



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

Kingston Transmission Line

Kingston Fossil Plant

Roane, Cumberland, and Anderson Counties, Tennessee

December 2022





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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</i> var. <i>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>Meehania cordata</i>	Heartleaf Meehania	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
Mammals					
<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 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	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 lucifugus</i>	Little Brown Bat	ST	Roost in caves, hollow trees, and human-made structures.	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>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	No
<i>Neotoma magister</i>	Allegheny Woodrat	SDNM	Rock outcrops, cliffs, talus slopes, crevices not present	No	No
<i>Perimyotis subflavus</i>	Tri-colored Bat	ST	Generally associated with forested landscapes but may roost near openings	Yes – roosting, foraging	No
<i>Sorex dispar</i>	Long-tailed Shrew	SDNM	Mountainous, forested areas with loose talus	Yes	No
<i>Synaptomys cooperi</i>	Southern bog lemming	SDNM	Marshy meadows, wet balds, & rich upland forests.	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>Cycleptus elongatus</i>	Blue Sucker	ST	Inhabits swift waters over firm substrates in big rivers.	No	No
<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>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	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>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	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>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	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
<i>Percina squamata</i>	Olive Darter	SDNM	Inhabits small-medium rivers; in strong flowing chutes with rubble/boulders in high-gradient streams	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 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	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 hamulatus</i>	Prickly Cave Crayfish	SDNM	Inhabits aquatic caves; Sequatchie Valley and southern Cumberland	No	No
<i>Cambarus obeyensis</i>	Obey Crayfish	SE	Inhabits small-medium sized streams; headwaters of East Fork Obey River; northern Cumberland	No	No
<i>Cambarus pristinus</i>	Pristine Crayfish	SE	Inhabits small-large streams; headwaters of Caney Fork River and abutting Sequatchie River tributaries	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
<i>Hemidactylium scutatum</i>	Four-toed Salamander	SDNM	Inhabits woodland swamps, shallow depressions, and sphagnum mats on acidic soils in middle and east Tennessee	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.

5 References

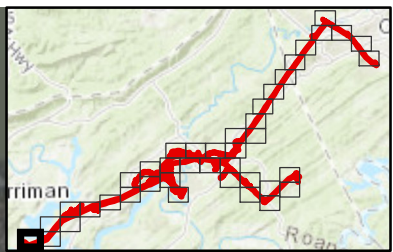
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Appendix A

Figures



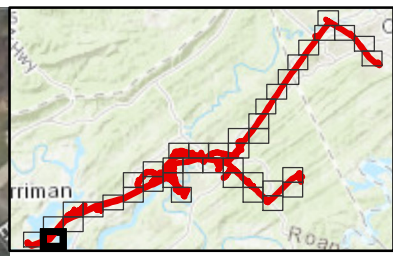
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LEGEND

- 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


















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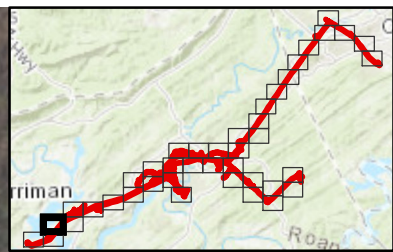
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-  Snags
-  High Quality Bat Habitat
-  Moderate Quality Bat Habitat
-  Low Quality Bat Habitat
-  Culvert
-  Delineated Perennial Stream
-  Delineated Intermittent Streams
-  Wet Weather Conveyance
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-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



DATA SOURCE: Bing Hybrid Aerial Imagery



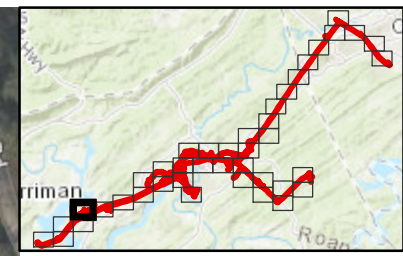
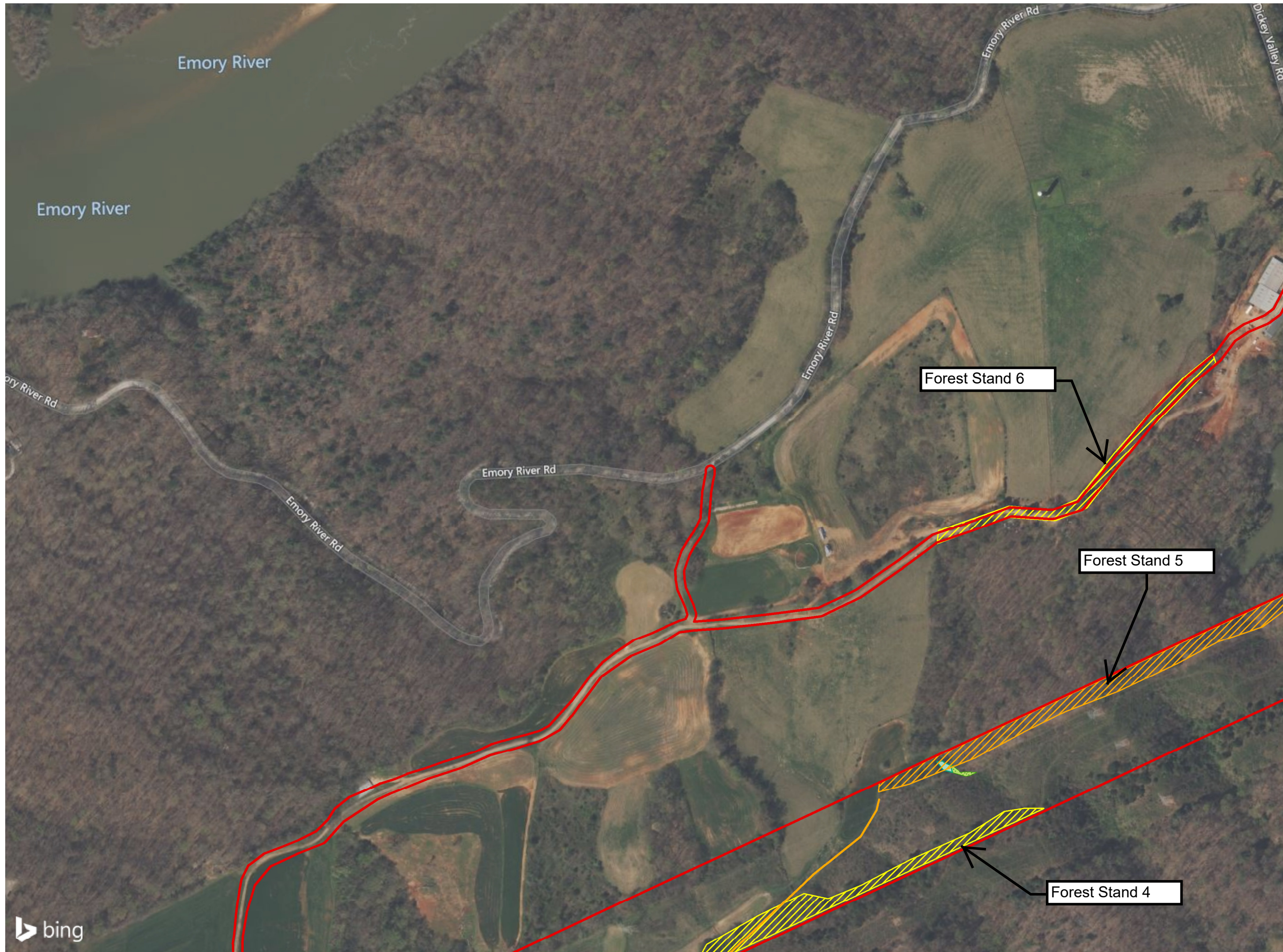
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- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
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- Wet Weather Conveyance
- HDR Delineated Open Water
- HDR Delineated Wetland



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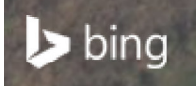
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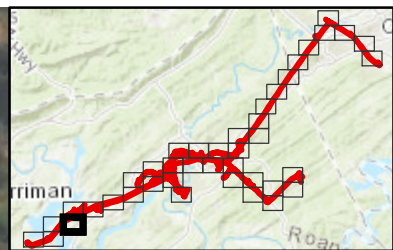
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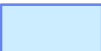



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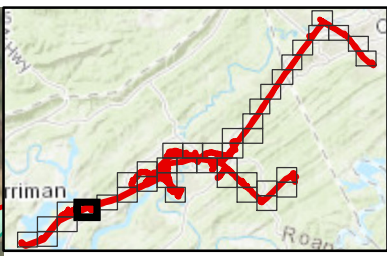
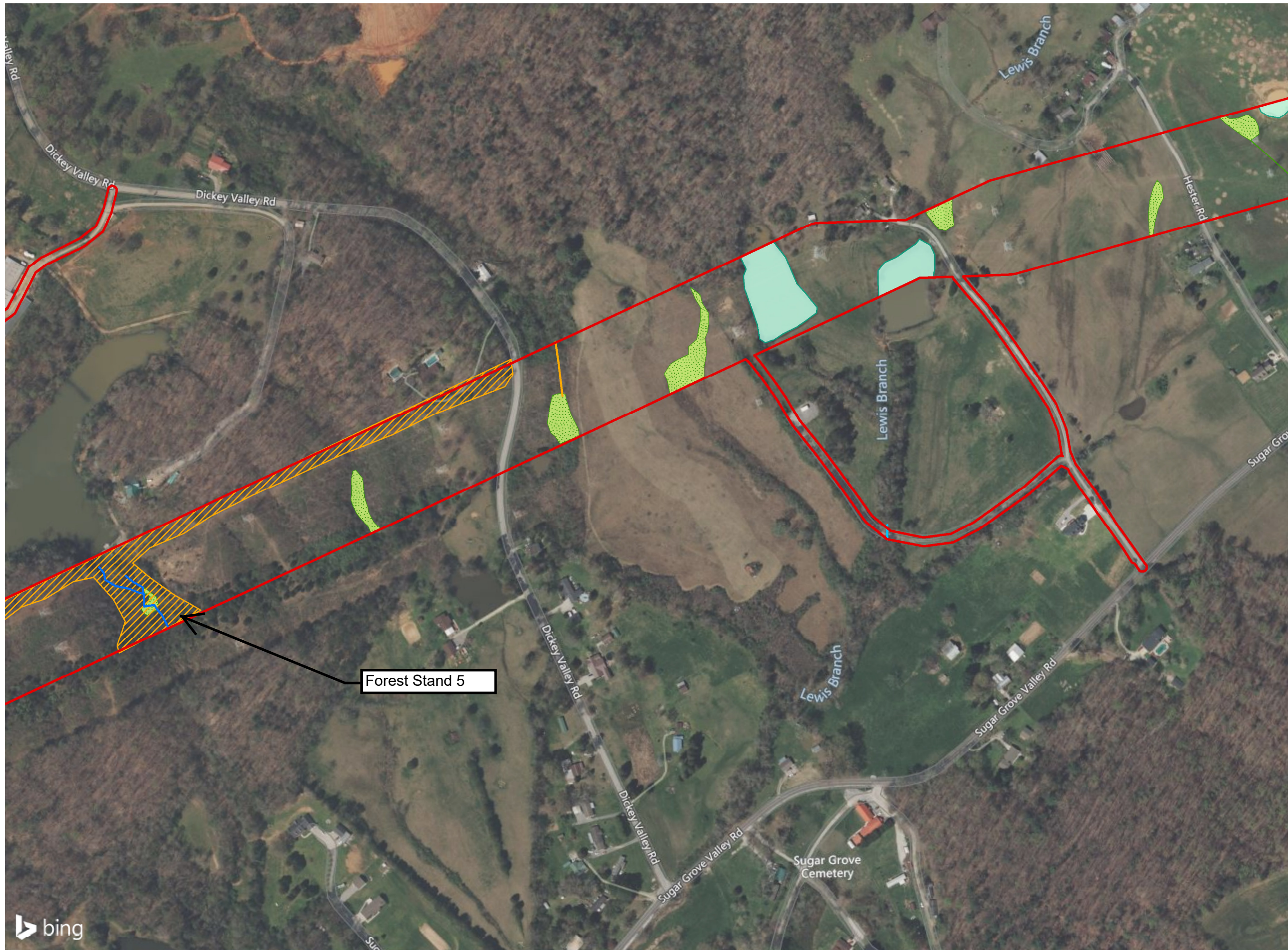
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LEGEND

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-  Milkweed Patch
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-  High Quality Bat Habitat
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-  Low Quality Bat Habitat
-  Culvert
-  Delineated Perennial Stream
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-  Wet Weather Conveyance
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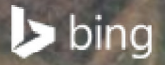
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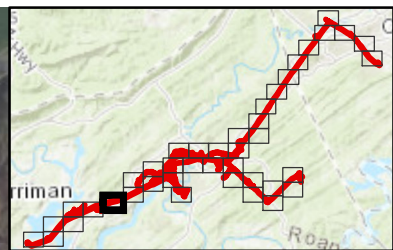
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- Wet Weather Conveyance
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- HDR Delineated Wetland

Forest Stand 5



DATA SOURCE: Bing Hybrid Aerial Imagery





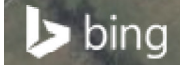
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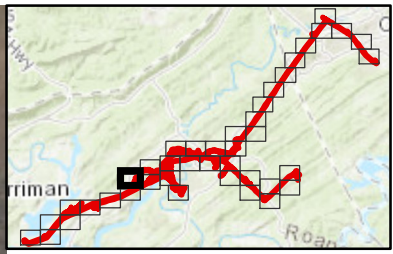
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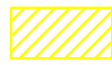





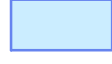


DATA SOURCE: Bing Hybrid Aerial Imagery





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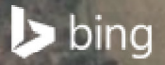
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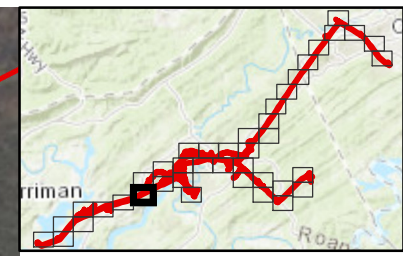
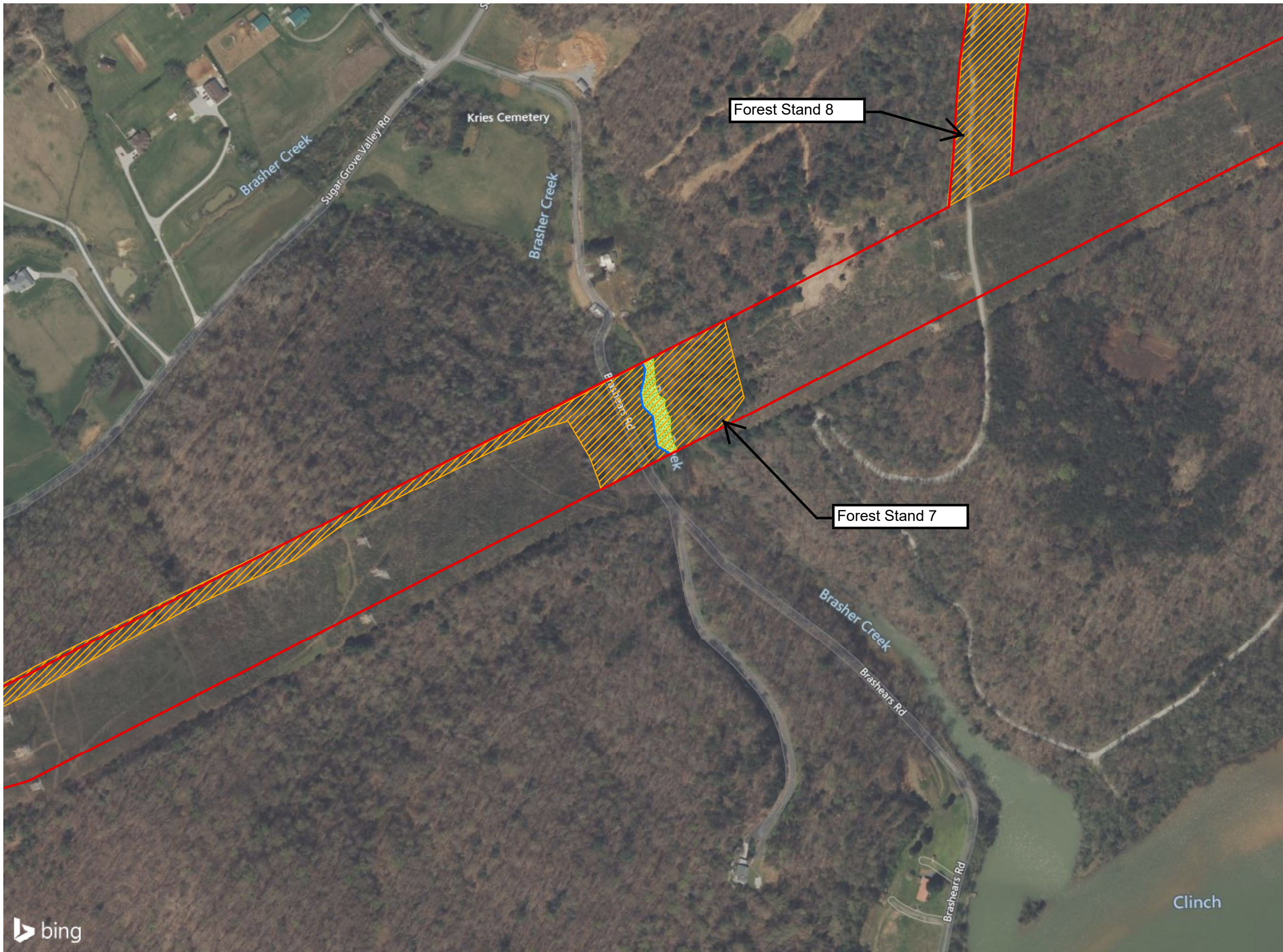
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-  Low Quality Bat Habitat
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-  Delineated Intermittent Streams
-  Wet Weather Conveyance
-  Delineated Perennial Stream
-  Wet Weather Conveyance
-  HDR Delineated Open Water
-  HDR Delineated Wetland

Forest Stand 8



DATA SOURCE: Bing Hybrid Aerial Imagery





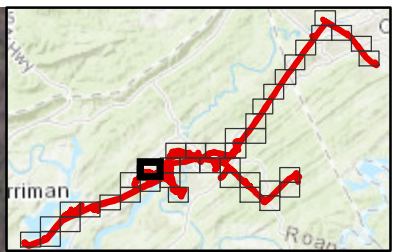
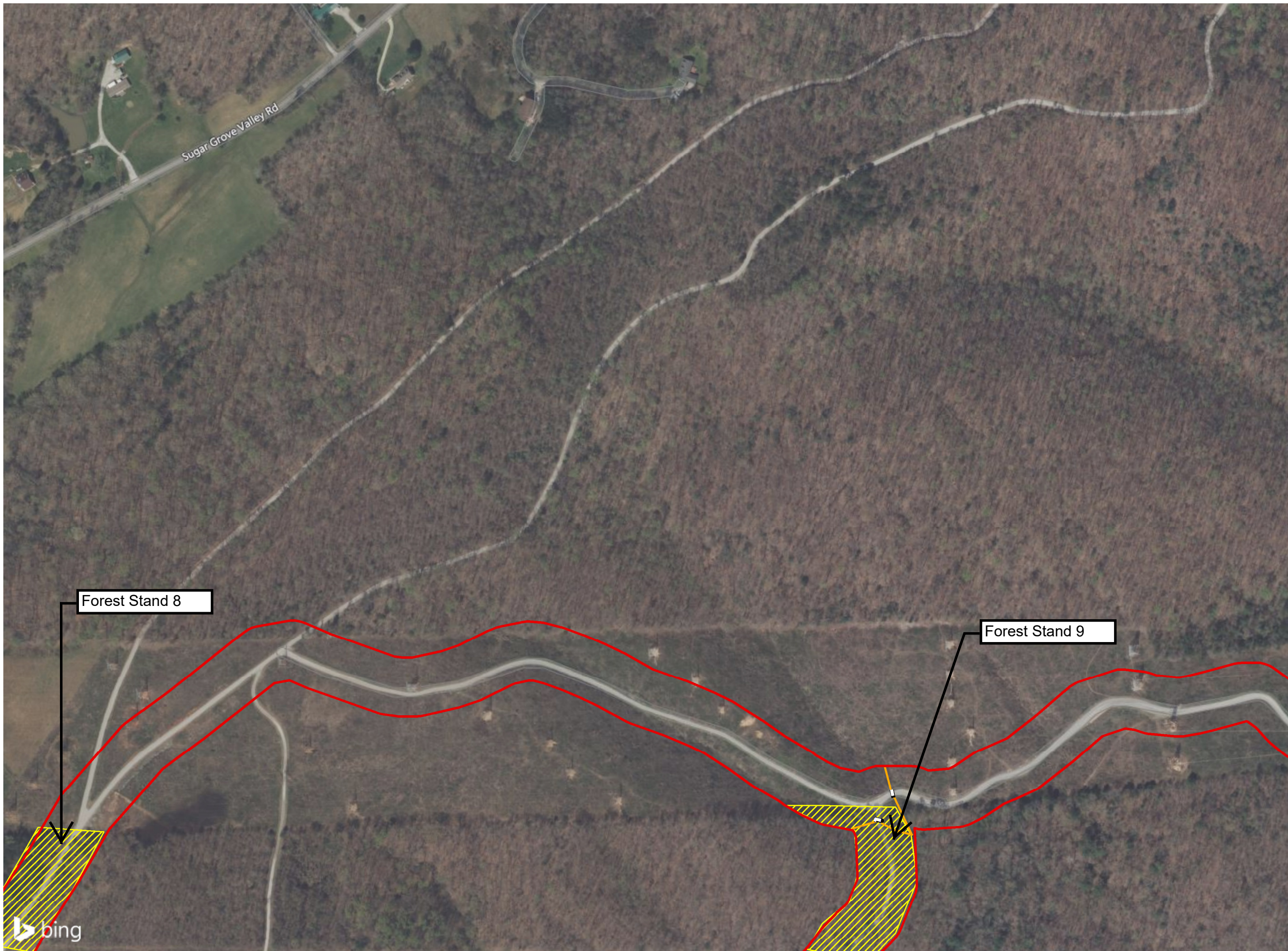
KINGSTON TRANSMISSION LINE - EAST

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



DATA SOURCE: Bing Hybrid Aerial Imagery



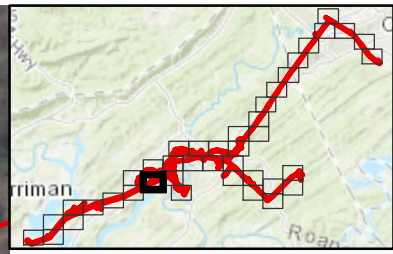
**KIINGSTON TRANSMISSION
LINE - EAST**

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







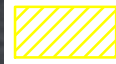










DATA SOURCE: Bing Hybrid Aerial Imagery



KINSTON 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

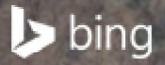
Forest Stand 9

Clinch

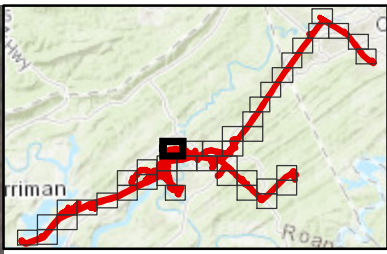
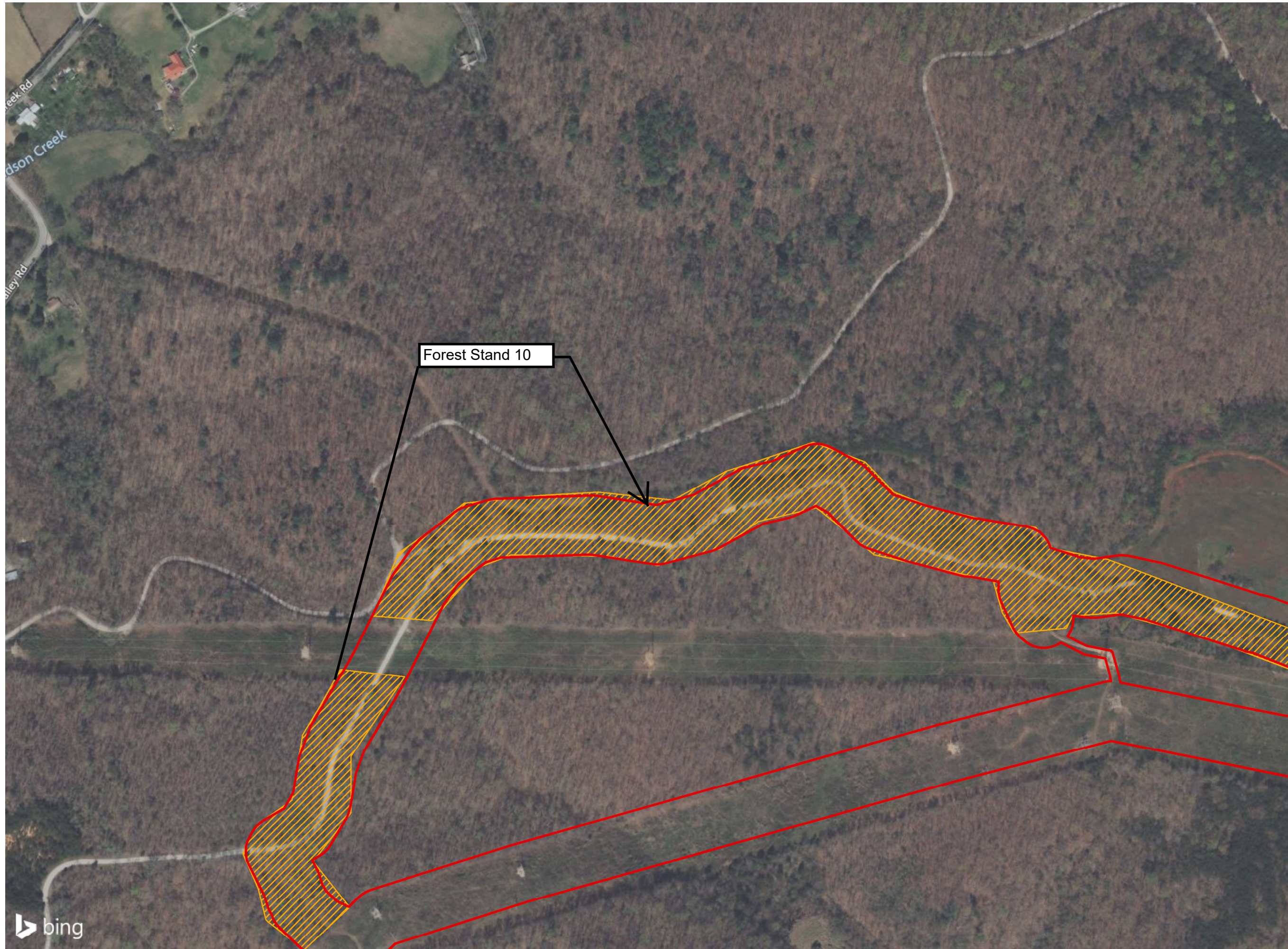
Clinch

McKinney Cemetery

Clinch



DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINE - EAST

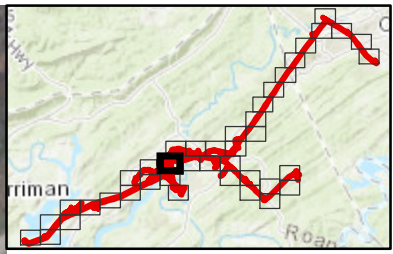
LEGEND

- 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







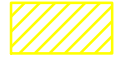










DATA SOURCE: Bing Hybrid Aerial Imagery



KINGSTON TRANSMISSION LINE - EAST

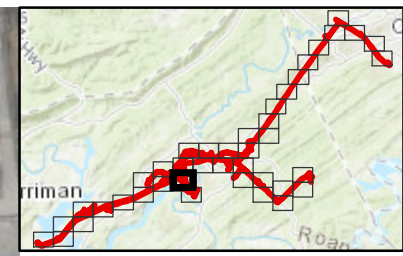
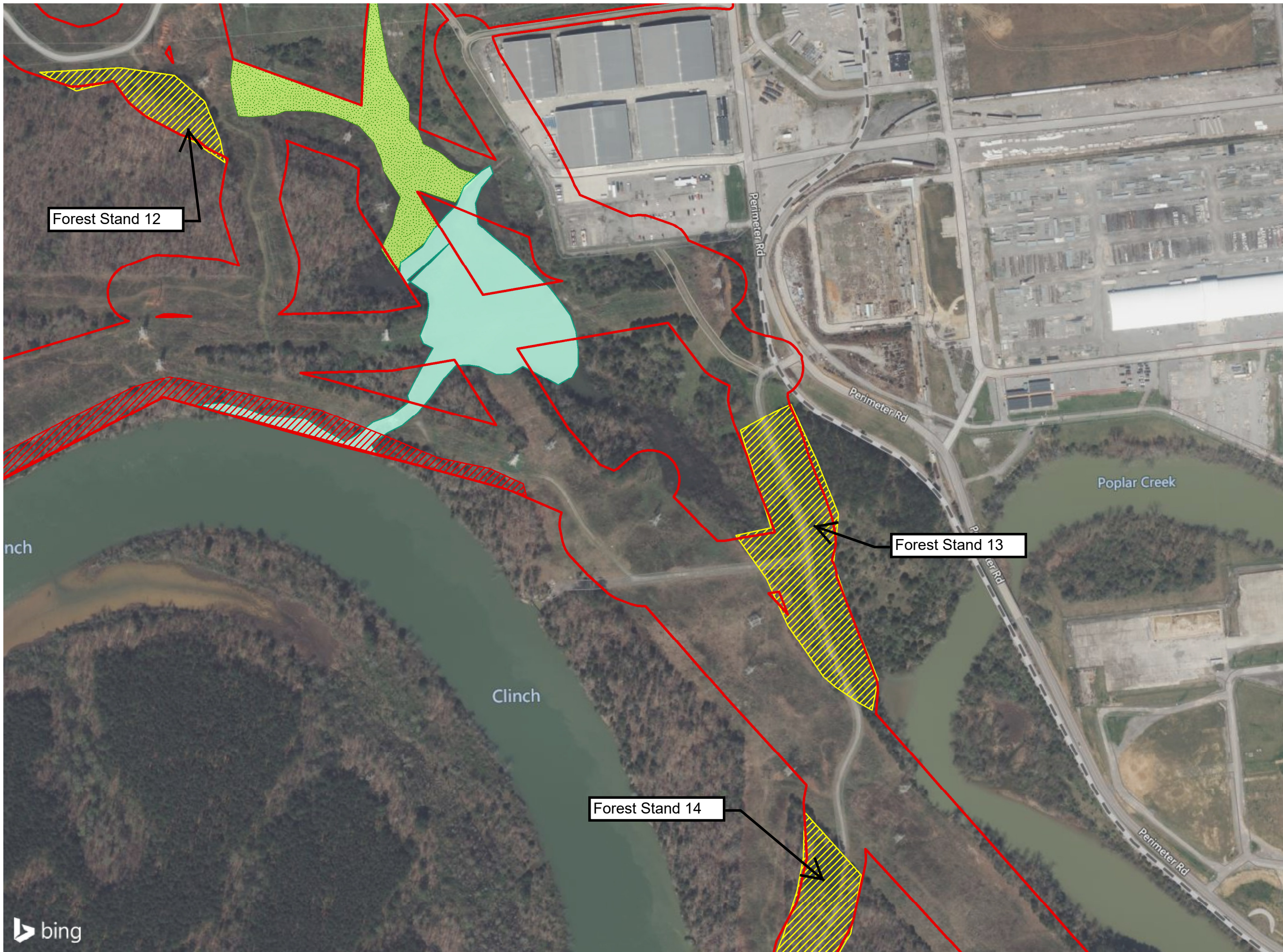
LEGEND

-  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 11



DATA SOURCE: Bing Hybrid Aerial Imagery



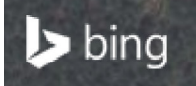
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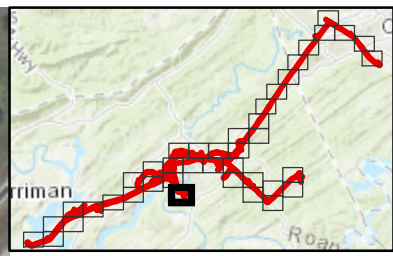
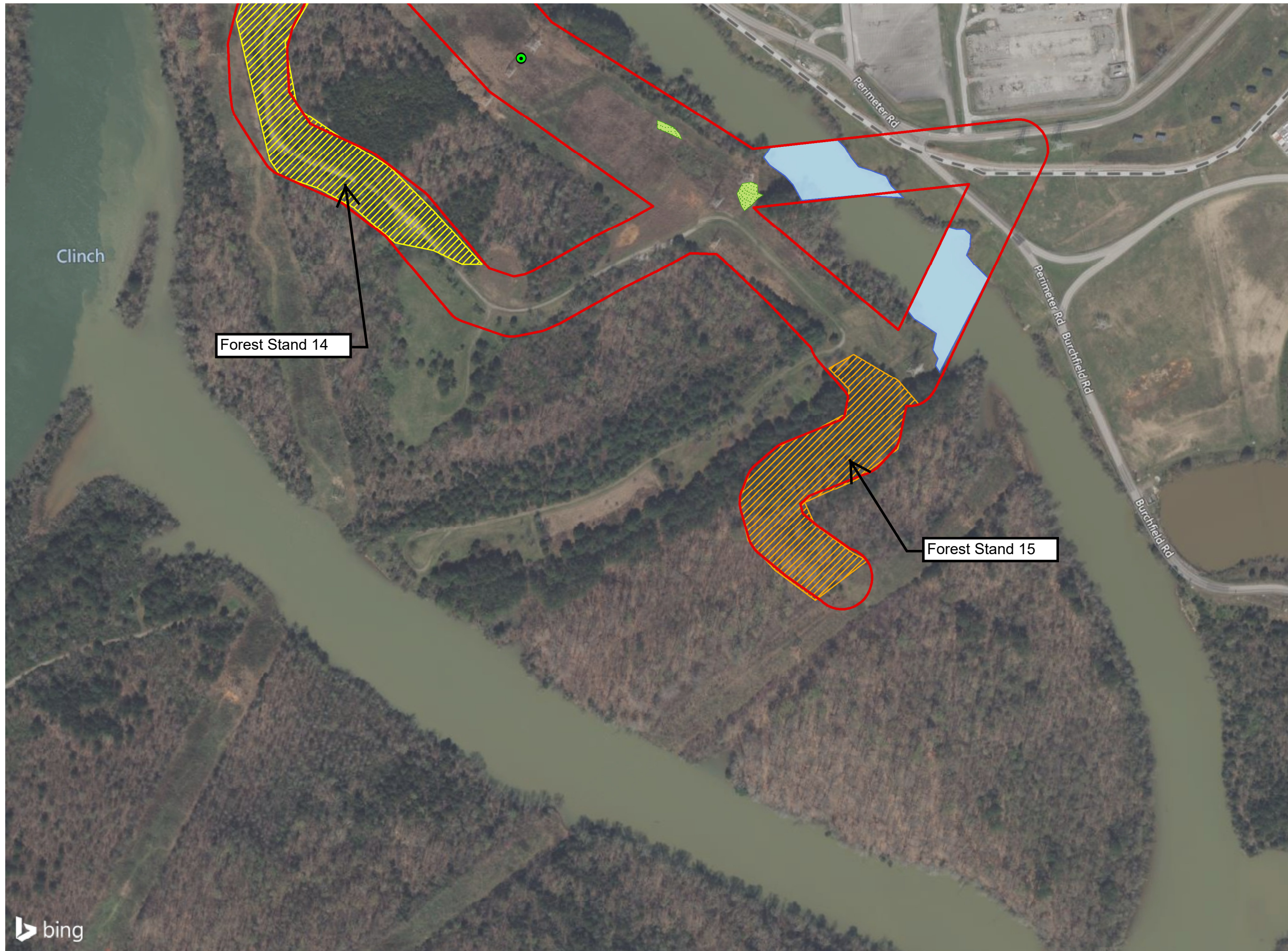
LEGEND

- 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

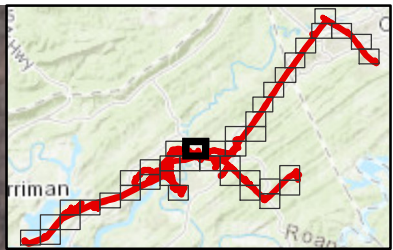
- Study Area
- Osprey
- ◉ Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated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

Forest Stand 14

Forest Stand 15















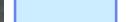


DATA SOURCE: Bing Hybrid Aerial Imagery



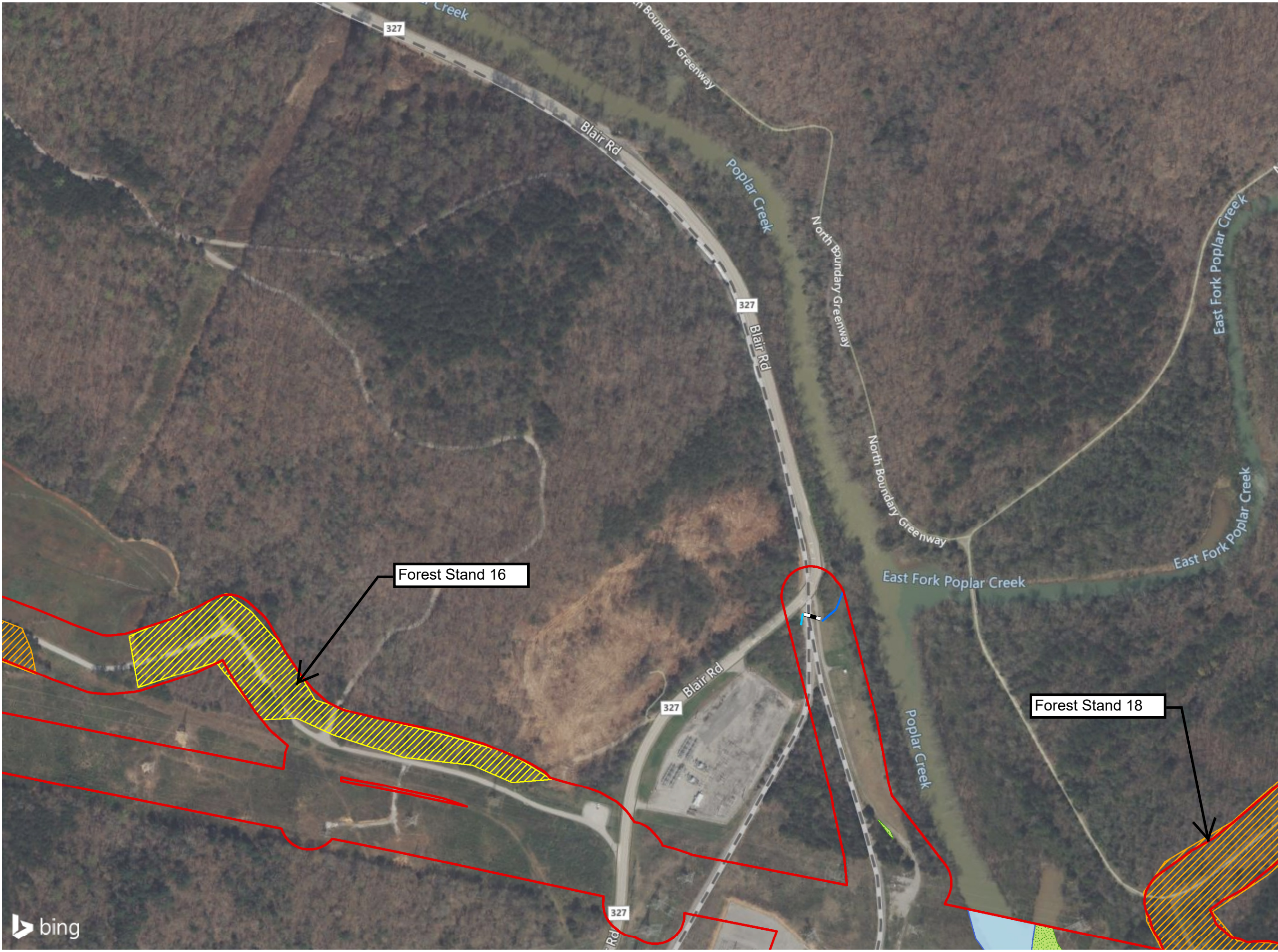
KINGSTON TRANSMISSION LINE - EAST

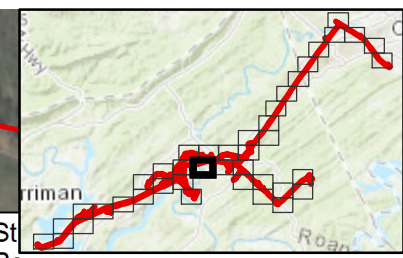
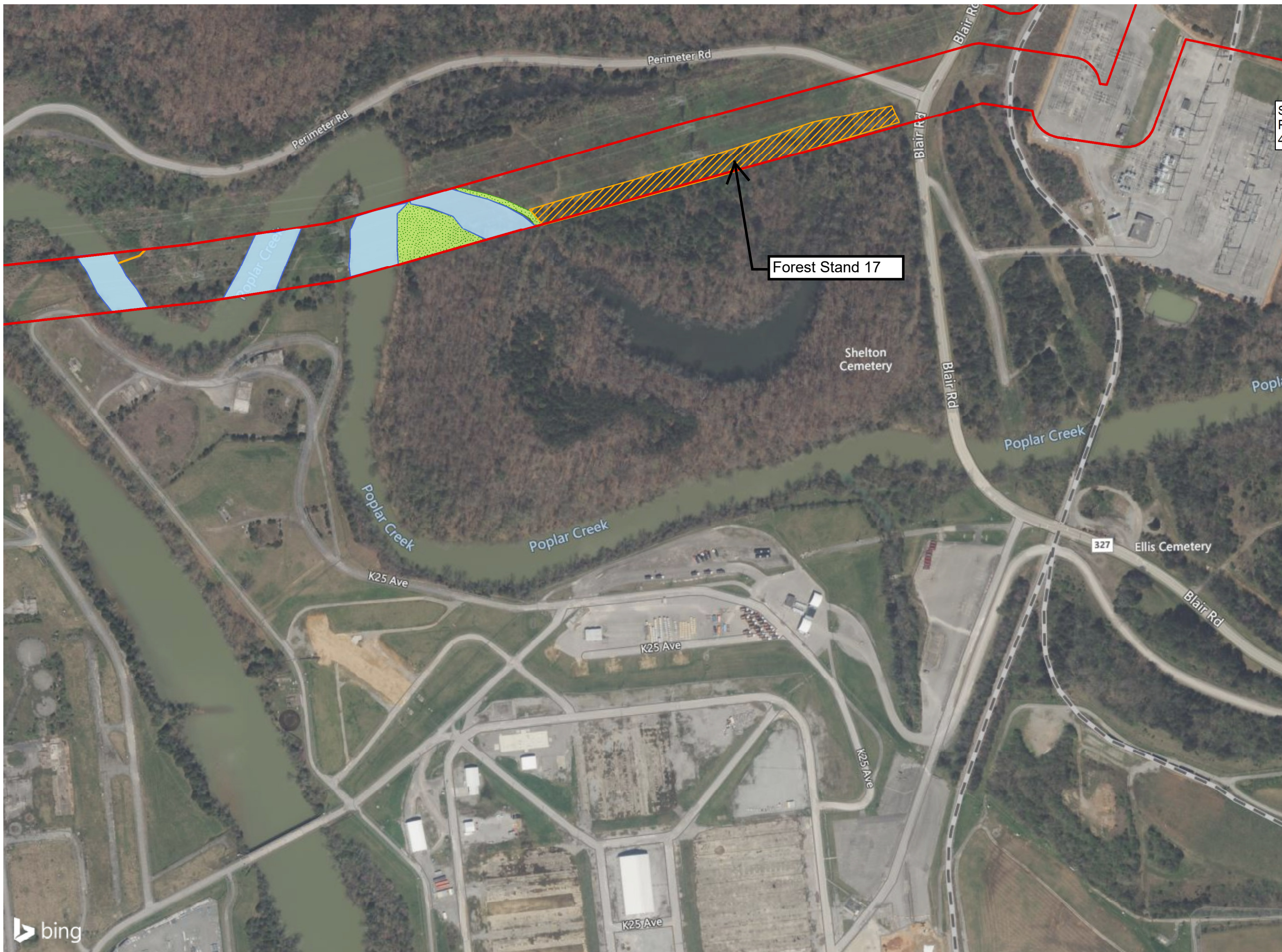
LEGEND

-  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





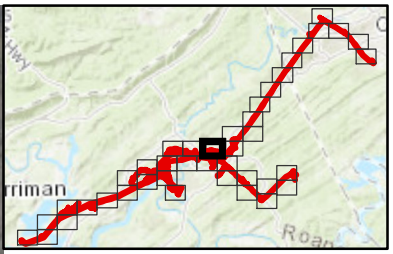
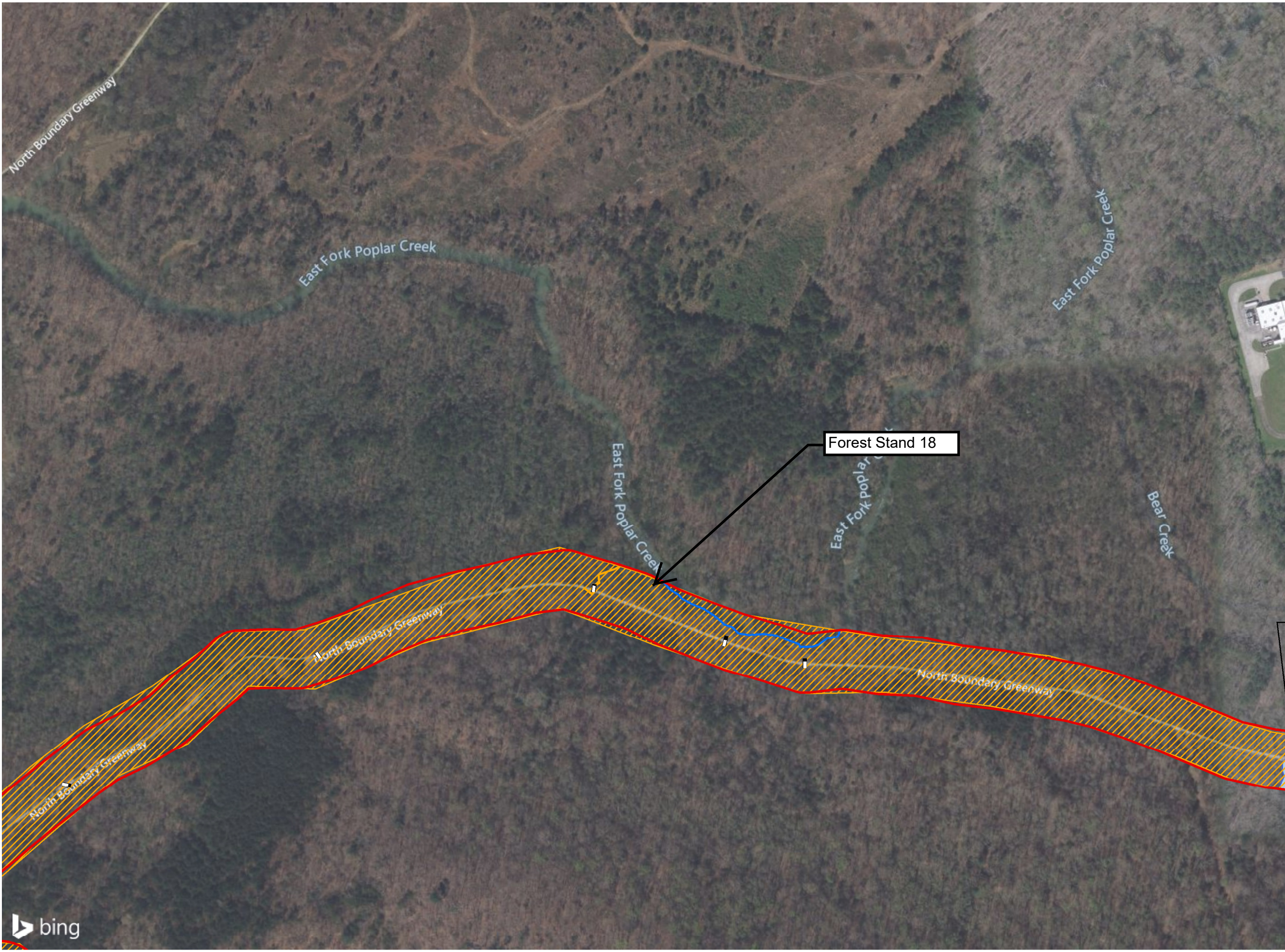
KINGSTON TRANSMISSION LINE - EAST

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



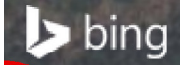
KINGSTON TRANSMISSION LINE - EAST

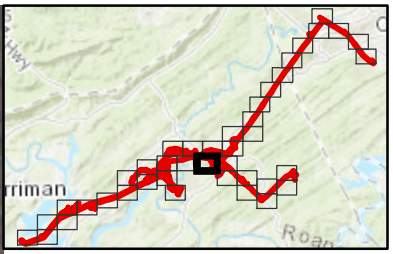
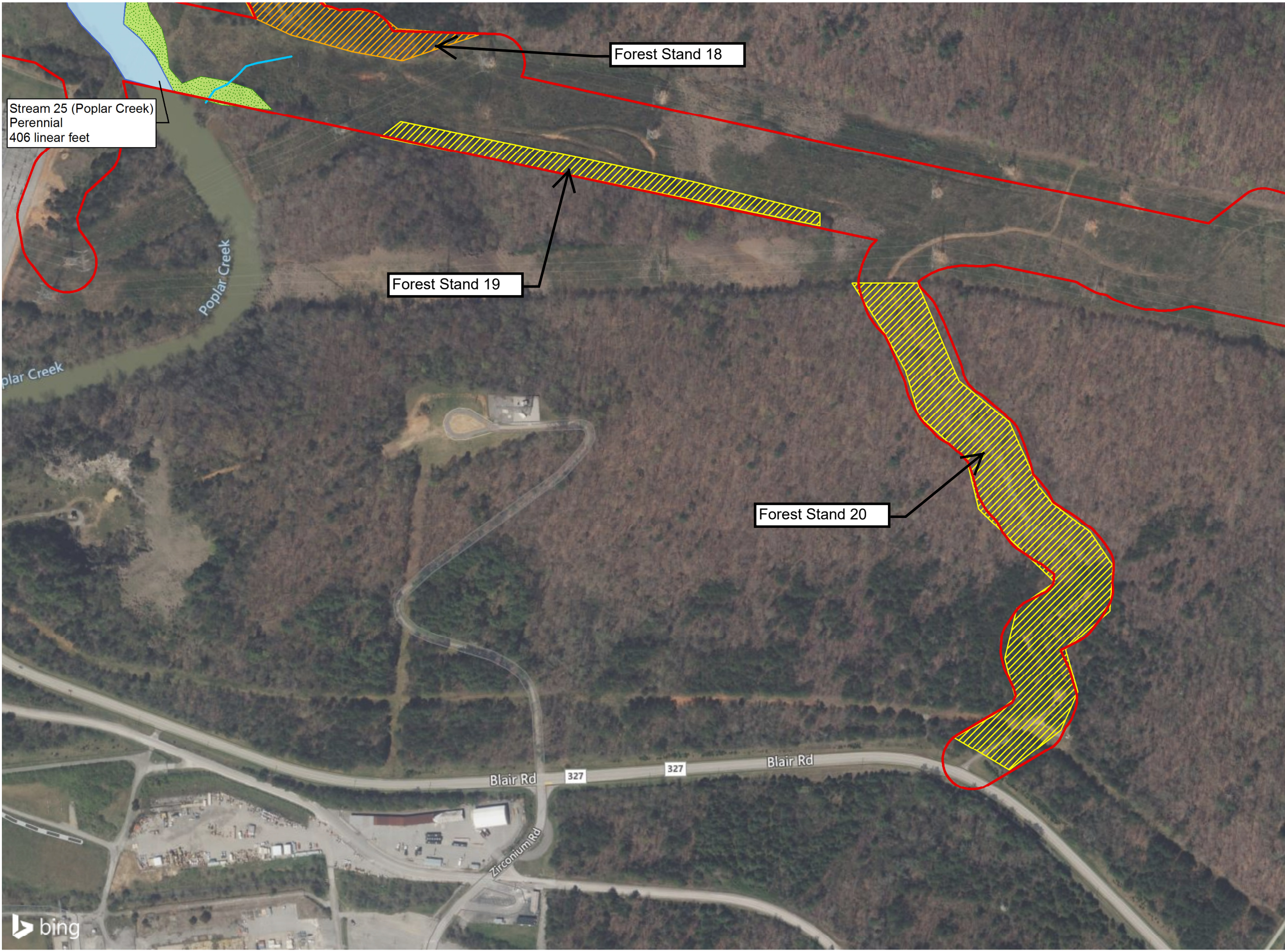
LEGEND

- 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





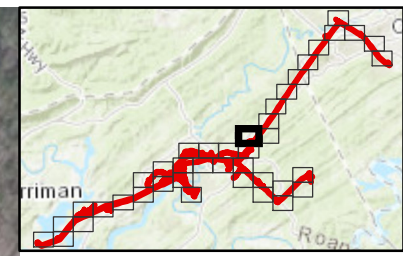
KINGSTON TRANSMISSION LINE - EAST

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



DATA SOURCE: Bing Hybrid Aerial Imagery



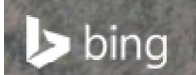
**KIINGSTON TRANSMISSION
LINE - EAST**

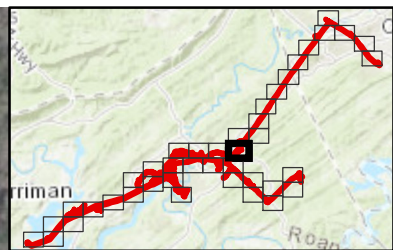
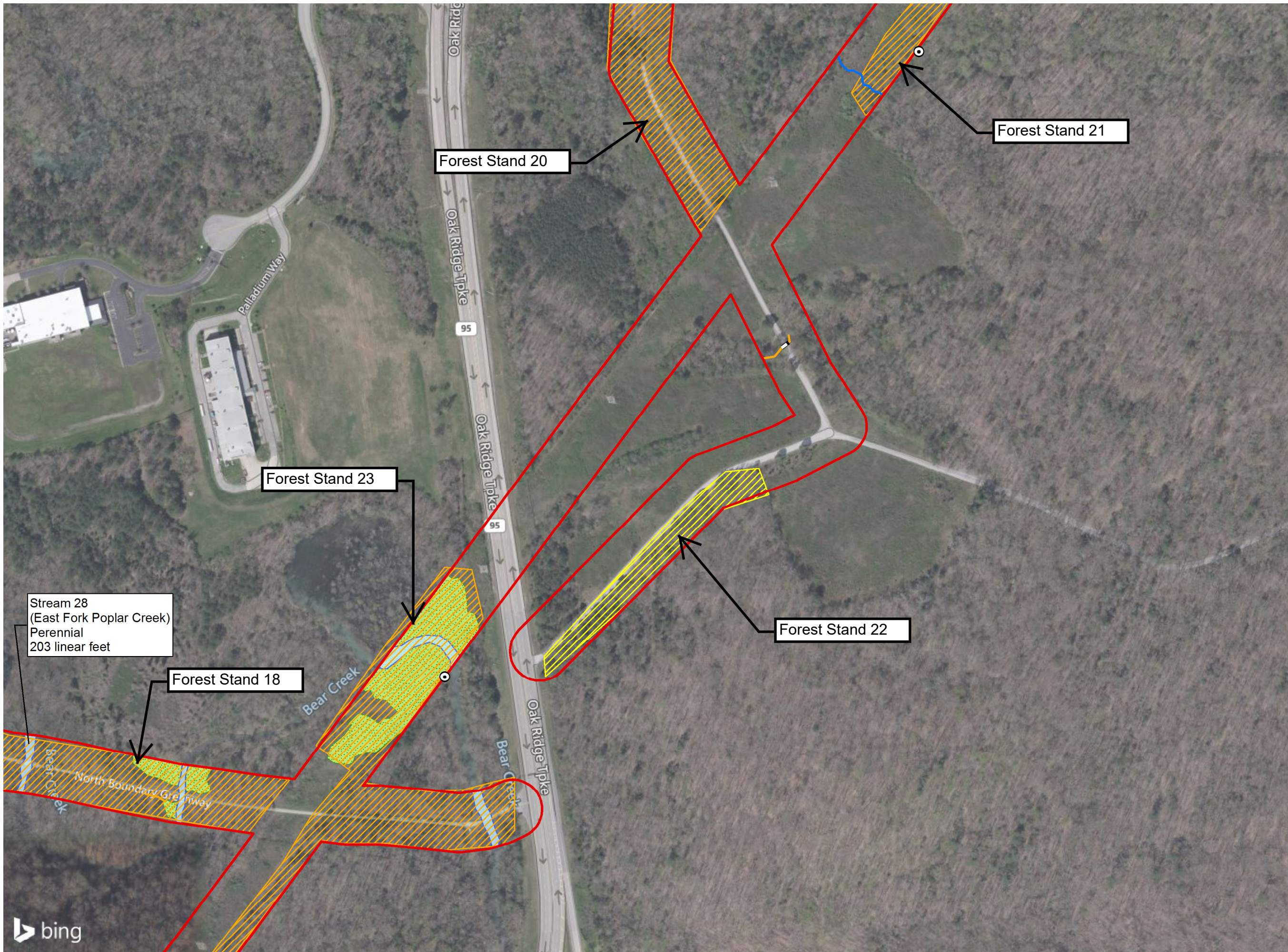
LEGEND

- 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

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

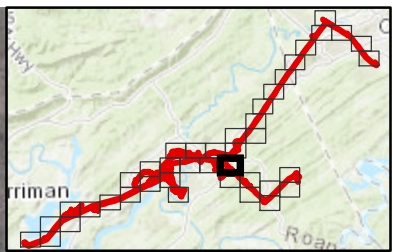
Forest Stand 18

Forest Stand 20

Forest Stand 21

Forest Stand 22

Forest Stand 23



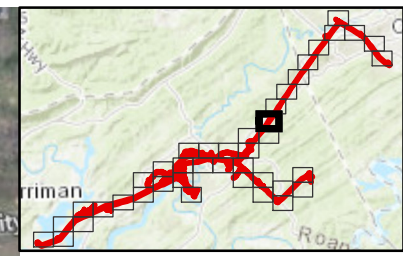
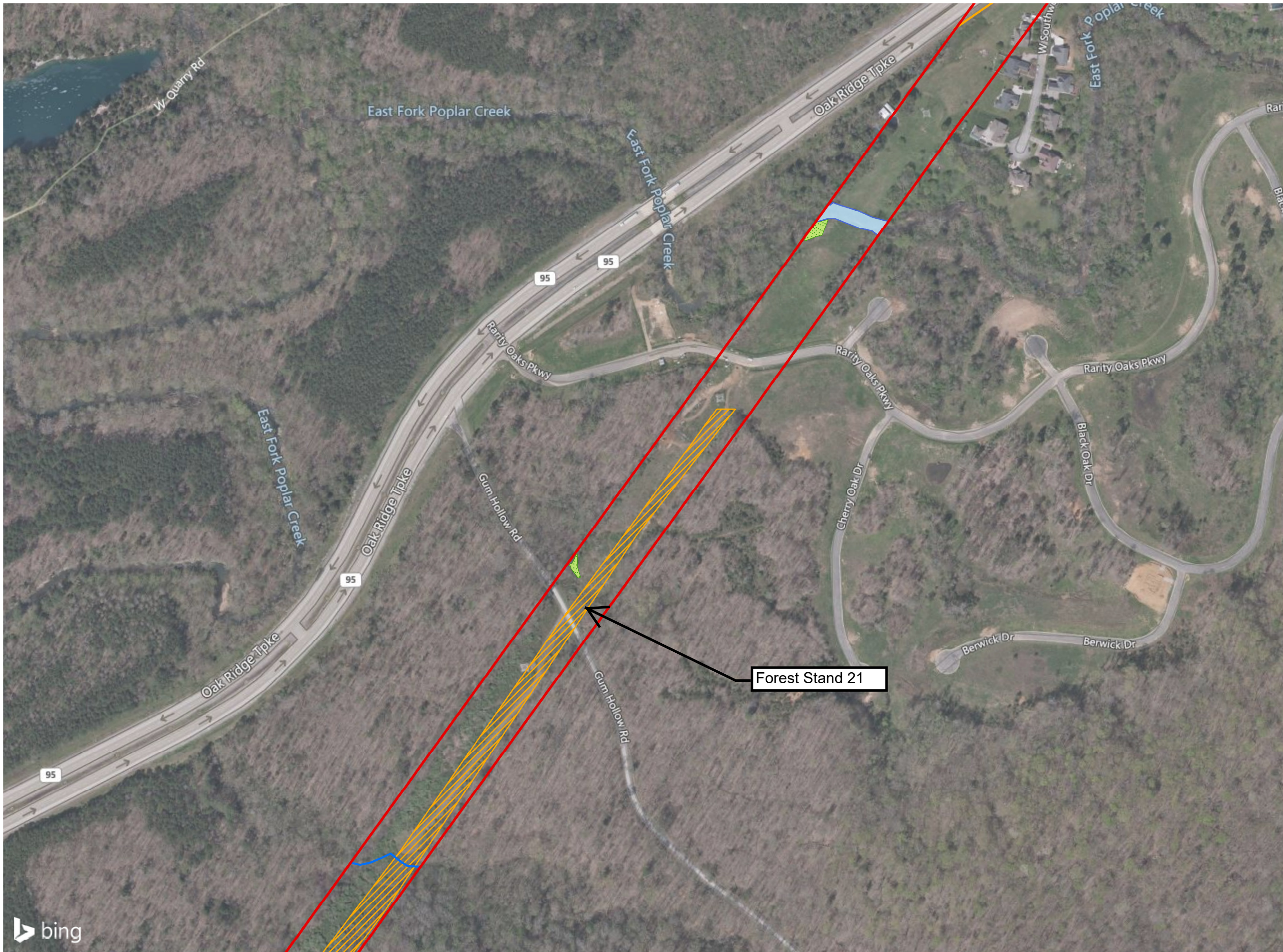
KIINGSTON TRANSMISSION LINE - EAST

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

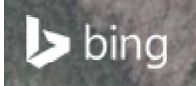
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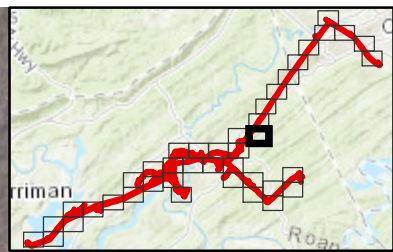
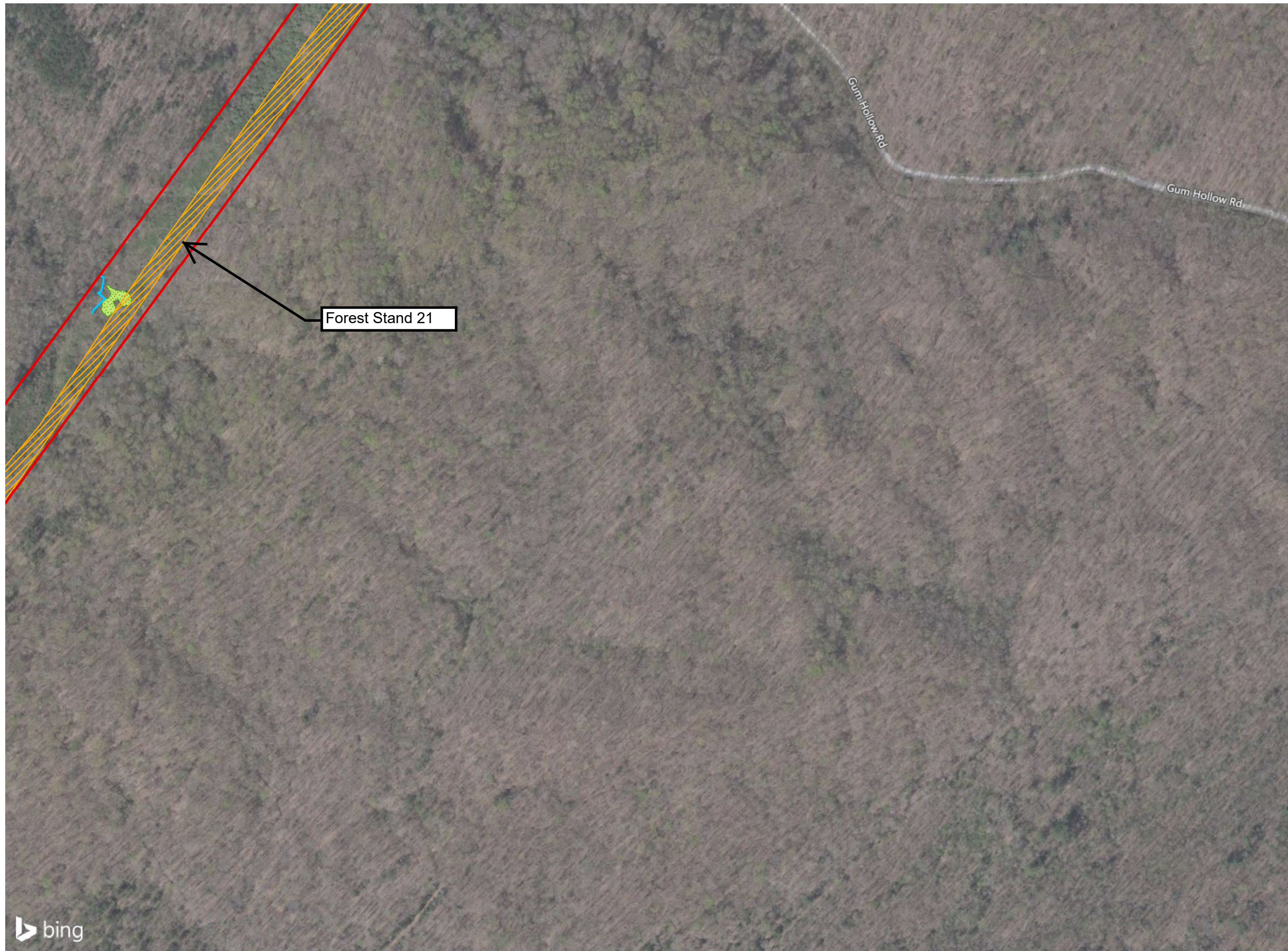
- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated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

Forest Stand 21



DATA SOURCE: Bing Hybrid Aerial Imagery





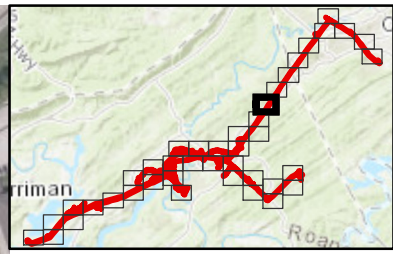
KINGSTON TRANSMISSION LINE - EAST

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














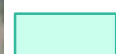



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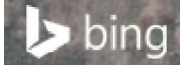
KIINGSTON TRANSMISSION LINE - EAST

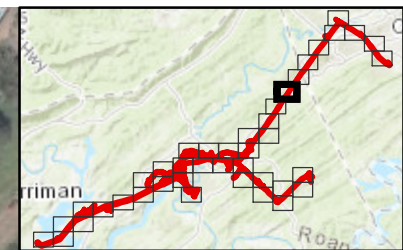
LEGEND

-  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





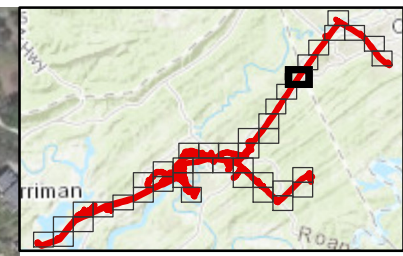
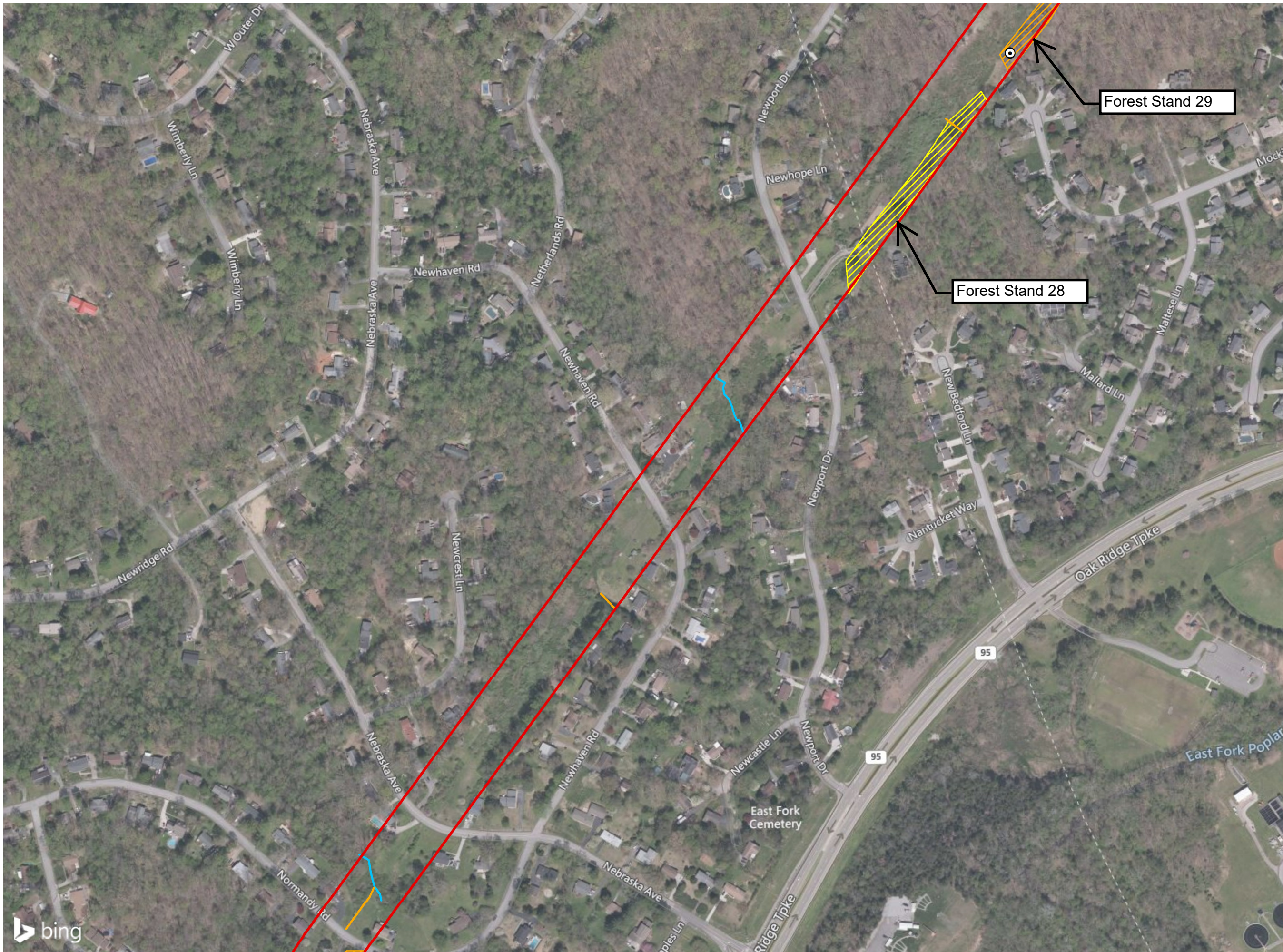
KINGSTON TRANSMISSION LINE - EAST

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

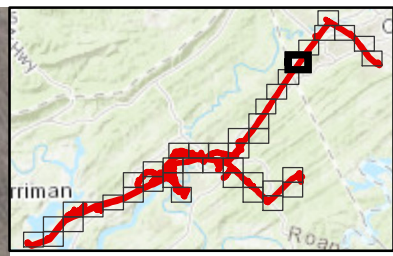
LEGEND

- 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





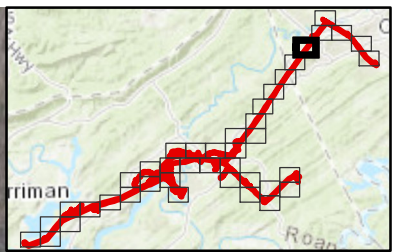
KINGSTON TRANSMISSION LINE - EAST

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



DATA SOURCE: Bing Hybrid Aerial Imagery



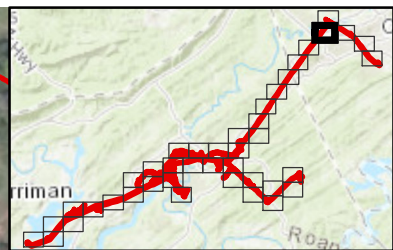
KIINGSTON TRANSMISSION LINE - EAST

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

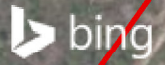
LEGEND

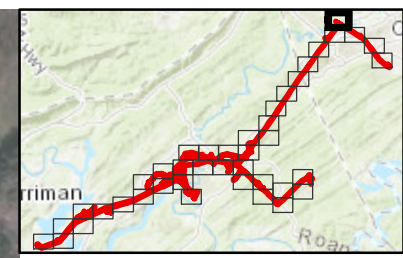
- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated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

Forest Stand 34



DATA SOURCE: Bing Hybrid Aerial Imagery





KINGSTON TRANSMISSION LINE - EAST

LEGEND

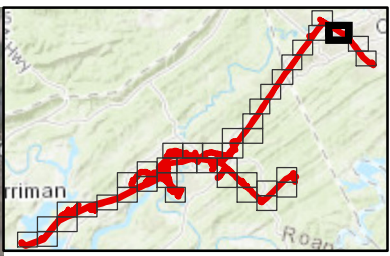
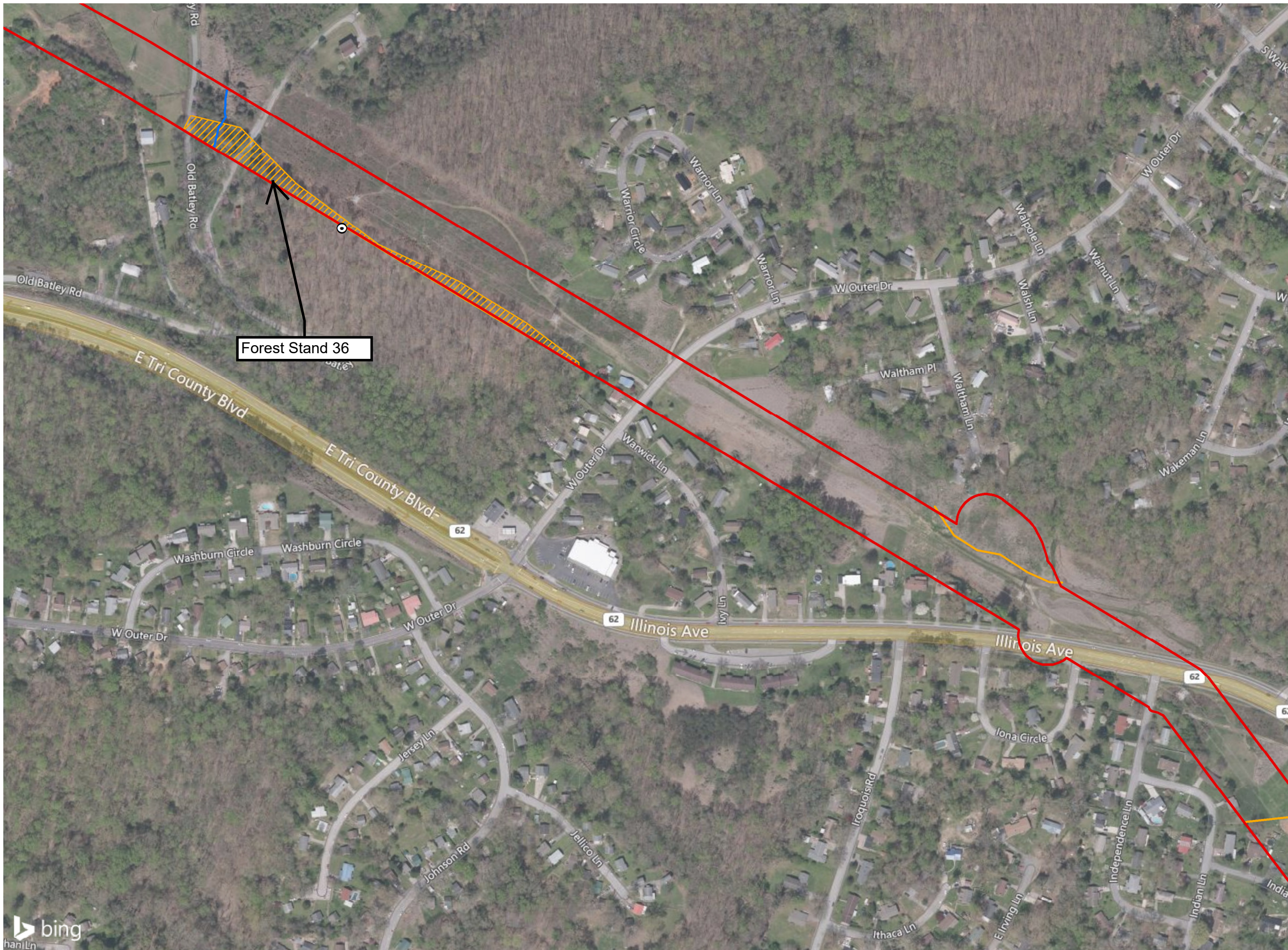
- Study Area
- Osprey
- Milkweed Patch
- Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated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

Forest Stand 35



DATA SOURCE: Bing Hybrid Aerial Imagery





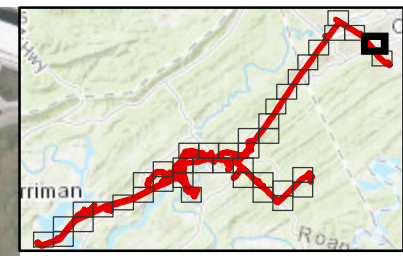
KINGSTON TRANSMISSION LINE - EAST

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



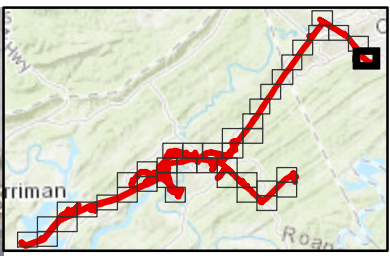
KINGSTON TRANSMISSION LINE - EAST

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



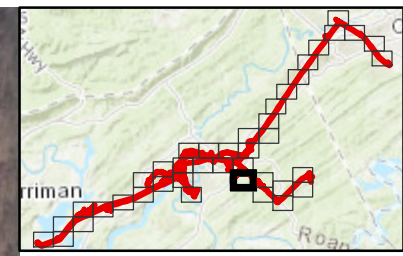
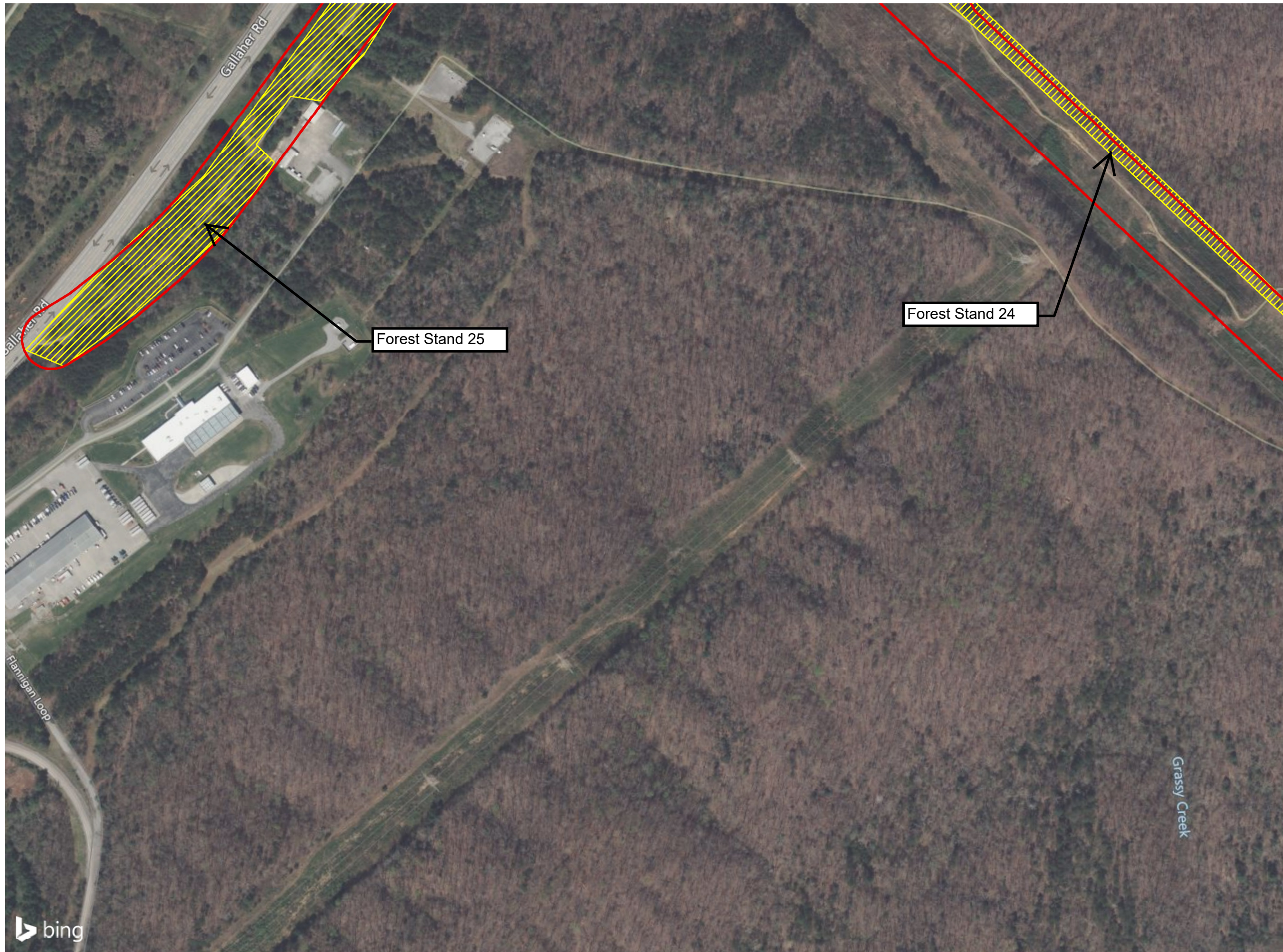
KINGSTON TRANSMISSION LINE - EAST

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



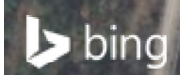
KIINGSTON TRANSMISSION LINE - EAST

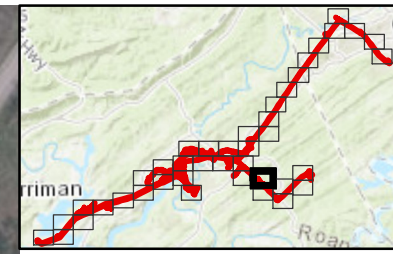
LEGEND

- 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

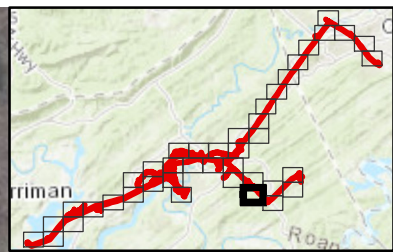
Forest Stand 24

Forest Stand 37

Bear Creek Rd

Bear Creek Rd

Bear Creek Rd



**KIINGSTON TRANSMISSION
LINE - EAST**

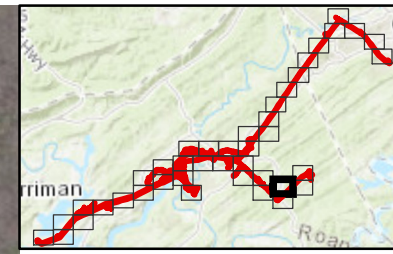
LEGEND

- 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 37



DATA SOURCE: Bing Hybrid Aerial Imagery



KIINGSTON TRANSMISSION LINE - EAST

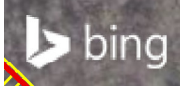
LEGEND

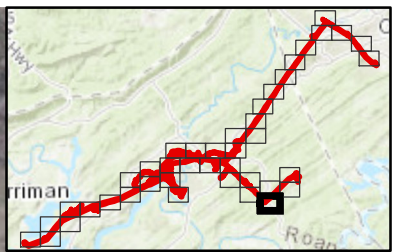
- Study Area
- Osprey
- Milkweed Patch
- ⊙ Snags
- High Quality Bat Habitat
- Moderate Quality Bat Habitat
- Low Quality Bat Habitat
- Culvert
- Delineated Perennial Stream
- Delineated Intermittent Streams
- Wet Weather Conveyance
- Delineated Perennial Stream
- Wet Weather Conveyance
- HDR Delineated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

Forest Stand 38



DATA SOURCE: Bing Hybrid Aerial Imagery





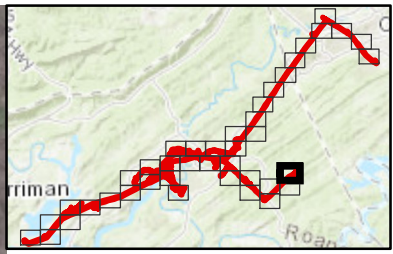
KINGSTON TRANSMISSION LINE - EAST

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













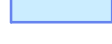




DATA SOURCE: Bing Hybrid Aerial Imagery



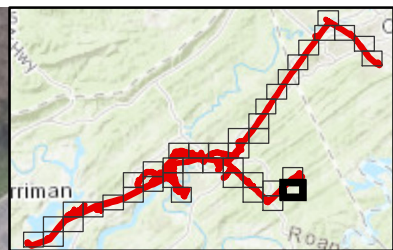
**KIINGSTON TRANSMISSION
LINE - EAST**

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



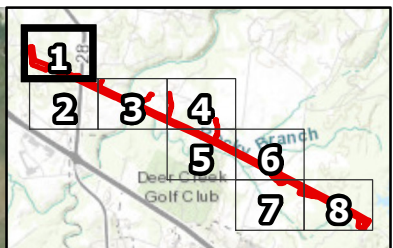
KIINGSTON TRANSMISSION LINE - EAST

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



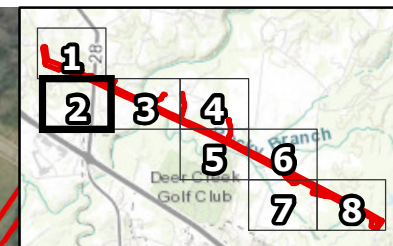
KINGSTON TRANSMISSION LINE - WEST

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



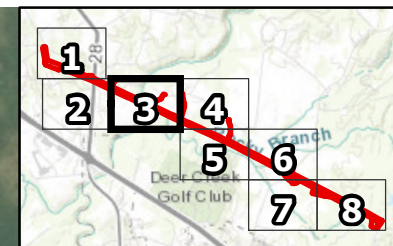
KINGSTON TRANSMISSION LINE - WEST

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



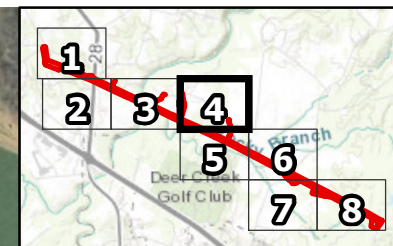
KINGSTON TRANSMISSION LINE - WEST

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



DATA SOURCE: Bing Hybrid Aerial Imagery



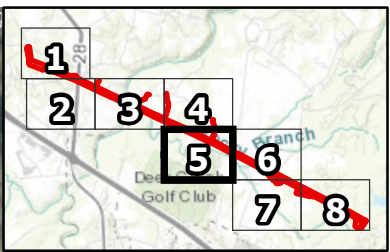
KINGSTON TRANSMISSION LINE - WEST

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



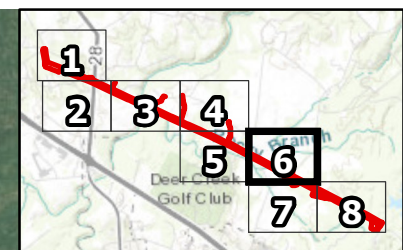
KIINGSTON TRANSMISSION LINE - WEST

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



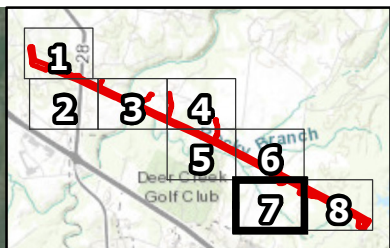
KIINGSTON TRANSMISSION LINE - WEST

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



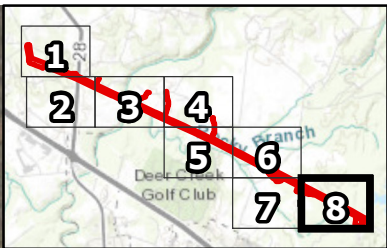
KINGSTON TRANSMISSION LINE - WEST

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

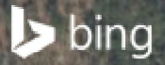
Forest Stand 3



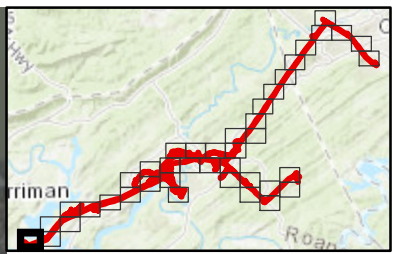
Potter Creek

Potter Creek

Walton Rd



DATA SOURCE: Bing Hybrid Aerial Imagery



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