Appendix B

Environmental Surveys and Correspondence

(B) Ecology

(B.1.) Ellijay- Rountop – Phase I USACE Carters Lake (P79427) 230kV Transmission Line-Environmental Survey Results Western Alternative Wetland and Ecological Consultants (October 11, 2011)

(B.2.) Survey for Istroia medeoloides (Small Whorled Pogonia) Along Ellijay Roundtop 230kV Transmission Line project Site: Gilmer County, Georgia Atlanta Botanical Garden (July 10-11, 2013)

(B.3.) USFWS letter- September 8, 2011

(B.4.) Ellijay- Rountop – Phase I USACE Carters Lake (P79427) 230kV Transmission Line-Environmental Survey Results Eastern Alternative Corblu Consultants (July 22, 2014)

(B.5.) Biological Evaluation (Bat Surveys) Ellijay –Roundtop T/L and Roundtop SS, Ellijay Gilmer County, Georgia, Terracon Consultants, (August 15, 2014)

(B.1.) Ellijay- Rountop – Phase I USACE Carters Lake (P79427) 230kV Transmission Line- Environmental Survey Results Western Alternative Wetland and Ecological Consultants (October 11, 2011)

WETLAND & ECOLOGICAL CONSULTANTS, LLC
MEMORANDUM

TO: **Ted Hicks, *Environmental Specialist II***
Georgia Transmission Corporation

FROM: **Shanna Cahill – Project Ecologist and**
Richard W. Whiteside, Ph.D., C.W.B., C.S.E. – Managing Member,
Wetland & Ecological Consultants

DATE: **October 11, 2011**

SUBJECT: **Ellijay Roundtop – Phase I - USACE Carters Lake (P79427) 230kV Transmission Line – Environmental Survey Results**

Wetland & Ecological Consultants (WEC) completed a jurisdictional waters delineation and threatened and endangered species (T&E) survey for Georgia Transmission Corporation (GTC) within the U.S. Army Corps of Engineers' (USACE) Carters Lake section of the proposed 230kV transmission line located in Gilmer County, GA on September 29-30, 2011. The survey corridor was limited to USACE properties, extending approximately 2 miles of a proposed new right-of-way (ROW) on either side (100 to 300 feet) of the surveyed and staked centerline of the proposed transmission line. The USACE property for this portion of the proposed ROW begins south of Tails Creek Road and terminates south of Carters Lake and north of Oak Hill Road, and also includes two access roads outside of the proposed project corridor (Figure 1). The survey of the project area was completed to support Phase I of the Ellijay Roundtop USACE Carters Lake (P79427) 230kV transmission line.

Methodology

In advance of the field delineation and T&E survey, in-house research was conducted using a combination of available resources, to include a list of federal and state listed species known to occur within the project area and vicinity and their preferred habitat using the U.S. Fish and Wildlife Service (USFWS) and Georgia Department of Natural Resources (GDNR) websites[1] (Table 1). Prior to the jurisdictional waters field delineation, the following resources were evaluated: 1) U.S. Geologic Survey 7.5-minute quadrangle topographic maps; 2) USFWS, National Wetland Inventory (NWI) maps; and 3) maps provided by GTC.

All habitats within the survey area were evaluated and visually inspected to determine the presence/absence of T&E species and their preferred habitat. The jurisdictional waters field delineation was completed using the Routine On-Site Determination Method as defined in the USACE 1987 Wetlands Delineation Manual[2] and regional supplement for the Eastern

[1] http://www.fws.gov/endangered/ and http://www.georgiawildlife.com/node/1370 , respectively.

[2] Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual. U.S. Army Corps of Engineers, Washington D.C.* 100 pp. plus appendices.

Mountains and Piedmont Region[3]. This technique uses a multi-parameter approach, which requires positive evidence of three criteria:

- Hydrophytic vegetation
- Hydric soil
- Wetland hydrology

Any areas exhibiting the above three wetland characteristics, as well as ponds, lakes, streams, and tributary systems, were considered jurisdictional waters regulated by the USACE. Jurisdictional wetland boundaries were marked in the field with pink flagging. The jurisdictional boundaries were then surveyed with our mapping grade (i.e. sub-meter accuracy) Trimble® Pathfinder® Pro XH Global Positioning System (GPS). Please note that Federal and State jurisdictional water boundaries identified in the field are not official until verified by the USACE (i.e., waters of the U.S.) and the Local Issuing Authority (LIA), respectively.

Results

Jurisdictional Water Features

During the field delineation, WEC personnel observed one perennial stream (Tails Creek, JWat 2; Photograph No. 1), four intermittent streams (JWat1, JWat 3, JWat 4 and JWat 6; Photograph Nos. 2-5) and one open water area (Carters Lake, JWat 5; Photograph No. 6) within the survey area (Figure 2). Photographs of each of these features are provided.

Other Features

WEC personnel also observed corrugated metal pipe roadway drainage culverts on the access road located within the northern portion of the project corridor (Photograph No. 7).

Protected Species

An observed upland oak-hickory-pine forest along the northern access road within the project corridor may provide suitable habitat for the Georgia aster (*Symphyotrichum georgianum*). The Georgia aster begins to bloom in early fall and continue into mid fall; therefore, was in bloom at the time of the survey. No Georgia asters were observed during the survey. Lower slopes with chestnut oak, red maple, hemlock, and white pine were observed in the mid-northern portion of the project corridor and may provide suitable habitat for the small whorled pogonia (*Isotria medeoloides*), which flower from April to May. Additionally, two areas with mixed pine, chestnut oak and dominated by rhododendron were observed south of Tails Creek (JWat 2) and south of Carters Lake (JWat 5) and may provide suitable habitat for the sweet pinesap (*Monotropsis odorata*) flowers from February to April therefore would not have been in bloom at the time of the survey. None of these terrestrial species listed above were observed during the field survey. It is noted that the survey was conducted in the non-flowering period for the small whorled

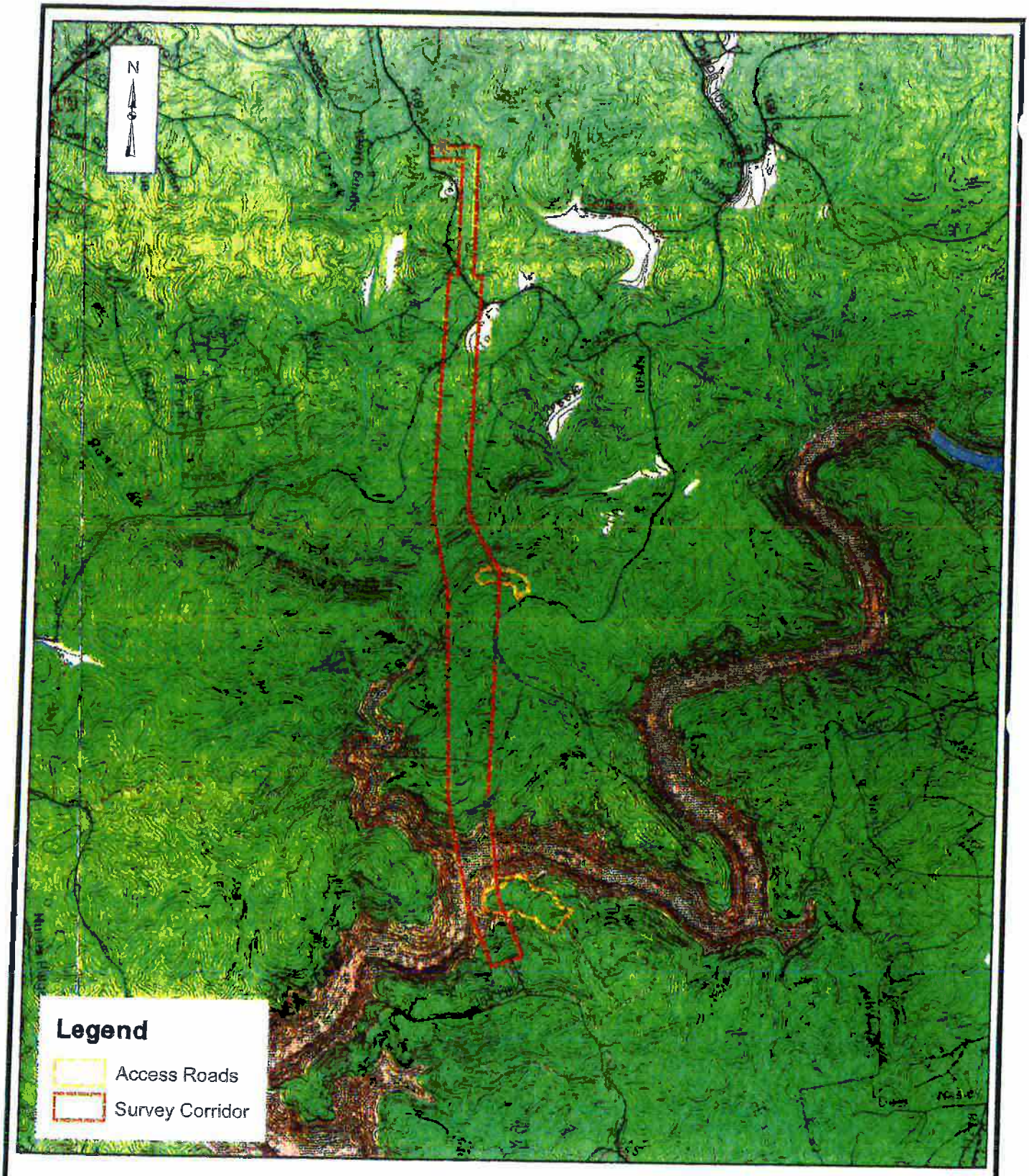
[3] U.S. Army Corps of Engineers. 2008. *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region, ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-30. Vicksburg MS: U.S. Army Engineer Research and Development Center.* 159 pp. plus appendices.

pogonia and the sweet pinesap, but there are no records for these species in the quarter quad (southwest quarter quadrangle of the Webb, GA; U.S. Geological Survey 7.5 minute quadrangle map); therefore, these species are not known or expected to occur within the surveyed area.

Tails Creek (JWat 2) has the potential to contain the aquatic T&E species listed in Table 1; however, it is not anticipated that this project will impact this jurisdictional feature. It is noted that all the streams except the open water (JWat 5) in Gilmer County downstream from the Georgia Highway 5 Bridge are classified as secondary trout streams, by the GDNR, which typically requires a 50 foot riparian stream buffer. An aquatic survey of the habitat was not conducted as part of this survey, as impacts to these habitat features are expected to be avoided by an aerial transmission line.

Boundaries of jurisdictional waters of the U.S. have not been verified by the USACE. We recommend regulatory verification prior to the proposed (P79427) 230kV transmission line if impacts to these features are possible. WEC can assist GTC in the preparation and submittal of any required permit applications for impacts to jurisdictional waters if needed and requested.

If you have any question regarding the information provided in this memorandum, please contact Richard Whiteside or Shanna Cahill at (770) 591-9990.



Base Map: USGS 7.5-Minute Topographic Quadrangel of Webb, GA.

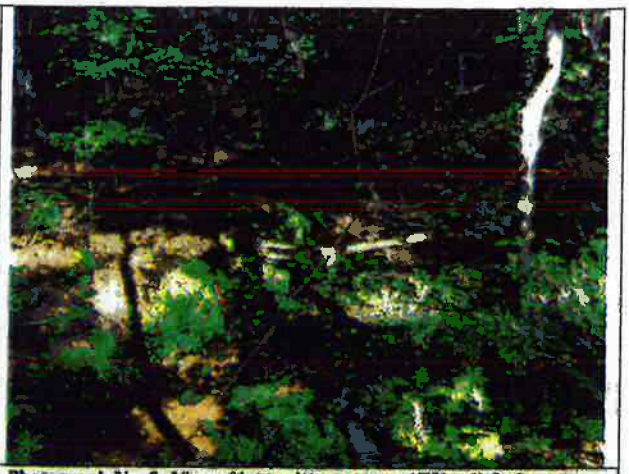
Georgia Transmission Corporation Ellijay Roundtop 230kV Transmission Line Gilmer County, Georgia	WETLAND & ECOLOGICAL CONSULTANTS, LLC Woodstock, Georgia	Figure 1 Site Location Map WEC Project No.02-091407-01

Base Map Source: USDA NAIP Gilmer County, GA, 2009.

1:17,000

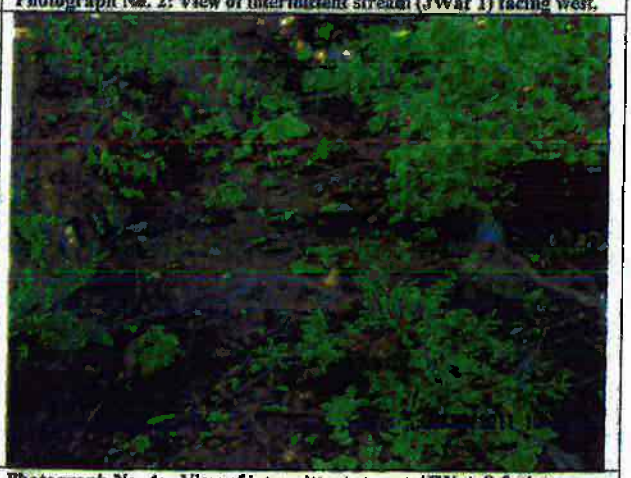
GTC Ellijay Roundtop – Phase I USACE CORPS Carters Lake 230kV Transmission Line Gilmer County, Georgia	WETLAND & ECOLOGICAL CONSULTANTS, LLC Woodstock, Georgia	Figure 2 Jurisdictional Waters Map WEC Project No. 02-091407-01

Photograph No. 1: View of Tails Creek (JWat 2) facing east.



Photograph No. 2: View of intermittent stream (JWat 1) facing west.

Photograph No. 3: View of intermittent stream (JWat 3) facing west.



Photograph No. 4: View of intermittent stream (JWat 4) facing northeast.

Photograph No. 5: View of intermittent stream (JWat 6) facing east.

Photograph No. 6: View of Carter Lake (JWat 5) facing west.

Photograph No. 7: View of culvert on northern access road facing north.

Table 1: Protected animal and plant species listed by USFWS and Georgia Department of Natural Resources as potentially occurring in Gilmer County.

Species Name (*Scientific Name*)	Federal Status[1]	State Status[2]	Preferred Habitat	Habitat Available in Project Area	Known to Occur in Project Area Quarter-Quad[3]
INVERTEBRATES					
Coosawattee Crayfish (*Cambarus coosawattae*)	G2	E/S1	Riffle habitats in the Coosawattee River system.	Unknown	Yes
Beautiful Crayfish (*Cambarus speciosus*)	G2	E/S2	Medium-sized streams with clear water and moderate to swift current with rock-littered substrate	Unknown	Yes
FISHES					
Blue shiner (*Cyprinella caerulea*)	LT/G2	E/S1	Medium to large clear cool streams with gravel-rubble-small boulder substrates; found in streams draining into the Coosa and Oostanaula Rivers.	Unknown	Yes
Holiday darter (*Etheostoma brevirostrum*)	G2	E/S2	Rocky streams in Coosa river system.	Unknown	Yes
Coosa Chub (*Macrhybopsis* sp. cf. *aestivalis*)	G3G4	E/S2	Medium to large clear streams in moderate current with substrate of gravel and cobble in the Tennesse and Cumberland river drainages.	Unknown	Yes

Table 1: Protected animal and plant species listed by USFWS and Georgia Department of Natural Resources[1] as potentially occurring in Gilmer County.

Species Name (*Scientific Name*)	Federal Status[1]	State Status[2]	Preferred Habitat	Habitat Available in Project Area	Known to Occur in Project Area Quarter-Quad[3]
Goldline darter (Percina aurolineata)	LT/G2	E/S1	Shallow, rocky riffles with swift current in medium sized rivers of the Cahaba and Coosawattee River systems.	Unknown	Yes
AMPHIBIANS					
Eastern hellbender (*Cryptobranchus alleganiensis*)	G3G4	T/S2	Clear, cool, and swiftly flowing streams with rocky bottoms; small streams may be inhabited, but those with widths greater than 5 m (16 ft) seem to provide more suitable conditions.	Yes	No
PLANTS					
Goldenseal (*Hydrastis canadensis*)	G4	E/S2	Moist, deciduous hardwood forests with neutral or basic soils over bedrock that is high in calcium or magnesium. Goldenseal thrives best under a somewhat patchily open canopy.	Unknown	No
Georgia Aster (*Symphyotrichum georgianum*)	G2G3	T/S2	Edges and openings in rocky, upland oak-hickory-pine forests, and rights-of-way through these habitats. Usually with circumneutral soils.	Yes	No

Table 1: Protected animal and plant species listed by USFWS and Georgia Department of Natural Resources[1] as potentially occurring in Gilmer County.

Species Name (*Scientific Name*)	**Federal Status**[1]	**State Status**[2]	**Preferred Habitat**	**Habitat Available in Project Area**	**Known to Occur in Project Area Quarter-Quad**[3]
Broadleaf Tickseed (*Coreopsis latifolia*)	G3	R/S1	Mesic hardwood forests over limestone.	Unknown	No
Pink Ladyslipper (*Cypripedium acaule*)	G5	U/S4	Mixed hardwood-hemlock forests.	Unknown	No
Small Whorled Pogonia (*Isotria medeoloides*)	LT/G2	T/S2	Rich woods and cove forests in the mountains.	Unknown	No
Sweet Pinesap (*Monotropsis odorata*)	G3	T/S1	Mixed hardwood-pine forests with open understory, history of nearby heavy logging, home site or road clearing activity.	Unknown	No
Green Pitcherplant (*Sarracenia oreophila*)	LE/G2	E/S1	Mesic hardwood forests over basic soils.	Unknown	No

Table 1: Protected animal and plant species listed by USFWS and Georgia Department of Natural Resources[1] as potentially occurring in Gilmer County.

Species Name (*Scientific Name*)	Federal Status[1]	State Status[2]	Preferred Habitat	Habitat Available in Project Area	Known to Occur in Project Area Quarter-Quad[3]
Starflower (*Trientalis borealis*)	G5	E/ S1S2	Dry open upland forests of mixed hardwood and pine.	Unknown	No

[1] Listed by the U.S. Fish and Wildlife Service, Region IV (Federal) database.

LE = listed as endangered, LT = listed as threatened,

G1 = critically imperiled globally, G2 = imperiled globally,

G3 = rare, G4 = apparently secure globally,

G5 = demonstrably secure globally

[2] Georgia Department of Natural Resources (State) Georgia Natural Heritage Program database

E = endangered, T = threatened, R = listed as rare

S1 = critically imperiled in state, S2 = imperiled in state,

S3 = rare or uncommon in state, S4 = apparently secure in state

Prepared by: SEC Date: 12/10/10

Checked by: MDH Date: 10/07/2011

[3] Based on the GDNR quarter-quad database.

Survey for *Isotria medeoloides* (Small Whorled Pogonia) along Ellijay Roundtop Road 230kV Transmission Line project site; Gilmer County, Georgia

Surveys conducted:

July 10-July 11 2013

Conducted and prepared by Matt Richards; Conservation Coordinator

The Atlanta Botanical Garden

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Atlanta, GA 30309

mrichards@atlantabotanicalgarden.org

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For:

Georgia Transmission Corporation

2100 East Exchange Place

Tucker, GA 30084

(B.2.) Survey for Istroia medeoloides (Small Whorled Pogonia) Along Ellijay Roundtop 230kV Transmission Line project Site: Gilmer County, Georgia Atlanta Botanical Garden (July 10-11, 2013)

Survey for *Isotria medeoloides* (Small Whorled Pogonia) along Ellijay Roundtop Road 230kV Transmission Line project site; Gilmer County, Georgia

Surveys conducted:

July 10-July 11 2013

Conducted and prepared by Matt Richards; Conservation Coordinator

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For:

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Tucker, GA 30084

Summary:

Georgia Transmission Corporation identified the need to survey for the federally threatened, Small Whorled Pogonia ((SWP) *Isotria medeoloides*) along the proposed Ellijay Roundtop Road 230kV Transmission line. Atlanta Botanical Garden was contracted to complete the survey as they have a great deal of experience in surveying for SWP in the past, working directly with USDA Forest Service conducting surveys, providing notes on habitat management, and conducting experimental propagation efforts. As the habitat for SWP occurs throughout this part of Gilmer County, surveys were to be slow and methodical. SWP's typical habitat is that of late successional mixed evergreen and deciduous hardwood forests. It is most typically associated with sloping ecotones along the fringes of jurisdictional wetlands, but also has been observed higher along ridges in more calcium rich soils. The purpose of this project is to determine the presence or absence of SWP along the project site and buffers. The large majority of wildland habitat along the project site and buffer included drier ridges with intermittent swales and a few small jurisdictional wetlands. **During these surveys, no populations of Small Whorled Pogonia were found along buffers and areas that would be impacted by the proposed 230kV Transmission Line site.**

Methods:

Surveys were conducted July 10 and July 11, 2013. The life cycle of this species allows for easy identification of individual plants should SWP be present. Though this species is never encountered in large population numbers, experienced botanists can confidently identify SWP from the time of flowering in late May, through the time of fruit dehiscence in October (Figure 1). In north Georgia, this species most often blooms in late May and early June. However, non-flowering stems sometimes continue to emerge when favored by moderate temperatures and above average rainfall as most of north Georgia has experienced this weather pattern through early summer of the survey season in 2013. Flowers are typically small and need not be present for identification. Given current and recent weather patterns, this survey was conducted well within the normal range of leaf/ fruit presence and would have made for easy identification if SWP occurred in the project area. Due to the small size of SWP, frequently low population census numbers, and the commonly encountered habitat type, we conducted surveys in east-west transects at approximated 20' intervals for the length of the proposed transmission line. Areas containing other habitat indicators for SWP were more methodically surveyed.

Figure 1: Large individual of *Isotria medeoloides* with fruit. This plant did not occur on the proposed Ellijay Roundtop Road 230kV Transmission line. Photo taken 6/21/2012.

Habitat Assessment

During the current survey, significant efforts were made to identify particular features that were commonly seen at known Small Whorled Pogonia sites. These included geological features, soil type, aspect, percent slope, proximity to streams or creeks, and associated canopy and herbaceous structures. *Isotria medeoloides* is most often found near the base of a late successional, mixed deciduous, hardwood and evergreen forested slope with an approximate estimated canopy age of approximately 35-50 years.

Forest Type:

Isotria medeoloides typically occurs in a late successional, even-aged, mixed deciduous hardwood and evergreen forest with an approximate estimated canopy age of 35-50 years. The most common associated canopy species includes, young oak and hickory species with the occasional beech (*Fagus grandifolia*), tulip-poplar (*Liriodendron tulipifera*), sourwood (*Oxydendron arboreum*), and sassafras (*Sassafras albidum*). Other typical canopy species include hemlock (*Tsuga canadensis*) and white and Virginia pines (*Pinus strobus* and *P. virginiana*). Young red maple (*Acer rubrum*) and sweet birch (*Betula lenta*) are also commonly associated with SWP. The pines and birch indicate a later successional nature of the sites. The mid-story is often dominated by the presence of mountain-laurel (*Kalmia latifolia*), white rosebay rhododendron (*Rhododendron maximum*), American holly (*Ilex opaca*), pagoda dogwood (*Cornus alternifolia*), young silverbell (*Halesia tetraptera*), buffalo-nut (*Pyrularia pubera*) and sweetshrub (*Calycanthus floridus*). Typical herbaceous species at all SWP sites include poison-ivy (*Toxicodendron radicans*), hearts a bustin', (*Euonymous americana*), christmas fern (*Polystichtum acrosticoides*) and partridgeberry (*Mitchella repens*), Virginia creeper, (*Parthenocissus quinquefolia*) and nearly always, fan club moss (*Lycopodium digitatum*) and Indian cucumber-root (*Medeola virginiana*). Yellow ladyslipper (*Cypripedium parviflorum*), and Showy Orchis (*Galearis spectabilis*) are also found sporadically in these habitats. *Isotria medeoloides* is rarely associated with a dry ridge type ecotone of the type that occurs in the survey area included in this study.

Geology:

Though the exact rock types were not determined for this survey site, most of this site had few or no calciphilic plant species, with the exception of a few isolated northern maiden hair ferns (*Adiantum pedatum*) and most areas had lower species diversity in general. Due to the plant species present, the soil reaction of all sites appeared to range from pH 5-6.5. The O and upper A horizons, in ecotones where associates occurred, appeared to be were typically organic and probably fairly acid. The lower A and B horizons usually had a texture of silty clay loam.

Hydrology:

Most of the surveyed site was conducted along ridgeline, with the occasional swale and a few widely scattered jurisdictional wetlands. Therefore, moisture levels were those of a mesic forest where suitable habitat for SWP might occur in lower swales. There were a few jurisdictional wetlands that intersected the proposed site and buffers. Moisture levels near these wetland areas and swales were more favorable for associated species and the potential for SWP and therefore these moist areas were surveyed more methodically. **However, SWP was not found.**

Landform:

SWP often occurrs on slopes with northerly aspects (NE-, N-, or NW-facing) that are adjacent to stream floodplains, especially, the ecotonal lower portion of the slope where it meets the stream floodplain. This would be consistent with soils derived colluvially from upslope as well as those deposited by significant flood events. This lower slope also tends to have a more reliably mesic moisture regime as opposed to ridge line. Few ecotones were encountered during this survey that warranted a more detailed survey effort. These ecotones included proper aspect, slope, mesic conditions, and appropriate suite of associated plants.

Surveys:

Surveys took place on July 10-11 2013. Beginning at the north end of the wildland tracts (See attached PDF, sheet 19), areas were surveyed for SWP starting at the southernmost point of this (northern) tract at proposed structure #98 and heading north. A small swale and associated wetland falls between proposed structures #98 and #97. On the southwestern side of this swale (JWAT 1) occurs an area of interest with associate species. Careful surveys of this microsite produced no signs of SWP or other key associates (*Medeola*, *Lycopodium*, or *Tsuga*). Following the proposed center line north tracts (See attached PDF, sheets 16-18), many areas showed typical forest structure associated with SWP, however there was a general lack of key herbaceous components to all areas, as well as no indication of SWP north, through proposed structure #91. On the intersection of Lower Tails Creek Rd. and Banks Rd tracts (see attached PDF, sheet 16)

just north of proposed structure #90 one plant of Appalachian Rose Gentian (*Sabatia capitata*) was located near an existing structure along the roadside.

Accessing the mid-section of the proposed transmission line (see attached PDF sheets 19-21), surveys began on the south end of this section near the parking lot on the boat access road (off Hap Holt Rd., sheet 21) at the southernmost proposed structure (#104) that is to span Carter's Lake to the south. One area of significance was found roughly equidistant from the structure and parking lot, between proposed structures #104 and #103 (see attached PDF, sheet 21). This area occurred on a gentle slope with many associated species present. Surveys yielded no populations of SWP, and again lacked key components to the canopy and herbaceous layers. Additional similar areas of interest were encountered (though on more steep terrain) between proposed structures #101-102 and also north of proposed structure #99. This area had typical canopy in the appropriate age (35-50 years) and many of the commonly seen associate understory species were present. However, there was a dense understory of mountain laurel on steep slopes and key components of expected understory species were missing (*Medeola, Lycopoidium, etc.*). No SWP were seen in this section despite its marginally suitable habitat.

Beginning at the north end of Oak Hill Rd. tracts (see attached PDF, sheets 22-26), surveys were completed along the south section of the wildland transects behind the proposed structures and buffers south to the intersection of Hwy 382. The areas north of proposed structure #106 tracts (see attached PDF, sheet 22) showed the most positive potential habitat for SWP populations in this section, however no populations were found. Areas surveyed southward included several swales (see attached PDF, sheets 23-25) that also had some associated species, but again yielded no populations of SWP. The proposed structures and buffers that would impact the areas adjacent to Oak Hill Rd. tracts (see attached PDF, sheets 25-26) do not include a typically natural forest habitat (largely roadside with existing structures present). No populations of SWP were seen, and suitable habitat or associated species were not present.

Conclusions:

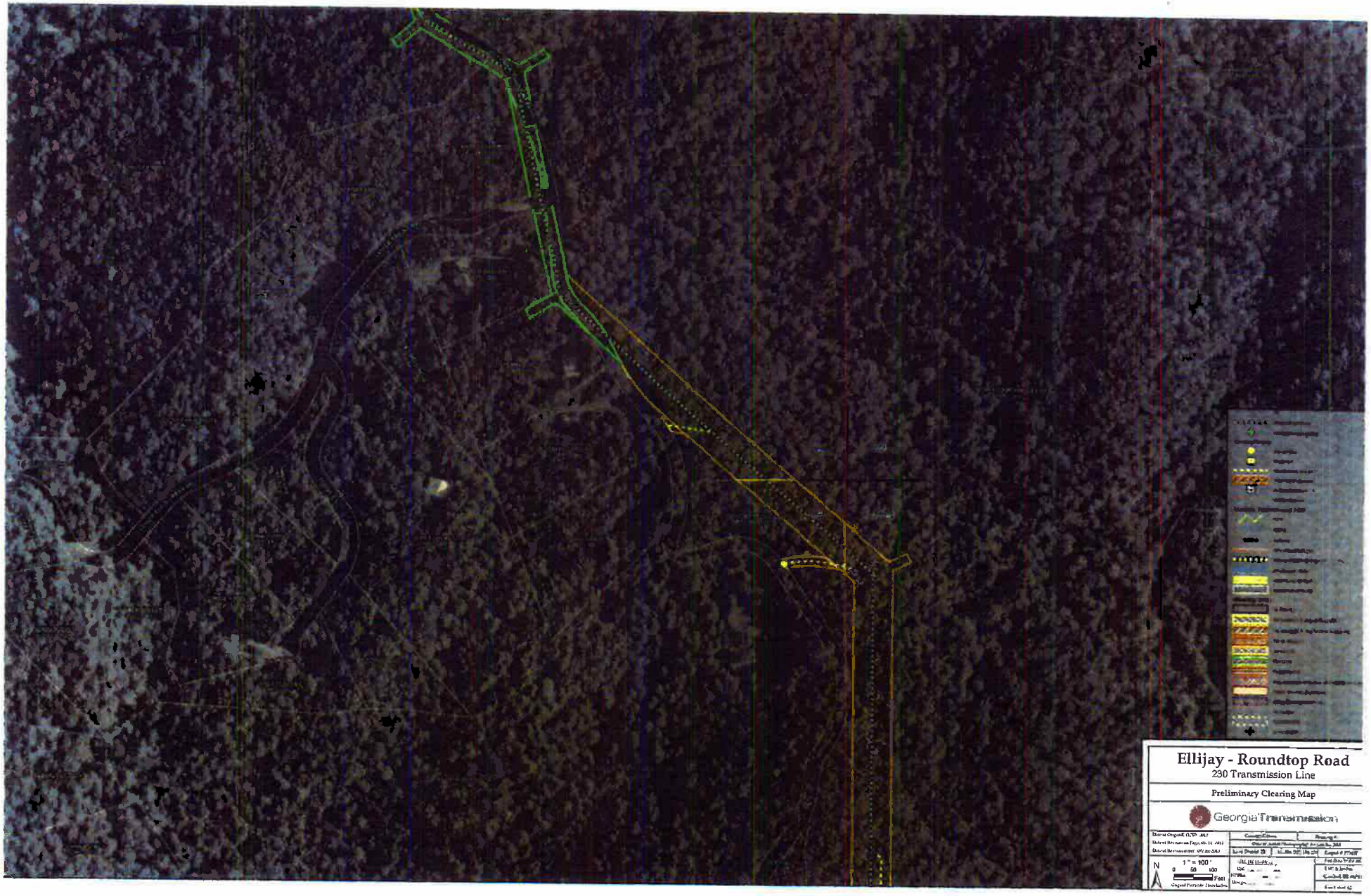
Surveys were conducted along transects spaced every 20 feet across the area that would be impacted by the proposed transmission line. No SWP plants were observed, and there was limited habitat present that would support this species. The proposed transmission line will **not** impact any existing populations of SWP. The conclusion is based on a number of key observations made during the surveys.

- No populations of SWP were observed

- Absence of sufficient habitat along wet-mesic slopes with associated species.
- Lack of habitat along typically appropriate gentle slopes and floodplains with northern aspects.
- Key canopy structural components were missing, largely being the absence of Canadian Hemlock (*Tsuga canadensis*).
- Key midstory components(*Kalmia latifolia, Rhododendron maximum*) were absent in most areas.
- Key herbaceous components (*Medeola virginiana, Huperzia lucidulum*) were absent from all areas surveyed.
- Absence of additional orchid diversity typically seen with SWP (*Galearis spectabilis, Liparis lilifolia*) with SWP.

Attachments

Map Sheets 16-26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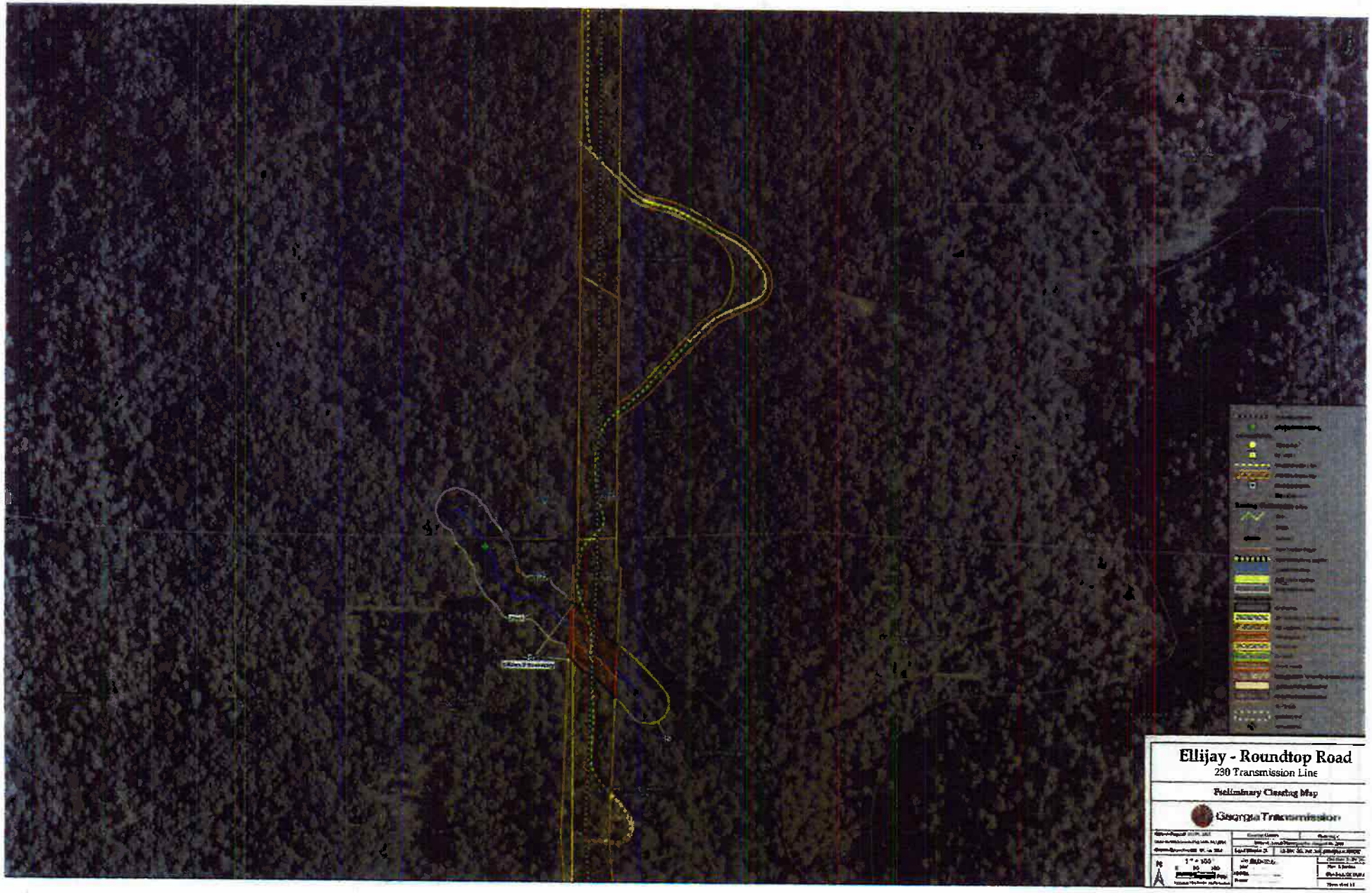
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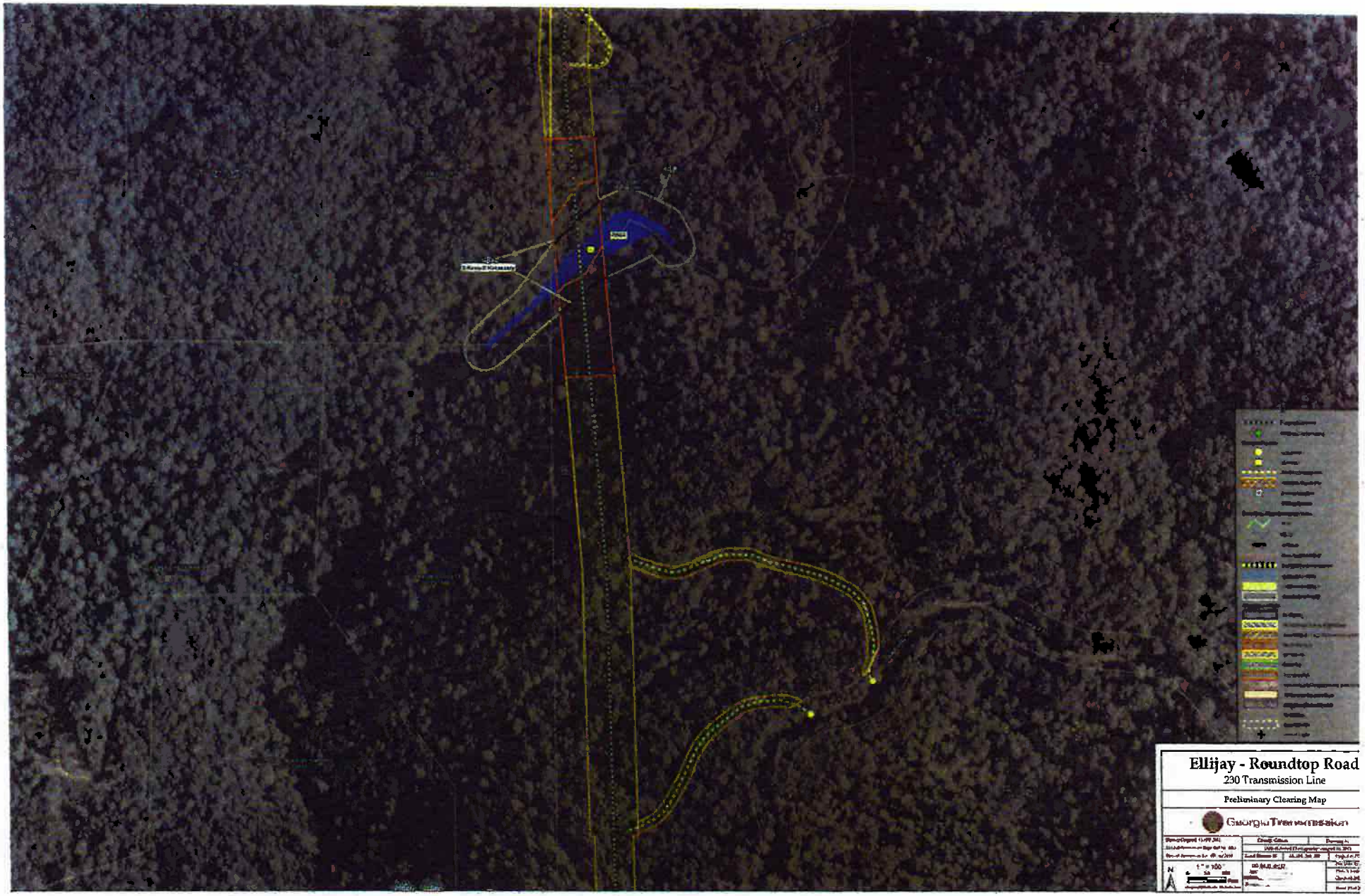
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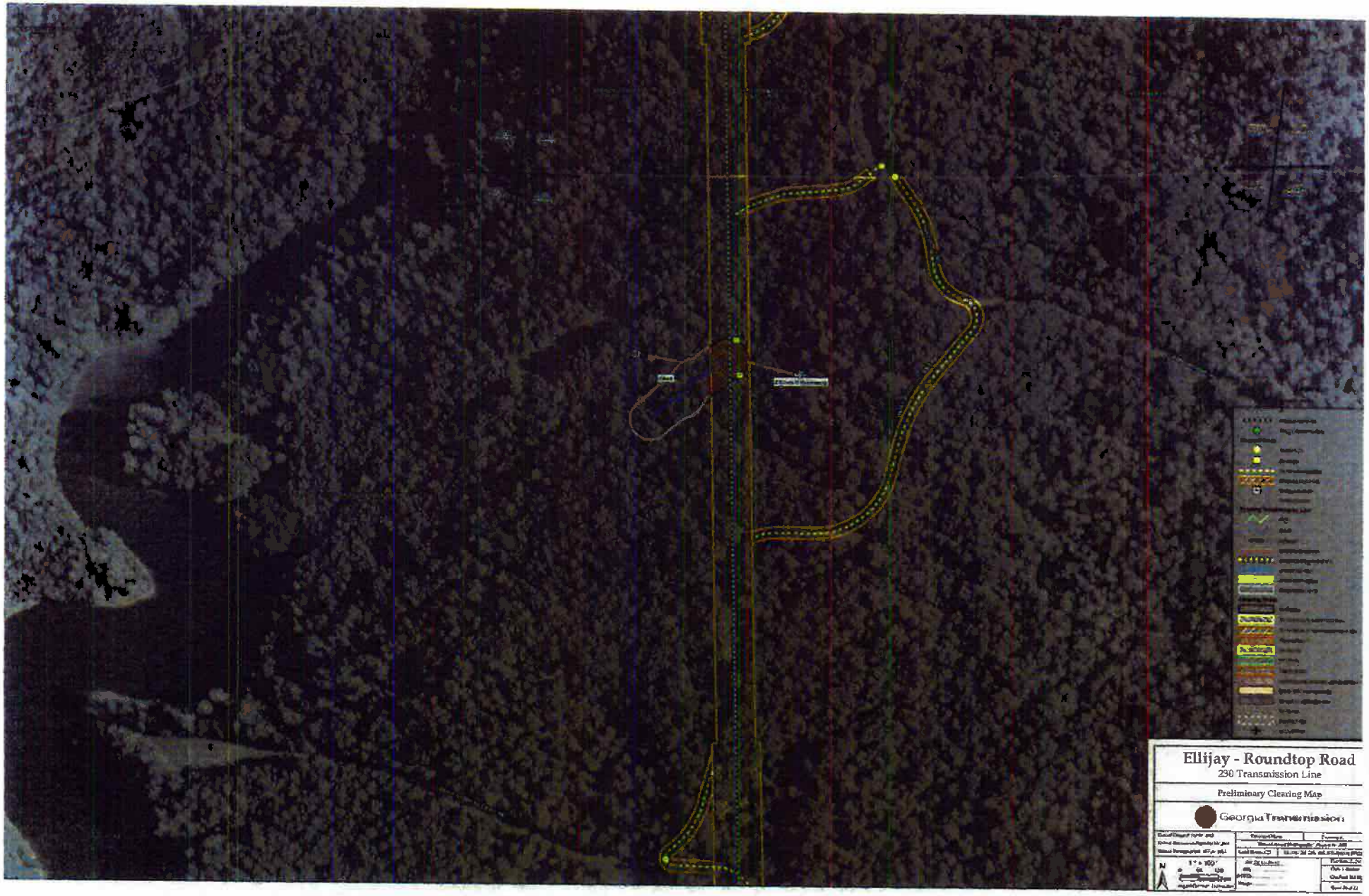
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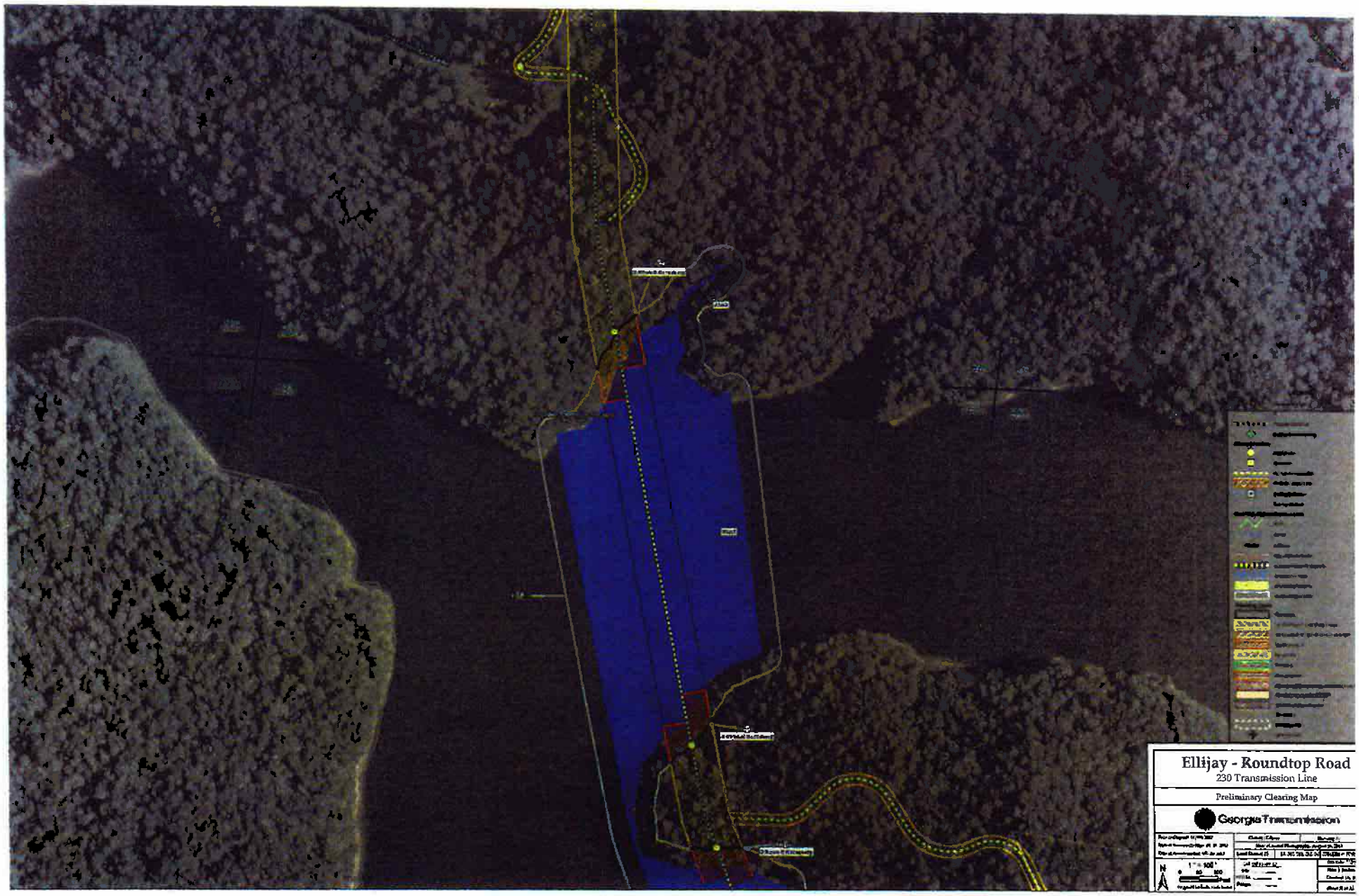
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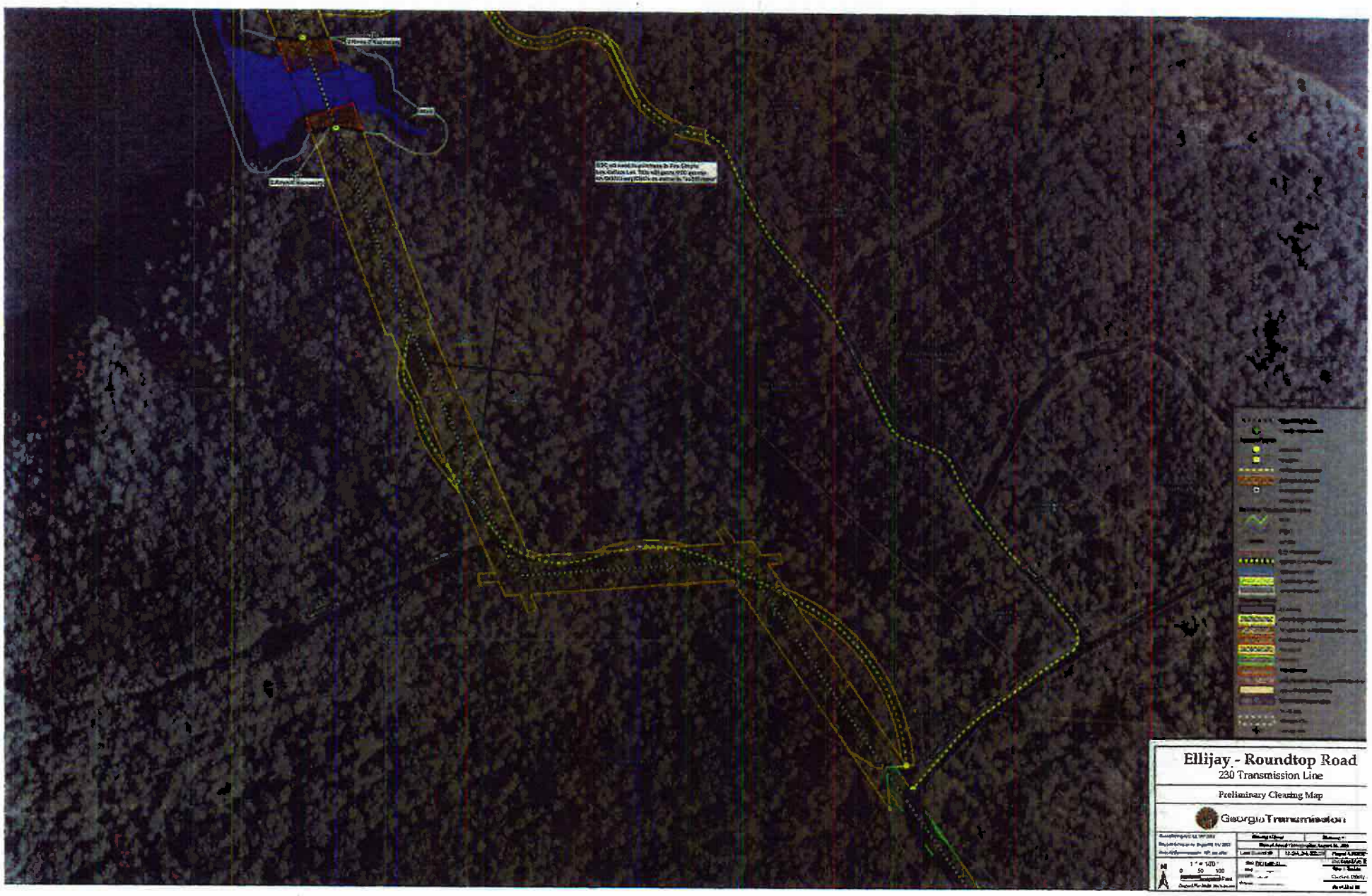
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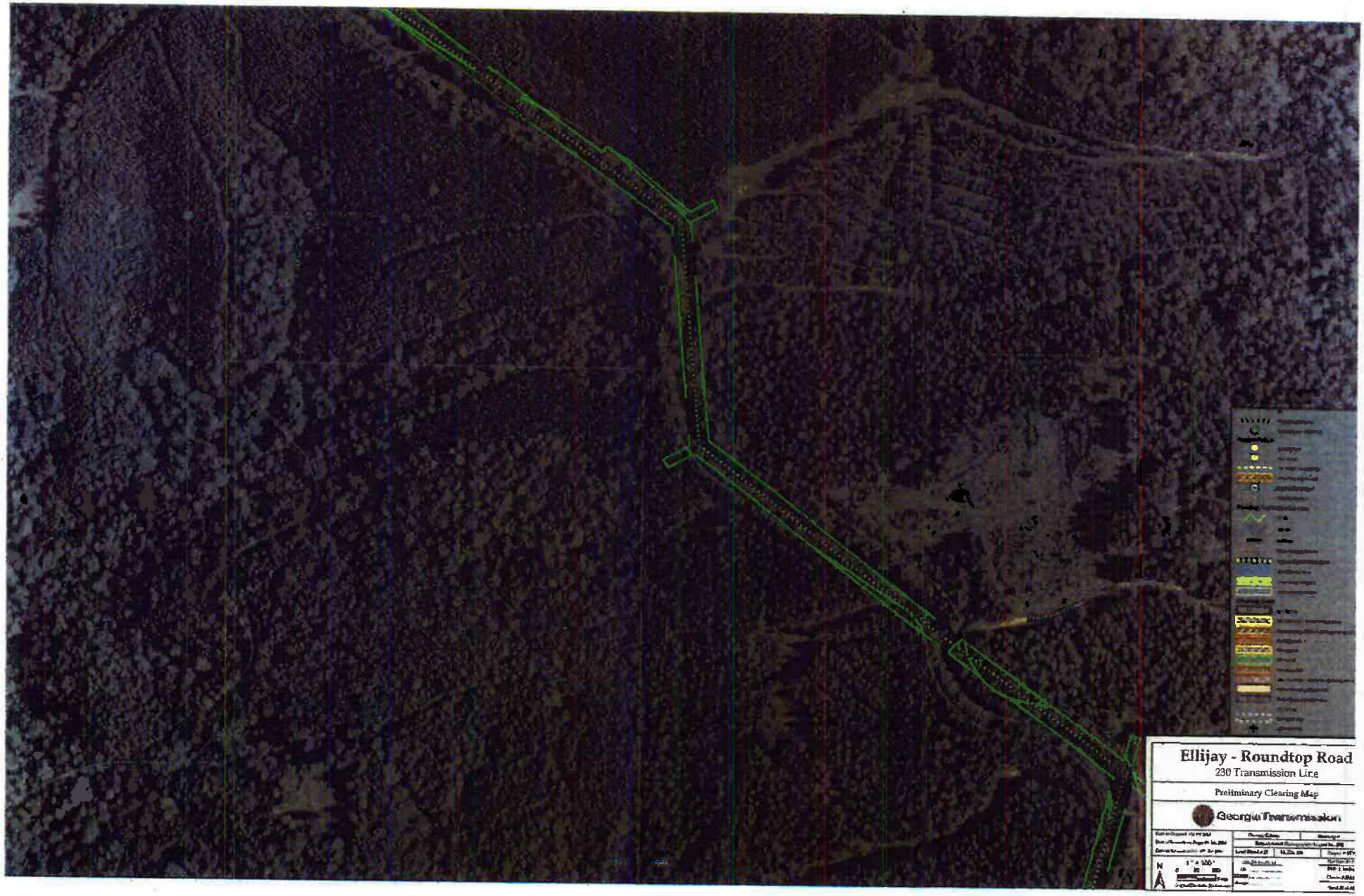
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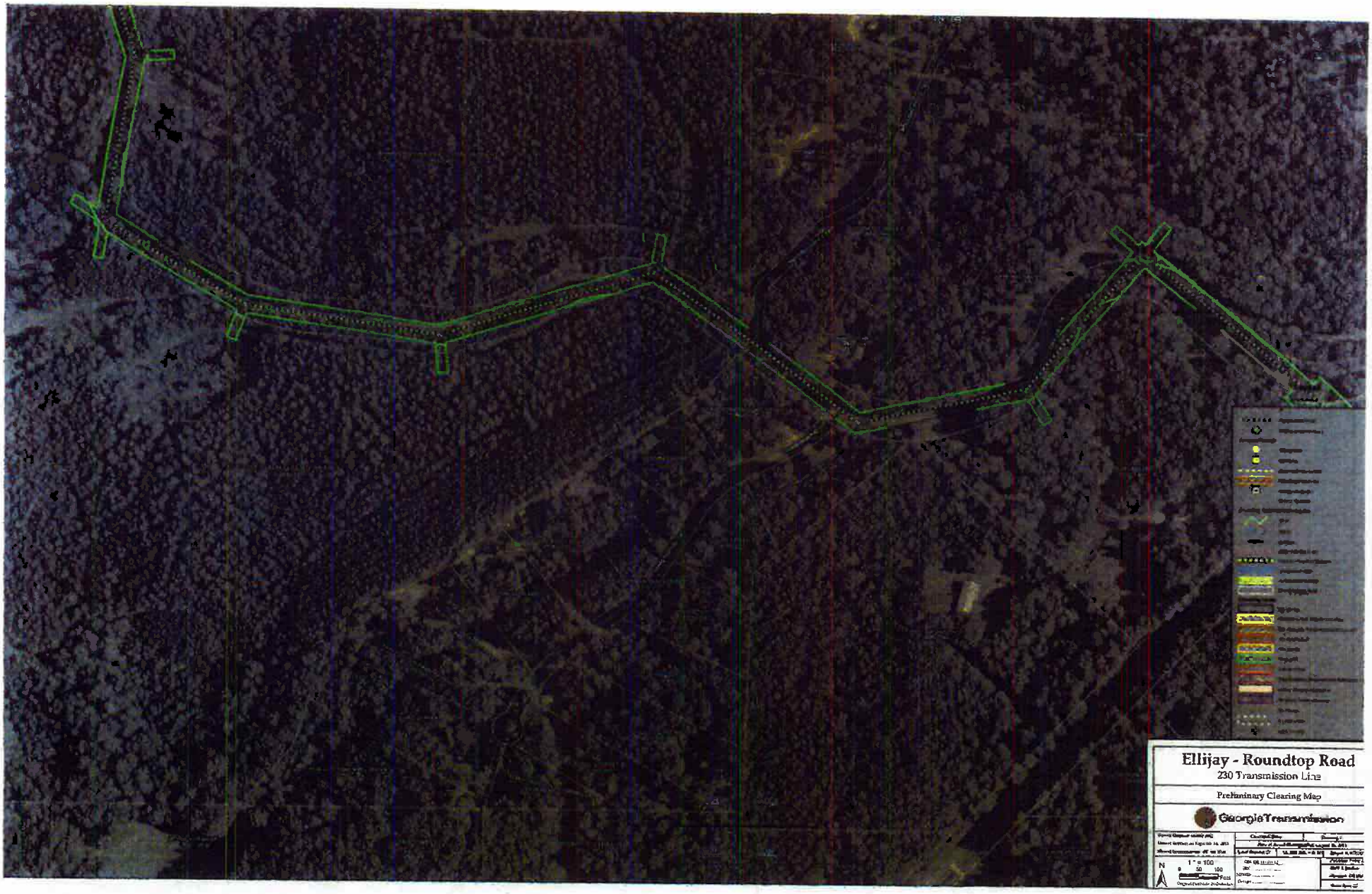
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Preliminary Clearing Map
GeorgiaTransmission
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1" = 100'
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Feet

(B.3.) USFWS letter- September 8, 2011

United States Department of the Interior
Fish and Wildlife Service
105 West Park Drive, Suite D
Athens, Georgia 30606
Phone: (706) 613-9493
Fax: (706) 613-6059

West Georgia Sub Office
P.O. Box 52560
Ft. Benning, Georgia 31995-2560
Phone: (706) 544-6428
Fax: (706) 544-6419

Coastal Sub Office
4980 Wildlife Drive
Townsend, Georgia 31331
Phone: (912) 832-8739
Fax: (912) 832-8744

September 8, 2011

Mr. Ted Hicks
Environmental Specialist II
Georgia Transmission Corporation
2100 East Exchange Place
Tucker, Georgia 30084

Re: FWS Log Number NG-11-278-Gilm

Dear Mr. Hicks:

Thank you for your letter regarding Georgia Transmission Corporation's proposed Ellijay-Roundtop 230kV transmission line in Gilmer County. The line would begin shortly south of Roundtop, cross Carters Lake moving north to US Hwy 76 east of Tails Creek, then proceed east to Ellijay, crossing both Mountaintown Creek and the Coosawattee River. We offer the following comments on the project under provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

The goldline darter (*Percina aurolineata*), which is listed as threatened under the Endangered Species Act, occurs in Mountaintown Creek and the Coosawattee River at the US Hwy 76 crossings. As you discussed with Fish and Wildlife Service biologist Robin Goodloe on August 8, 2011, utility poles at these two stream crossings will be set at least 100 feet from the top of the banks, and only limited tree clearing will be needed on creek banks (photos received August 22, 2011). We recommend that any work adjacent to Mountaintown Creek and the Coosawattee River be conducted during periods outside the goldline darter's spawning period (April 1-July 31) to avoid increased turbidity and sedimentation that could bury eggs and affect larval and juvenile goldline darters.

At all stream crossings, we recommend the following measures, in addition to State of Georgia requirements, to minimize sediment and contaminant transport from the utility right-of-way (ROW) into stream systems:

- Retain existing shrub and other low-growing vegetation at steam crossings, rather than clearing to ground level, to maintain bank stability. Where crossings have little vegetation (and the landowner is willing), plant riparian buffers of native shrubs within a 25-100-foot buffer on the ROW.

- If new stream crossings are necessary for heavy equipment access, use temporary bridges or fords, rather than culverted crossings that can degrade stream channels and block fish passage.
- Streambanks should be restored to normal contours, stabilized, and planted to native shrub vegetation after the temporary crossing is removed.
- Mow/maintain the powerline ROW on a minimum three-year schedule, where possible and prohibit use of herbicides or other chemicals within 200 feet of a stream crossing (unless applying to cut stumps to limit coppice growth).
- Locate all staging areas and equipment maintenance areas at least 200 feet from stream banks.

Thank you for the opportunity to comment on this project. Please contact Robin Goodloe at 706-613-9493 X221 (robin_goodloe@fws.gov) if you have questions.

Sincerely,

Sandra S. Tucker
Field Supervisor

(B.4.) Ellijay- Rountop – Phase I USACE Carters Lake (P79427) 230kV Transmission Line-Environmental Survey Results Eastern Alternative Corblu Consultants (July 22, 2014)

corblu
ECOLOGY GROUP

MEMORANDUM

TO: **Ted Hicks, *Environmental Specialist II***
Georgia Transmission Corporation

FROM: **Matthew W. Otto, CE, WPIT – Project Ecologist and**
Richard W. Whiteside, PhD, CWB, CSE – President
Corblu Ecology Group, LLC

DATE: **July 22, 2014**

SUBJECT: **Ellijay Roundtop Alternative Route – USACE Carter Lake Property 230kV Transmission Line – Environmental Survey Results**

Corblu Ecology Group, LLC (Corblu) completed a jurisdictional waters delineation and threatened and endangered species (T&E) survey for Georgia Transmission Corporation (GTC) within the U.S. Army Corps of Engineers' (USACE) Carters Lake section of the alternative route for the proposed 230kV transmission line located in Gilmer County, GA on June 23-24, 2014. The survey corridor was limited to USACE properties, covering approximately 1.5 miles of a proposed new right-of-way (ROW) on either side (300 feet) of the surveyed and staked centerline of the proposed transmission line. The USACE property for this portion of the proposed alternate route begins west of Ridgeway Road and terminates south of Carters Lake and north of Oak Hill Road (Figure 1). The survey of the project area was completed to support the alternative route analysis for the Ellijay Roundtop USACE Carters Lake 230kV transmission line.

Methodology

In advance of the field delineation and T&E survey, in-house research was conducted using a combination of available resources, to include a list of federal and state listed species known to occur within the project area and vicinity, and their preferred habitat using the U.S. Fish and Wildlife Service (USFWS) and Georgia Department of Natural Resources (GDNR) websites[1] (Table 1). Prior to the jurisdictional waters field delineation, the following resources were evaluated: 1) U.S. Geologic Survey 7.5-minute quadrangle topographic maps; 2) USFWS, National Wetland Inventory (NWI) maps; and 3) maps provided by GTC.

All habitats within the survey area were evaluated and visually inspected to determine the presence/absence of T&E species and their preferred habitat. The jurisdictional waters field delineation was completed using the Routine On-Site Determination Method as defined in the USACE 1987 Wetlands Delineation Manual[2] and regional supplement

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[1] http://www.fws.gov/endangered/ and http://www.georgiawildlife.com/node/1370 .

[2] Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual. U.S. Army Corps of Engineers,Washington D.C.* 100 pp. plus appendices.

for the Eastern Mountains and Piedmont Region[3]. This technique uses a multi-parameter approach, which requires positive evidence of three criteria:

- Hydrophytic vegetation
- Hydric soil
- Wetland hydrology

Any areas exhibiting the above three wetland characteristics, as well as ponds, lakes, streams, and tributary systems, were considered jurisdictional waters regulated by the USACE. Jurisdictional wetland boundaries were marked in the field with pink flagging. The jurisdictional boundaries were then surveyed with our mapping grade (i.e. sub-meter accuracy) Trimble® Pathfinder® Pro XH Global Positioning System (GPS). Please note that Federal and State jurisdictional water boundaries identified in the field are not official until verified by the USACE (i.e., waters of the U.S.) and the Local Issuing Authority (LIA), respectively.

Results

Jurisdictional Water Features

During the field delineation, Corblu personnel observed a single jurisdictional water feature in the alternative route, an open water area (Carters Lake, JWat1; Photograph Nos. 1 & 2, Figure 2).

Protected Species

The primary habitat observed throughout the survey corridor was mixed hardwood pine forest. This habitat was then further divided into dry ridgetop oak-hickory-pine forest and moist lower slope oak-maple-hemlock forest sub-habitats. Also, a paved access road for a USACE campground was located within the dry ridgetop oak-hickory-pine forest, providing an opening within the forest canopy which would be considered suitable habitat for the Georgia aster (*Symphyotrichum georgianum*) along the road edges. The moist lower slope oak-maple-hemlock forest would be considered suitable habitat for the following threatened and endangered species: 1) small whorled pogonia (*Isotria medeoloides*), 2) sweet pinesap (*Monotropsis odorata*), and 3) starflower (*Trientalis borealis*). There was also suitable summer roost habitat for the northern long-eared bat (*Myotis septentrionalis*) and the Indiana bat (*Myotis Sodalis*) throughout the survey corridor (i.e., exfoliating bark, cavities, and crevices of living and dead trees).

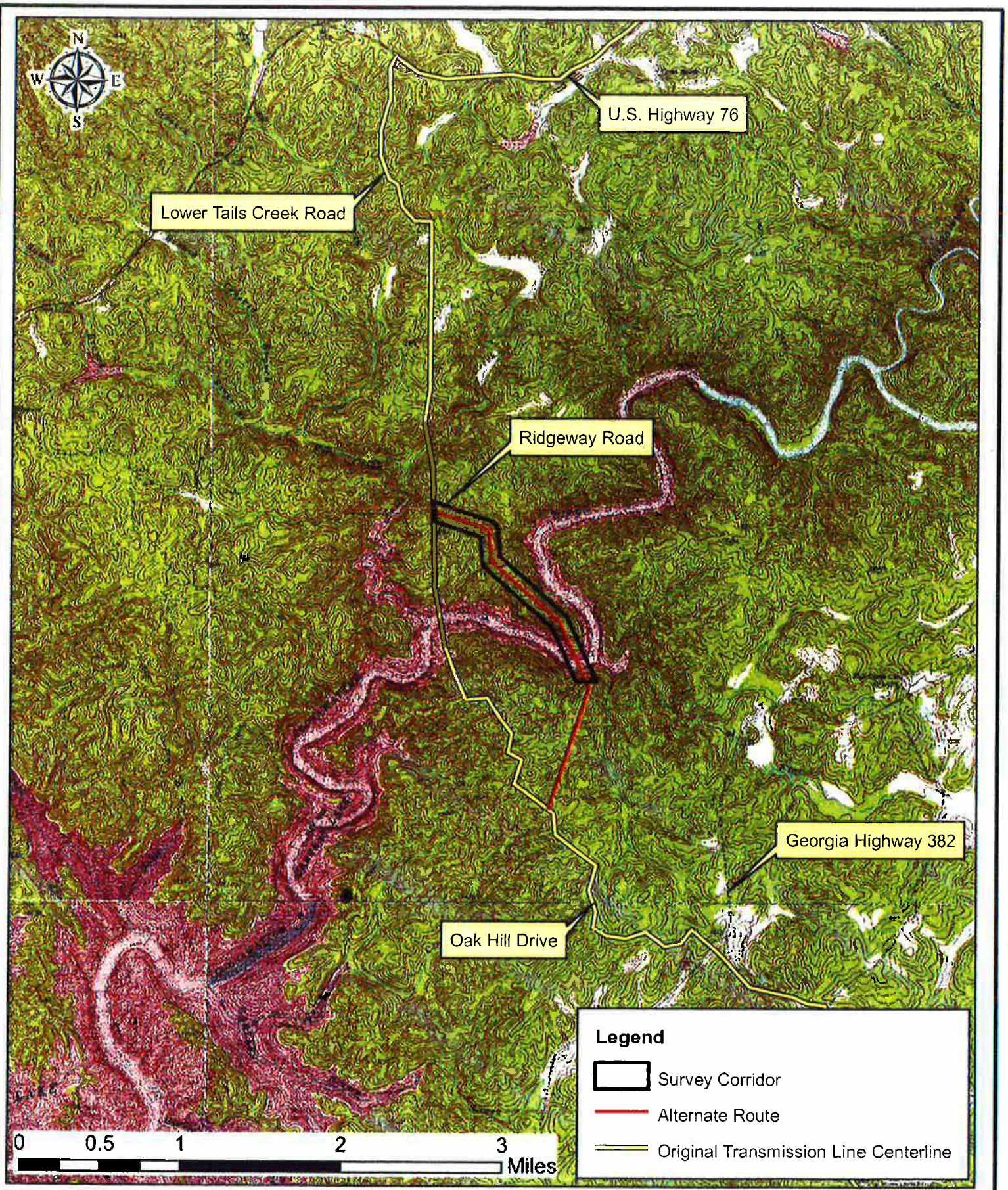
None of the plant species listed above were observed during the field survey. It should be noted that the survey was conducted during the flowering period for the small whorled pogonia and the starflower but in the non-flowering period for the sweet pinesap and Georgia aster. Also, no survey was conducted to determine the presence/absence of the above listed bats species. However, there are no records of these plant and animal

[3] U.S. Army Corps of Engineers. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0,* ed. J. F. Berkowitz, J. S. Wakeley, R. W. Lichvar, C. V. Noble. ERDC/EL TR-12-9. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

species in the projects quarter quad (southwest quarter quadrangle of the Webb, GA; U.S. Geological Survey 7.5 minute quadrangle map). Additionally, a letter requesting any additional protected species information within the vicinity of the project area was submitted to the GDNR's Natural Heritage Program (NHP). The NHP response letter, dated March 26, 2012, included no known occurrences of any terrestrial threatened and endangered species (Appendix A); therefore, these above listed species are not known or expected to occur within the surveyed area.

Boundaries of jurisdictional waters of the U.S. have not been verified by the USACE. We recommend regulatory verification prior to the construction of the proposed 230kV transmission line if impacts to these features are possible. Corblu can assist GTC in the preparation and submittal of any required permit applications for impacts to jurisdictional waters if needed and requested.

If you have any question regarding the information provided in this memorandum, please contact Richard Whiteside or Matthew Otto at (770) 591-9990.



Base Map: USGS 7.5-Minute Topographic Quadrangle Maps - Oakman, Ramhurst, Talking Rock, and Webb, GA.

Georgia Tansmission Corporation
Ellijay-Roundtop Alternative Route
230 Transmission Line
Carter Lake USACE Property
Gilmer County, Georgia

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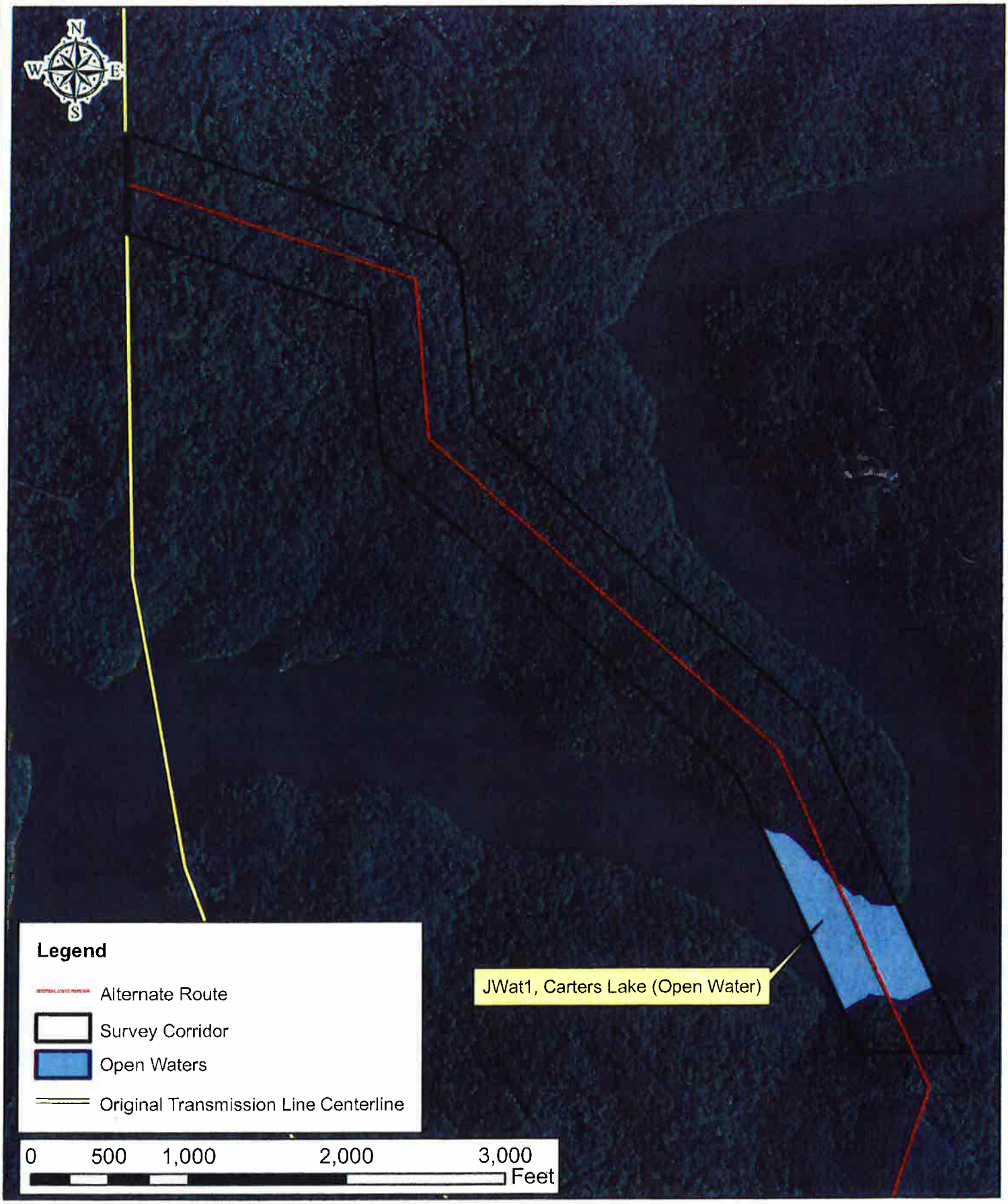
ECOLOGY GROUP
Woodstock, Georgia

Figure 1
Project Location Map
Project No. 02-012014



Base Map: USGS 7.5-Minute Topographic Quadrangle Maps - Oakman, Ramhurst, Talking Rock, and Webb, GA.

Georgia Tansmission Corporation
Ellijay-Roundtop Alternative Route
230 Transmission Line
Carter Lake USACE Property
Gilmer County, Georgia

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ECOLOGY GROUP
Woodstock, Georgia

Figure 2
Jurisdictional Waters Map
Project No. 02-012014

Table 1: Protected animal and plant species listed by USFWS and Georgia Department of Natural Resources as potentially occurring in Gilmer County, Georgia.

Species Name (*Scientific Name*)	Federal Status[1]	State Status[2]	Preferred Habitat	Habitat Available in Project Area	Known to Occur in Project Area Quarter-Quad[3]
INVERTEBRATES					
Mollusk					
Finelined pocketbook (*Lampsilis altilis*)	LT/G2	T/S1S2	Typically occupies small streams to large rivers in sandy to muddy sand substrates or gravel shoals with slight to moderate current.	No	No
Alabama mocassinshell (*Medionidus acutissimus*)	LT/G2	T/S1	Rivers and large creeks. Prefers stable gravel or sandy gravel substrates.	No	No
Coosa moccasinshell (*Medionidus parvulus*)	LE/G1	E/S1	Small streams to large rivers with sand, gravel, or cobble substrates and swift flowing shoal areas.	No	No
Southern clubshell (*Pleurobema decisum*)	LE/G2	E/S1	Large streams to large rivers with moderate flow and sand or gravel substrates; sometimes found in pools with slow or no current.	No	No
Southern pigtoe (*Pleurobema georgianum*)	LE/G1	E/S1	Medium size streams to large rivers with moderate flow and sand or gravel substrates.	No	No
Georgia pigtoe (*Pleurobema hanleyianum*)	LE/G1	E/S1	Coarse sand and gravel substrates in medium sized creeks to large rivers.	No	No
Triangular kidneyshell (*Ptychobranchus greenii*)	LE/G1	E/S1	High quality rivers and large creeks in stable gravel and sandy gravel substrates.	No	No

Table 2: Protected animal and plant species listed by USFWS and Georgia Department of Natural Resources[1] as potentially occurring in Gilmer County (Con't).

Species Name (*Scientific Name*)	Federal Status[1]	State Status[2]	Preferred Habitat	Habitat Available in Project Area	Known to Occur in Project Area Quarter-Quad[3]
Crayfish					
Coosawattee crayfish (*Cambarus coosawattae*)	G2	E/S1	Riffle habitats in the Coosawattee River system.	No	No
Beautiful crayfish (*Cambarus speciosus*)	G2	E/S2	Medium-sized streams with clear water and moderate to swift current with rock-littered substrate.	No	No
FISHES					
Blue shiner (*Cyprinella caerulea*)	LT/G2	E/S1	Medium to large clear cool streams with gravel-rubble-small boulder substrates; found in streams draining into the Coosa and Oostanaula Rivers.	No	No
Holiday darter (*Etheostoma brevirostrum*)	G2	E/S2	Rocky streams in Coosa river system.	No	No
Etowah darter (*Etheostoma etowahae*)	LE/G1	E/S1	Shallow riffle habitat, with large gravel, cobble, and small boulder substrates. Usually found in medium and large cool water creeks or small rivers (15-30 m wide) with moderate or high gradients and rocky bottoms.	No	No
Cherokee darter (*Etheostoma scotti*)	LT/G2	T/S2	Inhabit small to medium-sized streams with gravel and cobble bed sediments and moderate to swift flowing current. Typically not found in streams with moderate or thick deposits of silt and sediment, as they require clean bed sediments for spawning.	No	No

Table 2: Protected animal and plant species listed by USFWS and Georgia Department of Natural Resources[1] as potentially occurring in Gilmer County (Con't).

Species Name (*Scientific Name*)	Federal Status[1]	State Status[2]	Preferred Habitat	Habitat Available in Project Area	Known to Occur in Project Area Quarter-Quad[3]
Coosa chub (*Macrhybopsis* sp. cf. *aestivalis*)	G3G4	E/S2	Medium to large clear streams in moderate current with substrate of gravel and cobble in the Coosa, Tallapoosa, and Cahaba river systems within Georgia, Tennessee, and Alabama.	No	No
Amber darter (*Percina antesella*)	LE/G1G2	E	Gentle riffle areas over sand and gravel substrate that becomes vegetated (primarily with *Podostemum*) during summer.	No	No
Goldline darter (*Percina aurolineata*)	LT/G2	E/S1	Shallow, rocky riffles with swift current in medium sized rivers of the Cahaba and Coosawattee River systems.	No	Yes
Conasauga logperch (*Percina jenkinsi*)	LE/G1	E/S1	Riffles and runs in the main channel of the Conasauga River, generally occurring at water depths greater than 0.5 m (1.6 ft) with swift current (often greater than 0.5 m/sec or 1.6 ft/sec) over cobble and gravel.	No	No
AMPHIBIANS					
Eastern hellbender (*Cryptobranchus alleganiensis*)	G3G4	T/S2	Clear, cool, and swiftly flowing streams with rocky bottoms; small streams may be inhabited, but those with widths greater than 5 m (16 ft) seem to provide more suitable conditions.	No	No
MAMMALS					
Gray bat (*Myotis grisescens*)	LE/G3	E/S1	Colonies restricted to caves or cave-like habitats; forage primarily over water along rivers or lakeshores.	No	No

Table 2: Protected animal and plant species listed by USFWS and Georgia Department of Natural Resources[1] as potentially occurring in Gilmer County (Con't).

Species Name (*Scientific Name*)	Federal Status[1]	State Status[2]	Preferred Habitat	Habitat Available in Project Area	Known to Occur in Project Area Quarter-Quad[3]
Northern long-eared bat (*Myotis septentrionalis*)	PE	No State Listing	Hibernate in large caves or mines with large passages and entrances during the winter; preferring constant temperatures, and high humidity with no air currents. Summer roosts include underneath loose bark, in cavities, or in crevices of both live and dead trees. Not specific to any one roost; instead are opportunistic.	Yes	No
Indiana bat (*Myotis sodalis*)	LE/G2	E/S1	Indiana bats gather in large groups in suitable caves to hibernate in the winter, but roost in trees during the rest of the year, usually under loose, exfoliating bark. Roost sites are typically at a woodland edge where the tree is warmed by the sun.	Yes	No
PLANTS					
Broadleaf tickseed (*Coreopsis latifolia*)	G3	R/S1	Mesic hardwood forests over limestone.	Yes	No
Pink ladyslipper (*Cypripedium acaule*)	G5	U/S4	Upland pine or mixed hardwood-pine forests with acidic soils.	Yes	No
Yellow ladyslipper (*Cypripedium parviflorum*)	G5	R/S3	Rich cove hardwood forests.	Yes	No
Goldenseal (*Hydrastis canadensis*)	G4	E/S2	Moist, deciduous hardwood forests with neutral or basic soils over bedrock that is high in calcium or magnesium. Goldenseal thrives best under a somewhat patchily open canopy.	No	No

Table 2: Protected animal and plant species listed by USFWS and Georgia Department of Natural Resources[1] as potentially occurring in Gilmer County (Con't).

Species Name (*Scientific Name*)	Federal Status[1]	State Status[2]	Preferred Habitat	Habitat Available in Project Area	Known to Occur in Project Area Quarter-Quad[3]
Small whorled pogonia (*Isotria medeoloides*)	LT/G2	T/S2	Rich woods and cove forests in the mountains.	Yes	No
Sweet pinesap (*Monotropsis odorata*)	G3	T/S1	Mixed hardwood-pine forests with open understory, history of nearby heavy logging, home site or road clearing activity.	Yes	No
Green pitcherplant (*Sarracenia oreophila*)	LE/G2	E/S1	Wet meadows, wet flatwoods, swamps, seepage slopes, and sandy stream banks.	No	No
Georgia aster (*Symphyotrichum georgianum*)	LC/ G2G3	T/S2	Edges and openings in rocky, upland oak-hickory-pine forests, and rights-of-way through these habitats. Usually with circumneutral soils.	Yes	No
Starflower (*Trientalis borealis*)	G5	E/S1S2	Moist, deciduous northern hardwood forests and boulderfields.	Yes	No

[1] Listed by the U.S. Fish and Wildlife Service, http://www.fws.gov/endangered/.
LE = listed as endangered, LT = listed as threatened, LC = listed as candidate, PE = proposed endangered
G1 = critically imperiled globally, G2 = imperiled globally,
G3 = rare, G4 = apparently secure globally,
G5 = demonstrably secure globally

[2] Georgia Department of Natural Resources (State) Georgia Natural Heritage Program database
E = endangered, T = threatened, R = listed as rare, U = listed as unusual
S1 = critically imperiled in state, S2 = imperiled in state,
S3 = rare or uncommon in state, S4 = apparently secure in state

[3] Based on the GDNR quarter-quad database (quarter-quad = Webb SW).

Prepared by: MWO Date: 07/18/2014
Checked by: WAP Date: 07/21/2014

Photograph No. 1: View of JWat1 (Carters Lake), facing east.

Photograph No. 2: View of JWat1 (Carters Lake), facing southwest.

APPENDIX A

Georgia Department of Natural Resources Response Letter

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
WILDLIFE RESOURCES DIVISION

MARK WILLIAMS
COMMISSIONER

DAN FORSTER
DIRECTOR

March 26, 2012

Matthew Otto
Project Ecologist
Wetland & Ecological Consultants, LLC
3225 South Cherokee Lane
Bldg 800
Woodstock, GA 30188

Subject: Known occurrences of natural communities, plants and animals of highest priority conservation status on or near Proposed Ellijay-Roundtop Road New 230 Transmission Line, Gilmer County, Georgia

Dear Mr. Otto:

This is in response to your request of February 17, 2012. According to our records, within a three-mile radius of the project corridor there are the following Natural Heritage Database occurrences:

East End - Ellijay (-84.48790, 34.68449; NAD27):

GA *Cambarus coosawattae* (Coosawattee Crayfish) approx. 2.0 mi. SE of site in the Cartecay River
GA *Cambarus coosawattae* (Coosawattee Crayfish) [HISTORIC?] approx. 1.0 mi. SW of site the Coosawattee River
GA *Cambarus speciosus* (Beautiful Crayfish) approx. 2.0 mi. SE of site in the Cartecay River
GA *Cryptobranchus alleganiensis alleganiensis* (Eastern Hellbender) approx. 1.5 mi. E of site
US *Cyprinella caerulea* (Blue Shiner) [HISTORIC] 0.3 mi. W on site in the Coosawattee River
US *Cyprinella caerulea* (Blue Shiner) [HISTORIC] approx. 1.5 mi. W of site the Coosawattee River
GA *Macrhybopsis sp. 1* (Coosa Chub) approx. 2.5 mi. N of site in the Ellijay River
GA *Macrhybopsis sp. 1* (Coosa Chub) approx. 2.0 mi. SE of site in the Cartecay River
US *Percina aurolineata* (Goldline Darter) on site in the Coosawattee River the Coosawattee River
US *Percina aurolineata* (Goldline Darter) 0.3 mi. W of site the Coosawattee River
US *Percina aurolineata* (Goldline Darter) 0.4 mi. E of site in the Cartecay River
US *Percina aurolineata* (Goldline Darter) approx. 0.5 mi. NE of site in the Ellijay River
US *Percina aurolineata* (Goldline Darter) approx. 1.0 mi. NE of site in the Ellijay River
US *Percina aurolineata* (Goldline Darter) approx. 1.0 mi. S of site the Coosawattee River
US *Percina aurolineata* (Goldline Darter) approx. 1.5 mi. W of site the Coosawattee River

NONGAME CONSERVATION SECTION
2065 U.S. HIGHWAY 278 S.E. | SOCIAL CIRCLE, GEORGIA 30025-4743
770.918.6411 | FAX 706.557.3033 | WWW.GEORGIAWILDLIFE.COM

US *Percina aurolineata* (Goldline Darter) approx. 2.0 mi. SE of site in the Cartecay River
US *Percina aurolineata* (Goldline Darter) approx. 2.5 mi. N of site in the Ellijay River
US *Percina aurolineata* (Goldline Darter) approx. 2.5 mi. SW of site the Coosawattee River
Cartecay River [High Priority Stream] 0.4 mi. E of site
Coosawattee River [High Priority Stream] on site
Ellijay River [High Priority Stream] approx. 0.5 mi. NE of site
Rich Mountain WMA [GA DNR] approx. 2.0 mi. E of site

North End (-84.54959, 34.70965; NAD27):
GA *Cambarus speciosus* (Beautiful Crayfish) approx. 3.0 mi. N of site in Mountaintown Creek
GA *Etheostoma brevirostrum* (Holiday Darter) approx. 0.5 mi. NW of site in Mountaintown Creek
GA *Etheostoma brevirostrum* (Holiday Darter) approx. 1.5 mi. NW of site in Mountaintown Creek
GA *Etheostoma brevirostrum* (Holiday Darter) on site in Mountaintown Creek
US *Percina aurolineata* (Goldline Darter) approx. 0.5 mi. NW of site in Mountaintown Creek
US *Percina aurolineata* (Goldline Darter) approx. 0.5 mi. SE of site in Mountaintown Creek
US *Percina aurolineata* (Goldline Darter) approx. 1.0 mi. SE of site in Mountaintown Creek
US *Percina aurolineata* (Goldline Darter) approx. 1.5 mi. NW of site in Mountaintown Creek
US *Percina aurolineata* (Goldline Darter) approx. 3.0 mi. N of site in Mountaintown Creek
Mountaintown Creek [High Priority Stream] on site

NW End (-84.60924, 34.68719; NAD27):
US *Percina aurolineata* (Goldline Darter) approx. 2.0 mi. SE of site in the Coosawattee River
Chattahoochee National Forest [U.S. Forest Service] approx. 1.5 mi. NW of site
Coosawattee River [High Priority Stream] approx. 3.0 mi. SE of site
Coosawattee WMA [GA DNR] on site

SW End (-84.56549, 34.59216; NAD27):
Coosawattee WMA [GA DNR] approx. 2.0 mi. W of site

* Entries above proceeded by "US" indicates species with federal status (Protected, Candidate or Partial Status). Species that are federally protected in Georgia are also state protected; "GA" indicates Georgia protected species.

Recommendations:

We have records of two federally listed species, *Cyprinella caerulea* (Blue Shiner) [HISTORIC] and *Percina aurolineata* (Goldline Darter) and one state-listed species, *Etheostoma brevirostrum* (Holiday Darter) within the project corridor. The Endangered Species Act states that taking or harming of a federally listed species is prohibited. We recommend all requestors with projects located near federally protected species consult with the United States Fish and Wildlife Service. For southeast Georgia, please contact Strant Colwell (912-265-9336, ext.30 or Strant_Colwell@fws.gov). In southwest Georgia, please contact John Doresky (706-544-6999

or John_Doresky@fws.gov). In north Georgia, please contact Robin Goodloe (706-613-9493, ext.221 or Robin_Goodloe@fws.gov).

In order to protect aquatic habitats and water quality, we recommend that all machinery be kept out of creeks during construction. Streams should not be culverted/forded to allow equipment access during construction or for future ROW maintenance. Further, we strongly advocate retaining at least a 25-foot vegetative buffer between each stream bank and the closest power pole, and allow this buffer to regenerate to shrub-scrub growth after the line is installed (if the landowner is willing). We realize that some trees may have to be removed, but recommend that shrubs and ground vegetation be left in place. Wider buffers may be needed for projects where land slopes sharply toward the stream being crossed. We also recommend that stringent erosion control practices be used during construction activities and that vegetation is re-established on disturbed areas as quickly as possible. Silt fences and other erosion control devices should be inspected and maintained until soil is stabilized by vegetation. Please use natural vegetation and grading techniques (e.g. vegetated swales, turn-offs, vegetated buffer strips) that will ensure that the project area does not serve as a conduit for storm water or pollutants into the water during or after construction. These measures will help protect water quality in the vicinity of the project as well as in downstream areas.

Keep in mind that this project crosses two high priority streams. As part of an effort to develop a comprehensive wildlife conservation strategy for the state of Georgia, the Wildlife Resources division developed and mapped a list of streams that are important to the protection or restoration of rare aquatic species and aquatic communities. High priority waters and their surrounding watersheds are important for aquatic biodiversity conservation, but do not receive any additional legal protections. We now have GIS ESRI shapefiles of GA high priority waters available on our website (http://www.georgiawildlife.com/node/1377). Please contact this office if you would like additional information on high priority waters.

Disclaimer:

Please keep in mind the limitations of our database. The data collected by the Nongame Conservation Section comes from a variety of sources, including museum and herbarium records, literature, and reports from individuals and organizations, as well as field surveys by our staff biologists. In most cases the information is not the result of a recent on-site survey by our staff. Many areas of Georgia have never been surveyed thoroughly. Therefore, the Nongame Conservation Section can only occasionally provide definitive information on the presence or absence of rare species on a given site. Our files are updated constantly as new information is received. **Thus, information provided by our program represents the existing data in our files at the time of the request and should not be considered a final statement on the species or area under consideration.**

If you know of populations of highest priority species that are not in our database, please fill out the appropriate data collection form and send it to our office. Forms can be obtained through our web site (http://www.georgiawildlife.com/node/1376) or by contacting our office. If I can be of further assistance, please let me know.

Sincerely,

Katrina Morris
Environmental Review Coordinator

Data Available on the Nongame Conservation Section Website

- Georgia protected plant and animal profiles are available on our website. These accounts cover basics like descriptions and life history, as well as threats, management recommendations and conservation status. Visit http://www.georgiawildlife.com/node/2721.

- Rare species and natural community information can be viewed by Quarter Quad, County and HUC8 Watershed. To access this information, please visit our GA Rare Species and Natural Community Information page at: http://www.georgiawildlife.com/conservation/species-of-concern?cat=conservation.

- Downloadable files of rare species and natural community data by quarter quad and county are also available. They can be downloaded from: http://www.georgiawildlife.com/node/1370.

(B.5.) Biological Evaluation (Bat Surveys) Ellijay –Roundtop T/L and Roundtop SS, Ellijay Gilmer County, Georgia, Terracon Consultants, (August 15, 2014)

Biological Evaluation

Ellijay – Roundtop T/L and Roundtop SS

Ellijay, Gilmer County, Georgia

Terracon Project No. 49147077

August 15, 2014

Prepared for:
Georgia Transmission Company
Tucker, Georgia

Prepared by:
Terracon Consultants, Inc.
Duluth, Georgia

Terracon

August 15, 2014

Georgia Transmission Company
2100 East Exchange Place
Tucker, GA 30084-5336

Attn: Ms. Dana Heil – Environmental Regulatory Compliance Coordinator
P: [770] 270-7983
F: [770] 270-7529
E: dana.heil@gatrans.com

Re: Biological Evaluation
Ellijay – Roundtop T/L and Roundtop SS
Ellijay, Gilmer County, Georgia
Terracon Project No. 49147077

Dear Ms. Heil:

Terracon Consultants, Inc. (Terracon) is pleased to submit this biological evaluation (BE) report detailing the results of field studies for federally endangered and proposed endangered bat species at the above referenced site. This work was performed in general accordance with the scope of services outlined in Terracon Proposal No. P49140034 dated March 12, 2014. This report has been prepared for the exclusive reliance of Georgia Transmission Company (GTC) and the Rural Utilities Service (RUS). Use or reliance by any other party is prohibited without the written authorization of the GTC and Terracon.

We appreciate the opportunity to provide services to GTC and RUS. If you have any questions concerning this report, or if we can assist you in any other matter, please call our office at 770-623-0755.

Very truly yours,
Terracon Consultants, Inc.

Emily Kosmalski
NEPA Group Manager

Jim W. Baxter, MFR
Senior Ecologist

TABLE OF CONTENTS

ATTACHMENTS

1.0 Introduction

GTC is proposing to construct a new 17 mile electric transmission project in the vicinity of Ellijay, Gilmer County, Georgia. The lead federal authority for the project is the United States Department of Agriculture (USDA) Rural Utilities Service (RUS) who is required to complete an environmental analysis of the project. As a condition of the National Environmental Policy Act (NEPA), an Environmental Assessment (EA) is being prepared to address the potential for significant environmental impacts as a result of the proposed action. Compliance may require consultation with the United States Fish and Wildlife (USFWS) in accordance with Section 7 of the Endangered Species Act (ESA). As a condition of Section 7 of the ESA, potential impacts to federally listed species must be addressed. This BE addresses applicable listed species and provides a preliminary effect conclusion to be submitted to the USFWS.

The purpose of our services is to determine whether the proposed construction of the transmission line and substation may affect the Indiana bat (*Myotis sodalis*), gray bat (*Myotis griscescens*), and/or Northern long-eared bat (*Myotis septentrionalis*). Services were conducted utilizing the January 2014 Range Wide Indiana Bat Summer Survey Guidelines (2014 Guidelines) as detailed by USFWS. The report will be submitted to the USFWS Athens Ecological Services Field Office for concurrence based on the results of a detailed habitat survey, acoustic surveying, and mist-netting activities performed at the site from mid April 2014 to early June 2014.

1.1 General Site Description

The site consists of an approximate 17-mile corridor that is proposed for the construction of a transmission line and substation. Approximately 14 miles of the corridor is road side with generally a 30-foot right of way on country roads that expands to as much as 100 feet on densely wooded minor roads. Approximately 3.25 miles of the corridor is undeveloped wooded land (cross-country) and open land with a 100-foot wide proposed cleared easement that expands to 125 feet wide near a proposed crossing at Carters Lake. The corridor begins on the west end of downtown Ellijay at an existing substation and extends generally in a westerly direction following Tails Creek Road. At the intersection of Lower Tails Creek Road the corridor turns south extending past Banks Road until entering the undeveloped (cross country) portion of the site. This area extends for approximately 3.25 miles, crossing Carters Lake before entering another road side portion along Oak Hill Drive. Additional roadside portions include Barnes Mountain Road and Knight Road to the south before intersecting Roundtop Road and heading south to a proposed substation location just north of the existing Carters Dam Nelson 230 KV transmission line easement. The corridor terminates at the proposed Roundtop substation. A site topographic map (Exhibit 1/1A) and site aerial location map (Exhibit 2/2A) have been attached to this report illustrating the approximate location of the site.

In order for a successful connection from the downtown Ellijay substation to the existing Carters Dam Nelson transmission easement to the south, the project must cross through an undisturbed

wooded area and across Carters Lake. The location of the lake crossing has been placed in a relatively narrow area of the water body with larger portions of the lake located to the west. The road side portion of the proposed easement generally only proposes a 30-foot right of way for most of the corridor and a majority of this area is open landscaped land along with adjacent commercial and residential development. Minimal impacts to the environment are expected for this area of the project. Proposed construction and conservation measures will be discussed following a habitat and species evaluation of the site.

An alternative crossing of the lake was also studied at the request of the United States Army Corps of Engineers (USACE). The location of this crossing is illustrated and Exhibits 1/1A and 2/2A.

2.0 Protected Species Review

Two federally protected bat species and one federally proposed endangered bat species have been identified as potentially occurring in the vicinity of the project site. The species of concern are the federally endangered Indiana bat and gray bat, and proposed endangered Northern long-eared bat. A brief description of each species is as follows:

Indiana Bat

The Indiana bat is a small dark gray to brownish black bat that is normally less than two inches in length. This Myotis species has a pinkish nose, small hind feet with few short hairs that do not extend beyond the toes, and a calcar (the spur extending from the ankle) that has a slight keel. Its hair is less glossy in appearance than that of little brown bats. Limestone caves with stable temperatures in the high 30s to mid-40s Farenheit (F) are preferred as hibernacula. Roosting and foraging takes place in hardwood and mixed hardwood-pine forests during the summer months, primarily in riparian and floodplain areas as well as adjacent coves and hillside forests. Trees with exfoliating bark and snags (dead trees) with loose, peeling chunks of bark and/or crevices and holes are utilized for roosting.

Gray Bat

The gray bat is the largest Myotis species found in the eastern United States generally averaging three to four inches in length. Fur is appropriately a gray color and usually wooly. Two specific characteristics of this bat are that it is the only Myotis with the wing membrane attached to the ankle (instead of at the base of the toe), and the only bat in its range with dorsal hair that is uniform in color from base to tip. Cave hibernation requires very specific temperatures normally from the low 40s to low 50s F. Summer caves must be warmer and close to rivers or lakes for feeding areas.

Northern long-eared bat

The northern long-eared bat is small to medium sized (generally around three inches in length), but has a much larger wingspan than other bats in eastern United States. This species is a light brownish color with wooly fur and is most often distinguished from other Myotis by its long ears.

As with Indiana and gray bats, the northern long-eared bat requires caves with stable temperatures for hibernation, although temperature range can vary more than the other two species. Summer roosting and foraging is similar to the Indiana bat; however, this species also more commonly utilizes ridgelines and hilly areas as well as riparian areas. Trees with exfoliating bark and snags (dead trees) with loose, peeling chunks of bark and/or crevices and holes are utilized for roosting.

A habitat survey has been conducted for all three species described above; however, a greater focus has been placed on the Indiana and northern long-eared bat due to specific foraging and roosting habitat characteristics being defined for these species. The gray bat forages in similar habitat; however, roosting takes place in caves and underground karst areas and no hibernacula was identified on or in the vicinity of the project site.

3.0 Habitat Survey

Terracon's habitat survey was performed by Mr. Jim Baxter (Terracon Senior Ecologist). Mr. Baxter is experienced in eastern Piedmont habitat types and has performed numerous tree surveys/timber cruises throughout the southeast identifying all tree-types in hardwood and mixed hardwood-pine forests. The survey was conducted from April 10 until May 1, 2014 with the summer forest canopy returning toward the end of the survey.

3.1 Methods

The habitat survey was performed in accordance with the 2014 Guidelines. Interim guidance for the northern long-eared bat is available; however, the Indiana bat guidelines were utilized for this species as well due to habitat characteristics in this particular range being very similar. The guidelines define suitable summer habitat as a wide variety of forested/wooded habitats where roosting and foraging may take place. Non-forested habitat such as wetland areas, wood lines, fence lines, and edges of agricultural fields may also qualify as travel corridors. Preferred tree species characteristics include exfoliating bark, crevices, cracks, etc. with a diameter breast height (dbh) of five inches or greater (three inches or greater for the northern long-eared bat). Wooded areas may be somewhat dense; however, open corridors that provide access to feeding in riparian and floodplain areas are necessary for travel purposes.

For the purposes of this habitat survey, the site was first split into two sections, the roadside portion of the corridor and the undeveloped cross-country portion of the corridor. These two categories were further split into the following (see Exhibits 22/22A) with the following sections illustrated and separated by red brackets):

Roadside Corridor Sections:

- Tails Creek Road
- Lower Tails Creek Road/Banks Road
- Oak Hill Drive
- Barnes Mountain Road/Knight Road
- Roundtop Road

Cross Country Corridor Sections:

- Banks Road CC
- Carters Lake North
- Carters Lake South
- Barnes Mountain Road CC
- Roundtop Road SS

All roadside sections were observed by walking generally along the proposed easement and detailing habitat characteristics thoroughly. Specific characteristics for observation included tree species type and size, bark characteristics, forest canopy and mid-story density, riparian and/or floodplain areas, flight corridors, and potential roost trees in open areas. Potential mist-netting sampling sites were identified based on the above listed features and total amount of suitable habitat identified. A survey data sheet was completed for potential sampling areas (see attached survey data sheets).

The cross-country sections were observed by walking the proposed easement and identifying similar characteristics as mentioned above. Data points were collected approximately every 500 feet to identify overall forest characteristics of the area, and potential mist-netting sites were recorded based on identifying the characteristics listed above in the roadside section. A survey data sheet was completed for each potential mist-netting site as well as each data point collected. All data points were collected within the 100-foot right of way proposed easement on the cross country section. Data sheets for sampling sites within the cross-country section are provided at the end of this document. Additional data sheets for overall forest characteristics and some areas of non-suitable habitat were completed and are available upon request.

The attached Exhibits 3 through 21 display the survey corridor on aerial imagery. It should be noted that access was not granted to areas shaded red on the exhibits, and a field inspection of those properties has not been conducted. A majority of these areas are within wooded areas of the cross country portion of the site and are being considered suitable habitat to be added to the entire linear footage of suitable habitat on the site.

3.2 Roadside Corridor

Tails Creek Road

The Tails Creek Road portion of the site includes an approximate eight mile stretch of roadside corridor extending west from downtown Ellijay to Lower Tails Creek Road where the corridor

shifts south. Numerous land cover types were observed along this portion of the site which is the longest portion of the roadside sections. Stands of mature hardwood and hardwood-pine forest were identified in extended areas along the road as well as many small fragmented forested areas that were identified as non-suitable. Steep hillsides within the corridor were also identified displaying young pine stands and thick hardwood trees less than five inches in diameter that have recently grown in a disturbed area. Other non-suitable habitat identified in this section includes stretches of open pastureland, commercial and residential development, and cleared land. The corridor crosses two major creek channels in Mountain Town Creek and Tails Creek, and also runs parallel to a smaller perennial stream at the east end of the section. A few other low areas were identified but were not observed as riparian in nature. Overall suitable habitat for the Tails Creek Road section is considered minimal.

Lower Tails Creek Road/Banks Road

This section of the roadside corridor extends south approximately 0.8 miles along Lower Tails Creek Road and a small portion of Banks Road before entering the undeveloped cross country portion of the site. The corridor along the north end of the section is within a residential area and then enters a roadside mixed hardwood-pine forest until turning southeast at the cross country section. A majority of the proposed easement is outside or just within the forested area of this section with few favorable habitat characteristics observed. A few small trees with exfoliating bark or crevices were observed, but no larger trees (greater than 10 inches dbh) displays potential prime roosting characteristics were observed. Overall suitable habitat for the Lower Tails Creek Road section is considered minimal to almost none.

Oak Hill Drive

This section of the roadside corridor is a gravel and dirt road that is primarily utilized by a logging company in regards to harvesting activities associated with a Virginia pine stand. The section begins at a former camping area just south of Carters Lake and extends south for approximately two miles where it intersects Highway 382 and enters the Barnes Mountain Road CC section. The north end of the Oak Hill Drive section was observed generally following a dirt road within the forest until reaching a USACE gate. Forest characteristics in this area were observed as a mature hardwood forest with some trail roads and open areas that may act as flight corridors. No riparian areas were observed with exception to Carters Lake further to the south; however, a low hardwood cove area was observed just below a trail road near the north end of the section.

The south end of the Oak Hill Drive section (south of the USACE gate) also extends generally through a forested area adjacent to a gravel road; however, the forest was observed as an extremely dense Virginia pine (*Pinus virginiana*) stand. Terracon observed the entire corridor in this area very thoroughly to confirm habitat characteristics. Canopy closure was observed as extremely thick with a very thick mid-story as well due to the lower trunk branches occurring on the Virginia pine species. The shaded conditions have also resulted in limited hardwood growth in the area with very few species greater than five inches dbh observed. No dead pine trees or any hardwood trees displaying favorable roosting bark characteristics were observed throughout

this stretch, and no riparian areas or flight corridors leading to areas of suitable habitat were observed. Furthermore, a timber company owns this area and frequent disturbance occurs from logging activities. Overall suitable habitat for the Oak Hill Drive section is considered very minimal.

Barnes Mountain Road/Knight Road

This section of the roadside corridor begins just south of the Barnes Mountain Road/Highway 382 intersection where the corridor emerges from a small cross country tract known as Barnes Mountain Road CC. The roadside corridor follows Barnes Mountain Road from approximately 0.6 miles of primarily residential and open land. A few small sections of forest are located in the area, but these patches are fragmented and no more than 100 linear feet in length. The corridor shifts further to the south at the Knight Road intersection and continues for approximately one mile until reaching Roundtop Road. No mature forested areas were observed along Knight Road which is largely residential with a young planted pine plantation encompassing the remainder of the corridor along this road. No potential roosting trees or maternity colony trees were observed within the sparsely vegetated or residential areas along Barnes Mountain Road and Knight Road. One wooded section along each road was identified as suitable habitat in the form of hardwood forest extending approximately 400 feet at each location; however, the corridor only enters the forest in limited locations and suitable sampling locations were not observed. Overall suitable habitat for the Barnes Mountain Road/Knight Road section is considered minimal.

Roundtop Road

The southernmost portion of the roadside corridor is the Roundtop Road section which extends south from Knight Road for approximately 0.8 miles until the corridor terminates at a proposed substation location just north of the Carters Dam power easement. Portions of the Roundtop Road section were observed as similar to Barnes Mountain Road in being residential, and two forested areas were observed that were determined to consist of low quality suitable habitat. No riparian corridors or flyways were observed in these areas which consisted of thick hardwood forest, and more desirable sampling locations are provided in other portions of the corridor. Overall suitable habitat for the Roundtop Road section is considered very minimal to almost none.

3.3 Cross Country Corridor

Banks Road CC

This section begins the cross country portion of the corridor where the proposed easement shifts southeast off of Banks Road into an undeveloped forested area. A dirt road is located near the corridor for portions of this segment; however, the entire section can be considered undeveloped. An open field area was observed on the east side of the corridor with large potential roosting trees on the west side within the forest, and a riparian area with a creek channel further to the south. A data point was collected approximately every 500 feet to detail overall forest characteristics (see attached survey sheets). Overall forest characteristics can be

summarized as a mature mixed-hardwood pine forest with moderate canopy coverage and a somewhat open understory throughout. The end of this section is at a steep ridgeline approximately 0.7 mile from the easement leaving Banks Road. Overall suitable habitat for the Banks Road CC section is considered moderate.

Carters Lake North

The end of the Banks Road CC section marks a location where access was not granted for approximately 0.4 miles of the cross country stretch. The Carters Lake North section begins near survey marker #101 and extends approximately 0.5 miles south until reaching the lake. The area was surveyed up to 200 feet from the high water mark of the lake as this portion of the corridor has been designated as a protected vegetative buffer zone. The area displays the steepest topography of the entire corridor with one riparian zone located in the area. Data points were collected approximately every 500 feet to detail overall forest characteristics which not surprisingly are extremely similar to the Banks Road CC section. Boat Ramp Road is crossed near the south end of this section with two open grassy areas before the corridor nears a ridge top above Carters Lake. The corridor descends down a steep hill toward the lake at that point. Overall suitable habitat for the Carters Lake North section is considered moderate.

Carters Lake South

The corridor crosses Carters Lake and remerges into a similar mixed hardwood-pine forest on the south side of the lake. This area was observed as very steep with some large hardwood trees and extending approximately 2,000 feet before entering the Oak Hill Drive roadside section. No open areas that could act as flight corridors were observed in the area; however, the understory was observed as moderately open in one area with a few larger oak species displaying exfoliating bark. In the same manner as the Carters Lake North section, the area within 200 linear feet of the high water mark of the lake has been designated with a protected vegetative buffer. Overall suitable habitat for the Carters Lake South section is considered moderate.

Barnes Mountain Road CC

This section of the cross country portion of the corridor includes a small tract of land just south of the Oak Hill Drive/Highway 382 intersection. The corridor follows this patch of wooded land before entering the Barnes Mountain Road CC. Only one data point was recorded in this section due to the smaller length; however, the area displays a mature mixed hardwood-pine forest. The only large shagbark hickory with exfoliating bark was observed near the data point as well as numerous large white oaks with exfoliating bark and some large snags. The canopy is well closed in this forested area and the understory is very open with little vegetative competition. Overall suitable habitat for the Barnes Mountain Road CC section is considered moderate.

Roundtop Road SS

The final forested area of the site consists of an approximate three acre tract where a substation is proposed at the south end terminating point of the site. A majority of the area was observed

as thick hardwood forest with an open/cleared area near the east end of the tract at Roundtop Road. A high number of chestnut oaks (*Quercus prinus*) were observed throughout the area, a characteristic not common throughout other forested areas of the site. Prime suitable habitat characteristics such as roosting trees, riparian areas, and flight corridors were not observed. The area is borderline defined as a roadside section with Roundtop Road and an existing power easement adjacent to the east and south. Overall suitable habitat for the Roundtop Road SS section is considered minimal. The location is designated as RRSS on Exhibit 21.

3.4 Summary

Of the five sections of both the roadside and cross country portions of the site, approximately 6.0 miles (9.6 kilometers) of suitable habitat was observed. A majority of the suitable habitat is located along the cross country portion of the corridor as expected with limited patches of desirable forested land on the roadside corridor. A habitat summary table is provided below.

Habitat Survey Results Table Summary

Roadside Corridor Sections	**Suitable Habitat**	**Non-Suitable Habitat**
Tails Creek Road	Minimal wooded land in areas, good riparian corridor	Open land along with substantial commercial and residential development
Lower Tails Creek/Banks Road	Very minimal	Primarily non-suitable outside of forested area
Oak Hill Drive	Very minimal	Thick Virginia pine dominates
Barnes Mtn./Knight Road	Minimal a few small sections of wooded land	Primarily open field and some residential development
Roundtop Road	Very minimal to almost none	Open land and residential
Cross Country Sections		
Banks Road CC	Moderate with established mixed hardwood pine and a few potential roost trees	Some open areas as well as dirt road corridors
Carters Lake North	Moderate with very steep topography	A few very thick forest patches that are not suitable
Carters Lake South	Moderate with very steep topography	A few very thick forest patches that are not suitable
Barnes Mountain Road CC	Roost trees identified with an established old growth forest	N/A – a majority of this section is suitable; however, no riparian areas or flight corridors
Roundtop Road SS	Minimal	Thick hardwood that is young aged adjacent to a developed area

Based on the 2014 Guidelines a total of 40 net nights (10 sampling sites) were completed to address 9.6 kilometers of suitable habitat. A meeting with USFWS took place following the habitat survey and the agency approved the amount of suitable habitat designated as well as the implementation of 10 mist net sampling sites. As a regional condition, acoustic surveys were requested to be conducted in conjunction with the netting sites. Based on this information, a sampling plan was drafted by Mr. Drew Carson of Power Engineers, Inc. (POWER) and approved by USFWS.

4.0 Mist Netting and Acoustic Sampling Activities

Mist netting and acoustic surveying activities were conducted at the site by Mr. Drew Carson of POWER during May and June 2014. As stated in Section 3.0, a total of ten sampling sites were selected based on the results on Terracon's habitat survey utilizing the methods outlined in the 2014 Guidelines. The location of each sampling site is approximated on Exhibit 2. The locations are also plotted on Exhibits 3-21 (locations not on all maps) with the latitude and longitude. A few of the survey locations were shifted slightly outside of the proposed easement corridor in order to place nets in a more desirable area to catch bat species. These locations were updated throughout the survey with the information provided and approved by the USFWS. A Draft Bat Mist Net Survey report was provided to Terracon on July 8, 2014 with an updated final version (based on USFWS comments) provided on August 15, 2014. The following paragraphs briefly summarize the methods and results of the survey. Further details of the study can be found in the attached report. Results from the alternative route requested by the USACE are also further discussed in the attached report.

Mr. Carson's mist netting sampling method consisted of placing two nets at each location for two nights resulting in four net nights per location and 40 overall net nights as required. Acoustic Anabat SD2 detectors were utilized each night at least 200 feet from the netting locations. Collected calls were downloaded and processed utilizing EchoClass 2.0 and BCID East acoustic software analysis.

The mist net survey resulted in the capture of 28 bats with at least one bat caught at each sampling location (with exception to TCR-1 where no bats were captured). The dominant species captured was the red bat (*Lasiurus borealis*) with a total number of 19 individuals. Additional species captured include the big brown bat (*Eptesicus fuscus*), tri-colored bat (*Perimyotis subflavus*), and evening bat (*Nycticeius humeralis*). No Indiana, gray, or Northern-long eared bats were captured.

Acoustic survey results generally identified calls from mist net captured species as well as a few other non-endangered species such as the hoary bat (*Lasiurus cinereus)* and silver-haired bat (*Lasionycteris noctivagans*). A few gray bat calls were identified as well. The BCID software identified one potential Indiana bat call at the TCR-6 location; however, the call was not identified by the EchoClass 2.0 software.

Final results of the study concluded that while suitable habitat is located on a portion of the site, future activities are not likely to adversely affect the Indiana bat or Northern long-eared bat. A more detailed analysis of the information (including an overall study of percentage composition of bat species identified in the acoustic analysis and qualitative analysis of identified Myotis calls) can be found in the attached document at the end of this report.

5.0 Project Effects of Protected Species

Potential effects to the evaluated species are generally limited to potential impact to existing suitable habitat, which would include:

- Tree clearing for the easement which would disturb the existing vegetative community
- Removal of wildlife habitat as a result of clearing activities
- Minor fragmentation of wildlife habitat

The most notable effect would be tree clearing of the 100-foot right of way along the cross-country portion of the site. This wooded land would be converted from generally a mixed hardwood-pine forest to an open scrub shrub area. Specific impacts to the bats species of interest have been further evaluated based on results of the detailed habitat survey in conjunction with mist netting and acoustic surveys performed at the site, and are discussed below.

Indiana Bat

As stated in Section 3.0, the habitat survey identified approximately 6 miles of suitable roosting habitat with a majority of the habitat located on the cross country portion of the project. No individuals were captured during mist netting activities. One potential Indiana bat call was identified; however, only one of the software tools picked up the call while the other showed no degree of confidence that the call was actually that of an Indiana bat. The overall acoustic analysis performed by POWER identified a low likelihood of the species being present in the area. The project area location is within a larger mixed hardwood-pine forest surrounding Carter's Lake, and proposed tree clearing activities will not fragment the habitat as a whole or cause jeapordization of the species. The resulting open easement corridor may even act as a potential flyway for Indiana bats that may pass through the area. The proposed project **may affect, but is not likely to adversely affect the Indiana bat.**

Gray Bat

No gray bats were captured during mist netting activities on the site; however, the acoustic survey did present evidence of gray bat calls in the area. Carters Lake is located in the site area and gray bats are known for sometimes flying over open water during the night hours. This species roosts in caves and karst systems and does not roost in forested areas as some other bats do. No caves or karst systems were observed on or in the vicinity of the site. Any potential gray bats in the area would only be active at night, and construction activities in the vicinity of

the lake will occur during the daytime hours. The proposed project will have **no effect on the gray bat**.

Northern long-eared bat

This species utilizes summer roosting habitat in a similar manner to the Indiana bat with suitable habitat on the site consisting of the same 6 mile stretch identified for the Indiana bat. No individuals were captured during mist netting activities and no calls were identified during the acoustic survey. The overall acoustic analysis performed by POWER identified a low likelihood of the species being present in the area. The project area location is within a larger mixed hardwood-pine forest surrounding Carter's Lake, and proposed tree clearing activities will not fragment the habitat as a whole or cause jeapordization of the species. The resulting open corridor may even act as a potential flyway for Northern long-eared bats that may pass through the area. The proposed project **may affect, but is not likely to adversely affect the Northern long-eared bat**.

6.0 Construction and Conservation Measures

Construction of the proposed easement involves land clearing activities, specifically vegetative clearing to provide an open corridor for power lines. Installation of the poles is a land disturbing activity that is normally achieved by digging a hole with an auger and embedding each pole structure in the ground. Numerous existing trails and access roads are located in the vicinity of the proposed easement; however, additional temporary construction roads and permanent access roads that are not located within the proposed easement may be necessary for construction and maintenance purposes. These access roads will be minimized to the greatest extent possible to prevent additional land disturbance.

GTC will be submitting a Notice of Intent for coverage under a National Pollution Discharge Elimination System (NPDES) general permit for construction sites. Standard best management practices will be installed during the construction phase including sedimentation and erosion control measures such as silt fencing, check dams, grass seeding, etc. All areas of land disturbance will be stabilized with the appropriate vegetation. No land disturbance is proposed within the stream channels along the easement, and no disturbance will be proposed within a majority of the 50' vegetative stream buffer zones. In areas where stream buffer encroachment is unavoidable and minimal land disturbance is proposed, a stream buffer variance has been acquired from the Georgia Environmental Protection Division (GEPD). An approximate 200-foot tree save easement will be utilized on each side of the Carters Lake crossing and one of the stream channel crossings.

Schedule

GTC proposes to commence construction activities in early to mid-2015 starting on the roadside portion of the proposed easement. Suitable habitat identified on the roadside portion of the project was observed as limited and of low quality in most areas where it exists. The Indiana bat and Northern long-eared bat generally roost in suitable trees during the summer months. In

areas of suitable habitat, tree removal will occur between the dates of October 15 and March 31 to prevent potential impact during the roosting season. GTC proposes to conduct tree clearing activities within the suitable habitat portion of the cross country sections of the project site during the "winter season" between October 15 and March 31. Areas determined as non-suitable habitat as well as the limited suitable habitat areas identified on the roadside portion of the project will not be subject to clearing restrictions. No clearing restrictions will be placed on the proposed substation portion of the project as minimal suitable habitat was identified in the area. Exhibits 12-16 of the attached habitat survey maps illustrate the cross county portion of the easement proposed for winter clearing.

7.0 Summary of Findings

The following table summarizes expected project effects on each species based on the information provided in this report.

Preliminary Effects Finding of Proposed Action on Evaluated Species

Common name (Scientific name)	Federal Status	Effect Determination
Indiana bat (*Myotis sodalis*)	Endangered	May affect, is not likely to adversely affect
Gray bat (*Myotis griscescens*)	Endangered	No effect
Northern long-eared bat (*Myotis septentrionalis*)	Proposed Endangered	May affect, is not likely to adversely affect

8.0 Standard of Care

Terracon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period. Terracon makes no warranties, express or implied, regarding the findings, conclusions or recommendations. Please note that Terracon does not warrant the work of laboratories, regulatory agencies or other third party resources supplying information used in the preparation of the report. These services were performed in accordance with the scope of work agreed to with our client. Findings, conclusions, and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time.

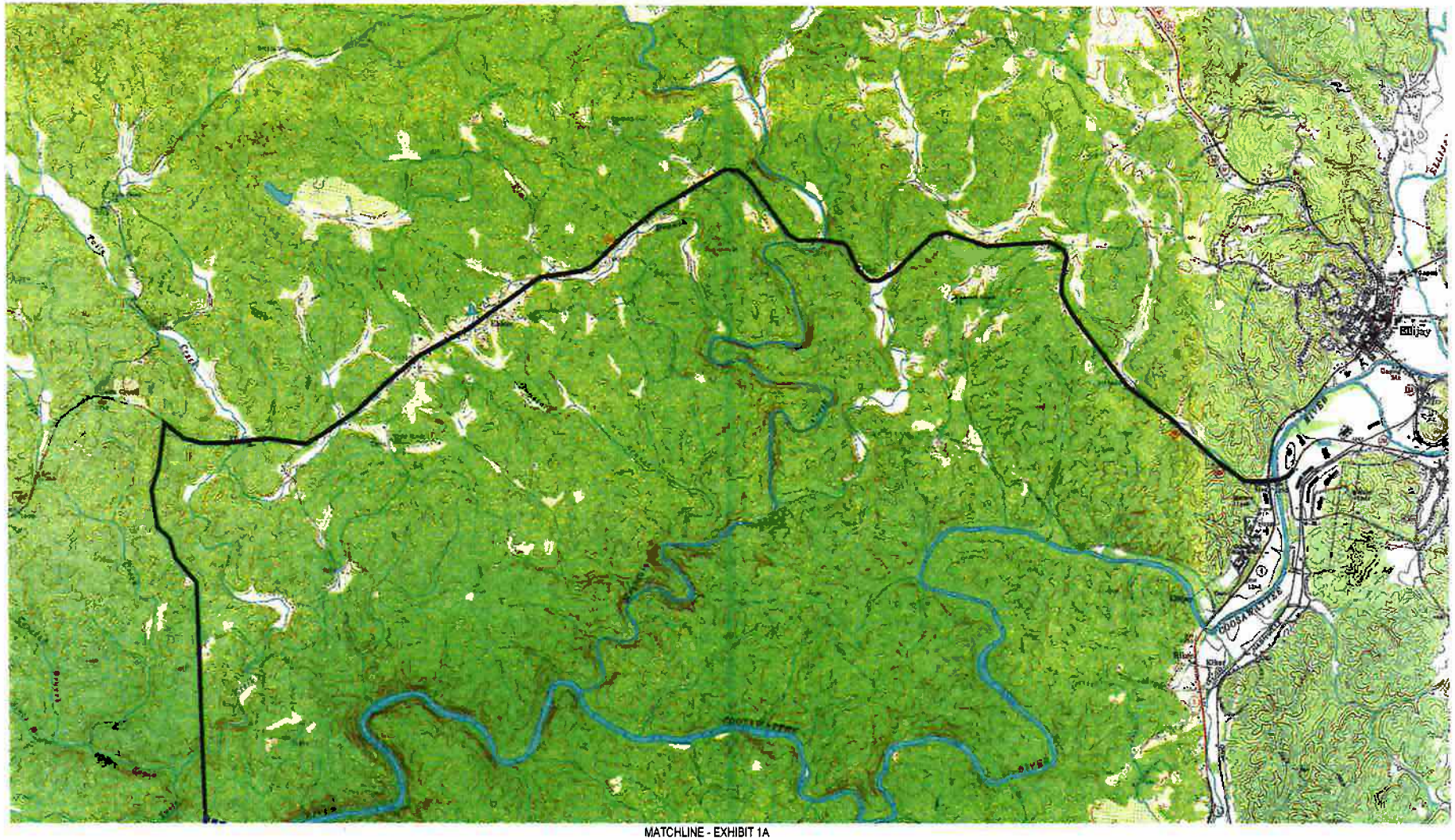
9.0 References

USFWS, 2014. Range Wide Indiana Bat Summer Survey Guidelines, dated January 2014.

USFWS, 2013. Final Indiana Bat Survey Guidance for Kentucky, USFWS and Kentucky Department of Fish and Wildlife Resources, May 2013.

USFWS, Information Planning and Conservation (IPAC) Website Search Engine for Federally Listed Species.

Kniowskie, Andrew, S. D. Gehrt, 2014. Journal of Wildlife Management, Home range and habitat selection of the Indiana bat, Volume 78, Issue 3.



MATCHLINE - EXHIBIT 1A

N

0 3000

Approximate Scale (Feet)

LEGEND

PROPOSED ALTERNATE ROUTE

APPROXIMATE CENTERLINE

QUADRANGLE
WEBB, GA 1971 & ELLIJAY, GA 1971
TALKING ROCK, GA 1971 PR1985

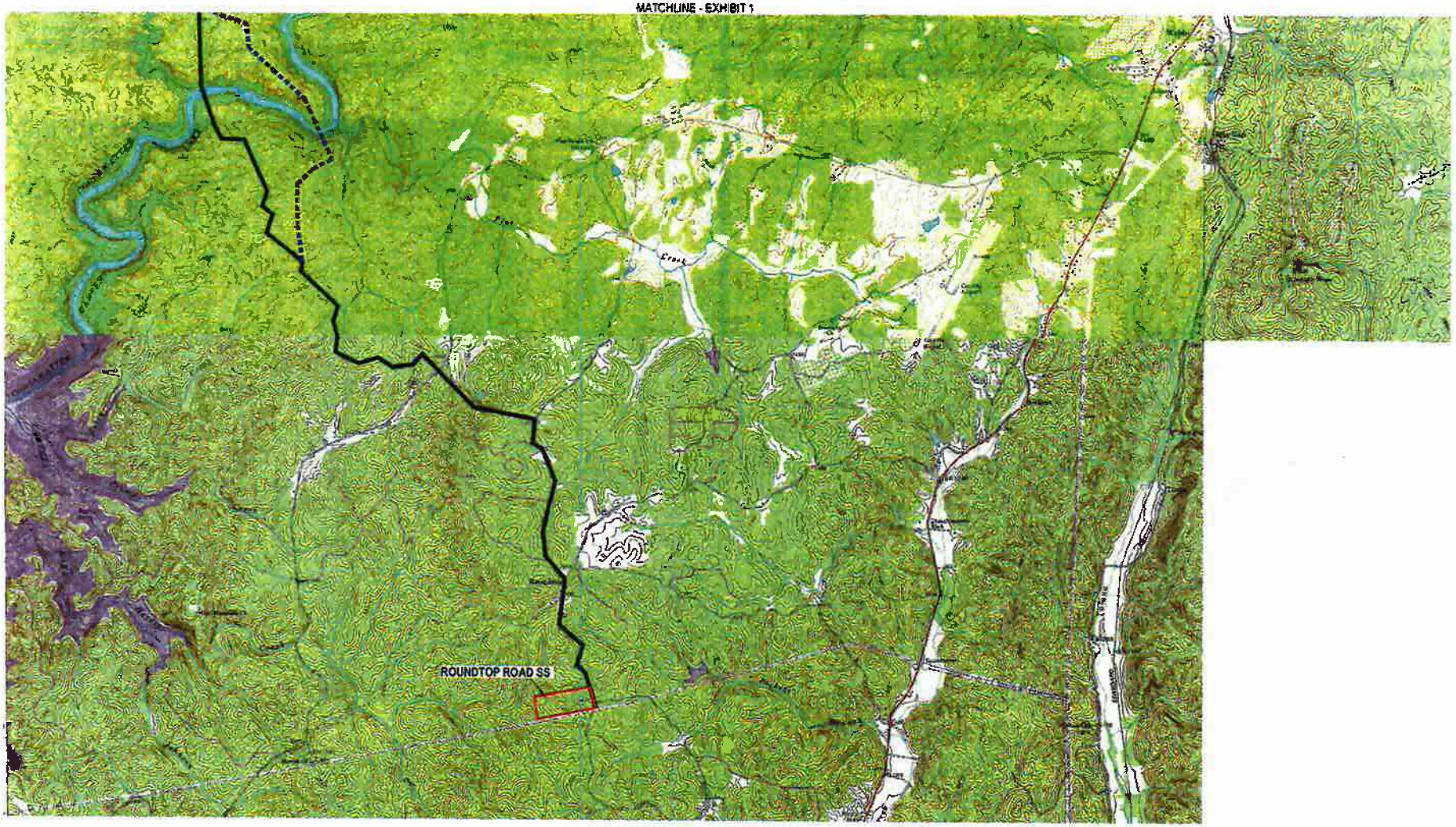
Project Engr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB
Project No.	49147077
Scale:	AS SHOWN
Plot No.	6BA9147077-1
Date:	AUGUST 2014

Terracon
Consulting Engineers and Scientists
2953 Pinnacle Parkway, Suite C Duluth, GA 30097
(770) 623-0755 (770) 623-0625

TOPOGRAPHIC VICINITY MAP
BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 1

THIS DIAGRAM IS FOR CONCEPTUAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES



N

0 3000

Approximate Scale (Feet)

LEGEND

PROPOSED ALTERNATE ROUTE

APPROXIMATE CENTERLINE

QUADRANGLE
WEBB, GA 1971 & ELLIJAY, GA 1971
TALKING ROCK, GA 1971 PR1985

Project Mgr:	JWB
Drawn By:	DWD
Checked By:	JMD/MBF
Approved By:	JWB
Project No.	45147077
Scale:	AS SHOWN
File No.	BE45147077-1
Date:	AUGUST 2014

Terracon
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TOPOGRAPHIC VICINITY MAP
BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 1A

MATCHLINE - EXHIBIT 2A

N

0 3000
Approximate Scale (Feet)

LEGEND

PROPOSED ALTERNATE ROUTE
APPROXIMATE CENTERLINE

Project Mngr.	JWB	Project No.	49147077
Drawn By	DWD	Scale	AS SHOWN
Checked By	JWB/MRF	File No.	EB49147077-2
Approved By	JWB	Date	AUGUST 2014

Terracon
Consulting Engineers and Scientists

SITE AERIAL VIEW
BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT
2

N

0 3000

Approximate Scale (Feet)

LEGEND

PROPOSED ALTERNATE ROUTE

APPROXIMATE CENTERLINE

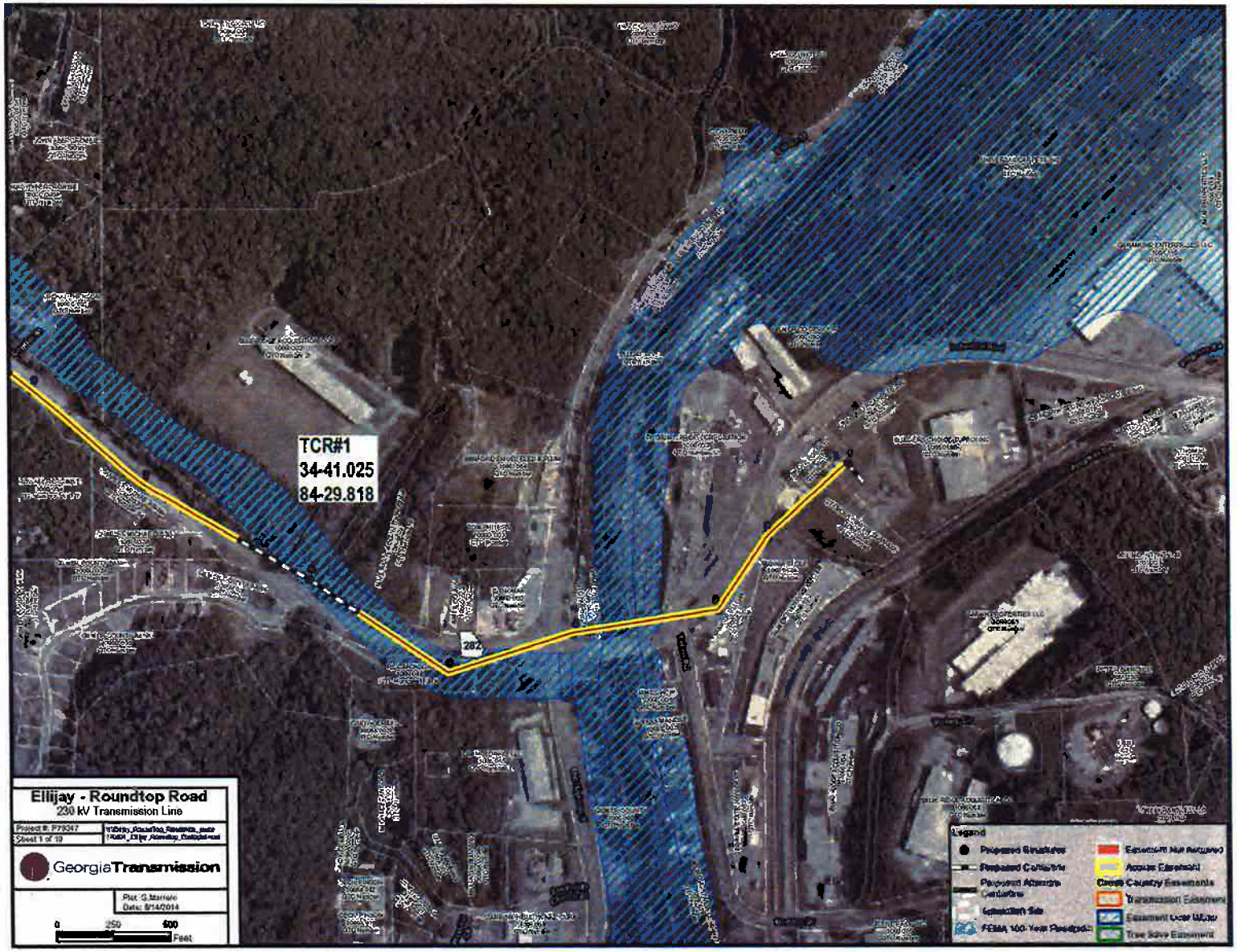
Project Mgr: JWB	Project No: 40147077
Drawn By: DWD	Scale: AS SHOWN
Checked By: JWB/MRF	File No:
Approved By: JWB	Date: AUGUST 2014

Terracon
Consulting Engineers and Scientists

SITE AERIAL VIEW

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 2A



Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

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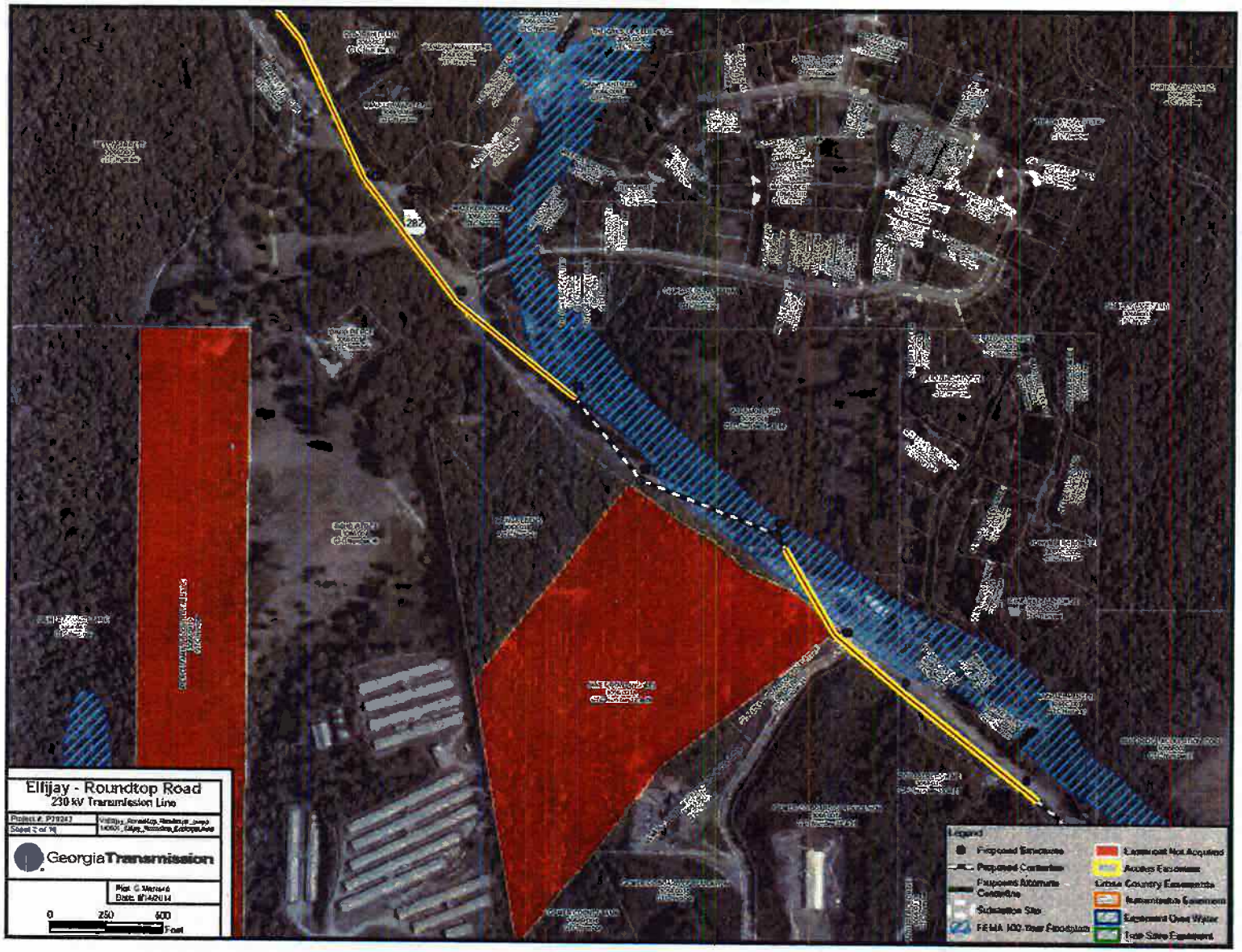
Consulting Engineers and Scientists
2855 Premiere Parkway, Suite C Duluth, GA 30097
(770) 823-0755 (770) 823-9628

HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 3



0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr.	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	8549147077-3A
Date:	AUGUST 2014

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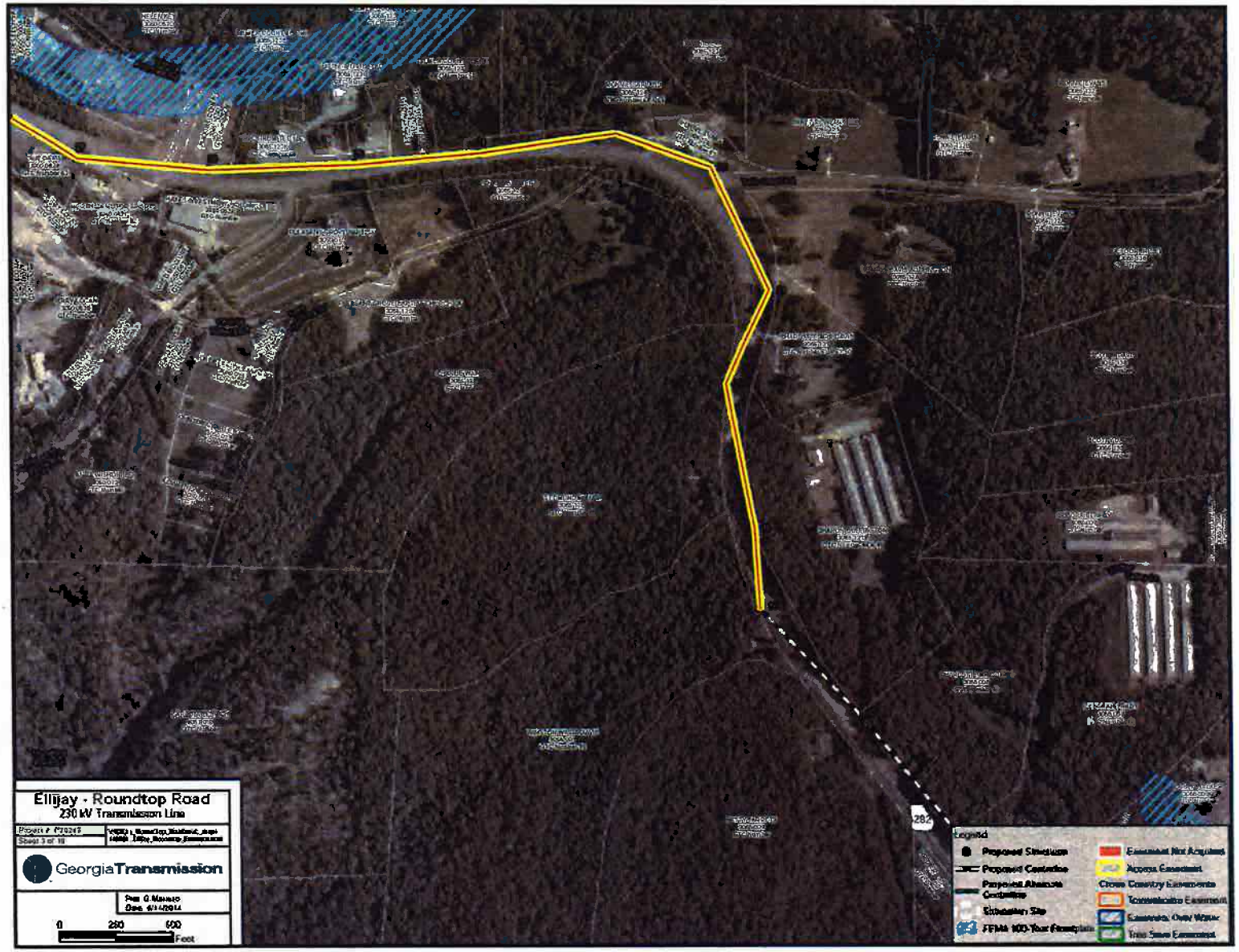
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 4



0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No:	49147077
Scale:	AS SHOWN
File No:	BE49147077-3A
Date:	AUGUST 2014

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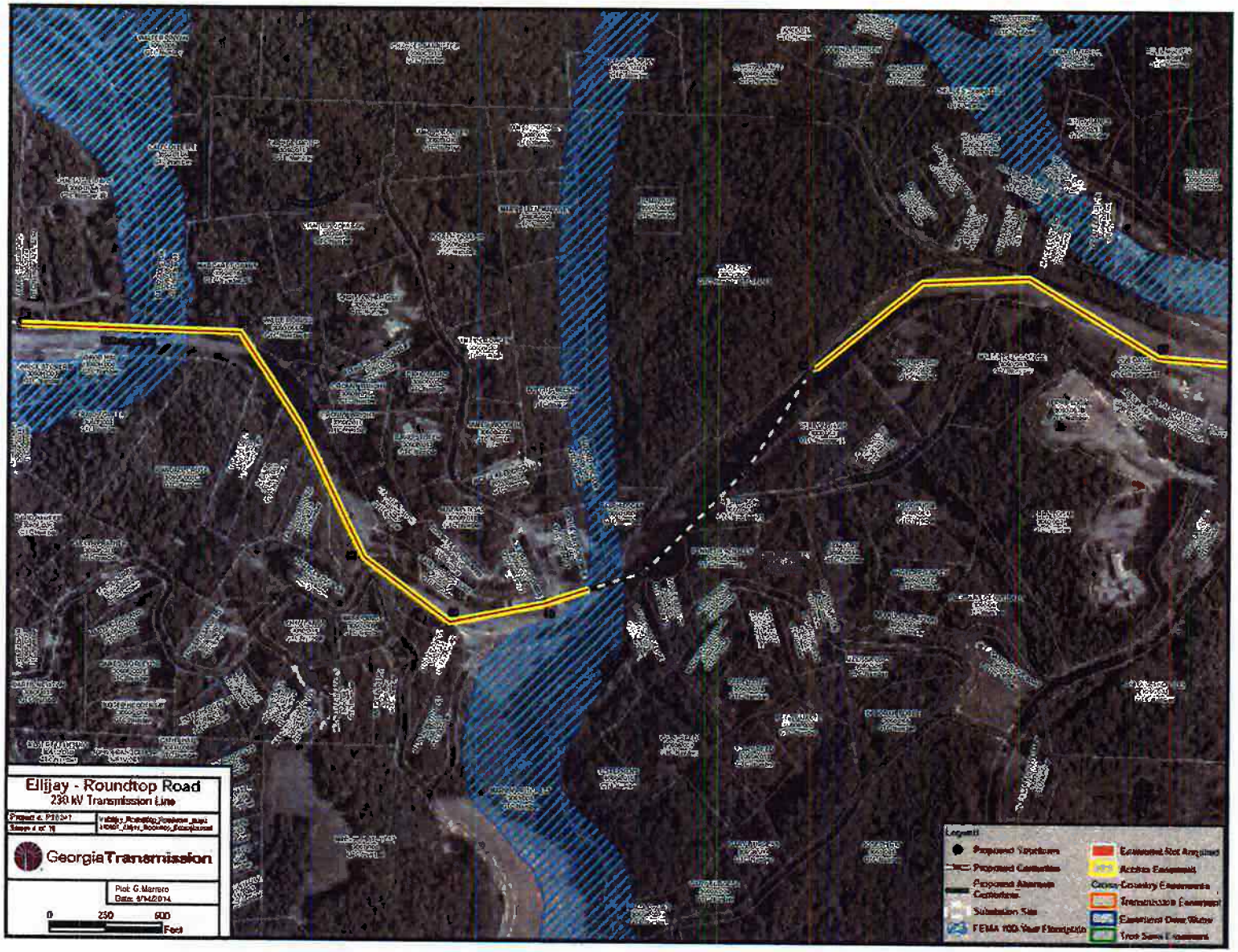
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 5



N

0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

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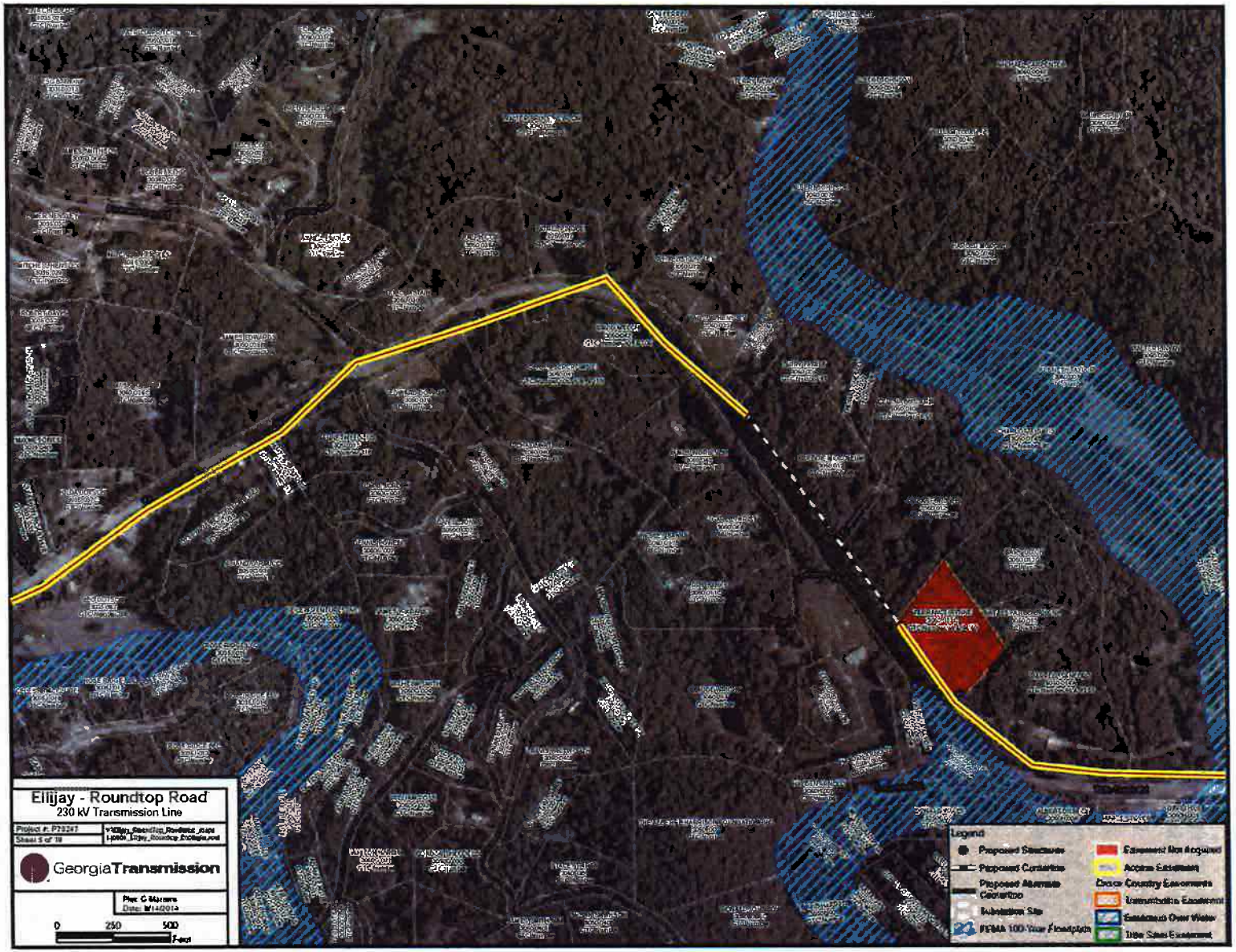
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 6



N

0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

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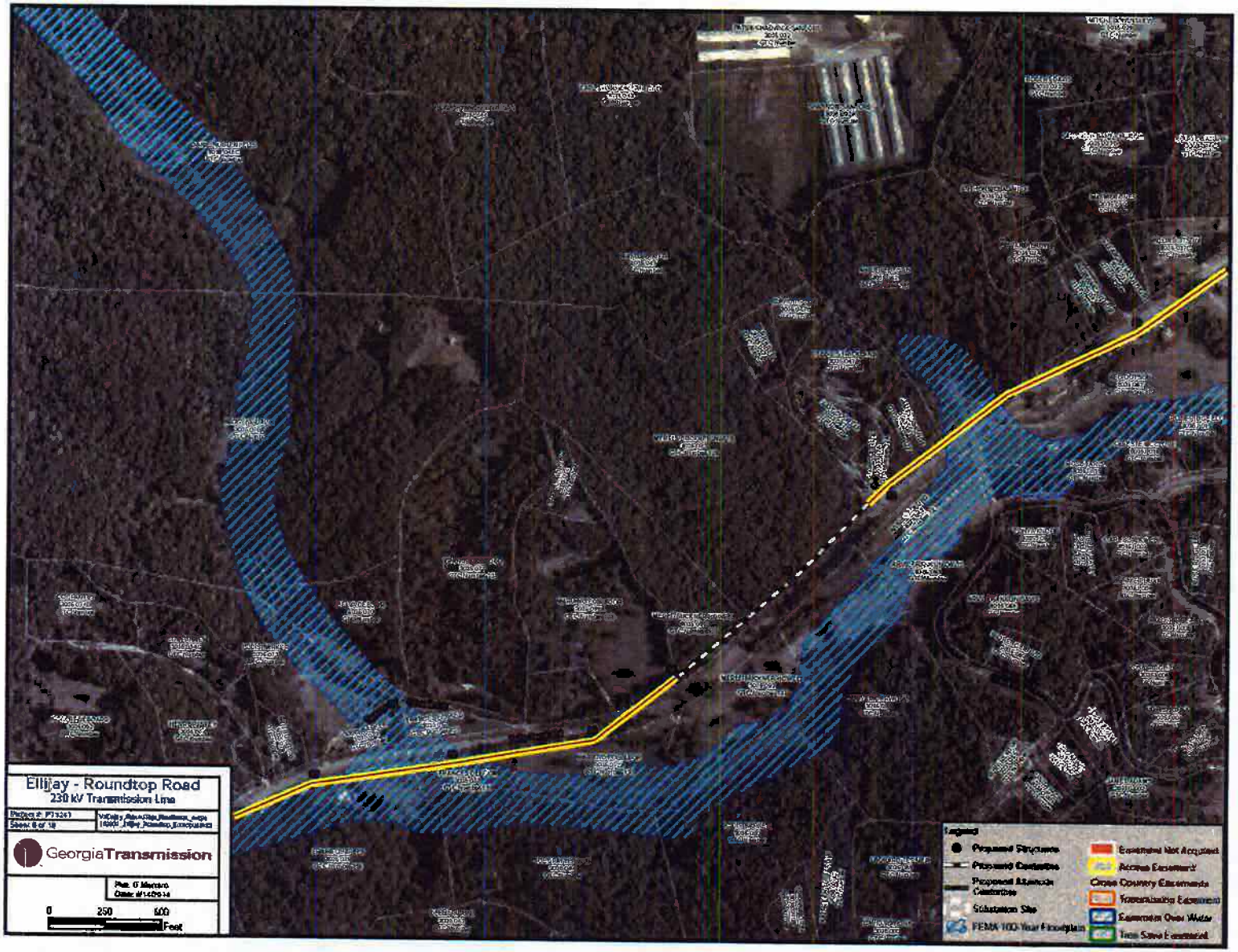
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 7



Project Mngr.	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

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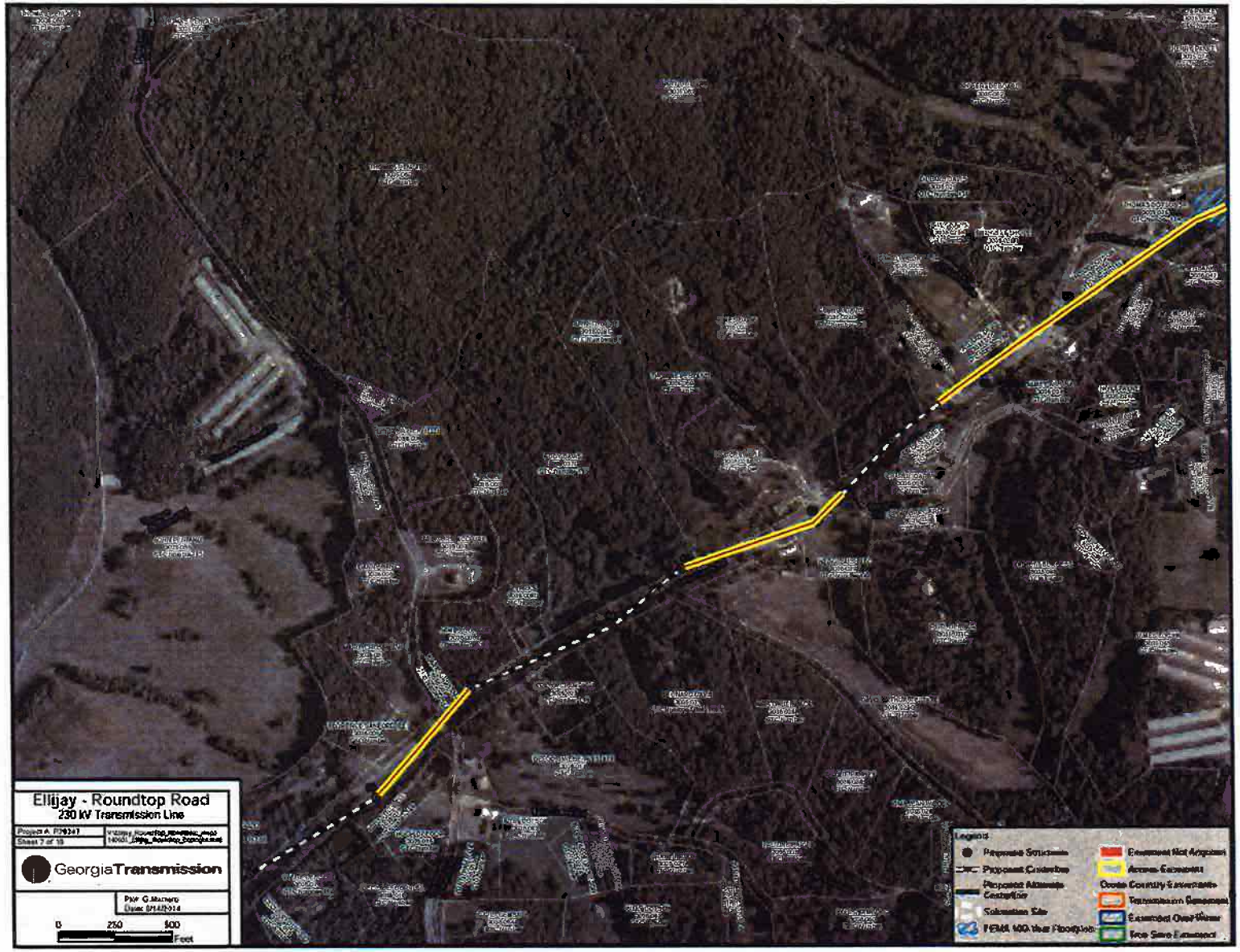
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 8



N

0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

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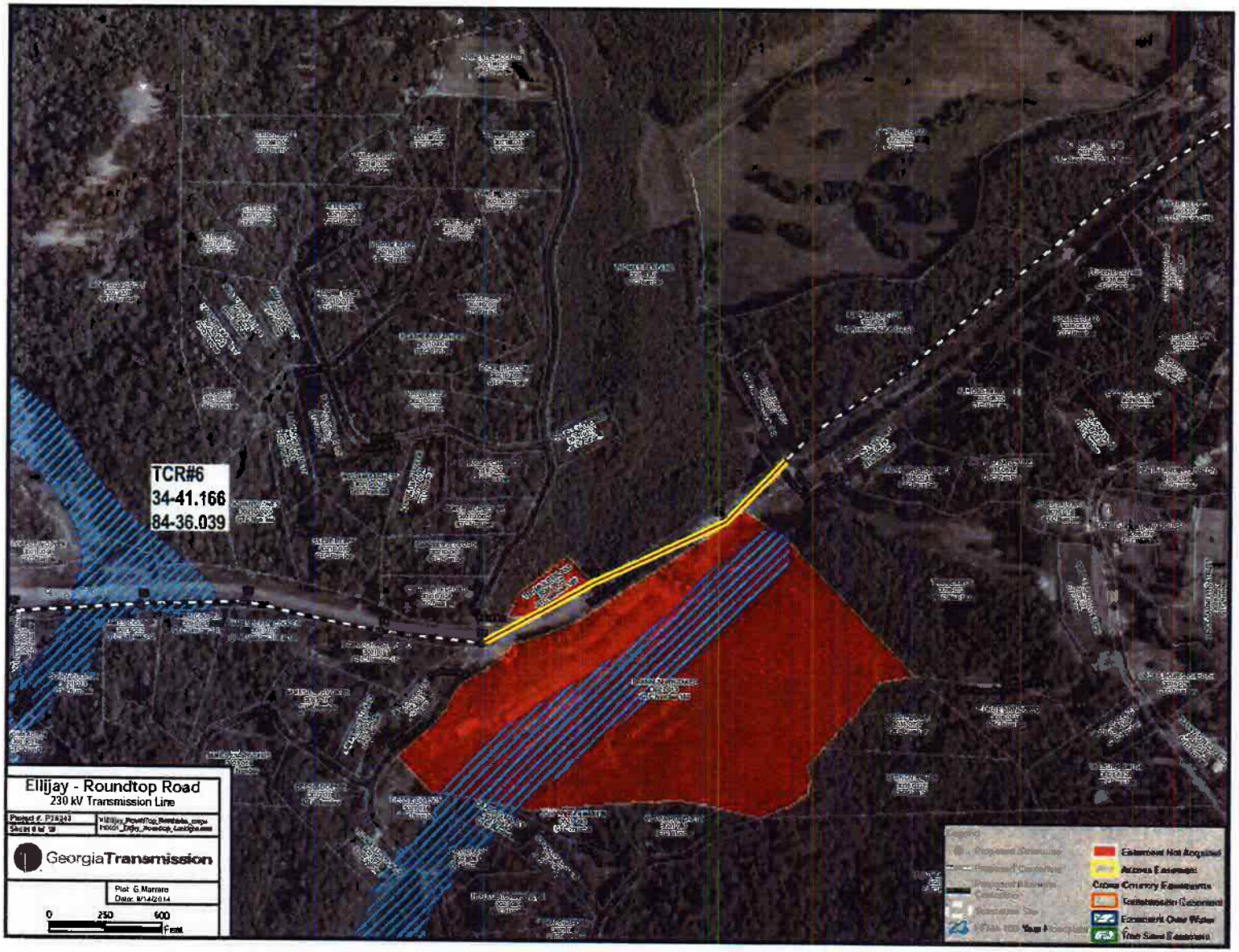
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 9



Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	8E49147077-3A
Date:	AUGUST 2014

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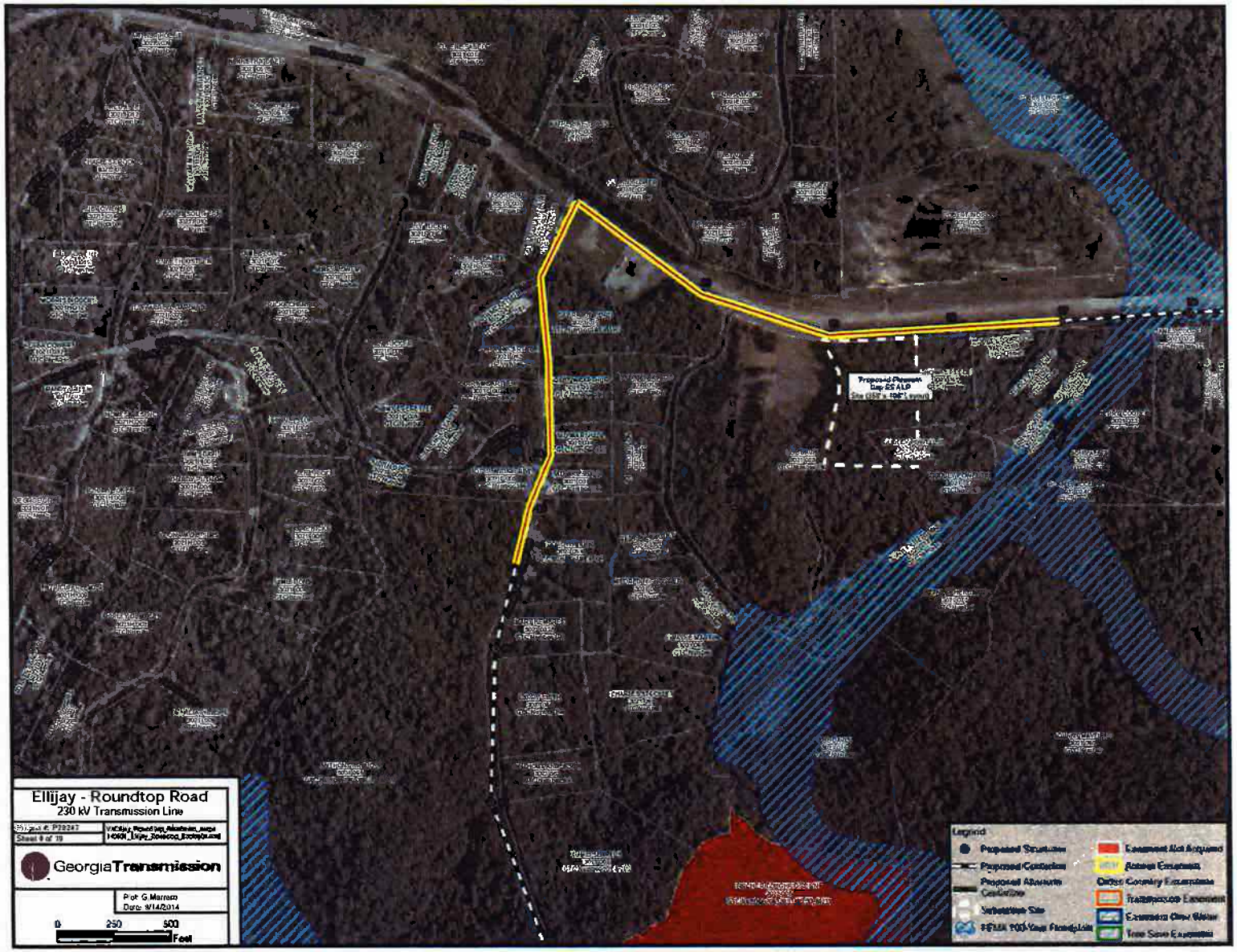
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 10



THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	SE49147077-3A
Date:	AUGUST 2014

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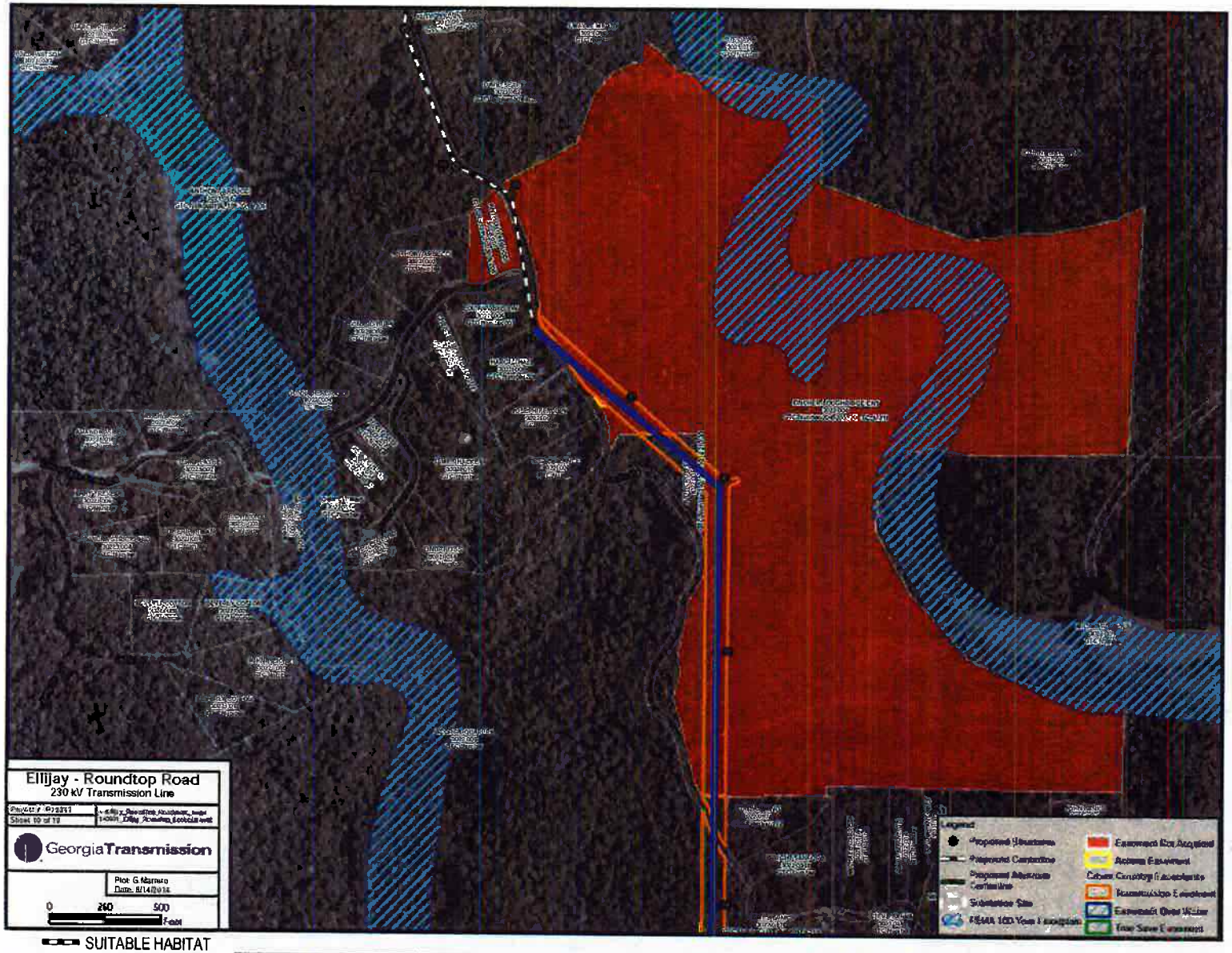
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 11



N

0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

PROPOSED WINTER CLEARING

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

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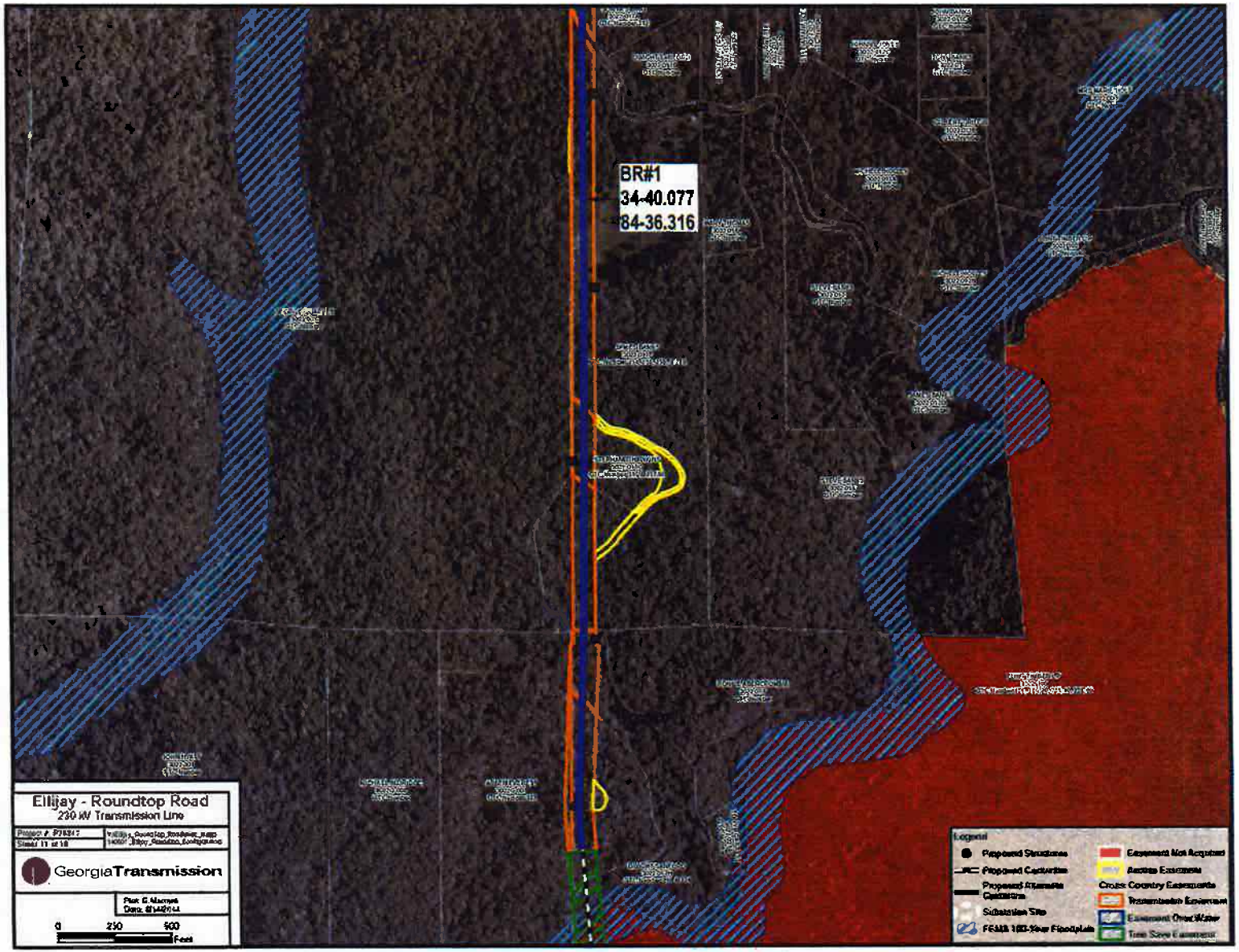
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 12



N

0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

PROPOSED WINTER CLEARING

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

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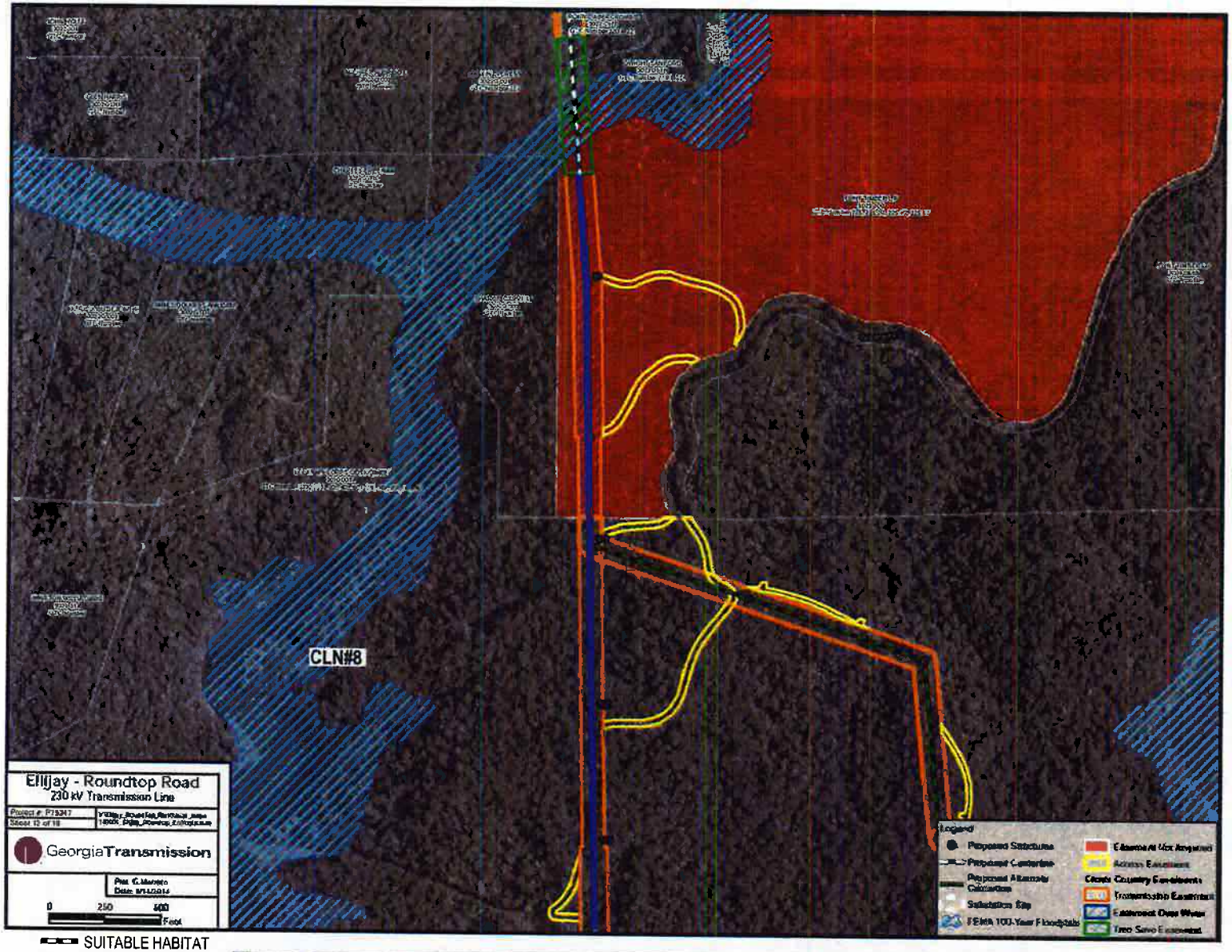
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 13



N

0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

PROPOSED WINTER CLEARING

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr.	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

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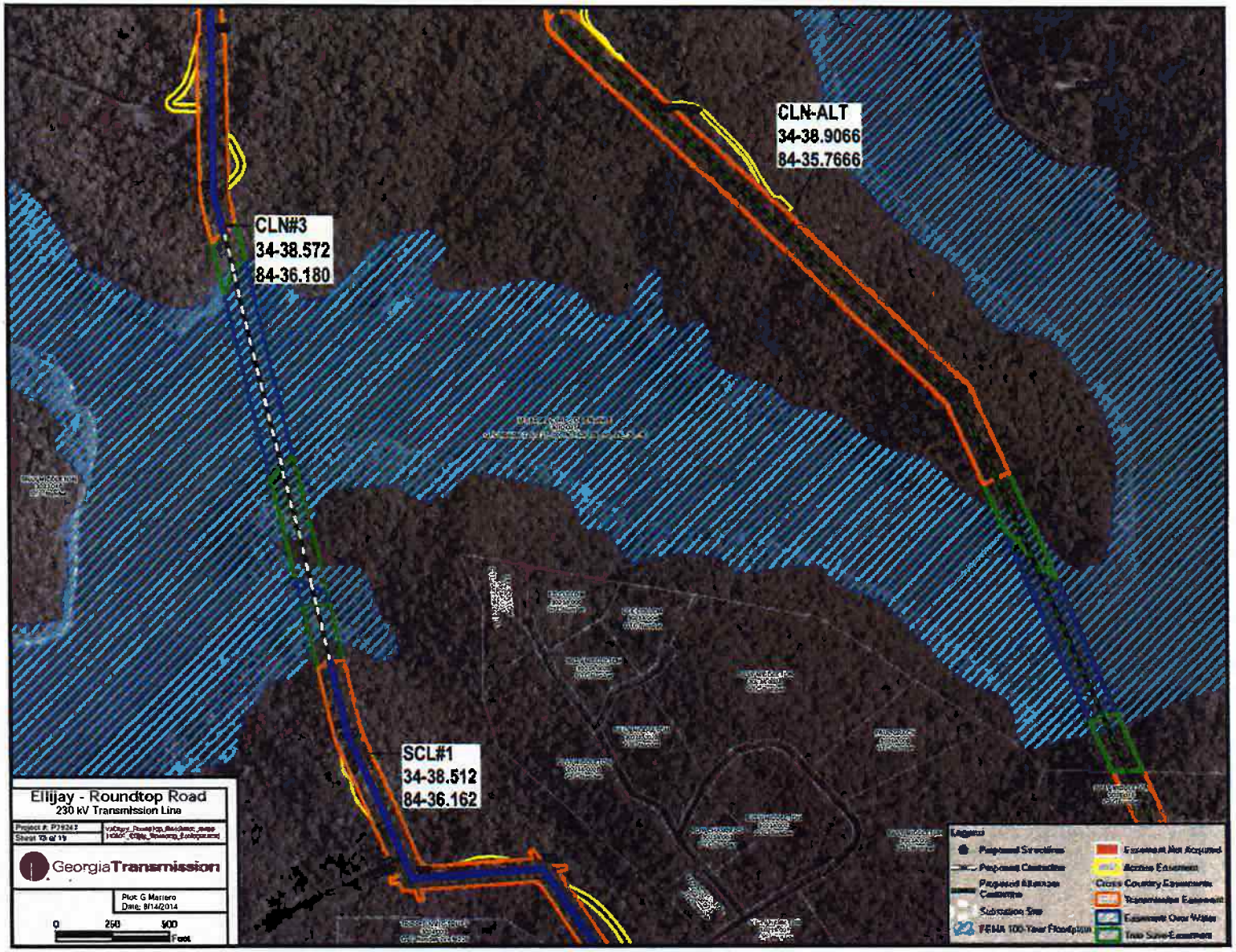
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 14



Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

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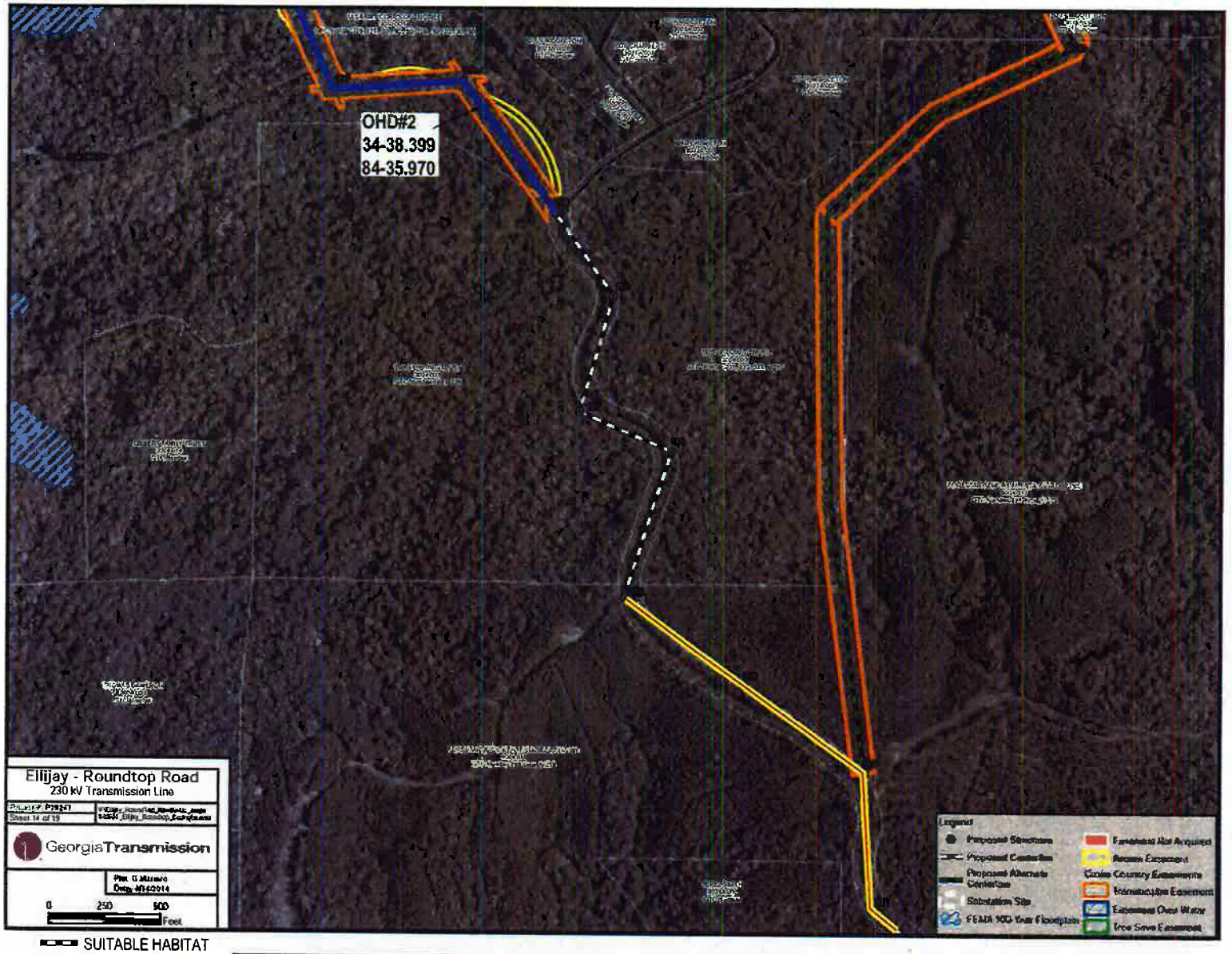
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT
15



N

0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

PROPOSED WINTER CLEARING

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

Terracon
Consulting Engineers and Scientists
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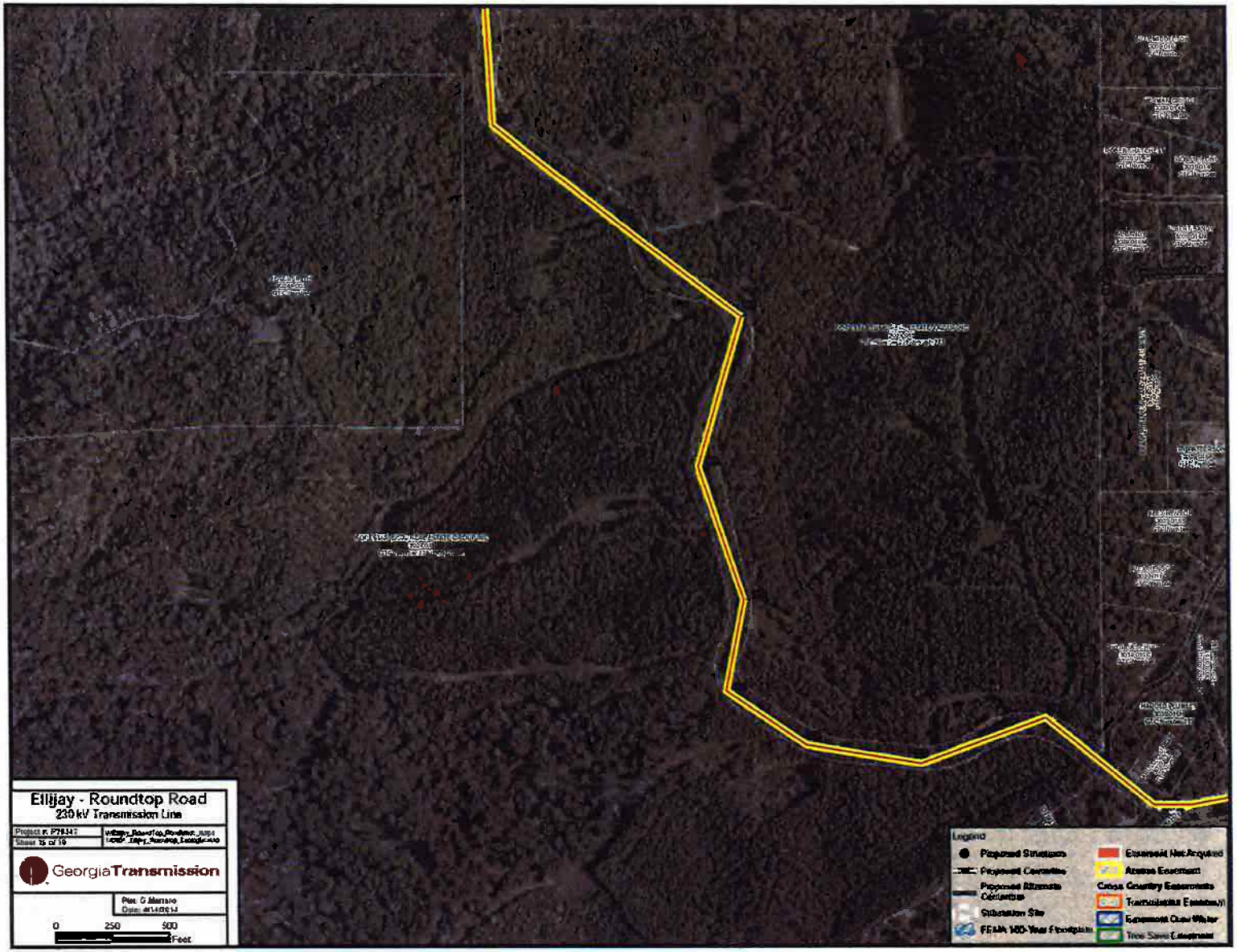
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 16



N

0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

Terracon
Consulting Engineers and Scientists
2855 Premiere Parkway, Suite C Duluth, GA 30097
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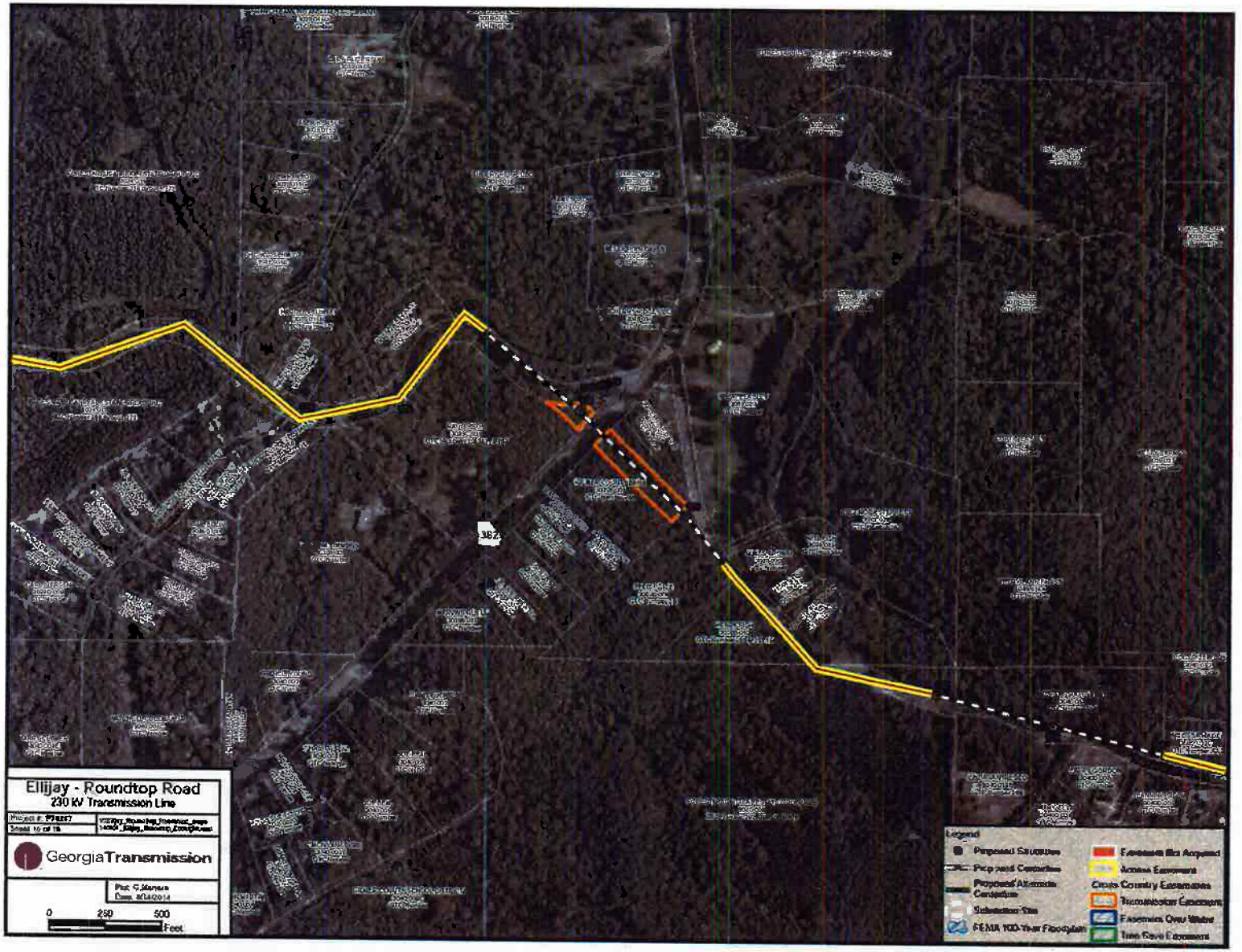
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 17



N

0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

Terracon
Consulting Engineers and Scientists
2855 Premiere Parkway, Suite C Duluth, GA 30097
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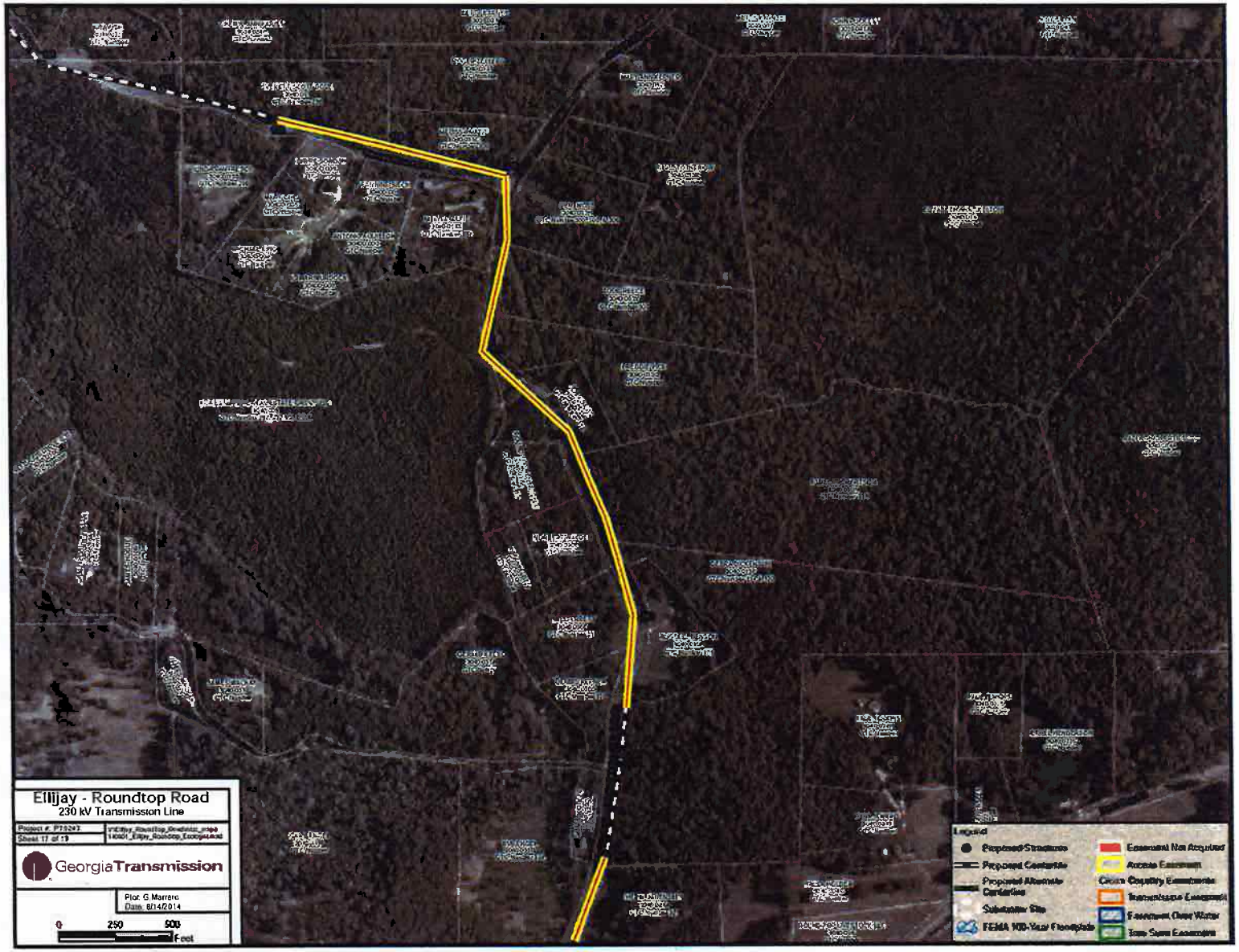
HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 18



N

0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr: JWB	Project No.: 49147077
Drawn By: DWD	Scale: AS SHOWN
Checked By: JWB/MRF	File No.: BE49147077-3A
Approved By: JWB	Date: AUGUST 2014

Terracon
Consulting Engineers and Scientists
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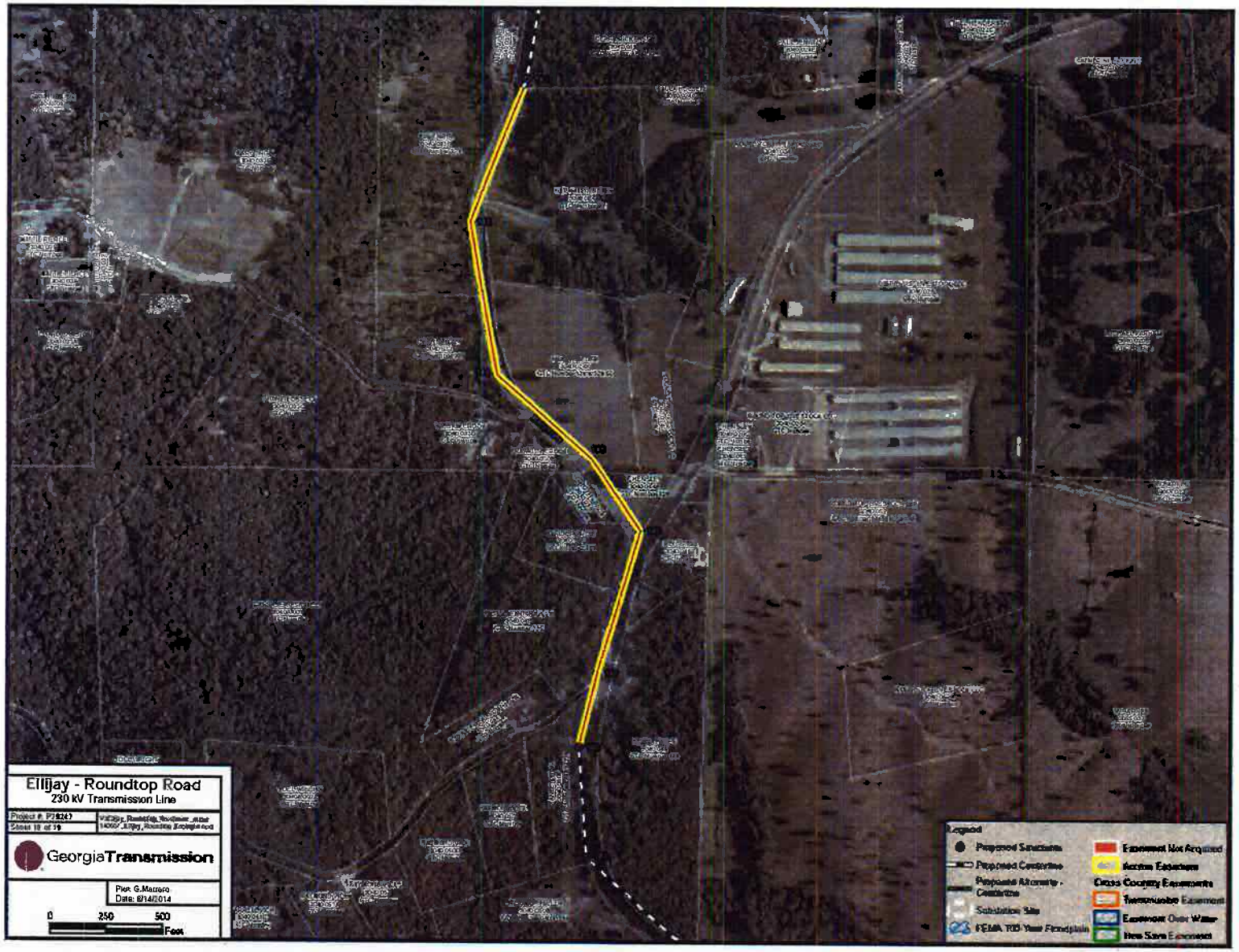
(770) 823-0755 (770) 823-9628

HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 19



N

0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

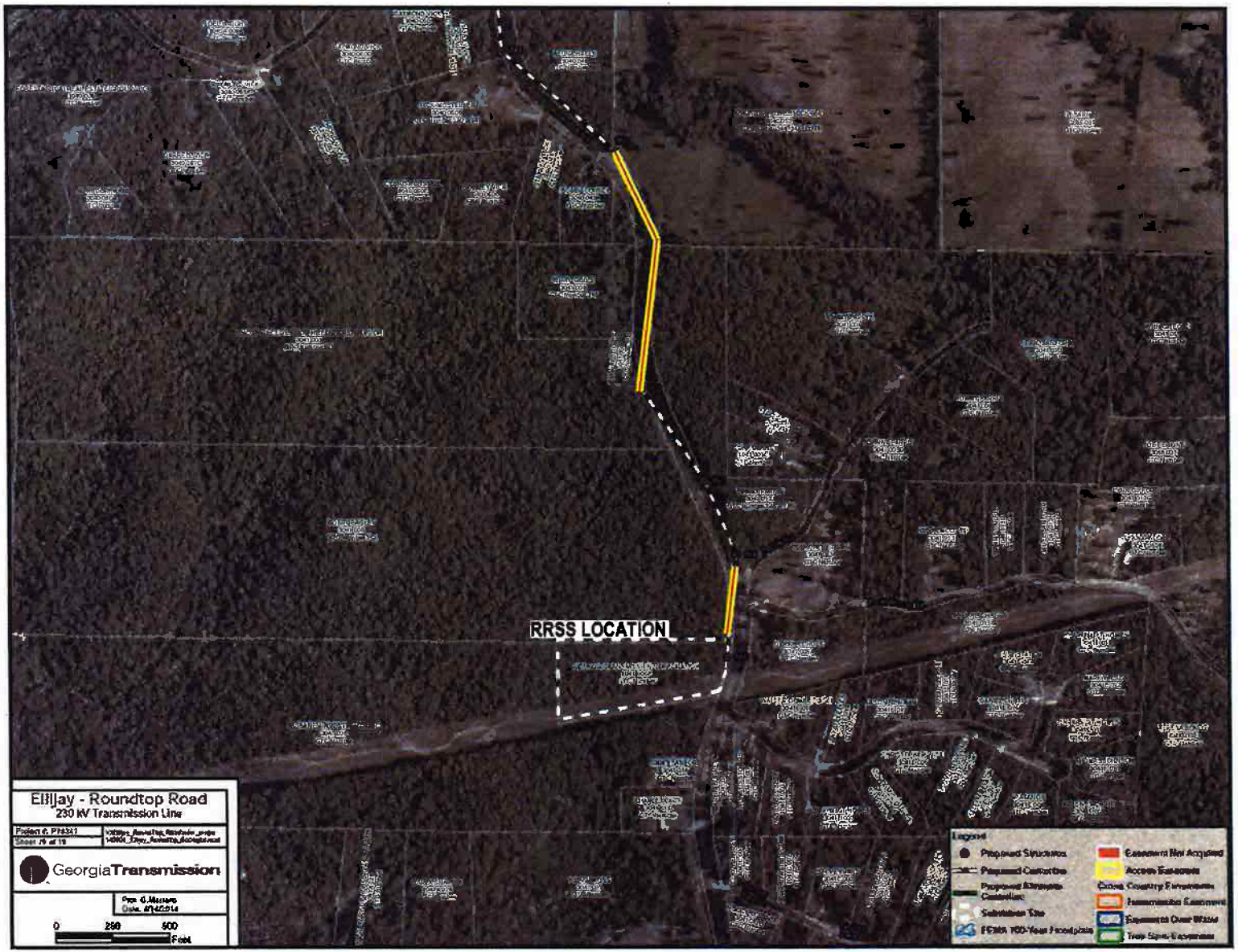
Terracon
Consulting Engineers and Scientists
2855 Premiere Parkway, Suite C Duluth, GA 30097
(770) 623-0755 (770) 623-9628

HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT

20



N

0 650

Approximate Scale (Feet)

SUITABLE HABITAT WITH NO CLEARING RESTRICTION

NON-SUITABLE HABITAT

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	JWB
Drawn By:	DWD
Checked By:	JWB/MRF
Approved By:	JWB

Project No.	49147077
Scale:	AS SHOWN
File No.	BE49147077-3A
Date:	AUGUST 2014

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HABITAT SURVEY MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT

21

MATCHLINE - EXHIBIT 4B

N

0 3000

Approximate Scale (Feet)

LEGEND

PROPOSED ALTERNATE ROUTE

APPROXIMATE CENTERLINE

Project Mgr: JWB	Project No.: 48147027
Drawn By: DWD	Scale: AS SHOWN
Checked By: JWB/MRF	File No.: BDR EXHIBIT-1A
Approved By: JWB	Date: AUGUST 2014

Terracon
Consulting Engineers and Scientists

HABITAT ZONE MAP

BIOLOGICAL EVALUATION
ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS
TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD
ELLIJAY, GILMER COUNTY, GA

EXHIBIT 22

Project Mgr: JWB	Project No.: 45147077	Terracon Consulting Engineers and Scientists	HABITAT ZONE MAP
Check By: DWG	Scale: AS SHOWN	3865 Presidents Parkway, Suite C Duluth, GA 30097 (770) 623-0755 (770) 623-0838	BIOLOGICAL EVALUATION ELLIJAY-ROUNDTOP T/L AND ROUNDTOP SS TAILS CREEK ROAD SOUTH TO ROUNDTOP ROAD ELLIJAY, GILMER COUNTY, GA
Drawn By: JWB/MRF	File No.: 45147077-4B		
Approved By: JWB	Date: AUGUST 2014		

EXHIBIT 22A

Photo 1: View of easement at Courier Road/Tails Creek Road, facing west.

Photo 2: View of riparian area just west of Courier Road at data point TCR #1.

Photo 3: View of open canopy area at TCR#1.

Photo 4: View of American sycamore and larger hardwoods above the slope at TCR#1.

Photo 5: View of red maple snag just west of TCR#1 location, two more large snags with adequate exfoliating bark beyond obscured by tree cover.

Photo 6: Overall view of riparian area at TCR1#, heavy beaver activity has caused water buildup and some tree culling resulting in open areas.

Photo 7: View of non-suitable habitat near Harrison Pike. Steep slopes and tree specimens primarily less than five inches diameter breast height (dbh).

Photo 8: View of open corridor along creek bed near far east end of the proposed easement.

Photo 10: View of approximate 12" dbh snag at TCR #2 near the open corridor.

Photo 11: View of approximate 10" white oak snag at TCR #2.

Photo 12: View of approximate 15" white oak with exfoliating bark at TCR #2.

Photo 13: View of non-suitable habitat with open grassy area and young loblolly pine.

Photo 14: View of open area along roadside easement, typical non-suitable area.

Photo 15: View of more open areas and non-suitable habitat at South Tails Creek Road.

Photo 16: View of typical young pine stand along the proposed roadside easement

Photo 17: View of easement facing west past Pleasant Church Road.

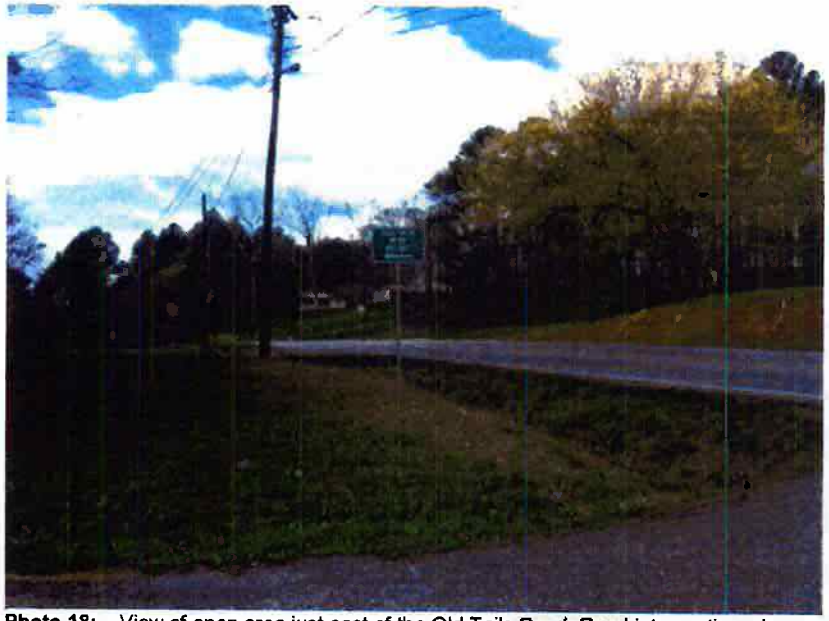

Photo 18: View of open area just east of the Old Tails Creek Road intersection where the easement turns south.

Photo 19: View of forest canopy and snags at BR#1.

Photo 20: View of open area next to canopy at BR#1.

Photo 21: Zoomed in view of exfoliating bark on potential roost tree near BR#1.

Photo 22: View of overall forest habitat near riparian area on the Banks Road portion of the site.

Photo 23: View of open road area near the south end of the Banks Road portion of the site.

Photo 24: View of Hap Holt Road near Boat Ramp Road entrance just north of Carters Lake.

Photo 25: View of stake #101 at the north end of access allowance north of Carters Lake.

Photo 26: View of riparian area near CLN #5, spring head located at base of hill.

Photo 27: View near spring head north of CLN #5.

Photo 28: View of north facing slope in wooded land near CLN #5.

Photo 29: View of large snags and open canopy at CLN #3.

Photo 30: View of large black oak snag with thick exfoliating bark at CLN #3.

Photo 31: View of 15" white oak near CLN #3.

Photo 32: View of two large white oaks, Eastern white pine, and sourwood trees near CLN #3.

Photo 33: View of open grassy area at hillside below CLN#3.

Photo 34: View of south facing slope on wooded land just north of Carters Lake.

Photo 35: View facing south toward Carters Lake with thick wooded canopy and mid-story.

Photo 36: View of forest canopy on south end of the Carters Lake.

Photo 37: View of Carters Lake.

Photo 38: View of steep north facing slope near SCL #1.

Photo 39: View of large oak snag near SCL #1.

Photo 40: Alternate view of snag and forest, facing north at SCL#1.

Photo 41: View of open trail and canopy at OHD #2.

Photo 42: View of cove area and thick hardwood forest to the east of OHD#2.

Photo 43: View of forest and low area at OHD #2.

Photo 44: View of forest opening just south of OHD#2

Photo 45: View of thick Virginia pine and hardwoods less than 5 inches dbh along Oak Hill Drive, area considered non-suitable habitat.

Photo 46: View of thick Virginia pine and hardwoods less than 5 inches dbh along Oak Hill Drive, area considered non-suitable habitat.

Photo 47: View of thick Virginia pine and hardwoods less than 5 inches dbh along Oak Hill Drive, area considered non-suitable habitat.

Photo 48: View of hardwood forest along Oak Hill Drive near Highway 382, suitable habitat.

Photo 49: View facing south where Oak Hill Drive intersects Highway 282. Barnes Mountain Drive CC portion across the street to the right of photo.

Photo 50: View of sloping topography in Barnes Mountain Drive CC area.

Photo 51: View of large shagbark hickory with minor exfoliating bark near BMRCC.

Photo 52: View of smaller shagbark hickory near BMRCC.

Photo 53: View shagbark hickory and open forest understory near BMRCC. Light exfoliating bark and no flight corridors exist in the area.

Photo 54: View of sloping open areas that are not suitable along Barnes Mountain Road.

Photo 55: View of proposed easement along open area outside of clearing areas typical along Barnes Mountain and most of Knight Road.

Photo 56: View of young planted pine which covers a good portion of the easement along Knight Road.

Photo 57: View of open non-suitable habitat on Roundtop Road.

Photo 58: View of the Carters Lake Dam easement at the south terminating end of the proposed easement.

Photo 59: View of cleared area within hardwood forest at proposed substation site, south end of the line.

Photo 60: View of thick forested area at proposed substation location with no flight corridors or potential roosting trees.

Terracon

Bat Habitat Survey Data Sheet

Date: 4-10-14

Project Name: Roundtop Road Transmission Line **Surveyor:** - Jim Baxter

Data Point Location: TCR #1

Latitude/Longitude: 34-41.025 N, 84-29.818 W

Vegetative Cover Table

Species	Diameter Breast Height (inches)	Exfoliating Bark
Platanus occidentalis	12	Minor, small peeling
Platanus occidentalis (2)	10	Minor, small peeling
Platanus occidentalis	10	Moderate peeling
Liquidambar styraciflua	8	None
Quercus alba	8	None
Liriodendron tulipifera	8	None
Liquidambar styraciflua	7	None

Flight Corridors – An open corridor exists over the creek bed with adequate tree cover on both sides. Corridor approximately 20 to 25 feet wide.

Canopy Coverage – 60% closed, mid-story is very open with some Chinese privet cover along the creek banks, overall coverage is somewhat contained by upper canopy

Riparian and/or Wetland Areas – Perennial stream corridor with heavy beaver activity. Result is more standing water and some open canopy areas.

Adjacent Property Description

North: Mature hardwood-pine forest on south facing slope
South: Grassy land followed by Tails Creek Road
East: Courier Drive followed by wooded land
West: Riparian forest

Other Notes: Excellent habitat quality, location within 30 feet of major road

Terracon

Bat Habitat Survey Data Sheet

Date: 4-10-14

Project Name: Roundtop Road Transmission Line

Surveyor: - Jim Baxter

Data Point Location: TCR #2

Latitude/Longitude: 34-41.374 N, 84-30.323 W

Vegetative Cover Table

Species	Diameter Breast Height (inches)	Exfoliating Bark
Quercus alba	14	Minor, small peeling
Platanus occidentalis	12	Minor, small peeling
Quercus coccinea (2)	10	None
Snag (oak)	10	Major peeling, crevices
Snag (unidentified)	8	Moderate
Liriodendron tulipifera	8	None
Quercus coccinea	7	None
Quercus alba	6	None

Flight Corridors – Cleared 10 to 15 foot path between canopy and stream channel, closed in by hardwood forest and thick privet thicket.

Canopy Coverage – 75% closed, mid-story scattered and somewhat open

Riparian and/or Wetland Areas – Perennial stream adjacent south within a privet thicket.

Adjacent Property Description

North: Mature hardwood-pine forest on south facing slope
South: Stream channel, minor riparian with privet thicket
East: Wooded land and hardwood forest
West: Wooded land and hardwood forest

Other Notes: Good survey corridor near exfoliating snags off the main road about 30 feet into hardwood forest

Terracon

Bat Habitat Survey Data Sheet

Date: 4-14-14

Project Name: Roundtop Road Transmission Line

Surveyor: - Jim Baxter

Data Point Location: TCR #6

Latitude/Longitude: 34-41.166 N, 84-36.039 W

Vegetative Cover Table

Species	Diameter Breast Height (inches)	Exfoliating Bark
Platanus occidnetalis (2)	8	Minor
Acer rubrum	7	None
Liquidambar styraciflua	7	None
Liquidambar styraciflua (2)	6	None

Flight Corridors – Major flight corridor along Tails Creek. The corridor is a strong sampling point candidate; however, the west side of the creek is open area and not closed in.

Canopy Coverage – 50% off creek, open over creek with adjacent forest to the east and open areas to the west

Riparian and/or Wetland Areas – Major perennial stream corridor

Adjacent Property Description

North: Tails Creek Road
South: Riparian hardwood forest
East: Riparian hardwood forest
West: Tails Creek

Other Notes: Location chosen just east of Tails Creek in riparian area. Thick forested area to the east and open areas to the west provides a potential flight pathway over and adjacent to the creek channel. The size of the creek (approximately 10 feet wide and not too deep) is also favorable for sampling conditions.

Terracon

Bat Habitat Survey Data Sheet

Date: 4-23-14

Project Name: Roundtop Road Transmission Line **Surveyor:** - Jim Baxter

Data Point Location: BR #1

Latitude/Longitude: 34-40.077 N, 84-36.316 W

Vegetative Cover Table

Species	Diameter Breast Height (inches)	Exfoliating Bark
Snag (Quercus coccinea)	30	Major exfoliating
Quercus alba	20	Minor
Quercus coccinea (2)	20	None
Snag (Quercus velutina)	20	Major exfoliating
Snag (Quercus coccinea)	18	Moderate, bark falling off
Oxydenrdrum arboreum	15	None
Pinus strobus	10	None

Flight Corridors – Open field just east of the wood line in which potential roost trees are located. A more closed corridor is just south and towards a riparian that may be even more suitable.

Canopy Coverage – 80% closed in canopy within wood line, completely open just east

Riparian and/or Wetland Areas – None, but small creek channel located a few hundred feet to the south

Adjacent Property Description
North: Mixed hardwood pine forest
South: Mixed hardwood pine forest
East: Dirt road and open field
West: Mixed hardwood pine forest

Other Notes: Large snags with exfoliating bark, open field and road may act as flight corridor.

Terracon

Bat Habitat Survey Data Sheet **Date: 4-25-14**

Project Name: Roundtop Road Transmission Line **Surveyor:** - Jim Baxter

Data Point Location: CLN #8

Latitude/Longitude: 34-39.213 N, 84-36.303 W (This location is where habitat survey was performed, but west of where field sampling eventually occurred).

Vegetative Cover Table

Species	Diameter Breast Height (inches)	Exfoliating Bark
Quercus coccinea	15	None
Quercus alba (2)	12	Moderate Peeling
Oxydendrum arboretum (2)	7	None
Pinus strobus (2)	7	None
Cornus florida	6	None

Flight Corridors – No, open hardwood forest though with corridor further to the west

Canopy Coverage – 75% closed in canopy, mid-story is marginally open

Riparian and/or Wetland Areas – Tributary to Tails Creek located a few hundred feet to the west. Not in easement, but provides riparian corridor in the area.

Adjacent Property Description
Mixed hardwood pine in all directions

Other Notes: Habitat survey was conducted within an directly adjacent to proposed easement; however future sampling location was shifted a few hundred feet west near a tributary of Tails Creek within a riparian corridor.

Terracon

Bat Habitat Survey Data Sheet

Date: 4-25-14

Project Name: Roundtop Road Transmission Line

Surveyor: - Jim Baxter

Data Point Location: CLN #5

Latitude/Longitude: 34-39.173 N, 84-36.288 W

Vegetative Cover Table

Species	Diameter Breast Height (inches)	Exfoliating Bark
Snag (scarlet oak)	12	Moderate
Quercus alba	25	Moderate
Snag (unidentified)	20	Minor, mostly bare trunk but a couple patches of peeling bark
Quercus alba (2)	10	Minor to none
Liriodendron tulipifera	10	None

Flight Corridors – A trail is located on the hillside in the area, only about 8 feet wide though. Mid-story is relatively open in this area with potential corridor locations for netting. Field scouting prior to netting will help here.

Canopy Coverage – 65% closed in canopy, mid-story is marginally open

Riparian and/or Wetland Areas – Yes, spring head of seasonal stream observed in the area.

Adjacent Property Description

Mainly hardwood forest in all directions with some young loblolly and Eastern white pine mixed in.

Other Notes: Riparian area with good potential roosting trees, small creek channel though

Terracon

Bat Habitat Survey Data Sheet

Date: 4-25-14

Project Name: Roundtop Road Transmission Line

Surveyor: - Jim Baxter

Data Point Location: CLN #3

Latitude/Longitude: 34-38.022 N, 84-36.285 W

Vegetative Cover Table

Species	Diameter Breast Height (inches)	Exfoliating Bark
Quercus alba (3)	12	Moderate to Major
Snag (black oak)	15	Moderate with some crevices
Quercus velutina	8	None
Oxydendron arboretum (3)	7	None

Flight Corridors – There are two separate potential corridors in the area which is on a hillside just above an open grassy area. The grassy area and a trail act as one and a paved road acts as more of a secondary corridor.

Canopy Coverage – 75% closed in canopy, mid-story is marginally open

Riparian and/or Wetland Areas – None

Adjacent Property Description

North: Hardwood pine forest
South: Hardwood pine forest
East: Hardwood pine forest
West: Boat Ramp Road followed by hardwood pine forest

Other Notes: A lot of large white oak trees with peeling bark here. Road is directly adjacent, but little to no traffic. Three large snags with peeling bark located across the road to the north.

Terracon

Bat Habitat Survey Data Sheet

Date: 4-23-14

Project Name: Roundtop Road Transmission Line **Surveyor:** - Jim Baxter

Data Point Location: SCL #1

Latitude/Longitude: 34-38.512 N, 84-36.162 W

Vegetative Cover Table

Species	Diameter Breast Height (inches)	Exfoliating Bark
Quercus velutina	25	None
Quercus velutina	20	None
Pinus strobus	18	None
Snag (oak)	15	Moderate to Major
Quercus coccinea	13	None
Quercus velutina	13	None
Quercus alba (2)	7	Minor
Acer rubrum	6	None

Flight Corridors – Thick woods here; however, mid story open a little down the hill.

Canopy Coverage – 75% closed in canopy, mid-story is marginally open and rhodendron and mountain laurel have crept in closer to the ground

Riparian and/or Wetland Areas – No

Adjacent Property Description
Mixed hardwood pine in all directions

Other Notes: Location is below ridge top south of Carters Lake on a north facing slope. Openings are average with a lot of large hardwood trees; however, this area is prime due to proximity and flight access to the lake area.

Terracon

Bat Habitat Survey Data Sheet **Date: 4-25-14**

Project Name: Roundtop Road Transmission Line **Surveyor:** - Jim Baxter

Data Point Location: OHD #2

Latitude/Longitude: 34-39.173 N, 84-35.970 W

Vegetative Cover Table

Species	Diameter Breast Height (inches)	Exfoliating Bark
Quercus coccinea (2)	15	None
Quercus alba	12	Moderate
Snag (unidentified)	12	Moderate with bark chunks
Quercus prinus (2)	10	None
Liriodendron tulipifera (2)	8	None
Carya glabra	7	None
Quercus alba	7	None

Flight Corridors – Mostly thick hardwood forest near a low cove area. Trail road in area may act as a corridor to this low area and alternate access to the lake.

Canopy Coverage – 75% closed in canopy, mid-story is marginally open

Riparian and/or Wetland Areas – None observed; however, an ephemeral drainage area located down a slope from this location

Adjacent Property Description
Mainly hardwood forest in all directions with Oak Hill Drive nearby.

Other Notes: Best place to potentially sample within this long stretch of hardwood forest on the back side of the south ridge from Carters Lake. Habitat south of here is thick Virginia pine forest that is not suitable.

Terracon

Bat Habitat Survey Data Sheet

Date: 4-23-14

Project Name: Roundtop Road Transmission Line

Surveyor: - Jim Baxter

Data Point Location: BMRCC

Latitude/Longitude: 34-38.572 N, 84-36.180 W

Vegetative Cover Table

Species	Diameter Breast Height (inches)	Exfoliating Bark
Carya ovata	24	Moderate and consistent
Quercus alba	18	Moderate
Liriodendron tulipifera	17	None
Quercus alba	12	None
Ulmus americana	7	None
Oxydendrum arboretum (2)	6	None

Flight Corridors – Mature hardwood forest with very open understory. Flight paths are evidence throughout that act as good corridors.

Canopy Coverage – 85% closed in canopy; however, understory is very open with little competition due to shade

Riparian and/or Wetland Areas – None

Adjacent Property Description
Mature hardwood-pine forest in all directions.

Other Notes: Small cross country portion at Barnes Mountain Road/Hwy 382. Two shagbark hickories noted in the area, only ones on the entire line. No riparian areas nearby, but solid location based on tree species and good flight paths.

Terracon

Bat Habitat Survey Data Sheet

Date: 5-1-14

Project Name: Roundtop Road Transmission Line

Surveyor: - Jim Baxter

Data Point Location: RRSS

Latitude/Longitude: 34-39.211 N, 84-36.164 W

Vegetative Cover Table

Species	Diameter Breast Height (inches)	Exfoliating Bark
Quercus velutina	20	Moderate and consistent
Quercus alba	15	Moderate
Liriodendron tulipifera (2)	15	None
Quercus prinus	12	None
Diospyros virginiana	7	None
Oxydendrum arboretum (2)	6	None

Flight Corridors – Mature hardwood forest with cleared area to the east.

Canopy Coverage – 75% closed in canopy, mid-story is moderately open

Riparian and/or Wetland Areas – None

Adjacent Property Description
Mature hardwood-pine forest in all directions.

Other Notes: Proposed substation location at the south end of the proposed easement. Area is mature hardwood. Potential roost trees not observed, and suitable habitat is considered minimal to poor.

August 15, 2014

TERRACON CONSULTANTS, INC.

Bat Mist Net Survey

Bat Mist Net Surveys Along the Proposed Ellijay-Roundtop Transmission Line and Proposed Roundtop Road Substation Site, Gilmer County, Georgia

PROJECT NUMBER:
134641

PROJECT CONTACT:
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POWER ENGINEERS

Bat Mist Net Surveys Along the Proposed Ellijay-Roundtop Transmission Line and Proposed Roundtop Road Substation Site Gilmer County, Georgia

PREPARED FOR: TERRACON CONSULTANTS, INC.

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TABLE OF CONTENTS

FIGURES:

TABLES:

APPENDICES:

1.0 INTRODUCTION

POWER Engineers, Inc. (POWER) was contracted by Terracon Consultants, Inc. (Terracon) to conduct mist net and acoustic surveys for bats, including the Indiana bat (*Myotis sodalis*; federally endangered) and northern long-eared bat (*Myotis septentrionalis*; proposed as an endangered species). These surveys were conducted at the request of Terracon's client, Georgia Transmission Corporation (GTC) for the proposed Ellijay-Roundtop transmission line and the Roundtop Road Substation Site in Gilmer County, Georgia (Figure 1).

The northern terminus of the project is approximately 0.25 miles northeast of GA 5 (S Main St) and Highway 76 (Industrial Blvd/Tails Creek Rd), in Ellijay, Gilmer County, Georgia. The proposed right-of-way (ROW) continues west along Tails Creek Road for approximately 8.75 miles before heading south on Lower Tails Creek Road. The proposed ROW will follow Lower Tails Creek Road for approximately 0.8 miles before heading southeast then south cross-country. The proposed ROW continues 1.5 miles across forested land south towards Carters Lake. Within the land managed by US Army Corps of Engineers surrounding and including the lake, the proposed ROW covers approximately 1.0 mile before joining the route of Oak Hill Road on the south side of Carters Lake. The proposed ROW follows the general route of Oak Hill Road for approximately 2.25 miles before picking up the route of Barnes Mountain Road, which it follows for approximately 0.6 miles towards Knight Road. Once reaching Knight Road, the proposed ROW continues south for approximately 1.0 mile towards Roundtop Road which it follows for approximately 0.8 miles where it meets its southern terminus at the proposed Roundtop Road substation. The route may deviate to the east of this proposed route on the north side of Carters Lake on USACE property. This proposed route and substation location will be hereafter referred to as the project area.

Land-use within the project area includes residential areas, commercial properties, and undeveloped land. The undeveloped land is dominated by forested areas, including hardwood, mixed forest, and pine plantation. Terracon conducted a habitat assessment within the project area and determined that there is a total of approximately 9.6 km of potential Indiana bat and northern long-eared bat habitat.

2.0 METHODS

2.1 Survey Site Selection

The level of survey effort for this project was established following the United States Department of the Interior, Fish and Wildlife Service (USFWS) January 2014 Indiana Bat Summer Survey Guidance (USFWS 2014) and discussions with the USFWS Athens Field Office. The USFWS guidance recommends four net nights per linear kilometer of suitable Indiana bat and northern long-eared bat habitat within a project area. POWER surveyed ten mist net sites on or near the proposed right-of-way (ROW). Additionally, the USFWS Athens Field Office requested supplemental acoustic surveys to complement each mist net site.

A work plan was drafted by POWER and approved by the USFWS on 6 July 2014 (Appendix A). Ten locations along the project area were selected for mist net surveys and for acoustic sampling (Table 1, Figure 1). Final mist net sites were selected during field reconnaissance and were placed within or as close as possible to the proposed ROW, in areas where survey access was granted. Site selection was based upon presence of appropriate habitat and conditions conducive to effective mist netting. Primary site selection criteria included presence of canopy cover and an open flyway, and nets were deployed in areas that provided optimum chance to capture bats. Acoustic sampling locations were chosen in the general vicinity of each mist net site and deployed in an area typically unsuitable for mist netting; a description of acoustic sampling methods is in Section 2.4.

TABLE 1 LOCATION OF TEN SAMPLING LOCATIONS SURVEYED ALONG THE PROPOSED ELLIJAY-ROUNDTOP TRANSMISSION LINE ROW IN GILMER COUNTY, GEORGIA.

SITE	LATITUDE	LONGITUDE
RRSS	34.59215	-84.56417
TCR-1	34.68371	-84.49695
BR-1	34.66537	-84.60474
TCR-6	34.68539	-84.60127
CLN-3	34.64938	-84.60438
CLN-ALT	34.64019	-84.59996
OHD-2	34.60000	-84.59926
SCL-1	34.64132	-84.60266
TCR-4	34.70371	-84.53956
CLN-8	34.65473	-84.60747

2.2 Mist Netting

Mist nets were of 2-ply, 50-denier, nylon construction with a mesh size of no larger than 1.5 inches. Hardware (metal poles, pulleys, and ropes) similar to that described in Gardner et al. (1989) was used to suspend the nets across flight corridors. Nets were placed across a flight corridor where the canopy cover and vegetation created a funneling effect to facilitate capture of bats to the maximum extent possible. Mist net sets were approximately 20-30 feet (ft) in height, and ranged from approximately 18 ft to 60 ft in width depending on the size of the flight corridor. A net set consisted of two nets suspended horizontally between poles. The nets were tiered and raised and lowered with a pulley system (Gardner et al. 1989). Two net sets were erected and spaced at least 100 ft apart at ten different sites. Mist nets were deployed at dusk (approximately 21:00 hours) and monitored every ten minutes for at least five hours after deployment. Temperature, wind speed and direction, percent cloud cover, and moon phase were recorded approximately every hour during the survey. Two net sets were operated for two calendar nights at each of the ten sites, resulting in a total of forty net nights (net night is defined as the operation of one net set for one night).

Mist netting was conducted only if the following weather conditions were met:

a) limited precipitation or less
b) temperature greater than 10°C (50°F)
c) minimal wind

If these weather conditions were not met, netting was suspended until appropriate sampling conditions returned.

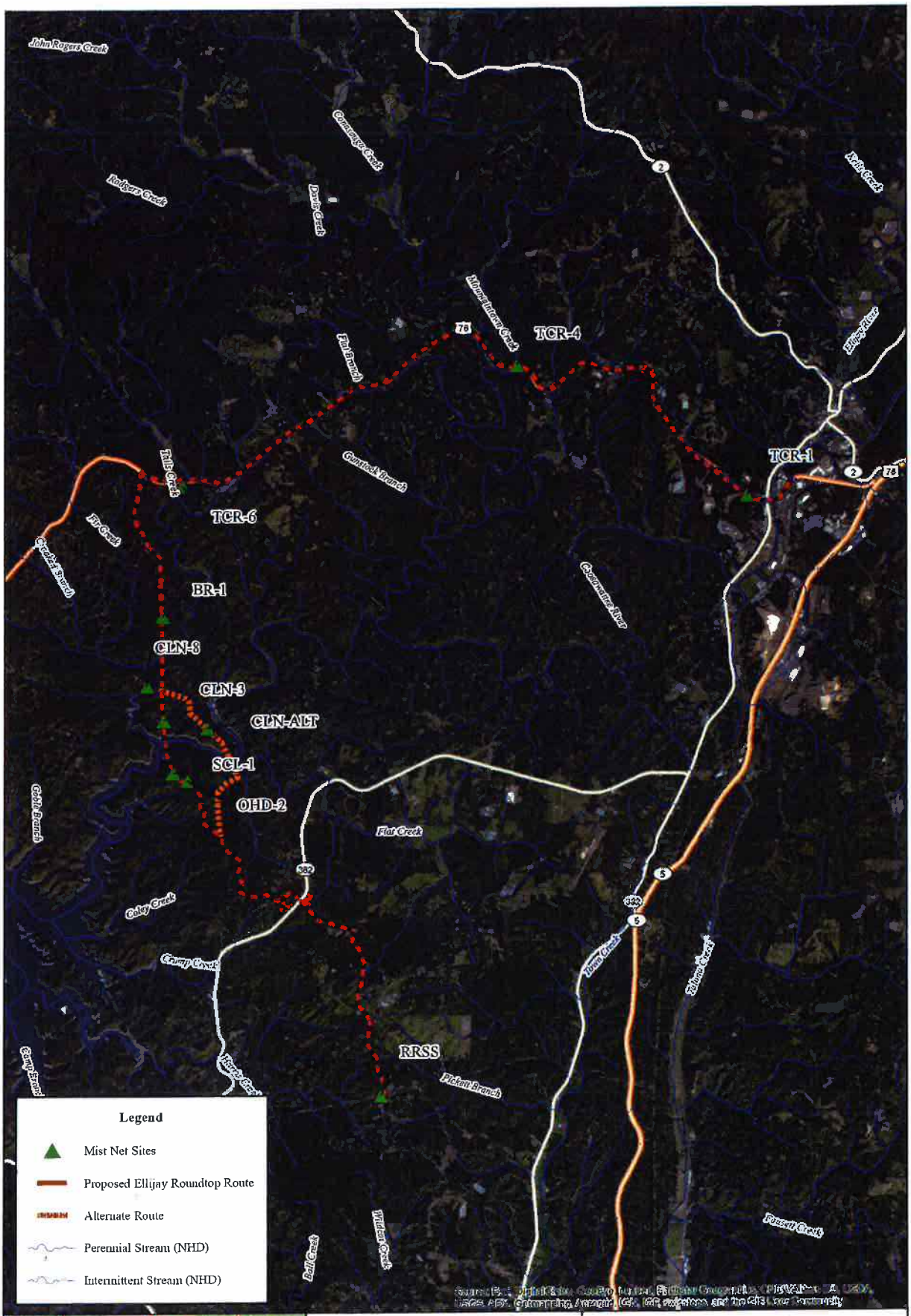

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Figure 1. Proposed Ellijay-Roundup ROW Route and Mist Net Sites.

POWER ENGINEERS

2.3 Bat Handling Procedures

Upon capture, bats were removed from the nets and the following data were recorded: species, age, sex, reproductive condition, right forearm (RFA) length (to nearest 0.1 millimeter using Vernier calipers), weight (to nearest half gram, using a Pesola® scale), time of capture, and capture height in net. All bats were identified to species based upon distinctive morphological characteristics (e.g., body size, hair color, ear length, tragus shape, presence/absence of a keeled calcar, and additional characters). Adult female bats were classified as reproductive if they were pregnant (determined by palpation of abdomen) or bore signs of nursing young (i.e., lack of hair surrounding the teats). Male bats whose testes were descended into the scrotum were considered reproductive. All bats were then released unharmed.

2.4 Acoustic Sampling

Acoustic sampling equipment was used in conjunction with mist netting. Acoustic data were collected using Anabat SD2 detectors (Titley Electronics, New South Wales, Australia). A single Anabat unit was placed in the vicinity of each mist net site surveyed, for a total of twenty detector nights (detector night is defined as the operation of one detector for one night). Detectors were placed at least 200 ft from the mist net sets and deployed in areas that cannot be effectively sampled with mist nets (e.g., forest edges, open fields, active roadways, large streams/creeks, large ponds, etc.). The sampling period began at or around sunset and continued for the duration of nightly mist net surveys (approximately five hours). At the conclusion of each sampling period, collected calls were downloaded and processed through EchoClass 2.0 and BCID East, two automated acoustic analysis software tools accepted by the USFWS.

3.0 RESULTS

3.1 Mist Netting

3.1.1 Site Descriptions

Ten mist net sites were surveyed within the project area (Tables 1 and 2, Figure 1). Sites were typically located within or as close as possible to the proposed right-of-way (ROW), in areas along nearby forested access roads or clearings. Datasheets with detailed site descriptions and photographs of each net are provided in Appendices A and C, respectively.

TABLE 2 DESCRIPTION OF TEN MIST NET SITES SURVEYED ALONG THE PROPOSED ELLIJAY-ROUNDTOP TRANSMISSION LINE ROW IN GILMER COUNTY, GEORGIA.

SITE NO.	DATES SURVEYED	NET PLACEMENT	DOMINANT OVERSTORY	DOMINANT UNDERSTORY
Site 1 RRSS	28 & 29 May	Net 1 and Net 2 placed across two openings that connect a small forest clearing with the ROW.	*Acer rubrum, Quercus alba, Quercus velutina*	*Acer rubrum, Quercus velutina, Pinus virginiana*
Site 2 TCR-1	30 & 31 May	Net 1 placed at opening in forested area surrounding Tails Creek. Net 2 placed over Tails Creek in forested area.	*Platanus occidentalis, Liriodendron tulipifera, Pinus virginiana*	*Platanus occidentalis, Acer rubrum*
Site 3 BR-1	1 & 2 June	Net 1 placed across a dirt road in a forested area where the road splits. Net 2 placed across a dirt road southwest of the split.	*Acer rubrum, Quercus alba, Pinus strobus*	*Occidendrum arborium, Cornus florida, Acer rubrum*

SITE NO.	DATES SURVEYED	NET PLACEMENT	DOMINANT OVERSTORY	DOMINANT UNDERSTORY
Site 4 TCR-6	3 & 4 June	Net 1 set across Tails Creek in forested area. Net 2 set across Tails Creek in forested area.	*Liriodendron tulipifera, Carpinus caroliniana*	*Carpinus caroliniana*
Site 5 CLN-3	6, 7, & 8 June	Net 1 set across access road between Boat Ramp Road and clearing in forest. Net 2 set across a linear clearing in a forested area.	*Liriodendron tulipifera, Quercus alba, Acer rubrum*	*Cornus florida, Liriodendron tulipifera, Acer rubrum*
Site 6 CLN-ALT	9 & 10 June	Net 1 set across road leading to campsite parking lot. Net 2 placed across two trails leading to campsites and picnic areas.	*Liriodendron tulipifera, Quercus stellate*	*Acer rubrum*
Site 7 OHD-2	11, 12 & 13 June	Net 1 and Net 2 set across Oak Hill Drive in a forested area.	*Liriodendron tulipifera, Pinus virginiana, Acer rubrum*	*Liriodendron tulipifera, Acer rubrum*
Site 8 SCL-1	14 & 15 June	Net 1 set across abandoned road in forested area. Net 2 set across abandoned road at forest edge that leads to a large open area.	*Liriodendron tulipifera, Pinus virginiana, Acer rubrum*	*Liriodendron tulipifera, Acer rubrum*
Site 9 TCR-4	17 & 18 June	Net 1 set across stream just north of Tails Creek Road Bridge. Net 2 set across Mountain Town Creek in a forested area	*Liriodendron tulipifera, Pinus virginiana, Acer rubrum*	*Liriodendron tulipifera, Acer rubrum*
Site 10 CLN-8	20 & 21 June	Net 1 set across Tails Creek over a riffle in a forested area. Net 2 set across Tails Creek just upstream of a riffle in a forested area.	*Pinus virginiana, Quercus alba, Tsuga canadensis*	*Tsuga canadensis, Cornus florida*

3.1.2 Bats Captured

A total of 28 bats representing four species were captured at the ten sites. Datasheets, including detailed information of the bat captured and site conditions, are provided in Appendix C. The following summary table describes each bat captured during the project.

TABLE 3 SUMMARY OF BAT SPECIES CAPTURED DURING MIST NET SURVEY AT TEN SITES SURVEYED ALONG THE PROPOSED ELLIJAY-ROUNDTOP TRANSMISSION LINE ROW IN GILMER COUNTY, GEORGIA.

		Big brown bat (*Eptesicus fuscus*)									Red bat (*Lasiurus borealis*)									Tri-colored Bat (*Perimyotis subflavus*)									Evening Bat (*Nycticelus humeralis*)									Total by Site
		Male		Female				Juv.		U	Male		Female				Juv.		U	Male		Female				Juv.		U	Male		Female				Juv.		U	
Date	Site	NR	TD	P	L	PL	NR	F	M		NR	TD	P	L	PL	NR	F	M		NR	TD	P	L	PL	NR	F	M		NR	TD	P	L	PL	NR	F	M		
5/28	RRSS										1		1						1																	
5/29	RRSS	1									1										1																6
5/30	TCR-1																																			
5/31	TCR-1																																			0
6/1	BR-1																																			
6/2	BR-1																	1	1																	3
6/3	TCR-6																													1						
6/4	TCR-6																				1															1
6/6	CLN-3																																			
6/7*	CLN-3*										1		1																							3
6/8	CLN-3												1																							
6/9	CLN-ALT																	2																		
6/10	CLN-ALT			1									1						1																	5
6/11	OHD-2										1							1	1	1																
6/12	OHD-2	1																																		7
6/13	OHD-2										1								1																	
6/14	SCL-1																																			1
6/15	SCL-1										1																									
6/17	TCR-4																																			1
6/18	TCR-4																										1									
6/20	CLN-8																																			1
6/21	CLN-8																																			
	Total by spp	2		1							6		4					4	5	1	2	1					1		1							28
		3									19									5								1								

NR= non-reproductive, TD= testes descended, P = pregnant, L = lactating PL = post-lactating, F= female, M = male, U = unknown; escaped from net, * = weather related cancellation

3.2 Acoustic Sampling

All data were initially analyzed using the USFWS approved automated identification programs BCID and Echoclass 2.0. The summary tables below shows the maximum likelihood estimation (MLE) results generated by each program. The MLE is the likelihood that a given set of parameters (those of the data collected during survey) match a second set of parameters (those of sample calls collected by the developers of each software program). Given the inherent uncertainty with acoustic analysis, these tables include only species identifications that reached an MLE of at least 90 percent.

TABLE 4 BATS IDENTIFIED VIA ACOUSTICAL SURVEY AND ANALYSIS USING BCID AT TEN SITES SURVEYED ALONG THE PROPOSED ELLIJAY-ROUNDTOP TRANSMISSION LINE ROW IN GILMER COUNTY, GEORGIA.

SITE	BIG BROWN BAT	SILVER-HAIRED BAT	RED BAT	HOARY BAT	GRAY BAT	LITTLE BROWN BAT	INDIANA BAT	EVENING BAT	TRI-COLORED BAT
RRSS	x	x	x			x		x	x
TCR-1								x	
BR-1		x	x	x	x	x			x
TCR-6		x	x	x	x	x	x	x	x
CLN-3								x	x
CLN-ALT			x			x			x
OHD-2	x	x	x			x		x	x
SCL-1	x	x	x					x	x
TCR-4									
CLN-8									

TABLE 5 BATS IDENTIFIED VIA ACOUSTICAL SURVEY AND ANALYSIS USING ECHOCLASS 2.0 AT TEN SITES SURVEYED ALONG THE PROPOSED ELLIJAY-ROUNDTOP TRANSMISSION LINE ROW IN GILMER COUNTY, GEORGIA.

SITE	BIG BROWN BAT	SILVER-HAIRED BAT	RED BAT	HOARY BAT	GRAY BAT	EVENING BAT	TRI-COLORED BAT
RRSS		x	x				x
TCR-1			x	x			
BR-1		x	x	x			
TCR-6	x		x	x	x		x
CLN-3			x	x		x	
CLN-ALT			x				x
OHD-2			x				x
SCL-1			x		x		x
TCR-4							
CLN-8							

The percent composition of each species as determined by each program from data aggregated from all ten sites is shown in Table 6. Finally, a qualitative analysis was performed for those calls that the automated identification software determined to have characteristics in common with known Myotis calls. A biologist with training and experience in conducting qualitative analysis of acoustic data reviewed each call file to determine whether or not it was likely to have been made by a Myotis species. A summary of the review is presented in Table 7. It was determined that the majority of those calls identified as Myotis by the automated identification programs were either tri-colored bats or red bats, both of which are known to be capable of producing calls similar to Myotis species in certain conditions. Other calls were determined to be feeding buzzes or high "clutter" calls that are similar to calls made by Myotis species, though within the context of the call file it was determined that they were unlikely to have been produced by a Myotis species. Lastly, it appears that there are three call files that contain calls with qualitative similarities to known Myotis calls. However, given the inherent uncertainties with acoustic analysis, it was not possible to confidently assign a species to those Myotis-like calls.

TABLE 6 PERCENT COMPOSITION OF BAT SPECIES AS DETERMINED USING TWO AUTOMATED ACOUSTIC IDENDTIFICATION PROGRAMS OF DATA COLLECTED AT TEN SITES ALONG THE PROPOSED ELLIJAY-ROUNDTOP TRANSMISSION LINE ROW IN GILMER COUNTY, GEORGIA.

PROGRAM	BIG BROWN BAT	SILVER-HAIRED BAT	RED BAT	HOARY BAT	MYOTIS SPP.	EVENING BAT	TRI-COLORED BAT	UNKNOWN SPECIES
BCID	2.3	5.2	18.2	0.3	1.4	12.7	57.4	2.4
Echoclass 2.0	0.4	1.0	45.8	3.2	3.2	4.0	7.3	35.2

TABLE 7 RESULTS OF QUALITATIVE ANALYSIS OF CALLS IDENTIFIED AS *MYOTIS* SPECIES BY TWO AUTOMATED ACOUSTIC IDENDTIFICATION PROGRAMS OF DATA COLLECTED AT TEN SITES ALONG THE PROPOSED ELLIJAY-ROUNDTOP TRANSMISSION LINE ROW IN GILMER COUNTY, GEORGIA.

PROGRAM	LIKELY MYOTIS	RED BAT	TRI-COLORED BAT	BIG BROWN BAT	UNKN FEEDING BUZZ	HIGH CLUTTER, UNKN
BCID	3	6	3	0	1	1
Echoclass 2.0	2	7	41	3	0	8

4.0 DISCUSSION

In May and June 2014, POWER conducted mist net and acoustic surveys at ten mist net sites in the project area for a new transmission line, in Gilmer County, Georgia. The surveys were carried out at the level of effort recommended by USFWS and additional guidance from the USFWS Athens Field Office. Timing of the survey and conditions in the field were appropriate for investigating presence of endangered bats, including the Indiana bat and northern long-eared bat, during the maternity season. Acoustic surveys were conducted concurrent with mist netting and the data were processed using two USFWS approved automated identification programs.

No Indiana bats or northern long-eared bats were captured during mist netting. Though BCID identified one site where there was a 90 percent or greater MLE for Indiana bats, Echoclass 2.0

determined that the calls did not rise to that level of confidence. Neither program determined that any calls reached an MLE of 90 percent or greater for northern long-eared bat calls. Qualitative analysis showed that there were likely to have been a small number of individuals from the *Myotis* genus within the project area. However, it was not possible to confidently assign these calls to species.

These sampling data indicate that it is not likely that northern long-eared bats or Indiana bats are present within the project area and while suitable habitat has been identified in portions of the project footprint, it is not likely that future activities in the area would adversely affect either species.

5.0 LITERATURE CITED

Gardner, J.E., J.D. Garner, and J.E. Hofmann. 1989. A portable mist netting system for capturing bats with emphasis on *Myotis sodalis* (Indiana bat). Bat Research News 30(1):1–8.

USFWS. 2013. Final Indiana Bat Survey Guidance for Kentucky. Developed by U.S. Fish and Wildlife Service and Kentucky Department of Fish and Wildlife Resources. May 1, 2013.

USFWS. 2014. 2014 Rangewide Indiana Bat Summer Survey Guidelines. Region 3 U.S. Fish and Wildlife Service, Ft. Snelling, Minnesota. January 13, 2014.

APPENDIX A AGENCY COORDINATION

POWER ENGINEERS, INC.

11733 Chesterdale Road
Cincinnati, Ohio 45246

PHONE 513-326-1500
FAX 513-326-1550

15 May 2014

ENERGY
FACILITIES
COMMUNICATIONS
ENVIRONMENTAL

Tamara Johnson
U.S. Fish and Wildlife Service
Ecological Services Field Office
105 Westpark Dr. Suite D
Athens, GA 30606

Re: Listed Bat Species Study Plan – Roundtop Transmission Line Project.

Dear Ms. Johnson,

Our client has requested that we conduct presence/probable absence surveys for listed bat species within the project area shown on the attached mapping. To that end, we are requesting your review of the following study plan, and concurrence with the conclusion that should this study plan by executed, and negative survey results are documented, USFWS will consider that the project is not likely to adversely affect the Indiana bat (*Myotis sodalis*) and/or northern long-eared bat (*Myotis septentrionalis*). Hereafter, these two bat species will be referred to as the listed bat species. This study plan is based on the methods and level of effort described in the *USFWS 2014 Range-Wide Indiana Bat Summer Survey Guidance* (USFWS Protocol). Per USFWS guidance, the USFWS Protocol methods are appropriate for use during northern long-eared bat presence/probable absence surveys as well.

Introduction:

Georgia Transmission Corporation is proposing to install a transmission line along the corridor depicted in the attached mapping. The northern terminus of the project is approximately 0.25 miles northeast of GA 5 (S Main St) and Highway 76 (Industrial Blvd/Tails Creek Rd), in Ellijay, Gilmer County, Georgia. The proposed right-of-way (ROW) continues west along Tails Creek Road for approximately 8.75 miles before heading south on Lower Tails Creek Road. The proposed ROW will follow Lower Tails Creek Road for approximately 0.8 miles before heading southeast then south cross-country. The proposed ROW continues 1.5 miles across forested land south towards Carters Lake. Within the land managed by US Army Corps of Engineers surrounding and including the lake, the proposed ROW covers approximately 1 mile before joining the route of Oak Hill Road on the south side of Carters Lake. The proposed ROW follows the general route of Oak Hill Road for approximately 2.25 miles before picking up the route of Barnes Mountain Road,

which it follows for approximately 0.6 miles towards Knight Road. Once reaching Knight Road, the proposed ROW continues south for approximately 1 mile towards Roundtop Road which it follows for approximately 0.8 miles where it meets its southern terminus at a proposed substation.

Potentially Suitable Listed Bat Species Habitat:

A field survey of potentially suitable listed bat species habitat was conducted in April, 2014. Field crews traveled the proposed ROW identifying areas that met the definition of suitable habitat as found in the USFWS Protocol as follows:

> Suitable summer habitat for Indiana bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥5 inches dbh (12.7 centimeter) that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat.

The attached mapping and photolog depict those areas where suitable habitat was observed. In total, 9.6 km of potentially suitable habitat were documented. Generally, the portions of the proposed ROW that were collocated with or near roadways offered limited and/or dispersed suitable habitat. The majority of the suitable habitat lies within the cross-country section surrounding Carters Lake.

One particular area to note is that between structures 113 and 124 on the attached exhibits 16 and 17. Though it is clear from aerial imagery that this area is forested, it was observed during the field survey to be a Virginia pine plantation. Within the proposed ROW, this plantation is extremely dense, to the point where flyways are unavailable. Therefore, this area was discounted as suitable habitat.

Sample Bat Habitat Survey Data Sheets documenting the habitat throughout the proposed ROW and selected photographs have been attached.

Level of Effort:

For linear projects in this region, the USFWS Protocol prescribes a level of effort of four net nights per 1 km of suitable listed bat species habitat. Given that field survey identified 9.6 km of suitable listed bat species habitat, POWER proposes a level of effort of 40 net nights.

Mist Net Sampling Methods:

POWER will sample 10 mist net locations with two nets each for two nights each, for the required total of 40 net nights. The attached mapping presents 11 potential mist net sets. This includes 10 mist net sites that will be surveyed and one alternate site in the event that a site is inaccessible or field review reveals a site is not appropriate for mist netting. Potential mist net sites are called out in white boxes with an approximate latitude and longitude.

Bat biologists will select the most appropriate mist net sites within or near the project area. Selection of mist net sites will be based on forest conditions (e.g., tree density, canopy cover), presence and size of flowing streams, and presence of an open flyway. Proposed mist net locations are shown on the attached mapping and photolog.

Each night, netting will begin at sunset and continue for at least five hours. Nets will be monitored every 10 minutes. Mist nets will extend approximately from water or ground level to tree canopy and will be bounded by foliage on the sides. Nets will vary in size depending on dimensions of the survey site but net width and height will be adjusted for the fullest possible coverage of the flight corridor at each site.

Mist net surveys will occur only if the following weather conditions are met:

a) limited precipitation
b) temperature greater than 10°C (50°F)
c) minimal wind

Bats will be live-caught in mist nets and released unharmed near the point of capture. Species, capture location, age, gender, reproductive condition, right forearm length, and weight of bats captured during the mist net survey will be recorded. Habitat near each mist net site will be characterized, and weather conditions during the survey will be recorded. Per the USFWS Protocol, photo-documentation of all bats captured and identified as Indiana bats and the first 10 little brown bats (*Myotis lucifigus*) per project are required to verify the identifications made in the field. Photo-documentation of all bats captured and identified as northern long-eared bats will also be completed. Photo-documentation will include diagnostic characteristics.

Should a listed bat species be captured, POWER will notify USFWS and Georgia Department of Natural Resources (GDNR) within 24 hours of capture, as required by conditions of POWER's federal permit. Bands supplied by GDNR will be applied to listed bat species using a banding tool to prevent wing damage.

White Nose Syndrome Disinfection Protocols

Gilmer County is known to be affected by White Nose Syndrome (WNS). Following guidelines issued by the USFWS, POWER will comply with measures to combat the potential spread of the disease among bats by washing and disinfecting all field equipment, including clothing and vehicles, at all survey locations. In addition to applying stringent decontamination protocols, POWER will assess any WNS scarring as a result of acute WNS infection. A wing score based on Reichard's "Wing-Damage Index Used for Characterizing Wing Condition of Bats Affected by White Nose Syndrome" will be recorded for all bats captured. In accordance with POWER's permit conditions, if any captured bats exhibit signs of WNS or abnormal characteristics, POWER will notify USFWS and GDNR within 24 hours.

Radio Tracking and Emergence Surveys:

Should a listed bat species be captured during the course of the mist net survey, POWER will attach radio transmitters following the USFWS Protocol as amended by the Athens USFWS Field Office. The Athens USFWS Field Office requires that the first female northern long-eared bat captured at each site and all Indiana bats captured during the survey be radio-tracked. Radio-tracking and emergence survey activities will commence immediately upon capture of a listed bat species. Radio-tracking will be conducted over a seven-day period as described below, and as required by the USFWS Protocol.

POWER will attach radio transmitters only to bats that weigh greater than 6.0 grams. Bats will be tracked during the day within a search radius of three miles from the point of capture to locate roost trees up to a maximum of 40 receiver hours (a receiver hour consists of one person operating a receiver for one hour) or 7 days, whichever is less. POWER will attempt to track bats from parks, roads, and other public lands within the search radius. POWER will not enter any property without the express consent of the landowner; POWER will not trespass during radio-tracking and emergence survey efforts. If access to roost trees is not available (e.g., located on private property without access permission), roost locations will be estimated using triangulation.

Where possible, crews will record the following information regarding roost trees: tree species, tree condition (living or dead), percent exfoliating bark, diameter at breast-height, estimated percent overstory within stand, and estimated percent understory/midstory within stand. If accessible, a photograph will be taken and the tree's location recorded with GPS.

An emergence survey will be conducted at each accessible roost tree identified during the tracking period to enumerate bats using the roost. Surveys will begin 30 minutes before dusk and will continue until at least one hour after sunset or until the roost tree is no longer visible without additional illumination. Surveys will only be conducted if the weather conditions described for mist netting are met.

Acoustic Surveys:

In addition to mist net surveys, POWER will conduct acoustic monitoring surveys as required by the USFWS Athens Field Office, following the USFWS/Kentucky Department of Fish and Wildlife Resources 2013 Indiana bat survey protocol (Kentucky Protocol). POWER will deploy Anabat SD2s in areas near mist net sites that are not suitable for mist net survey. The Kentucky Protocol specifies that monitoring be conducted concurrently with mist netting. Data will be analyzed nightly using Bat Call ID East and Analook. Presence/probable absence of listed bat species will not be assumed from acoustic results alone and additional net nights of survey will not be conducted based on acoustic results.

Personnel:

Mist net and acoustic surveys will be conducted by Drew Carson, who is listed on Federal Recovery Permit TE38789A-2. He will be assisted by a technician familiar with conducting mist net surveys and who will be working only under his direct supervision.

If you have any questions or require further technical detail regarding this application please call me at 513.326.1519 (office) or 513.407.0508 (mobile) or contact me via email at drew.carson@powereng.com

Sincerely,

POWER Engineers, Inc.
Drew Carson
Bat Ecologist/Project Manager

C. Pete Pattavina, USFWS
Dana Heil, Georgia Transmission Corporation
Jim Baxter, Terracon Consultants, Inc.

GeorgiaTransmission

October 31, 2014

Georgia Transmission Corporation
2100 East Exchange Place
Tucker, GA 30084-5336
phone 770-270-7400
fax 770-270-7872

OCT 30 2014

ATHENS, GA

Tamara Johnson
US Fish and Wildlife Service
105 West Park Drive, Suite D
Athens, GA 30606

Subject: Biological Evaluation – GTC/RUS Ellijay – Roundtop T/L and Roundtop S/S Projects, Gilmer County, GA

Dear Ms. Johnson:

Please find attached the Biological Evaluation for various bat species conducted by Terracon and Powers Engineering on the behalf of the Rural Utility Service (RUS) and Georgia Transmission Corporation (GTC).

This correspondence is to request your review of the document and a concurrence that the above reference project "may affect, but is not likely to adversely affect" the Indiana and Northern Long Eared bats and will have "no effect" on the Gray bat.

GTC will conduct winter clearing of trees on all suitable habitat located on the cross country portion of the project.

Should you have any questions or would like to discuss further, please give me a call at 770-270-7983.

Sincerely,

Dana M. Heil

Dana M. Heil
Environmental Regulatory Compliance Coordinator

DMH:jed

Enclosure

cc. Lauren McGee Rayburn, RUS
Pete Patavina, USFWS
Vince Howard, GTC

U. S. Fish and Wildlife Service
105 Westpark Drive, Suite D
Athens, GA 30606
706-613-9493 Fax 706-613-6059

FWS Log No.
NG-14-GTLM

Based on the information you provided, no further action is required under Section 7(a)(2) of the Endangered Species Act. However, if new information or changes in the project involve federally-listed species, further consultation with the Service will be required.

Donald W. Imm, Ph.D., Field Supervisor

Date 11/21/14

APPENDIX B DATA SHEETS

Site Name/Number: KES

NET SITE DESCRIPTION

Biologists (full names): DREW CARLSON + GEOFFREY PALMER Date: 05/28/14

County: GILMER State: GEORGIA Project Name: ELLIJAY RUNWAY Project Number: 134641

Latitude: 34.592222 Longitude: -84.561167 Stream Name: N/A

Comments (indicate photos on sketch, including direction camera was facing):
SITE ADJACENT TO EXISTING TRANSMISSION LINE. SMALL PATCH OF FOREST SELECTIVELY CLEARED. TWO OPENINGS CONNECT CLEARING WITH T-LINE ROW. NETS 1 and 2 ARE ACROSS EACH OPENING.

STREAM:

Bank Height (feet): N/A Channel Width (feet): N/A Avg. Water Depth (inches): N/A

~~Dominant Substrates~~ (circle all that apply): Cobble Gravel Sand Silt Other:

~~Turbidity (circle one):~~ ~~Clear~~ ~~Moderate~~ ~~Turbid~~ Open flyway present (circle one)? (Yes) No

VEGETATION:

Dominant canopy species (scientific names; spell out):
ACER RUBRUM, QUERCUS ALBA, QUERCUS VELUTINA

Average canopy diameter at breast height (DBH; inches):
10

Dominant understory species (scientific names; spell out):
ACER RUBRUM, OXYDENDRUM ARBOREUM, PINUS VIRGINIANA

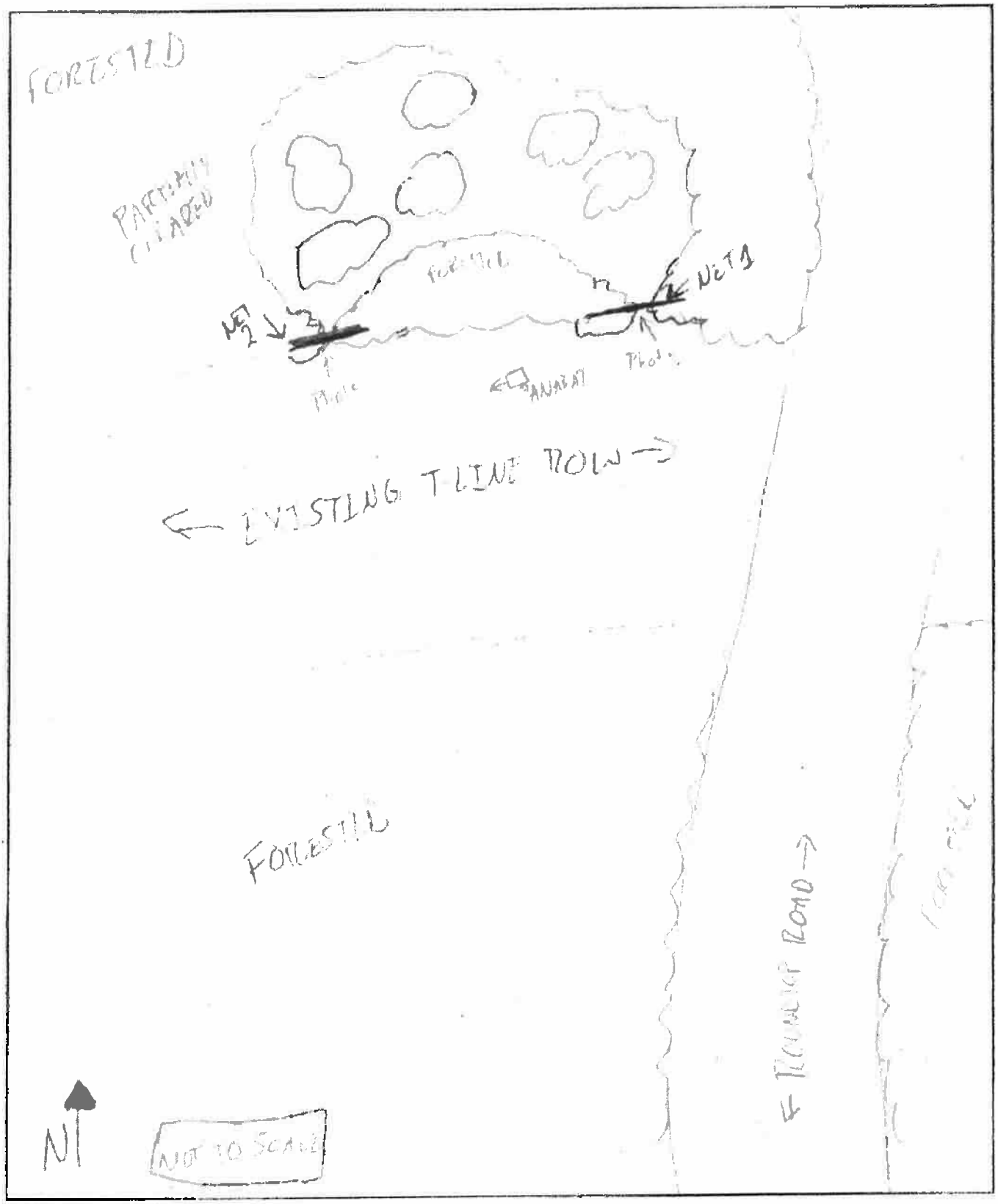
Estimated density of understory vegetation (circle one): (high) moderate low

Description of potential Indiana bat roost trees visible from net site:

Tree Species	Condition (circle one)	Est. DBH (inches)	Est. % loose bark	Comments
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			

Site Name/Number: KIESS

Drawing of net site (include north arrow & location of each net. Indicate photo location and direction camera was facing.)



Site Name/Number: RPSS

WEATHER DATA

Biologists (full names): DREW CARSON & GEOFFREY PALMER Date: 05/28/14

County: GILMER State: GEORGIA Night: 1 of 2

Project Name: ELLIJAY – ROUND TOP Project Number: 134641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 0 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

(Sunset to Moonset) Moonrise to end of netting Not present Present during all of netting

Military Time of Moonrise/set: MOONSET = 20:41

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
20:20	72	1-3	EAST	N	N	—	—	25	
21:30	70	<1	EAST	N	N	—	—	30	
22:30	68	1-3	EAST	N	N	—	—	30	
23:30	66	1-3	EAST	N	N	—	—	30	
00:30	64	1-3	EAST	N	N	—	—	30	
01:30	62	<1	EAST	N	N	—	—	30	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: RRSS

Night 1 of 2 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): DREW CARSON + GEOFFREY PALMER **Date:** 05/28/14 **Project Number:** 134641

Project Name: ELLIJAY - BLOCK 2 TDR **County:** GILMER **State:** GEORGIA

ID's Confirmed By: DREW CARSON **Locations Selected By:** DREW CARSON **Net Up Time:** 20:30 **Net Down Time:** 01:30

Site Comments: SEE NET SITE DESCRIPTION DATASHEET.

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	18	20	75 %
2	18	10	100 %
3	—	—	—
4	—	—	—

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	1	21:35	5	A	F	D	[illegible]	39.1	0	—	LABO	Y	
2	1	22:55	4	A	M	N	9.0	36.9	0	—	LABO	Y	
3	1	23:30	—	—	—	—	—	—	—	—	LABO	—	ESCAPE FROM HS
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: YESS

WEATHER DATA

Biologists (full names): [illegible] Date: 05/29/11

County: [illegible] State: GEORGIA Night: 2 of 2

Project Name: ELLISAY, GEORGIA - TRANSMISSION Project Number: 134641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 2 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset Moonrise to end of netting Not present Present during all of netting

Military Time of Moonrise/set: MOONSET 21:33

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
21:00	68	<1	EAST	N	N			25	
22:00	66	<1	EAST	N	N			5	
23:00	64	<1	EAST	N	N			0	
00:00	64	<1	EAST	N	N			0	
01:00	64	<1	EAST	N	N			15	
02:00	64	1-3	EAST	N	N			0	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: 2RSS

Night 2 of 2 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): Drew Carson + Geoffrey Palmer **Date:** 05/29/14 **Project Number:** 134641

Project Name: Ellijay, Georgia - Roundtop **County:** Gilmer **State:** Georgia

ID's Confirmed By: Drew Carson **Locations Selected By:** Drew Carson **Net Up Time:** 2100 **Net Down Time:** 0200

Site Comments: See net site description data sheet

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	18	20	75%
2	18	10	100%
3	—	—	—
4	—	—	—

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	1	2145	2	A	M	NR	10.5	37.8	0	—	LABO	N	
2	1	2145	5	A	M	NR	15.5	45.1	0-P	—	EPFU	Y	[illegible]
3	1	2200	5	A	M	-L	5.5	32.4	0	—	PESU	Y	
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

POWER Engineers, Inc.

Site Name/Number: TCR-1 Page 1 of 2

NET SITE DESCRIPTION

Biologists (full names): Drew Carson & Whitney Palmer Date: 05/30/14

County: Gilmer State: Georgia Project Name: Ellijay, GA Project Number: 134611

Latitude: 34.68371 Longitude: -84.49695 Stream Name: Tails Creek

Comments (indicate photos on sketch, including direction camera was facing):
NET 1 placed at opening in forested area surrounding Tails Creek. Net 2 placed over Tails Creek in forested area.

STREAM:

Bank Height (feet): 1 Channel Width (feet): 6 Avg. Water Depth (inches): 24

Domiant Substrates (circle all that apply): Cobble Gravel Sand (Silt) Other:

Turbidity (circle one): Clear (Moderate) Turbid Open flyway present (circle one)? (Yes) No

VEGETATION:

Dominant canopy species (scientific names; spell out):
Platanus occidentalis, Liriodendron tulipifera, Pinus sp.

Average canopy diameter at breast height (DBH; inches):
8"

Dominant understory species (scientific names; spell out):
Platanus occidentalis, Acer rubrum

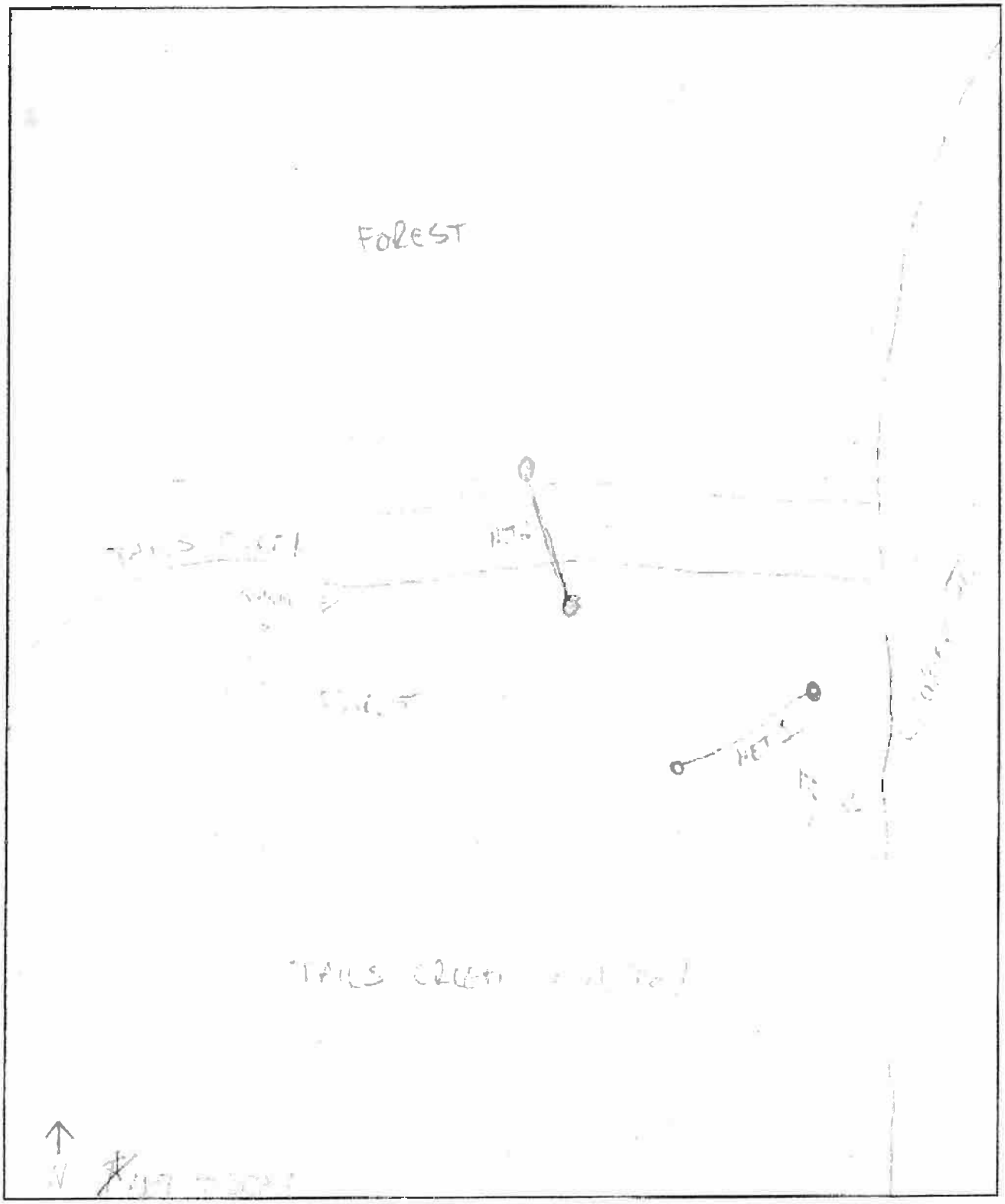
Estimated density of understory vegetation (circle one): high (moderate) low

Description of potential Indiana bat roost trees visible from net site:

Tree Species	Condition (circle one)	Est. DBH (inches)	Est. % loose bark	Comments
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			

Site Name/Number: _____ **Page** ___ **of** ___

Drawing of net site (include north arrow & location of each net. Indicate photo location and direction camera was facing.)



Site Name/Number: TCR - 1 Page 1 of 1

WEATHER DATA

Biologists (full names): DREW CARSON + [illegible] Date: 05/30/14

County: GILMER State: GEORGIA Night: 1 of 2

Project Name: ELLIJAY, GEORGIA - Pumpstop Project Number: 134641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 4 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

(Sunset to Moonset) Moonrise to end of netting Not present Present during all of netting

Military Time of Moonrise/set: SET = 22:21

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
21:00	70	<1	EAST	N	N			0	
22:00	68	<1	EAST	N	N			0	
23:00	66	<1	EAST	N	N			0	
24:00	66	<1	EAST	N	N			0	
01:00	66	<1	EAST	N	N			0	
02:00	66	<1	EAST	N	N			0	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: TR-1 Night 1 of 2 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): DREW CARLSON + GEOFFREY PRIMM **Date:** 05/30/14 **Project Number:** 134641

Project Name: ELLIJAY, GEORGIA – ROUNDTOP **County:** GILMER **State:** GEORGIA

ID's Confirmed By: DREW CARLSON **Locations Selected By:** DREW CARLSON **Net Up Time:** 21:00 **Net Down Time:** 07:00

Site Comments: ☆ SEE NET SITE DESCRIPTIONS DATA SHEET

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	18	20	75 %
2	18	20	75 %
3	—	—	—
4	—	—	—

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1													
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: _____ **Page** 1 **of** 1

WEATHER DATA

Biologists (full names): _____ **Date:** 05/31/14

County: _____ **State:** _____ **Night:** 2 **of** 2

Project Name: _____ **Project Number:** 13[illegible]11

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 9 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

(Sunset to Moonset) Moonrise to end of netting Not present Present during all of netting

Military Time of Moonrise/set: SET: 23 04

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
21:00	72	<1	EAST	N	N			50	
22:00	71	<1	EAST	N	N			50	
23:00	71	1-3	EAST	N	N			50	
13:50	70	1-3	EAST	N	N			100	[illegible]
13:50	70	1-3	EAST	N	N			75	[illegible]
00:30	68	<1	EAST	N	N			25	
01:30	67	1-3	EAST	N	N			50	
02:30	66	1-3	EAST	N	N			50	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: TCF-1

Night 2 of 2 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): [illegible] **Date:** 05/31/14 **Project Number:** [illegible]

Project Name: ELLIJAY, GEORGIA - ROUND TOP **County:** GILMER **State:** GEORGIA

ID's Confirmed By: [illegible] **Locations Selected By:** [illegible] **Net Up Time:** 21:00 **Net Down Time:** 02:20

Site Comments: X- SEE NET SITE DESCRIPTION
NETS CLOSED FROM 2330 - 2350 DUE TO RAIN

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	18	20	75%
2	18	30	25%
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1													
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: BR 1 Page 1 of 2

NET SITE DESCRIPTION

Biologists (full names): Drew Carson + Geoffrey Palmer **Date:** 06/01/14

County: Gilmer **State:** Georgia **Project Name:** Ellijay Boulevard **Project Number:** 134641

Latitude: 34.66537 **Longitude:** -84.60474 **Stream Name:** N/A

Comments (indicate photos on sketch, including direction camera was facing):
NET 1 PLACED ACROSS A DIRT ROAD IN A FORESTED AREA JUST AFTER ROAD SPLITS. NET 2 PLACED ACROSS SINGLE LANE DIRT ROAD IN FORESTED AREA

STREAM:

Bank Height (feet): ______ **Channel Width (feet):** ______ **Avg. Water Depth (inches):** ______

Dominant Substrates (circle all that apply): Cobble Gravel Sand Silt Other: ______

Turbidity (circle one): Clear Moderate Turbid **Open flyway present (circle one)?** Yes No

VEGETATION:

Dominant canopy species (scientific names; spell out):
Acer rubrum, Quercus alba, Pinus strobus

Average canopy diameter at breast height (DBH; inches):
12

Dominant understory species (scientific names; spell out):
Oxydendrum arboreum; Cornus florida; Acer rubrum

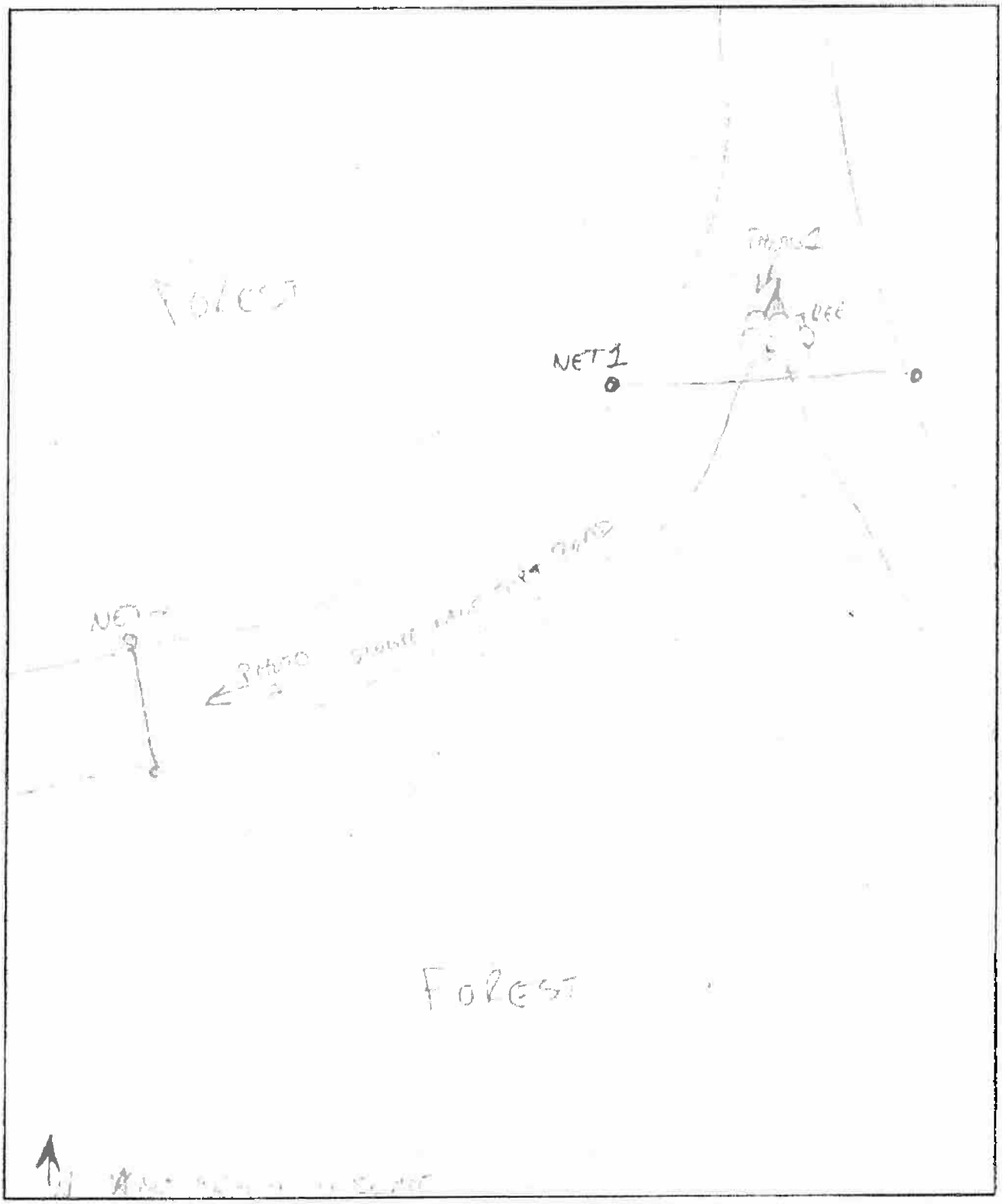
Estimated density of understory vegetation (circle one): high (moderate) low

Description of potential Indiana bat roost trees visible from net site:

Tree Species	Condition (circle one)	Est. DBH (inches)	Est. % loose bark	Comments
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			

Site Name/Number: BR1 **Page** 2 **of** 2

Drawing of net site (Include north arrow & location of each net. Indicate photo location and direction camera was facing.)



Site Name/Number: SR 2 Page 1 of 1

WEATHER DATA

Biologists (full names): DREW CARLSON + GRIFFIN PALMER Date: 06/01/14

County: GLYNN State: GEORGIA Night: 1 of 2

Project Name: ELLIJAY, GEORGIA - PALMWOOD Project Number: 134641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 17 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

(Sunset to Moonset) Moonrise to end of netting Not present Present during all of netting

Military Time of Moonrise/set: SET: 23:44

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
20:45	70	<1	SE	N	N			0	
21:45	70	<1	SE	N	N			0	
22:45	68	<1	SE	N	N			0	
23:45	66	<1	SE	N	N			0	
00:45	66	1-3	SE	N	N			0	
01:45	64	<1	SE	N	N			0	

*Use the following guidelines to determine wind speed:

<1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: BR2

Night 1 of 2 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): Drew Carson + Geoffrey Parage **Date:** 06/01/14 **Project Number:** 134641

Project Name: Fieldday Georgia - Rowdy[illegible] **County:** Gilmer **State:** Georgia

ID's Confirmed By: Drew Carson **Locations Selected By:** Drew Carson **Net Up Time:** 20:45 **Net Down Time:** [illegible]

Site Comments: ★See Nest Site Description Data Sheet★

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	30	20	75%
2	30	20	75%
3	—	—	—
4	—	—	—

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	1	2105	3	J	M	NR	9.5	37.1	0	—	LABO	N	
2	2	23:55	6	—	—	—	—	—	—	—	LABO	—	Escaped from net
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: BR1 Page 1 of 1

WEATHER DATA

Biologists (full names): DREW CARSON + GEOFFREY PALMER Date: 06/02/14

County: GILMER State: GEORGIA Night: 1 of 2

Project Name: ELLIJAY - ROUND TRIP Project Number: 134641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 23 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

(Sunset to Moonset) Moonrise to end of netting Not present Present during all of netting

Military Time of Moonrise/set: 00.21

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
2045	72	<1	SOUTHEAST	N	N			0	
2145	66	<1	SOUTHEAST	N	N			0	
2245	61	1-3	SOUTHEAST	N	N			0	
2345	64	1-3	SOUTHEAST	N	N			0	
0045	64	1-3	SOUTHEAST	N	N			0	
0145	61	1-3	SOUTHEAST	N	N			0	

*Use the following guidelines to determine wind speed:

<1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: B21 Night 2 of 2 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): DREW CARSON + GEOFFREY PRICE **Date:** 06/02/14 **Project Number:** 134641

Project Name: EUJAY - ROUND TOP **County:** GILMER **State:** GEORGIA

ID's Confirmed By: DREW CARSON **Locations Selected By:** DREW CARSON **Net Up Time:** 20:45 **Net Down Time:** 01:45

Site Comments: SEE NET SITE DESCRIPTION DATA FORM

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	30	20	75%
2	30	20	75%
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	1	2200	2	A	M	TD	10.5	35.6	0	—	NYHU	Y	
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: TCR-6 Page 1 of 2

NET SITE DESCRIPTION

Biologists (full names): DREW CARSON, GEOFFREY PAINE Date: 06/05/14

County: GILMER State: GEORGIA Project Name: FULTON BOTTOM Project Number: 134641

Latitude: 34.688539 Longitude: -84.60127 Stream Name: TAILS CREEK

Comments (indicate photos on sketch, including direction camera was facing):
NET 1 SET ACROSS TAILS CREEK IN FORESTED AREA.
NET 2 SET ACROSS TAILS CREEK IN FORESTED AREA.

STREAM:

Bank Height (feet): 1 Channel Width (feet): 10 Avg. Water Depth (inches): 1

Domiant Substrates (circle all that apply): (Cobble) (Gravel) (Sand) Silt Other: BOULDER

Turbidity (circle one): (Clear) Moderate Turbid Open flyway present (circle one)? (Yes) No

VEGETATION:

Dominant canopy species (scientific names; spell out):
LIRIODENDRON TULIPIFERA, CARPINUS CAROLINIANA

Average canopy diameter at breast height (DBH; inches):
10

Dominant understory species (scientific names; spell out):
CARPINUS CAROLINIANA

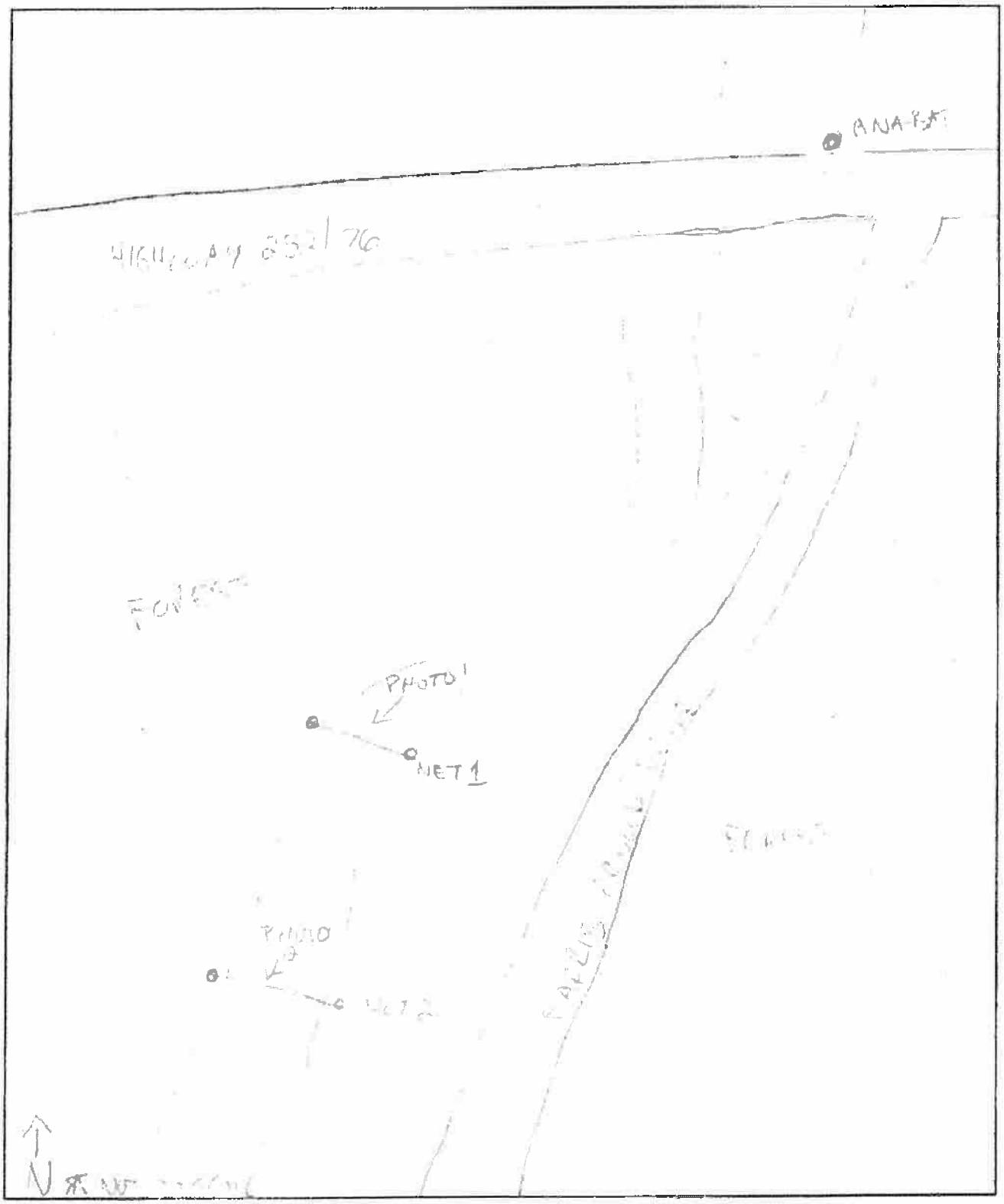
Estimated density of understory vegetation (circle one): high (moderate) low

Description of potential Indiana bat roost trees visible from net site:

Tree Species	Condition (circle one)	Est. DBH (inches)	Est. % loose bark	Comments
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			

Site Name/Number: _____ Page 2 of 2

Drawing of net site (include north arrow & location of each net. Indicate photo location and direction camera was facing.)



Site Name/Number: TKC-6 **Page** 1 **of** 1

WEATHER DATA

Biologists (full names): [illegible] **Date:** 06/03/14

County: PALMER **State:** GEORGIA **Night:** 1 **of** 2

Project Name: ELLIJAY - POWDER SPRINGS **Project Number:** 134641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 32 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset Moonrise to end of netting Not present Present during all of netting

Military Time of Moonrise/set: AT 00:55

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
20:45	72	<1	[illegible]	N	N			35	
21:45	66	1-3	[illegible]	N	N			35	
22:45	66	1-3	[illegible]	N	N			0	
23:45	64	1-3	[illegible]	N	N			0	
00:45	64	1-3	[illegible]	N	N			0	
01:45	62	1-3	[illegible]	N	N			0	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: TEC-6 Night 1 of 2 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): DREW CARSON & GEOFFREY PALMER **Date:** 06/03/14 **Project Number:** 134641

Project Name: ELIJAY – POWDER SP **County:** GILMER **State:** GEORGIA

ID's Confirmed By: DWCARSON **Locations Selected By:** DREW CARSON **Net Up Time:** 20:45 **Net Down Time:** 01:45

Site Comments: ☆ SEE NEST SITE DESCRIPTION

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	31	30	75%
2	18	30	75%
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1													
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: TRC-6 Page 1 of 1

WEATHER DATA

Biologists (full names): D. Carson & [illegible] Date: 06/04/14

County: Gilmer State: Georgia Night: 2 of 2

Project Name: Ellijay - Rondo Project Number: 134641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 91 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

(Sunset to Moonset) Moonrise to end of netting Not present Present during all of netting

Military Time of Moonrise/set: SET: 01:27

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
00:45	77	<1	NORTHEAST	N	N			75	
01:45	75	<1	NORTHEAST	N	N			0	
02:45	72	1-3	NORTHEAST	N	N			0	
03:45	70	1-3	NORTHEAST	N	N			25	
00:45	70	1-3	WEST	N	N			0	
01:45	70	1-3	W	N	N			0	

*Use the following guidelines to determine wind speed:

<1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: RC-6 Night 2 of 2 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): DREW CARSON & BARCLAY PRATT **Date:** 6/4/14 **Project Number:** 131641

Project Name: ELLIJAY - ROUNDTOP **County:** GILMER **State:** GEORGIA

ID's Confirmed By: DREW CARSON **Locations Selected By:** DREW CARSON **Net Up Time:** 20:45 **Net Down Time:** 01:45

Site Comments: * SEE NET SITE DESCRIPTION DATASHEET

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	30	20	75%
2	18	20	75%
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	2	21:10	1	A	M	TD	5.0	32.3	0		RESU	N	
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: CLN-3 Page 1 of 2

NET SITE DESCRIPTION

Biologists (full names): DREW CARSON & GEOFFREY PALMER Date: 06/06/14

County: GILMER State: GEORGIA Project Name: ELLIJAY Project Number: 134641

Latitude: 34.64938 Longitude: -84.60438 Stream Name: N/A

Comments (indicate photos on sketch, including direction camera was facing):
NET 1: ACROSS ACCESS ROAD BETWEEN BOAT RAMP ROAD AND CLEARING IN WOODS. NET 2 ACROSS CLEARING IN WOODS. SEE SKETCH

STREAM:

Bank Height (feet): _____ Channel Width (feet): _____ Avg. Water Depth (inches): _____

Domiant Substrates (circle all that apply): Cobble Gravel Sand Silt Other: _____

Turbidity (circle one): Clear Moderate Turbid Open flyway present (circle one)? Yes No

VEGETATION:

Dominant canopy species (scientific names; spell out):
Liriodendron tulipifera, Quercus alba; Acer rubrum

Average canopy diameter at breast height (DBH; inches):
8

Dominant understory species (scientific names; spell out):
Cornus florida, Liriodendron tulipifera, Acer rubrum

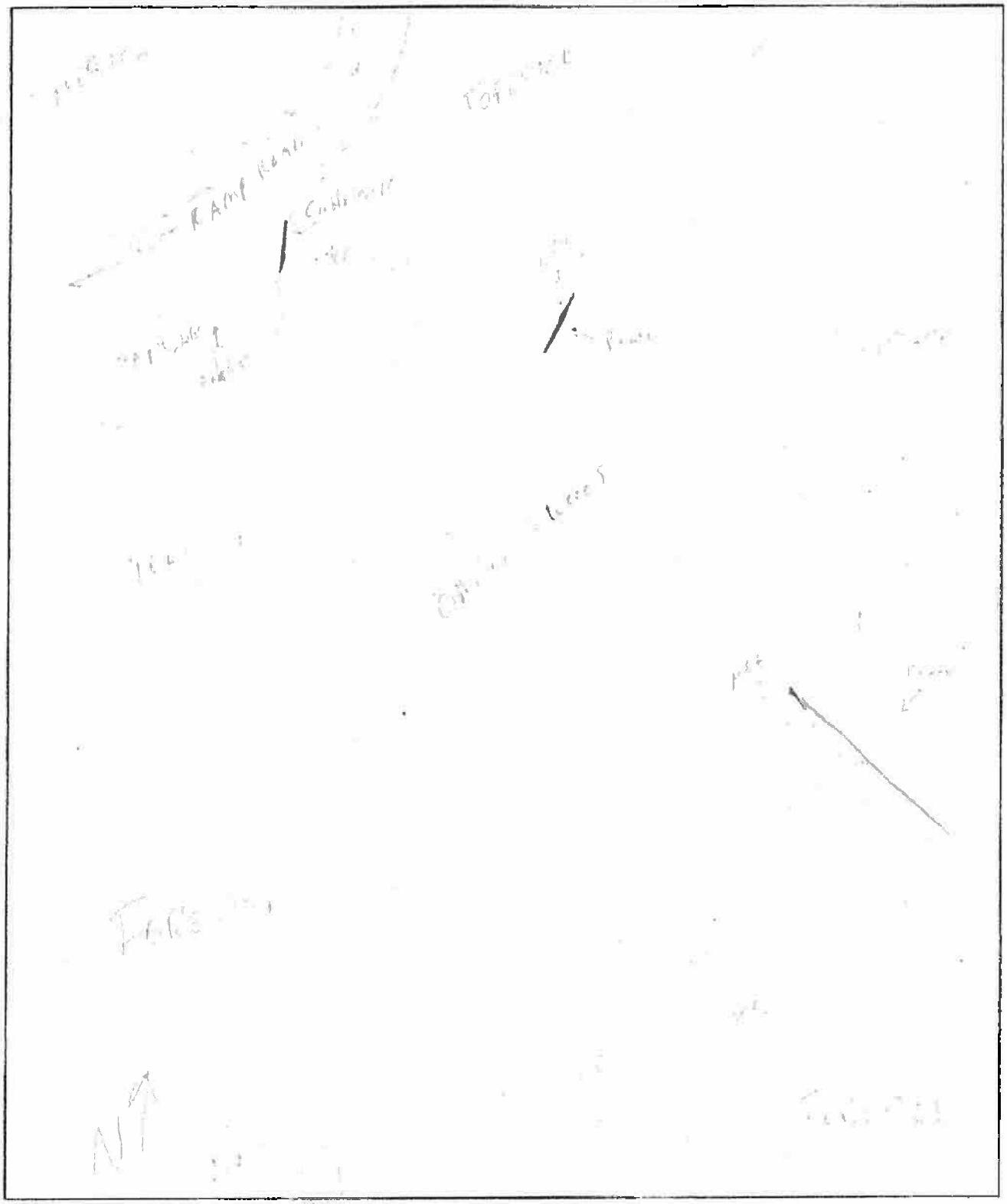
Estimated density of understory vegetation (circle one): high moderate low

Description of potential Indiana bat roost trees visible from net site:

Tree Species	Condition (circle one)	Est. DBH (inches)	Est. % loose bark	Comments
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			

Site Name/Number: CLN-3 **Page** 2 **of** 2

Drawing of net site (include north arrow & location of each net. Indicate photo location and direction camera was facing.)



Site Name/Number: CLN-3 Page 1 of 1

WEATHER DATA

Biologists (full names): [illegible] **Date:** 06/[illegible]/14

County: Gilmer **State:** Georgia **Night:** 1 **of** 2

Project Name: Ellijay - [illegible] **Project Number:** [illegible]

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 60 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset Moonrise to end of netting Not present **(circled) Present during all of netting**

Military Time of Moonrise/set: N/A

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
20:45	78	<1	North	N	N			50	
21:45	76	<1	North	N	N			50	Occasional Gusts ~ 8-12 mph
22:45	75	<1	N/A	N	N			25	
23:45	75	<1	N/A	N	N			25	
00:45	75	<1	N/A	N	N			25	
01:45	75	<1	N/A	N	N			25	

*Use the following guidelines to determine wind speed:

<1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: CLN - 3

Night 1 of 3 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): Drew Carlson & Geoffrey Palmer **Date:** 06/06/14 **Project Number:** 134641

Project Name: Ellijay - [illegible] **County:** Gilmer **State:** GA

ID's Confirmed By: Drew Carlson **Locations Selected By:** Drew Carlson **Net Up Time:** 08:45 **Net Down Time:** 01:45

Site Comments: *See net site description data sheet

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	18	20	100
2	30	20	75
3	—	—	—
4	—	—	—

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	1	2220	2	A	M	NR	11.5	38.7	—	—	LABO	N	
2	2	2250	3	A	F	P	16.5	38.0	—	—	LABO	N	
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: CLN-3 Page 1 of 1

WEATHER DATA

Biologists (full names): Drew Carson & Geoffrey Palmer Date: 08/07/14

County: Gilmer State: Georgia Night: 2 of 3

Project Name: Ellijay - Roundtop Project Number: 34641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 70 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset   Moonrise to end of netting   Not present   Present during all of netting (circled)

Military Time of Moonrise/set: N/A

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
2045	74	<1	N/A	N	N	|	|	0	
2145	74	<1	N/A	N	N	|	|	100	
[illegible]	70	<1	N/A	N	N	|	|	100	
[illegible]45	70	<1	N/A	N	N	|	|	100	
0045	70	<1	N/A	N	N	|	|	100	Severe weather approaching
									Netting suspended

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: CLN-3 Night 2 of 3 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): DREW CARSON + GEOFFREY [illegible] **Date:** 06/07/14 **Project Number:** 134691

Project Name: [illegible] **County:** GILMER **State:** GEORGIA

ID's Confirmed By: DREW CARSON **Locations Selected By:** DREW CARSON **Net Up Time:** 20:45 **Net Down Time:** 00:15

Site Comments: * SEE NET SITE DESCRIPTION DATA SHEET P – SOME WEATHER APPROACHING SITE, CLOSED NETS AT 2015 DUE TO LIGHTNING AND IMPENDING RAIN.

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	8	20	100
2	31	20	75
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1													
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: CLN-3 Page 1 of 1

WEATHER DATA

Biologists (full names): Drew Carson Dave Bell Date: 6-8-14

County: Gilmer State: Georgia Night: 3 of 3

Project Name: Ellijay - Roundtop Project Number: 134641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 69 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset Moonrise to end of netting Not present (Present during all of netting)

Military Time of Moonrise/set: N/A

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
2045	76	<1	N/A	N	N			25	
2145	74	<1	N/A	N	N			25	
2245	72	<1	N/A	N	N			50	
2345	70	<1	N/A	N	N			50	
0045	69	<1	N/A	N	N			25	
0145	68	<1	N/A	N	N			25	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: CLN-3 Night 3 of 3 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): Drew Carson + DAVE BELL **Date:** 6-8 13 **Project Number:** 134641

Project Name: ELLISON - ROUND TOP **County:** GILMER **State:** TX

ID's Confirmed By: DRC **Locations Selected By:** DRC **Net Up Time:** 20:45 **Net Down Time:** 0115

Site Comments: SEE NAT Site Description

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	18	20	100
2	30	20	75
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	2	21:35	1	A	F	P	16	40.8	0	—	LABO	N	
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: CLN-ALT

NET SITE DESCRIPTION

Biologists (full names): David Carson Dave Bell Date: 6-9-14

County: Gilmer State: GA Project Name: Ellijay-Blue Ridge Project Number: 134641

Latitude: 34.649284 Longitude: -84.596340 Stream Name: N/A

Comments (indicate photos on sketch, including direction camera was facing):
NET 1 ACROSS ROAD LEADING TO CAMPSITE PARKING LOT. NET 2 PLACED ACROSS TWO TRAILS LEADING TO CAMPSITES AND PUBLIC AREAS.

STREAM:

Bank Height (feet): _____ Channel Width (feet): _____ Avg. Water Depth (inches): _____

Domiant Substrates (circle all that apply): Cobble Gravel Sand Silt Other: _____

Turbidity (circle one): Clear Moderate Turbid Open flyway present (circle one)? Yes No

VEGETATION:

Dominant canopy species (scientific names; spell out):
LIRIODENDRON TULIPIFERA, Quercus stellata

Average canopy diameter at breast height (DBH; inches):
12

Dominant understory species (scientific names; spell out):
Acer rubrum

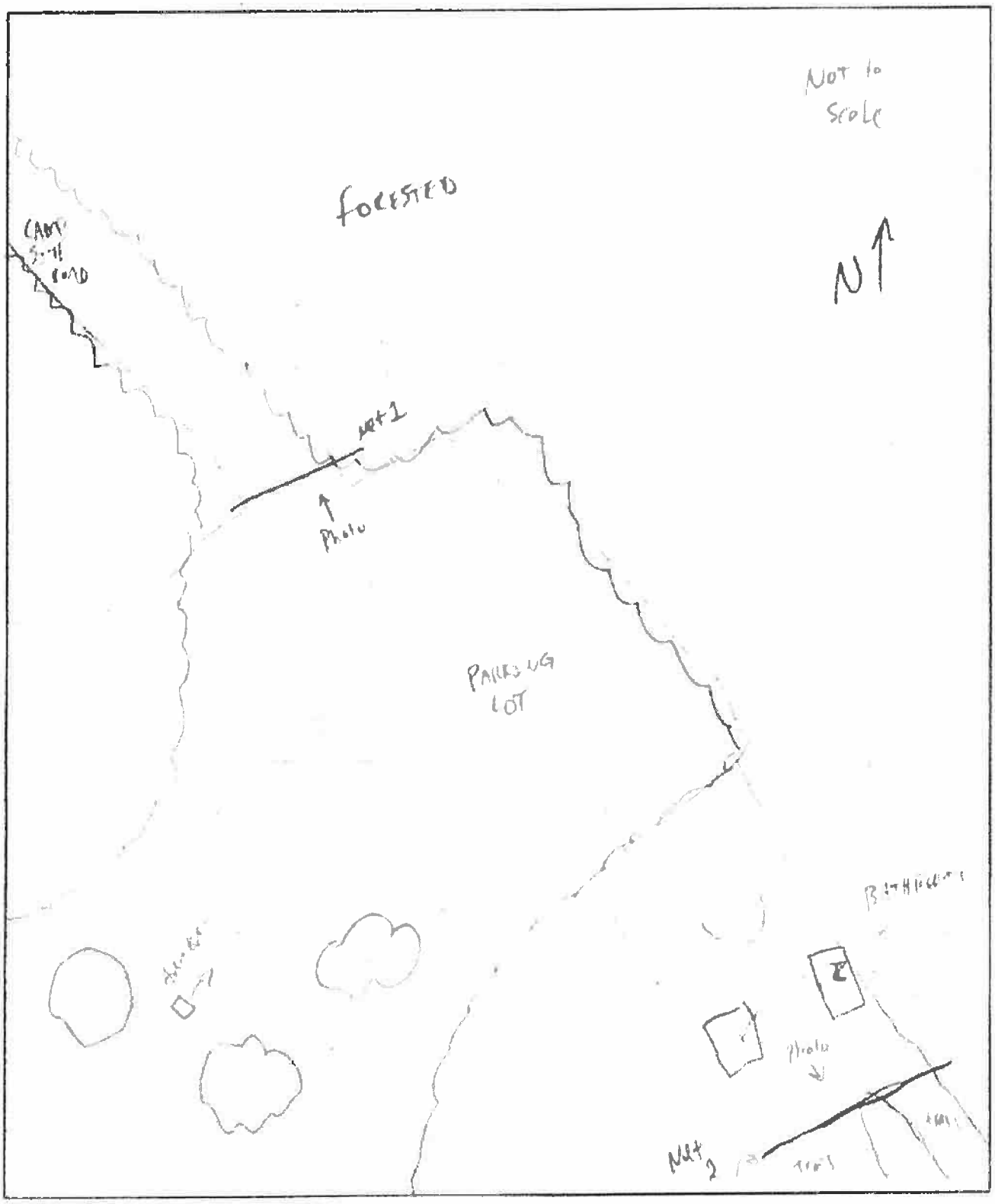
Estimated density of understory vegetation (circle one): high moderate low

Description of potential Indiana bat roost trees visible from net site:

Tree Species	Condition (circle one)	Est. DBH (inches)	Est. % loose bark	Comments
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			

Site Name/Number: CIN-ALT

Drawing of net site (Include north arrow & location of each net. Indicate photo location and direction camera was facing.)



Site Name/Number: CLN-AIT

WEATHER DATA

Biologists (full names): DREW CARSON DAVE BEIL Date: 6-9-14

County: Gilmer State: GA Night: 1 of 2

Project Name: Ellijay Roundup Project Number: 134161

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 87% % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset Moonrise to end of netting Not present (Present during all of netting)

Military Time of Moonrise/set: N/A

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
2045	77	<1	N/A	N	N			50	
2145	76	<1	N/A	N	N			25	
2245	74	<1	N/A	N	N			25	
2345	73	<1	N/A	N	N			25	
0045	71	<1	N/A	N	N			0	
0145	69	<1	N/A	N	N			0	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: CLN-ALT

Night 1 of 2 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): DREW CARSON - DAVE BELL **Date:** 6-9-14 **Project Number:** 134641

Project Name: BLUESKY - ROUNDTOP **County:** GILMER **State:** GA

ID's Confirmed By: DEC **Locations Selected By:** DEC **Net Up Time:** 2045 **Net Down Time:** 0145

Site Comments: SEE NET SITE DESCRIPTION

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	30	30	75
2	30	30	100
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	1	21:05	6	J	M	Non	7.5	37.8	0	—	LABO	N	
2	1	21:25	5	J	M	Non	8.0	38.1	0	—	LABO	N	
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: GLN-ALT

WEATHER DATA

Biologists (full names): DREW CARSON + DAVE BELL Date: 6-10-14

County: GILMER State: GA Night: 2 of 2

Project Name: ELLISAY - ROOFTOP Project Number: 134641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 93 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset Moonrise to end of netting Not present (Present during all of netting)

Military Time of Moonrise/set: N/A

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
2045	78	<1	N/A	N	N			50	
2145	77	<1	N/A	N	N			50	
2245	76	<1	N/A	N	N			50	
2345	74	<1	N/A	N	N			75	
0045	72	<1	N/A	N	N			50	
0145	71	<1	N/A	N	N			50	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: CLN-A1T Night 2 of 3 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): DREW CARSON + DAVE BELL **Date:** 6-10-14 **Project Number:** 134641

Project Name: ELLISAY ROUNDTOP **County:** GILMER **State:** GA

ID's Confirmed By: DRC **Locations Selected By:** DRC **Net Up Time:** 2045 **Net Down Time:** 0145

Site Comments: SEE NET SITE DESCRIPTION

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	30	30	75
2	30	20	100
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	2	2120	2	A	F	P	18.0	39.8	0	—	LABO	N	
2	1	2130	2	—	—	—	—	—	—	—	LABO	N	Escaped from net
3	1	2215	1	A	F	P	24.0	46.9	0	—	EPFU	Y	
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: OHD-2 Page 1 of 2

NET SITE DESCRIPTION

Biologists (full names): Drew Carson, Dave Boll, & Geoffrey Palmer Date: 06/11/14

County: Gilmer State: Georgia Project Name: Ellijay Roundup Project Number: 134641

Latitude: 34.64000 Longitude: -84.59926 Stream Name: N/A

Comments (indicate photos on sketch, including direction camera was facing):
NET 2 AND NET 3 SET ACROSS OAK HILL DRIVE IN A FORESTED AREA. OAK HILL DRIVE IS CLOSED TO TRAFFIC. SEE SKETCH ON BACK OF PAGE.

STREAM:

Bank Height (feet): _____ Channel Width (feet): _____ Avg. Water Depth (inches): _____

Dominant Substrates (circle all that apply): Cobble Gravel Sand Silt Other: _____

Turbidity (circle one): Clear Moderate Turbid Open flyway present (circle one)? Yes No

VEGETATION:

Dominant canopy species (scientific names; spell out):
Liriodendron tulipifera, Pinus virginiana, Acer rubrum

Average canopy diameter at breast height (DBH; inches):
12

Dominant understory species (scientific names; spell out):
Liriodendron tulipifera, Acer rubrum

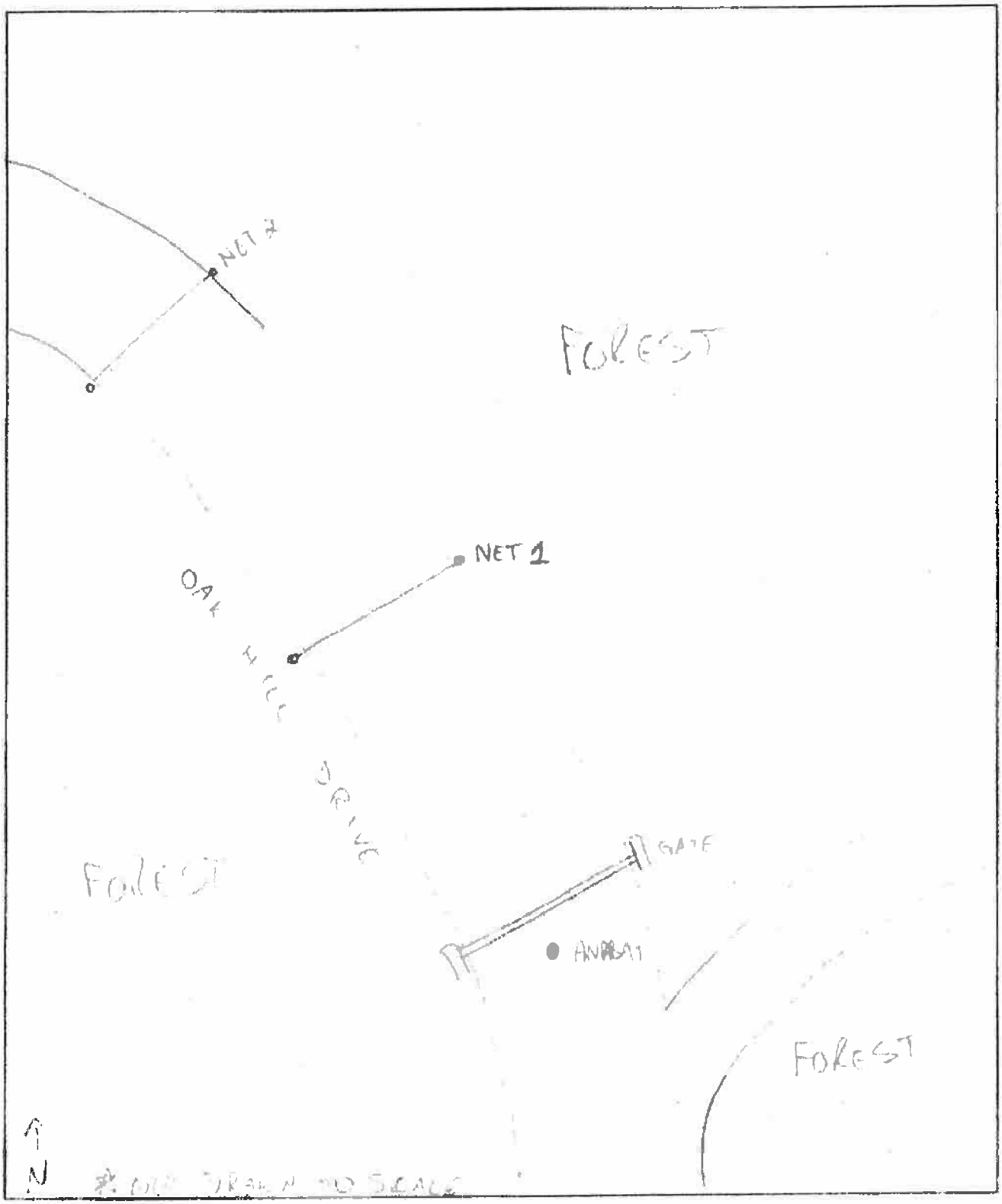
Estimated density of understory vegetation (circle one): high moderate low

Description of potential Indiana bat roost trees visible from net site:

Tree Species	Condition (circle one)	Est. DBH (inches)	Est. % loose bark	Comments
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			

Site Name/Number: OHIO - 2 **Page** 2 **of** 4

Drawing of net site (include north arrow & location of each net. Indicate photo location and direction camera was facing.)



Site Name/Number: OHD-2 Page 1 of 1

WEATHER DATA

Biologists (full names): DREW CARSON + DAVE BELL Date: 6-11-14

County: GILMER State: GA Night: 1 of 3

Project Name: ELLISAY - ROUNDTOP Project Number: 134641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 98 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset Moonrise to end of netting Not present (Present during all of netting)

Military Time of Moonrise/set: N/A

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
2045	80	<1	N/A	N	N			25	
2145	79	<1	N/A	N	N			25	
2245	78	<1	N/A	N	N			25	
2345	76	1-3	NE	N	N			75	
0045	72	1-3	NE	N	N			100	
0145	70	1-3	NE	N	N			100	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: OHD-2 Night 1 of 3 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): DREW CARSON + DAVE BELL **Date:** 6-11-14 **Project Number:** 134641

Project Name: ELLISAY - ROUNDUP **County:** GILMER **State:** _____

ID's Confirmed By: DRC **Locations Selected By:** DRC **Net Up Time:** 2045 **Net Down Time:** 0145

Site Comments: SEE NETSITE DESCRIPTION

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	18	20	75
2	30	30	100
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	1	2125	6	J	M	NR	11.5	41.3	0	—	LABO	N	
2	2	2150	1	A	M	NR	11.0	38.8	0	—	LABO	N	
3	1	2200	1	—	—	—	—	—	—	—	LABO	N	Escaped From Net
4	1	2220	2	A	M	NR	5.5	34.2	0	—	PESU	N	
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: OHD 2 Page 1 of 1

WEATHER DATA

Biologists (full names): DEBWCARSON. DAVE BELL Date: 6-12-14

County: GILMER State: GEORGIA Night: 2 of 3

Project Name: BLIDAY-ROUNDTOP Project Number: 134641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 100 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset (Moonrise to end of netting) Not present Present during all of netting

Military Time of Moonrise/set: 2055

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
2045	80	< 1	N/A	N	N			75	
2145	79	1-3	NE	N	N			100	
2245	76	1-3	NE	N	N			100	
2315	75	1-3	NE	N	N			100	Netting suspended due to rain
0000	72	1-3	NE	N	N			100	Netting cancelled due to rain

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: OHO-2

Night 2 of 3 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): Dan Gr[illegible] + Dale B[illegible] **Date:** 6-[illegible]-[illegible] **Project Number:** 134641

Project Name: [illegible] **County:** Gilmer **State:** GA

ID's Confirmed By: DRC **Locations Selected By:** DRC **Net Up Time:** 2045 **Net Down Time:** 0[illegible]

Site Comments: SEE NET SITE DESCRIPTION

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	18	20	75
2	30	30	100
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	2	2212	2	A	M	NO	17.0	41.8	0	—	EPFU	N	
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high). See "Wing-Damage Index (Reichard)" in binder for complete information.

POWER Engineers, Inc.

Site Name/Number: OHD-2 Page 1 of 1

WEATHER DATA

Biologists (full names): [illegible] Date: 06/13/14

County: [illegible] State: [illegible] Night: 3 of 3

Project Name: [illegible] Project Number: 15161

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 100 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset | Moonrise to end of netting | Not present | Present during all of netting

Military Time of Moonrise/set: Rise 21 21

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
20:45	67	<1	N/A	N	N			100	
21:45	66	<1	N/A	N	N			25	
22:45	64	<1	N/A	N	N			0	
23:45	61	<1	N/A	N	N			0	
00:45	61	<1	N/A	N	N			0	
01:45	62	<1	N/A	N	N			0	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: CAT-2 Night 3 of 3 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): DREW CARLSON + [illegible] **Date:** [illegible] **Project Number:** [illegible]

Project Name: [illegible] **County:** [illegible] **State:** [illegible]

ID's Confirmed By: [illegible] **Locations Selected By:** [illegible] **Net Up Time:** [illegible] **Net Down Time:** [illegible]

Site Comments: [illegible]

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	18	30	75
2	30	30	100
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	2	2120	3	A	M	N	10.0	39.2	—	—	LABO	N	
2	1	2238	3								LABO	N	ESCAPED FROM NET
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: SCL-1

NET SITE DESCRIPTION

Biologists (full names): Drew Carson + Geoffrey Palmer **Date:** 06/14/14

County: Gilmer **State:** Georgia **Project Name:** [illegible] **Project Number:** 131641

Latitude: 34.64132 **Longitude:** -84.60266 **Stream Name:** N/A

Comments (indicate photos on sketch, including direction camera was facing):

Net 1 set across abandoned old logging road in forested area. Net 2 set across abandoned old logging road at forest edge with large open area north of the net.

STREAM:

Bank Height (feet): ______ **Channel Width (feet):** ______ **Avg. Water Depth (inches):** ______

Domiant Substrates (circle all that apply): Cobble Gravel Sand Silt Other: ______

Turbidity (circle one): Clear Moderate Turbid **Open flyway present (circle one)?** Yes No

VEGETATION:

Dominant canopy species (scientific names; spell out):

Pinus virginiana, Liriodendron tulipifera, Acer rubrum

Average canopy diameter at breast height (DBH; inches):

12

Dominant understory species (scientific names; spell out):

Liquidambar styraciflua, Acer rubrum

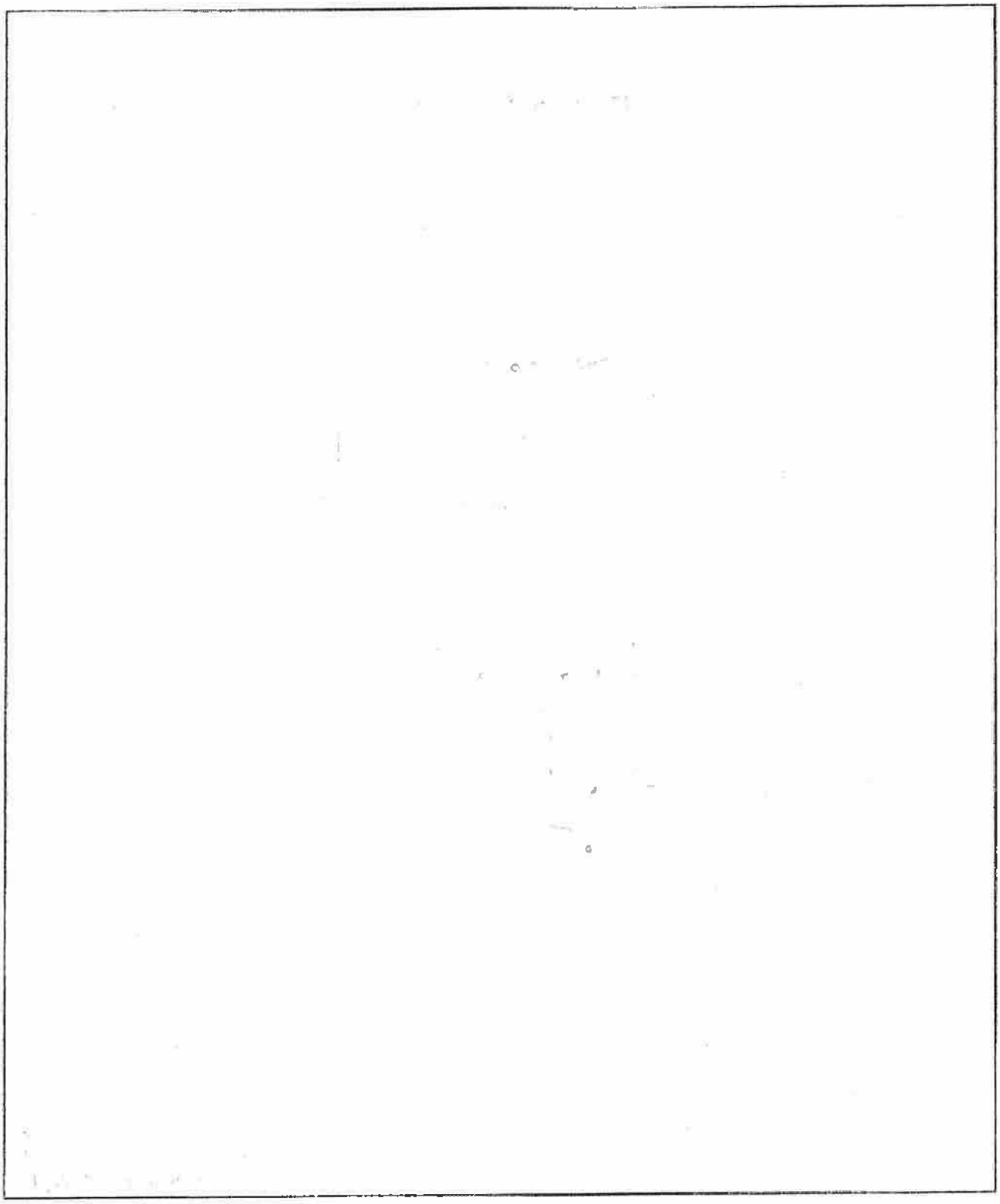
Estimated density of understory vegetation (circle one): high moderate low

Description of potential Indiana bat roost trees visible from net site:

Tree Species	Condition (circle one)	Est. DBH (inches)	Est. % loose bark	Comments
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			

Site Name/Number: SCL-1 **Page** 2 **of** 2

Drawing of net site (Include north arrow & location of each net. Indicate photo location and direction camera was facing.)



Site Name/Number: SCL-1

WEATHER DATA

Biologists (full names): [illegible] Geoffrey Palmer Date: 06/14/14

County: Gilmer State: Georgia Night: 1 of 2

Project Name: [illegible] – [illegible] Project Number: 134641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 96 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset Moonrise to end of netting (circled) Not present Present during all of netting

Military Time of Moonrise/set: Rise [illegible]

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
[illegible]	74	<1	N/A	N	N	|	|	25	
[illegible]	71	<1	N/A	N	N	|	|	25	
[illegible]	72	<1	N/A	N	N	|	|	0	
[illegible]	72	<1	N/A	N	N	|	|	0	
00:45	70	<1	N/A	N	N	|	|	0	
01:45	66	<1	N/A	N	N	|	|	0	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: SCL-2 Night 1 of 2 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): [illegible] **Date:** 06/10/14 **Project Number:** [illegible]

Project Name: [illegible] **County:** Grimes **State:** [illegible]

ID's Confirmed By: [illegible] **Locations Selected By:** [illegible] **Net Up Time:** 20:45 **Net Down Time:** [illegible]

Site Comments: [illegible]

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	18	30	75
2	18	30	100
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1													
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: SCL-1 **Page** 1 **of** 1

WEATHER DATA

Biologists (full names): [illegible] **Date:** [illegible]

County: [illegible] **State:** [illegible] **Night:** [illegible] **of** [illegible]

Project Name: [illegible] **Project Number:** [illegible]

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: [illegible] % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset Moonrise to end of netting Not present Present during all of netting

Military Time of Moonrise/set: [illegible]

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
20:45	[illegible]	[illegible]	N/A	N	N			50	
21:45	[illegible]	[illegible]	N/A	N	N			[illegible]	
22:45	[illegible]	[illegible]	N	N	N			15	
23:45	[illegible]	[illegible]	SE	N	N			0	
0:45	[illegible]	[illegible]	SE	N	N			0	
1:45	[illegible]	[illegible]	SE	N	N			0	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: SCL-1 Night 1 of 2 Page ___ of 1

BAT CAPTURE DATA SHEET

Biologists (full names): _____ **Date:** _____ **Project Number:** _____

Project Name: _____ **County:** _____ **State:** _____

ID's Confirmed By: _____ **Locations Selected By:** _____ **Net Up Time:** _____ **Net Down Time:** _____

Site Comments: _____

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	18	20	75
2	18	20	100
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	1	2230	2	A	M	N	10.2	39.1	0	—	LABO	N	
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: TCV 4 Page 1 of 2

NET SITE DESCRIPTION

Biologists (full names): [illegible] Date: 06/17/14

County: GILMER State: GEORGIA Project Name: ELLIJAY Project Number: 134691

Latitude: 34.70374 Longitude: -84.53956 Stream Name: [illegible]

Comments (indicate photos on sketch, including direction camera was facing):
NET 1 PLACED ACROSS STREAM NORTH OF THE TAILS CREEK ROAD BRIDGE. NET 2 WAS 20 FEET TALL FOR NIGHT 1 AND INCREASED TO 30 FEET TALL FOR NIGHT 2. NET 3 WAS SET ACROSS MOUNTAIN DOWN CREEK IN A FORESTED AREA. SEE SKETCH ON BACK.

STREAM:

Bank Height (feet): 4 Channel Width (feet): 50 Avg. Water Depth (inches): 1

Domiant Substrates (circle all that apply): (Cobble) (Gravel) (Sand) (Silt) Other: BOULDERS

Turbidity (circle one): (Clear) Moderate Turbid Open flyway present (circle one)? (Yes) No

VEGETATION:

Dominant canopy species (scientific names; spell out):
Acer rubrum, Liriodendron tulipifera, Pinus virginiana

Average canopy diameter at breast height (DBH; inches):
8

Dominant understory species (scientific names; spell out):
Acer rubrum, Liriodendron tulipifera

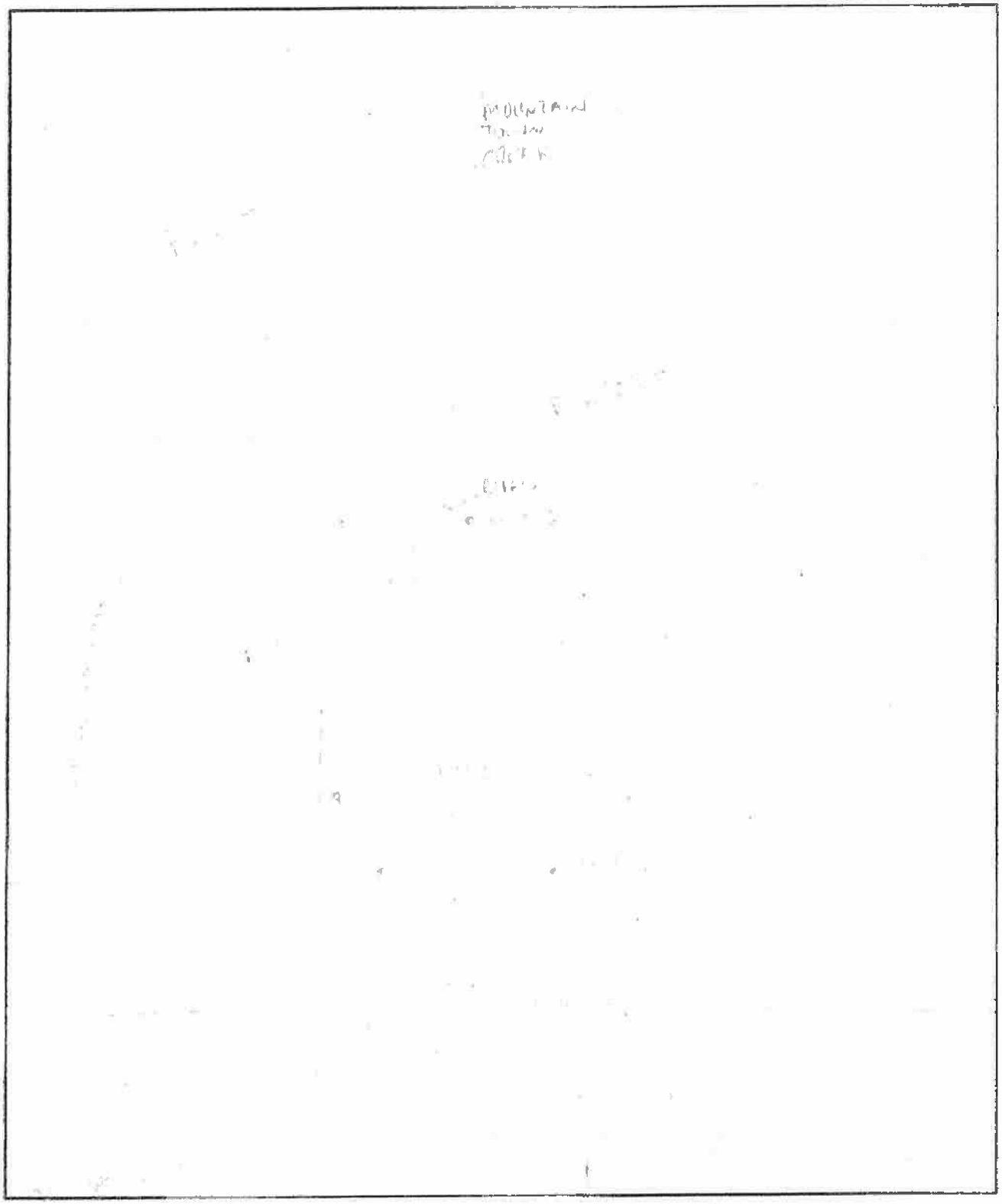
Estimated density of understory vegetation (circle one): high moderate low

Description of potential Indiana bat roost trees visible from net site:

Tree Species	Condition (circle one)	Est. DBH (inches)	Est. % loose bark	Comments
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			

Site Name/Number: _____ **Page ___ of ___**

Drawing of net site (Include north arrow & location of each net. Indicate photo location and direction camera was facing.)



Site Name/Number: [illegible] 4

WEATHER DATA

Biologists (full names): [illegible] Date: [illegible]

County: [illegible] State: [illegible] Night: 1 of 2

Project Name: [illegible] Project Number: [illegible]

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 65 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset   (Moonrise to end of netting)   Not present   Present during all of netting

Military Time of Moonrise/set: [illegible] 00:53

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
[illegible]	[illegible]	<1	N/A	N	N			[illegible]	
[illegible]	[illegible]	<1	N/A	N	N			0	
[illegible]	[illegible]	1-3	N	N	N			0	
[illegible]	70	1-3	N	N	N			0	
00:45	68	1-3	N	N	N			0	
[illegible]	68	[illegible]	N	N	N			[illegible]	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: _____ Night ___ of _2_ Page _1_ of _1_

BAT CAPTURE DATA SHEET

Biologists (full names): _____ **Date:** _____ **Project Number:** _____

Project Name: _____ **County:** _____ **State:** _____

ID's Confirmed By: _____ **Locations Selected By:** _____ **Net Up Time:** _____ **Net Down Time:** 01:45

Site Comments: _____

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1			
2			
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1													
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: TCP 4 Page 1 of 1

WEATHER DATA

Biologists (full names): [illegible] Date: 06/15/14

County: GILMER State: [illegible] Night: 2 of 2

Project Name: ELLIJAY - ROUNDTOP Project Number: 13461

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 54 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset (Moonrise to end of netting) Not present Present during all of netting

Military Time of Moonrise/set: RISE : 0115

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
00:45	71	4-7	N	N	N			50	
01:45	74	4-7	N	N	N			50	
02:45	70	1-3	N	N	N			0	
03:45	70	1-3	N	N	N			0	
00:45	68	1-3	N	N	N			0	
01:45	68	1-3	N	N	N			0	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: TCR 9 Night 2 of 2 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): Drew Carson + [illegible] **Date:** [illegible] **Project Number:** [illegible]

Project Name: [illegible] **County:** [illegible] **State:** [illegible]

ID's Confirmed By: Drew Carson **Locations Selected By:** Drew Carson **Net Up Time:** 20:45 **Net Down Time:** 01:45

Site Comments: ☆ SEE NET SITE DESCRIPTION DATA SHEET.

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	100	30	0
2	30	20	35
3	—	—	—
4	—	—	—

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1													
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

Site Name/Number: CLN 8 Page 1 of 2

NET SITE DESCRIPTION

Biologists (full names): Drew Carson & Geoffrey Parker Date: 06/20/14

County: Gilmer State: Georgia Project Name: Ellijay Project Number: 134641

Latitude: 34.695473 Longitude: -84.607141 Stream Name: Tails Creek

Comments (indicate photos on sketch, including direction camera was facing):
NET 2 SET ACROSS TAILS CREEK OVER RIFFLE JUST NORTH OF ARMY CORP PEDESTRIAN BRIDGE IN A FORESTED AREA. NET 3 SET ACROSS TAILS CREEK JUST UPSTREAM OF A RIFFLE IN A FORESTED AREA. SEE SKETCH ON BACK OF PAGE.

STREAM:

Bank Height (feet): 5 Channel Width (feet): 30 Avg. Water Depth (inches): 18

Dominant Substrates (circle all that apply): Cobble Gravel Sand Silt Other: Bedrock + Boulders

Turbidity (circle one): Clear Moderate Turbid Open flyway present (circle one)? Yes No

VEGETATION:

Dominant canopy species (scientific names; spell out):
Pinus virginiana; Quercus alba; Tsuga canadensis

Average canopy diameter at breast height (DBH; inches):
12

Dominant understory species (scientific names; spell out):
Tsuga canadensis, Cornus florida

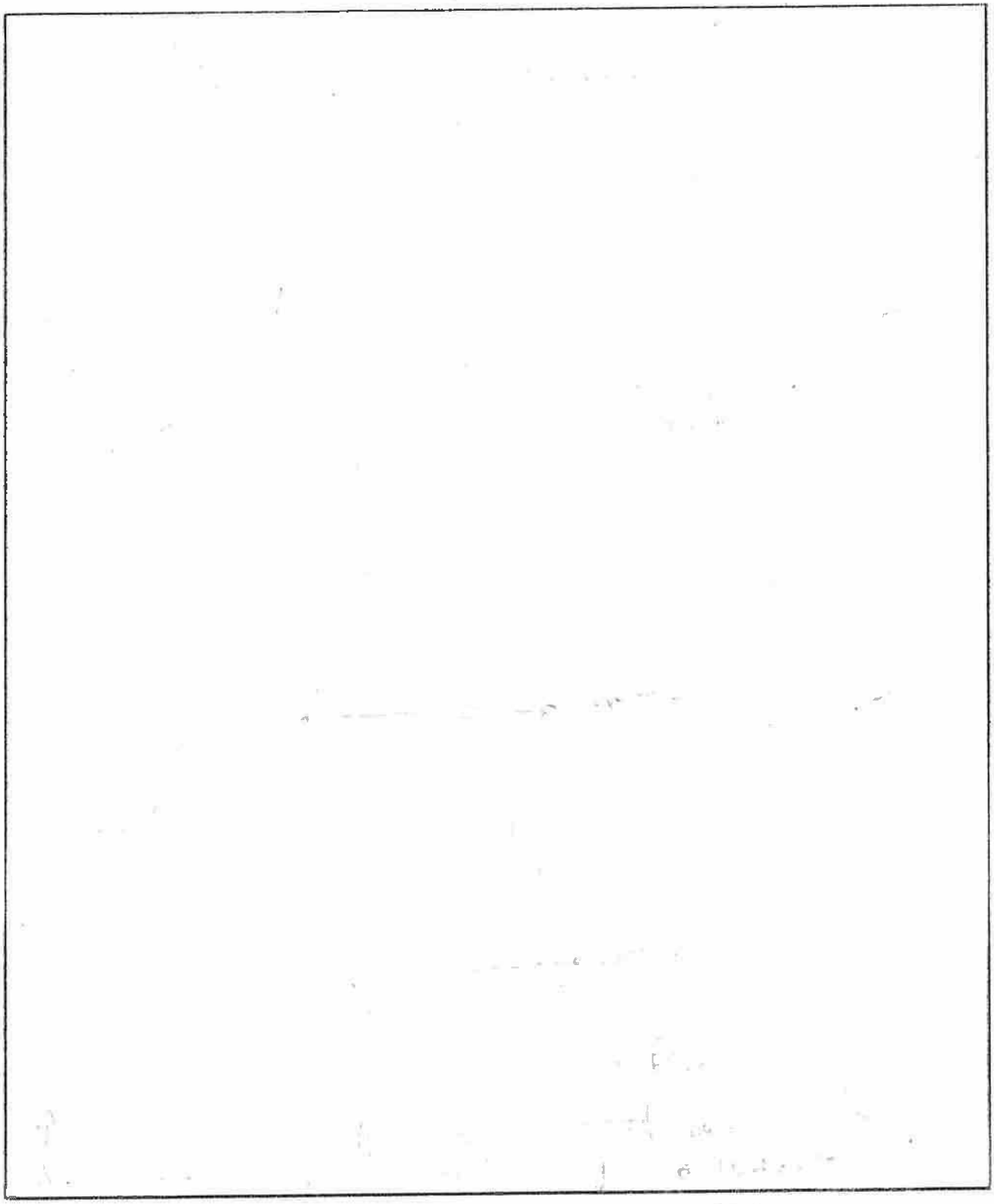
Estimated density of understory vegetation (circle one): high moderate low

Description of potential Indiana bat roost trees visible from net site:

Tree Species	Condition (circle one)	Est. DBH (inches)	Est. % loose bark	Comments
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			
	Live / Dead			

Site Name/Number: _____ Page ___ of ___

Drawing of net site (Include north arrow & location of each net. Indicate photo location and direction camera was facing.)



Site Name/Number: CLN-8

WEATHER DATA

Biologists (full names): [illegible] Date: 06/19/14

County: [illegible] State: Georgia Night: 1 of 2

Project Name: Ellijay - Roundtop Project Number: 124641

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 42 % of the moon's disk is illuminated

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset Moonrise to end of netting Not present Present during all of netting

Military Time of Moonrise/set: N/A
(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
2045	71	1-3	N	N	N			35	
2145	71	1-3	N	N	N			35	
2245	70	1-3	N	N	N			[illegible]	
2345	69	1-3	N	N	N			[illegible]	
0045	68	1-3	N	N	N			[illegible]	
0145	68	1-3	N	N	N			[illegible]	

*Use the following guidelines to determine wind speed:

< 1 mph	calm; smoke rises vertically; no perceivable movement
1-3 mph	smoke drift shows wind direction; barely moves tree leaves
4-7 mph	wind felt on face; leaves rustle; small twigs move
8-12 mph	leaves and small twigs in constant motion; blows up dry leaves
13-18 mph	moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

POWER Engineers, Inc.

Site Name/Number: CLN-8

Night ___ of 2 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): [illegible] **Date:** 06/9/14 **Project Number:** 3464

Project Name: [illegible] **County:** [illegible] **State:** [illegible]

ID's Confirmed By: [illegible] **Locations Selected By:** [illegible] **Net Up Time:** 2045 **Net Down Time:** 01:45

Site Comments: SEE NET SITE DESCRIPTION DATA SHEET

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	30	30	100
2	32	30	35
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1	1	21:30	6	A	F	P	10.5	34.1	0	—	PESU	N	
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

POWER Engineers, Inc.

Site Name/Number: CLN-8 Page 1 of 1

WEATHER DATA

Biologists (full names): [illegible] Date: 06/20/14

County: [illegible] State: Georgia Night: 2 of 2

Project Name: [illegible] Project Number: [illegible]

Look up moon phase data at: http://aa.usno.navy.mil/data/docs/RS_OneDay.php

Moon Phase: 31 **% of the moon's disk is illuminated**

Period during netting when moon is present (not necessarily visible from net site – circle one):

Sunset to Moonset Moonrise to end of netting (Not present) Present during all of netting

Military Time of Moonrise/set: n/a

(Only if moonrise/set occurred during netting period. If neither occurred, write N/A)

Time (military)	Temp (°F)	Wind Speed*	Wind Direction	Is Moon Illuminating Net?** (Y/N) 1	2	3	4	% Cloud Cover	Comments
20:45	74	1-3	N	N	N			100	
21:45	74	1-3	N	N	N			100	
22:45	74	1-3	N	N	N			100	
23:45	72	1-3	N	N	N			100	
00:45	70	1-3	N	N	N			50	
01:45	68	1-3	N	N	N			0	

*Use the following guidelines to determine wind speed:

- <1 mph calm; smoke rises vertically; no perceivable movement
- 1-3 mph smoke drift shows wind direction; barely moves tree leaves
- 4-7 mph wind felt on face; leaves rustle; small twigs move
- 8-12 mph leaves and small twigs in constant motion; blows up dry leaves
- 13-18 mph moves small branches; raises dust

**If yes, provide justification for continuation of netting in the comments column.

Site Name/Number: ELD-8 Night 2 of 2 Page 1 of 1

BAT CAPTURE DATA SHEET

Biologists (full names): [illegible] **Date:** 8/20/14 **Project Number:** 13461

Project Name: [illegible] **County:** [illegible] **State:** [illegible]

ID's Confirmed By: [illegible] **Locations Selected By:** [illegible] **Net Up Time:** [illegible] **Net Down Time:** 0145

Site Comments: [illegible]

Net Number	Width (feet)	Height (feet)	Estimated Canopy Closure
1	30	30	30
2	30	20	25
3			
4			

	Net No.	Time (military)	Height (m)	Age (A/J)	Sex (F/M)	Repro. Cond.*	Weight (g)	RFA (mm)	WNS Score**	Band Color/#	Species Code	Photos? (Y/N)	Comments
1													
2													
3													
4													
5													
6													
7													
8													

*Reproductive Condition: N = non-reproductive, P = pregnant, L = lactating, PL = post-lactating, TD = testes descended. **WNS Score: 0 (none) to 3 (high); See "Wing-Damage Index (Reichard)" in binder for complete information.

APPENDIX C SITE PHOTOGRAPHS

Photo 1. Site RRSS, Net 1.

Photo 2. Site RRSS, Net 2.

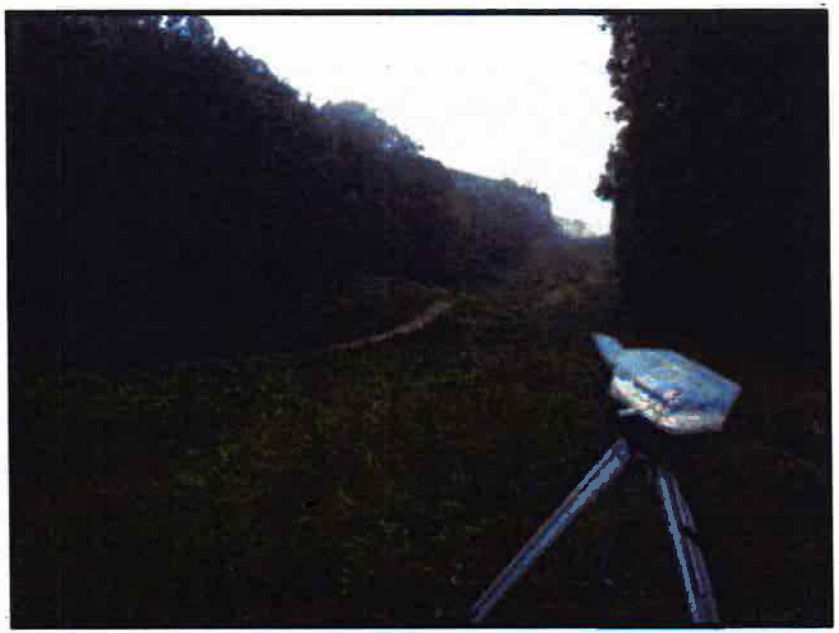


Photo 3. Site RRSS, AnaBat.

Photo 4. Site TCR-1, Net 1.

Photo 5. Site TCR-1, Net 2.

Photo 6. Site TCR-1, AnaBat.

Photo 7. Site BR-1, Net 1.

Photo 8. Site BR-1, Net 2.

Photo 9. Site BR-1, AnaBat.

Photo 10. Site TCR-6, Net 1.

Photo 11. Site TCR-6, Net 2.

Photo 12. Site TCR-6, AnaBat.

Photo 13. Site CLN-3, Net 1.

Photo 14. Site CLN-3, Net 2.

Photo 15. Site CLN-3, AnaBat.

Photo 16. Site CLN-ALT, Net 1.

Photo 17. Site CLN-ALT, Net 2.

Photo 18. Site CLN-ALT, AnaBat.

Photo 19. Site OHD-2, Net 1.

Photo 20. Site OHD-2 Net 2.

Photo 21. Site OHD-2, AnaBat.

Photo 22. Site SCL-1, Net 1.

Photo 23. Site SCL-1, Net 2.

Photo 24. Site SCL-1, AnaBat.

Photo 25. Site TCR-4, Net 1.

Photo 26. Site TCR-4, Net 2.

Photo 27. Site TCR-4, AnaBat 1.

Photo 28. Site CLN-8, Net 1.

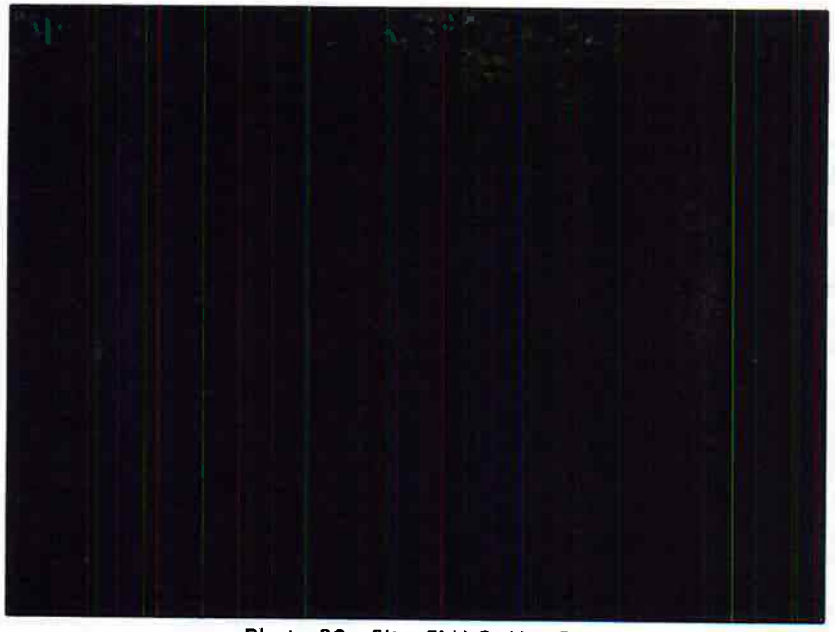


Photo 29. Site CLN-8, Net 2.

Photo 30. Site CLN-8, AnaBat.

Photo 31. Big brown bat.

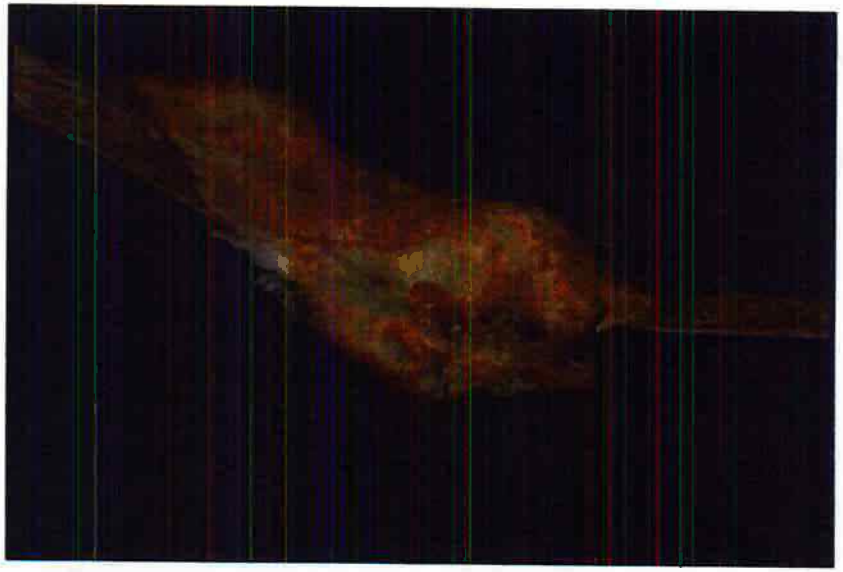


Photo 32. Eastern red bat.

Photo 33. Tri-colored bat.

Photo 34. Evening bat.