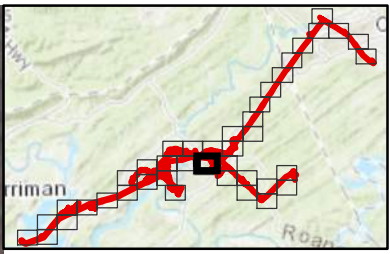


KIINGSTON TRANSMISSION LINE - EAST

- LEGEND**
- Study Area
 - Vegetation Community
 - Dry Deciduous
 - Dry Herbaceous
 - Kudzu Infested
 - Maintained Access Road
 - Maintained Lawn
 - Open Water
 - Pasture/Hay
 - Pasture/Maintained Lawn
 - Wet Deciduous
 - Wet Herbaceous




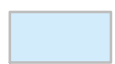
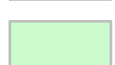
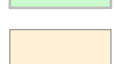



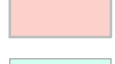



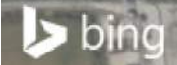
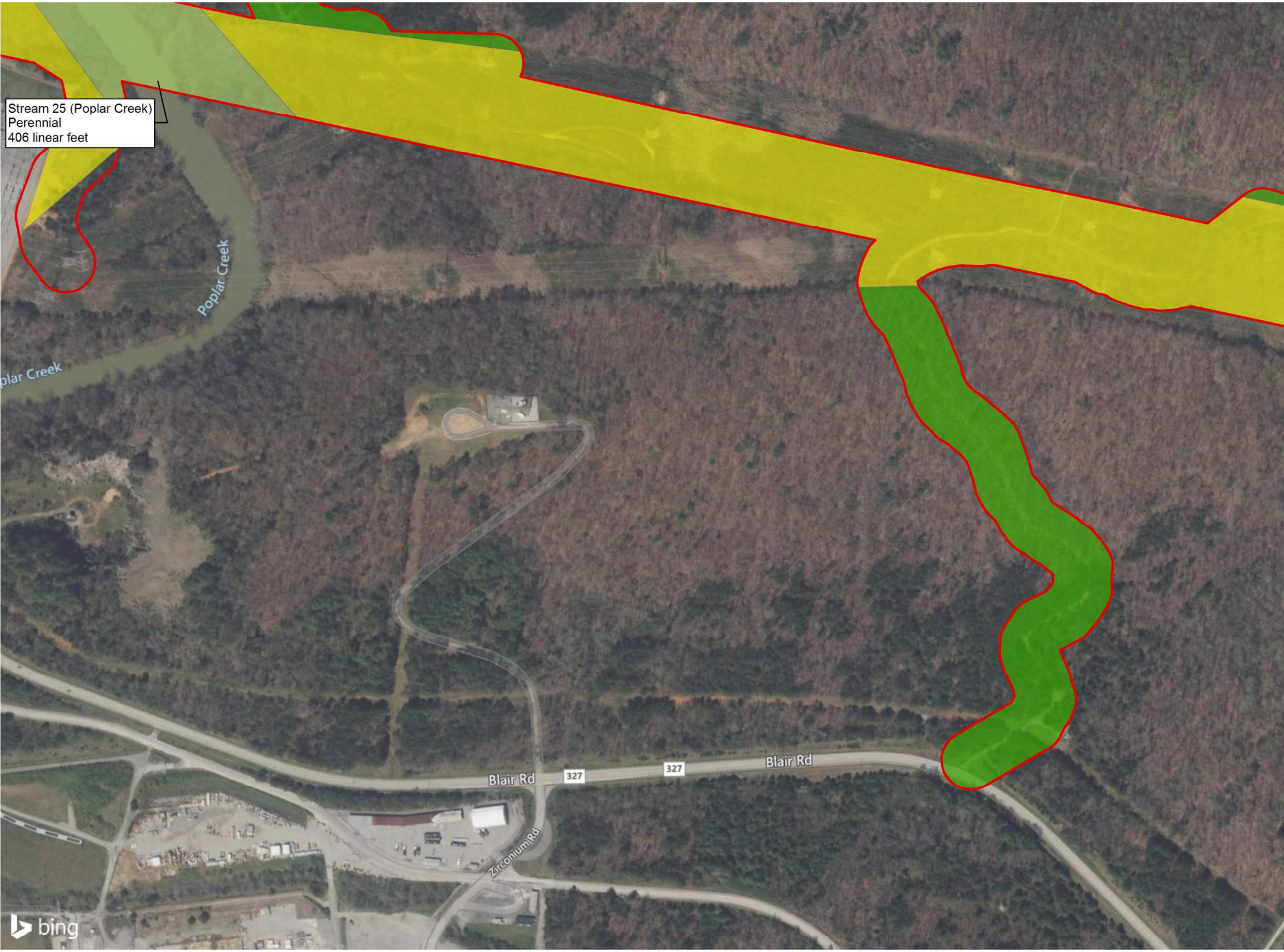
Stream 25 (Poplar Creek)
Perennial
406 linear feet



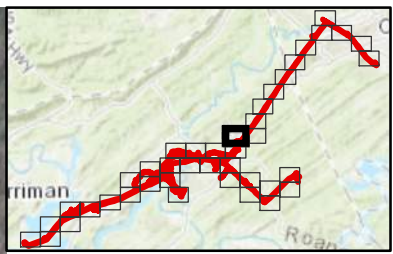
KIINGSTON TRANSMISSION
LINE - EAST

LEGEND

-  Study Area
- Vegetation Community
 -  Dry Deciduous
 -  Dry Herbaceous
 -  Kudzu Infested
 -  Maintained Access Road
 -  Maintained Lawn
 -  Open Water
 -  Pasture/Hay
 -  Pasture/Maintained Lawn
 -  Wet Deciduous
 -  Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



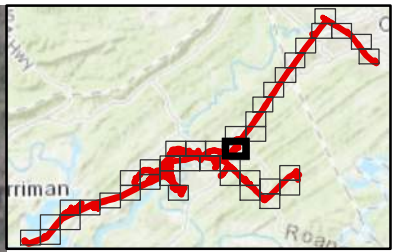
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



**KIINGSTON TRANSMISSION
LINE - EAST**

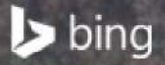
LEGEND

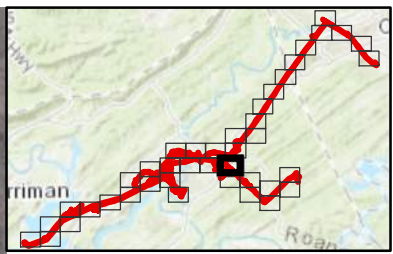
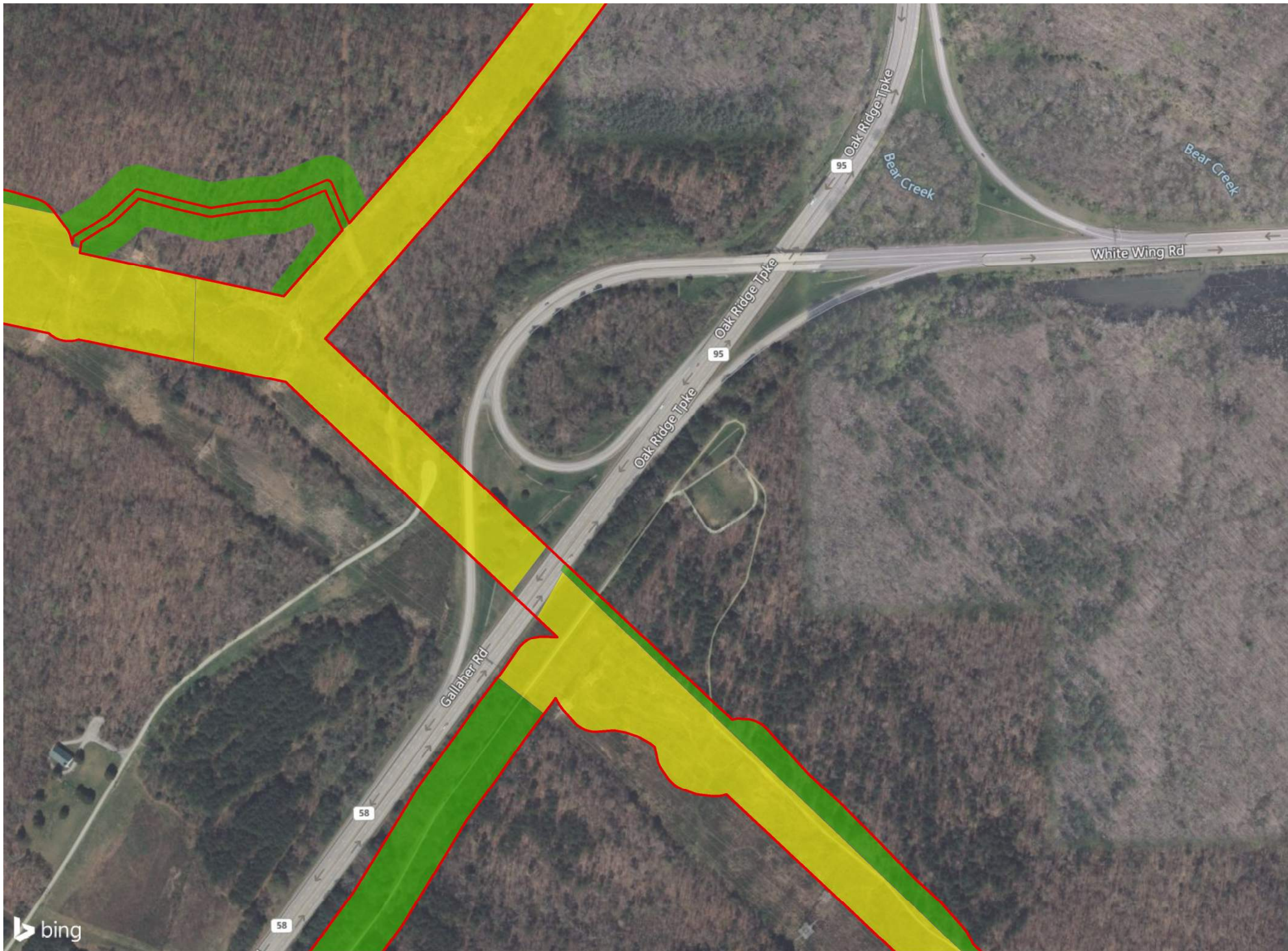
- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous

Stream 28
(East Fork Poplar Creek)
Perennial
203 linear feet



DATA SOURCE: Bing Hybrid Aerial Imagery





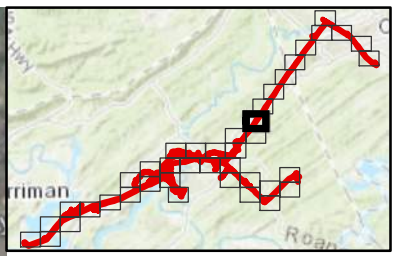
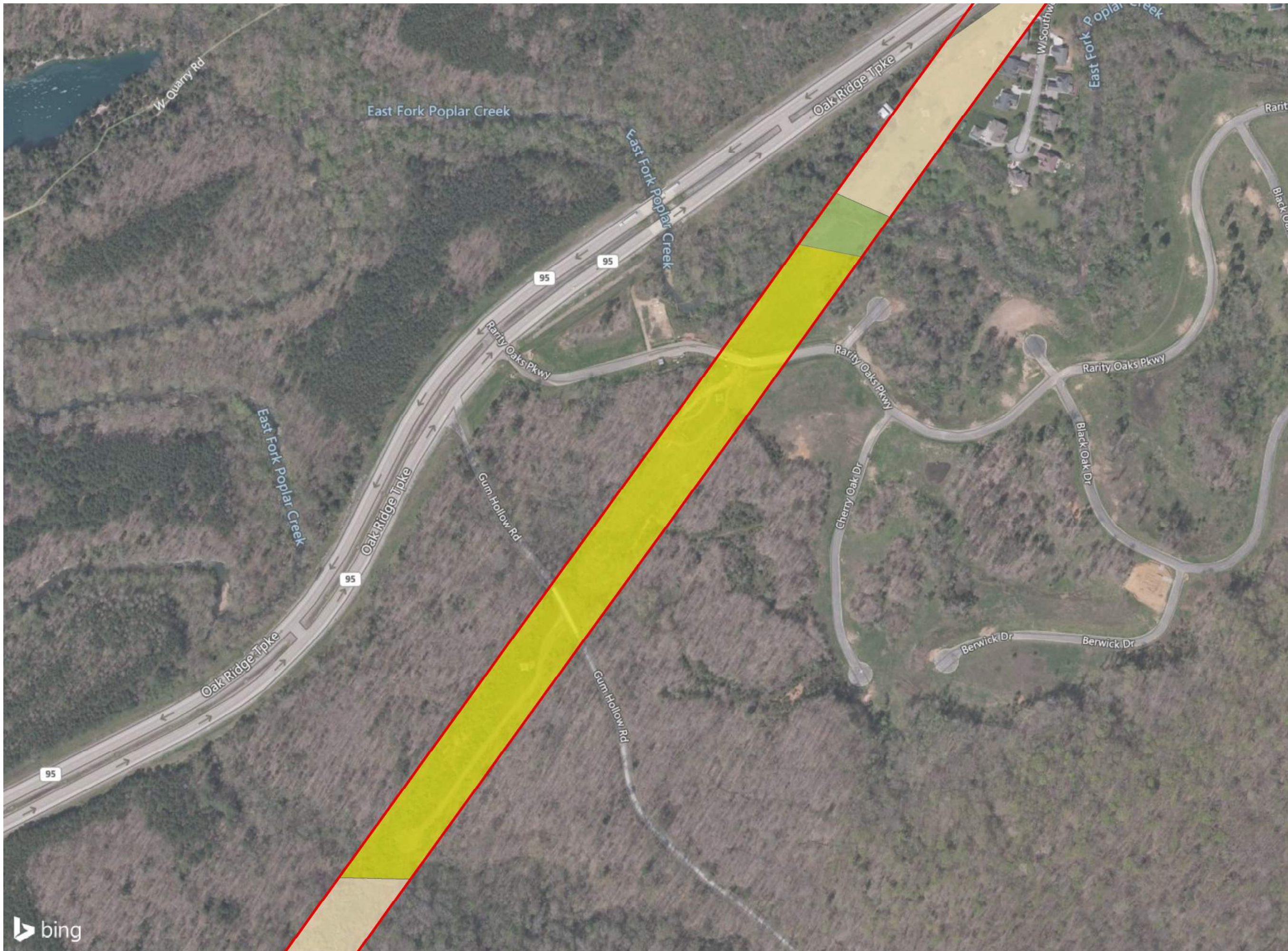
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



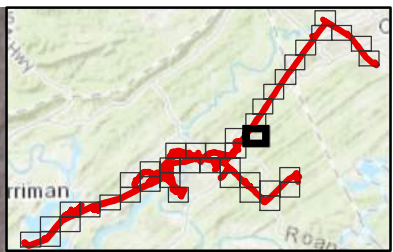
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



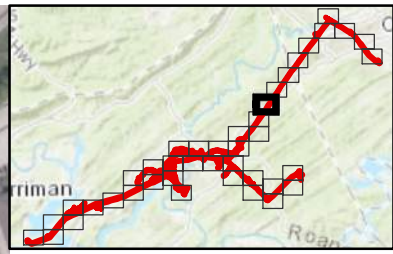
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



**KIINGSTON TRANSMISSION
LINE - EAST**

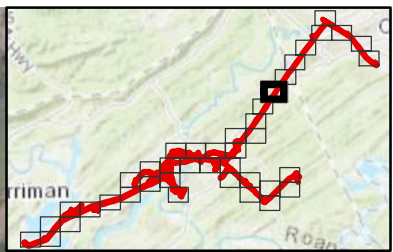
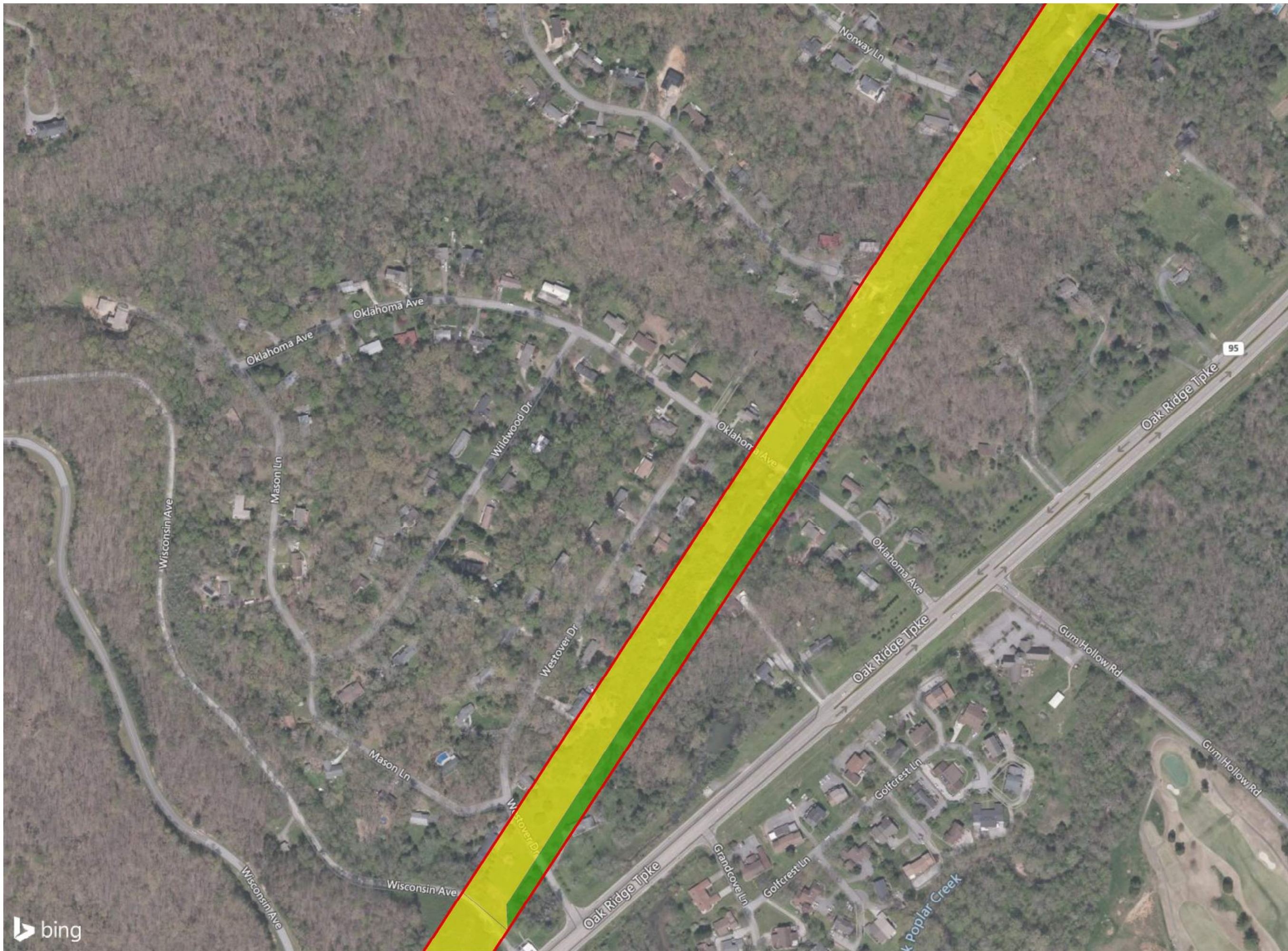


LEGEND

-  Study Area
- Vegetation Community**
-  Dry Deciduous
-  Dry Herbaceous
-  Kudzu Infested
-  Maintained Access Road
-  Maintained Lawn
-  Open Water
-  Pasture/Hay
-  Pasture/Maintained Lawn
-  Wet Deciduous
-  Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



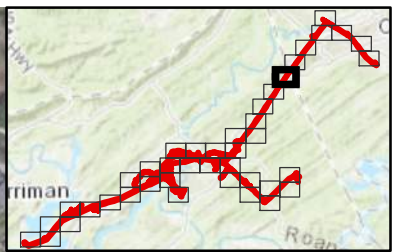
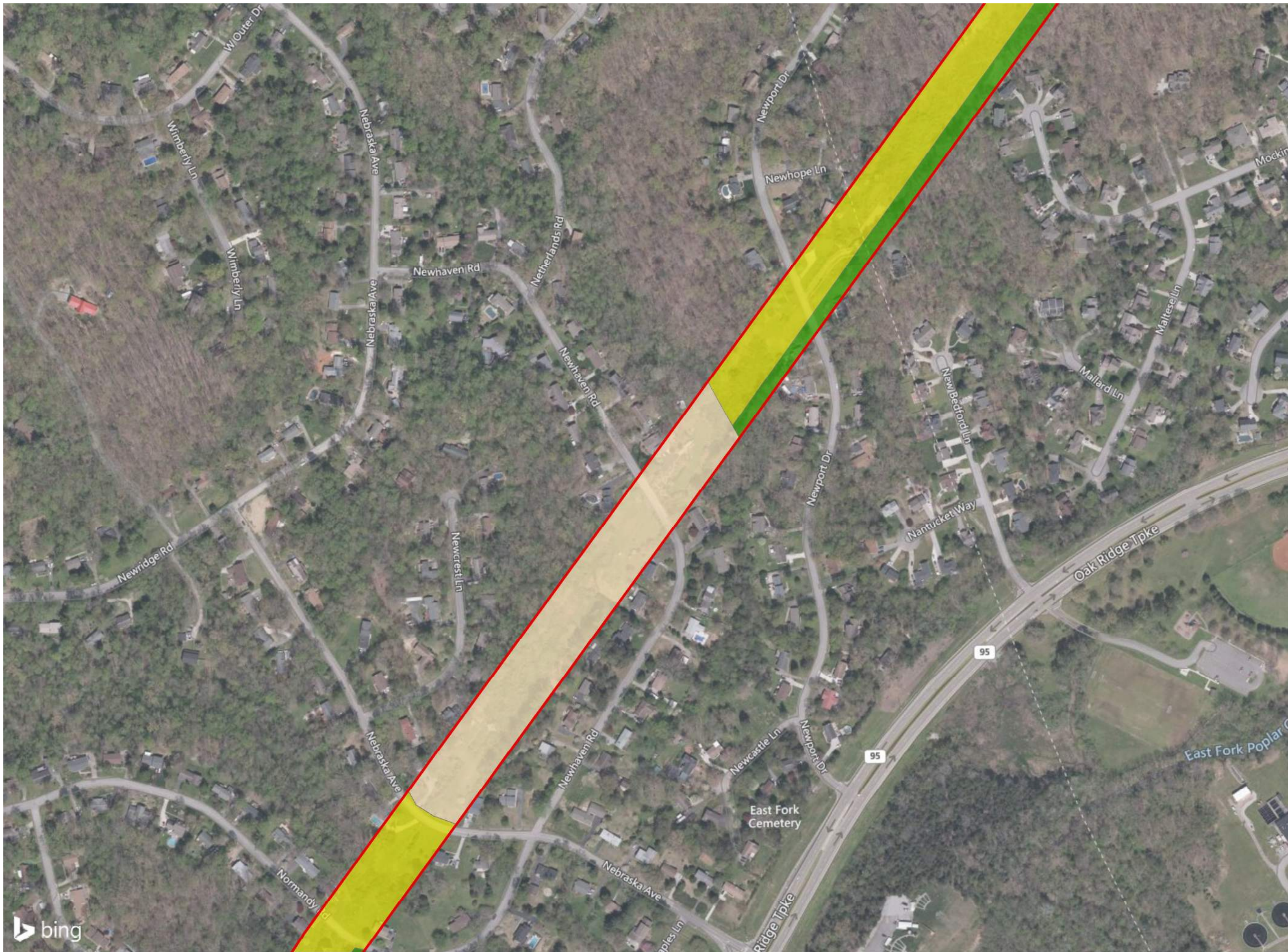
KIINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



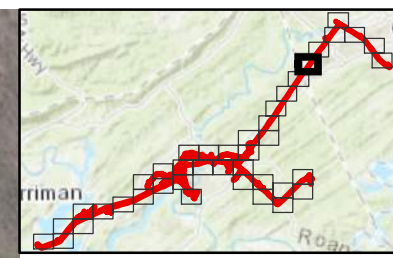
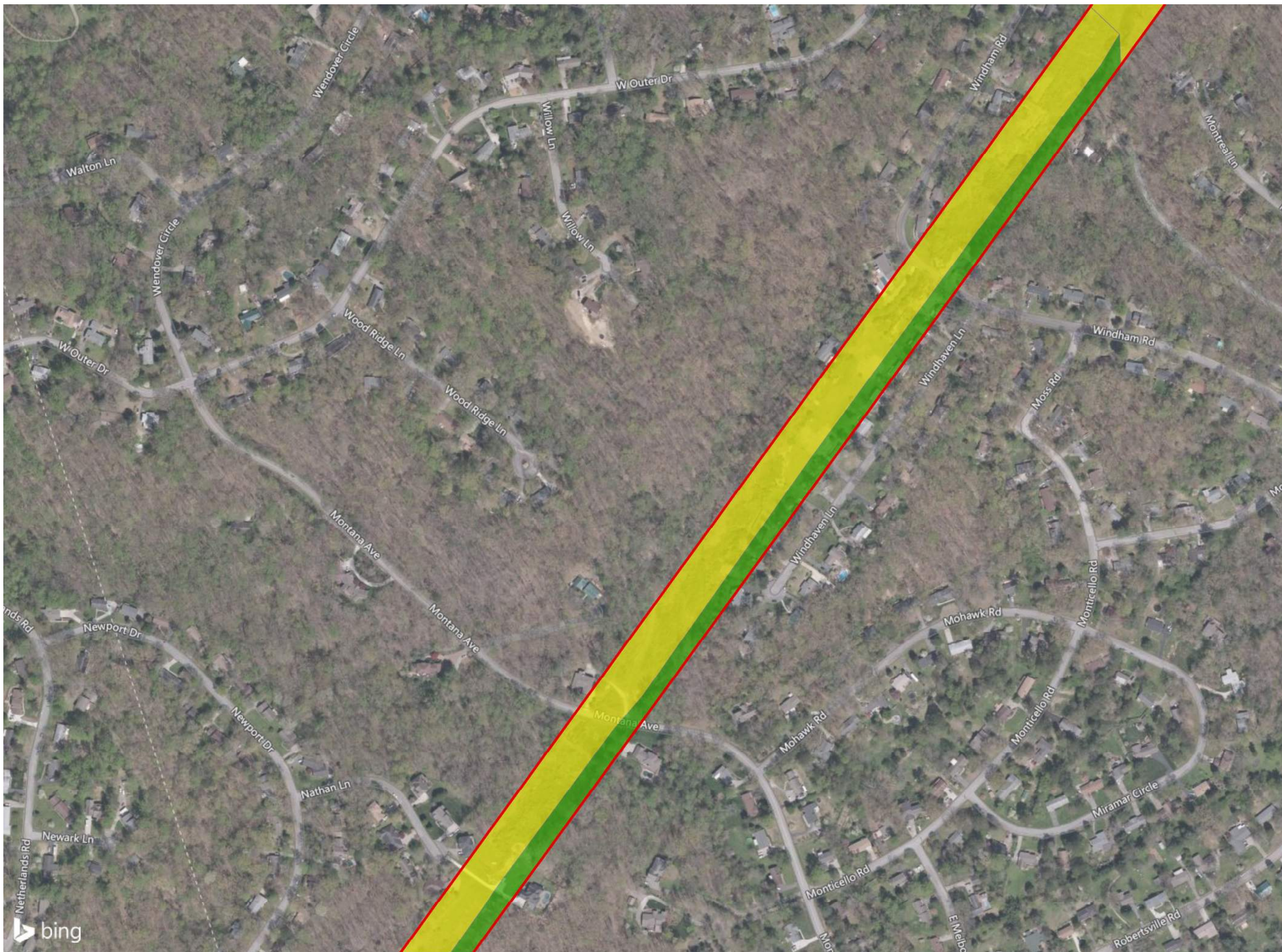
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



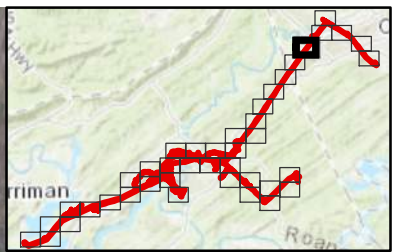
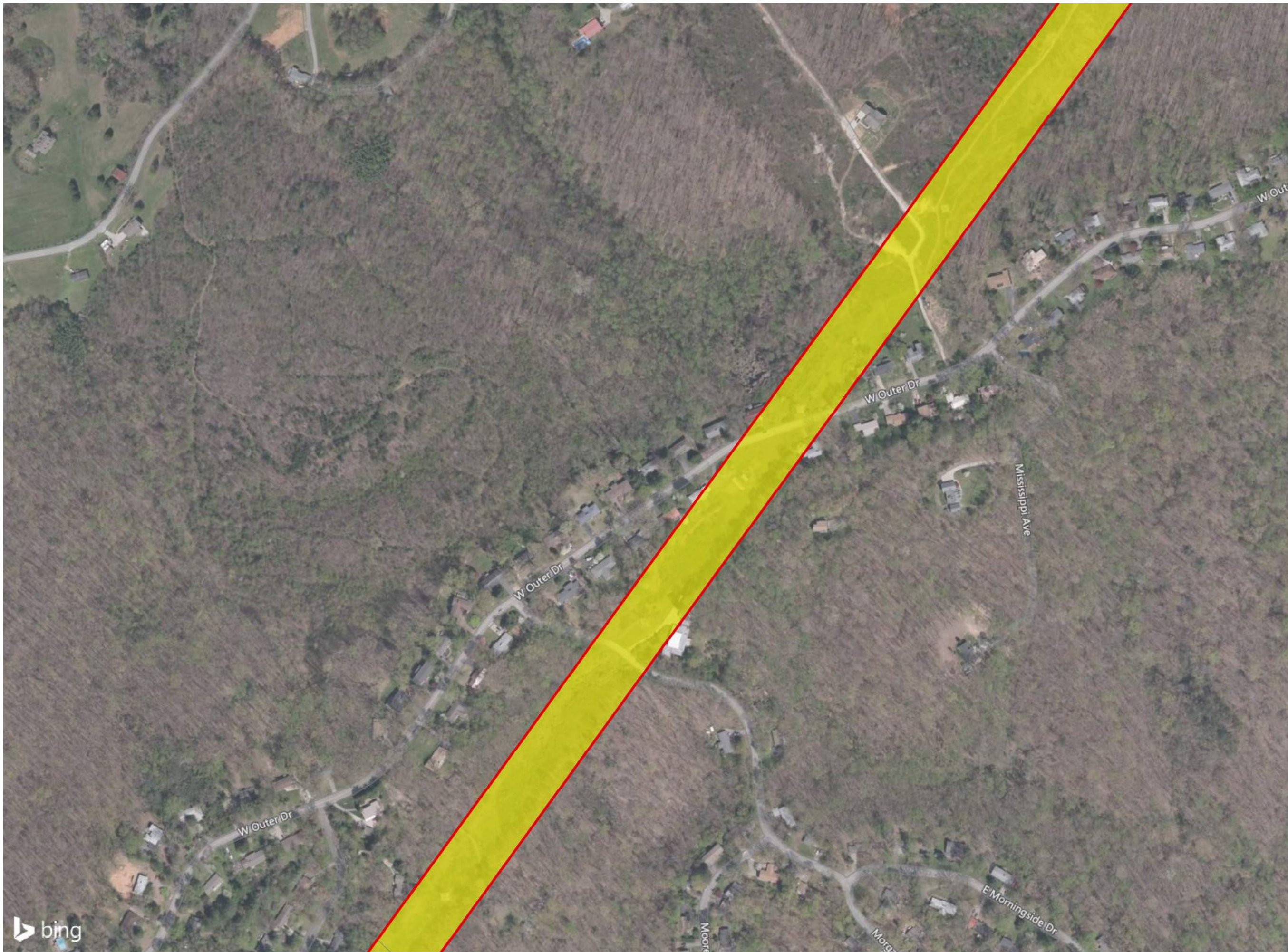
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



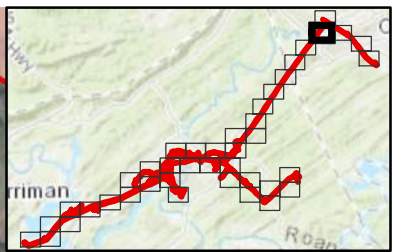
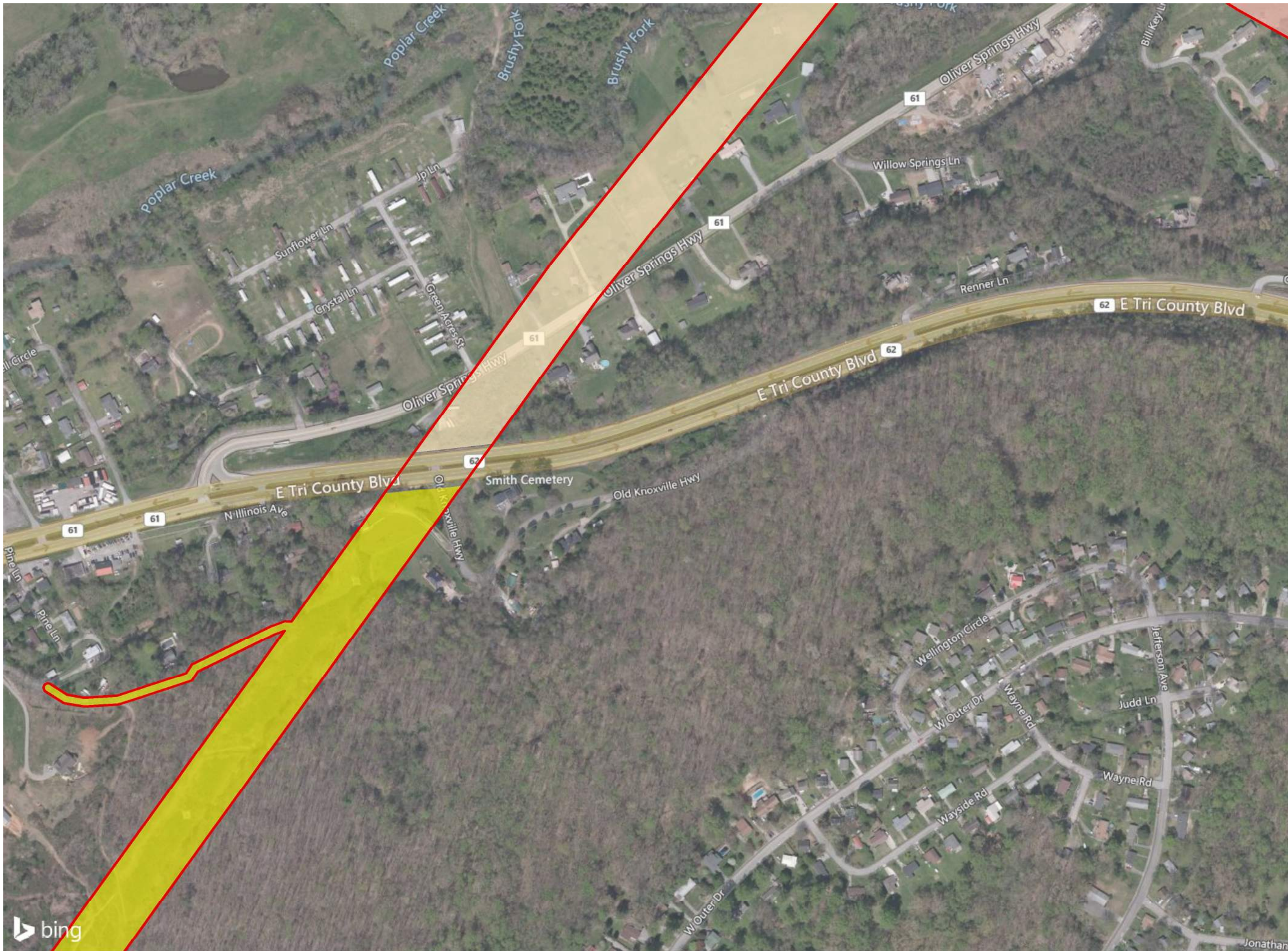
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



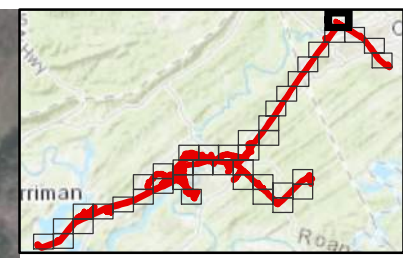
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



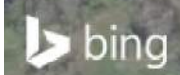
KINGSTON TRANSMISSION LINE - EAST

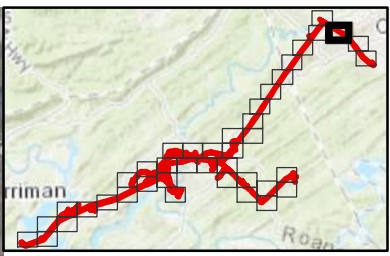
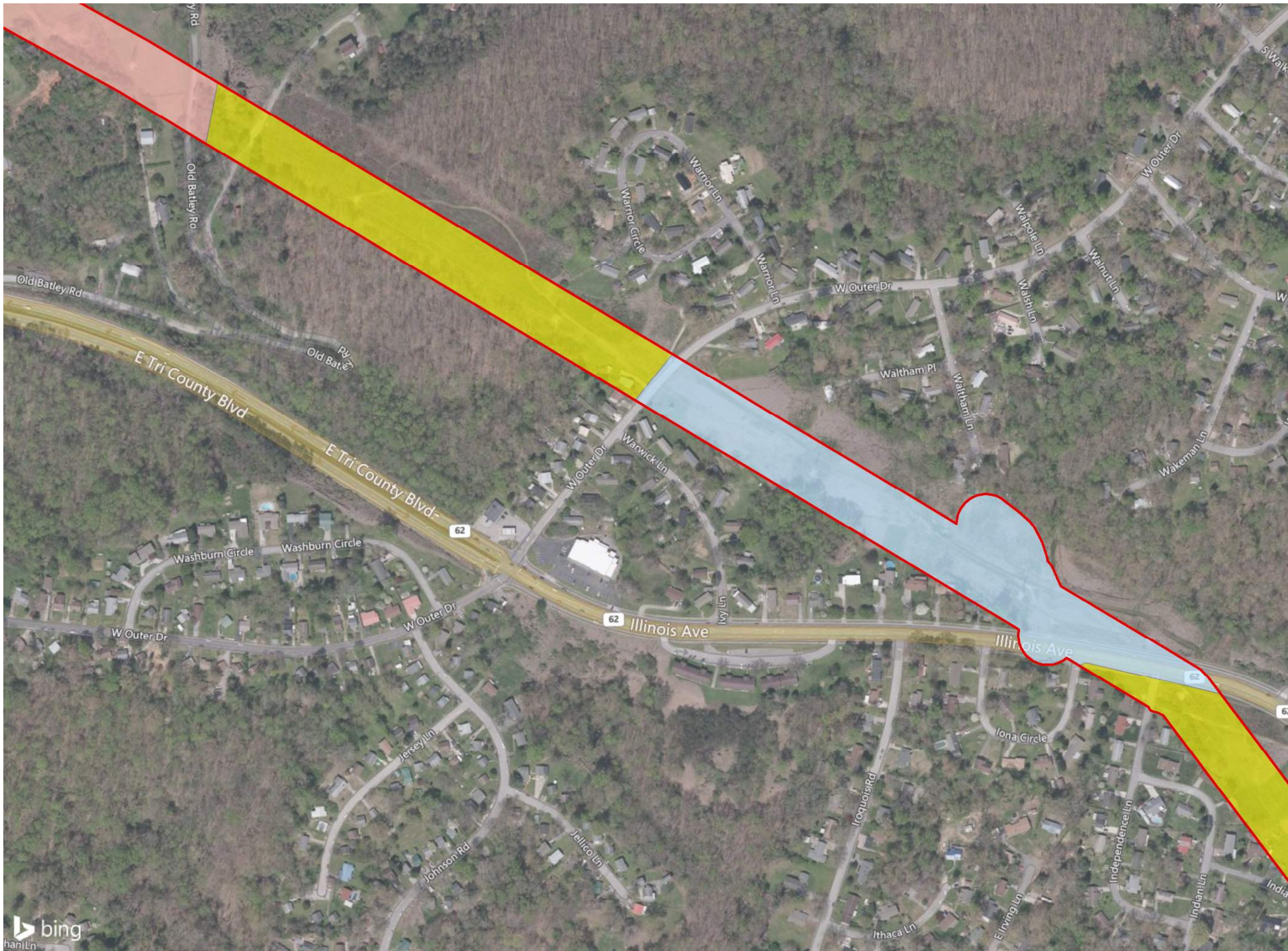
LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery





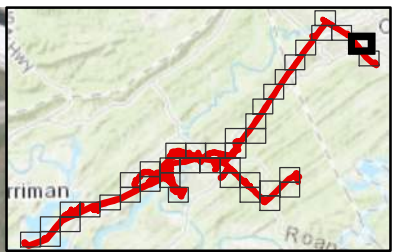
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



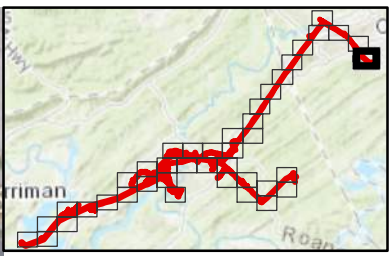
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
 - Dry Deciduous
 - Dry Herbaceous
 - Kudzu Infested
 - Maintained Access Road
 - Maintained Lawn
 - Open Water
 - Pasture/Hay
 - Pasture/Maintained Lawn
 - Wet Deciduous
 - Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



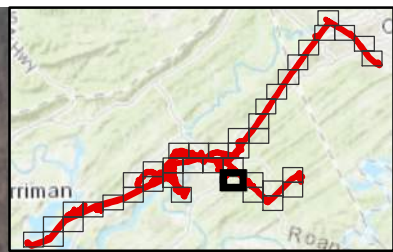
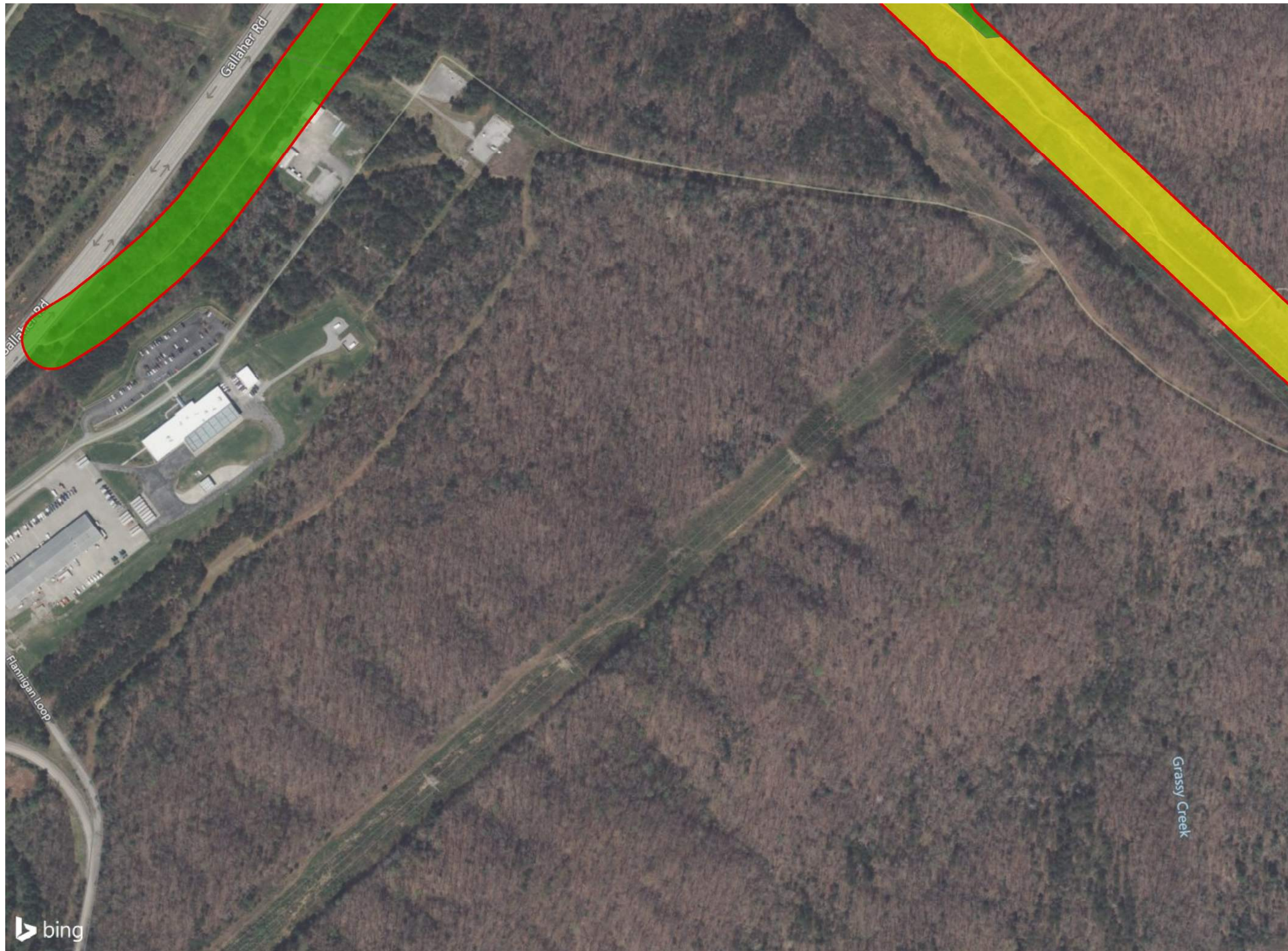
KINGSTON TRANSMISSION LINE - EAST

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



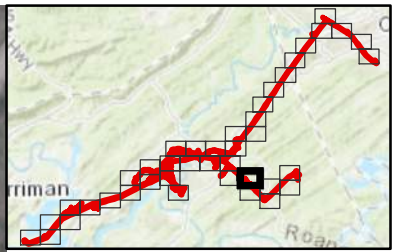
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

- Study Area
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Deciduous
- Wet Herbaceous














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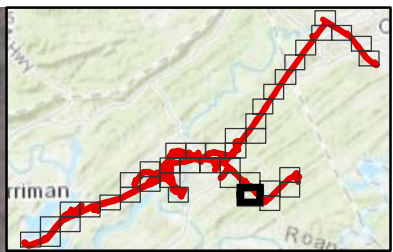
**KIINGSTON TRANSMISSION
LINE - EAST**

LEGEND

-  Study Area
- Vegetation Community
 -  Dry Deciduous
 -  Dry Herbaceous
 -  Kudzu Infested
 -  Maintained Access Road
 -  Maintained Lawn
 -  Open Water
 -  Pasture/Hay
 -  Pasture/Maintained Lawn
 -  Wet Deciduous
 -  Wet Herbaceous



DATA SOURCE: Bing Hybrid Aerial Imagery



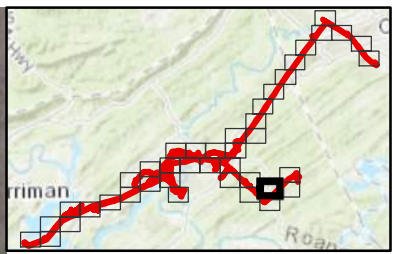
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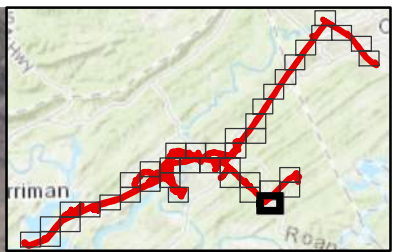
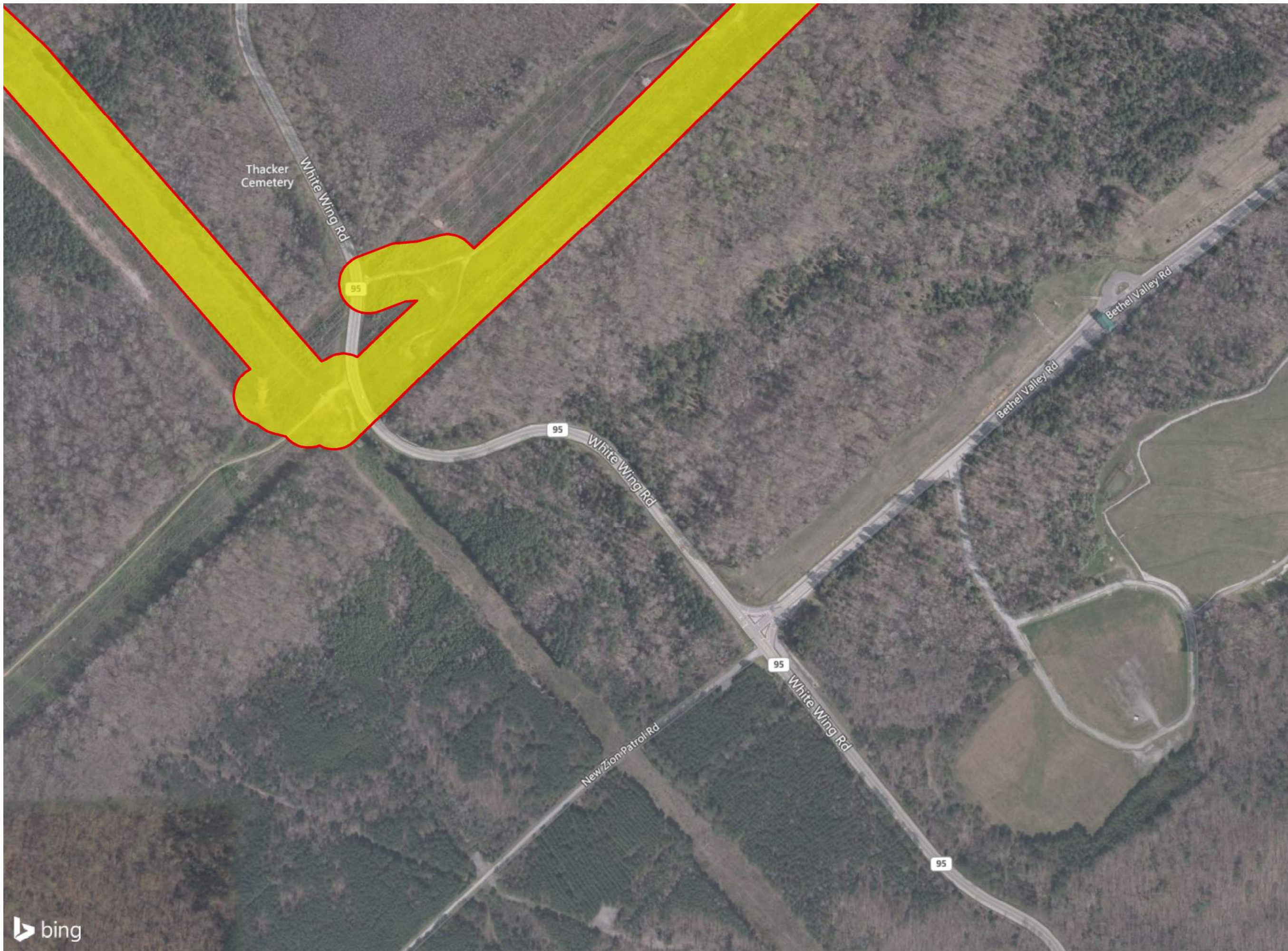
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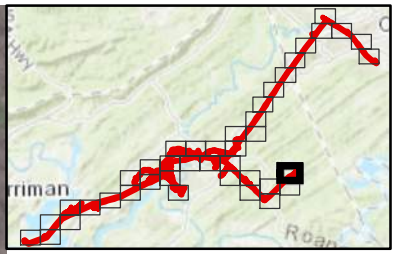
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










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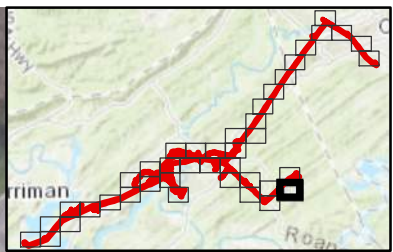
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LINE - EAST**

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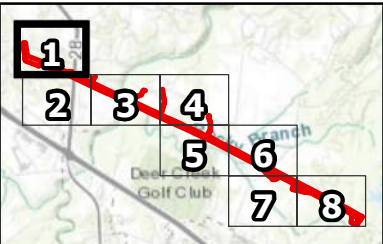
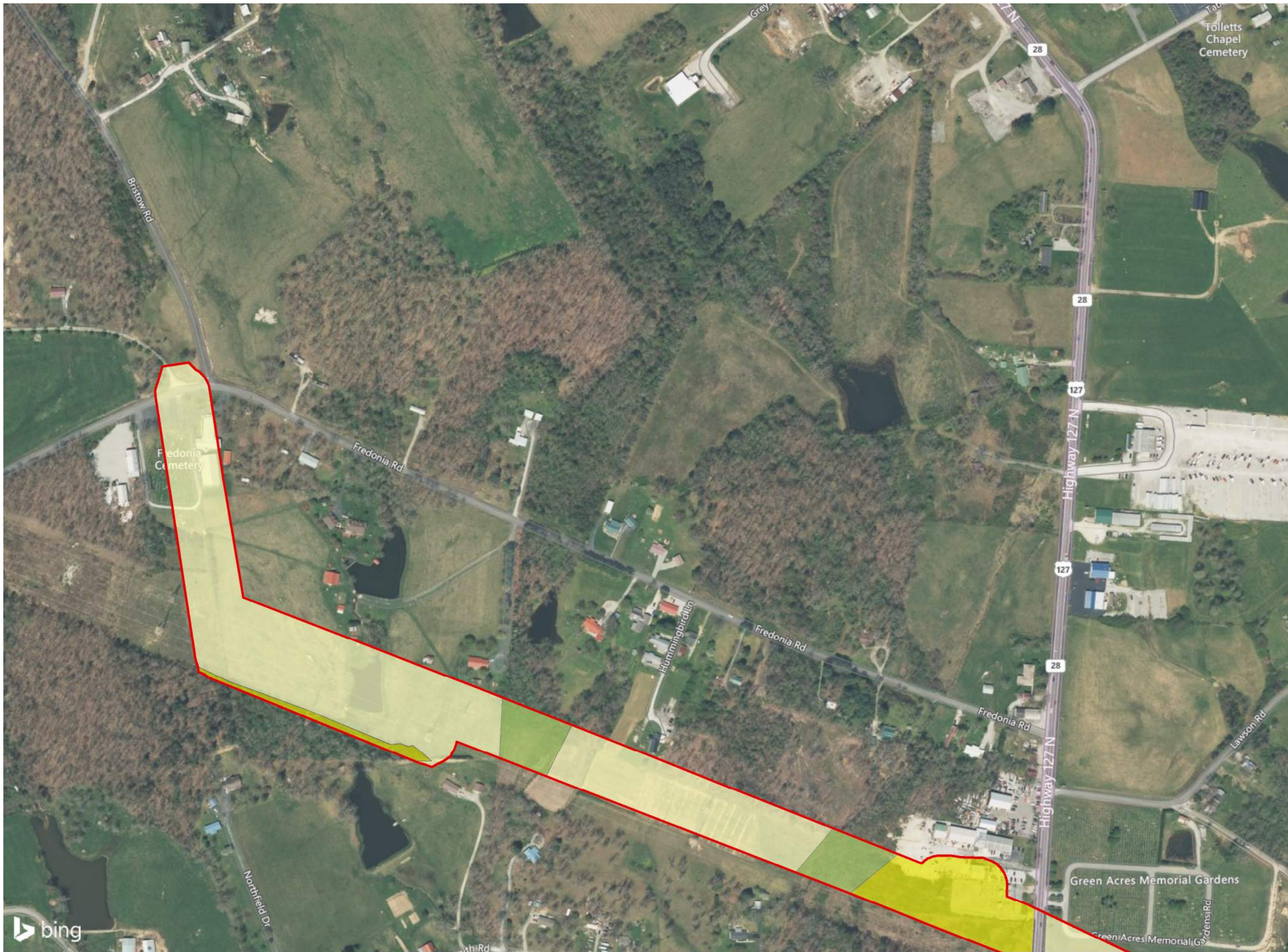
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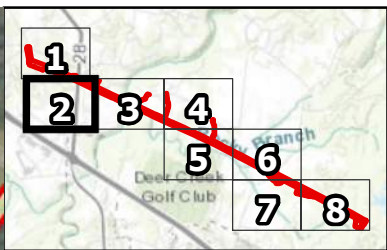
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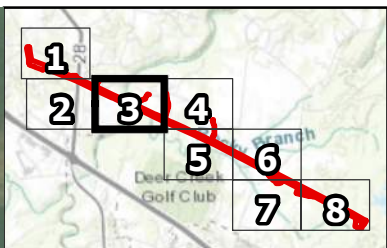
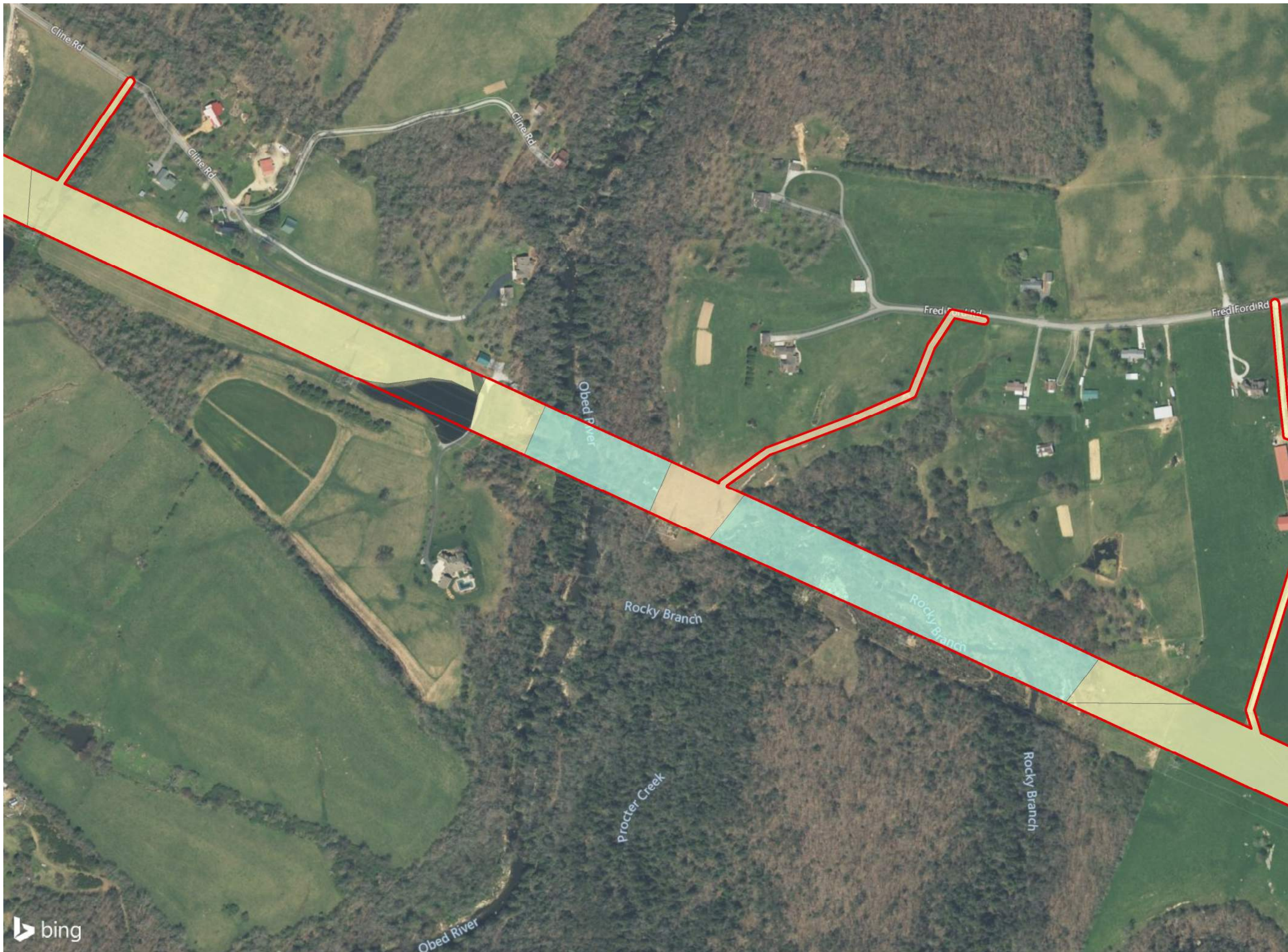
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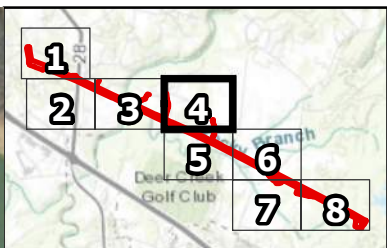
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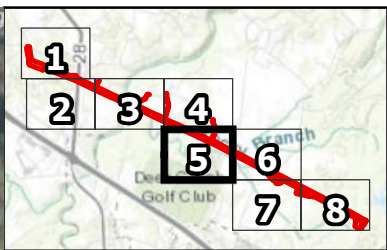
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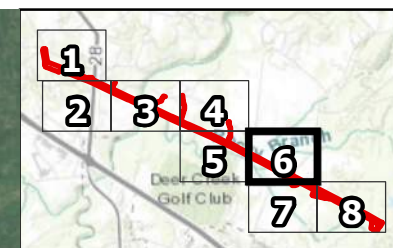
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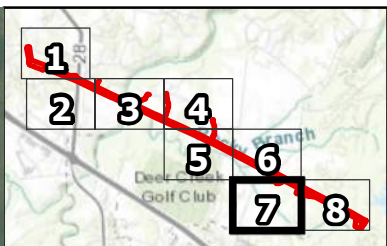
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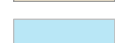


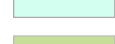


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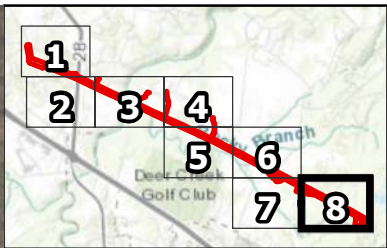
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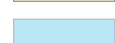


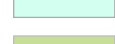


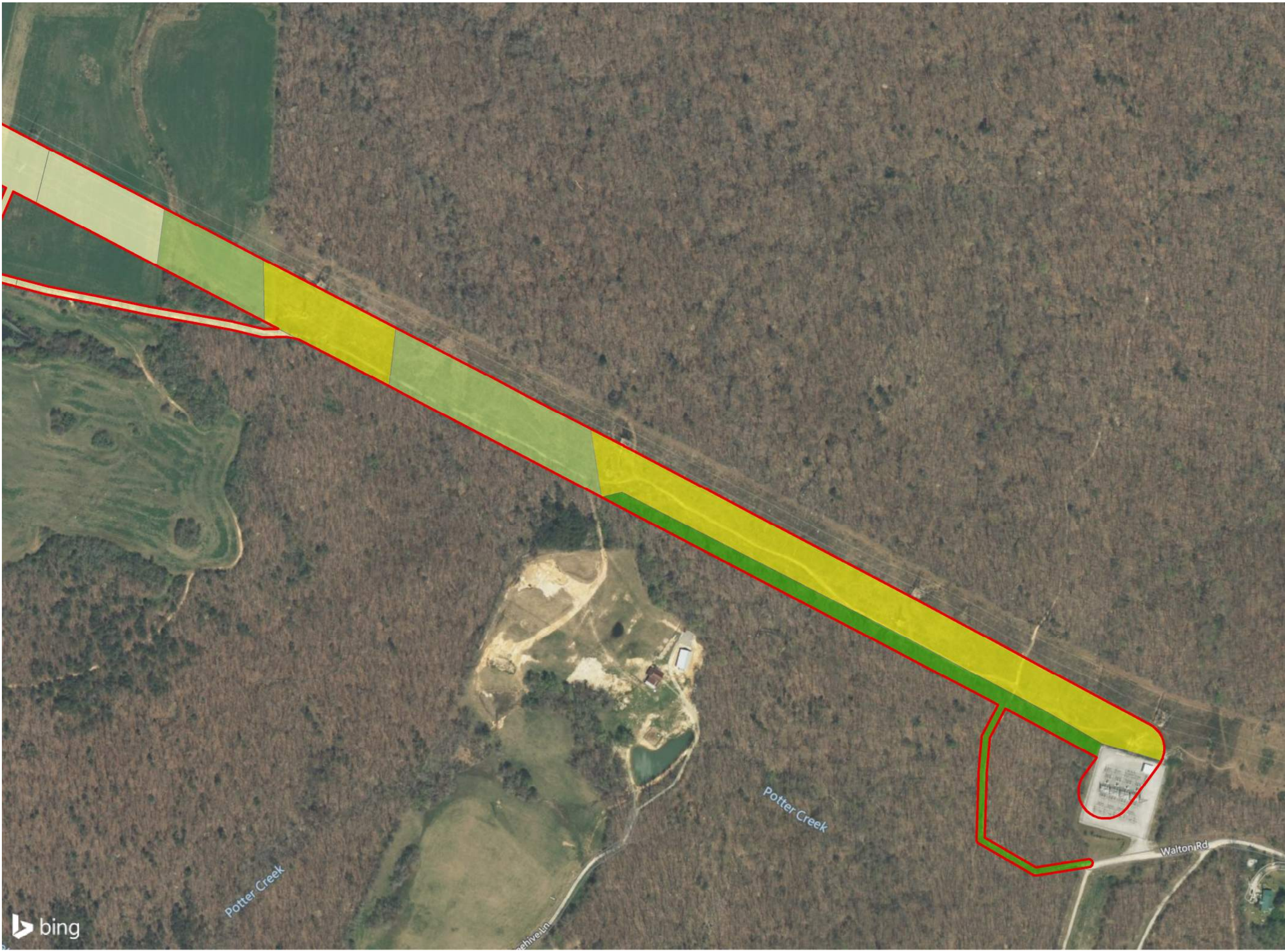
DATA SOURCE: Bing Hybrid Aerial Imagery



**KIINGSTON TRANSMISSION
LINE - WEST**

LEGEND

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B

Appendix B – USFWS
IPaC, TVA RHND, 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 affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

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

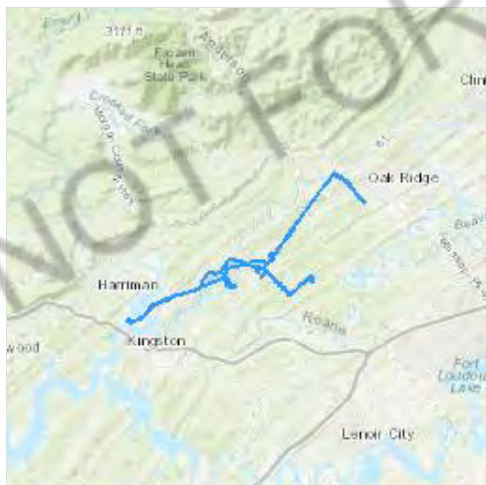
Project information

NAME

Kingston_TransLine_East

LOCATION

Anderson and Roane counties, Tennessee




DESCRIPTION

None

Local office

Tennessee Ecological Services Field Office

☎ (931) 528-6481

 (931) 528-7075

446 Neal Street

Cookeville, TN 38501-4027

NOT FOR CONSULTATION

Endangered species

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

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

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

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

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

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 office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

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

Mammals

NAME	STATUS
------	--------

Gray Bat *Myotis grisescens* Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/6329>

Indiana Bat *Myotis sodalis* Endangered

Wherever found

There is **no** critical habitat for this species. The location of the critical habitat is not available.

<https://ecos.fws.gov/ecp/species/5949>

Northern Long-eared Bat *Myotis septentrionalis* Threatened

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/9045>

Fishes

NAME

STATUS

Slender Chub *Erimystax cahni* Threatened

Wherever found

There is **no** critical habitat for this species. The location of the critical habitat is not available.

<https://ecos.fws.gov/ecp/species/6637>

Spot n Chub *Erimonax monachus* Threatened

There is **no** critical habitat for this species. The location of the critical habitat is not available.

<https://ecos.fws.gov/ecp/species/1521>

Yellow n Madtom *Noturus flavipinnis* Threatened

There is **no** critical habitat for this species. The location of the critical habitat is not available.

<https://ecos.fws.gov/ecp/species/8565>

Clams

NAME

STATUS

Alabama Lampmussel *Lampsilis virescens* Endangered

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/916>

Birdwing Pearlymussel *Lemiox rimosus* EXPN

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/6636>

Cracking Pearlymussel <i>Hemistena lata</i>	Endangered
No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4130	
Cumberland Bean (pearlymussel) <i>Villosa trabalis</i>	Endangered
No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6061	
Dromedary Pearlymussel <i>Dromus dromas</i>	Endangered
No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6377	
Fanshell <i>Cyprogenia stegaria</i>	Endangered
Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4822	
Finerayed Pigtoe <i>Fusconaia cuneolus</i>	Endangered
No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3038	
Orangefoot Pimpleback (pearlymussel) <i>Plethobasus cooperianus</i>	Endangered
Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1132	
Pink Mucket (pearlymussel) <i>Lampsilis abrupta</i>	Endangered
Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7829	
Purple Bean <i>Villosa perpurpurea</i>	Endangered
Wherever found There is nal critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/4125	
Ring Pink (mussel) <i>Obovaria retusa</i>	Endangered
Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4128	

Rough Pigtoe *Pleurobema plenum* Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/6894>

Rough Rabbitsfoot *Quadrula cylindrica strigillata* Endangered

Wherever found

There is **nal** critical habitat for this species. The location of the critical habitat is not available.

<https://ecos.fws.gov/ecp/species/5629>

Sheepnose Mussel *Plethobasus cyphus* Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/6903>

Shiny Pigtoe *Fusconaia cor* Endangered

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/2573>

Spectaclecase (mussel) *Cumberlandia monodonta* Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/7867>

Turgid Blossom (pearlymussel) *Epioblasma turgidula* Endangered

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/7659>

Snails

NAME

STATUS

Anthony's Riversnail *Athearnia anthonyi*

EXPN

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/4827>

Anthony's Riversnail *Athearnia anthonyi*

Endangered

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/4827>

Insects

NAME

STATUS

Monarch Butterfly *Danaus plexippus*

Candidate

Wherever found

No critical habitat has been designated for this species.

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

Flowering Plants

NAME

STATUS

Virginia Spiraea *Spiraea virginiana*

Threatened

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/1728>

White Fringeless Orchid *Platanthera integrilabia*

Threatened

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/1889>

Critical habitats

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

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

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

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>

- Nationwide conservation measures for birds

<http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur on 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 (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle *Haliaeetus leucocephalus*

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1626>

Breeds Sep 1 to Aug 31

Bobolink *Dolichonyx oryzivorus*

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

Breeds May 20 to Jul 31

Canada Warbler *Cardellina canadensis*

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

Breeds May 20 to Aug 10

Cerulean Warbler <i>Dendroica cerulea</i>	Breeds Apr 27 to Jul 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	
Eastern Whip-poor-will <i>Antrostomus vociferus</i>	Breeds May 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	
Kentucky Warbler <i>Oporornis formosus</i>	Breeds Apr 20 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	
Prairie Warbler <i>Dendroica discolor</i>	Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	
Prothonotary Warbler <i>Protonotaria citrea</i>	Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i>	Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	
Rusty Blackbird <i>Euphagus carolinus</i>	Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	
Wood Thrush <i>Hylocichla mustelina</i>	Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	

Probability of Presence Summary

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

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be

used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

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

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

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

Breeding Season (■)

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

Survey Effort (|)

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

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

No Data (—)

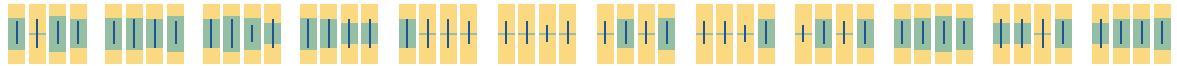
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Survey Timeframe

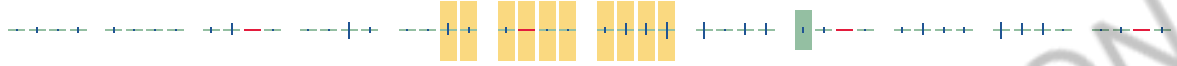
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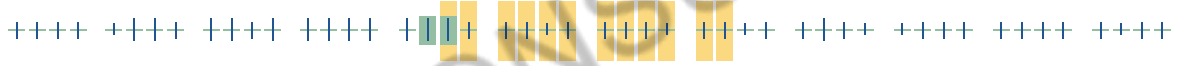
Bald Eagle
 Non-BCC
 Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



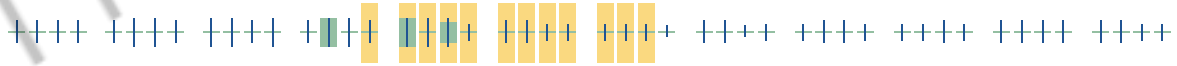
Bobolink
 BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



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



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



Eastern Whip-poor-will
 BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)





Wood Thrush
BCC Rangewide
(CON) (This is a
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Conservation
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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 migratory birds potentially occurring in my specified location?

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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 [AKN Phenology Tool](#).

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

Details about birds that are potentially affected by offshore projects

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

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

What if I have eagles on my list?

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

Proper Interpretation and Use of Your Migratory Bird Report

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

or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

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

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

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

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

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

Data limitations

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

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted.

Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

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

Data exclusions

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

Data precautions

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

NOT FOR CONSULTATION

IPaC resource list

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

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

Project information

NAME

Kingston_TransLine_West

LOCATION

Cumberland County, Tennessee




DESCRIPTION

None

Local office

Tennessee Ecological Services Field Office

☎ (931) 528-6481

 (931) 528-7075

446 Neal Street
Cookeville, TN 38501-4027

NOT FOR CONSULTATION

Endangered species

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

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

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

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

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

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 office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

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

Mammals

NAME	STATUS
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Gray Bat *Myotis grisescens* Endangered
 Wherever found
 No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/6329>

Indiana Bat *Myotis sodalis* Endangered
 Wherever found
 There is **no** critical habitat for this species. The location of the critical habitat is not available.
<https://ecos.fws.gov/ecp/species/5949>

Northern Long-eared Bat *Myotis septentrionalis* Threatened
 Wherever found
 No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/9045>

Fishes

NAME

STATUS

Spot n Chub *Erimonax monachus* Threatened
 There is **no** critical habitat for this species. Your location overlaps the critical habitat.
<https://ecos.fws.gov/ecp/species/1521>

Clams

NAME

STATUS

Cumberland Bean (pearlymussel) *Villosa trabalis* Endangered
 No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/6061>

Purple Bean *Villosa perpurpurea* Endangered
 Wherever found
 There is **no** critical habitat for this species. The location of the critical habitat is not available.
<https://ecos.fws.gov/ecp/species/4125>

Insects

NAME

STATUS

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

Flowering Plants

NAME	STATUS
Cumberland Rosemary <i>Conradina verticillata</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3677	Threatened
Virginia Spiraea <i>Spiraea virginiana</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1728	Threatened
White Fringeless Orchid <i>Platanthera integrilabia</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1889	Threatened

Critical habitats

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

This location overlaps the critical habitat for the following species:

NAME	TYPE
Spot n Chub <i>Erimonax monachus</i> https://ecos.fws.gov/ecp/species/1521#crithab	Final

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

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

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>

- Measures for avoiding and minimizing impacts to birds
<http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds
<http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur on 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 (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle *Haliaeetus leucocephalus*

Breeds Sep 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1626>

Bobolink *Dolichonyx oryzivorus*

Breeds May 20 to Jul 31

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

Eastern Whip-poor-will <i>Antrastomus vociferus</i>	Breeds May 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	
Prairie Warbler <i>Dendroica discolor</i>	Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i>	Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	
Wood Thrush <i>Hylocichla mustelina</i>	Breeds May 10 to Aug 31
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Probability of Presence Summary

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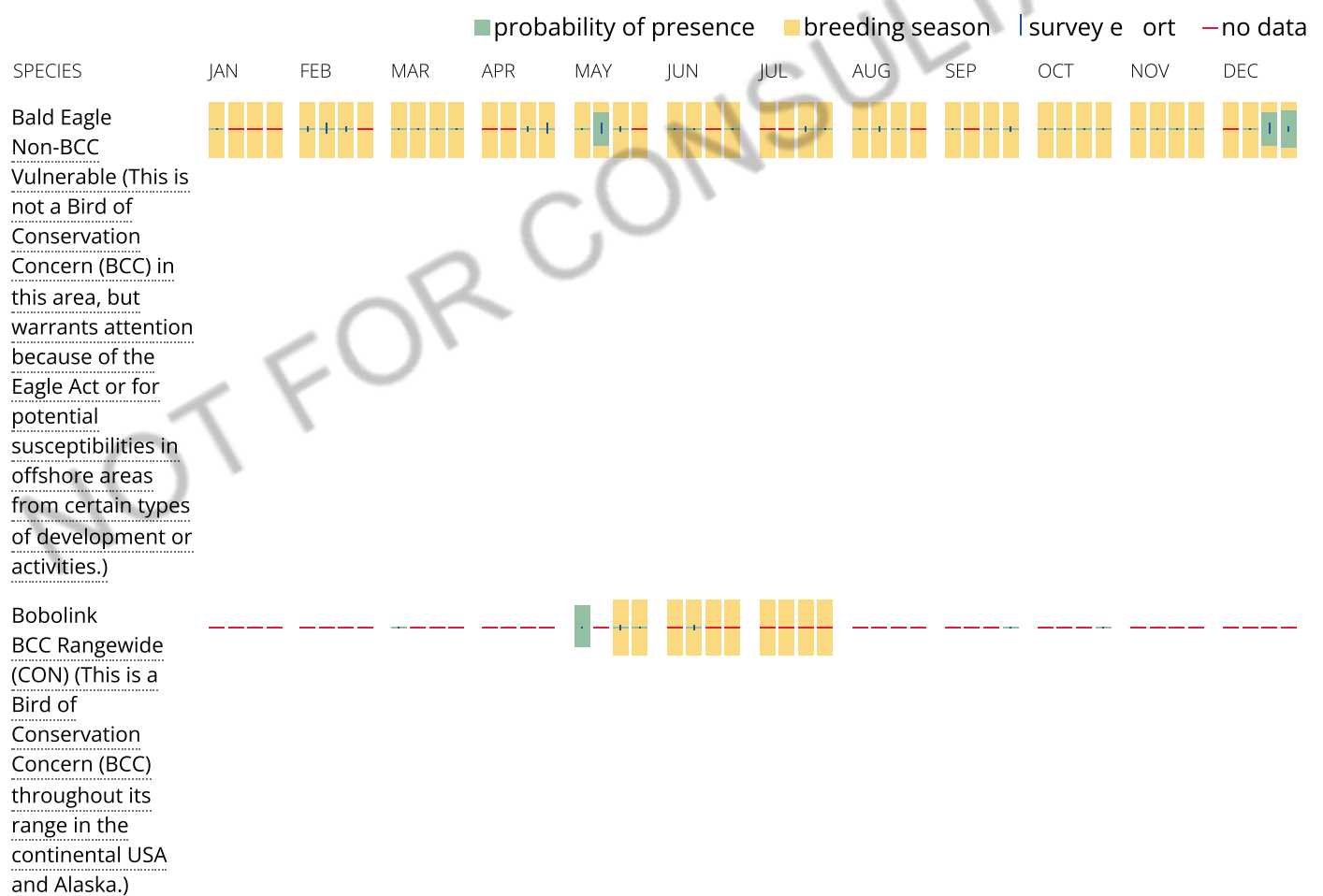
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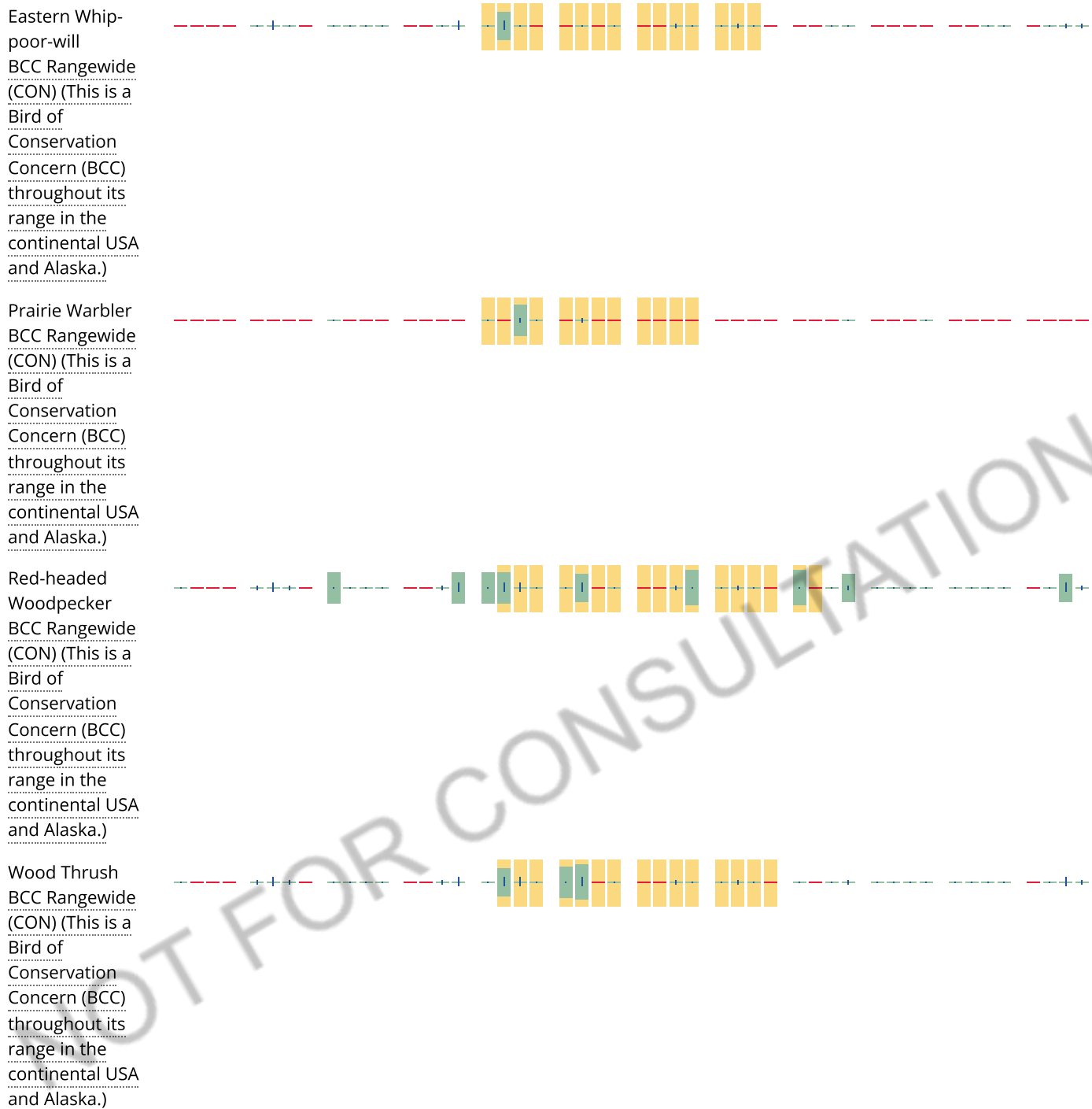
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Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information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

Details about birds that are potentially affected by offshore projects

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

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

What if I have eagles on my list?

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

Proper Interpretation and Use of Your Migratory Bird Report

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

Facilities

National Wildlife Refuge lands

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

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

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

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

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

Data limitations

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

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

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

Data exclusions

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

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in

activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION



Rare Species by Watershed **Rare Species by County** Rare Species by Quadrangle Stormwater Programs

Help • [Download Status and Ranks](#)

Key to Status and Ranks

Rare Species by County

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

Q Go Rows All Actions ▾

County = 'Roane'

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County	Type	Category	Scientific Name	Common Name	Global Rank	State Rank	Fed. Status	State Status	Habitat	Wet Habitat Flag
Roane	Vertebrate Animal	Mammal	Spilogale putorius	Eastern Spotted Skunk	G4	S3	--	Rare, Not State Listed	Rocky outcrops, open prairies, brushy areas, cultivated fields, and barnyards; more common in east Tennessee; reclusive.	Upland
Roane	Invertebrate Animal	Crustacean	Caecidotea incurva	Incurved Cave Isopod	G2G4	S1	--	Rare, Not State Listed	Aquatic cave obligate; known from two wet caves in east Tennessee.	Aquatic
Roane	Animal Assemblage	No Data	Rookery	Heron Rookery	G5	SNR	--	Rare, Not State Listed	No Data	No Data
Roane	Vertebrate Animal	Fish	Percina aurantiaca	Tangerine Darter	G4	S3	--	D	Large-moderate size headwater tribs to Tennessee River, in clear, fairly deep, rocky pools, usually below riffles.	Aquatic
Roane	Vascular Plant	Flowering Plant	Helianthus occidentalis	Naked-stem Sunflower	G5	S2	--	S	Limestone Glades And Barrens	Upland
Roane	Vascular Plant	Flowering Plant	Diervilla sessilifolia var. rivularis	Mountain Bush-honeysuckle	G3	S2	--	T	Dry Cliffs And Bluffs	Upland
Roane	Vascular Plant	Flowering Plant	Elodea nuttallii	Nuttall's Waterweed	G5	S2	--	S	Aquatic; Streams And Ponds	Aquatic
Roane	Vertebrate Animal	Fish	Erimonax monachus	Spotfin Chub	G2	S2	LT,XN	T	Clear upland rivers with swift currents & boulder substrates; portions of the Tennessee River watershed.	Aquatic
Roane	Vertebrate Animal	Fish	Cycleptus elongatus	Blue Sucker	G3G4	S2	--	T	Swift waters over firm substrates in big rivers.	Aquatic
Roane	Vertebrate Animal	Bird	Peucaea aestivalis	Bachman's Sparrow	G3	S1B	--	E	Dry open pine or oak woods; nests on the ground in dense cover.	Upland
Roane	Vascular Plant	Flowering Plant	Platanthera integrilabia	White Fringeless Orchid	G2G3	S2S3	LT	E	Acidic Seeps And Stream Heads	Possible
Roane	Vascular Plant	Flowering Plant	Platanthera flava var. herbiola	Tuberclad Rein-orchid	G4?T4Q	S2	--	T	Swamps And Floodplains	Possible
Roane	Vascular Plant	Flowering Plant	Agalinis auriculata	Earleaved False-foxtail	G3	S2	--	E	Barrens	Upland
Roane	Vascular Plant	Flowering Plant	Delphinium exaltatum	Tall Larkspur	G3	S2	--	E	Glades And Barrens	Upland
Roane	Vascular Plant	Flowering Plant	Bolboschoenus fluviatilis	River Bulrush	G5	S1	--	S	Marshes	Possible
Roane	Vascular Plant	Fern and Fern Ally	Asplenium scolopendrium var. americanum	Hart's-tongue Fern	G4T3	S1	LT	E	Sinks	Possible
Roane	Vascular Plant	Flowering Plant	Juncus brachycephalus	Small-headed Rush	G5	S2	--	S	Seeps And Wet Bluffs	Possible
Roane	Invertebrate Animal	Mollusc	Lampisilis abrupta	Pink Mucket	G1G2	S2	LE	E	Generally a large river species, preferring sand-gravel or rocky substrates with mod-strong currents; Tennessee & Cumberland river systems.	Aquatic

Roane	Vertebrate Animal	Mammal	<u>Myotis grisescens</u>	Gray Myotis	G4	S2	LE	E	Cave obligate year-round; frequents forested areas; migratory.	Upland
Roane	Invertebrate Animal	Mollusc	<u>Plethobasus cyphyus</u>	Sheepnose	G3	S2S3	LE	E	Large to medium-sized rivers, in riffles and coarse sand/gravel subst; TN & Cumb river systems incl KY Reservoir; W Uplands & Rim.	Aquatic
Roane	Invertebrate Animal	Mollusc	<u>Cumberlandia monodonta</u>	Spectaclecase	G3	S2S3	LE	E	Medium to large rivers; in substrates from mud and sand to gravel, cobble, and boulders; Cumberland and Tennessee river systems.	Aquatic
Roane	Vascular Plant	Flowering Plant	<u>Draba ramosissima</u>	Branching Whitlow-grass	G4	S2	--	S	Calcareous Bluffs	Upland
Roane	Vascular Plant	Flowering Plant	<u>Erysimum capitatum</u>	Western Wallflower	G5	S1S2	--	E	Rocky Bluffs	Upland
Roane	Vascular Plant	Flowering Plant	<u>Pseudognaphalium helleri</u>	Heller's Catfoot	G4G5	S2	--	S	Dry Sandy Woods	Upland
Roane	Vascular Plant	Flowering Plant	<u>Ribes missouriense</u>	Missouri Gooseberry	G5	S2	--	S	Rocky Woods	Upland
Roane	Nonvascular Plant	Non-Vascular Plant	<u>Preissia quadrata</u>	A Liverwort	G5	S1	--	T	Seepy Limestone Cliffs And Bluffs	Possible
Roane	Vascular Plant	Flowering Plant	<u>Juglans cinerea</u>	Butternut	G3	S3	--	T	Rich Woods And Hollows	Possible
Roane	Vertebrate Animal	Amphibian	<u>Hemidactylium scutatum</u>	Four-toed Salamander	G5	S3	--	D	Woodland swamps, shallow depressions, & sphagnum mats on acidic soils; middle & east Tennessee.	Possible
Roane	Vascular Plant	Flowering Plant	<u>Marshallia grandiflora</u>	Large-fl. Barbara's-buttons	GNR	S2	--	E	Rocky River Bars	Possible
Roane	Vascular Plant	Flowering Plant	<u>Liatris cylindracea</u>	Slender Blazing-star	G5	S2	--	T	Barrens	Upland
Roane	Vertebrate Animal	Fish	<u>Chrosomus tennesseensis</u>	Tennessee Dace	G3	S3	--	D	First order spring-fed streams of woodlands in Ridge and Valley limestone region; Tennessee River watershed.	Aquatic
Roane	Vascular Plant	Flowering Plant	<u>Diervilla lonicera</u>	Northern Bush-honeysuckle	G5	S2	--	T	Rocky Woodlands And Bluffs	Upland
Roane	Vertebrate Animal	Reptile	<u>Pituophis melanoleucus melanoleucus</u>	Northern Pinesnake	G4T4	S3	--	T	Well-drained sandy soils in pine/pine-oak woods; dry mountain ridges; E portions of west TN, E to lower elev of the Appalachians.	Upland
Roane	Vascular Plant	Flowering Plant	<u>Leucothoe racemosa</u>	Fetter-bush	G5	S2	--	T	Acidic Wetlands And Swamps	Possible
Roane	Vertebrate Animal	Amphibian	<u>Aneides aeneus</u>	Green Salamander	G3G4	S3S4	--	Rare, Not State Listed	Damp crevices in shaded rock outcrops and ledges; beneath loose bark and cracks of trees and sometimes in/or under logs.	Upland
Roane	Invertebrate Animal	Mollusc	<u>Obovaria retusa</u>	Ring Pink	G1	S1	LE,XN	E	Large rivers in gravel and sand bars; Tennessee & Cumberland river watersheds; many historic locations currently inundated.	Aquatic
Roane	Invertebrate Animal	Mollusc	<u>Venustaconcha trabalis</u>	Tennessee Bean	G1	S1	LE, XN	E	Riffle areas of small rivers & streams in sand, gravel, & cobble substrates with swift current; upper Cumb. & upper Tenn. river systems.	Aquatic
Roane	Invertebrate Animal	Mollusc	<u>Plethobasus cooperianus</u>	Orangefoot Pimpleback	G1	S1	LE, XN	E	Large rivers in sand-gravel-cobble substrates in riffles and shoals in deep flowing water; Cumberland & Tennessee river systems.	Aquatic
Roane	Vertebrate Animal	Amphibian	<u>Gyrinophilus gulolineatus</u>	Berry Cave Salamander	G1Q	S1	C	T	Aquatic cave obligate; Ridge & Valley; formerly	Aquatic

Roane	Vertebrate Animal	Mammal	Perimyotis subflavus	Tri-colored bat	G2G3	S2S3	--	T	included with <i>G. pallucus</i> . Generally associated with forested landscapes but may roost near openings.	No Data
Roane	Vascular Plant	Flowering Plant	Spiranthes lucida	Shining Ladies'-tresses	G4	S1S2	--	T	Alluvial Woods And Moist Slopes	Possible
Roane	Vascular Plant	Flowering Plant	Panax quinquefolius	American Ginseng	G3G4	S3S4	--	S-CE	Rich Woods	Possible
Roane	Invertebrate Animal	Mollusc	Fusconaia cuneolus	Finerayed Pigtoe	G1	S1	LE, XN	E	Riffles of fords and shoals of mod gradient streams in firm cobble and gravel substrates; middle & upper Tennessee River watershed.	Aquatic
Roane	Vascular Plant	Flowering Plant	Aureolaria patula	Spreading False-foxglove	G3	S3	--	S	Oak Woods And Edges	Upland
Roane	Vascular Plant	Flowering Plant	Oligoneuron album	Prairie Goldenrod	G5	S1S2	--	E	Barrens	Upland
Roane	Invertebrate Animal	Mollusc	Lampsilis virescens	Alabama Lampmussel	G1	S1	LE	E	Found in sand and gravel substrates in shoal areas of small-medium size rivers; middle and upper TN R system; recently rediscovered in Emory River.	Aquatic
Roane	Invertebrate Animal	Crustacean	Cambarus deweesae	Valley Flame Crayfish	G4	S1	--	E	Primary burrower; open areas with high water tables; northern Ridge & Valley.	Aquatic
Roane	Invertebrate Animal	Mollusc	Fusconaia cor	Shiny Pigtoe	G1	S1	LE, XN	E	Shoals and riffles of small-medium sized rivers with mod-fast current over sand-cobble substrates; upper Tennessee River watershed.	Aquatic
Roane	Invertebrate Animal	Mollusc	Theliderma cylindrica strigillata	Rough Rabbitsfoot	G3G4T2	S2	LE	E	Small-medium sized rivers, in clear, shallow riffles with sand-gravel substrates; Tenn. & Cumb. river systems; upland form.	Aquatic
Roane	Vascular Plant	Flowering Plant	Liparis loeselii	Fen Orchis	G5	S1	--	T	Calcareous Seeps	Possible
Roane	Vascular Plant	Flowering Plant	Pedicularis lanceolata	Swamp Lousewort	G5	S1S2	--	S	Wet Acidic Barrens And Seeps	Possible
Roane	Vertebrate Animal	Mammal	Sorex dispar	Long-tailed Shrew	G4	S2	--	D	Mountainous, forested areas with loose talus; east Tennessee.	Upland
Roane	Vascular Plant	Flowering Plant	Symphyotrichum pratense	Barrens Silky Aster	G4?	S1	--	E	Barrens	Upland
Roane	Nonvascular Plant	Non-Vascular Plant	Myurella julacea	A Moss	G5	SH	--	S-P	Shale Bluffs	Possible
Roane	Vertebrate Animal	Fish	Hemitremia flammea	Flame Chub	G3	S3	--	D	Springs and spring-fed streams with lush aquatic vegetation; Tennessee & middle Cumberland river watersheds.	Aquatic
Roane	Vertebrate Animal	Amphibian	Cryptobranchus alleganiensis	Hellbender	G3	S3	No Status	E	Rocky, clear creeks and rivers with large shelter rocks.	Aquatic
Roane	Vascular Plant	Flowering Plant	Spiraea virginiana	Virginia Spiraea	G2	S2	LT	E	Stream Bars And Ledges	Possible
Roane	Invertebrate Animal	Mollusc	Io fluviialis	Spiny Riversnail	G1G2	S2	--	Rare, Not State Listed	Shallow waters of shoals that are rapid to moderate and well-oxygenated; Tennessee River & main tributaries; E Tennessee.	Aquatic
Roane	Vascular Plant	Flowering Plant	Loniceria dioica	Mountain Honeysuckle	G5	S2	--	S	Mountain Woods And Thickets	Possible
Roane	Vertebrate Animal	Mammal	Synaptomys cooperi	Southern Bog Lemming	G5	S4	--	D	Marshy meadows, wet balds, & rich upland forests.	Possible
Roane	Invertebrate Animal	Mollusc	Pleurobema rubrum	Pyramid Pigtoe	G2G3	S1S2	--	Rare, Not State Listed	Rivers with strong current and firm sand/gravel substrates; TN & Cumb river systems incl KY Reservoir; W Uplands & W Highland Rim.	Aquatic

Rare Species by County

Roane	Vertebrate Animal	Mammal	<u>Myotis septentrionalis</u>	Northern Myotis	G1G2	S1S2	LT	T	A forest bat whose summer roosts may include caves, mines, live trees and snags; hibernates in caves and mines, often using small cracks and fissures. Notably susceptible to White-Nose Syndrome.	No Data
Roane	Vascular Plant	Flowering Plant	<u>Eurybia schreberi</u>	Schreber's Aster	G4	S1	--	S	Mesic Woods & Seepage Slopes	Upland
Roane	Vertebrate Animal	Reptile	<u>Ophisaurus attenuatus longicaudus</u>	Eastern Slender Glass Lizard	G5T5	S3	--	D	Dry upland areas including brushy, cut-over woodlands and grassy fields; nearly statewide but obscure; fossorial.	Upland
Roane	Vertebrate Animal	Bird	<u>Limnothlypis swainsonii</u>	Swainson's Warbler	G4	S3	--	D	Mature, rich, damp, deciduous floodplain and swamp forests.	Possible
Roane	Invertebrate Animal	Mollusc	<u>Cyprogenia stegaria</u>	Fanshell	G1	S1	LE, XN	E	Medium to large streams and rivers with coarse sand and gravel substrates; Cumberland and Tennessee river systems.	Aquatic

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If you have any questions or comments, Email ask.tdec@tn.gov or call at (888) 891-TDEC (8332).





[Rare Species by Watershed](#)
[Rare Species by County](#)
[Rare Species by Quadrangle](#)
[Stormwater Programs](#)

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- [Download Status and Banks g](#)

[Key to Status and Banks g](#)

Ande son	Inve teb Mte Anim al	Ilusc	<u>lethob sus</u> coope i nus g	Or n efoot imple ck	G1	S1	LE, XN	E g	L e ive s in s nd- vel-cobble subst tes in iffles nd g sho ls in deep flowin w te ; Cumbe l nd & Tennessee ive systems. Found in s nd nd vel subst tes in sho l e s of smal- medium size ive s; middle nd uppe TN system; ecently ediscover ed in Emo y ive .	Aqu tic
Ande son g	Inve teb te g Anim al g	Ilusc g	L mpsilis vi escens	Al b ma g L mp mussel g	G1 g	S1 g	LE g	E		Aqu tic g
Ande son g	Ve teb te Anim al g	Fish g	<u>E imon x mon chus</u>	Spotfin Chub g	G2 g	S2 g	LT, XN g	T g	Cle upl nd ive s with swift cu ents & boude subst tes; po tions of g the Tennessee ive w te shed.	Aqu tic
Ande son g	Inve teb te g Anim al g	Insect g	seud nophth Imus <u>w ll cej</u>	Wall ce's C ve g Beetle	G1 g	S1 g	--	e, Not St te Listed g	Te est i l c ve obli te; id e & g V lley; Ande son County.	Upl nd
Ande son g	V scul g l nt	Flowe in g l nt	yn nthemum <u>to ei</u>	To ey's unbin-mint	G2	S1 g	-- g	E g	B ens	Upl nd
Ande son g	Ve teb te Anim al g	Fish g	E imyst x c hni g	Slende Chub g	G1 g	S1 g	LT, XN g	T	jo he dw te t ibs to TN ive with smal vel subst tes & swift-mode te cu ents.	Aqu tic
Ande son	V scul g l nt	Flowe in g l nt	Au eol i p tul	Sp e din g F lse-fox love g	G3 g	S3 g	--	S	O k Woods And Ed es	Upl nd
Ande son g	Ve teb te Anim al	Fish g	Cycleptus elon tus	Blue Sucke	3G4	S2 g	-- g	T g	Swift w te s ove fi m subst tes in bi ive s.	Aqu tic
Ande son g	Inve teb te Anim al g	Ilusc g	<u>Cyp o eni ste i g</u>	nshell g	G1 g	S1 g	LE, XN g	F E g	diuen to l e st e ms nd ive s with co se s nd nd vel subst tes; g Cumbe l nd nd Tennessee ive systems.	Aqu tic
Ande son g	V scul g l nt	Flowe in g l nt	<u>l t nthe fl v g</u> <u>y he biol</u>	Tube cled ein- o chid g	G4?T4Q g	S2 g	-- g	T g	Sw mps And Floodpl ins	ossible
Ande son g	Inve teb te g Anim al g	Insect g	seud nophth Imus pusillus	Tiny C ve Beetle	G1 g	S1 g	-- g	e, Not St te Listed	Te est i l c ve obli te; no the n g id e & V lley.	Upl nd
Ande son g	V scul g l nt	Flowe in g l nt	<u>Heli nthus g</u> <u>occident lis g</u>	N ked-stem g Sunflowe g	G5 g	S2 g	-- g	S g	Limestone Gl des And B ens	Upl nd
Ande son g	Inve teb te g Anim al g	A chnid g	Hespe oche nes <u>mi bilis g</u>	Southe ste n g C ve seudosco pion g	G5 g	S3 g	--	e, Not St te Listed g	Te est i l c ve obli te; wood t deb is in c ves; middle Tennessee.	Upl nd
Ande son g	V scul g l nt	Flowe in l nt	Ju l ns cine e g	utte nut g	G3 g	S3 g	-- g	T g	ich Woods And Hollows	ossible
Ande son g	V scul g l nt	Flowe in l nt	<u>n ssi</u> ndifoli g	L e-le ved Gr ss-of- g p n ssus g	G3 g	S3 g	-- g	S g	C lc eous Seeps P g	ossible
Ande son g	Ve teb te g Anim al g	eptile g	ituophis <u>mel noleucus</u> <u>mel noleucus g</u>	No the n inesn ke	G4T4 g	S3 g	-- g	T g	Well-d ined s ndy soils in pine/pine-o k woods; d y mount in g id es; E po tions of west TN, E to lowe elev of the App l chi ns.	Upl nd
Ande son g	V scul g l nt	Flowe in g l nt	<u>eheni co d t g</u>	He tle f g eheni	G5 g	S2 g	-- g	T g	Waded unt in Slopes	Upl nd
Ande son g	Ve teb te g Anim al g	Fish g	Etheostom ab ileyi g	Eme l D te g	4G5	S2 g	-- g	D g	C eeks nd smal ive s with iffles cont inin vel o ubble; uppe Cumbe l nd d in e.	Aqu tic
Ande son g	V scul g l nt	Flowe in l nt	<u>Sulliv nti sulliv nti</u>	Sulliv nti g	4 g	S1 g	-- g	E g	oist Sh ded Cliffs g	Upl nd
Ande son g	Ve teb te Anim al	mmal	Syn ptomys coope i	Southe n Bo g Lemmin	G5 g	S4 g	-- g	D g	shy me dows, wet g b lds, & ich upl nd fo ests.	ossible
Ande son	V scul l nt	Flowe in l nt	<u>D b mosissima</u>	B nchin Whitlow- ss g	G4 g	S2 g	-- g	S g	C lc eous Bluffs g	Upl nd
Ande son	Inve teb te g Anim al	Ilusc g	Athe ni nthonyi g	Anthony's ive sn il	G1 g	S1 g	LE, XN g	E g	L e ive s nd g downst e m st etches g	Aqu tic

Ande son g	Inve teb te g Anim al	Ilusæ g	<u>Fuscon i co g</u>	hiny i toe g	G1 g	S1 g	LE, XN	E g	of l c eeks, on cobble/boulde subst tes dj. iffles; po tions of uppe TN ive b sin.	Aqu tic
Ande son g	Inve teb te g Anim al	Ilusæ g	<u>lo fluvi lis g</u>	Spiny ive sn il	G1G2	S2 g	-- g	e, Not St te Listed g	Sho llow w te s of sho ls th t e pid to mode te nd well-oxy en ted; Tennessee g	Aqu tic
Ande son g	Inve teb te Anim al	Ilusæ g	<u>Lemiox imosus g</u>	Bi dwin e lymussel	G1 g	S1	LE, XN	E g	Sm all-medium size ive s in iffle e s with g s nd nd vel subst tes in mod-f st cu ents; Tennessee ive system.	Aqu tic
Ande son g	Ve teb te Anim al	Bi d g	<u>Limnothlypis g sw insonii g</u>	Sw inson's Wa ble	G4 g	S3	-- g	D g	tu e, ich, d mp, deciduous floodpl in g nd sw mp fo ests.	ossible
Ande son g	Inve teb te Anim al	Ilusæ g	<u>C ychium sty ium g</u>	C ve Tho n g	G3 g	S2 g	--	e, Not St te Listed	C ve obli te; feeds on c icket u no; Hi hl nd g im & esc pment of Cumbe l nd l te u.	Upl nd
Ande son g	Ve teb te Anim al	Amphibi n g	<u>Aneides eneus g</u>	Green S l m ande	G3G4	S3S4	--	e, Not St te Listed g	D mp c evices in sh ded ock outc ops nd led es; bene th loose b k nd c cks of t ees nd sometimes in/o unde lo s.	Upl nd g
Ande son g	Nonv scul l nt	Non-V scul l nt	<u>L mocl dium leskeoides</u>	Mo A ss g	G3G5	S1 g	-- g	T g	Seepy Limestone Cliffs g And Bluffs	ossible g
Ande son g	Ve teb te Anim al	mmal	<u>e imyotis g subfl vus</u>	T i-colo ed b t g	G3G4	S2S3	-- g	T g	Gene lly ssoci ted with fo ested l ndsc pes but may oost ne openin s.	No D t
Ande son g	Inve teb te Anim al	Ilusæ g	<u>lethob sus cic ticosus g</u>	White Wa tyb ckg	G1 g	S1	LE, XN	E g	esumed to inh bit sho ls nd iffles in l e ive s; Tennessee g & Cumbe l nd ive systems. Ve y e & poss exti p ted in TN.	Aqu tic
Ande son g	Inve teb te Anim al	Ilusæ g	<u>Hemisten l t g</u>	C ckin e lymussel	G1 g	S1	LE, XN	E g	diun-sized ive s of mod cu ent, deeply bu ied in mud, s nd, g vel, nd cobble subst tes; Tennessee & Cumb. ive systems.	Aqu tic
Ande son g	V scul l nt	Flowe in g l nt	<u>Elode nutt llii g</u>	Nutt ll's Wate weed	G5 g	S2	-- g	S g	Aqu tic; St e ms And onds	Aqu tic
Ande son g	Inve teb te Anim al	Insect g	<u>seud nophth lmus p ynei</u>	yne's C ve Beetle	G1 g	S1	--	e, Not St te Listed	Te est i l c ve obli te; no the g id e & V lley; epo ted f om Ande son County.	Upl nd
Ande son g	Ve teb te Anim al	Amphibi n g	<u>Hemid ctylium g scutum</u>	Fou -toed S l m ande	G5 g	S3	-- g	D g	Woodl nd sw mps, sh llow dep essions, & sph num mats on cidic soils; middle & e st Tennessee.	ossible
Ande son g	Nonv scul l nt	Non-g V scul l nt	<u>Homai delphus g sh pii g</u>	Sh p's Homai delphus	G3? g	S1	-- g	E g	C lc eous Or g Dolomite Bluffs	Upl nd
Ande son g	Ve teb te Anim al	Bi d g	<u>Ve mivo ch ysopte</u>	Golden-win ed Wa ble	G4 g	S3B	-- g	T g	E lly succession l g h bit ts in foothill e ions of App l chi ns.	Upl nd
Ande son g	V scul l nt	Flowe in g l nt	<u>Oli oneu on lbum g</u>	i ie Golden od	G5 g	S1S2	--	E g	B ens	Upl nd
Ande son g	Ve teb te Anim al	Fish	<u>Etheostoma g maydeni</u>	edlips D te g	N	2 g	-- g	T g	Found in slow-movin l e c eeks nd ive s in pools lon the b nks st ewn with g	No D t

Ande son g	Animal Assembl e	No D t g	<u>ooke y g</u>	He on ooke y g	G5 g	SN g	- g	e, Not St te Listed g	boulde s nd woody deb is.	No D t	o D t
Ande son g	Ve teb te g Animal g	Fish g	<u>Ch osomus g tennesseensis g</u>	Tennessee D ce g	G3 g	S3 g	-- g	D g	Fi st o de sp in -fed st e ms of woodl nds in id e nd V lley limestone e ion; Tennessee ive w te shed.		Aqu tic
Ande son	V gcul l nt	Flowe in l nt	<u>Die vill lonice g</u>	No the n Bush-honeysuckle	G5 g	S2	--	T	ocky Woodl nds And Bluffs		Upl nd
Ande son g	V scul g l nt	Flowe in g l nt	<u>Fothe ill majo g</u>	untbin Witch- lde	G3 g	S2 g	-- g	T g	ocky Slopes And ive B nks		ossible
Ande son g	Inve teb te g Animal g	llusæ g	<u>Fuscon i cuneolus g</u>	Fine yed i toe	G1 g	S1 g	LE, XN g	E g	iffles of fo ds nd sho ls of mod dient st e ms in fi m cobble nd vel subst tes; g		Aqu tic
Ande son g	Ve teb te g Animal g	mmal g	<u>otiv isescens g</u>	Mÿ otis g	G3G4	S2 g	LE g	E g	C ve obli te ye -ound; f equents fo ested e s; mi to y.		Upl nd
Ande son g	Ve teb te g Animal g	Fish g	<u>Notu us fl vipinnis g</u>	Yellowfin g dtom	G1 g	S1 g	LT, XN g	T g	dium size to l e c eeks nd sm l ive s th t e unpolluted & el tively unsilted; uppe Tennessee ive w te shed.		Aqu tic
Ande son g	Ve teb te g Animal g	Fish g	<u>e cin u nti c</u>	T n e ine g D te g	G4 g	S3 g	-- g	D g	L e-mode te size he dw te t ibs to Tennessee ive , in cle , fi ly deep, ocky pools, usu lly below iffles.		Aqu tic
Ande son g	V scul g l nt	Flowe in g l nt	<u>Delphinium ex lltum g</u>	T ll L kspu g	3 g	S2 g	-- g	E	Gl des And B ens		Upl nd
Ande son g	Ve teb te g Animal g	Amphibi n g	<u>Desmo n thus g welte i g</u>	Mÿ ck unt in S l m ande g	G4 g	S3 g	-- g	D g	Sp in uns nd pe mæ nst e ms in wooded mount inous te in; no the n Cumbe l nds.		Aqu tic
Ande son g	Inve teb te g Animal g	llusæ g	<u>D omus d omæ g</u>	D omed y e lymussel g	G1 g	S1 g	LE, XN g	E	dien-l e ive s with iffles nd sho ls w/ el tively fi m ubble, vel, nd st ble subst tes; Tennessee & Cumbe l nd systems.		Aqu tic
Ande son g	Inve teb te g Animal g	A chnid g	<u>Nesticus p ynei g</u>	A C ve Spide g	3G4	S3 g	-- g	e, Not St te Listed g	Te est i l c ve ssoci te; lso may be found on su f ce; no the n id e & V lley.		Upl nd
Ande son g	V scul g l nt	Flowe in l nt	<u>l is fulv</u>	oppe l is	G5 g	S2	-- g	T g	Bottoml nds P		ossible
Ande son g	V scul g l nt	Flowe in l nt	<u>Epilobium cili tum</u>	H i y Willow- he b	G5 g	S1 g	-- g	T g	ount in B lds P g		ossible
Ande son g	Ve teb te g Animal g	Bi d g	<u>Setoph ce ule g</u>	Ce ule n Wa ble g	G4 g	S3B g	-- g	D g	tu e deciduous fo est, p ticul ly in floodpl ins o mesic conditions.		Upl nd
Ande son g	Ve teb te g Animal g	Bi d g	<u>Th yomæ nes bewicki g</u>	Bewick's Wren g	G5 g	S1 g	-- g	D g	B ushy e s, thicket s nd sc ub in open count y, open nd ip i n woodl nd.		Upl nd

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If you h ve ny questions o comments, Emål sk.tdec@tn. ov o c ll t (888) 891-TDEC (8332). g





Rare Species by Watershed Rare Species by County Rare Species by Quadrangle Stormwater Programs

Help • Download Status and Ranks g

Key to Status and Ranks g

Rare Species by County

It is established on or around July 1st and July 15th of each year.

Search bar with 'Go' button, 'rows 25', and 'Actions' dropdown.

County = 'Cumberland'

1 - 25 of 74 g

r

Cumberland Vegetation Animal

Cumberland Vegetation Animal

Cumberland Vascular Plant

Cumberland Invertebrate Animal

Cumberland Vascular Plant

Cumberland Vertebrate Animal

Cumberland Vegetation Animal

Cumberland Vascular Plant

Cumberland Vascular Plant

Cumberland Vascular Plant

Cumberland Invertebrate Animal, Ecological System, Classification

Cumberland Invertebrate Animal

Cumberland Vascular Plant

Cumberland Vascular Plant

		l nt	<u>b evifoli g</u>	yssop					shes g	
Cumbe l nd	V scul l nt	Flowe in l nt	<u>Di mo ph g smalii</u>	Small's Stonecrop	G4 g	S1S2	-- g	E g	S ndstone Outc ops	Upl nd
Cumbe l nd	V scul l nt	Flowe in g l nt	<u>sh lli ndiflo</u>	L e-fl. B b 's- buttons	GNg	2	-- g	E g	ocky ive B s P	ossible g
Cumbe l nd	Inve teb te g Animal	Insect g	<u>Ophio omphus lle h niensis</u>	Alle heny Sn ket il	G3T2T3Q g	S1	-- g	e, Not St te Listed	iffle e s of sp in -fed st e ms; Cumbe l nd l te u, id e & V lley, & Blue id e; not w te shed specific.	Aqu tic
Cumbe l nd	V scul l nt	Flowe in l nt	<u>o oni ophio lossoides</u>	ose o oni	5 g	S2 g	--	E g	Wet Acidic B ens P	ossible G
Cumbe l nd	V scul l nt g	Flowe in g l nt	<u>ot mo eton mplifolius</u>	L e-le f ondweed	G5	S1 g	-- g	T g	L kes And St e ms	Aqu tic
Cumbe l nd	V scul l nt	Flowe in l nt	<u>Heli nthus occident lis g</u>	N ked-stem Sunflower	G5	S2	--	S g	Limestone Gl des And B ens	Upl nd
Cumbe l nd	V scul l nt	Flowe in l nt	<u>Uticul i subul t</u>	Zi z Bl dde wo t	G5	S1	-- g	T g	Wet B ens, Ecotones	ossible
Cumbe l nd	V scul l nt	Flowe in g l nt	<u>Spi e vi ini n g</u>	Vi ini Spi e	2?	S2	LT	E g	St e m B s And Led es G g	ossible
Cumbe l nd	Ve teb te g Animal	Amphibi n	<u>Desmo n thus g bditus</u>	Cumbe l nd Dusky S l mande	G2G3	S2S3	-- g	D g	Assoc. with st e ms of Cumbe l nd l te u; unde ocks lon small st e ms o dj. g cove ; G undy counties.	Aqu tic
Cumbe l nd	V scul l nt g	Flowe in g l nt	<u>Amel nchie g s n uine</u>	oundle f g Sh dbush	G5 g	S2 g	-- g	T g	ocky Slopes And g ive B nks	Upl nd

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C

Appendix C – Photographs



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Photograph 1- Representative of pasture/hay field within the Project Area, facing west.



Photograph 2- Representative of dry deciduous forest within the Project Area, facing east.



Photograph 3- Representative of wet deciduous forest within the Project Area, facing northeast.



Photograph 4- Representative of dry herbaceous within the Project Area, facing northwest.



Photograph 5- Representative of wet herbaceous within the Project Area, facing northwest.



Photograph 6- Representative of Kudzu infestation within the Project Area, facing east.



Photograph 7- Forest Stand 1 high quality bat habitat, facing south.



Photograph 8- Forest Stand 1 high quality bat foraging habitat, facing north.



Photograph 9- Forest Stand 2 moderate quality foraging bat habitat, facing north.



Photograph 10- Forest stand 2 moderate bat habitat, facing west.



Photograph 11- Forest Stand 3 low quality bat habitat, facing north.



Photograph 12- Forest stand 4 low quality bat habitat, facing northeast.



Photograph 13- Forest Stand 5 moderate bat habitat, facing northeast.



Photograph 14- Forest Stand 5 moderate quality foraging habitat, facing north.



Photograph 15- Forest Stand 6 low quality bat habitat, facing west.



Photograph 16- Forest Stand 7 moderate foraging bat habitat, facing south.



Photograph 17- Forest Stand 7 moderate quality bat habitat, facing north.



Photograph 18- Forest Stand 8 moderate quality bat habitat, facing north.



Photograph 19- Forest Stand 8 and 9 foraging bat habitat, facing southeast.



Photograph 20- Forest Stand 9 low quality bat habitat, facing south.



Photograph 21- Forest Stand 10 moderate quality bat habitat, facing south.



Photograph 22- Forest Stand 10 moderate quality bat habitat, facing southeast.



Photograph 23- Forest Stand 11 low quality bat habitat, facing west.



Photograph 24- Forest Stand 12 low quality habitat for bats, facing southwest.



Photograph 25- Forest Stand 13 low quality bat habitat, facing northeast.



Photograph 26- Forest Stand 13, 14, and 15 foraging habitat, facing northeast.



Photograph 27- Forest Stand 14 low quality bat habitat, facing south.



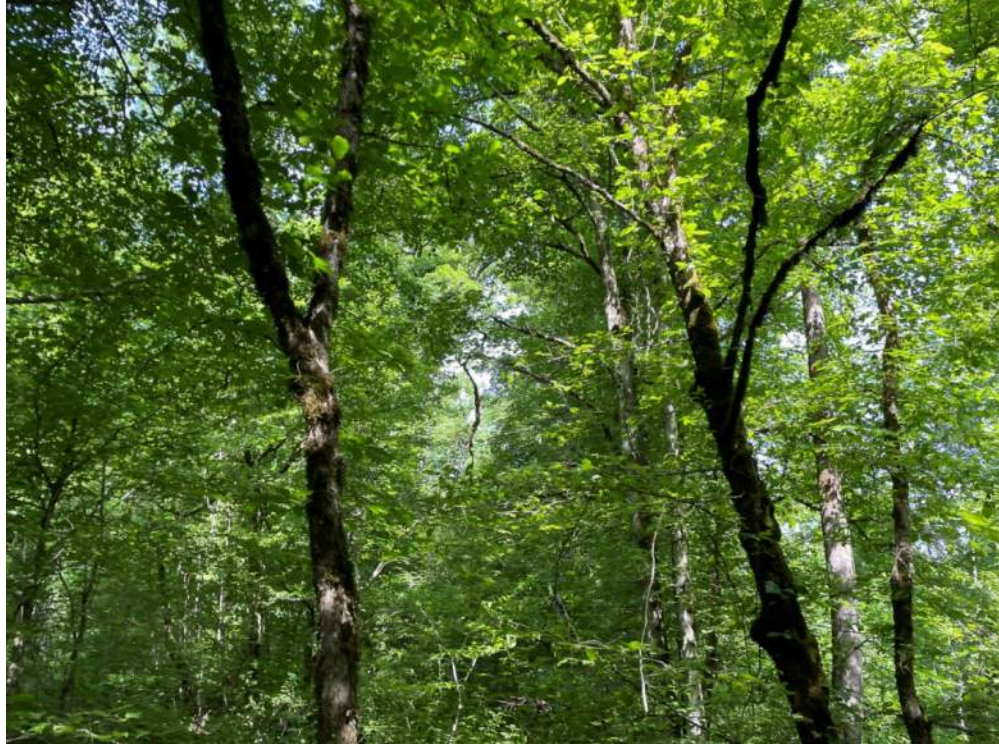
Photograph 28- Forest Stand 15 moderate quality bat habitat, facing southwest.



Photograph 29- Forest Stand 16 low quality bat habitat, facing northeast.



Photograph 30- Forest Stand 17 foraging habitat, facing west.



Photograph 31- Forest Stand 18 moderate quality bat habitat, facing northeast.



Photograph 32- Forest Stand 18 foraging habitat, facing east.



Photograph 33- Forest Stand 19 low quality bat habitat, facing west.



Photograph 34- Forest Stand 19 foraging habitat, facing east.



Photograph 35- Forest Stand 20 low quality bat habitat, facing south.



Photograph 36- Forest Stand 20 box culvert and water resource within stand, facing west.



Photograph 37- Forest Stand 21 moderate quality bat habitat, facing southeast.



Photograph 38- Forest Stand 22 low quality bat habitat, facing northeast



Photograph 39- Forest Stand 23 moderate quality bat habitat, facing north.



Photograph 40- Forest Stand 23 foraging bat habitat, facing north



Photograph 41- Forest Stand 24 low quality bat habitat, facing southeast.



Photograph 42- Forest Stand 25 low quality bat habitat, facing northeast



Photograph 43- Forest Stand 26 low quality bat habitat, facing southeast.



Photograph 44- Forest Stand 27 moderate quality bat habitat, facing south



Photograph 45- Forest Stand 27 Intermittent Stream, facing northwest.



Photograph 46- Forest Stand 28 low quality bat habitat, facing northeast.



Photograph 47- Forest Stand 29 moderate quality bat habitat (snag), facing north



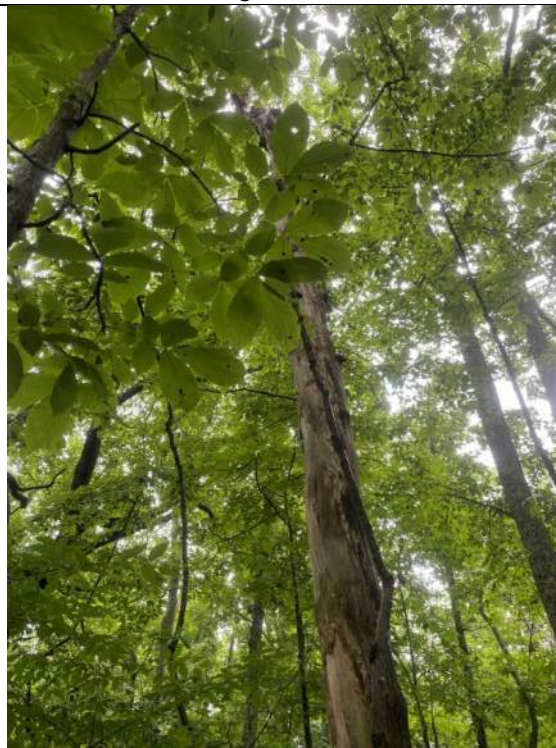
Photograph 48- Forest Stand 29 Intermittent stream, facing north.



Photograph 49- Forest Stand 30 and 31 low quality bat habitat, facing northeast



Photograph 50- Forest Stand 32 and Forest Stand 33 moderate quality bat habitat, facing northeast.



Photograph 51- Forest Stand 32 representative snag, facing northeast



Photograph 52- Forest Stand 34 low quality bat habitat, facing southwest.



Photograph 53- Forest Stand 35 moderate quality bat habitat, facing west.



Photograph 54- Forest Stand 36 moderate quality bat habitat, facing southwest.



Photograph 55- Forest Stand 36 Perennial Stream, facing southwest.



Photograph 56- Forest Stand 37 low quality bat habitat, facing northeast.



Photograph 57- Forest Stand 38 low quality bat habitat, facing east.



Photograph 58- Forest Stand 38 Intermittent Stream within Stand 38, facing northwest.




Photograph 59- Forest Stand 39 low quality bat habitat, facing south.



Photograph 60- Forest Stand 40, low quality bat habitat, facing east.

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D

Appendix D – Botany
Report



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Kingston Fossil Plant (KIF) Botanical Survey Memo

Roane, Cumberland, and Anderson Counties, TN
November 30, 2022



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Attachments

Attachment A- List of Botanical Species Observed during Kingston TL Botanical Field Survey

Attachment B- Photographs of Botanical Survey

Project Background

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units, and construction and operation of approximately 1,500 megawatts (MW) of replacement generation requiring extensive regional transmission system upgrades to be completed and operational prior to coal unit retirement. Upgrades may include upgrading, reconductoring, or rebuilding transmission lines (TLs) as well as replacing terminal equipment, bus work, or jumpers.

HDR Engineering, Inc (HDR) conducted an environmental site assessment of the Project Area which consisted of three TLs: (1) the Eastern Segment TLs (L5108 and L5302) located north of the city of Kingston and west of the city of Oak Ridge, in Anderson and Roane Counties, Tennessee; and (2) the Western Segment TL (L5383) located north of the city of Crossville, in Cumberland County, Tennessee, and associated access roads (Project Area) proposed for upgrades under Alternative A of the KIF Retirement EIS Project. Under Alternative A, TVA would make improvements to existing transmission lines within the Kingston Reservation, including new TL connections to the proposed combined cycle gas facilities and switch station. As part of the environmental site assessment, HDR was tasked with surveying the Project for threatened and endangered plant species. From August 15 to 18, 2022, the Project Area was surveyed for the presence of federally and state-listed threatened or endangered plant species throughout the various habitat types within the Project limits.

Habitat Overview

The Project Area lies within the Central Plateau (CU) – Cumberland Co. and Ridge and Valley (RV), in Roane, Cumberland, and Anderson Counties, Tennessee. A variety of vegetative communities are known to exist within these physiographic regions and were divided into 10 habitat type categories through a desktop review for the purposes of this study.

Category 1. Wetlands (i.e., swamps and floodplains, acidic wetlands and swamps, acidic seeps wet meadows, marshes, emergent herbaceous wetlands, bogs, acidic open wetlands)

Category 2. Acidic and calcareous seeps

Category 3. Wet and dry barrens (i.e., limestone glades and barrens, wet acidic barrens)

Category 4. Outcrops (i.e., dry sandstone, granite outcrops, sandstone outcrops)

Category 5. Stream, ponds, and lakes (i.e., lakes (margins), streams (margins), ponds (margins), slow acidic streams, stream bars and ledges, stream heads, sandy/rocky river bars, Rocky sand stream sides)

Category 6. Rocky woods, rock slopes, riverbanks, and river bars

Category 7. Bluffs, cliffs, and mountain balds (i.e., calcareous bluffs/seepy limestone cliffs/bluffs/shale bluffs, dolomite bluffs, wet bluffs, moist shaded cliffs, rocky bluffs)

Category 8. Wooded areas (i.e., rich woods/hollows, rich oak woods, dry woods, wooded mt. slopes and mt. thickets, dry sandy woods, Mesic woods and seepage slopes, mesic woods and seepage slopes, oak woods and edges [maintained row], alluvial/moist ravines in dry ridges, bottomland hardwoods [*could include wetlands])

Category 9. Sinks

Category 10. Dry openings, powerlines

The species on the targeted threatened and endangered list can all be categorized as being found in one (or more) of these ten generalized habitat types. A list of state and federal protected species with potential to exist within the various broad habitat types in the Project Area is provided in the Kingston Wetlands and Streams Survey Report and is based on resources provided in Appendix B of that report.

Methodology

A desktop review was performed to identify general vegetation communities and habitat types with potential to occur within the Project survey area. In June 2022, HDR field biologists then performed a field verification of the information compiled during the desktop assessment. Based on the results of desktop review and field habitat and vegetation characterizations, approximately 30 botanical survey locations were identified for follow-up with a focused field assessment. The objective of the survey was to determine the suitability of the Project Area habitat for any threatened or endangered species and document the presence/absence of federal and state listed species during the field assessment. At the time of the survey, there were 70 state-listed protected species, three of which were also listed as federally threatened: white fringeless orchid (*Platanthera integrilabia*), Cumberland rosemary (*Conradina verticillata*), and Virginia spirea (*Spirea virginiana*). HDR staff, including a botanist, surveyed for federal and state listed species at approximately 30 locations along the TL alignment and associated access roads in the Project Area that were previously identified as having habitat conditions potentially supportive of the listed species.

Observational Data

Areas surveyed along the western Project alignment near Crossville, Tennessee (L5383), contained higher diversity than the more urbanized eastern Project TLs (L5108 and L5302). Land use along the western alignment was primarily agricultural land with some scattered pond/open water wetlands, where most of the increased biodiversity was observed during the botanical survey. Invasive and opportunistic species were more abundant along the eastern alignment near Oak Ridge, Tennessee, which can be correlated to the high density of urbanization.

The federally listed white fringeless orchid flowers from June to September in Tennessee and generally prefers wet, flat, boggy areas in acidic muck or sand, and partially shaded areas at the head of streams or seepage slopes. Although several locations with potentially suitable habitat were identified along the Project alignment during the June 2022 field botany survey, no individuals of white fringeless orchid were found to be present at the time of the survey.

The federally listed Virginia spirea and Cumberland Rosemary prefer stream bars and stream ledges, as well as gravel bars, sandy riverbanks, and riparian areas with seasonal flooding. Riverbank and river bar habitat were present along the Obed River, Clinch River, Poplar Creek, East Fork Poplar Creek, and several unnamed tributaries; however, no state or federally listed species were observed to be present. Boat surveys were not implemented at these locations due to time and budget constraints and on the premise that the Project would not be associated with any riverbank or stream bar activity.

Remnants of sandstone, shallow bedrock, glade and barren like habitat, and chert rock habitat were observed throughout the Project Area. These rocky habitat types have the potential to support state listed species including (but not limited to) branching whitlow-grass (*Draba ramosissima*), mountain bush-honeysuckle (*Diervilla sessilifolia* var. *rivularis*), myurella moss (*Myurella julacea*), naked-stem sunflower (*Helianthus occidentalis*), prairie goldenrod (*Oligoneuron album*), roundleaf shadbush (*Amelanchier sanguinea*), Sharp's homaliadelphus (*Homaliadelphus sharpi*), Sharp's lejeunea (*Lejeunea sharpii*), silverling (*Paronychia agryrocoma*), slender blazing-star (*Liatris cylindracea*), Small's stonecrop (*Diamorphia smallii*), tall larkspur (*Delphinium exaltatum*), Torrey's mountain-mint (*Pycnanthemum torrei*), western wallflower (*Erysimum capitatum*), and zigzag bladderwort (*Utricularia subulate*); however, none of these species were observed during the field botanical survey.

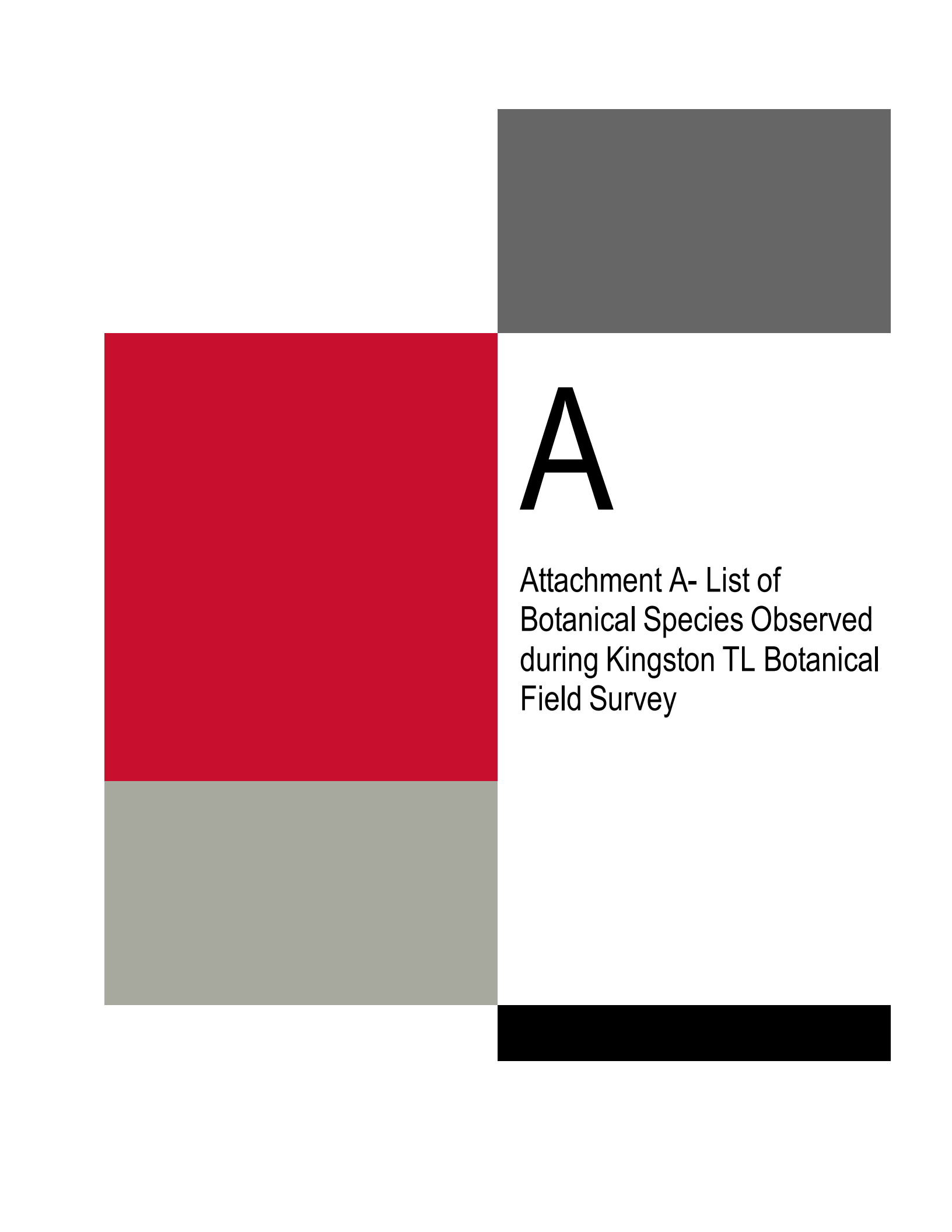
Dry powerline openings, bog and wet meadows, and disturbed prairie habitat were found throughout the Project alignment. State listed species with the potential to occur in these habitats include (but are not limited to) early St. John's wort (*Hypericum nudiflorum*), Muhlenberg's nutrush (*Scleria muehlenbergii*), ovate-leaved arrowhead (*Sagittaria platyphylla*), spoonleaf sundew (*Drosera intermedia*), sticky hedge-hyssop (*Gratiola brevifolia*), swamp lousewort (*Pedicularis lanceolata*), tawny cotton-grass (*Eriophorum virginicum*), tubercled rein-orchid (*Platanthera flava* var. *herbioloa*), and wood lily (*Lilium philadelphicum*). Several forested areas associated with planned access roads were also surveyed and included both younger successional woodlands of old fencerows and abandoned agricultural lots, and mature, upland, oak-hardwood communities. These forested areas were comprised largely of common and abundant woody species and no state or federally listed species were observed during the time of the field botanical survey.

Agricultural fields and ponds, and urbanized locations where invasives were plentiful were surveyed but deemed as areas of low ecological value with no suitable habitat for any of the state or federally listed species identified during the desktop review. Invasive species such as kudzu (*Pueraria montana*) and Johnson grass (*Sorghum halepense*) were plentiful in the Project area near Oak Ridge, and herbicide use was evident at many of the locations in the western alignment. A list of notable, but unlisted/protected plants observed during the survey can be found in Attachment A. Photos taken during the botanical survey are provided in Attachment B.

Survey Results

In June 2022 a field botanical survey of 30 areas identified as having potentially suitable habitat for federal and state listed species was evaluated by HDR biologists and botanist. Although

potentially suitable habitat was identified within the Kingston TL Project area, no federal or state listed botanical species were observed occupying those habitats at the time of the survey.



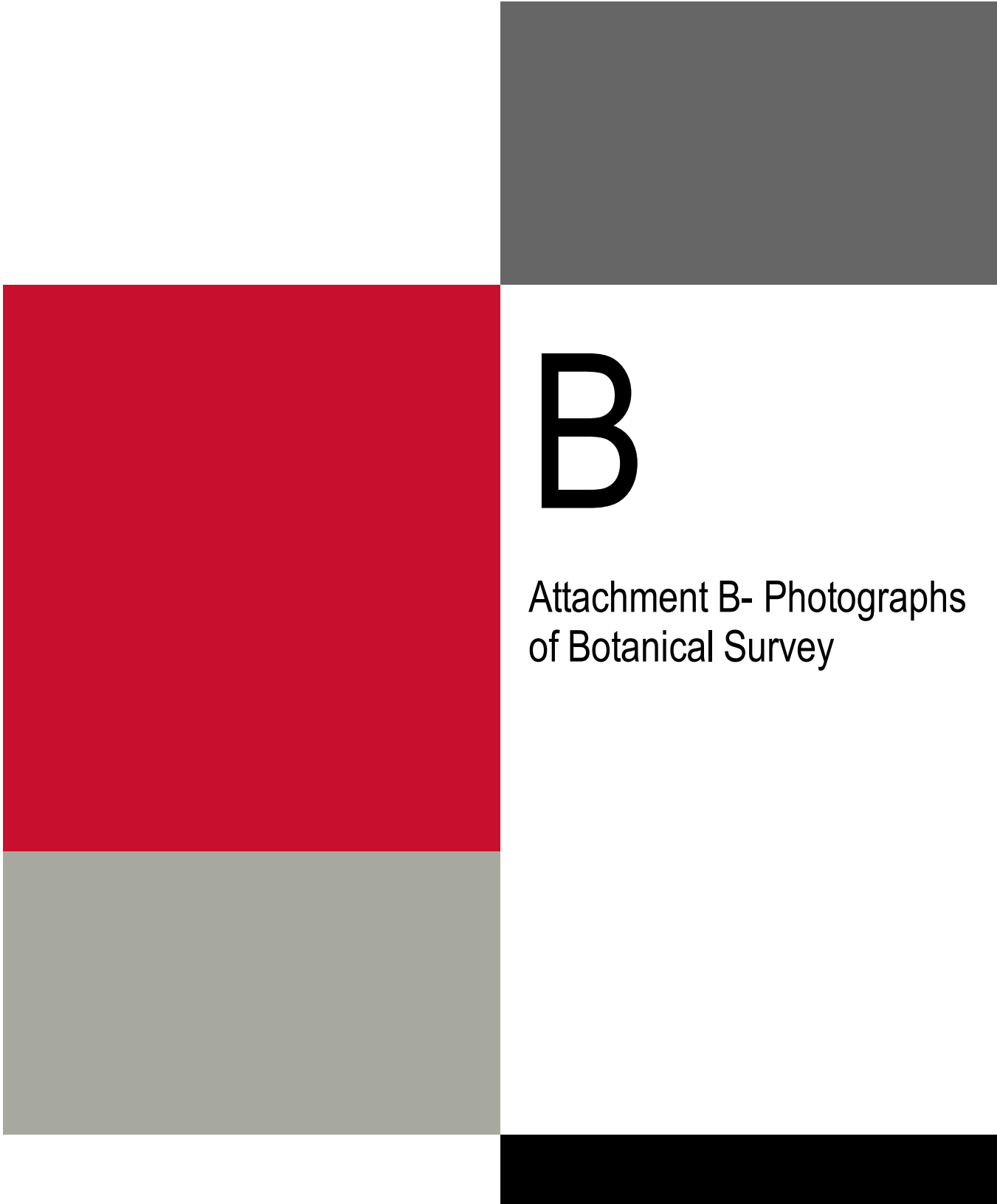
A

Attachment A- List of
Botanical Species Observed
during Kingston TL Botanical
Field Survey

Scientific Name	Common Name
<i>Agave virginica</i>	false aloe
<i>Agrimonia parviflora</i>	harvestlice
<i>Alisma plantago-aquatica</i>	common water plantain
<i>Apocynum cannabinum</i>	Indian hemp
<i>Arisaema dracontium</i>	green dragon
<i>Aronia arbutifolia</i>	red chokeberry
<i>Asclepias tuberosa</i>	butterfly milkweed
<i>Asclepias verticillata</i>	whorled milkweed
<i>Bidens aristosa</i>	bearded beggarticks
<i>Bignonia capreolata</i>	crossvine
<i>Boehmeria cylindrica</i>	false nettle
<i>Carex crinita</i>	fringed sedge
<i>Cichorium intybus</i>	chicory
<i>Cirsium discolor</i>	field thistle
<i>Clinopodium vulgare</i>	wild basil
<i>Conocephalum conicum</i>	great scented liverwort
<i>Conoclinium coelestinum</i>	blue mistflower
<i>Coreopsis major</i>	greater Tickseed
<i>Cryptotaenia canadensis</i>	honestwort
<i>Dichanthelium clandestinum</i>	deertongue
<i>Dichanthelium oligosanthes</i>	Heller's rosette grass
<i>Diodia teres</i>	rough buttonweed
<i>Dulichium arundinaceum</i>	threeway sedge
<i>Elymus virginicus</i>	Virginia wild-rye
<i>Erigeron strigosus</i>	prairie fleabane
<i>Euonymus fortunei</i>	winter creeper euonymus
<i>Eupatorium altissimum</i>	tall boneset
<i>Frangula caroliniana</i>	Carolina buckthorn
<i>Gaylussacia baccata</i>	black huckleberry
<i>Lactuca floridana</i>	woodland lettuce
<i>Lespedeza hirta</i>	hairy lespedeza
<i>Lindernia dubia</i>	yellowseed false pimpernel
<i>Lobelia spicata</i>	pale spiked lobelia
<i>Lonicera maackii</i>	Amur honeysuckle
<i>Ludwigia alternifolia</i>	seedbox
<i>Lycopus americanus</i>	American bugleweed

Scientific Name	Common Name
<i>Mimulus alatus</i>	sharpwing moonkeyflower
<i>Mimulus ringens</i>	Allegheny monkeyflower
<i>Monarda fistulosa</i>	wild bergamot
<i>Nabalus albus</i>	white lettuce
<i>Nabalus albus</i>	white rattlesnakeroot
<i>Oenothera biennis</i>	evening-primrose
<i>Oenothera guara</i>	biennial gaura
<i>Panicum oligosanthos</i>	Fewanther obscuregrass
<i>Parthenium integrifolium</i>	wild quinine
<i>Penthorum sedoides</i>	ditch stonecrop
<i>Phlox maculata</i>	wild sweetwilliam
<i>Phlox paniculata</i>	garden phlox
<i>Phyla lanceolata</i>	fogfruit
<i>Pinus virginiana</i>	Virginia pine
<i>Platanther ciliaris</i>	orange-fringed orchid
<i>Polygala curtissii</i>	Curtis's milkwort
<i>Polygala sanguinea</i>	purple milkwort
<i>Potamogeton natans</i>	floating pondweed
<i>Prunella vulgaris</i>	common selfheal
<i>Pycnanthemum albescens</i>	whiteleaf mountainmint
<i>Pycnanthemum muticum</i>	blunt mountainmint
<i>Pycnanthemum tenuifolium</i>	narrow-leaf mountainmint
<i>Ranunculus hispidus</i>	bristly buttercup
<i>Ratibida pinnata</i>	praria coneflower
<i>Rudbeckia laciniata</i>	cutleaf coneflower
<i>Rudbeckia trilobia</i>	brown-eyed susan
<i>Sabata stellans</i>	marsh pink
<i>Sagittaria latifolia</i>	broadleaf arrowhead
<i>Salvia lyrata</i>	lyreleaf sage
<i>Scutellaria incana</i>	hoary skullcap
<i>Scutellaria integrifolia</i>	helmet skullcap
<i>Sedum ternatum</i>	woodland stonecrop
<i>Senna marylandica</i>	Maryland sena
<i>Silphium integrifolium</i>	wholeleaf rosinweed
<i>Silphium perfoliatum</i>	cup plant
<i>Sparganium americanum</i>	American bur-reed

Scientific Name	Common Name
<i>Spiraea tomentosa</i>	steeplebush
<i>Tripsacum dactyloides</i>	Eastern gamagrass
<i>Verbesena alternifolia</i>	common wingstem
<i>Verbesena virginica</i>	frostweed
<i>Vernonia noveboracensis</i>	ironweed
<i>Vitis labrusca</i>	fox grape



B

Attachment B- Photographs
of Botanical Survey



Photo 1. Wet opening with *Boehmeria cylindrica*.



Photo 2. Sprayed portion along Clinch River with *Solidago* spp. and *Rubus* spp.



Photo 3. *Hypericum* spp. determined not to be state listed.



Photo 4. Upland transitional edge with *Solidago* spp.



Photo 5. Orange crested orchid, a non-listed species.



Photo 6. Nabalus spp, a non-listed species.



Photo 7. Dry powerline opening with Solidago spp.



Photo 8. Lillium spp. determined not to be state-listed.



Photo 9. River bar surveyed and had no listed species.



Photo 10. Rocky cliff surveyed and had no state-listed species.



Photo 11. Riparian area with wingstem and other non-listed species.



Photo 12. Small mudflat lacking vegetation.



Photo 13. Survey site with submerged aquatic vegetation (SAV).

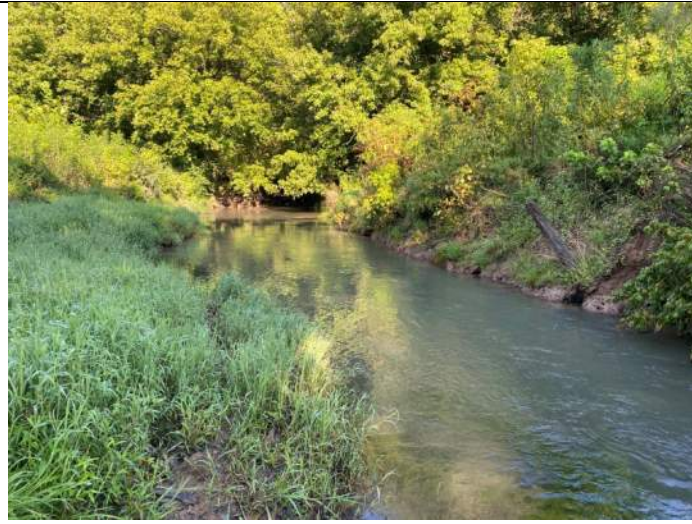


Photo 14. SAVs present but no listed species observed.



Photo 15. Dry ridge with small seep containing woolgrass.



Photo 16. Pond on Oak ridge property with mostly Rubus spp. on banks.



Photo 17. Pond on Oak Ridge property. No visual observance of any listed species.



Photo 18. A dry opening containing *Rubus* spp., *Solidago* spp., and other non-listed species.



Photo 19. Pond with emergent edge containing woolgrass and *Boehmeria cylindrica*.



Photo 20. Mature forested area along access road with oaks and other non-listed hardwoods



Photo 21. An agricultural pond containing *Wolffia* spp. Emergent fringe containing *Ludwigia* spp.



Photo 22. An abandoned agricultural field containing an assortment of non-listed grasses and weedy species.



Photo 23. Regularly mowed section of the transmission line.



Photo 24. A Dry opening containing *Solidago* spp. and other non-listed species.



Photo 25. Stream draining off-site pond with emergent wetland edge. No observance of listed species.



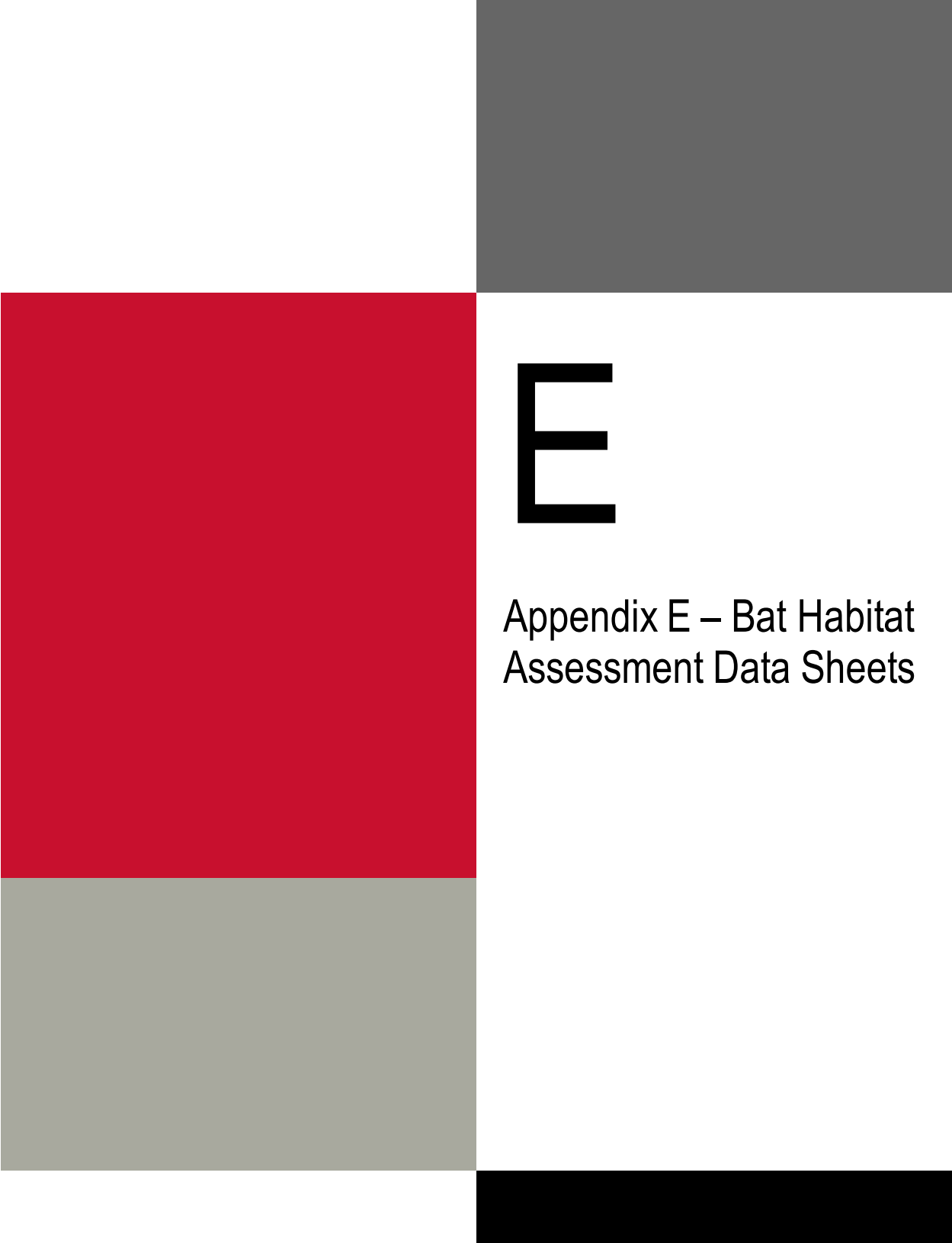
Photo 26. Large patch of Rubus spp. and Smilax spp.



Photo 27. Close-up of SAV, determined not to be state listed species.



Photo 28. Johnsongrass and pokeweed growing along powerline.



E

Appendix E – Bat Habitat
Assessment Data Sheets



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APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/14/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 34.768784/ -90.267322 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?

The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>1</u>

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: A large freshwater river (obed river) exists within the middle of the stand and a freshwater agricultural pond exists just outside the stand. They both act a good water source for bats
	0	0	Obed River: 260 ft	
Pools/Ponds (# and size)	Open and accessible to bats?			
	Yes			
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%
	4	3	1	
Dominant Species of Mature Trees	Eastern red cedar, red oak, white oak, sweetgum, tulip poplar			
% Trees w/ Exfoliating Bark	5	10	5	
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? Yes and NLEB

Additional Comments:
Stand 1 had several trees with exfoliating bark, moderate diversity in portions of the stand (Right Bank of the Obed River) and had connection to a larger forest stand. No snags were observed within the stand at the time of the survey. Quality of the stand is considered high for the NLEB and Indiana Bat.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/16/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 34.768784/ -90.267322 Surveyor: Lyranda Thiem

Brief Project Description
 Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area				
Project	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types	
Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius
 Flight corridors to other forested areas?
 Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>2</u>

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 2- 1,003 feet	Describe existing condition of water sources: An agricultural field with a large open water and Rocky Branch and its associated tributaries provide year round water. Rocky Branch ranges from 10-20 feet wide and is flows into two forested areas and a non forested area
Pools/Ponds (# and size)	1- 0.84 acres	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	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	Eastern red cedar, red oak, white oak, sweetgum, tulip poplar			
% Trees w/ Exfoliating Bark	0	5	4	
Size Composition of Live Trees (%)	Small (3-8 in) 10	Med (9-15 in) 45	Large (>15 in) 45	
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: Stand 2 had some trees with exfoliating bark, moderate diversity in portions of the stand and had connection to a larger forest stand. No snags were observed within the stand at the time of the survey. Quality of the stand is considered moderate for the NLEB and Indiana Bat.
--

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/16/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.990926/-84.988344 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>3</u>

Water Resources at Sample Site				Describe existing condition of water sources: NA
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	1- 0.84 acres	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	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	White oak, red oak, sweet gum, virginia pine, red maple, mockernut hickory, sugar maple			
% Trees w/ Exfoliating Bark	0	5	4	
Size Composition of Live Trees (%)	Small (3-8 in) 10	Med (9-15 in) 40	Large (>15 in) 50	
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: Stand 3 had some trees with exfoliating bark, moderate diversity in portions of the stand and had connection to a larger forest stand. No snags were observed within the stand at the time of the survey. Quality of the stand is considered moderate for the NLEB and Indiana Bat.
--

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/20/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 34.768784/ -90.267322 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>4</u>

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: Only one small ephemeral acts as a water source for this stand. It only flows during rain events
	1-775 feet	0	0	
Pools/Ponds (# and size)	Open and accessible to bats?			
0				
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%
	1	2	5	
Dominant Species of Mature Trees	Eastern red cedar, red oak, white oak, and bush honeysuck;e			
% Trees w/ Exfoliating Bark	0	1	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	60	30	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? Yes and NLEB

Additional Comments: Stand 4 contained very dense understory with little to no trees with exfoliating bark . No snags were observed in the stand. One ephemeral acts as a water source but does not provide water year round.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/20/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.915765/-84.475226 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>5</u>

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	Describe existing condition of water sources: One small fresh water pond near a maintained lawn with an abutting freshwater emergent wetland
Pools/Ponds (# and size)	1-0.02 acres	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent 1-0.02 acres	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 3	Midstory (20-50') 5	Understory (<20') 3	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	Eastern red cedar, red oak, white oak, pignut hickory, bush honeysuckle, mimosa tree			
% Trees w/ Exfoliating Bark	0	4	5	
Size Composition of Live Trees (%)	Small (3-8 in) 30	Med (9-15 in) 30	Large (>15 in) 40	
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: Stand 5 at first had a thick, dense understory but opened up more towards the north and south of the forested stand. Stand 5 was considered to have moderate habitat quality due to presence of a water source and open field for foraging, lack of snags, and was connected to a larger forested stand.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/21/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.916648/ -84.478334 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>6</u>

Water Resources at Sample Site				Describe existing condition of water sources: N/A- no water source exists within this stand that occurs within the TL Upgrade Area
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	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	Pignut hickory, white oak, southern red oak, common hackberry, red cherry, and chinese privet.			
% Trees w/ Exfoliating Bark	0	10	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 60	Large (>15 in) 30	
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: Forest stand 6 is part of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area. No water is within this stand.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/21/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.922630/ -84.449057 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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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): <u>7</u>

Water Resources at Sample Site				Describe existing condition of water sources: One large perennial stream with open canopy and a Scrub-shrub wetland is located within the middle of the stand and acts as a water source.
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1-354 feet	
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 1-0.38 acres	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 2	Midstory (20-50') 4	Understory (<20') 3	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	Common hackberry, white oak, black walnut, pignut hickory, and eastern red cedar			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 60	Large (>15 in) 30	
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: Forest stand 7 is part of a larger forested stand. No snags were observed within the forested stand that occurred within the TL Upgrade Area. One large perennial stream with open canopy and a Scrub-shrub wetland is located within the middle of the stand
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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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/21/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.934956/-84.422271 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>8</u>

Water Resources at Sample Site				Describe existing condition of water sources: Clinch River and tributaries off of the Clinch River. The Clinch River is just south of the stand
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 1	
Dominant Species of Mature Trees	Pignut hickory, white oak, southern red oak, common hackberry, red cherry, and chinese privet.			
% Trees w/ Exfoliating Bark	0	10	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 60	Large (>15 in) 30	
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: Forest stand 9 is part of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area. No water is within this stand.

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

APPENDIX A: P A E A I A A E M E N

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/21/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.934956/-84.422271 Surveyor: Lyranda Thiem

Brief Project Description
 Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area				
	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types	
Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius
 Flight corridors to other forested areas?
 Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>9</u>

Water Resources at Sample Site				Describe existing condition of water sources: Clinch River and tributaries off of the Clinch River. The Clinch River is just south of the stand
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 1	
Dominant Species of Mature Trees	Pignut hickory, white oak, southern red oak, common hackberry, red cherry, and chinese privet.			
% Trees w/ Exfoliating Bark	0	10	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 60	Large (>15 in) 30	
	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: Forest stand 9 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area. No water is within this stand.
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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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/21/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.950314/ -84.405378 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?

The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>10</u>

Water Resources at Sample Site				Describe existing condition of water sources: N/A however the Clinch River is nearby
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	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	Pignut hickory, white oak, southern red oak, common hackberry, red cherry, and chinese privet.			
% Trees w/ Exfoliating Bark	5	10	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 40	Large (>15 in) 40	
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: Forest stand 10 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area. No water is within this stand but the Clinch River is located nearby.
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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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/21/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.940508/ -84.414154 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>11</u>

Water Resources at Sample Site				Describe existing condition of water sources: N/A
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 2	Midstory (20-50') 3	Understory (<20') 4	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	eastern red cedar, bush honeysuckle, common hackberry, and white oak			
% Trees w/ Exfoliating Bark	0	2	0	
Size Composition of Live Trees (%)	Small (3-8 in) 50	Med (9-15 in) 30	Large (>15 in) 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? Yes and NLEB

Additional Comments: <small>Forest stand 11 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area. No water is within this stand</small>

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/21/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.937187/ -84.415078 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>12</u>

Water Resources at Sample Site				Describe existing condition of water sources: N/A
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 2	Midstory (20-50') 3	Understory (<20') 4	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	eastern red cedar, bush honeysuckle, common hackberry, and white oak			
% Trees w/ Exfoliating Bark	0	2	0	
Size Composition of Live Trees (%)	Small (3-8 in) 50	Med (9-15 in) 30	Large (>15 in) 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? Yes and NLEB

Additional Comments: <small>Forest stand 12 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area. No water is within this stand</small>

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.932594/-84.407687 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>13</u>

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1- 433 feet	Describe existing condition of water sources: Poplar Creek (20-40 feet width) acts as a good water source within the project area
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	eastern red cedar, bush honeysuckle, common hackberry, and white oak			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 30	Large (>15 in) 50	
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: <small>Forest stand 13 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area. No water is within this stand</small>

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.927665/ -84.407214 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?

The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>14</u>

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1- 433 feet	Describe existing condition of water sources: Poplar Creek (20-40 feet width) acts as a good water source within the project area. The Clinch River is also nearby
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	eastern red cedar, bush honeysuckle, common hackberry, and white oak			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 30	Large (>15 in) 50	
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: <small>Forest stand 14 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area. Two large water bodies exist nearby this stand.</small>

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

APPENDIX A: P A E A I A A E M E N

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone 35.924796/ -84.401315 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>15</u>

Water Resources at Sample Site				Describe existing condition of water sources: Poplar Creek (20-40 feet width) acts as a good water source within the project area. The Clinch River is also nearby
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1- 433 feet	
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 0	Seasonal 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%
	4	3	2	
Dominant Species of Mature Trees	eastern red cedar, bush honeysuckle, red oak, virginia pine common hackberry, and white oak			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	20	30	50	
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: <small>Forest stand 15 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area. Two large water bodies exist nearby this stand.</small>

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.949170/ -84.395105 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>16</u>

Water Resources at Sample Site				Describe existing condition of water sources: N/A
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	eastern red cedar, bush honeysuckle, red oak, virginia pine common hackberry, and white oak			
% Trees w/ Exfoliating Bark	5	10	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 30	Large (>15 in) 50	
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: Forest stand 16 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area. No water source was observed within the stand.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.949183/ -84.378707 Surveyor: Lyranda Thiem

Brief Project Description
 Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area				
	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types	
Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius
 Flight corridors to other forested areas?
 Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>17</u>

Water Resources at Sample Site				Describe existing condition of water sources: East Fork Poplar Creek (15-20 feet width) acts as a good water source
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1- 709 feet	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 4- 2.79	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	shagbark hickory, white oak, ironwood-musclewood, tulip poplar, sugar maple, common hackberry, Virginia pine			
% Trees w/ Exfoliating Bark	5	10	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 30	Large (>15 in) 50	
	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: Forest stand 17 is apart of a larger forested stand. No snags were observed within the area within the TL Upgrade area. East Fork Poplar Creek acts as a water source
--

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.949183/ -84.378707 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?

The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>18</u>

Water Resources at Sample Site				Describe existing condition of water sources: East Fork Poplar Creek (15-20 feet width) acts as a good water source
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1- 709 feet	
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 4- 2.79	Seasonal 0		

Forest Resources at Sample Site				1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	
Dominant Species of Mature Trees	shagbark hickory, white oak, ironwood-musclewood, tulip poplar, sugar maple, common hackberry, Virginia pine			
% Trees w/ Exfoliating Bark	5	10	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 30	Large (>15 in) 50	
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: Forest stand 18 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area. East Fork Poplar Creek acts as a water source
--

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.944966/-84.382177 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>19</u>

Water Resources at Sample Site				Describe existing condition of water sources: East Fork Poplar Creek (15-20 feet width) acts as a good water source
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1- 709 feet	
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	
Dominant Species of Mature Trees	white oak, tulip poplar, sugar maple, common hackberry, Virginia pine			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 50	Large (>15 in) 30	
	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: Forest stand 19 is apart of a larger forested stand. No snags were observed within the area within the TL Upgrade area. No water source was observed within the stand
--

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.942018/ -84.376232 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?

The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 20

Water Resources at Sample Site				Describe existing condition of water sources: N/A
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	white oak, tulip poplar, sugar maple, common hackberry, Virginia pine			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	20	50	30	
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: Forest stand 20 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area.
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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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.956628 /-84.356102 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

Project	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?

The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 21

Water Resources at Sample Site				Describe existing condition of water sources: One Perennial Stream occurs near the end of this forested stand
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1-229 feet	
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	white oak, tulip poplar, sugar maple, common hackberry, Virginia pine			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 50	Large (>15 in) 30	
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: Forest stand 21 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area.
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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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.948882/-84.362221 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 22

Water Resources at Sample Site				Describe existing condition of water sources: N/A
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	
Dominant Species of Mature Trees	white oak, tulip poplar, sugar maple, common hackberry, Virginia pine			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 50	Large (>15 in) 30	
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: Forest stand 22 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area.
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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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.947141/-84.365307 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?

The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 23

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1-287 feet	Describe existing condition of water sources: One Perennial Stream occurs near the end of this forested stand and a permanent wetland surrounds the stream
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 1- 2.64	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	ironwood- muscle wood, common hackberry, black walnut, and black cherry			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 50	Large (>15 in) 30	
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: Forest stand 23 is apart of a larger forested start. No snags were observed within the stand

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.938436/ -84.363627 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?

The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>24</u>

Water Resources at Sample Site				Describe existing condition of water sources: NA
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	ironwood- muscle wood, common hackberry, black walnut, and black cherry			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 50	Large (>15 in) 30	
	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: Forest stand 24 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area.
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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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.937729/-84.368646 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 25

Water Resources at Sample Site				Describe existing condition of water sources: NA
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 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%
		4	3	
Dominant Species of Mature Trees	ironwood- muscle wood, common hackberry, black walnut, and black cherry			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	20	50	30	
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: Forest stand 25 is apart of a larger forested stand, however the section that occurs within the TL Upgrade Area contains a gravel path that is utilized by vehicles. No snags were observed within the area within the TL Upgrade area.
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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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.983584/ -84.332082 Surveyor: Lyrandia Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area				
	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 26

Water Resources at Sample Site				Describe existing condition of water sources: NA
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	ironwood- muscle wood, common hackberry, black walnut, and black cherry			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	20	50	30	
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:
Forest Stand 26 lies northwest of Old Ridge TKPE and residential neighborhoods

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.987148/ -84.329146 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 27

Water Resources at Sample Site				Describe existing condition of water sources: Several intermittent streams cross the forested stand
Stream Type (# and length)	Ephemeral 0	Intermittent 2-460 feet	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	ironwood- muscle wood, common hackberry, black walnut, and black cherry			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 50	Large (>15 in) 30	
	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: Forest stand 27 lies northwest of Oak Ridge TKPE and residential neighborhoods

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.987148/ -84.329146 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 28

Water Resources at Sample Site				Describe existing condition of water sources: NA
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	ironwood- muscle wood, common hackberry, black walnut, and black cherry			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 50	Large (>15 in) 30	
	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: Forest Stand 28 is surrounded by residential neighborhoods

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

APPENDIX A: P A E A I A A E M E N

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.986649/-84.329538 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 29

Water Resources at Sample Site				Describe existing condition of water sources: Two ephemeral channels occur within this channel
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	
	2- 330 feet	0	0	
Pools/Ponds (# and size)	Open and accessible to bats?			
	0	0		
Wetlands (approx. ac.)	Permanent	Seasonal		
	0	0		

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

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 29 contains one small snag (10 dbh) with no holes and approximately 12 feet tall. The stand is also surrounded by residential neighborhoods

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

APPENDIX A: P A E A I A A E M E N

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 36.009954/-84.308059 Surveyor: Lyranda Thiem

Brief Project Description
 Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area				
	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types	
Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius
Flight corridors to other forested areas?
Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 30

Water Resources at Sample Site				Describe existing condition of water sources: NA
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	ironwood- muscle wood, common hackberry, black walnut, and black cherry			
% Trees w/ Exfoliating Bark	5	10	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 30	Large (>15 in) 50	
	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: Forest stand 30 is surrounded by residential neighborhoods

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 36.000274/ -84.317089 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?

The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 31

Water Resources at Sample Site				Describe existing condition of water sources: NA
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	ironwood- muscle wood, common hackberry, black walnut, and black cherry			
% Trees w/ Exfoliating Bark	5	10	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 30	Large (>15 in) 50	
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:
Forest Stand 31 is surrounded by residential neighborhoods

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 36.008213/ -84.309671 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?

The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 32

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: Two very week ephemeral streams act as a water source
	2- 330 feet	0	0	
Pools/Ponds (# and size)	Open and accessible to bats?			
	0	0		
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%
	4	3	2	
Dominant Species of Mature Trees	ironwood- muscle wood, common hackberry, black walnut, and black cherry			
% Trees w/ Exfoliating Bark	5	10	5	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	20	30	50	
No. of Suitable Snags	1			

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 32 is surrounded by residential neighborhoods and near the edge of the TVA ROW

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 36.009814/ -84.308119 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 33

Water Resources at Sample Site				Describe existing condition of water sources: NA
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	ironwood- muscle wood, common hackberry, black walnut, and black cherry			
% Trees w/ Exfoliating Bark	2	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 30	Large (>15 in) 50	
	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 33 is surrounded by residential neighborhoods

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

APPENDIX A: P A E A I A A E M E N

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/22/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 36.015743/ -84.302719 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 34

Water Resources at Sample Site				Describe existing condition of water sources: NA
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	Understory (<20') 2	
Dominant Species of Mature Trees	sugar maple, common hackberry, sweet gum, Virginia pine, and eastern red cedar			
% Trees w/ Exfoliating Bark	2	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 30	Large (>15 in) 50	
	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: Forest stand 34 is apart of a larger forested stand, however the section that occurs just out side the TVA ROW Powerline areas. No snags were observed within the area within the TL Upgrade area.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/8/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 36.022019/ -84.287523 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?

The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 35

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1-212 feet	Describe existing condition of water sources: A perennial stream acts as a water source for this stand Kudzu infestations makes the stream not as accessible
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 3	Midstory (20-50') 4	Understory (<20') 2	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	pignut hickory, oak species, sugar maple, common hackberry, and shagbark hickory			
% Trees w/ Exfoliating Bark	5	10	10	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 30	Large (>15 in) 50	
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: <small>Forest stand 36 is apart of a larger forested stand that exists outside of the TVA ROW. No snags were observed within the area within the TL Upgrade area.</small>
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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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/20/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.935442/-84.317449 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 36

Water Resources at Sample Site				Describe existing condition of water sources: A perennial stream acts as a water source for this stand Kudzu infestations makes the stream not as accessible
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1-212 feet	
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

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

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: <small>Forest stand 36 is apart of a larger forested stand that exists outside of the TVA ROW. No snags were observed within the area within the TL Upgrade area.</small>
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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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/20/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.923122/ -84.344308 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?

The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 37

Water Resources at Sample Site				Describe existing condition of water sources: NA
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 2	Midstory (20-50') 4	Understory (<20') 3	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	white oak, common hackberry, Virginia pine, sugar maple, and eastern red cedar			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 50	Large (>15 in) 30	
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: Forest stand 37 is alongside the edge of the TVA ROW. Stand 37 is apart of a larger forested stand that is not within the TL Upgrade Area.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/20/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.928570/-84.328124 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): 38

Water Resources at Sample Site				Describe existing condition of water sources: Two intermittent streams and one ephemeral provide a seasonal water source
Stream Type (# and length)	Ephemeral 1-185 feet	Intermittent 2-456 feet	Perennial 0	
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 2	Midstory (20-50') 4	Understory (<20') 3	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	white oak, common hackberry, Virginia pine, sugar maple, and eastern red cedar			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 50	Large (>15 in) 30	
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: Forest stand 38 is alongside the edge of the TVA ROW. Stand 39 is apart of a larger forested stand that is not within the TL Upgrade Area.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/20/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.933044/-84.322086 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>39</u>

Water Resources at Sample Site				Describe existing condition of water sources: NA
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	0	Open and accessible to bats? 0		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 2	Midstory (20-50') 4	Understory (<20') 3	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	white oak, common hackberry, Virginia pine, sugar maple, and eastern red cedar			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 20	Med (9-15 in) 50	Large (>15 in) 30	
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: Forest stand 39 is alongside the edge of the TVA ROW. Stand 39 is apart of a larger forested stand that is not within the TL Upgrade Area.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Kingston TL Upgrade Area Date: 6/20/2022
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.935442/-84.317449 Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	1421.92	408.35		781.11
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

PPENDIX A P E A I A A E MEN

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): <u>40</u>

Water Resources at Sample Site				Describe existing condition of water sources: NA
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	Open and accessible to bats? 0			
Wetlands (approx. ac.)	Permanent 0	Seasonal 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%
		2	4	
Dominant Species of Mature Trees	Chestnut oak, white oak, common hackberry, Virginia pine, sugar maple, eastern red cedar			
% Trees w/ Exfoliating Bark	5	5	5	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	20	40	40	
No. of Suitable Snags	1			

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 40 is apart of a larger forested stand that exists outside of the TVA ROW. The stand is adjacent to a paved road and is not connected to adjacent stands. One medium sized snag was observed within this stand
--

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



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**Appendix F.4 – Wildlife and Vegetation Assessment Technical Report.
Kingston Fossil Plant Retirement Project: Offsite Transmission Line
Upgrades (L5116, L5280, and L5280)**

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Wildlife and Vegetation Assessment Technical Report

Kingston Fossil Plant Retirement
Project: Offsite Transmission Line
Upgrades

Roane and Anderson Counties, Tennessee

September 2023



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Acronyms and Abbreviations

BGEPA	Bald and Golden Eagle Protection Act
DBH	diameter at breast height
ESA	Endangered Species Act
HDR	HDR Engineering, Inc
IPaC	Information for Planning and Conservation
KIF	Kingston Fossil Plant
MBTA	Migratory Bird Treaty Act
NLEB	northern long-eared bat
NRCS	Natural Resources Conservation Service
Project Site	Kingston Fossil Plant
RNHD	Regional Natural Heritage Database
ROW	right-of-way
TDEC	Tennessee Department Environment and Conservation
TL	transmission line
TVA	Tennessee Valley Authority
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

1 Introduction

On behalf of Tennessee Valley Authority (TVA), HDR Engineering, Inc (HDR) conducted a wildlife and vegetation assessment for the Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades (Project Site), located in Anderson and Roane counties, Tennessee. TVA has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units, and construction and operation of approximately 1,500 megawatts of replacement generation requiring extensive regional transmission system upgrades to be completed and operational prior to coal unit retirement. To recover the generation capacity lost from the retirement of the KIF coal units, upgrades are proposed for 20 miles of offsite transmission lines (TLs) L5116, L5302, and L5381 located approximately 1.5 miles northeast of the City of Kingston and approximately 3 miles southwest of the City of Oak Ridge. Upgrades may include upgrading, reconductoring, or rebuilding TLs, as well as replacing terminal equipment, bus work, or jumpers.

1.1 Project Location

The Project Site consists of an existing TVA right-of-way (ROW) which extends from KIF for approximately 20 miles, terminating at the Oak Ridge Laboratory (Appendix A, Figure 1). The approximate Project Site central coordinates are: 35.9293215, -84.3570032 (decimal degrees).

1.2 Project Site Description

The Project Site consists of maintained TVA ROW and unimproved and improved access roads with some forested edges. The terrain consists of moderately steep rolling valley and ridge systems running in a northeast to southwest orientation, with elevations ranging from 737 to 1,185 feet above mean sea level (msl). Several streams and wetland systems along the valleys of most hillslopes were documented during the field surveys. Open water areas from historic agricultural activities are present on the western portion of the Project Site.

From May 15th through 19th, June 5th through 9th, and June 12th through 15th of 2023, HDR Engineering, Inc (HDR) conducted field surveys following TVA's Contractor *Guidelines for Conducting Biological and Cultural Surveys and Impact Analyses* (TVA 2022) to map vegetation, describe plant and wildlife communities, and identify potential habitat for federal and state-listed threatened and endangered species on the Project Site. This report documents the results of these field surveys.

2 Vegetation Field Survey

2.1 Methods

Following TVA (2022) guidelines, HDR reviewed the TVA Regional Natural Heritage Database (RNHD) for state-listed plants potentially occurring in the Project Site or the surrounding five-mile radius (TVA 2023); the Tennessee Department Environment and Conservation (TDEC) Rare Species Data Viewer to identify state-listed plant species occurring in Anderson and Roane counties (TDEC 2023), and the U.S. Fish and Wildlife Service (USFWS) Information for

Planning and Conservation (IPaC) for federally threatened and endangered plants (USFWS 2023); these resources are hereafter referenced as “resource lists” for the Project Site. The resulting compiled species lists are included in Appendix B.

Field surveys were conducted by HDR environmental scientists (Ivan Maldonado, Jessica Tisdale, Lyrandia Thiem [QHP-IT], Brittany Schweiger, Michelle Emmerson, Erin Baily, Michael Inman, Ethan Lawton, and Rebekkah Riley [QHP-IT]) to document plant communities, including invasive plants. Additionally, a habitat assessment for rare plant species and other state and federally listed species was conducted on the Project Site.

Locations containing one or more habitat types and having high floral diversity were specifically chosen for botanical surveys. The Project Site lies within the Ridge and Valley physiographic province; a variety of vegetative communities are known to exist within this region and were divided into 7 habitat categories through a desktop review for the purposes of this survey.

- **Category 1.** Wetlands (i.e., swamps and floodplains, acidic wetlands and swamps, acidic seeps, calcareous seeps, wet meadows, marshes, emergent herbaceous wetlands, bogs, acidic open wetlands)
- **Category 2.** Wet and dry barrens (i.e., limestone glades and barrens, wet acidic barrens) and Outcrops (i.e., dry sandstone, granite outcrops, sandstone outcrops)
- **Category 3.** Stream, ponds, and lakes (i.e., lakes [margins], streams [margins], ponds [margins], slow acidic streams, stream bars and ledges, stream heads, sandy/rocky river bars, rocky sand stream sides)
- **Category 4.** Rocky woods, rock slopes
- **Category 5.** Bluffs, cliffs, and mountain balds (i.e., calcareous bluffs/seepy limestone cliffs/bluffs/shale bluffs, dolomite bluffs, wet bluffs, moist shaded cliffs, rocky bluffs)
- **Category 6.** Wooded areas (i.e., rich woods/hollows, rich oak woods, dry woods, wooded mt. slopes and mt. thickets, dry sandy woods, mesic woods and seepage slopes, mesic woods and seepage slopes, oak woods and edges [maintained row], alluvial/moist ravines in dry ridges, bottomland hardwoods)
- **Category 7.** Dry openings, powerlines

Protected plant species survey locations were chosen by reviewing provided desktop data sources including TVA plant areas, TN Natural Heritage Program (TNNHP) Conservation Sites, and TNNHP Managed Areas. Additional desktop data reviewed prior to botany field surveys consisted of aerial imagery, 2-ft topography, and recent data from HDR wetland and streams surveys conducted on May 15 – 19 and June 5 – 8, 2023. Pre-deployment coordination with David Mitchell, TVA botanist, assisted in determining survey areas on the Project Site where state listed rare plants have previously been documented to occur or where adjacent areas are known to support state listed species.

Plant communities observed on the Project Site were classified using the National Vegetation Classification System (Grossman et al. 1998). Plant communities were delineated using ESRI Field Maps 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 invasive plants



identified on the Project Site were noted and are discussed below. Photographs referenced in the body of this report are presented in Appendix C.

2.2 Results

2.2.1 Vegetation Communities

Using the National Vegetation Classification System (Grossman et al. 1998), vegetation types on the Project Site were classified as a combination of herbaceous vegetation, mixed deciduous forest, lawn, garden and recreational vegetation, and pastureland. The majority of the Project Site consists of TVA ROW, which is dominated by dry and wet herbaceous vegetation communities. Areas outside of the TVA ROW are surrounded by agricultural fields and mixed deciduous forested areas. The diversity of community types identified on the Project Site is a result of topography, landscape position, soil types, and current and previous land uses. Table 1 provides a summary of the vegetation community types as defined by Grossman et al. (1998) and locations are shown on Figure 2 (Appendix A).

Table 1. Plant Communities in the Project Site

Vegetation Community	Area (acres)	Percentage of Project Site (%)
Dry Herbaceous (TVA ROW)	325	70
Wet Herbaceous (TVA ROW)	106	23
Wet Deciduous Forest	0.15	<1
Dry Deciduous Forest	7	1.5
Pastureland	7	1.5
Lawn, Garden, Recreational Vegetation	19	3.9
Total	464	100

Vegetation in the TVA ROW (dry herbaceous and wet herbaceous communities) comprised approximately 93 percent of the Project Site. The TVA ROW is routinely maintained by periodic mowing and the use of herbicides to limit woody vegetation and maintain accessibility and reliability of the transmission system. During routine maintenance, trees and shrubs are removed from the ROW, resulting in a predominately grassland habitat. Although some grassland areas within ROWs can develop with native species and provide high conservation value, the herbaceous communities on the Project Site were dominated by non-native species, such as sericea lespedeza, wingstem, and broom sedge occur throughout the ROW. Other herbaceous species observed throughout the TVA ROW include common ragweed, butterfly milkweed, false nettle, Frank’s sedge, bladder sedge, broom sedge, fox sedge, field thistle, greater tickseed, deer tongue, velvet panicum, blunt spikerush, dog fennel, joe pye weed, morning glory, soft rush, seedbox, loosestrife species, Japanese stiltgrass, fogfruit, cinquefoil, Christmas fern, mountain mint, multiflora rose, raspberry species, curly dock, little bluestem, tall goldenrod, Johnson grass, American bur-reed, poison ivy, red clover, ironweed, grass species, and fescue species (see Appendix C, Photographs 1 and 2). Additional species within this vegetation community are included in Appendix E (List of Plant Species).

Wet deciduous forests occupied approximately less than one percent of the Project Site and were present along streams and other small drainages. Streamside riparian forest stands were typically narrow. Typical canopy species observed in this vegetation community include box elder, red maple, sweet gum, tulip poplar, Virginia pine, American sycamore, black willow, and winged elm. Understory shrubs, woody vines, and sapling species identified consisted of red maple, poison ivy, Chinese privet, spicebush, and greenbriers. Herbaceous cover in this vegetation community typically included greenbrier, fox sedge, bladder sedge, soft rush, and other grass species (Appendix C, Photograph 3).

Comprising approximately 1.5 percent, dry deciduous forests were found on the edges of the Project Site. Common overstory trees observed included sugar maple, tree of heaven, mockernut hickory, common hackberry, Virginia pine, eastern red cedar, white oak, southern red oak, other oak species, and tulip poplar. The shrub layer varied from dense to relatively open and contained hickory species, white oak, red oak, and eastern red cedar. The herbaceous and vine layer in this forest type consisted of greenbrier and a variety of grass species (Appendix C, Photograph 4).

Pastureland comprised approximately 1.5 percent of the Project Site and occurred within the western portion of the TL. This area is currently used for cultivating hay or as pastureland for cattle. Typical herbaceous species observed in this vegetation community include buttercup species, soybean, Johnson grass, fescue species, grass species, dandelion species, and white clover (see Appendix C, Photograph 5).

Lawn, Garden, Recreational Vegetation comprised approximately four percent of the Project Site and was observed within the western portion of the TL. Common species in this vegetation community included panic grass, clover species and other grass species. These areas are maintained within the ROW (see Appendix C, Photograph 6).

2.2.1.1 Unusual Plant Communities

No unusual plant communities (globally rare plant communities) were observed on the Project Site.

Three ponds surrounded by forested areas occur near the active open pastureland on the western portion of the Project Site (see Appendix C, Photograph 7). The ponds were created to support prior agricultural activities in those locations. Water appears to remain present within these depressions during much of the year and has persisted due to shallow groundwater flow. Common woody species surrounding the ponds include sweetgum, black willow (*Salix nigra*), and red maple.

2.2.1.2 Federal-noxious Weeds/ Non-native plants

Twenty non-native species were documented on the Project Site which include tree of heaven, Japanese honeysuckle, Japanese stiltgrass, Johnson grass, Chinese privet, Deptford Pink, winter creeper, soybean, common velvet grass, sericea lespedeza, white sweet clover, yellow sweet clover, Timothy grass, red clover, moth mullein, autumn olive, shrub lespedeza, Amur honeysuckle, wineberry, and paper mulberry (Appendix E). Of these species, tree of heaven, paper mulberry, autumn olive, winter creeper, shrub lespedeza, Chinese privet, Japanese

honeysuckle, Amur honeysuckle, Japanese stiltgrass, kudzu, wineberry, and Johnson grass were listed on the Tennessee Invasive Plant Council's Invasive Plants of Tennessee list (TN ICP 2023). These species are most often found in ruderal forested areas, along field edges, and in areas prone to disturbance line transmission line ROWs. Kudzu, a federal-noxious weed as defined by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) (2012), was observed throughout the eastern TLs (L5108 and L5302) and access road portions of the Project Site. Tree of heaven, Japanese honeysuckle, Japanese stiltgrass, Chinese privet, autumn olive, Amur honeysuckle, wineberry, winter creeper, and multiflora rose were also observed in some of the forested stands. Where present, these species occur on less than 10 percent of the Project Site. Invasive plants were found in both forested and herbaceous vegetation areas.

2.2.2 Listed and Protected Plant Species

Table 2 presents two federally listed and 46 state-listed endangered and threatened plant species that may occur within Anderson and Roane counties based on review of the compiled resources list (TVA 2023, TDEC 2023, and USFWS 2023). The two federally listed plants as reported by the USFWS IPaC include Virginia spirea and white fringeless orchid (Appendix B). Specific locations of the previously documented plant occurrences are not available from TVA RNHD or TDEC, but likelihood of species occurrence can be estimated by matching species habitat requirements with land cover types and vegetation communities. During coordination with TVA botanist, David Mitchell, it was suggested surveys for the large-flowered Barbara's buttons, Missouri gooseberry, and Virginia spirea were not required due to lack of required habitat present or distance from known occurrences to the Project Site. Virginia spiraea habitat is found around large streams and the upgrades to the Project Site would not occur on the banks of the large rivers and streams in the Project Site, therefore boating surveys and stream bank surveys were not completed.

Species on the targeted threatened and endangered list were categorized as occurring in one (or more) of these 7 generalized habitat categories. The Project Site lies within the Ridge and Valley physiographic province; a variety of vegetative communities are known to exist within this region and were divided into 7 habitat type categories through a desktop review for the purposes of this survey.

- **Category 1.** Wetlands (i.e., swamps and floodplains, acidic wetlands and swamps, acidic seeps, calcareous seeps, wet meadows, marshes, emergent herbaceous wetlands, bogs, acidic open wetlands)
- **Category 2.** Wet and dry barrens (i.e., limestone glades and barrens, wet acidic barrens) and Outcrops (i.e., dry sandstone, granite outcrops, sandstone outcrops)
- **Category 3.** Stream, ponds, and lakes (i.e., lakes [margins], streams [margins], ponds [margins], slow acidic streams, stream bars and ledges, stream heads, sandy/rocky river bars, rocky sand stream sides)
- **Category 4.** Rocky woods, rock slopes
- **Category 5.** Bluffs, cliffs, and mountain balds (i.e., calcareous bluffs/seepy limestone cliffs/bluffs/shale bluffs, dolomite bluffs, wet bluffs, moist shaded cliffs, rocky bluffs)



- **Category 6.** Wooded areas (i.e., rich woods/hollows, rich oak woods, dry woods, wooded mt. slopes and mt. thickets, dry sandy woods, mesic woods and seepage slopes, mesic woods and seepage slopes, oak woods and edges [maintained row], alluvial/moist ravines in dry ridges, bottomland hardwoods
- **Category 7.** Dry openings, powerlines.

A full list of the federal and state-listed species identified through a review of potential to exist within the various habitat types in the Project Site is included in Table 2.

Table 2. Federally Listed or Protected Plant Species in Anderson and Roane Counties, Tennessee, and Likelihood of Occurrence in the Project Site

Scientific Name	Common Name	Federal and State Protected Status ¹	Habitat Requirements	Suitable Habitat Observed	Species Observed in Project Site
<i>Agalinis auriculata</i>	Earleaved False-foxglove	SE	Barrens	Yes	No
<i>Allium tricoccum</i>	Ramps	---	Upland woods, mixed mesophytic hardwood forests	Yes	No
<i>Asplenium scolopendrium</i> var. <i>americanum</i>	Hart's-tongue Fern	SE	Sinks	No	No
<i>Aureolaria patula</i>	Spreading False-foxglove	SSSC	Oak woods and edges	Yes	Yes, observed by TVA in the vicinity of TLs
<i>Berberis canadensis</i>	American Barberry	SSSC	Rocky woods and river bars	Yes	No
<i>Bolboschoenus fluviatilis</i>	River Bulrush	SSSC	Marshes, openings in swamps, edges of ponds and streams, fresh tidal marshes, and inland salt marshes and ponds	Yes	No
<i>Carex tetanica</i>	Rigid Sedge	SE	Floodplain forests, wooded bluffs, and wooded rocky slopes	Yes	Yes, observed by TVA in the vicinity of TLs and by HDR biologist outside the TLs
<i>Carex hitchcockiana</i>	Hitchcock's Sedge	---	Rich woods, floodplain forests, wooded bluffs, and wooded rocky slopes	Yes	No
<i>Collinsia verna</i>	Spring Blue-eyed Mary		Damp woods and meadows	Yes	No
<i>Delphinium exaltatum</i>	Tall Larkspur	SE	Glades and barrens	Yes	Yes, observed by

Scientific Name	Common Name	Federal and State Protected Status ¹	Habitat Requirements	Suitable Habitat Observed	Species Observed in Project Site
					HDR within TL
<i>Diervilla lonicera</i>	Northern Bush-honeysuckle	ST	Rooky woodlands and bluffs	Yes	No
<i>Diervilla sessilifolia</i> var. <i>rivularis</i>	Mountain Bush-honeysuckle	ST	Dry cliffs and bluffs	Yes	No
<i>Draba ramosissima</i>	Branching Whitlow-grass	SSSC	Calcareous bluffs	Yes	No
<i>Erysimum capitatum</i>	Western Wallflower	SE	Rocky bluffs	Yes	No
<i>Eupatorium godfreyanum</i>	Godfrey's Thoroughwort	SSSC	Dry woods	Yes	Yes, observed by TVA in the vicinity of TLs
<i>Eurybia schreberi</i>	Schreber's Aster	SSSC	Mesic woods and seepage slopes	Yes	No
<i>Fothergilla major</i>	Mountain Witch-alder	ST	Rocky slopes and riverbanks	Yes	No
<i>Elodea nuttallii</i>	Waterweed	SSSC	Lakes, reservoirs, ponds, rivers, and ditches	Yes	No
<i>Helianthus occidentalis</i>	Naked-stem Sunflower	SSSC	Limestone glades and barrens	Yes	Yes, observed by TVA within TL
<i>Epilobium ciliatum</i>	Hairy Willow-herb	ST	Forests, meadows, fields, and wetlands	Yes	No
<i>Parnassia grandifolia</i>	Large-leaved Grass-of-Parnassus	ST	Open wet areas over calcareous soil	Yes	No
<i>Iris fulva</i>	Copper Iris	ST	Bottomlands	Yes	No
<i>Juglans cinerea</i>	Butternut	ST	Rich woods and hollows	Yes	No
<i>Juncus brachycephalus</i>	Short-headed Rush	SSSC	Seeps and wet bluffs	Yes	Yes, observed by TVA in the vicinity of TL's
<i>Leucothoe racemose</i>	Fetter-bush	ST	Acidic wetlands and swamps	Yes	No
<i>Liatris cylindracea</i>	Slender Blazing Star	ST	Barrens and powerlines	Yes	No
<i>Liparis loeselii</i>	Fen Orchid/ Loesel's Twayblade	ST	Calcareous seeps	Yes	Yes, observed by TVA in the



Scientific Name	Common Name	Federal and State Protected Status ¹	Habitat Requirements	Suitable Habitat Observed	Species Observed in Project Site
					vicinity of TLs
<i>Lonicera dioica</i>	Mountain Honeysuckle	SSSC	Mountain woods and thickets	Yes	Yes, observed by TVA in the vicinity of TLs
<i>Marshallia grandiflora</i>	Large-fl. Barbara's-buttons	SE	Rocky river bars	Yes	No
<i>Meehanian cordata</i>	Heartleaf Meehanian	ST	Wooded mountain slopes	Yes	No
<i>Myurella julacea</i>	Small mousetail moss	SSSC	Shale bluffs	Yes	No
<i>Oligoneuron album</i>	Prairie Goldenrod	SE	Barrens	Yes	No
<i>Panax quinquefolius</i>	American Ginseng	SSSC	Rich woods	Yes	Yes, observed by TVA in the vicinity of TLs
<i>Pedicularis lanceolata</i>	Swamp Lousewort	SSSC	Wet acidic barrens and seeps	Yes	No
<i>Platanthera flava var. herbiola</i>	Tuberclad Rein-orchid	ST	Swamps and floodplains	Yes	Yes, observed by TVA in the vicinity of TLs and by HDR biologists outside the TLs
<i>Preissia quadrata</i>	Narrow Mushroom-headed liverwort	ST	Seepy limestone cliffs and bluffs	Yes	No
<i>Pseudognaphalium helleri</i>	Heller's Catfoot	SSSC	Dry sandy woods	Yes	No
<i>Pycnanthemum torrei</i>	Torrey's Mountain-mint	SE	Barrens	Yes	No
<i>Ribes missouriense</i>	Missouri Gooseberry	ST	Disturbed meadows and fields	Yes	No
<i>Solidago ptarmicoides</i>	Prairie Goldenrod	ST	Dry, sandy calcareous soils, cracks in rocks, limestone pavements, and rocky outcrops	Yes	No

Scientific Name	Common Name	Federal and State Protected Status ¹	Habitat Requirements	Suitable Habitat Observed	Species Observed in Project Site
<i>Spiraea virginiana</i>	Virginia Spiraea	FT, ST	Openings in the floodplain woodlands, swamps, marshes, low areas along ponds, rivers, and ditches. This grass also prefers disturbed open fields.	Yes	No
<i>Spiranthes lucida</i>	Shining Ladies'-tresses	SE	Alluvial woods and moist slopes	Yes	Yes, observed by TVA in the vicinity of TLs
<i>Stellaria fontinalis</i>	Water Stitchwort	---	Streambanks, washouts, moss-covered cliffs overlooking streams, and calcareous seeps in glade woods	Yes	No
<i>Sullivantia sullivantii</i>	Sullivantia	SE	Moist shaded cliffs	Yes	No
<i>Symphyotrichum pratense</i>	Barrens Silky Aster	SE	Barrens	Yes	No
<i>Thuja occidentalis</i>	Northern White Cedar	---	Common on shallow loam over broken limestone; often forms pure stands in old fields and pastures on moist, well-drained soils	Yes	No
<i>Trillium pusillum</i>	Least Trillium	SE	Alluvial/moist ravines in dry ridges	Yes	No
<i>Veratrum woodii</i>	Ozark Bunchflower	SE	Moist hardwoods and stream terraces	Yes	Yes, observed by TVA in the vicinity of TLs
<i>Platanthera integrilabia</i>	White Fringeless Orchard	FT	Flat, boggy areas at the head of streams or seepage slopes.	No	No

Source: IPaC 2023; TDEC 2023; TVA 2023.

1) Federal Status: FE- federal endangered, FT – federal threatened; State Status: SE – state endangered, ST – state threatened, SSSC – state species of special concern.

Previously known protected plant areas provided by TVA and visited by the HDR botanist during the botany survey include A1758, A563, A1857, A1864, A1858, A3781, A3782, A3755. Plant Area A0894 was also visited by TVA botanist, David Mitchell. Many other areas outside of the TVA-identified protected plant areas were systematically surveyed along the Project Site route.

Two state protected plant species were identified in the ROW during the June 2023 survey efforts. One state-endangered species, tall larkspur, was documented at two locations on the Project Site (Appendix C, Photographs 33 and 34). Tall larkspur was documented within TVA Plant Area A1858 between structures 118 and 119 and TVA Plant Area A0894 between structures 95 and 97 (Appendix A, Figure 2, page 27 of 32). Tall larkspur at Plant Area A1858

were located within and below a rocky outcrop area that had recently experienced ROW vegetation management practices, as noted by small, downed saplings. There were approximately 15 young, tall larkspur plants counted at Plant Area A1858. Associated plants noted at the outcrop included wild geranium, eastern redbud, eastern red cedar, trumpet creeper, common blackberry, beebalm, and butterfly weed. TVA botanists also observed tall larkspur at Plant Area A0894 between structures 95-97 on the east edge of the ROW, with a total of 210 individuals counted. Plant Area A1864 was visited to document tall larkspur but no individuals were found.

The northern section of Plant Area A1864 was comprised of a steep, dry slope overgrown with blackberry species, hardwood and pine saplings. However, the mid-section of Plant Area A1864 between structures 116 and 117 had a high diversity of prairie ridge species including rattlesnake master, coneflower, pinnate prairie coneflower, blue wild indigo and other more common prairie ridges species. These species were concentrated on the edge of disturbed soil pits where dirt moving had occurred and disturbed the seed source.

Naked-stem sunflower was also observed by TVA botanists in June 2023. Between 200 and 300 seedlings were identified in the center of the ROW between structures 97 and 98.

Outside the Project Site and south of structures 60 and 61, the rare species, rigid sedge and tubercled rein-orchid were observed in the floodplains of a UNT to Grassy Creek with TVA botanist, Adam Dattilo.

The Project Site intersects the TNNHP Conservation Site, Orr Fringeless Orchid wetlands (NA 27) between structures 61 and 64, however no walking surveys were carried out on this site due to likely ongoing routine monitoring by NHP.

The federally listed Virginia spiraea shrub prefers stream bars and stream ledges, as well as gravel bars, sandy riverbanks, and riparian areas with seasonal flooding. It often occurs in flood-scoured, high-gradient sections of rocky riverbanks of second and third order streams, often in gorges or canyons. This perennial shrub grows in sunny areas on moist, acidic soils, primarily over sandstone. The shrub tends to be found in thickets with little arboreal or herbaceous competition along early successional areas that rely on periodic disturbances such as high-velocity scouring floods to eliminate such competition. Virginia spiraea also occurs on meander scrolls and point bars, natural levees, and other braided features of lower stream reaches, often near the stream mouth. Scoured, riverine habitat sites are found where deposition occurs after high waterflows, such as on floodplains and overwash islands, rather than along areas of maximum erosion. Occurrences in depositional habitats are found among riparian debris piles, on fine alluvial sand and other alluvial deposits, or between boulders. This species is known to occur in only eight counties in Tennessee it is limited to the Ridge and Valley and Cumberland Plateau ecoregions. Limited riverbank and river bar habitat were present along the large rivers, Emory River, and Poplar Creek. Because upgrades for this project are limited to areas outside of streambanks and rivers, the presence of Virginia spiraea was not assessed via boat surveys along the rivers during this field survey.

The federally threatened white fringeless orchid typically inhabits flat, boggy areas at the head of streams or seepage slopes in partially shaded areas, where it occurs in the east Tennessee region of its range. It is a perennial herb that blooms from late July to early September that has a showy inflorescence with large, ghost-white flowers with conspicuous long spurs, clustered in loose racemes. This species is often associated with sphagnum species, cinnamon fern, netted chainfern, and New York fern in acidic muck or sand. The white fringeless orchid is known to occur in only 11 counties in Tennessee and is limited to the Cumberland Plateau with some occurrences in the southern extent of the Ridge and Valley ecoregion. The Project Site did not cross any boggy headwater streams; therefore, neither habitat nor this species was on the Project Site.

Despite our systematic searches of potential habitat for an array of rare species that inhabit wetland/valley system to ridges and bluffs, only individuals of the rare tall larkspur and naked-stem sunflower were found during the course of the botany survey. No other federally or state-listed plant species were observed by HDR or TVA botanists within the Project Site. A partial list of vascular plant species identified during the survey within dry ridge slope prairie habitat, wetlands/valley systems, and areas throughout the Project Site are provided in Appendix E.

3 Wildlife Survey

3.1 Methods

Pedestrian surveys for terrestrial wildlife habitat were conducted simultaneously with the vegetation and wetland/stream surveys described in Section 2.1. These surveys focused on forested edges, roadsides, recently disturbed areas, and areas of previous human use. The Project Site was also traversed by vehicle via existing roads. Visual (naked eye and binoculars) and auditory spot checks were performed in forested stands and along streams, drainageways, and the perimeters of open grasslands. Isolated pockets of woodlands were inspected and woodland edges on either side of the transmission line within the Project Site were also traversed for bat habitat assessment. These results are summarized in Table 3.

Following TVA (2022) guidelines, HDR reviewed the TVA RNHD for state-listed wildlife within the Study Area and a three-mile radius, the USFWS IPaC for federally threatened and endangered wildlife, and the TDEC Rare Species Data Viewer for a list of federally and state-protected species within Anderson and Roane counties. The resulting compiled species list is included in Appendix B.

3.2 Results

3.2.1 Observed Wildlife

Table 3 presents a list of species that were either directly observed on the Project Site or whose evidence of occurrence (e.g., tracks, scat, remains) was indicated during the field survey.



Table 3. Wildlife Species Observed or Indicated in Project Site

Species Observed (Common Name)	Notes/Habitat Observed in Project Site
Birds	
White-eyed Vireo	Observed and heard near forested edge
Brown Thrasher	Observed and heard near forested edge
Northern Mockingbird	Observed flying near cow pastures within TL ROW
Northern Cardinal	Observed flying within TL ROW and near forested edge
Carolina Wren	Heard near forested edge
Carolina Chickadee	Observed and heard flying near forested edge
Eastern Towhee	Heard near TL ROW
Red-tailed Hawk	Observed flying over TL ROW near Poplar Creek
Indigo Bunting	Observed flying within managed areas
Yellow-breasted Chat	Heard and observed near forested edges throughout all of TL ROW
Prairie Warbler	Observed near forested edge along TL ROW
American Robin	Observed near cow pasture near the TL ROW
Eastern Bluebird	Observed near bluebird boxes within managed areas
Field Sparrow	Observed and heard near forested edge of TL ROW
Common Yellowthroat	Heard near forested edge and TL ROW
Red-winged Blackbird	Observed on narrow leaf cattail near large wetland system near maintained walking/biking trail
Red-eyed Vireo	Heard near TL ROW and forested edge
Scarlet Tanager	Observed flying within managed area within TL ROW
Song Sparrow	Heard near managed area within TL ROW
Wood Thrush	Heard near forested edge of TL ROW
Cedar Waxwing	Observed near manage area within TL
Red Bellied Woodpecker	Observed multiple times throughout the forested areas of TL ROW
Turkey	Observed in the forested areas of TL ROW
Eastern Kingbird	Observed near open water within TL ROW
Canada Goose	Observed flying over the TL ROW
Eastern Phoebe	Heard near forested edge and TL ROW
Bluegray Gnatcatcher	Heard near forested edge and TL ROW
Downy Woodpecker	Observed in forested area of the TL
Broad-headed Cowbird	Observed and heard in multiple locations along the TL ROW
Blue Heron	Observed in large wetland/open water system within TL ROW
Wood Duck	Observed in large/open water system within TL ROW
Mourning Dove	Observed on utility lines throughout the TL ROW
Tree Swallow	Heard near forested edge of the TL ROW
Oven Bird	Heard near forested edge of the TL ROW
Green Heron	Observed within large open water/wetland system within TL ROW
Double-crested Cormorant	Observed in large open water system within TL ROW
Gold Finch	Heard and observed within forested edge of TL ROW
Northern Flicker	Observed near forested edge and TL ROW
Hummingbird sp.	Observed flying near shrubs/ wetland within TL ROW
Osprey	Observed on Poles 44 through 47
Amphibians	
Cricket Frog	Observed in wetland/stream system
Leopard Frog	Observed near open water
Bullfrog	Observed and heard near larger stream systems
Reptiles	
Eastern Box Turtle	Observed near streams throughout the TL ROW after rainfall
Snapping Turtle	Observed in muddy stream within TL ROW
Slider sp.	Observed in open water within TL ROW
Black Rat Snake	Observed moving across gravel road within TL ROW
Black Racer	Observed within TL ROW near Poplar Creek



Species Observed (Common Name)	Notes/Habitat Observed in Project Site
Mammals	
White-tailed Deer	Observed running through forested areas throughout TL ROW
Nine-banded Armadillo	Observed multiple burrows within forested areas
Beaver	Observed one large beaver near beaver lodge
Wild Hog	Observed crossing TL ROW
Tracks/Scat/Remains	
Coyote tracks and scat	Observed along access roads and near drainages within TL ROW
Raccoon track	Observed in several of the creek beds throughout the TL ROW

3.2.2 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 Endangered Species Act (1973), as well as under state laws and per local policies. These species are vulnerable to habitat loss and population decline because of their rarity. HDR’s assessment also considered wildlife protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. §§ 703-712), Executive Order for Migratory Birds (E.O. 13186 of January 10, 2001), and the Bald and Golden Eagle Protection Act of 1940 (BGEPA; 16 U.S.C. 668-668d).

Table 4 provides a summary of the federally and state-listed species that were identified in the resource lists for the Project Site (Appendix B). No designated critical habitat for federally listed species overlaps with the Project Site. Also summarized in Table 4 are species habitat requirements and the potential for suitable habitat to occur on the Project Site based on the field visits conducted for vegetation and wildlife surveys in May and June 2023.

Observational field assessments for protected species were centered on terrestrial species. The survey focused on the general characteristics of the land cover, vegetation communities, and wildlife habitats currently present within and immediately adjacent to the Project Site. Although stream and wetland surveys were conducted, specific habitat characterizations such as stream substrate types were not conducted, therefore habitat determinations for some aquatic species were not made (e.g., fish and mussels that require certain substrate types).

HDR’s desktop database search and field survey indicate that the Project Site contains suitable habitat for the three federally listed bats, one bird, and one insect that is a candidate for federal listing as described in this section.



Table 4. Federally and State-Listed Animal Species and Likelihood of Occurrence in the Project Site

Scientific Name	Common Name	Protected Status ¹	Habitat Requirements	Suitable Habitat Present
<i>Myotis grisescens</i>	Gray Bat	FE, SE	Roosts in caves or karst features year-round. Foraging habitats include wet meadows, damp woods, and uplands. No suitable roosting habitat present on-site, however, foraging habitat present.	Yes – roosting, foraging
<i>Myotis lucifugus</i>	Little Brown Bat	ST	Roost in caves, hollow trees, and human-made structures	Yes – roosting, foraging
<i>Myotis septentrionalis</i>	Northern Long-eared Bat (NLEB)	FT*, ST	Various habitats including wet meadows, damp woods, and uplands, including abandoned structures, sinkhole/karst features; statewide	Yes – roosting, foraging
<i>Myotis sodalis</i>	Indiana Bat	FE, SE	Various habitats including wet meadows, damp woods, and uplands, including abandoned structures and sinkhole fissures/karst features; statewide	Yes – roosting, foraging
<i>Perimyotis subflavus</i>	Tricolored Bat	PE	Generally associated with forested landscapes, but may roost near openings	Yes – roosting, foraging
<i>Zapus hudsonius</i>	Meadow Jumping Mouse	Verified extant, viability not assessed	Inhabits moist grasslands or vegetated areas bordering streams, ponds, or marshes	No
<i>Sorex longirostris</i>	Southeastern Shrew	Verified extant, viability not assessed	Inhabits river floodplains, river swamps and freshwater marshes	No
<i>Synaptomys cooperi</i>	Southern Bog Lemming	SDNM	Inhabits marshy meadows, wet balds, and rich upland forests	No
Fish				
<i>Acipenser fulvescens</i>	Lake Sturgeon	Verified extant, viability not assessed	Inhabits riverbeds and lakes	No
<i>Percina williamsi</i>	Sickle Darter	FT	Inhabits flowing pools over rocky, sandy or silty substrates in clear creeks or small rivers	No



Scientific Name	Common Name	Protected Status ¹	Habitat Requirements	Suitable Habitat Present
<i>Chrosomus tennesseensis</i>	Tennessee Dace	SDNM	Inhabits first order spring-fed streams of woodlands in Ridge and Valley limestone region; Tennessee River watershed	No
<i>Cycleptus elongatus</i>	Blue Sucker	ST	Inhabits swift waters over firm substrates in big rivers	Potentially
<i>Erimonax monachus</i>	Spotfin Chub	FT, ST	Inhabits clear upland rivers with swift currents and boulder substrates; portions of the Tennessee River watershed	No
<i>Erimystax cahni</i>	Slender Chub	FT, ST	Restricted to bars and shoals of fine to medium gravel in runs and riffles of medium to large, clear, warm rivers	Potentially
<i>Carpiodes velifer</i>	Highfin Carpsucker	Possibly Historical	Inhabits medium to large sized rivers over rocky gravel substrates	Potentially
<i>Etheostoma maydeni</i>	Redlips Darter	ST	Inhabits slow-moving large creeks and rivers in pools along the banks strewn with boulders and woody debris	No
<i>Hemitremia flammea</i>	Flame Chub	SDNM	Inhabits springs and spring-fed streams with lush aquatic vegetation; Tennessee and middle Cumberland watersheds	No
<i>Percina aurantiaca</i>	Tangerine Darter	SDNM	Inhabits large-moderate size headwater tributaries to Tennessee River, in clear, fairly deep, rocky pools, usually below riffles	No
<i>Percina macrocephala</i>	Longhead Darter	Verified extant, viability not assessed	Inhabits the Ohio, Tennessee and Allegheny River drainage. It occurs in moderate to large-sized clear streams with swift currents and bottoms of gravel and boulders.	No
<i>Noturus flavipinnis</i>	Yellowfin Madtom	FT, ST	Inhabits pools and backwaters around slab rocks, bedrock ledges, and tree roots in clear creeks and small rivers	No



Scientific Name	Common Name	Protected Status ¹	Habitat Requirements	Suitable Habitat Present
<i>Athearnia anthonyi</i>	Anthony's Riversnail	FE, SE	Inhabits large-medium rivers with moderate-high gradient, or riffles of larger creeks with cobble/boulder substrate	No
<i>Cumberlandia monodonta</i>	Spectaclecase	FE, SE	Inhabits large rivers where they live in areas sheltered from the main force of the river current	UNK
<i>Cyprogenia stegaria</i>	Fanshell	FE, SE	Inhabits medium to large rivers in gravel riffles	No
<i>Dromus dromas</i>	Dromedary Pearlymussel	FE, SE	Inhabits small to medium, low turbidity, high to moderate gradient streams	No
<i>Epioblasma turgidula</i>	Turgid Blossom (pearlymussel)	FE, SE	Requires clear, unpolluted water; typically found buried in sand and gravel substrates of shallow, fast-flowing streams	UNK*
<i>Fusconaia cor</i>	Shiny Pigtoe	FE, SE	Inhabits relatively silt-free substrates of sand, gravel, and cobble in good flows of smaller streams.	UNK*
<i>Fusconaia cuneolus</i>	Fine-rayed Pigtoe	FE, SE	Inhabits Sand and gravel shoals of streams and rivers	UNK*
<i>Hemistena lata</i>	Cracking Pearlymussel	FE, SE	Inhabits medium to large rivers in mud, sand, or gravel	UNK*
<i>Lampsilis abrupta</i>	Pink Mucket	FE, SE	Inhabits larger tributaries in gravel or sand	UNK
<i>Lampsilis virescens</i>	Alabama Lampmussel	FE, SE	Inhabits smaller, upstream creeks or in downstream areas of large rivers	UNK*
<i>Lemiox rimosus</i>	Birdwing Pearlymussel	FE, SE	Inhabits riffles with stable, sand and gravel substrates in moderate to fast currents in small to medium sized rivers	UNK*
<i>Obovaria retusa</i>	Ring Pink	FE, SE	Inhabits the sandy but silt-free bottoms of large rivers.	UNK*
<i>Plethobasus cooperianus</i>	Orangefoot Pimpleback	FE, SE	Inhabits large rivers in gravel or mixed sand and gravel	UNK*

Scientific Name	Common Name	Protected Status ¹	Habitat Requirements	Suitable Habitat Present
<i>Plethobasus cyphus</i>	Sheepnose Mussel	FE, SE	Inhabits larger rivers and streams where they are usually found in shallow areas with moderate to swift currents that flow over coarse sand and gravel.	UNK*
<i>Pleurobema plenum</i>	Rough Pigtoe	FE, SE	Inhabits medium to large rivers in sand, gravel, and cobble substrates in shoals	UNK*
<i>Villosa iris</i>	Rainbow Mussel	Verified extant, viability not assessed	Inhabits small to medium-sized rivers with a moderate to strong current and sand, rocky, or gravel bottoms.	UNK
<i>Venustaconcha trabalis</i> (formerly <i>Villosa perpurpurea</i> and <i>V. trabalis</i>)	Tennessee Bean	FE, SE	Inhabits small headwater streams to medium-sized rivers with moderate to fast-flowing riffles that has sand, gravel, and cobble substrates and rarely it is found in deep pools or slack water	UNK
<i>Potamilus alatus</i>	Pink Heelsplitter	Verified extant, viability not assessed	Inhabits medium to large rivers in nearly every type of substrate including gravel, sand, and mud	UNK
<i>Pleuronaia dolabelloides</i>	Slabside Pearlymussel	FE, SE	Inhabits small streams to large rivers with flowing water in TN Basin tributaries; stable gravel with interstitial sand	UNK
<i>Pleuronaia barnesiana</i>	Tennessee Pigtoe	Verified extant, viability not assessed	Inhabits small streams to large rivers with flowing water in TN Basin tributaries; stable gravel with interstitial sand	UNK
<i>Pleurobema rubrum</i>	Pyramid Pigtoe	PT	Inhabits a wide variety of flowing-water habitats from small tributary streams to medium sized rivers; Substrate preference is sandy gravel. Stagnant waters and silt-heavy habitats do not support this species.	UNK
<i>Pleurobema oviforme</i>	Tennessee Clubshell	Imperiled	This mussel is endemic to the Cumberland and Tennessee river systems and two major tributaries of the Ohio River. In the Cumberland in Kentucky and Tennessee, it occurs only downstream of Cumberland Falls.	UNK
<i>Plethobasus cicatricosus</i>	White Wartyback	FE, SE	Inhabits large rivers with gravel substrates	UNK*



Scientific Name	Common Name	Protected Status ¹	Habitat Requirements	Suitable Habitat Present
			This species is known from the Cumberland, Ohio, St. Lawrence, and Tennessee River drainages. It inhabits shallow riffle zones over sand and gravel in large to medium sized rivers.	
			Inhabits small to medium-sized rivers, and sometimes large rivers, in areas with coarse sand to boulder substrata (rarely in mud) and moderate to swift currents	
<i>Io fluvialis</i>	Spiny Riversnail	Imperiled	Within its rather restricted range, spiny riversnail inhabits rocky riffles with good flow	UNK
<i>Cambarus sp. 1</i>	Emory River Crayfish	Possibly Historical	Inhabits a range of freshwater environments including streams, rivers, lakes, and burrows	Yes
Amphibians				



Scientific Name	Common Name	Protected Status ¹	Habitat Requirements	Suitable Habitat Present
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Vulnerable	Inhabits forested areas adjacent to large bodies of water for nesting habitat	Yes
<i>Colonial Wading Bird Colony</i>	Colonial Wading Bird Colony	Extirpated; Possibly historical; verified extant (viability not assessed)	Woody vegetation either submerged or surrounded by water	No
<i>Vermivora chrysoptera</i>	Golden-winged Warbler	ST	Inhabits early successional habitats in foothills regions of Appalachians	Yes
<i>Thryomanes bewickii</i>	Bewick's Wren	SDNM	Inhabits brushy areas, thickets and scrubs in open country, open and riparian woodland	Yes
<i>Pseudanopthalmus wallacei</i>	Wallace's Cave Beetle	Rare not state listed	Terrestrial cave obligate	No
<i>Pseudanopthalmus pusillus</i>	Tiny Cave Beetle	Rare not state listed	Terrestrial cave obligate	No
<i>Hesperochnes mirabilis</i>	Southeastern cave pseudoscorpian	Rare not state listed	Terrestrial cave obligate	No

Source: USFWS 2023; TDEC NHP 2023.

¹FT= Federally Threatened; FE= Federally Endangered; PE= Federally Proposed Endangered; PT= Federally Proposed Threatened; FCS= Federal Candidate Species for Listing; SE= State Endangered; ST= State Threatened; SDNM= State listed as Deemed in Need of Management; EXPN= Experimental Population; non-essential

UNK: Unknown due to limited habitat information, such as substrate characterization. Those denoted with (*) are unlikely to support protected species regardless of habitat due to local extirpation (NatureServe 2023).

3.2.2.1 Mammals

Five species of federally and/or state- listed mammals were identified during the review of the resource lists for the Project Site: the northern long-eared bat or NLEB, gray bat, Indiana bat, tricolored bat, and the little brown bat (TVA 2023, TDEC 2023, and USFWS 2023). The gray bat, NLEB, Indiana bat and the little brown bat prefer winter habitats that include caves, rock crevices, and mines (TWRA 2023; USFWS 2006, 2015). No caves, defined as any natural cavity with a horizontal length of 50 feet, total vertical extent of 40 feet, or a pit depth of 30 feet were observed on the Project Site; however, the TVA NHP review dated March 28, 2023, documented six caves within a 3-mile radius of the Project Site in Roane County and four caves in Anderson County. Additionally, no karst features were observed on the Project Site at the time of the survey.

During the summer, the NLEB, Indiana bat, tricolored bat, and little brown bat roost singly or in colonies underneath bark, in cavities, or crevices of both live and dead trees of varying size, age, and species (USFWS 2006, 2015). Suitable summer roost habitat for the four bat species consisting of trees of varying ages, including dead snags, are present in the Project Site, including a total of approximately 13 acres of moderate to high quality suitable summer roost habitat (Appendix A, Figure 3).

Foraging habitat for the listed bat species is present on the Project Site over open waters, wetlands, streams, and rivers. Additional foraging habitat for these bat species occurs within forested habitat, forest edges, and tree lines. Water resources for the five bat species include three open waters primarily fed by streams and rainwater, larger stream systems crossing the TL multiple times, and Clinch River. A more detailed description of potential habitat for listed bats in the Project Site is presented below.

3.2.2.1.1 Potential Suitable Summer Bat 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 roost habitat for federally and state listed bat species. Forested stands were determined to provide low, moderate or high-quality habitat based on presence of trees with peeling/exfoliating bark, suitable snags, distance from water source, and connection to other stands. No abandoned structures were observed within the Project Site. Photographs were taken to visually document the assessed forested stands (see Photographs 11-32 in Appendix C). The boundaries of potentially suitable bat habitat were mapped using a combination of aerial photography, GIS, and a sub-meter GPS field mapping unit.

A total of 16 forest stands totaling approximately 31 acres (Appendix A, Figure 3) were determined to provide potential summer roosting and foraging habitat for the federally listed bat species. Forest stands are depicted in Appendix A, Figure 4 and further detailed in Table 5. Of the 31 acres of forest stands, six percent (1.89 acres) provide high-quality habitat, 36 percent (11.05 acres) provide moderate-quality habitat, and 58 percent (15.95 acres) provide low-quality habitat. Several large snags occurred in the high-quality and moderate-quality bat habitat and throughout the Project Site.

Refer to Appendix D for bat habitat assessment data sheets completed by HDR as part of this study.

Table 5. Summary of Potential Bat Roost Forest Stands

Stand Number	Habitat Suitability	Area (acres)
Forest Stand 1	Moderate Quality	0.91
Forest Stand 2	Moderate Quality	0.38
Forest Stand 3	Low Quality	7.37
Forest Stand 4	Moderate Quality	0.71
Forest Stand 5	High Quality	1.89
Forest Stand 6	Moderate Quality	1.88
Forest Stand 7	Moderate Quality	1.22
Forest Stand 8	Moderate Quality	0.39
Forest Stand 9	Moderate Quality	4.57
Forest Stand 10	Moderate Quality	0.99
Forest Stand 11	Low Quality	2.46
Forest Stand 12	Low Quality	0.17
Forest Stand 13	Low Quality	0.88
Forest Stand 14	Low Quality	1.68
Forest Stand 15	Low Quality	2.45
Forest Stand 16	Low Quality	0.94
Total		28.89

Forest Stand 1

Forest Stand 1 is located on the far western portion of the Project Site and consists of a small mixed deciduous forest that abuts the Emory River to the southwest. Dominant canopy and understory trees include red oak, loblolly pine, eastern red cedar, white oak, pin oak, red maple, sweet gum, and willow oak. Trees range in size from three inches diameter at breast height (DBH) to up to approximately 30 inches DBH. Forest Stand 1 has moderate quality bat habitat due to many trees with exfoliating bark, a moderate level of diversity in tree species throughout the stand, and an available water source (Emory River). However, no snags were observed in Forest Stand 1 and this forested area is also fragmented due to a lack of connection to a larger forested stand or contiguous forested area. Photograph 11 is representative of Forest Stand 1 (Appendix C).

Forest Stand 2

Forest Stand 2 consists of a small mixed deciduous forest adjacent to the Emory River located on the western portion of the Project Site. Dominant canopy and understory trees mostly consist of tulip poplar, hickory species, sweet gum, white oak, autumn olive, and white oak. Trees range in size from three inches DBH to up to approximately 25 inches DBH. Stand 2 has moderate quality bat habitat due to a few trees with exfoliating bark, three total snags, and an available water source (Emory River). Stand 2 exhibits low diversity in (tree) species throughout the stand and lacks a connection to a larger forested area. Photographs 12 and 13 are representative of Forest Stand 2 (Appendix C).

Forest Stand 3

Forest Stand 3 consists of a moderately mixed deciduous forest abutting the northern boundary TVA transmission line on the western portion of the Project Site. Dominant canopy and

understory trees include tulip poplar, chestnut oak, red maple, Chinese privet, bush honeysuckle, and autumn olive. Trees range in size from three inches DBH to up to approximately 30 inches DBH. Forest Stand 3 has low quality bat habitat due to few trees with exfoliating bark, no snags, and no connection to a larger forested area. Several small wetlands and streams occur as water sources within this stand and the stand exhibits moderate tree diversity. Photograph 14 is representative of Forest Stand 3 (Appendix C).

Forest Stand 4

Forest Stand 4 consists of a small mixed deciduous bottomland forest surrounding a perennial stream on the western portion of the Project Site. Dominant canopy and understory trees include red oak, white oak, loblolly pine, sugar maple, red maple, American sycamore, hickory species, and tulip poplar. Tree diameters range in size from three inches DBH to up to approximately 35 inches DBH. Forest Stand 4 has moderate quality bat habitat due to several trees with exfoliating bark throughout the stand, one snag, moderate diversity in trees, and a connection to Clinch River as a water source, in addition to the perennial stream. Forest Stand 4 also has connection to larger forested areas. Photographs 15 and 16 are representative of Forest Stand 4 (Appendix C).

Forest Stand 5

Forest Stand 5 consists of a small mixed deciduous forest bordered by Poplar Creek on two sides in the center of the Project Site along the southern boundary. Forest Stand 5 is located centrally within the Project Site. Dominant canopy and understory trees include red oak, white oak, eastern red cedar, sugar maple, red maple, sweetgum, hickory species, autumn olive, and tulip poplar. Trees ranged in size from three inches DBH to up to approximately 40 inches DBH. Stand 5 has high quality bat habitat due to several trees with exfoliating bark throughout stand, three total snags, a moderate level of diversity in trees throughout the stand, and connection to Poplar Creek as a water source. Forest Stand 5 lacks connection to a larger forested area. Photograph 17 and 18 are representative of Forest Stand 5 (Appendix C).

Forest Stand 6

Forest Stand 6 consists of a small mixed deciduous forest in the center of the Project Site along the southern boundary, abutting Poplar Creek. Dominant canopy and understory trees include white oak, hickory species, eastern red cedar, sugar maple, red maple, sweetgum, American beech, autumn olive, and tulip poplar. Trees range in size from 3 inches DBH to up to approximately 35 inches DBH. Forest Stand 6 has moderate quality bat habitat due to few trees with exfoliating bark, no snags, moderate diversity in trees throughout the stand, and connection to Poplar Creek as a water source. Forest Stand 6 lacks connection to a larger forested area. Photograph 19 is representative of Forest Stand 6 (Appendix C).

Forest Stand 7

Forest Stand 7 consists of a small mixed deciduous forest in the center of the Project Site along the northern boundary, abutting Poplar Creek. Dominant canopy and understory trees include white oak, hickory species, sugar maple, red maple, sweetgum, American beech, autumn olive, and tulip poplar. Trees range in size from 3 inches DBH to up to approximately 30 inches DBH. Forest Stand 7 has moderate quality bat habitat due to some trees with exfoliating bark, one snag, moderate diversity in trees throughout the stand, and connection to Poplar Creek as a

water source. Forest Stand 7 lacks connection to a larger forested area. Photographs 20 and 21 are representative of Forest Stand 7 (Appendix C).

Forest Stand 8

Forest Stand 8 consists of a small mixed deciduous forest in the center of the Project Site along the eastern boundary, abutting a channel to Poplar Creek and a large wetland complex. Dominant canopy and understory trees include white oak, hickory species, sugar maple, red maple, sweetgum, autumn olive, and tulip poplar. Trees range in size from three inches DBH to up to approximately 30 inches DBH. Forest Stand 8 has moderate quality bat habitat due to some trees containing exfoliating bark, moderate diversity in trees throughout the stand, and connection to an unnamed tributary (UNT) to Poplar Creek. Forest Stand 8 does not contain snags and lacks connection to a larger forested area. Photograph 22 is representative of Forest Stand 8 (Appendix C).

Forest Stand 9

Forest Stand 9 consists of a moderately sized mixed deciduous forest located centrally within the Project Site. Dominant canopy and understory trees include white oak, red oak, post oak, hickory species, sugar maple, red maple, autumn olive, and tulip poplar. Trees range in size from three inches DBH to up to approximately 40 inches DBH. Forest Stand 9 has moderate quality bat habitat due to several trees containing exfoliating bark, two snags, elevated diversity in trees throughout the stand, and connection to forested and emergent wetlands and several streams as water sources, however Forest Stand 9 lacks connection to a larger forested area. Photographs 23 and 24 are representative of Stand 9 (Appendix C).

Forest Stand 10

Forest Stand 10 consists of a small mixed deciduous forest located centrally within the Project Site and south of Haul Road. Dominant canopy and understory trees include white oak, red oak, post oak, hickory species, sugar maple, red maple, sweetgum, autumn olive, and tulip poplar. Trees range in size from three inches DBH to up to approximately 40 inches DBH. Forest Stand 10 has moderate quality bat habitat due to several trees with exfoliating bark, two snags, moderate diversity in trees throughout the stand, and connection to forested and emergent wetlands and several streams as water sources. Stand 10 lacks connection to a larger forested area. Photographs 25 and 26 are representative of Forest Stand 10 (Appendix C).

Forest Stand 11

Forest Stand 11 consists of a small mixed deciduous forest located within the eastern portion of the Project Site, south of Haul Road. Dominant canopy and understory trees include hickory species, sugar maple, red maple, sweetgum, autumn olive, and tulip poplar. Trees range in size from 10 inches DBH to up to approximately 30 inches DBH. Forest Stand 11 has low quality bat habitat due to few trees with exfoliating bark, no snags, low diversity in trees throughout the stand, and lacking connection to a larger forested area. The stand does have connection to an intermittent stream and two wetlands as water sources. Photograph 27 is representative of Forest Stand 11 (Appendix C).

Forest Stand 12

Forest Stand 12 consists of a small mixed deciduous forest located on the eastern portion of the Project Site between Bethel Valley Road and Bear Creek Road. Dominant canopy and understory trees include hickory species, red maple, sweetgum, autumn olive, bush honeysuckle, and tulip poplar. Trees range in size from 5 inches DBH to up to approximately 20 inches DBH. Forest Stand 12 has low quality bat habitat due to few trees with exfoliating bark, no snags, low diversity in trees throughout the stand, and lack of connection to a larger forested area, however this stand has one connection to an intermittent stream as a water source. Photograph 28 is representative of Forest Stand 12 (Appendix C).

Forest Stand 13

Forest Stand 13 consists of a small mixed deciduous forest located within the eastern portion of the Project Site, east of Bethel Valley Road. Dominant canopy and understory trees include hickory species, sugar maple, red maple, sweetgum, autumn olive, and tulip poplar. Trees ranged in size from five inches DBH to up to approximately 25 inches DBH. Forest Stand 13 contains low quality bat habitat due to few trees containing exfoliating bark, no snags, low diversity in trees throughout the stand, and no connection to a water source within the stand, however The stand does have connection to a larger forested area. Two emergent wetlands exist adjacent to the stand that could act as a water source. Photograph 29 is representative of Forest Stand 13 (Appendix C).

Forest Stand 14

Stand 14 consists of a small mixed deciduous forest located on the far eastern portion of the Project Site and north of the current substation. Dominant canopy and understory trees include hickory species, sugar maple, red maple, white oak, sweetgum, autumn olive, bush honeysuckle, and tulip poplar. Trees range in size from five inches DBH to up to approximately 25 inches DBH. Forest Stand 14 has low quality bat habitat due to containing few trees with exfoliating bark, no snags, low diversity in trees throughout the stand, and no connection to a water source within the stand, however the stand has connection to a larger forested area and Melton Hill Lake to the east of the stand can serve as a water source. Photograph 30 is representative of Forest Stand 14 (Appendix C).

Forest Stand 15

Forest Stand 15 consists of a small mixed deciduous forest located on the far eastern portion of the Project Site along the eastern boundary and north of the current substation. Dominant canopy and understory trees include hickory species, sugar maple, red maple, white oak, sweetgum, autumn olive, eastern red cedar, and tulip poplar. Trees range in size from five inches DBH to up to approximately 30 inches DBH. Stand 15 has low quality bat habitat due to few trees with exfoliating bark and no snags, however the stand exhibits moderate diversity in tree species, several streams are present as water sources (in addition to Melton Hill Lake to the east), and the stand has connection to a larger forested area. Photograph 31 is representative of Forest Stand 15 (Appendix C).

Forest Stand 16

Forest Stand 16 consists of a small mixed deciduous forest located on the far eastern portion of the Project Site along the western boundary and north of the current substation. Dominant

canopy and understory trees include hickory species, sugar maple, red maple, white oak, sweetgum, autumn olive, eastern red cedar, and tulip poplar. Trees range in size from five inches DBH to up to approximately 35 inches DBH. Stand 16 has low quality bat habitat due to few trees containing exfoliating bark, no snags, and low diversity in trees throughout the stand, however two small intermittent streams running through the stand as potential water sources (in addition to Melton Hill Lake to the east) and the stand has connection to a larger forested area. Photograph 32 is representative of Forest Stand 16 (Appendix C).

3.2.2.2 Fish

The wildlife survey was primarily centered on terrestrial species, however many waterbodies exist across the Project Site that could support aquatic species. Based on the review of the resource lists, four federally listed and two state-listed fish species were reported for the Project Site: yellowfin madtom, slender chub, sickle darter, spotfin chub, blue sucker, and redlips darter. Of these, species associated with medium to large rivers could have potential suitable habitat due to the Project Site crossing of the Emory River and Poplar Creek, such as slender chub, spotfin chub, and blue sucker.

Additionally, five state-protected fish species were also identified on the resource lists, including lake sturgeon, highfin carpsucker, flame chub, tangerine darter, longhead darter, and Tennessee dace. Of these, only the lake sturgeon, and highfin carpsucker have potential for suitable habitat on the Project Site, again related to larger creeks and rivers such as the Emory River and Poplar Creek. None of the other fish species listed in Table 4 were observed to have potential suitable habitat on the Project Site.

3.2.2.3 Mollusks

There are 22 species of freshwater mussels or mollusks with federal protection as threatened, proposed threatened, or endangered that were provided on the resource lists for the Project Site. Thirteen of the 22 mollusk species are known to be extinct or locally extirpated, and therefore unlikely to be present; these species include the turgid blossom, shiny pigtoe, fine-rayed pigtoe, cracking pearlymussel, Alabama lampmussel, birdwing pearlymussel, ring pink, orangefoot pimpleback, sheepsnose mussel, rough pigtoe, white wartyback, green blossom pearlymussel, and tan riffleshell (NatureServe 2023).

Specific habitat characteristics such as substrates of streams and rivers were not conducted as part of this assessment, therefore uncertainty exists as to whether appropriate habitat conditions are present to support some mussel species. Mollusks with certain habitat requirements related to moderate or high stream or river gradients and riffles, such as Anthony's riversnail, fanshell, and Dromedary pearlymussel (all federally and state-listed as endangered), are unlikely to be present since the streams and rivers in the vicinity of the Project Site are generally low gradient, meandering waterbodies.

One federally and state-endangered mussel (pink mucket) and three state-protected mollusks listed as imperiled (Tennessee clubshell, ornate rocksnail and spiny riversnail) are unlikely to be present in waters on the Project Site due to rarity and/or based on current known distribution which do not include waterbodies or drainages on the Project Site (NatureServe 2023).

Although specifics of substrate characteristics of waters crossed by or on the Project Site are not fully known, up to 11 species of mussel could be present in waters on the Project Site based on understood distributions. These include the federally endangered spectaclecase, Tennessee bean, slabside pearlymussel, and oyster mussel; state-threatened pyramid pigtoe; and state-ranked pocketbook (secure), rainbow mussel, pink heelsplitter, Tennessee pigtoe, wavy-rayed lampmussel, and spike (each ranked as verified extant, viability not assessed). The wavy-rayed lampmussel, pink heelsplitter, rainbow mussel, and pyramid pigtoe inhabit riffles on medium to large sized rivers with gravel and sand substrates, and the spectaclecase is found in large rivers in areas sheltered from the main force of the current (NatureServe 2023); suitable habitat for these species was observed within Emory River and Poplar Creek within the Project Site. The Tennessee pigtoe, spike, and slabside pearlymussel are found in small to large streams with gravel substrates (NatureServe 2023), which was also observed on the Project Site. The Tennessee bean, oyster mussel, and pocketbook have more specific habitat requirements related to particular bottom substrate types; if these conditions are met, the known distribution of these species suggests they could be present in waters on the Project Site.

3.2.2.4 Crustaceans

One state-ranked (possibly historical record) crustacean was listed on the TNNHP species list: the Emory River crayfish. The Emory River crayfish inhabits range of freshwater environments including streams, rivers, lakes, and burrows. The Emory River traverses the western portion of the Project Site, and many other surface waters are located within the Project Site boundaries. Therefore, it is likely that suitable habitat exists for this crayfish on the Project Site..

3.2.2.5 Amphibians

Five state-listed or state-ranked species were reported on the resource lists for the Project Site, including the hellbender, longtail salamander, cave salamander, four-toed salamander, and berry cave salamander. No caves or woodland swamps occur on the Project Site, therefore no potential suitable habitat is present for the cave salamander, four-toed salamander, or berry cave salamander. The hellbender inhabits clean and flowing water with plenty of oxygen in large streams and creeks with an abundance of rocks and submerged logs. Brashear Creek and White Oak Creek on the Project Site provide coarse substrates and riffle-pool sequences, however both also contain silt, rendering these surface waters unsuitable for this species. The longtail salamander is considered to have verified extant, viability not assessed by the TNNHP. This species inhabits streamsides, spring runs, ponds, cave mouths, and abandoned mines. Streams and ponds are present on the Project Site, which may provide this species with potential suitable habitat.

3.2.2.6 Reptiles

Two state-ranked (painted turtle and eastern slender glass lizard) and one state-threatened (northern pine snake) reptile species were reported on the resource lists for the Project Site. The northern pine snake inhabits well-drained sandy soils in pine/pine-oak woods and dry mountain ridges. No suitable habitat exists onsite for this species. The painted turtle is a state-listed species with potential to occur within the Project Site. The painted turtle inhabits bodies of water with soft, muddy bottoms and plentiful aquatic vegetation; examples include lakes, rivers, ponds, wetlands, ditches, oxbows, and reservoirs. Three ponds with some aquatic vegetation

occur on the western portion of the Project Site. Therefore, suitable habitat is present for the painted turtle within the Project Site. No individuals were observed at the time of the survey. The slender glass lizard inhabits dry upland areas including brush, cut-over woodlands, and grassy fields. Potentially suitable habitat exists for this species; however, no incidental observations of the lizard were made in the habitat at the time of the field survey.

3.2.2.7 Birds

There are two state-listed, five state-ranked, and one federally listed bird species identified on the resource lists: Bachman's sparrow, Bewick's wren, cerulean warbler, golden-winged warbler, osprey, bald eagle, whooping crane, and Swainson's warbler. Bachman's sparrow and Bewick's wren inhabit dry open pine or oak woodlands (NatureServe 2023). Cerulean warbler and Swainson's warbler inhabit deciduous floodplain/mesic forests (Audubon 2023). The golden-winged warbler is found in upland sites on abandoned farmland in early successional habitats, powerline ROWs, dry and shrubby fields, woodland clearings, and wet areas covered by felled trees (NatureServe 2023). The Bald eagles and osprey inhabit forested areas or nest in high structures (such as utility towers) in proximity to large bodies of water (NatureServe 2023). The whooping crane, listed as an experimental population for the Project Site, breeds, migrates, winters and forages in a variety of habitats, including coastal inland marshes, lakes, open ponds, wet meadows and rivers, pastures and agricultural fields (USFWS 2023). Potentially suitable habitat exists onsite for all of these species; however, no individuals were observed at the time of the field survey except for osprey. Four active osprey nests were observed on poles 44 through 47 on the Project Site (Appendix A, Figure 3, Appendix C, Photographs 35 and 36).

Several colonial wading bird colony entries were also listed on the TNNHP list with ranks of extirpated, possibly historical, and verified extant (viability not assessed). No indication was available for what species of bird colonies the entries reference. If wading bird colonies are present, they are likely associated with the Emory River (which is crossed by the Project Site), Clinch River, and/or Watts Bar Reservoir.

3.2.2.8 Insect

The monarch butterfly is the only federally listed candidate insect that was reported on the resource lists for the Project Site. The monarch butterfly prefers habitats that contain milkweed species and flowering plants often along roadside areas, open areas, wet areas, or urban gardens (NatureServe 2023). No monarch butterflies were observed during the field survey; however, milkweed (butterfly milkweed) was observed in multiple areas throughout the Project Site, therefore, potential suitable habitat for the monarch butterfly exists on the Project Site (Appendix A, Figure 3 and Appendix C, Photograph 37).

Three rare but not state-listed species identified on the resource lists include Wallace's cave beetle, Payne's cave beetle, and the tiny cave beetle. These species are terrestrial cave obligates. Suitable habitat does not occur on the Project Site for these species.



3.2.2.9 Arachnid

The southeastern cave pseudoscorpian is a rare but not state listed species on the resource list for the Project Site. This pseudoscorpian is an aquatic cave obligate and no caves exist on the Project Site, therefore no suitable habitat is present.

3.2.3 Migratory Birds and Eagles

Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) directs federal agencies to take certain actions to further implement the MBTA. 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 278 species of migratory birds have been identified in Roane County and 265 species of migratory birds within Anderson County (eBird 2023), and additional species likely occur regularly. The USFWS maintains a list of migratory birds of conservation concern (USFWS 2021). These species are not listed under the Endangered Species Act (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. The Project Site lies within Bird Conservation Region 28 (BCR 28), Appalachian Mountains, which contains 20 birds of conservation concern (USFWS 2021). Species from this list with a “common” occurrence (during all seasons, breeding, wintering, or migration) as shown on range maps by the National Audubon Society (2023) are listed in Table 6. Additionally, species from the Migratory Birds list obtained from the USFWS IPaC report (USFWS 2023) were also included.

Table 6. Migratory Bird Species of Conservation Concern Potentially Occurring in the Project Site

Scientific Name	Common Name	Season of Occurrence	Likelihood of Suitable Habitat Presence
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo (Eastern)	Breeding season	Possible , occurs in wooded habitat with dense cover and water nearby, including woodlands with low, scrubby, vegetation, overgrown orchards, abandoned farmland and dense thickets along streams and marshes
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	Breeding season	Possible , occurs along wood edges, groves, thickets. Breeds mostly in deciduous thickets and shrubby places, often on the edges of woodland or around marshes, however breeding is uncommon in this range
<i>Caprimulgus vociferus</i>	Eastern Whip-poor-will	Breeding season	Likely ; deciduous and or mixed woods
<i>Chaetura pelagica</i>	Chimney Swift	Breeding season	Possible , nests in chimneys and less frequently large, open-topped hollow trees; reported from vicinity and likely forages in TL area
<i>Aegolius acadicus</i>	Northern Saw-whet Owl	Winter	Possible , occurs in forest with an open understory for foraging, deciduous trees for nesting, dense conifers for roosting, and riverside habitat nearby. But they nest in a wide range of wooded habitats, including coniferous



Scientific Name	Common Name	Season of Occurrence	Likelihood of Suitable Habitat Presence
			swamps, disturbed deciduous woods, savannahs, riverside forest, and shrub-steppe habitat
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	Year-round	Likely ; inhabits open forests and pine savannahs, reported from vicinity
<i>Hylocichla mustelina</i>	Wood Thrush	Breeding season	Likely , occurs in deciduous and mixed forests with shrubs in understory; reported from vicinity
<i>Dolichonyx oryzivorus</i>	Bobolink	Migrant species	Likely , open country with a preference for large hayfields, moist meadows and weedy fields dominated by a mixture of tall grasses
<i>Branta canadensis</i>	Canada Goose	Migrant species	Likely , lakes, ponds, bays, marshes, fields.
<i>Cardellina canadensis</i>	Canada Warbler	Migrant species	Likely , forest undergrowth, shady thickets. Breeds in mature mixed hardwoods of extensive forests and streamside thickets.
<i>Vermivora chrysoptera</i>	Golden-winged Warbler	Migrant species	Likely , open woodlands, brushy clearings, undergrowth. Breeds in brushy areas with patches of weeds, shrubs, and scattered trees (such as alder or pine). This habitat type is found in places where a cleared field is growing up to woods again, as well as in marshes and tamarack bogs.
<i>Chordeiles minor</i>	Common Nighthawk	Breeding season	Likely , inhabits any kind of open or semi-open terrain, including clearings in forest, open pine woods, prairie country, farmland, suburbs, and city centers.
<i>Euphagus carolinus</i>	Rusty Blackbird	Winter	Possible , occurs in forested wetlands
<i>Protonotaria citrea</i>	Prothonotary Warbler	Breeding season	Possible , forested wetlands with areas of standing water
<i>Oporornis formosus</i>	Kentucky Warbler	Breeding season	Likely , moist deciduous forest with shrubby understory
<i>Dendroica cerulea</i>	Cerulean Warbler	Breeding season	Possible , mature deciduous forest with scattered canopy gaps
<i>Dendroica discolor</i>	Prairie Warbler	Breeding season	Likely , brushy fields and recently harvested, regenerating woodlands

A large portion of the forested area on the Project Site provide suitable habitat for one or more of the birds listed in Table 6. Many additional migratory bird species not listed as a Birds of Conservation Concern likely also occur on the Project Site. Table 3 lists a few of these species whose presence was confirmed during the field survey. The other species likely present include wood ducks and other waterfowl, additional species of hawks and owls, woodpeckers, flycatchers, vireos, thrushes, and warblers. The deciduous forests, open water, managed land, and open herbaceous areas also provide habitat for migratory birds with declining populations that are not listed as Birds of Conservation Concern by the USFWS (2021).

Both bald and golden eagles are protected by the MBTA and the Bald and Golden Eagle Protection Act (BGEPA). Under the BGEPA it is illegal to kill, harass, possess (without a permit), or sell bald and golden eagles and their parts. Bald and golden 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 trees 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 (TWRA 2021) and 632 observations were made in Roane County and 599 observations in Anderson County (eBird 2023). The suitability of the Project Site as habitat for the bald eagle is generally low due to the absence of large water bodies throughout much of the Project Site; however, potentially suitable habitat does occur on the eastern TLs where the Project Site crosses the Emory River on the upstream end of Watts Bar Reservoir near the Kingston reservation, and Poplar Creek.

The golden eagle is a rare winter resident in Tennessee and most reports of the species have been in the vicinity of reservoirs. Wintering habitat includes a mix of forest and open habitats for foraging. The Project Site provides suitable winter roosting and foraging habitat, and one observation of the golden eagle has been reported from Anderson County (eBird 2023). Therefore, the golden eagle may occur in the Project Site, although none were observed during the field survey.

Osprey typically inhabit areas along large rivers, lakes, and reservoirs. Osprey will nest on utility poles and other artificial structures within transmission lines. Suitable nesting habitat was observed within the transmission line near a UNT to Clinch River and the adjacent wetlands, and 2,143 osprey observations have been reported from Roane County and 1,731 osprey observations were reported from Anderson County (eBird 2023). Four active osprey nests and one currently being built were observed nesting on utility poles 44 through 47 (Appendix A, Figure 4 and Appendix C, Photographs 35 and 36).

4 Results Summary

A large portion of the Project Site contains dry herbaceous vegetation communities within the TVA ROW, with some agricultural lands and mixed deciduous forests interspersed. Potential suitable habitat was identified and evaluated during field surveys for the presence of the federal and state protected plant species listed in Table 4; the state-endangered tall larkspur and naked-stem sunflower were documented within the Project Site during the time of the field survey.

Forested areas within the Project Site provide potential suitable summer bat habitat for federally listed bat species, as well as several other bat species. Several migratory birds considered to be of conservation concern, as well as many other bird species, some with declining populations, likely occur on the Project Site. Additionally, four active osprey nests were observed within on the Project Site on poles 44 through 47.

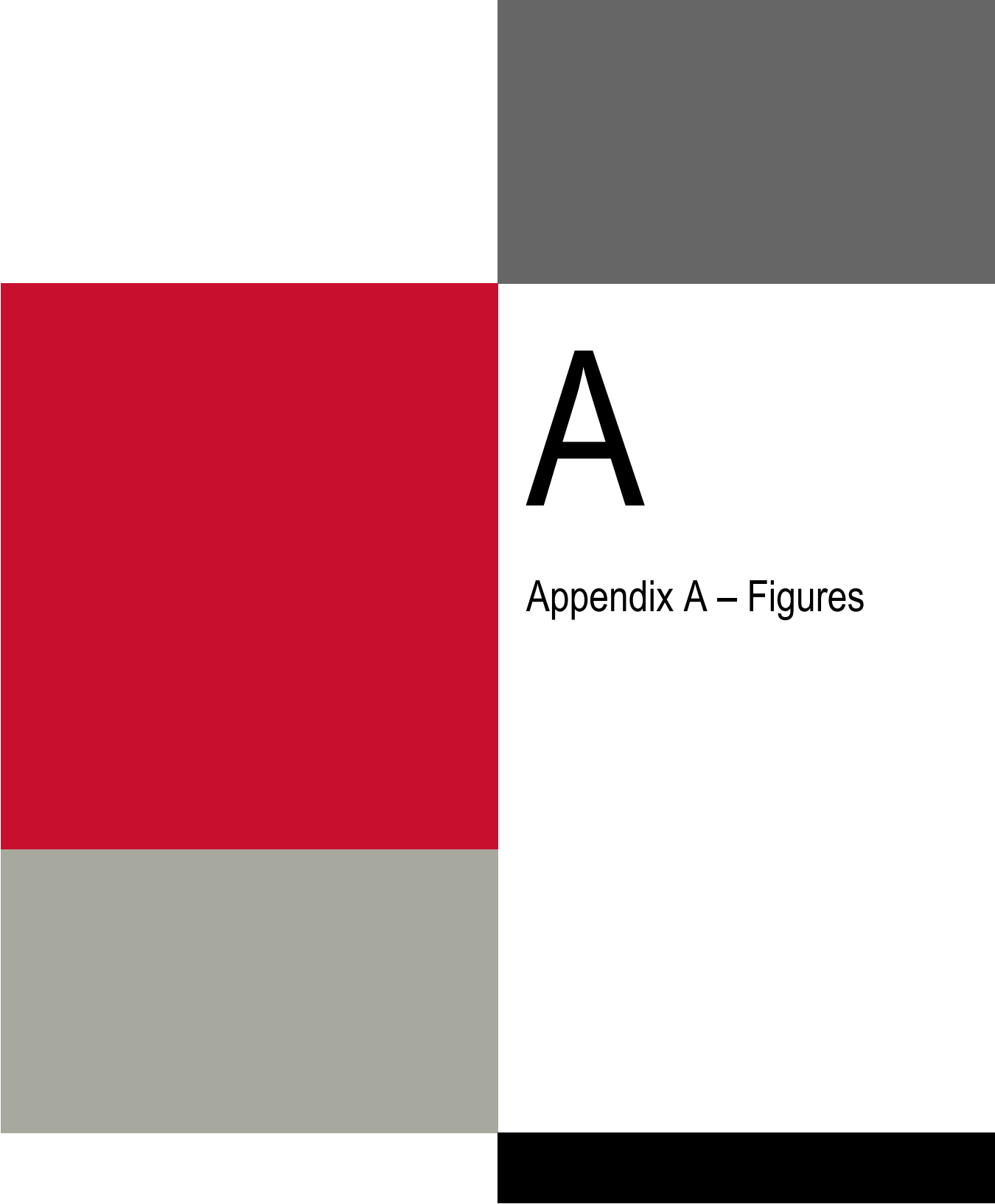
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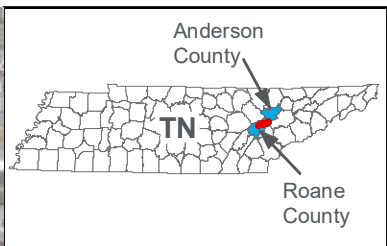
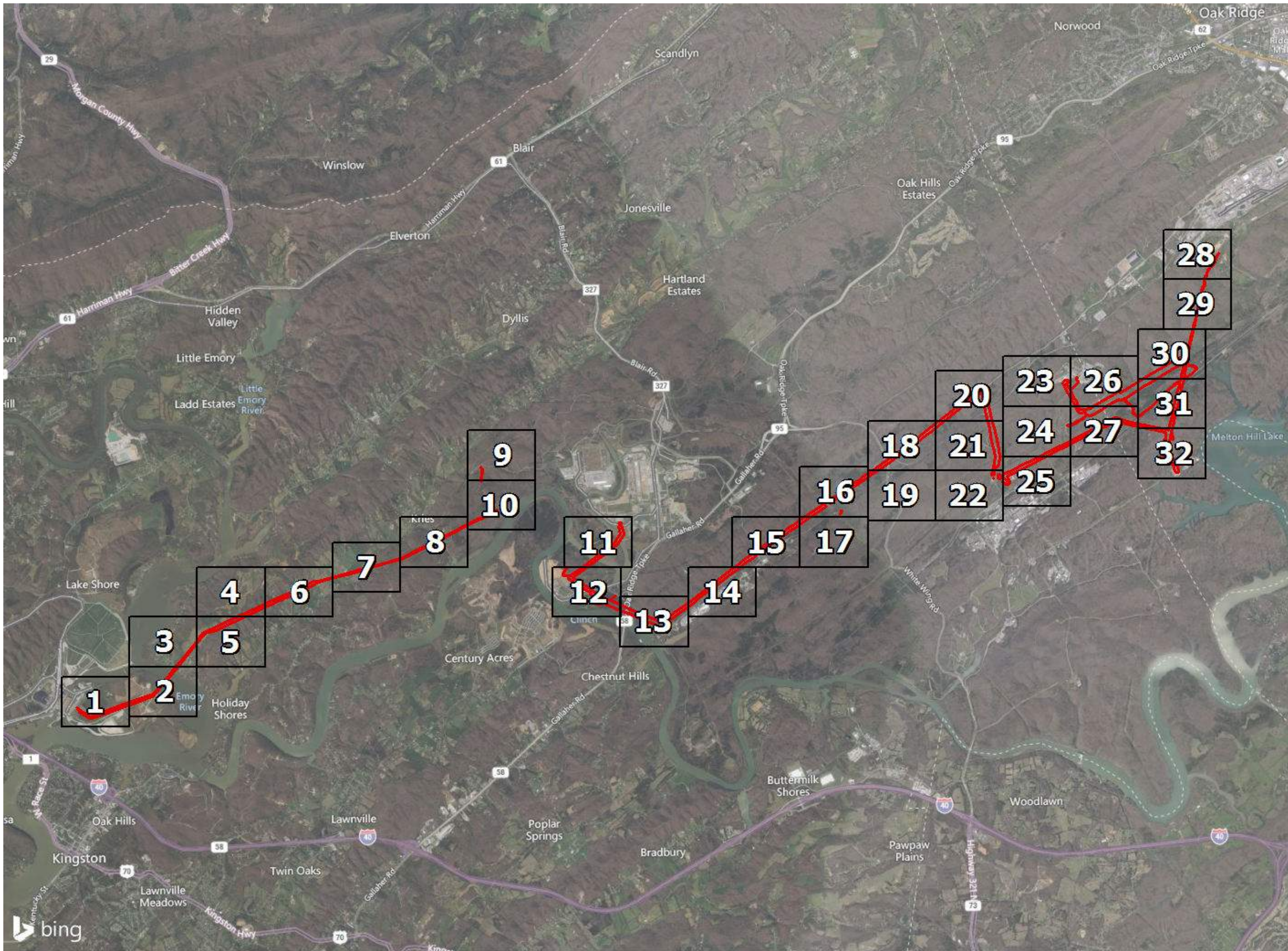
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Appendix A – Figures

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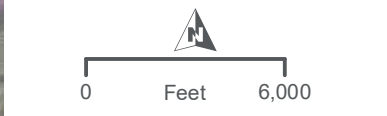
Figure 1: Project Site Overview

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KINGSTON TRANSMISSION LINE

LEGEND
 Project Site



DATA SOURCE: Bing Hybrid Aerial Imagery
OVERVIEW



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Figure 2: Vegetation Community

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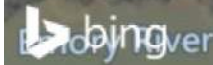
KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↑ Photo Location
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pastureland
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Herbaceous
- Wet Deciduous



DATA SOURCE: Bing Hybrid Aerial Imagery





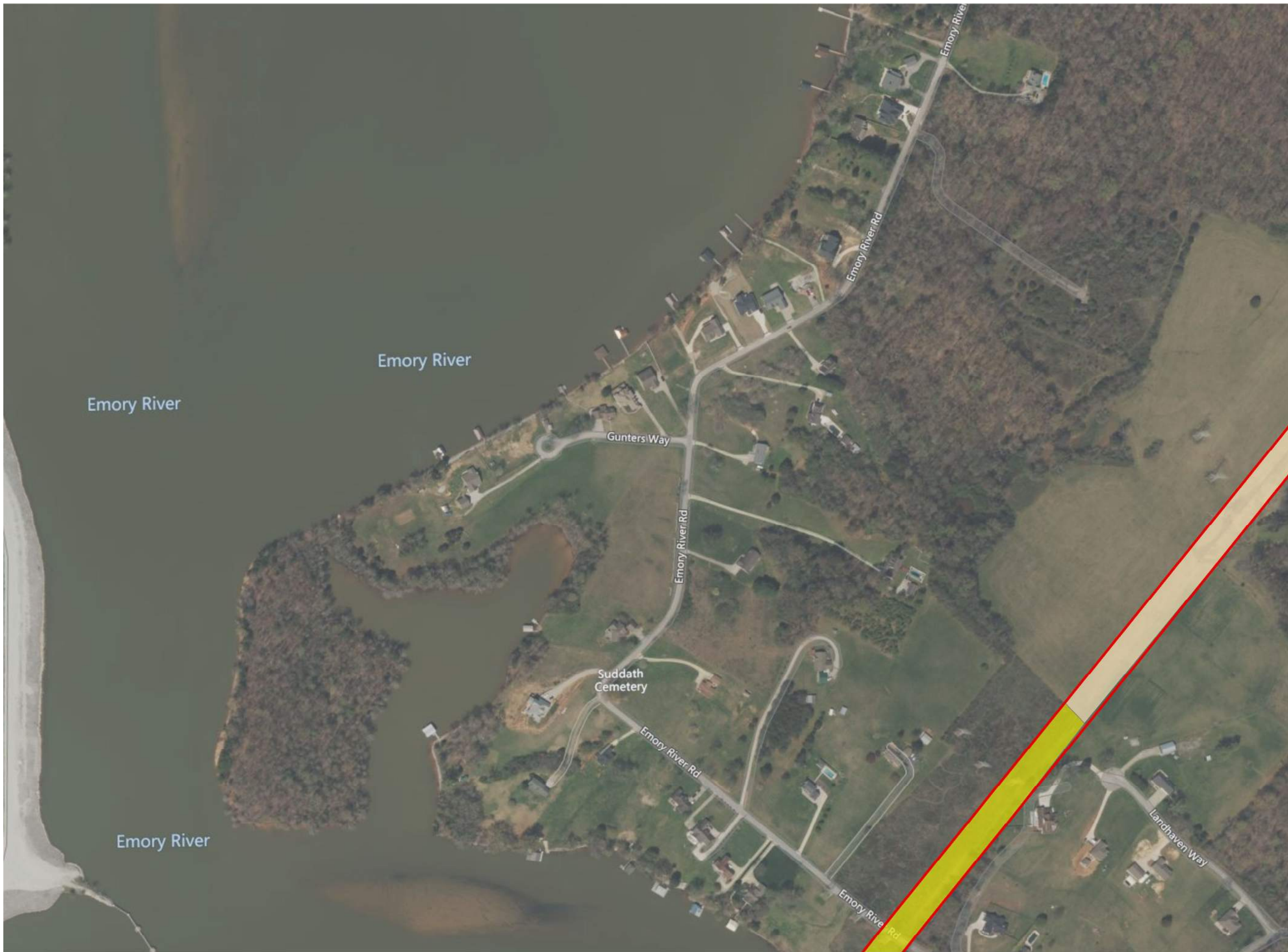
KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↑ Photo Location
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pastureland
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Herbaceous
- Wet Deciduous



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↑ Photo Location
- Vegetation Community
- Dry Deciduous
- Dry Herbaceous
- Kudzu Infested
- Maintained Access Road
- Maintained Lawn
- Open Water
- Pastureland
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Herbaceous
- Wet Deciduous



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

- LEGEND**
- Project Site
 - ↑ Photo Location
 - Vegetation Community
 - Dry Deciduous
 - Dry Herbaceous
 - Kudzu Infested
 - Maintained Access Road
 - Maintained Lawn
 - Open Water
 - Pastureland
 - Pasture/Hay
 - Pasture/Maintained Lawn
 - Wet Herbaceous
 - Wet Deciduous



DATA SOURCE: Bing Hybrid Aerial Imagery



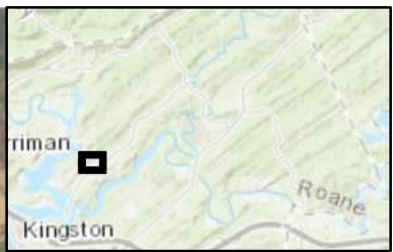
KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↗ Photo Location
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- Maintained Access Road
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- Wet Deciduous



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND

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- Pastureland
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Herbaceous
- Wet Deciduous



DATA SOURCE: Bing Hybrid Aerial Imagery



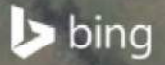
KINGSTON TRANSMISSION LINES

LEGEND

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- Maintained Access Road
- Maintained Lawn
- Open Water
- Pastureland
- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Herbaceous
- Wet Deciduous





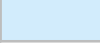
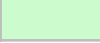



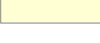
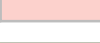




DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINES

- LEGEND**
-  Project Site
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 - Vegetation Community
 -  Dry Deciduous
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 -  Maintained Lawn
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 -  Pasture/Hay
 -  Pasture/Maintained Lawn
 -  Wet Herbaceous
 -  Wet Deciduous



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND



Project Site

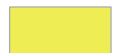


Photo Location

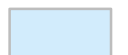
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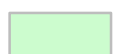
Dry Deciduous



Dry Herbaceous



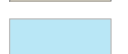
Kudzu Infested



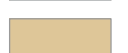
Maintained Access Road



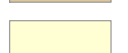
Maintained Lawn



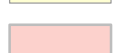
Open Water



Pastureland



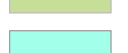
Pasture/Hay



Pasture/Maintained Lawn



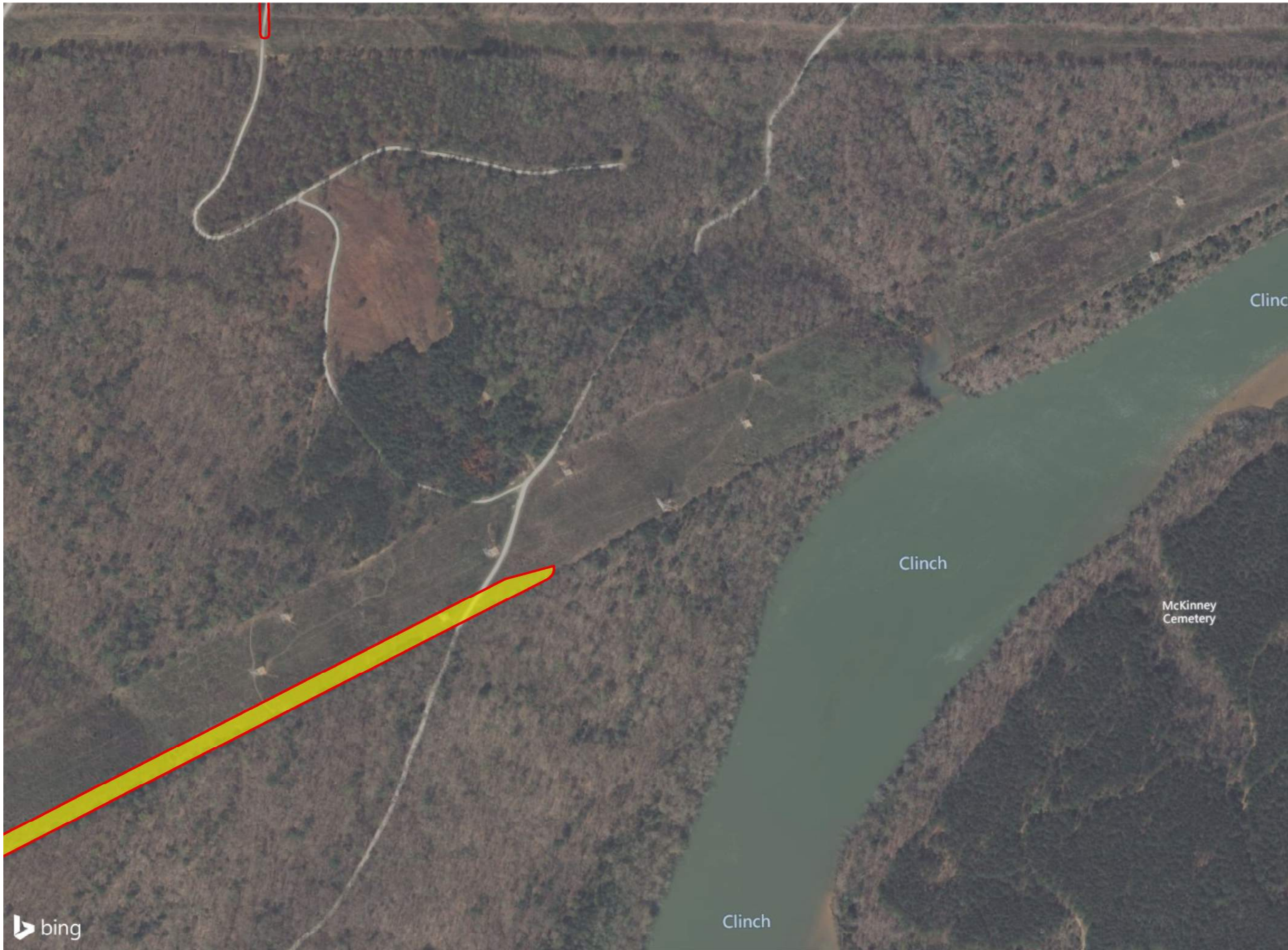
Wet Herbaceous



Wet Deciduous



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND

-  Project Site
-  Photo Location
- Vegetation Community
 -  Dry Deciduous
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DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

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DATA SOURCE: Bing Hybrid Aerial Imagery



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DATA SOURCE: Bing Hybrid Aerial Imagery



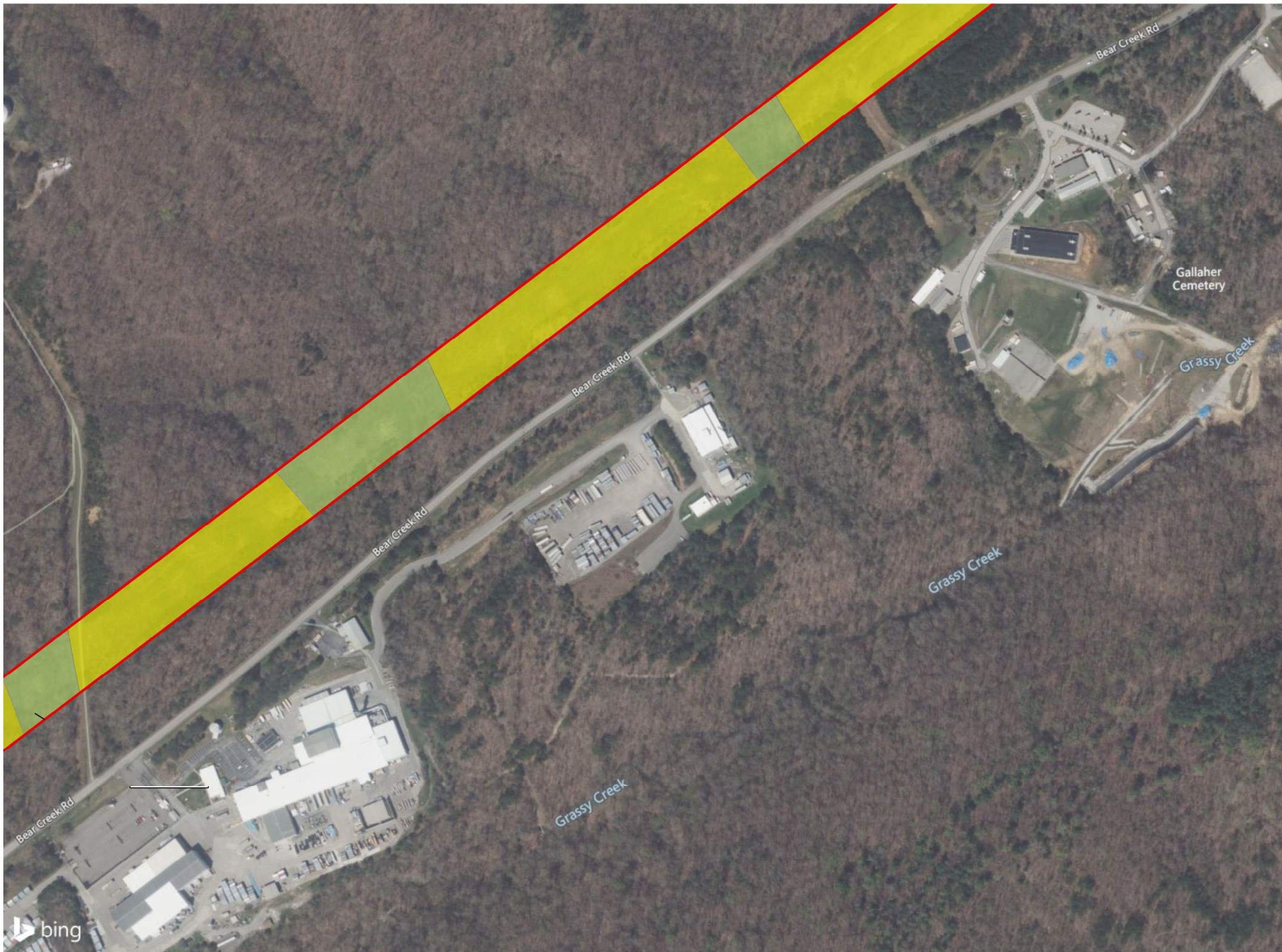
KINGSTON TRANSMISSION LINES

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- Maintained Lawn
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- Pasture/Hay
- Pasture/Maintained Lawn
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DATA SOURCE: Bing Hybrid Aerial Imagery



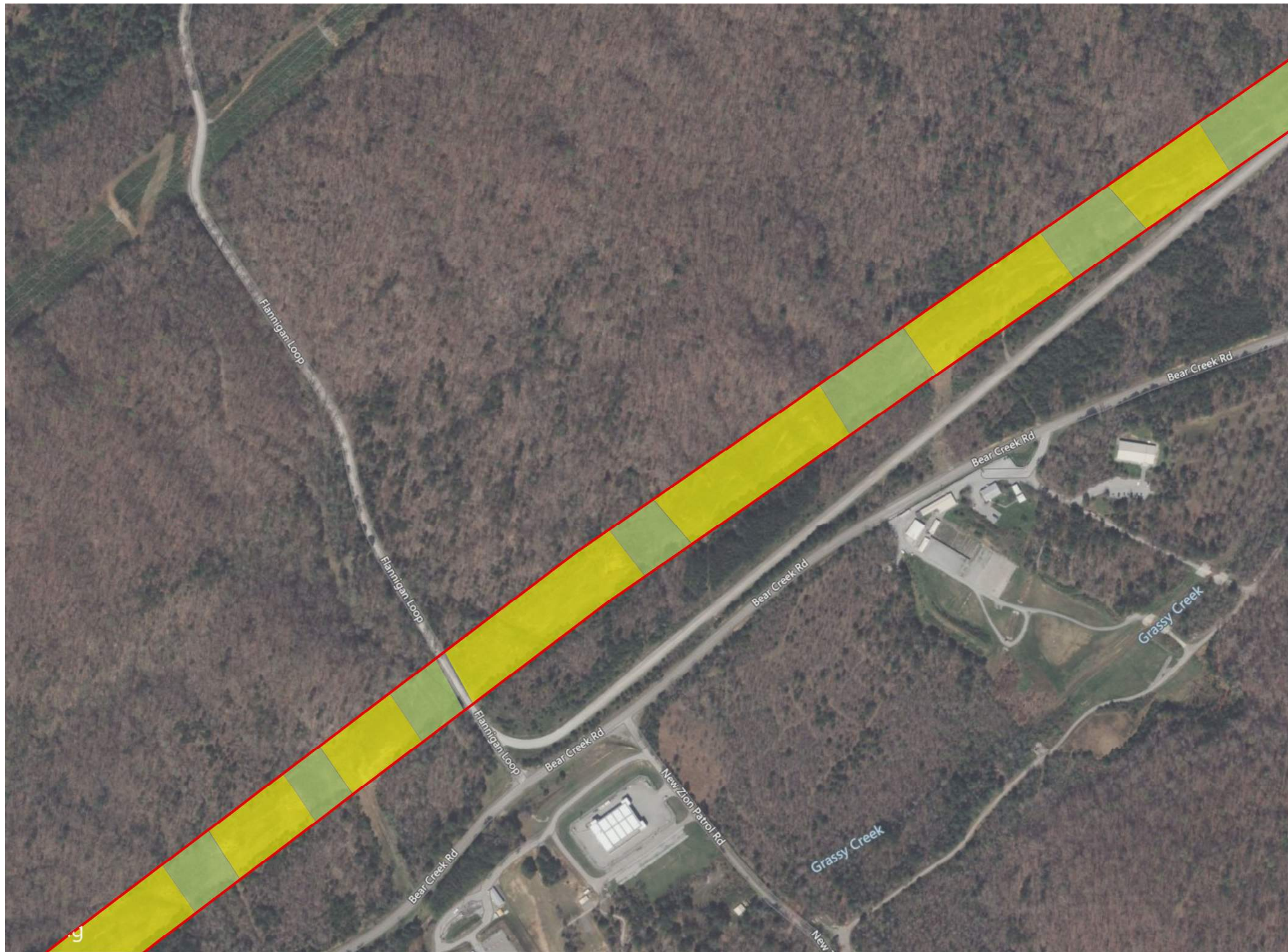
KINGSTON TRANSMISSION LINES

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DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

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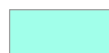


DATA SOURCE: Bing Hybrid Aerial Imagery



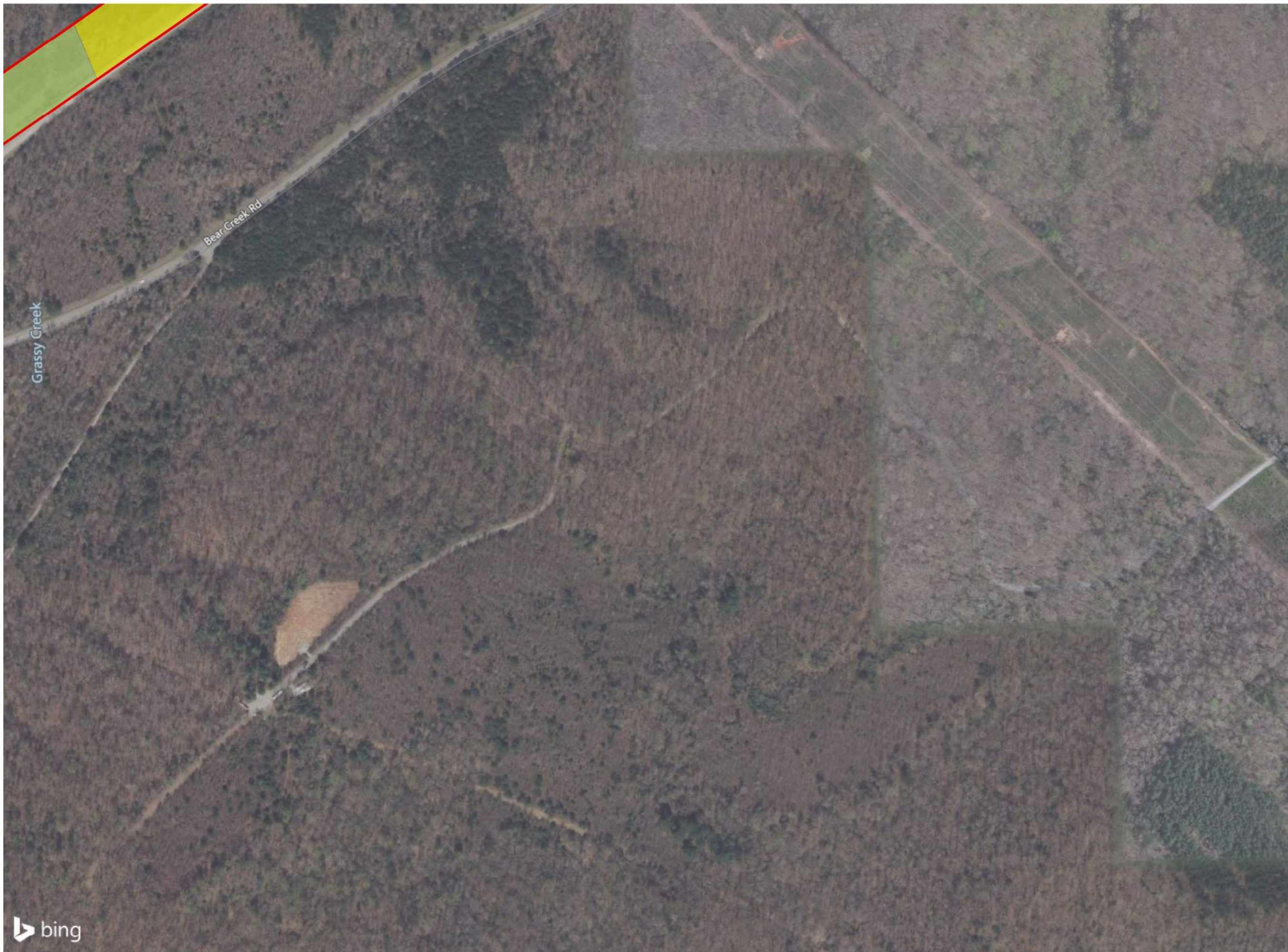
KINGSTON TRANSMISSION LINES

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DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

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 -  Wet Herbaceous
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DATA SOURCE: Bing Hybrid Aerial Imagery



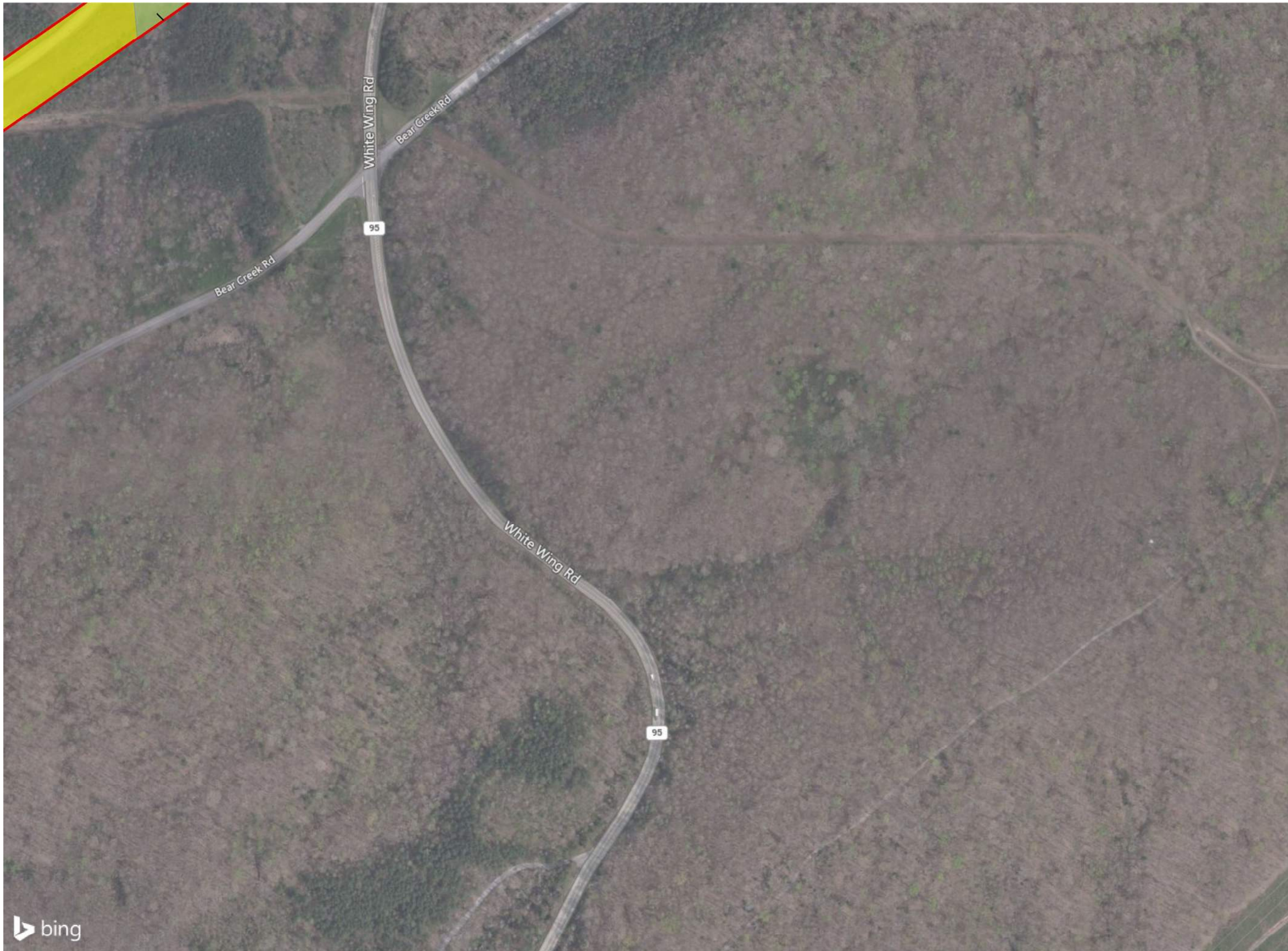
KINGSTON TRANSMISSION LINES

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- Project Site
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DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND



Project Site

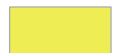


Photo Location

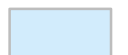
Vegetation Community



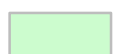
Dry Deciduous



Dry Herbaceous



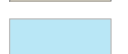
Kudzu Infested



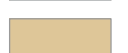
Maintained Access Road



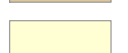
Maintained Lawn



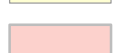
Open Water



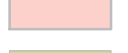
Pastureland



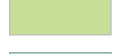
Pasture/Hay



Pasture/Maintained Lawn



Wet Herbaceous



Wet Deciduous




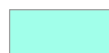
0 Feet 300

DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND

-  Project Site
-  Photo Location
- Vegetation Community**
-  Dry Deciduous
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-  Maintained Lawn
-  Open Water
-  Pastureland
-  Pasture/Hay
-  Pasture/Maintained Lawn
-  Wet Herbaceous
-  Wet Deciduous



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND














- Project Site
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DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

- LEGEND**
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DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

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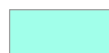


DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND

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 -  Dry Herbaceous
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DATA SOURCE: Bing Hybrid Aerial Imagery



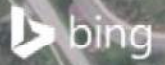
KINGSTON TRANSMISSION LINES

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DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINES

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- Pasture/Hay
- Pasture/Maintained Lawn
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DATA SOURCE: Bing Hybrid Aerial Imagery



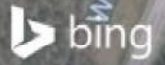
KINGSTON TRANSMISSION LINES

LEGEND

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- ↑ Photo Location
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- Maintained Lawn
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DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
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- Pasture/Hay
- Pasture/Maintained Lawn
- Wet Herbaceous
- Wet Deciduous



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND



Project Site



Photo Location

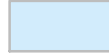
Vegetation Community



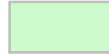
Dry Deciduous



Dry Herbaceous



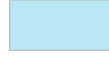
Kudzu Infested



Maintained Access Road



Maintained Lawn



Open Water



Pastureland



Pasture/Hay



Pasture/Maintained Lawn



Wet Herbaceous



Wet Deciduous



0 Feet 300

DATA SOURCE: Bing Hybrid Aerial Imagery



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LEGEND

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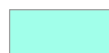


DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

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DATA SOURCE: Bing Hybrid Aerial Imagery

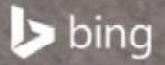








Figure 3: Wildlife and Rare Plant Species Habitat

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KINGSTON TRANSMISSION LINES

LEGEND







-  Project Site
-  Photo Location
-  Rare Plant-Delphinium
-  Milkweed Patch
-  Osprey Nest on Nearby Pole
-  Snags

Potential Bat Habitat

-  High Quality
-  Moderate Quality
-  Low Quality

HDR Delineated Stream

Type

-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Delineated Ephemeral Stream
-  Wet Weather Conveyance
-  HDR Delineated Wetland
-  HDR Delineated Open Water









DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND






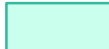
-  Project Site
-  Photo Location
-  Rare Plant-Delphinium
-  Milkweed Patch
-  Osprey Nest on Nearby Pole
-  Snags

Potential Bat Habitat

-  High Quality
-  Moderate Quality
-  Low Quality

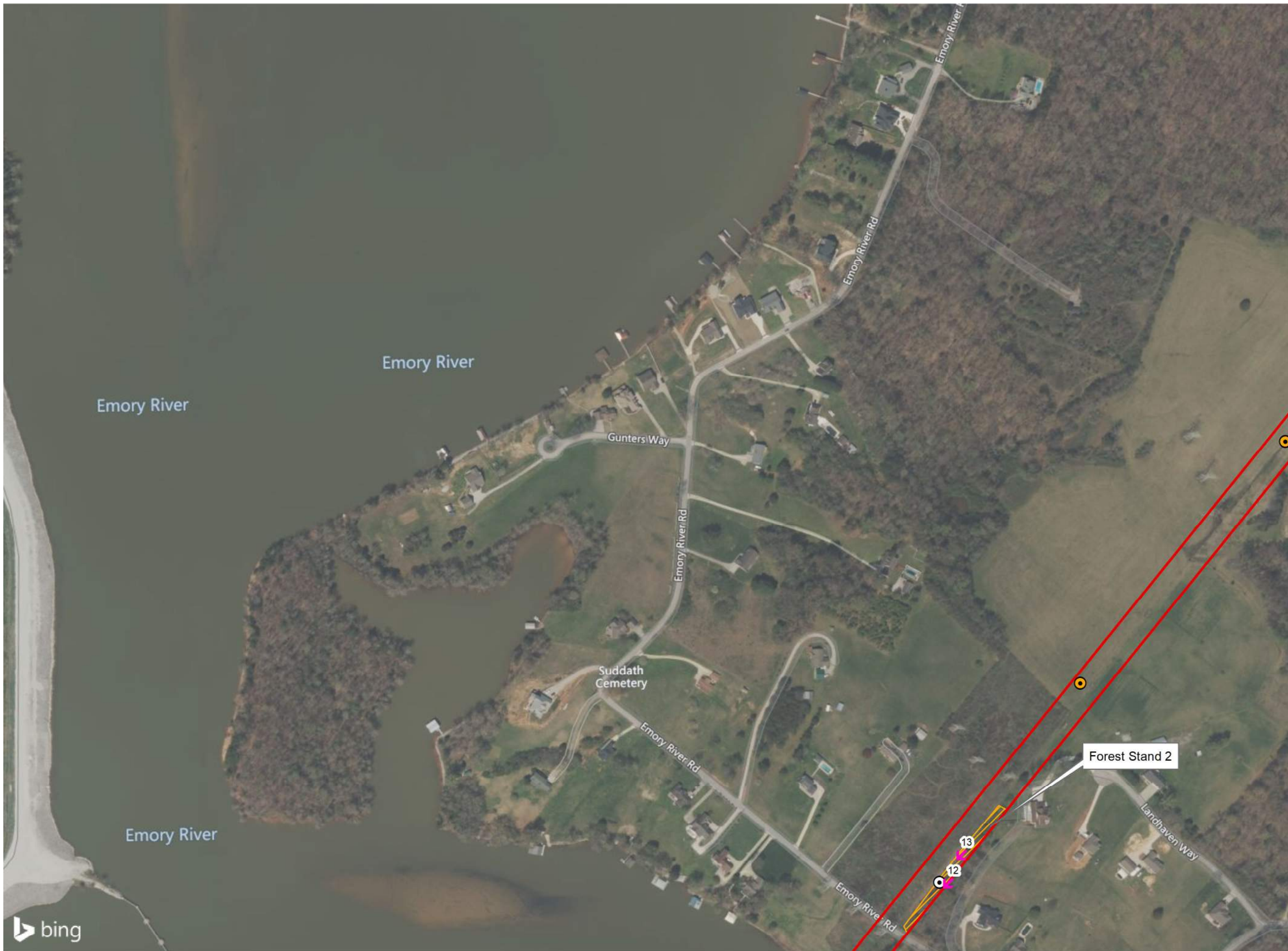
HDR Delineated Stream

Type

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-  Delineated Intermittent Streams
-  Delineated Ephemeral Stream
-  Wet Weather Conveyance
-  HDR Delineated Wetland
-  HDR Delineated Open Water



DATA SOURCE: Bing Hybrid Aerial Imagery



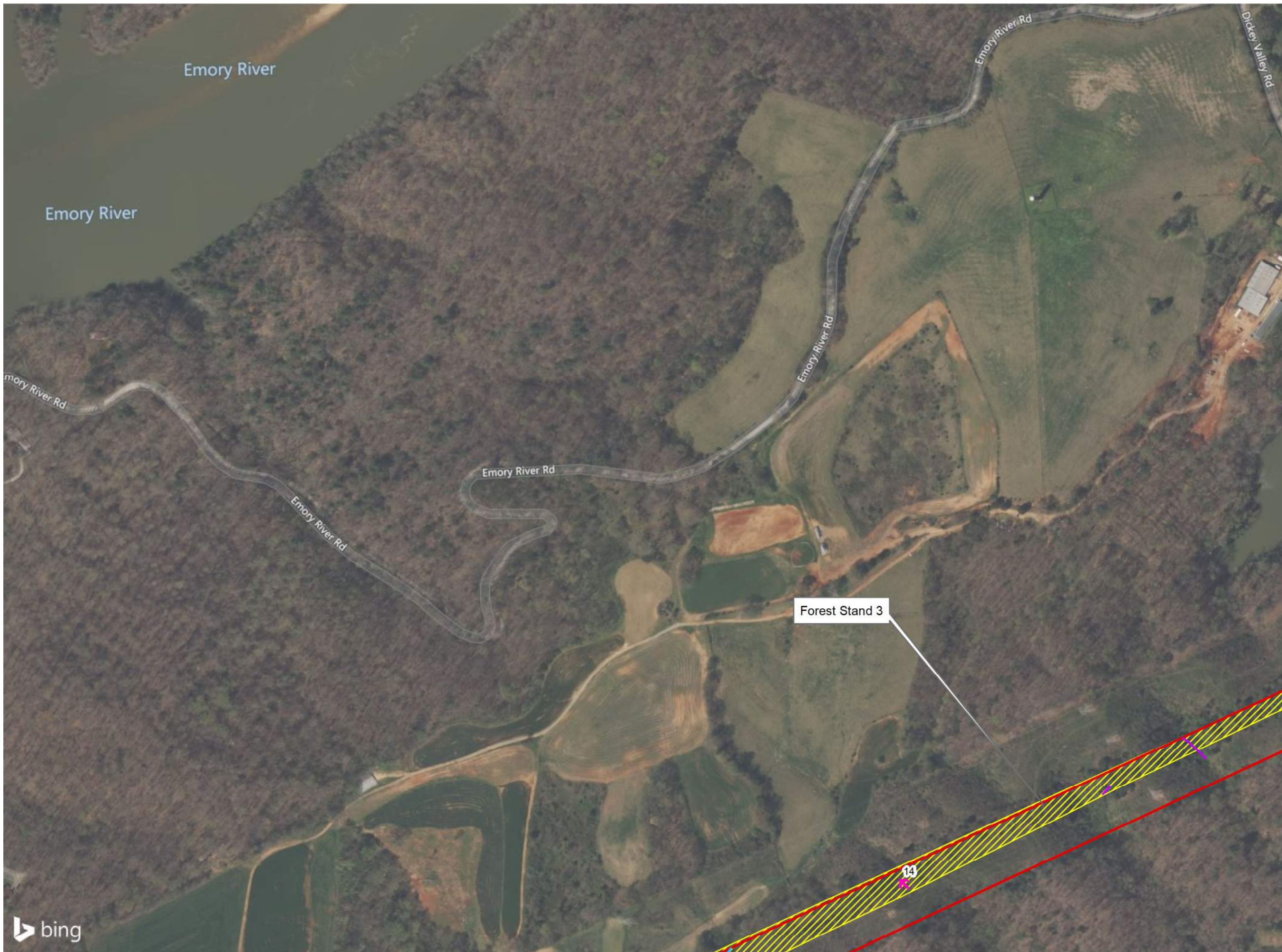
KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↑ Photo Location
- Rare Plant-Delphinium
- Milkweed Patch
- Osprey Nest on Nearby Pole
- Snags
- Potential Bat Habitat**
- High Quality
- Moderate Quality
- Low Quality
- HDR Delineated Stream**
- Type**
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Delineated Ephemeral Stream
- Wet Weather Conveyance
- HDR Delineated Wetland
- HDR Delineated Open Water



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

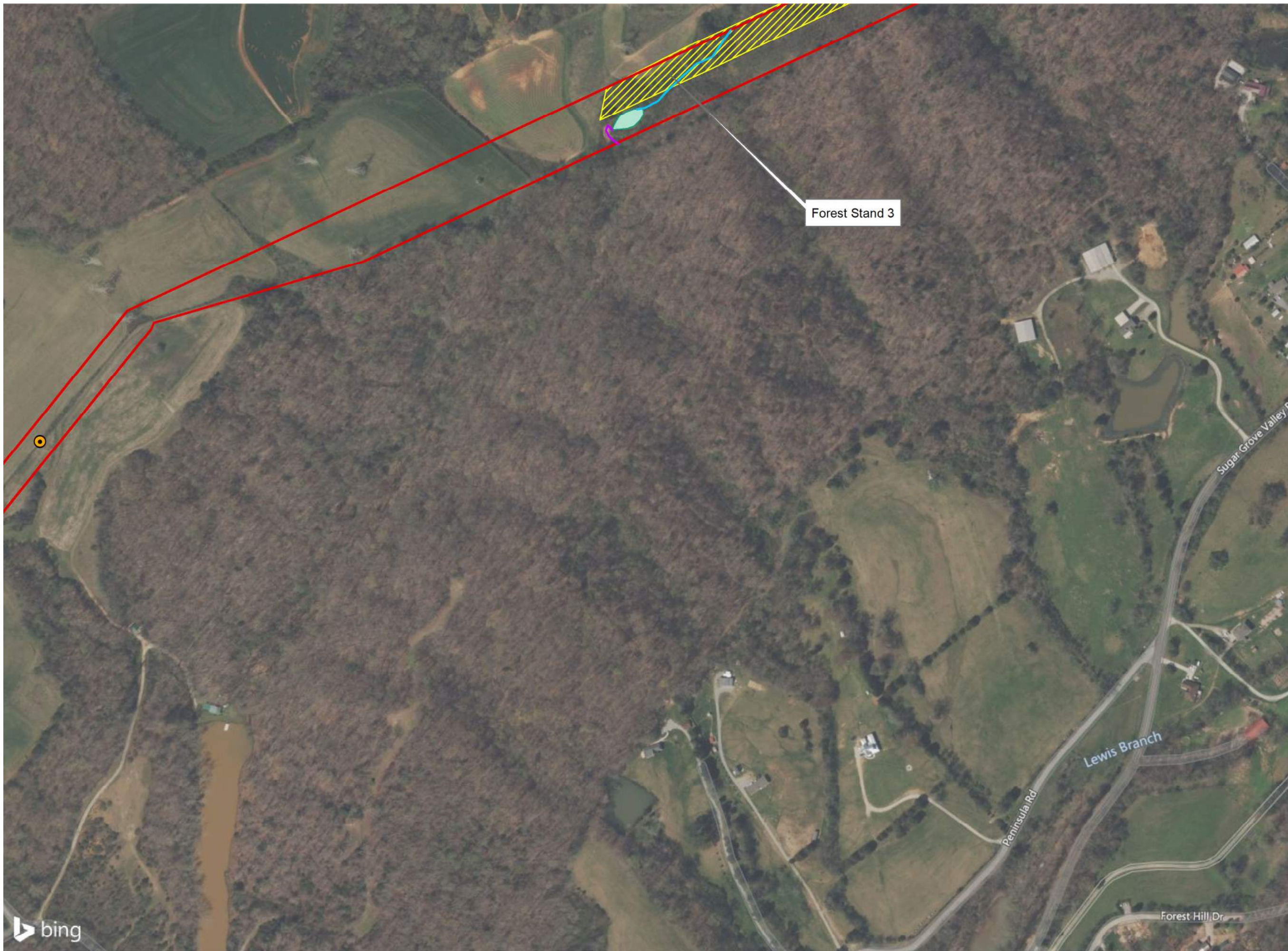
LEGEND

- Project Site
 - ↑ Photo Location
 - Rare Plant-Delphinium
 - Milkweed Patch
 - Osprey Nest on Nearby Pole
 - Snags
- Potential Bat Habitat
- High Quality
 - Moderate Quality
 - Low Quality
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 - Delineated Intermittent Streams
 - Delineated Ephemeral Stream
 - Wet Weather Conveyance
- HDR Delineated Wetland
 - HDR Delineated Open Water



DATA SOURCE: Bing Hybrid Aerial Imagery





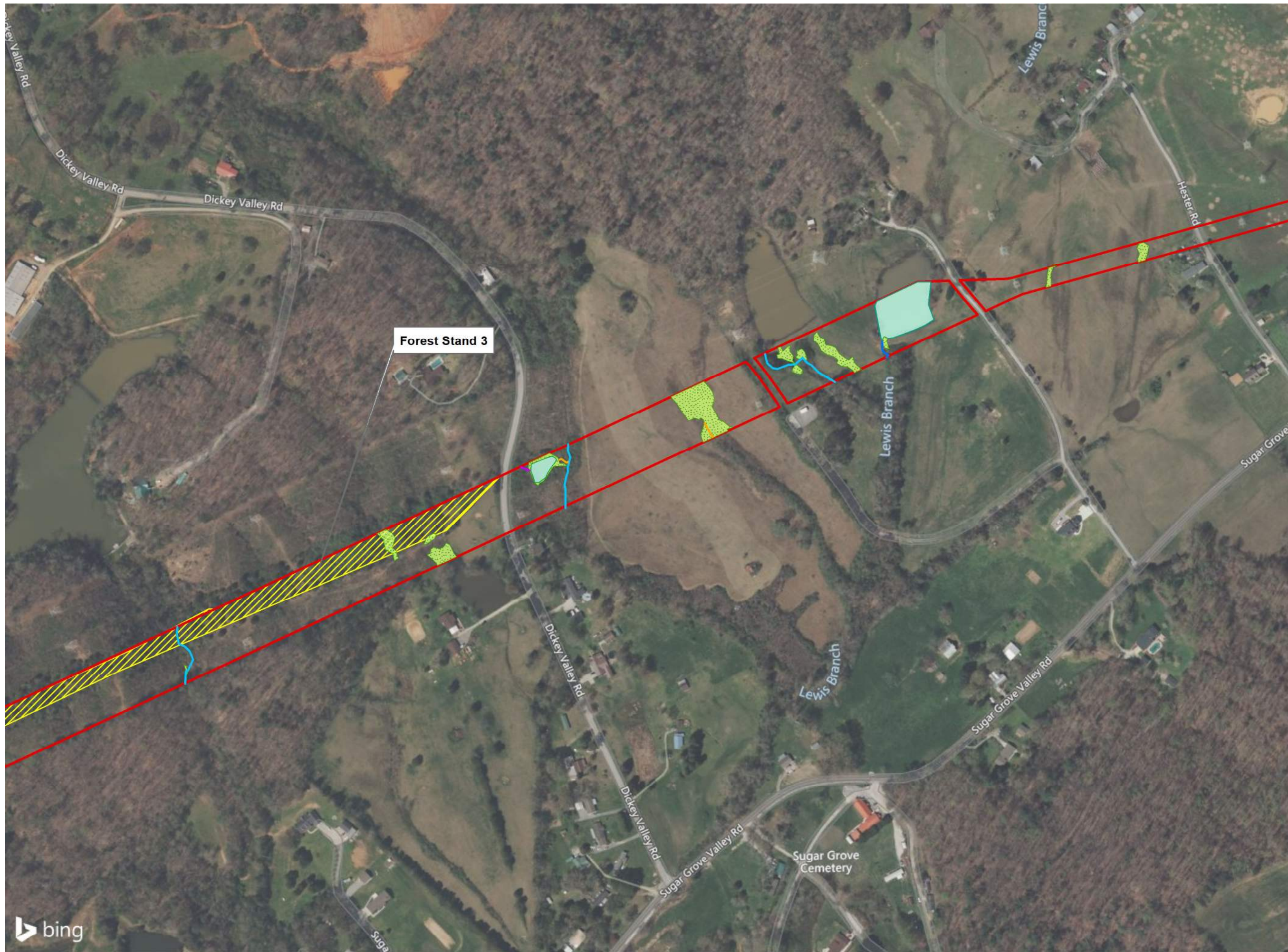
KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↑ Photo Location
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 - HDR Delineated Open Water



DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINES

LEGEND

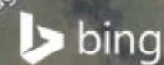
- Project Site
- ↑ Photo Location
- Rare Plant-Delphinium
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- Osprey Nest on Nearby Pole
- Snags

- Potential Bat Habitat
- High Quality
 - Moderate Quality
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KINGSTON TRANSMISSION LINES

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DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↑ Photo Location
- Rare Plant-Delphinium
- Milkweed Patch
- Osprey Nest on Nearby Pole
- ⊙ Snags

Potential Bat Habitat

- High Quality
- Moderate Quality
- Low Quality

HDR Delineated Stream

- Type**
- Delineated Perennial Stream
 - Delineated Intermittent Streams
 - Delineated Ephemeral Stream
 - Wet Weather Conveyance
 - HDR Delineated Wetland
 - HDR Delineated Open Water



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↑ Photo Location
- Rare Plant-Delphinium
- Milkweed Patch
- Osprey Nest on Nearby Pole
- Snags

Potential Bat Habitat

- High Quality
- Moderate Quality
- Low Quality

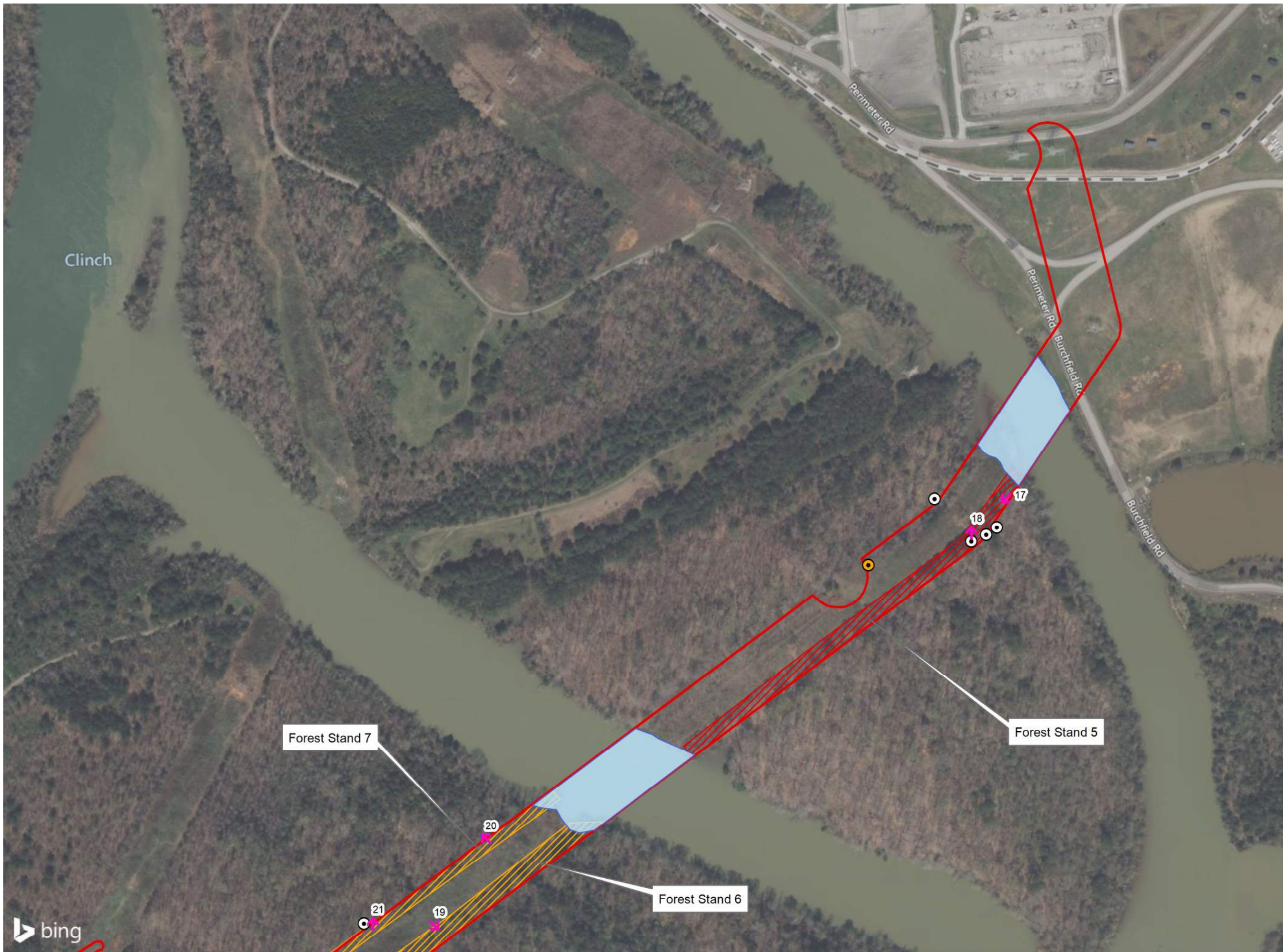
HDR Delineated Stream

- Type**
- Delineated Perennial Stream
 - Delineated Intermittent Streams
 - Delineated Ephemeral Stream
 - Wet Weather Conveyance

- HDR Delineated Wetland
- HDR Delineated Open Water



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
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- Rare Plant-Delphinium
- Milkweed Patch
- Osprey Nest on Nearby Pole
- Snags
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- High Quality
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- Type**
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- Delineated Ephemeral Stream
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DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- Photo Location
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- Milkweed Patch
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- Snags

- Potential Bat Habitat
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 - Low Quality

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- Type**
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 - Delineated Ephemeral Stream
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DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES





LEGEND


-  Project Site
-  Photo Location
-  Rare Plant-Delphinium
-  Milkweed Patch
-  Osprey Nest on Nearby Pole
-  Snags

Potential Bat Habitat

-  High Quality
-  Moderate Quality
-  Low Quality

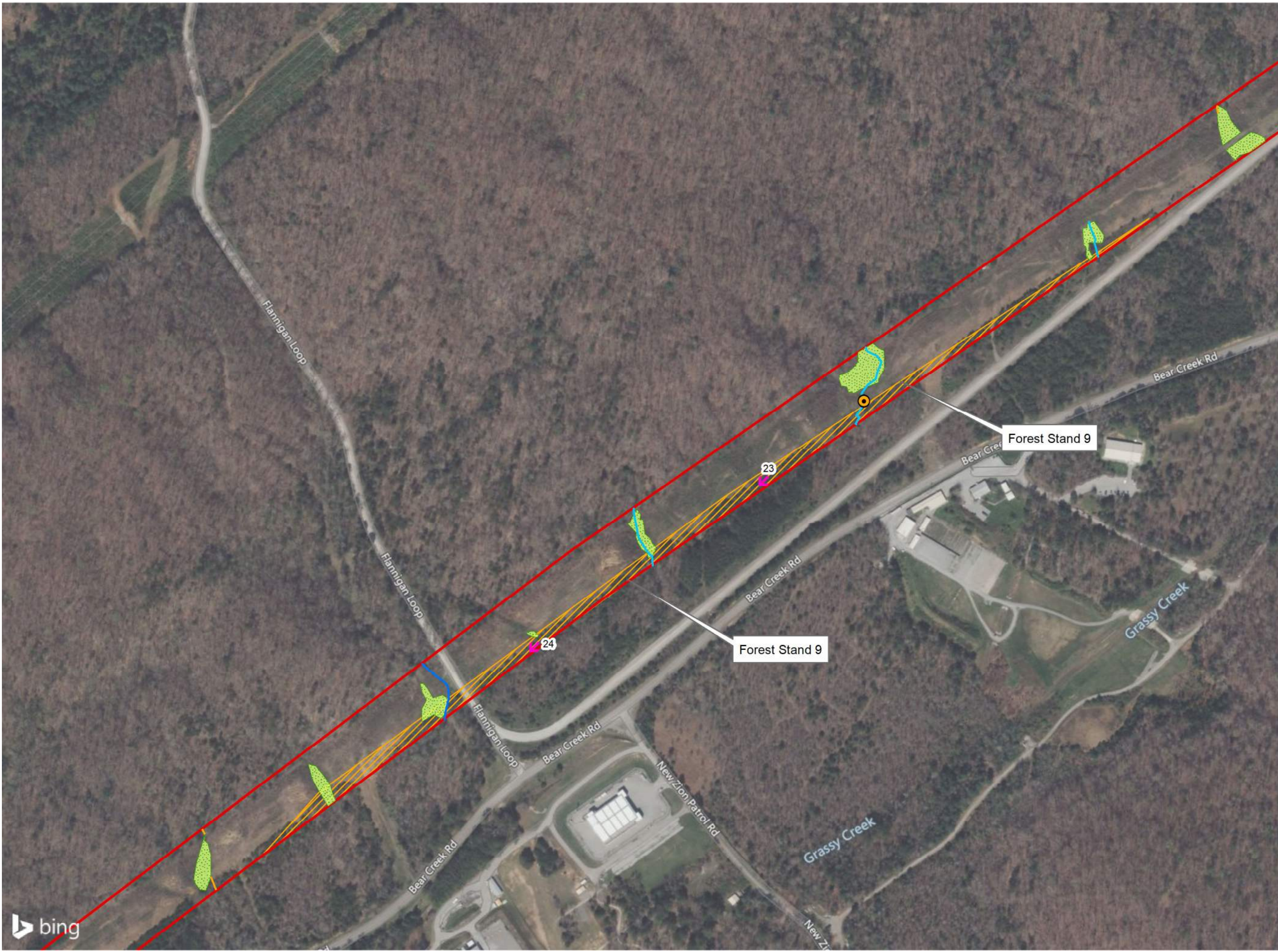
HDR Delineated Stream

- Type**
-  Delineated Perennial Stream
 -  Delineated Intermittent Streams
 -  Delineated Ephemeral Stream
 -  Wet Weather Conveyance

-  HDR Delineated Wetland
-  HDR Delineated Open Water



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↑ Photo Location
- Rare Plant-Delphinium
- Milkweed Patch
- Osprey Nest on Nearby Pole
- Snags

Potential Bat Habitat

- High Quality
- Moderate Quality
- Low Quality

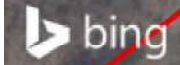
HDR Delineated Stream

Type

- Delineated Perennial Stream
- Delineated Intermittent Streams
- Delineated Ephemeral Stream
- Wet Weather Conveyance
- HDR Delineated Wetland
- HDR Delineated Open Water



DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- Photo Location
- Rare Plant-Delphinium
- Milkweed Patch
- Osprey Nest on Nearby Pole
- Snags

Potential Bat Habitat

- High Quality
- Moderate Quality
- Low Quality

HDR Delineated Stream

- #### Type
- Delineated Perennial Stream
 - Delineated Intermittent Streams
 - Delineated Ephemeral Stream
 - Wet Weather Conveyance
 - HDR Delineated Wetland
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Grassy Creek

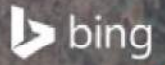
Forest Stand 10

26 25

Bear Creek Rd

Bear Creek Rd

Bear Creek Rd









DATA SOURCE: Bing Hybrid Aerial Imagery






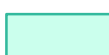


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LEGEND

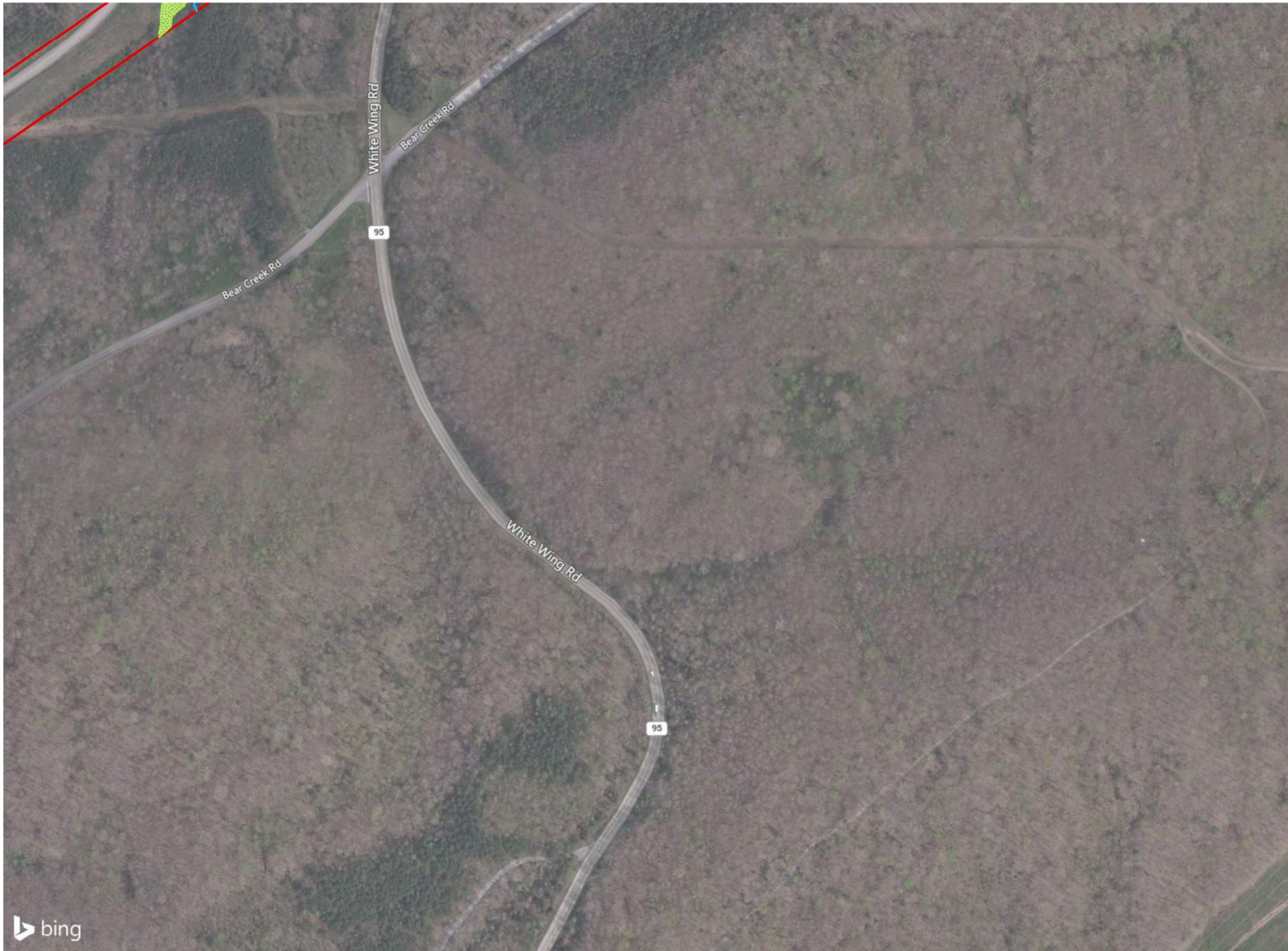
-  Project Site
-  Photo Location
-  Rare Plant-Delphinium
-  Milkweed Patch
-  Osprey Nest on Nearby Pole
-  Snags

- Potential Bat Habitat
-  High Quality
 -  Moderate Quality
 -  Low Quality

- HDR Delineated Stream**
- Type
-  Delineated Perennial Stream
 -  Delineated Intermittent Streams
 -  Delineated Ephemeral Stream
 -  Wet Weather Conveyance
 -  HDR Delineated Wetland
 -  HDR Delineated Open Water









DATA SOURCE: Bing Hybrid Aerial Imagery









KINGSTON TRANSMISSION LINES

LEGEND

-  Project Site
-  Photo Location
-  Rare Plant-Delphinium
-  Milkweed Patch
-  Osprey Nest on Nearby Pole
-  Snags

- Potential Bat Habitat
-  High Quality
 -  Moderate Quality
 -  Low Quality

- HDR Delineated Stream**
- Type**
-  Delineated Perennial Stream
 -  Delineated Intermittent Streams
 -  Delineated Ephemeral Stream
 -  Wet Weather Conveyance
 -  HDR Delineated Wetland
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DATA SOURCE: Bing Hybrid Aerial Imagery



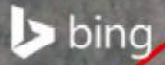
KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↑ Photo Location
- Rare Plant-Delphinium
- Milkweed Patch
- Osprey Nest on Nearby Pole
- ⊙ Snags
- Potential Bat Habitat**
- High Quality
- Moderate Quality
- Low Quality
- HDR Delineated Stream**
- Type**
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Delineated Ephemeral Stream
- Wet Weather Conveyance
- HDR Delineated Wetland
- HDR Delineated Open Water



DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↑ Photo Location
- Rare Plant-Delphinium
- Milkweed Patch
- Osprey Nest on Nearby Pole
- ⊙ Snags

- Potential Bat Habitat
- High Quality
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- Type
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 - Delineated Ephemeral Stream
 - Wet Weather Conveyance
 - HDR Delineated Wetland
 - HDR Delineated Open Water


















DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND

-  Project Site
-  Photo Location
-  Rare Plant-
Delphinium
-  Milkweed Patch
-  Osprey Nest on
Nearby Pole
-  Snags
- Potential Bat Habitat**
-  High Quality
-  Moderate Quality
-  Low Quality
- HDR Delineated Stream**
- Type**
-  Delineated
Perennial Stream
-  Delineated
Intermittent Streams
-  Delineated
Ephemeral Stream
-  Wet Weather
Conveyance
-  HDR Delineated
Wetland
-  HDR Delineated
Open Water



DATA SOURCE: Bing Hybrid Aerial Imagery



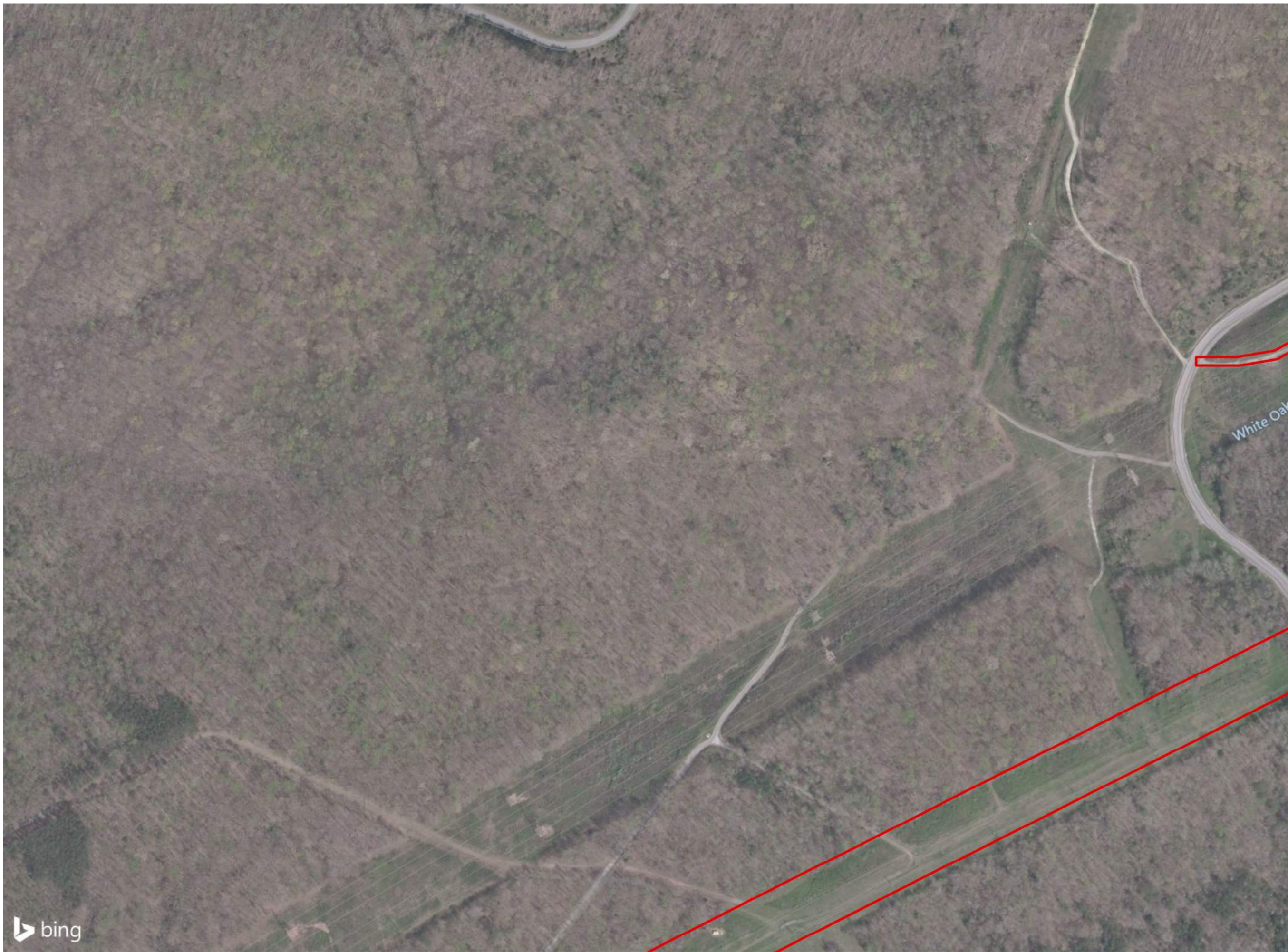
KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↑ Photo Location
- Rare Plant-Delphinium
- ⦿ Milkweed Patch
- Osprey Nest on Nearby Pole
- ⦿ Snags
- Potential Bat Habitat**
- High Quality
- Moderate Quality
- Low Quality
- HDR Delineated Stream**
- Type**
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Delineated Ephemeral Stream
- Wet Weather Conveyance
- HDR Delineated Wetland
- HDR Delineated Open Water









DATA SOURCE: Bing Hybrid Aerial Imagery









KINGSTON TRANSMISSION LINES

LEGEND

-  Project Site
-  Photo Location
-  Rare Plant-Delphinium
-  Milkweed Patch
-  Osprey Nest on Nearby Pole
-  Snags

- Potential Bat Habitat
-  High Quality
 -  Moderate Quality
 -  Low Quality

- HDR Delineated Stream
- Type
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KINGSTON TRANSMISSION LINES

LEGEND







-  Project Site
-  Photo Location
-  Rare Plant-Delphinium
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-  Osprey Nest on Nearby Pole
-  Snags

Potential Bat Habitat

-  High Quality
-  Moderate Quality
-  Low Quality

HDR Delineated Stream

Type

-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Delineated Ephemeral Stream
-  Wet Weather Conveyance
-  HDR Delineated Wetland
-  HDR Delineated Open Water



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↑ Photo Location
- Rare Plant-Delphinium
- Milkweed Patch
- Osprey Nest on Nearby Pole
- ⊙ Snags

Potential Bat Habitat

- High Quality
- Moderate Quality
- Low Quality

HDR Delineated Stream

- Type**
- Delineated Perennial Stream
 - Delineated Intermittent Streams
 - Delineated Ephemeral Stream
 - Wet Weather Conveyance
 - HDR Delineated Wetland
 - HDR Delineated Open Water



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- Plant Area
- Utility Pole Structure
- Photo Location
- Rare Plant-Delphinium
- Milkweed Patch
- Snags

Potential Bat Habitat

- High Quality
- Moderate Quality
- Low Quality

HDR Delineated Stream

Type

- Delineated Perennial Stream
- Delineated Intermittent Streams
- Delineated Ephemeral Stream
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DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES

LEGEND

- Project Site
- ↑ Photo Location
- Rare Plant-Delphinium
- Milkweed Patch
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- Snags

Potential Bat Habitat

- High Quality
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HDR Delineated Stream

Type

- Delineated Perennial Stream
- Delineated Intermittent Streams
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- Wet Weather Conveyance
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DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINES







LEGEND

-  Project Site
-  Photo Location
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-  Milkweed Patch
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Potential Bat Habitat

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HDR Delineated Stream

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KINGSTON TRANSMISSION LINES

LEGEND

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- ⊙ Snags

Potential Bat Habitat

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- Moderate Quality
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HDR Delineated Stream

Type

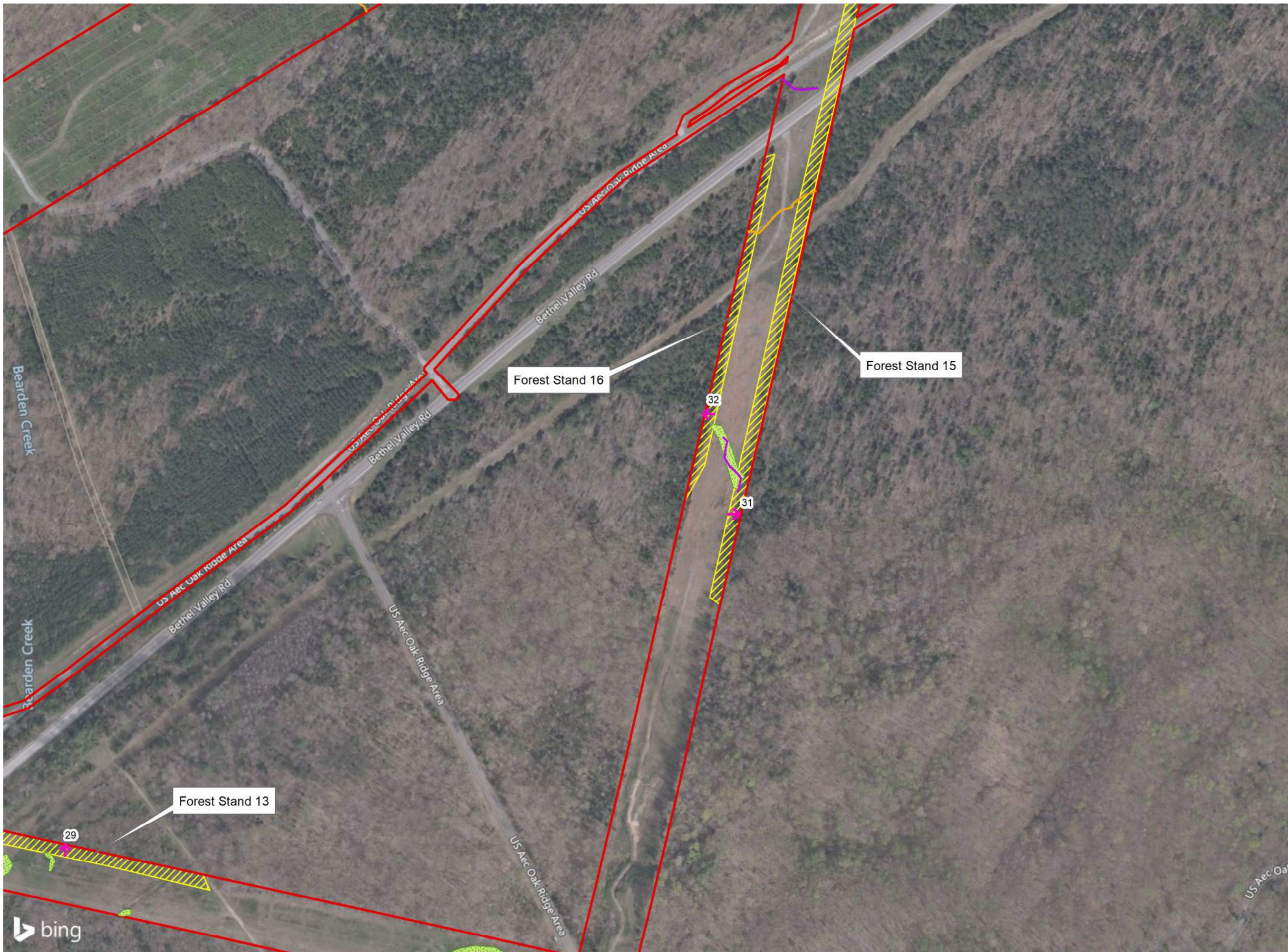
- Delineated Perennial Stream
- Delineated Intermittent Streams
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- Wet Weather Conveyance

- HDR Delineated Wetland
- HDR Delineated Open Water



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KINGSTON TRANSMISSION LINES

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HDR Delineated Stream

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DATA SOURCE: Bing Hybrid Aerial Imagery









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DATA SOURCE: Bing Hybrid Aerial Imagery



B

Appendix B – USFWS IPaC,
TVA RNHD, TDEC Rare
Species Dataviewer

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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 affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

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

Location

Anderson and Roane counties, Tennessee



Local office

Tennessee Ecological Services Field Office

☎ (931) 528-6481

📠 (931) 528-7075

446 Neal Street

The nearest street
Cookeville, TN 38501-4027

NOT FOR CONSULTATION

Endangered species

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

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

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

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

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

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

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 office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

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

Mammals

NAME	STATUS
Gray Bat <i>Myotis grisescens</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat <i>Myotis sodalis</i> Wherever found There is no 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 <i>Myotis septentrionalis</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Birds

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

Fishes

NAME	STATUS
------	--------

Sickle Darter *Percina williamsi* Threatened
 Wherever found
 There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat.
<https://ecos.fws.gov/ecp/species/9866>

Slender Chub *Erimystax cahni* Threatened
 Wherever found
 There is **nal** critical habitat for this species. Your location does not overlap the critical habitat.
<https://ecos.fws.gov/ecp/species/6637>

Spot n Chub *Erimonax monachus* Threatened
 There is **nal** critical habitat for this species. Your location does not overlap the critical habitat.
<https://ecos.fws.gov/ecp/species/1521>

Yellow n Madtom *Noturus flavipinnis* Threatened
 There is **nal** critical habitat for this species. Your location does not overlap the critical habitat.
<https://ecos.fws.gov/ecp/species/8565>

Clams

NAME	STATUS
Alabama Lampmussel <i>Lampsilis virescens</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/916	Endangered
Birdwing Pearlymussel <i>Lemiox rimosus</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6636	EXPN
Cracking Pearlymussel <i>Hemistena lata</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4130	Endangered
Dromedary Pearlymussel <i>Dromus dromas</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6377	Endangered

<p>Fanshell <i>Cyprogenia stegaria</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4822</p>	<p>Endangered</p>
<p>Finerayed Pigtoe <i>Fusconaia cuneolus</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3038</p>	<p>Endangered</p>
<p>Orangefoot Pimpleback (pearlymussel) <i>Plethobasus cooperianus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1132</p>	<p>Endangered</p>
<p>Pink Mucket (pearlymussel) <i>Lampsilis abrupta</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7829</p>	<p>Endangered</p>
<p>Purple Bean <i>Villosa perpurpurea</i> Wherever found There is no critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/4125</p>	<p>Endangered</p>
<p>Ring Pink (mussel) <i>Obovaria retusa</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4128</p>	<p>Endangered</p>
<p>Rough Pigtoe <i>Pleurobema plenum</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6894</p>	<p>Endangered</p>
<p>Rough Rabbitsfoot <i>Quadrula cylindrica strigillata</i> Wherever found There is no critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5629</p>	<p>Endangered</p>

Shiny Pigtoe *Fusconaia cor* Endangered
No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/2573>

Spectaclecase (mussel) *Cumberlandia monodonta* Endangered
Wherever found
No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/7867>

Turgid Blossom (pearlymussel) *Epioblasma turgidula* Endangered
No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/7659>

Snails

NAME	STATUS
Anthony's Riversnail <i>Athearnia anthonyi</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4827	EXPN
Anthony's Riversnail <i>Athearnia anthonyi</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4827	Endangered

Insects

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

Flowering Plants

NAME	STATUS
Virginia Spiraea <i>Spiraea virginiana</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1728	Threatened

White Fringeless Orchid *Platanthera integrilabia*
No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/1889>

Threatened

Critical habitats

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

There are no critical habitats at this location.

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

Bald & Golden Eagles

Bald and golden eagles are protected under the [Bald and Golden Eagle Protection Act](#) and the [Migratory Bird Treaty Act](#).

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

Additional information can be found using the following links:

- Eagle 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-incidentals-migratory-birds>
- Nationwide conservation measures for birds
<https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

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

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

Bald Eagle *Haliaeetus leucocephalus*

Breeds Sep 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Probability of Presence Summary

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

Probability of Presence (■)

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

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

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

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

Breeding Season (■)

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

Survey Effort (l)

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

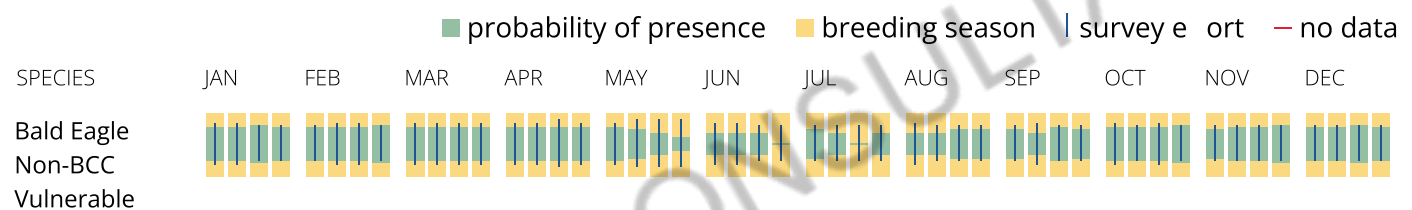
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (-)

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

Survey Timeframe

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



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

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

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

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

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

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

What if I have eagles on my list?

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

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

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

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

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

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\) list](#) or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur on 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
<p>Bald Eagle <i>Haliaeetus leucocephalus</i></p> <p>This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.</p>	Breeds Sep 1 to Aug 31
<p>Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/9399</p>	Breeds May 15 to Oct 10
<p>Bobolink <i>Dolichonyx oryzivorus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 20 to Jul 31
<p>Canada Warbler <i>Cardellina canadensis</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 20 to Aug 10
<p>Cerulean Warbler <i>Dendroica cerulea</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/2974</p>	Breeds Apr 27 to Jul 20
<p>Chimney Swift <i>Chaetura pelagica</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Mar 15 to Aug 25
<p>Eastern Whip-poor-will <i>Antrostomus vociferus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 1 to Aug 20
<p>Golden-winged Warbler <i>Vermivora chrysoptera</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/8745</p>	Breeds May 1 to Jul 20

Kentucky Warbler *Oporornis formosus* Breeds Apr 20 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prairie Warbler *Dendroica discolor* Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler *Protonotaria citrea* Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker *Melanerpes erythrocephalus* Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Rusty Blackbird *Euphagus carolinus* Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Wood Thrush *Hylocichla mustelina* Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

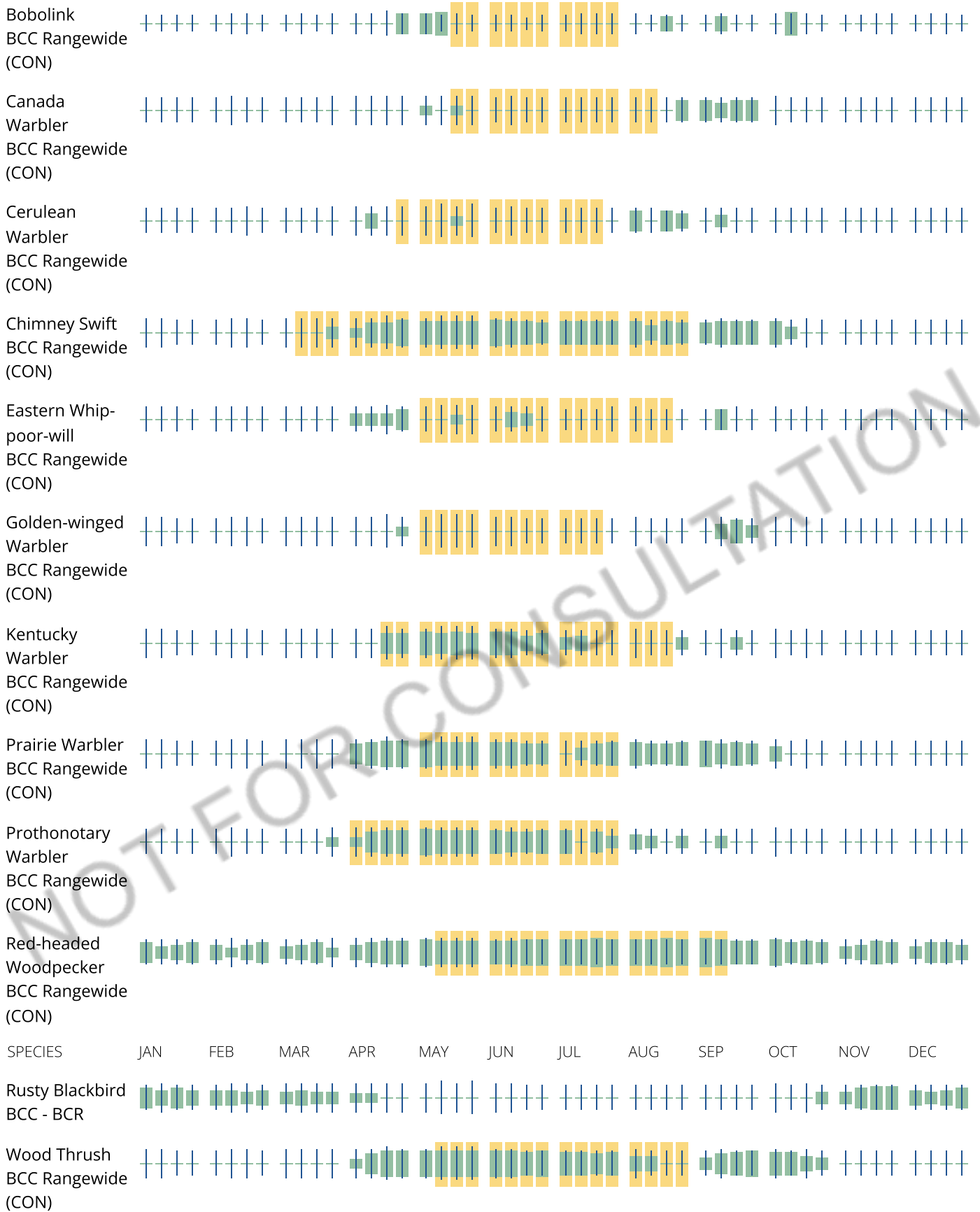
Probability of Presence Summary

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

Probability of Presence (■)

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

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



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

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

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

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

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

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

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

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

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

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

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

What are the levels of concern for migratory birds?

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

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);

2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

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

Details about birds that are potentially affected by offshore projects

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

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

What if I have eagles on my list?

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

Proper Interpretation and Use of Your Migratory Bird Report

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

Facilities

National Wildlife Refuge lands

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

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

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

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Wetland information is not available at this time

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

Data limitations

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

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

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

Data exclusions

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

Data precautions

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

Help • [Download Status and Ranks](#)

Key to Status and Ranks

Rare Species by County

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

Rows

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County	Type	Category	Scientific Name	Common Name	Global Rank	State Rank	Fed. Status	State Status	Habitat	Wet Habitat Flag
Anderson	Vertebrate Animal	Bird	Vermivora chrysoptera	Golden-winged Warbler	G4	S3B	--	T	Early successional habitats in foothill regions of Appalachians.	Upland
Anderson	Vascular Plant	Flowering Plant	Oligoneuron album	Prairie Goldenrod	G5	S1S2	--	E	Barrens	Upland
Anderson	Vertebrate Animal	Bird	Setophaga cerulea	Cerulean Warbler	G4	S3B	--	D	Mature deciduous forest, particularly in floodplains or mesic conditions.	Upland
Anderson	Invertebrate Animal	Insect	Pseudanophthalmus wallacei	Wallace's Cave Beetle	G1	S1	--	Rare, Not State Listed	Terrestrial cave obligate; Ridge & Valley; Anderson County.	Upland
Anderson	Vascular Plant	Flowering Plant	Pycnanthemum torrei	Torrey's Mountain-mint	G2	S1	--	E	Barrens	Upland
Anderson	Vascular Plant	Flowering Plant	Sullivantia sullivanii	Sullivantia	G4	S1	--	E	Moist Shaded Cliffs	Upland
Anderson	Vertebrate Animal	Mammal	Synaptomys cooperi	Southern Bog Lemming	G5	S4	--	D	Marshy meadows, wet bays, & rich upland forests.	Possible
Anderson	Vertebrate Animal	Bird	Thryomanes bewickii	Bewick's Wren	G5	S1	--	D	Brushy areas, thickets and scrub in open country, open and riparian woodland.	Upland
Anderson	Vertebrate Animal	Fish	Etheostoma maydeni	Redlips Darter	GNR	S2	--	T	Found in slow-moving large creeks and rivers in pools along the banks strewn with boulders and woody debris.	No Data
Anderson	Animal Assemblage	No Data	Rookery	Heron Rookery	G5	SNR	--	Rare, Not State Listed	No Data	No Data
Anderson	Invertebrate Animal	Insect	Pseudanophthalmus paynei	Payne's Cave Beetle	G1	S1	--	Rare, Not State Listed	Terrestrial cave obligate; northern Ridge & Valley; reported from Anderson County.	Upland
Anderson	Invertebrate Animal	Insect	Pseudanophthalmus pusillus	Tiny Cave Beetle	G1	S1	--	Rare, Not State Listed	Terrestrial cave obligate; northern Ridge & Valley.	Upland
Anderson	Vascular Plant	Flowering Plant	Helianthus occidentalis	Naked-stem Sunflower	G5	S2	--	S	Limestone Glades And Barrens	Upland
Anderson	Vertebrate Animal	Amphibian	Hemidactylium scutatum	Four-toed Salamander	G5	S3	--	D	Woodland swamps, shallow depressions, & sphagnum mats on acidic soils; middle & east Tennessee.	Possible
Anderson	Invertebrate Animal	Mollusc	Hemistena lata	Cracking Pearlymussel	G1	S1	LE, XN	E	Medium-sized rivers of mod current, deeply buried in mud, sand, gravel, and cobble substrates; Tennessee & Cumb. river systems.	Aquatic

Anderson	Invertebrate Animal	Arachnid	<u>Hesperocheernes mirabilis</u>	Southeastern Cave Pseudoscorpion	G5	S3	--	Rare, Not State Listed	Terrestrial cave obligate; woodrat debris in caves; middle Tennessee.	Upland
Anderson	Nonvascular Plant	Non-Vascular Plant	<u>Homaliadelphus sharpii</u>	Sharp's Homaliadelphus	G3?	S1	--	E	Calcareous Or Dolomite Bluffs	Upland
Anderson	Invertebrate Animal	Mollusc	<u>Io fluviialis</u>	Spiny Riversnail	G1G2	S2	--	Rare, Not State Listed	Shallow waters of shoals that are rapid to moderate and well-oxygenated; Tennessee River & main tributaries; E Tennessee.	Aquatic
Anderson	Vascular Plant	Flowering Plant	<u>Iris fulva</u>	Copper Iris	G5	S2	--	T	Bottomlands	Possible
Anderson	Vascular Plant	Flowering Plant	<u>Juglans cinerea</u>	Butternut	G3	S3	--	T	Rich Woods And Hollows	Possible
Anderson	Invertebrate Animal	Mollusc	<u>Lampsilis abrupta</u>	Pink Mucket	G1G2	S2	LE	E	Generally a large river species, preferring sand-gravel or rocky substrates with moderate to strong currents; Tennessee & Cumberland river systems.	Aquatic
Anderson	Invertebrate Animal	Mollusc	<u>Lampsilis virescens</u>	Alabama Lamprussel	G1	S1	LE	E	Found in sand and gravel substrates in shoal areas of small-medium size rivers; middle and upper TN R system; recently rediscovered in Emory River.	Aquatic
Anderson	Nonvascular Plant	Non-Vascular Plant	<u>Lejeunea sharpii</u>	Sharp's Lejeunea	G2G3	S1S2	--	E	Calcareous Bluffs, Rock & Logs Of Wet Sinks	Possible
Anderson	Invertebrate Animal	Mollusc	<u>Lemiox rimosus</u>	Birdwing Pearlymussel	G1	S1	LE, XN	E	Small-medium size rivers in riffle areas with sand and gravel substrates in mod-fast currents; Tennessee River system.	Aquatic
Anderson	Vertebrate Animal	Bird	<u>Limnothlypis swainsonii</u>	Swainson's Warbler	G4	S3	--	D	Mature, rich, damp, deciduous floodplain and swamp forests.	Possible

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If you have any questions or comments, Email ask.tdec@tn.gov or call at (888) 891-TDEC (8332).



Help • Download Status and Ranks

Key to Status and Ranks

Rare Species by County

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

Rows

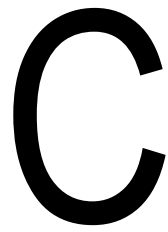
1 - 25 of 71

County	Type	Category	Scientific Name	Common Name	Global Rank	State Rank	Fed. Status	State Status	Habitat	Wet Habitat Flag
Carter	Invertebrate Animal	Tardigrade	Hypsibius roanensis	A Tardigrade	GNR	S1	--	Rare, Not State Listed	Beech-maple forests @ high elevations; in lichen or mosses on beech trees; Roan Mountain; Blue Ridge; Carter County.	Upland
Carter	Vascular Plant	Flowering Plant	Carex roanensis	Roan Mountain Sedge	G3	S2	--	S	Mid-Elevation Woodlands	Upland
Johnson	Vascular Plant	Flowering Plant	Carex roanensis	Roan Mountain Sedge	G3	S2	--	S	Mid-Elevation Woodlands	Upland
Polk	Vascular Plant	Flowering Plant	Carex roanensis	Roan Mountain Sedge	G3	S2	--	S	Mid-Elevation Woodlands	Upland
Roane	Invertebrate Animal	Mollusc	Venustaconcha trabalis	Tennessee Bean	G1	S1	LE, XN	E	Riffle areas of small rivers & streams in sand, gravel, & cobble substrates with swift current; upper Cumb. & upper Tenn. river systems.	Aquatic
Roane	Nonvascular Plant	Non-Vascular Plant	Preissia quadrata	A Liverwort	G5	S1	--	T	Seepy Limestone Cliffs And Bluffs	Possible
Roane	Invertebrate Animal	Mollusc	Pleurobema rubrum	Pyramid Pigtoe	G2G3	S1S2	--	Rare, Not State Listed	Rivers with strong current and firm sand/gravel substrates; TN & Cumb river systems incl KY Reservoir; W Uplands & W Highland Rim.	Aquatic
Roane	Invertebrate Animal	Mollusc	Plethobasus cyphus	Sheepnose	G3	S2S3	LE	E	Large to medium-sized rivers, in riffles and coarse sand/gravel subst; TN & Cumb river systems incl KY Reservoir; W Uplands & Rim.	Aquatic
Roane	Invertebrate Animal	Mollusc	Plethobasus cooperianus	Orangefoot Pimpleback	G1	S1	LE, XN	E	Large rivers in sand-gravel-cobble substrates in riffles and shoals in deep flowing water; Cumberland & Tennessee river systems.	Aquatic
Roane	Vascular Plant	Flowering Plant	Platanthera integrilabia	White Fringeless Orchid	G2G3	S2S3	LT	E	Acidic Seeps And Stream Heads	Possible
Roane	Vascular Plant	Flowering Plant	Platanthera flava var. herbiola	Tubercled Rein-orchid	G4?T4Q	S2	--	T	Swamps And Floodplains	Possible
Roane	Vertebrate Animal	Reptile	Pituophis melanoleucus melanoleucus	Northern Pinesnake	G4T4	S3	--	T	Well-drained sandy soils in pine/pine-oak woods; dry mountain ridges; E portions of west TN, E to lower elev of the Appalachians.	Upland
Roane	Vertebrate Animal	Mammal	Perimyotis subflavus	Tri-colored bat	G3G4	S2S3	--	T	Generally associated with forested landscapes but may roost near openings.	No Data
Roane	Vertebrate Animal	Fish	Percina aurantiaca	Tangerine Darter	G4	S3	--	D	Large-moderate size headwater tribs to Tennessee River, in clear, fairly deep, rocky pools, usually below riffles.	Aquatic

Roane	Vascular Plant	Flowering Plant	Pedicularis lanceolata	Swamp Lousewort	G5	S1S2	--	S	Wet Acidic Barrens And Seeps	Possible
Roane	Vertebrate Animal	Reptile	Ophisaurus attenuatus longicaudus	Eastern Slender Glass Lizard	G5T5	S3	--	D	Dry upland areas including brushy, cut-over woodlands and grassy fields; nearly statewide but obscure; fossorial.	Upland
Roane	Invertebrate Animal	Mollusc	Obovaria retusa	Ring Pink	G1	S1	LE,XN	E	Large rivers in gravel and sand bars; Tennessee & Cumberland river watersheds; many historic locations currently inundated.	Aquatic
Roane	Nonvascular Plant	Non-Vascular Plant	Myurella julacea	A Moss	G5	SH	--	S-P	Shale Bluffs	Possible
Roane	Vertebrate Animal	Mammal	Myotis septentrionalis	Northern Myotis	G2G3	S1S2	LT	T	A forest bat whose summer roosts may include caves, mines, live trees and snags; hibernates in caves and mines, often using small cracks and fissures. Notably susceptible to White-Nose Syndrome.	No Data
Roane	Vertebrate Animal	Mammal	Myotis grisescens	Gray Myotis	G3G4	S2	LE	E	Cave obligate year-round; frequents forested areas; migratory.	Upland
Roane	Vascular Plant	Flowering Plant	Lonicera dioica	Mountain Honeysuckle	G5	S2	--	S	Mountain Woods And Thickets	Possible
Roane	Vertebrate Animal	Amphibian	Gyrinophilus gulolineatus	Berry Cave Salamander	G1Q	S1	C	T	Aquatic cave obligate; Ridge & Valley; formerly included with G. palleucus.	Aquatic
Roane	Vascular Plant	Flowering Plant	Marshallia grandiflora	Large-fl. Barbara's-buttons	GNR	S2	--	E	Rocky River Bars	Possible
Roane	Invertebrate Animal	Mollusc	Fusconaia cuneolus	Finerayed Pigtoe	G1	S1	LE, XN	E	Riffles of fords and shoals of mod gradient streams in firm cobble and gravel substrates; middle & upper Tennessee River watershed.	Aquatic
Roane	Invertebrate Animal	Mollusc	Fusconaia cor	Shiny Pigtoe	G1	S1	LE, XN	E	Shoals and riffles of small-medium sized rivers with mod-fast current over sand-cobble substrates; upper Tennessee River watershed.	Aquatic



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Appendix C – Site
Photographs

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Photo 1- Representative of dry herbaceous plant community within the Project Site, facing northeast.



Photo 2- Representative of wet herbaceous plant community within the Project Site, facing northwest.



Photo 3- Representative of wet deciduous plant community within the Project Site, facing northeast.

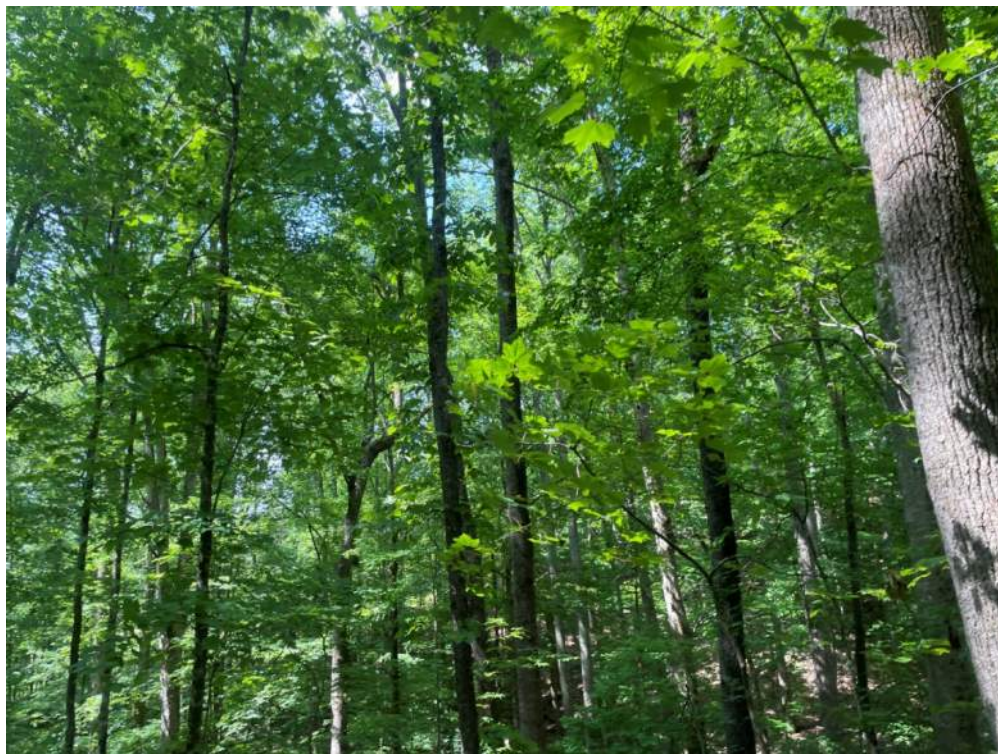


Photo 4- Representative of dry deciduous plant community within the Project Site, facing south.



Photo 5- Representative of pastureland plant community within Project Site, facing east.



Photo 6- Representative of maintained lawn within Project site, facing east.



Photo 7- Representative of freshwater pond within pastureland in Project Site, facing northeast.



Photo 8- Representative of Emory River along the western portion of the Project Site, facing southwest.



Photo 9- Representative of Poplar Creek within Project Site, facing southwest.



Photo 10- Representative of a large wetland/open water system in the Project Site, facing northwest.



Photo 11- Representative of Forest Stand 1 moderate quality bat habitat, facing southwest.



Photo 12- Representative of Forest Stand 2 moderate quality bat habitat, facing southwest.



Photo 13- Representative of snag with peeling bark within Forest Stand 2, facing southwest.



Photo 14- Representative of Forest Stand 3 low quality bat habitat, facing northwest.

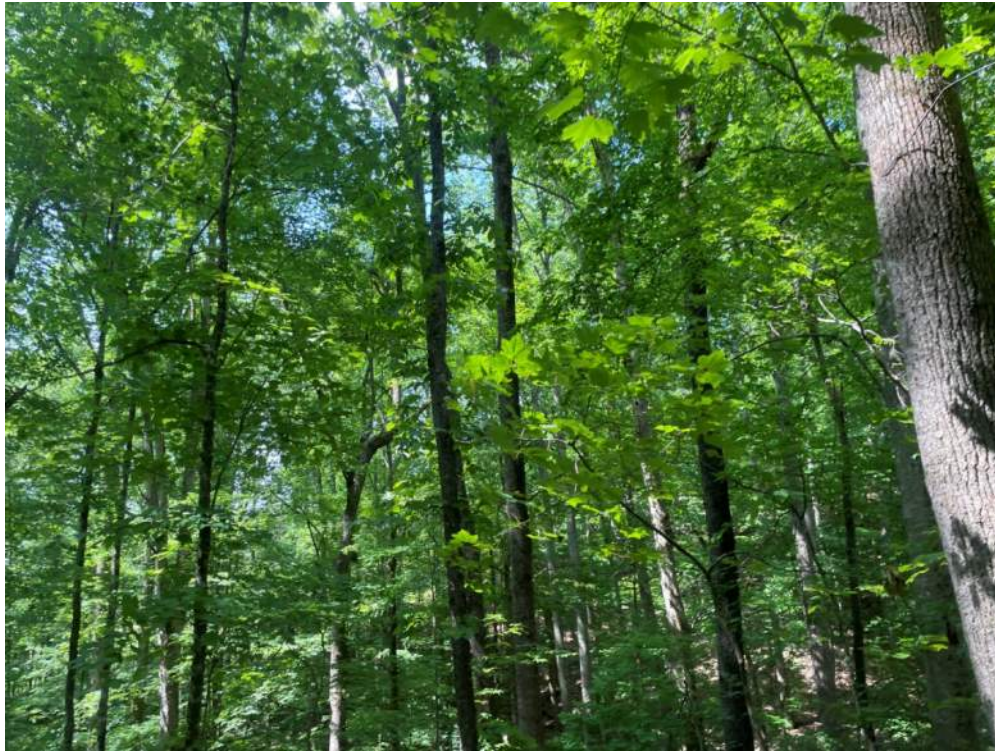


Photo 15- Representative of Forest Stand 4 moderate quality bat habitat, facing southwest.



Photo 16- Representative of snag within Forest Stand 4 within Project Site, facing south.



Photo 17- Representative of Forest Stand 5, high quality bat habitat, within Project Site, facing southwest.



Photo 18- Representative of snag within Forest Stand 5 within Project Site, facing north.



Photo 19- Representative of Forest Stand 6, moderate bat habitat quality, within Project Site, facing southeast.



Photo 20- Representative Forest Stand 7, moderate habitat quality, within Project Site, facing northwest.



Photo 21- Representative of snag within Forest Stand 7, facing north.



Photo 22- Representative of Forest Stand 8, moderate habitat quality, within Project Site, facing north.



Photo 23- Representative of Forest Stand 9, moderate habitat quality, within Project Site, facing southwest.



Photo 24- Representative of exfoliating bark within Forest Stand 9 within the Project Site, facing southwest.



Photo 25- Representative of Forest Stand 10, moderate habitat quality, within Project, facing southeast.



Photo 26- Representative of snag within Forest Stand 10 within Project Site, facing south.



Photo 27- Representative of Forest Stand 11, low quality bat habitat within Project Site, facing south.



Photo 28- Representative of Forest Stand 12, low quality bat habitat, within Project Site, facing east.



Photo 29- Representative of Forest Stand 13, low quality bat habitat within Project Site, facing north.

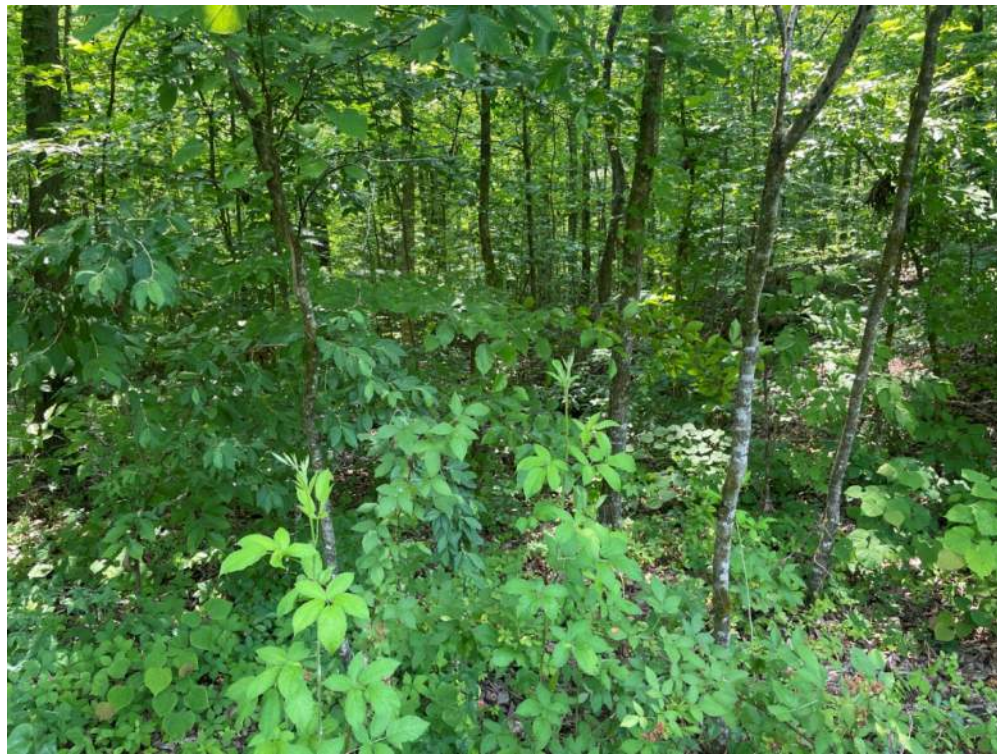


Photo 30- Representative of Forest Stand 14, low quality bat habitat within Project Site, facing east.



Photo 31- Representative of Forest Stand 15, low quality bat habitat within Project Site, facing east.



Photo 32- Representative of Forest Stand 16, low bat habitat quality within Project Site, facing west.

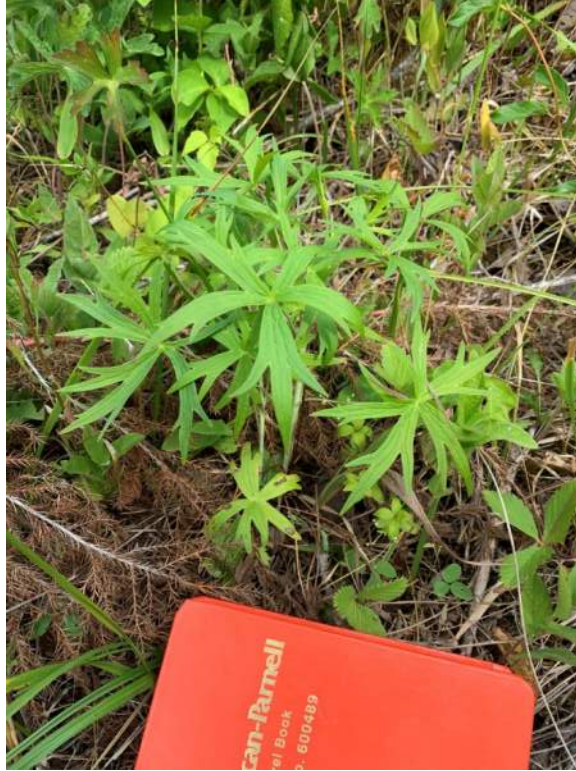


Photo 33- Tall Larkspur (rare plant species) found within rock outcrop within Project Site



Photo 34- Representative of rare plant area A1858 where known tall larkspur occurs, facing north.



Photo 35- Representative of osprey nest on poles 44 through 47 within Project Site, facing northeast.




Photo 36- Representative of osprey near osprey nest on utility pole within Project Site, facing northeast.



Photo 37- Representative of milkweed found within Project Site.

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D

Appendix D – Bat Habitat
Assessment Data Sheets

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APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023
 Township/Range/Section:
 Lat Long/UTM/ Zone: 35.9006725°/ -84.4977422° Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?
 Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>1</u>

Water Resources at Sample Site				Describe existing condition of water sources: The Emory River lies directly to the east of this stand and is open and accessible to the river
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial Emory River: 145 ft	
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	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	Red oak, loblolly pine, eastern red cedar, white oak, pin oak, red maple, sweet gum, and willow oak			
% Trees w/ Exfoliating Bark	5	2	5	
Size Composition of Live Trees (%)	Small (3-8 in) 30	Med (9-15 in) 60	Large (>15 in) 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? Yes and NLEB

Additional Comments:
Stand 1 consists of a small mixed deciduous forest with abutting Emory River to the southwest. Forest Stand 1 is located within the far western portion of the Project Site. Dominant canopy and understory trees include red oak, loblolly pine, eastern red cedar, white oak, pin oak, red maple, sweet gum, and willow oak. Trees ranged in size from 3 inches diameter at breast height (DBH) to up to approximately 30 inches DBH. Stand 1 was determined to have moderate habitat quality due to containing trees with exfoliating bark, some diversity in tree species throughout the stand, no snags, and having available water source. Stand 1 lacked a connection to a larger forested stand. The Clinch River occurs as a good water source within this stand.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023
 Township/Range/Section:
 Lat Long/UTM/ Zone: 35.9047101°/ -84.4935773° Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?
Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>2</u>

Water Resources at Sample Site				Describe existing condition of water sources: The Emory River lies directly to the east of this stand and is open and accessible to the river
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial Emory River: 145 ft	
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	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	tulip poplar, hickory species, sweet gum, white oak, autumn olive, and white oak			
% Trees w/ Exfoliating Bark	1	5	0	
Size Composition of Live Trees (%)	Small (3-8 in) 30	Med (9-15 in) 60	Large (>15 in) 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? Yes and NLEB

Additional Comments:
Stand 2 consists of a small mixed deciduous forest adjacent to the Emory River. Forest Stand 2 is located within the western portion of the Project Site. Dominant canopy and understory trees mostly consist of tulip poplar, hickory species, sweet gum, white oak, autumn olive, and white oak. Trees ranged in size from 3 inches DBH to up to approximately 25 inches DBH. Stand 2 was determined to have moderate habitat quality due to containing few trees with exfoliating bark, three snags, little diversity in tree species throughout the stand, and having an available water source. Stand 2 lacked a connection to a larger forested area. The Emory River occurs as a good water source near this stand.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023

Township/Range/Section: _____

Lat Long/UTM/ Zone: 35.9140375° / -84.4769782°

Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?
Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>3</u>

Water Resources at Sample Site				Describe existing condition of water sources: One perennial stream, three ephemeral streams and one agricultural pond act as a good water source for this stand.
Stream Type (# and length)	Ephemeral 3:242 ft	Intermittent 0	Perennial 1: 436ft	
Pools/Ponds (# and size)	1:0.11acres	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent 0	Seasonal 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%
	4	3	1	
Dominant Species of Mature Trees	tulip poplar, chestnut oak, red maple, Chinese privet, bush honeysuckle, and autumn olive			
% Trees w/ Exfoliating Bark	0	5	2	
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? Yes and NLEB _____

Additional Comments:
Stand 3 consists of a moderately sized mixed deciduous forest abutting the TVA transmission line along the northern boundary near the western portion of the Project Site. Dominant canopy and understory trees include tulip poplar, chestnut oak, red maple, Chinese privet, bush honeysuckle, and autumn olive. Trees ranged in size from 3 inches DBH to up to approximately 30 inches DBH. Stand 3 was determined to have low habitat quality due to containing few trees with exfoliating bark, no snags, no connection to a larger forested area and some tree diversity. Several small wetlands and stream occur as a water source within this stand.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023

Township/Range/Section: _____

Lat Long/UTM/ Zone: 35.9252952°/ -84.4382901°

Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?
Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>4</u>

Water Resources at Sample Site				Describe existing condition of water sources: One perennial stream and one emergent wetland occur as a good water source within this stand
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1:67 ft	
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent 1:0.07 acres	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	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	red oak, white oak, loblolly pine, sugar maple, red maple, American sycamore, hickory species, and tulip poplar			
% Trees w/ Exfoliating Bark	0	5	2	
Size Composition of Live Trees (%)	Small (3-8 in) 30	Med (9-15 in) 60	Large (>15 in) 10	
No. of Suitable Snags	1			

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:
Stand 4 consists of a small mixed deciduous bottomland forest surrounding a perennial stream. Stand 4 is located within the western portion of the Project Site. Dominant canopy and understory trees include red oak, white oak, loblolly pine, sugar maple, red maple, American sycamore, hickory species, and tulip poplar. Trees ranged in size from 3 inches DBH to up to approximately 35 inches DBH. Stand 4 was determined to have moderate habitat quality due to containing several trees with exfoliating bark throughout the entire stand, one snag, some diversity in trees throughout the stand, and connection to Clinch River. Stand 4 has connection to larger forested areas.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.9233003°/ -84.4009731° Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

Project	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?
 Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>5</u>

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial Poplar Creek-965 ft	Describe existing condition of water sources: Poplar Creek acts as a large open water sources within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	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	red oak, white oak, eastern red cedar, sugar maple, red maple, sweetgum, . . hickory species, autumn olive, and tulip poplar			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 30	Med (9-15 in) 60	Large (>15 in) 10	
No. of Suitable Snags	1			

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:
Stand 5 consists of a small mixed deciduous forest surrounding between poplar creek and the southern boundary of the Project Site. Stand 5 is located centrally within the Project Site. Dominant canopy and understory trees include red oak, white oak, eastern red cedar, sugar maple, red maple, sweetgum, hickory species, autumn olive, and tulip poplar. Trees ranged in size from 3 inches DBH to up to approximately 40 inches DBH. Stand 5 was determined to have high habitat quality due to containing several trees with exfoliating bark throughout the entire stand, three snags, some diversity in trees throughout the stand, and connection to Poplar Creek. Stand 5 lacks connection to a larger forested area. Poplar Creek occurs as good water source near this stand.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023
 Township/Range/Section:
 Lat Long/UTM/ Zone: 35.9204020°/- 84.4059189° Surveyor: Lyranda Thiem

Brief Project Description
 Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area				
	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types	
Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius
Flight corridors to other forested areas?
 Yes
Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>6</u>

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: Poplar Creek acts as a large open water sources within this stand
	0	0	Poplar Creek-965 ft	
Pools/Ponds (# and size)	Open and accessible to bats?			
	0	Yes		
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%
	4	3	1	
Dominant Species of Mature Trees	white oak, hickory species, eastern red cedar, sugar maple, red maple, sweetgum, American beech, autumn olive, and tulip poplar			
% Trees w/ Exfoliating Bark	2	10	5	
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? Yes and NLEB

Additional Comments:
Stand 6 consists of a small mixed deciduous forest abutting poplar creek to the southwest and the southern boundary of the Project Site. Stand 6 is located centrally within the Project Site. Dominant canopy and understory trees include white oak, hickory species, eastern red cedar, sugar maple, red maple, sweetgum, American beech, autumn olive, and tulip poplar. Trees ranged in size from 3 inches DBH to up to approximately 35 inches DBH. Stand 6 was determined to have moderate habitat quality due to containing few trees with exfoliating bark, no snags, some diversity in trees throughout the stand, and connection to Poplar Creek. Stand 6 lacks connection to a larger forested area. Poplar Creek occurs as good water source near this stand.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023

Township/Range/Section:

Lat Long/UTM/ Zone: 35.9206141° -84.4064122°

Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?
Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E M E N

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): <u>7</u>

Water Resources at Sample Site				Describe existing condition of water sources: Poplar Creek acts as a large open water sources within this stand
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial Poplar Creek-965 ft	
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	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	white oak, hickory species, eastern red cedar, sugar maple, red maple, sweetgum, American beech, autumn olive, and tulip poplar			
% Trees w/ Exfoliating Bark	2	5	5	
Size Composition of Live Trees (%)	Small (3-8 in) 30	Med (9-15 in) 60	Large (>15 in) 10	
No. of Suitable Snags	1			

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:
Stand 6 consists of a small mixed deciduous forest abutting poplar creek to the southwest and the southern boundary of the Project Site. Stand 6 is located centrally within the Project Site. Dominant canopy and understory trees include white oak, hickory species, eastern red cedar, sugar maple, red maple, sweetgum, American beech, autumn olive, and tulip poplar. Trees ranged in size from 3 inches DBH to up to approximately 35 inches DBH. Stand 6 was determined to have moderate habitat quality due to containing few trees with exfoliating bark, no snags, some diversity in trees throughout the stand, and connection to Poplar Creek. Stand 6 lacks connection to a larger forested area. Poplar Creek occurs as good water source near this stand.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.9156458°/ -84.4038829° Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?
 Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>8</u>

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1-127 ft	Describe existing condition of water sources: One Perennial stream occurs within this stand and acts as a good water source.
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	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	white oak, hickory species, sugar maple, red maple, sweetgum, autumn olive, and tulip poplar			
% Trees w/ Exfoliating Bark	0	2	0	
Size Composition of Live Trees (%)	Small (3-8 in) 30	Med (9-15 in) 60	Large (>15 in) 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? Yes and NLEB

Additional Comments:
Stand 8 consists of a small mixed deciduous forest abutting a channel to poplar creek located centrally within the Project Site. Dominant canopy and understory trees include white oak, hickory species, sugar maple, red maple, sweetgum, autumn olive, and tulip poplar. Trees ranged in size from 3 inches DBH to up to approximately 30 inches DBH. Stand 8 was determined to have moderate habitat quality due to containing some trees with exfoliating bark, no snags, some diversity in trees throughout the stand, and connection to a channel off of Poplar Creek. Stand 8 lacks connection to a larger forested area. A channel off of Poplar Creek occurs as good water source near this stand.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023
 Township/Range/Section:
 Lat Long/UTM/ Zone: 35.9232460° / -84.3673916° Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

Project	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?
 Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>9</u>

Water Resources at Sample Site				Describe existing condition of water sources: Three seasonal intermittent streams and 3 small emergent/ forested wetlands act as a good water source for this stand
Stream Type (# and length)	Ephemeral 0	Intermittent 3: 676 ft	Perennial 0	
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent 3: 0.26 acres	Seasonal 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%
	4	3	1	
Dominant Species of Mature Trees	white oak, red oak, post oak, hickory species, sugar maple, red maple, autumn olive, and tulip poplar			
% Trees w/ Exfoliating Bark	2	6	3	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	30	60	10	
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: Stand 9 consists of a moderately sized mixed deciduous forest located centrally within the Project Site. Dominant canopy and understory trees include white oak, red oak, post oak, hickory species, sugar maple, red maple, autumn olive, and tulip poplar. Trees ranged in size from 3 inches DBH to up to approximately 40 inches DBH. Stand 9 was determined to have moderate habitat quality due to containing several trees with exfoliating bark, two snags, some diversity in trees throughout the stand, and connection to forested and emergent wetlands and several streams. Stand 9 lacks connection to a larger forested area. Several wetlands and streams occur as good water sources within this stand

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023
 Township/Range/Section:
 Lat Long/UTM/ Zone: 35.9321252°/-84.3510490° Surveyor: Lyranda Thiem

Brief Project Description
 Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area				
	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types	
Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius
Flight corridors to other forested areas?
 Yes
Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>10</u>

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: Two seasonal streams and five emergent wetlands occur within this stand as a good water source
	1: 491 ft	1: 140 ft	0	
Pools/Ponds (# and size)	Open and accessible to bats?			
	0	Yes		
Wetlands (approx. ac.)	Permanent	Seasonal		
	5: 0.35 acres	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%
	4	3	1	
Dominant Species of Mature Trees	white oak, red oak, post oak, hickory species, sugar maple, red maple, sweetgum, autumn olive, and tulip poplar			
% Trees w/ Exfoliating Bark	0	5	5	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	30	60	10	
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:
Stand 10 consists of a small mixed deciduous forest located centrally within the Project Site and south of Haul Road. Dominant canopy and understory trees include white oak, red oak, post oak, hickory species, sugar maple, red maple, sweetgum, autumn olive, and tulip poplar. Trees ranged in size from 3 inches DBH to up to approximately 40 inches DBH. Stand 10 was determined to have moderate habitat quality due to containing several trees with exfoliating bark, two snags, some diversity in trees throughout the stand, and connection to forested and emergent wetlands and several streams. Stand 10 lacks connection to a larger forested area. Several wetlands and streams occur as good water sources within this stand.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023
 Township/Range/Section:
 Lat Long/UTM/ Zone: 35.9468488°/- 84.3254804° Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

Project	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?
 Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>11</u>

Water Resources at Sample Site				Describe existing condition of water sources: Two seasonal streams and one emergent wetlands occur within this stand as a good water source
Stream Type (# and length)	Ephemeral 1: 213 ft	Intermittent 1: 224 ft	Perennial 0	
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent 1: 0.1 acre	Seasonal 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%
	4	3	1	
Dominant Species of Mature Trees	hickory species, sugar maple, red maple, sweetgum, autumn olive, and tulip poplar			
% Trees w/ Exfoliating Bark	0	5	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? Yes and NLEB

Additional Comments: Stand 11 consists of a small mixed deciduous forest located within the eastern portion of the Project Site and south of Haul Road. Dominant canopy and understory trees include hickory species, sugar maple, red maple, sweetgum, autumn olive, and tulip poplar. Trees ranged in size from 10 inches DBH to up to approximately 30 inches DBH. Stand 11 was determined to have low habitat quality due to containing few trees with exfoliating bark, no snags, some diversity in trees throughout the stand, and connection to an intermittent stream and two wetlands. Stand 11 lacks connection to a larger forested area. One forested and emergent wetland and one stream occur as good water sources within this stand.
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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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.9439166°/-84.2881244° Surveyor: Lyranda Thiem

Brief Project Description
 Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area				
	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types	
Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius
 Flight corridors to other forested areas?
 Yes
 Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>12</u>

Water Resources at Sample Site				Describe existing condition of water sources: One perennial stream acts as a good water source within Stand 12
Stream Type (# and length)	Ephemeral 0	Intermittent 0	Perennial 1:274 ft	
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent 0	Seasonal 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50%) 4	Midstory (20-50%) 3	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	red maple, sweetgum, autumn olive, bush honeysuckle, and tulip poplar.			
% Trees w/ Exfoliating Bark	0	2	2	
Size Composition of Live Trees (%)	Small (3-8 in) 30	Med (9-15 in) 60	Large (>15 in) 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? Yes and NLEB

Additional Comments:
Stand 12 consists of a small mixed deciduous forest located within the eastern portion of the Project Site and west of Bethel Valley Road. Dominant canopy and understory trees include hickory species, red maple, sweetgum, autumn olive, bush honeysuckle, and tulip poplar. Trees ranged in size from 5 inches DBH to up to approximately 20 inches DBH. Stand 12 was determined to have low habitat quality due to containing few trees with exfoliating bark, no snags, some diversity in trees throughout the stand, and connection to an intermittent stream. Stand 12 lacks connection to a larger forested area. One stream occurs as a water source within this stand.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023
 Township/Range/Section: _____
 Lat Long/UTM/ Zone: 35.9435724°/-84.2862756° Surveyor: Lyranda Thiem

Brief Project Description
 Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area				
	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types	
Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius
Flight corridors to other forested areas?
 Yes
Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>13</u>

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

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	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	hickory species, sugar maple, red maple, sweetgum, autumn olive, and tulip poplar			
% Trees w/ Exfoliating Bark	0	0	2	
Size Composition of Live Trees (%)	Small (3-8 in) 30	Med (9-15 in) 60	Large (>15 in) 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? Yes and NLEB

Additional Comments:
Stand 13 consists of a small mixed deciduous forest located within the eastern portion of the Project Site and east of Bethel Valley Road. Dominant canopy and understory trees include hickory species, sugar maple, red maple, sweetgum, autumn olive, and tulip poplar. Trees ranged in size from 5 inches DBH to up to approximately 25 inches DBH. Stand 13 was determined to have low habitat quality due to containing few trees with exfoliating bark, no snags, some diversity in trees throughout the stand, and no connection to a water source within the stand. Stand 13 has connection to a larger forested area. No water sources exist within the stand; however, two emergent wetlands exist adjacent to the stand and act as a water source for this stand.

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023
 Township/Range/Section:
 Lat Long/UTM/ Zone: 35.9399375°/-84.2805628° Surveyor: Lyranda Thiem

Brief Project Description
 Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area				
	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types	
Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius
Flight corridors to other forested areas?
 Yes
Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>14</u>

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

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 4	Midstory (20-50') 3	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	hickory species, sugar maple, red maple, white oak, sweetgum, autumn olive, bush honeysuckle, and tulip poplar.			
% Trees w/ Exfoliating Bark	0	5	0	
Size Composition of Live Trees (%)	Small (3-8 in) 30	Med (9-15 in) 60	Large (>15 in) 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? Yes and NLEB

Additional Comments: Stand 14 consists of a small mixed deciduous forest located within the far eastern portion of the Project Site and north of the current substation. Dominant canopy and understory trees include hickory species, sugar maple, red maple, white oak, sweetgum, autumn olive, bush honeysuckle, and tulip poplar. Trees ranged in size from 5 inches DBH to up to approximately 25 inches DBH. Stand 14 was determined to have low habitat quality due to containing few trees with exfoliating bark, no snags, some diversity in trees throughout the stand, and no connection to a water source within the stand. Stand 14 has connection to a larger forested area. No water sources exist within the stand; however, a large reservoir exists to the east of the stand and can act as a water source for this stand

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023

Township/Range/Section: _____

Lat Long/UTM/ Zone: 35.9399375°/-84.2805628°

Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?
Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>15</u>

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: Two seasonal ephemeral streams exist within this stand however these do not offer a good water source
	2: 408 ft	0	0	
Pools/Ponds (# and size)	Open and accessible to bats?			
	yes			
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%
	4	3	1	
Dominant Species of Mature Trees	hickory species, sugar maple, red maple, white oak, sweetgum, autumn olive, eastern red cedar, and tulip poplar			
% Trees w/ Exfoliating Bark	2	5	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? Yes and NLEB

Additional Comments:
Stand 15 consists of a small mixed deciduous forest located within the far eastern portion of the Project Site and north of the current substation. Dominant canopy and understory trees include hickory species, sugar maple, red maple, white oak, sweetgum, autumn olive, eastern red cedar, and tulip poplar. Trees ranged in size from 5 inches DBH to up to approximately 30 inches DBH. Stand 15 was determined to have low habitat quality due to containing few trees with exfoliating bark, no snags, some diversity in trees throughout the stand, and several streams running through the stand. Stand 15 has connection to a larger forested area. Several streams act as a water source for this stand and a large reservoir exists to the east of the stand and can also act as a water source for this stand

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

APPENDIX A: P A E A I A A E MEN

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: TVA- Kingston Fossil Plant Retirement: Offsite Transmission Line Upgrades Date: 5/17/2023
 Township/Range/Section:
 Lat Long/UTM/ Zone: 35.9484762°/-84.2786148° Surveyor: Lyranda Thiem

Brief Project Description

Tennessee Valley Authority (TVA) has proposed the retirement of the Kingston Fossil Plant (KIF), demolition of the coal units and construction and operation of a CC Gas Plant paired with a dual-fuel Aero CT Gas Plant on the KIF reservation. This alternative also includes construction and operation of a natural gas pipeline, a related action to be constructed, owned and operated by ETNG pending FERC approval.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	464.05	7.61		456.4
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
Mixed Deciduous pasture/hay Wet Herbaceous Dry Herbaceous Maintained lawns	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?
 Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)
 Adjacent properties to the TL upgrade areas include mixed deciduous forest, industrial and commercial properties, residential neighborhoods, maintained areas, and streams/ freshwater ponds.

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)?
 The TL upgrade area goes through the Black Oak Ridge Wildlife management area

APPENDIX A: P A E A I A A E MEN

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): <u>16</u>

Water Resources at Sample Site				Describe existing condition of water sources: Two seasonal ephemeral streams exist within this stand however these do not offer a good water source
Stream Type (# and length)	Ephemeral 2: 408 ft	Intermittent 0	Perennial 0	
Pools/Ponds (# and size)	0	Open and accessible to bats? yes		
Wetlands (approx. ac.)	Permanent 0	Seasonal 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%
	4	3	1	
Dominant Species of Mature Trees	hickory species, sugar maple, red maple, white oak, sweetgum, autumn olive, eastern red cedar, and tulip poplar.			
% 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			

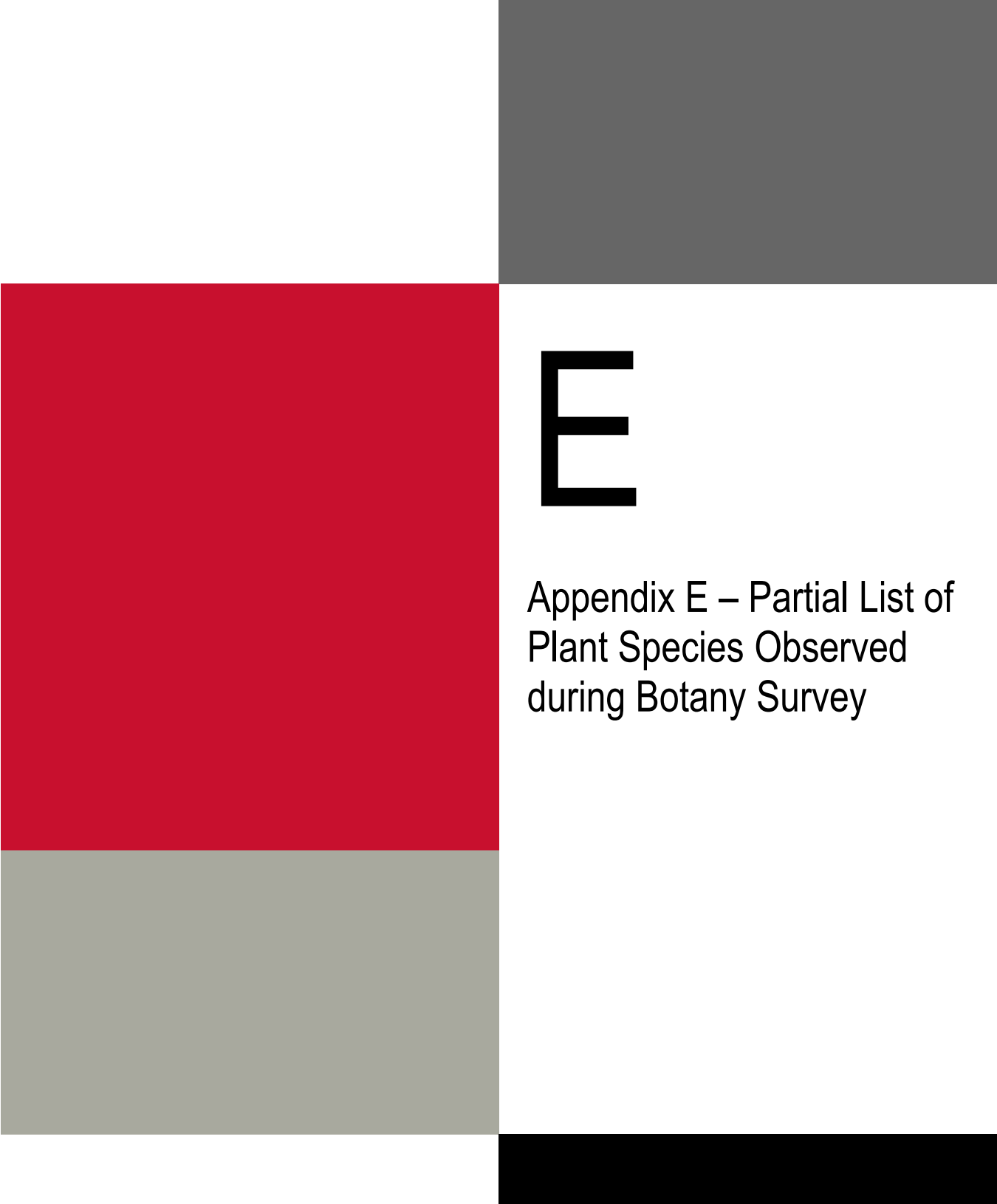
Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:
Stand 16 consists of a small mixed deciduous forest located within the far eastern portion of the Project Site and north of the current substation. Dominant canopy and understory trees include hickory species, sugar maple, red maple, white oak, sweetgum, autumn olive, eastern red cedar, and tulip poplar. Trees ranged in size from 5 inches DBH to up to approximately 35 inches DBH. Stand 16 was determined to have low habitat quality due to containing few trees with exfoliating bark, no snags, some diversity in trees throughout the stand, and having two small intermittent streams running through the stand. Stand 16 has connection to a larger forested area. Two streams act as a water source for this stand and a large reservoir exists to the east of the stand and can also act as a water source for this stand.

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



E

Appendix E – Partial List of
Plant Species Observed
during Botany Survey

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Scientific Name	Common Name	Dry Ridge/ Slope	Wetland/ Valley	Throughout	Non-native
Herbs					
<i>Achillea millefolium</i>	Common Yarrow	x			
<i>Agrimonia parviflora</i>	Southern Agrimony		x		
<i>Alisma subcordatum</i>	Water Plantain		x		
<i>Allium vineale</i>	Ornamental Onion			x	
<i>Ambrosia artemisifolia</i>	Common Ragweed	x			
<i>Amorpha fruticosa</i>	Desert False Indigo		x		
<i>Andropogon gerardii</i>	Big Bluestem			x	
<i>Andropogon virginicus</i>	Broomsedge			x	
<i>Anemone quiquefolia</i>	Wood Anemone		x		
<i>Anemone virginiana</i>	Tall Tumbleweed	x			
<i>Angelica venenosa</i>	Hairy Angelica	x			
<i>Apocynum cannabinum</i>	Indian Hemp	x			
<i>Arenaria serpyllifolia</i>	Thyme-leaf Sandwort	x			
<i>Arnoglossum atriplicifolium</i>	Pale Indian Plantain			x	
<i>Asclepias amplexicaulis</i>	Clasping Milkweed	x			
<i>Asclepias syrica</i>	Common Milkweed	x			
<i>Asclepias tuberosa</i>	Butterfly Weed	x			
<i>Asclepias verticillata</i>	Whorled Milkweed	x			
<i>Asplenium platyneuron</i>	Ebony Spleenwort			x	
<i>Baptisia australis</i>	Wild Indigo	x			
<i>Boehmeria cylindrica</i>	False Nettle		x		
<i>Carex bushii</i>	Bush's Sedge		x		
<i>Carex crinita</i>	Fringed Sedge		x		
<i>Carex frankii</i>	Frank's Sedge		x		
<i>Carex lupulina</i>	Hop Sedge		x		
<i>Carex lurida</i>	Shallow Sedge		x		
<i>Carex scoparia</i>	Broom Sedge		x		
<i>Carex tribuloides</i>	Blunt Broom Sedge		x		
<i>Carex vulpinoidea</i>	Fox Sedge		x		
<i>Cephalanthis occidentalis</i>	Buttonbush		x		
<i>Chamaecrista fasciculata</i>	Partridge Pea	x			
<i>Cicuta maculata</i>	Spotted Water Hemlock		x		
<i>Cirsium</i> sp.	Thistle			x	
<i>Coreopsis lanceolata</i>	Lance-leaved Coreopsis		x		
<i>Coreopsis major</i>	Greater Tickseed	x			
<i>Coreopsis tinctoria</i>	Plains Coreopsis	x			
<i>Coreopsis tripteris</i>	Tall Tickseed	x			
<i>Cyperus eragrostis</i>	Tall Flatsedge	x			
<i>Daucus carota</i>	Queen Anne's Lace			x	

Scientific Name	Common Name	Dry Ridge/ Slope	Wetland/ Valley	Throughout	Non-native
<i>Delphinium exaltatum</i> *	Tall Larkspur	x			
<i>Desmodium paniculatum</i> var. <i>paniculatum</i>	Panicleleaf Ticktrefoil	x			
<i>Desmodium rotundifolium</i>	Prostrate Ticktrefoil	x			
<i>Dianthus armeria</i>	Deptford Pink	x		x	x
<i>Dichanthelium clandestinum</i>	Deertongue	x			
<i>Dichanthelium scoparium</i>	Velvet Panicum		x		
<i>Echinacea</i> sp.	Coneflower	x			
<i>Eleocharis obtusa</i>	Blunt Spikerush		x		
<i>Elymus hystrix</i>	Bottlebrush	x			
<i>Equisetum</i> sp.	Horsetail		x		
<i>Erigeron strigosus</i>	Common Fleabane	x			
<i>Eryngium yuccifolium</i>	Rattlesnake Master	x			
<i>Euonymus fortunei</i>	Winter Creeper	x			x
<i>Eupatorium capillifolium</i>	Dog Fennel			x	
<i>Eupatorium rotundifolium</i>	Roundleaf Thoroughwort	x			
<i>Euphorbia corollata</i>	Flowering Spurge	x			
<i>Eutrochium maculatum</i>	Joe-Pye Weed		x		
<i>Fragaria vesca</i>	Wild Strawberry	x			
<i>Galium aparine</i>	Catchweed		x		
<i>Galium</i> spp.			x		
<i>Geranium maculatum</i>	Wild Geranium	x			
<i>Glycine max</i>	Soybean		x		x
<i>Helenium flexuosum</i>	Purple-headed Sneezeweed	x			
<i>Helianthus divaricatus</i>	Woodland Sunflower	x			
<i>Helianthus microcephalus</i>	Small Woodland Sunflower	x			
<i>Heuchera americana</i>	American Alumroot	x			
<i>Holcus lanatus</i>	Common Velvet Grass		x		x
<i>Houstonia longifolia</i>	Longleaf Summer Bluet	x			
<i>Houstonia purpurea</i>	Venus' Pride	x			
<i>Hydrangea aborescens</i>	Wild Hydrangea	x			
<i>Hypericum prolificum</i>	Shrubby St. John's Wort	x			
<i>Impatiens capensis</i>	Orange Jewelweed		x		
<i>Juncus effusus</i>	Common Rush		x		
<i>Juncus marginatus</i>	Grassleaf Rush		x		
<i>Juncus tenuis</i>	Slender Rush		x		
<i>Lespedeza capitata</i>	Roundhead Bushclover	x			
<i>Lespedeza cuneata</i>	Sericea Lespedeza		x		x
<i>Leucanthemum vulgare</i>	Oxeye Daisy	x			

Scientific Name	Common Name	Dry Ridge/ Slope	Wetland/ Valley	Throughout	Non-native
<i>Lobelia spicata</i>	Palespike Lobelia			x	
<i>Lolium arundinaceum</i>	Tall Fescue			x	
<i>Ludwigia alternifolia</i>	Seedbox		x		
<i>Lycopus americanus</i>	American Bugleweed		x		
<i>Lysimachia ciliata</i>	Fringed Yellow-loosestrife		x		
<i>Lysimachia quadrifolia</i>	Fourflower Yellow Loosestrife	x			
<i>Maianthemum racemosum</i>	False Solomon's Seal			x	
<i>Melilotus albus</i>	White Sweet Clover	x			x
<i>Melilotus officinalis</i>	Yellow Sweet Clover	x			x
<i>Microstegium vimineum</i>	Japanese Stiltgrass			x	x
<i>Monarda fistulosa</i>	Wild Bergamot	x			
<i>Oxalis stricta</i>	Yellow Woodsorrel	x			
<i>Oxypolis rigidor</i>	Stiff Cowbane		x		
<i>Packera anonyma</i>	Appalachia Ragwort	x			
<i>Parthenium integrifolium</i>	Wild Quinine	x			
<i>Passiflora incarnata</i>	Passion Flower	x			
<i>Penstemon digitalis</i>	Foxglove Beardtongue		x		
<i>Persicaria virginiana</i>	Jumpseed		x		
<i>Phleum pratense</i>	Timothy Grass	x			x
<i>Phytolacca americana</i>	Pokeweed	x			
<i>Podophyllum peltatum</i>	Mayapple		x		
<i>Polystichum acrostichoides</i>	Christmas Fern	x			
<i>Potentilla canadensis</i>	Dwarf Cinquefoil	x			
<i>Prunella vulgaris</i>	Self-heal	x			
<i>Pteridium</i> sp.	Bracken Fern	x			
<i>Pycnanthemum pilosum</i>	Hairy Mountain Mint	x			
<i>Pycnanthemum tenuifolium</i>	Slender Mountain Mint	x			
<i>Ratibida pinnata</i>	Pinnate Prairie Coneflower	x			
<i>Rudbeckia hirta</i>	Black-eyed Susan	x			
<i>Ruellia caroliniensis</i>	Wild Petunia		x		
<i>Rumex crispus</i>	Curly Dock		x		
<i>Sagittaria latifolia</i>	Broadleaf Arrowhead		x		
<i>Sanicula canadensis</i>				x	
<i>Schizachyrium scoparium</i>	Little Bluestem	x			
<i>Schoenoplectus tabernaemontani</i>	Softstem Bulrush		x		
<i>Scirpus atrovivens</i>	Dark Green Bulrush		x		
<i>Scirpus cyperinus</i>	Woolgrass		x		
<i>Scirpus pendulus</i>	Pendulous Bulrush		x		

Scientific Name	Common Name	Dry Ridge/ Slope	Wetland/ Valley	Throughout	Non-native
<i>Scleria trglomerata</i>	Whip Nutrush	x			
<i>Scutellaria integrifolia</i>	Helmet Flower		x		
<i>Securigera varia</i>	Crown Vetch			x	
<i>Sericocarpus linifolius</i>	Narrowleaf Whitetop Aster	x			
<i>Silene virginica</i>	Fire Pink			x	
<i>Silphium integrifolium</i>	Rosinweed	x			
<i>Silphium terebinthinaceum</i>	Prarie Dock	x			
<i>Smallanthus uvedalia</i>	Bear's Foot	x			
<i>Solidago gigantea</i>	Tall Goldenrod	x			
<i>Solidago speciosa</i>	Showy Goldenrod	x			
<i>Solidago spp.</i>	Goldenrod	x			
<i>Sorghum halepense</i>	Johnsongrass		x		x
<i>Tephrosia spicata</i>	Spiked Hoarypea	x			
<i>Teucrium canadense</i>	American Germander		x		
<i>Thalictrum dasycarpum</i>	Tall Meadow Weed	x			
<i>Thalictrum pubescens</i>	Tall Meadow Rue		x		
<i>Trifolium pratense</i>	Red Clover	x			x
<i>Triodanis perfoliata</i>	Clasping Venus's Looking Glass	x			
<i>Typha latifolia</i>	Broadleaf Cattail		x		
<i>Urtica dioica</i>	Stinging Nettle		x		
<i>Verbascum blattaria</i>	Moth Mullein	x			x
<i>Verbena simplex</i>	Narrowleaf Vervain			x	
<i>Verbesina alternifolia</i>	Wingstem	x		x	
<i>Veronia noveboracensis</i>	Ironweed		x		
<i>Viola pubescens</i>	Downy Yellow Violet	x			
Shrubs					
<i>Aralia spinosa</i>	Devil's Walking Stick			x	
<i>Ceanothus americana</i>	New Jersey Tea		x		
<i>Elaeagnus umbellata</i>	Autumn Olive	x			x
<i>Euonymus americanus</i>	American Strawberry Bush		x		
<i>Lespedeza bicolor</i>	Shrub Lespedeza	x			x
<i>Ligustrum japonicum</i>	Japanese Privet	x			x
<i>Lindera benzoin</i>	Spicebush		x		
<i>Lonicera maackii</i>	Amur Honeysuckle			x	x
<i>Rosa setigera</i>	Prairie Rose			x	
<i>Rubus alleghaniensis</i>	Blackberry			x	

Scientific Name	Common Name	Dry Ridge/ Slope	Wetland/ Valley	Throughout	Non-native
<i>Rubus occidentalis</i>	Black Raspberry			x	
<i>Rubus phoenicolasius</i>	Wineberry			x	x
<i>Sambucus canadensis</i>	American Elderberry		x	x	
<i>Vaccinium arboreum</i>	Sparkleberry	x			
Trees					
<i>Acer negundo</i>	Boxelder	x			
<i>Acer rubrum</i>	Red Maple			x	
<i>Acer saccharum</i>	Sugar Maple			x	
<i>Aesculus flava</i>	Yellow Buckeye	x			
<i>Ailanthus altissima</i>	Tree of Heaven	x			x
<i>Alnus</i> sp.	Alder		x		
<i>Broussonetia papyrifera</i>	Paper Mulberry	x			x
<i>Carya tomentosa</i>	Mockernut Hickory	x			
<i>Carya</i> spp.	Hickories			x	
<i>Celtis occidentalis</i>	Common Hackberry	x			
<i>Cercis canadensis</i>	Eastern Redbud	x			
<i>Cornus amomum</i>	Silky Dogwood		x		
<i>Cornus florida</i>	Flowering Dogwood		x		
<i>Diospyros virginiana</i>	Persimmon	x			
<i>Fraxinus pennsylvanica</i>	Green Ash		x		
<i>Juniperus virginiana</i>	Eastern Red Cedar	x			
<i>Liquidambar straciflua</i>	Sweetgum	x			
<i>Liriodendron tulipifera</i>	Yellow Poplar			x	
<i>Pinus taeda</i>	Loblolly Pine			x	
<i>Pinus virginiana</i>	Virginia Pine			x	
<i>Platanus occidentalis</i>	Sycamore		x		
<i>Quercus alba</i>	White Oak	x			
<i>Rhus copallinum</i>	Shining Sumac	x			
<i>Rhus glabra</i>	Smooth Sumac	x			
<i>Salix nigra</i>	Black Willow		x		
<i>Ulmus alata</i>	Winged Elm		x		
<i>Ulmus rubra</i>	Slippery Elm		x		
<i>Quercus alba</i>	White Oak	x			
<i>Quercus prinus</i>	Chestnut Oak	x			
<i>Quercus rubra</i>	Red Oak	x			
<i>Quercus</i> spp.	Oak species			x	
Vines					
<i>Campsis radicans</i>	Trumpet Creeper			x	
<i>Clematis virginiana</i>	Virgin's Bower		x		
<i>Lonicera japonica</i>	Japanese Honeysuckle			x	x
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	x			
<i>Smilax glauca</i>	Cat Greenbrier			x	

<i>Smilax rotundifolia</i>	Common Greenbriar	x	
<i>Vitis rotundifolia</i>	Muscadine	x	
<i>Vitis vulpina</i>	Frost Grape		x
<i>Toxicodendron radicans</i>	Poison Ivy		x

* - rare

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