Rare, Threatened, and Endangered Species Survey Report

Church to Steele

Queen Anne's & Caroline Counties, Maryland

Prepared for:
Delmarva Power & Light Company

Under Contract to:
McCormick Taylor, Inc.
509 South Exeter Street
Baltimore, MD 21202

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TABLE OF CONTENTS

LIST OF FIGURES

APPENDICES

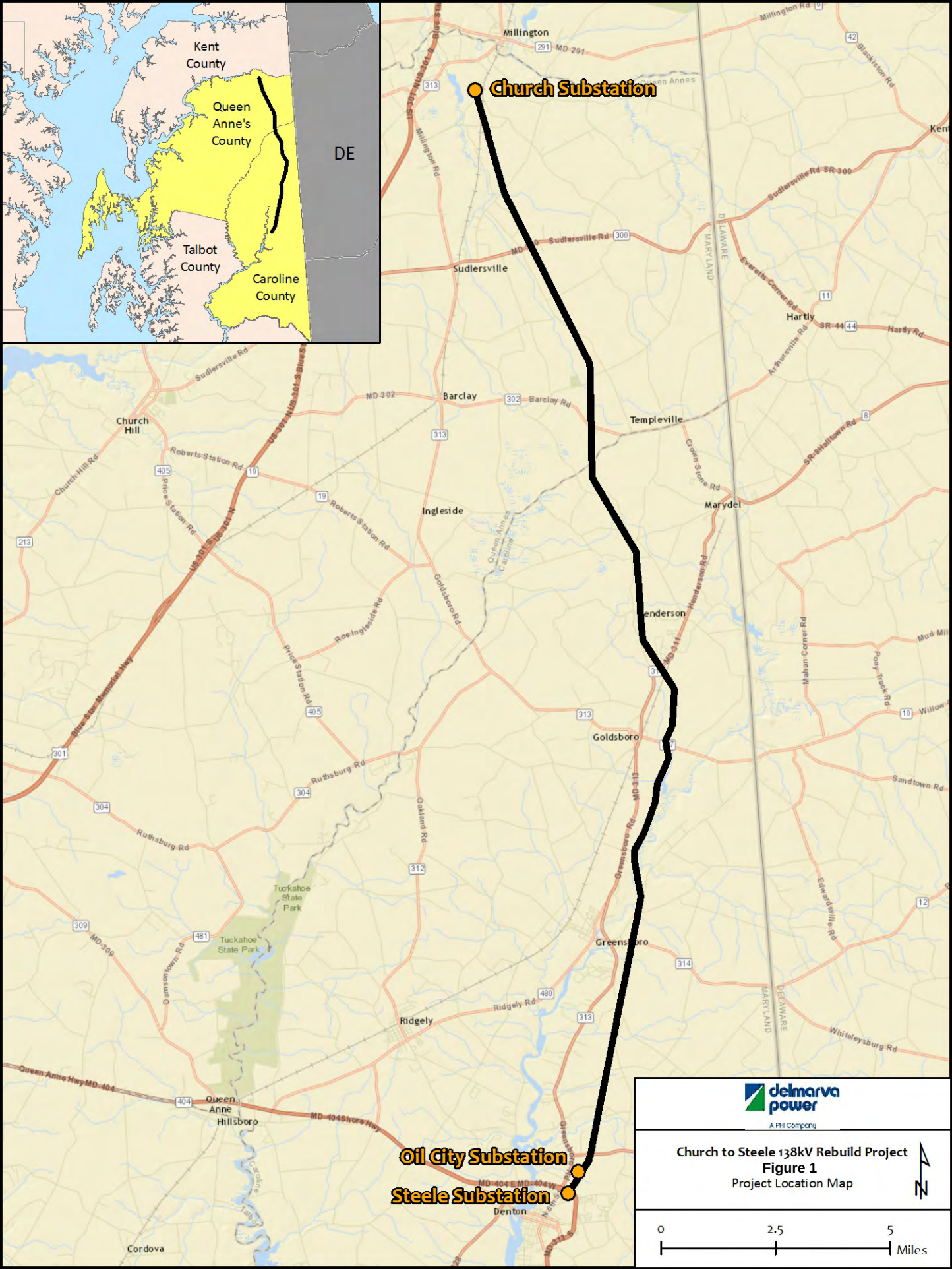
A. Introduction

Coastal Resources, Inc. (CRI) was retained by McCormick Taylor, Inc. on behalf of Delmarva Power & Light (Delmarva Power), a PHI Service Company, to perform a rare, threatened and endangered (T&E) species-specific survey on the Church to Steele 138 kilovolt (kV) transmission line right-of-way (ROW); herein referred to as the study area (see **Figure 1, Project Location Map**). The ROW is operated and maintained by Delmarva Power & Light Company (Delmarva Power), a transmission owning affiliate of Pepco Holdings, Inc. (PHI).

As part of the environmental screening process for this project, letters were sent in late 2013 and early 2014 to the various state and federal agencies responsible for T&E species review. The U.S. Fish and Wildlife Service (USFWS) and U.S. National Marine Fisheries Service (NMFS) were contacted to determine the potential for the project to impact federally listed T&E species. The Maryland Department of Natural Resources Wildlife and Heritage Service (DNR-WHS) and Maryland Department of Natural Resources Integrated Policy and Review Unit (DNR-IPRU) were contacted to determine the potential for the project to impact Maryland state listed T&E species.

The results of the DNR-WHS agency review documented the potential presence of 11 state listed plant species, two amphibian species, two damselfly species, one mussel species, and several species of boney fishes (see DNR-WHS review letter in **Appendix A)**. No response was received from the USFWS or NMFS regarding federally listed species. However, the online USFWS search for potential federally listed species indicated the potential presence of the endangered Delmarva fox squirrel (*Sciurus niger cinereus*) and dwarf wedge mussel (*Alasmidonta heterodon*). Regarding the Delmarva fox squirrel, the USFWS only requests surveys for Delmarva fox squirrel presence if the project lies within a three-mile radius of known occupied fox squirrel habitat. The Church to Steele project lies over three miles from any known Delmarva fox squirrel areas, thus further coordination with the USFWS regarding the Delmarva fox squirrel is not necessary. For the dwarf wedge mussel, the USFWS did not provide any specific guidance, while the DNR-WHS stated that this species is known to occur within the headwaters of the Upper Choptank River.

The DNR-WHS response letter (**Appendix A**) mentioned the presence of T&E fish species known to occur within streams crossed by the project area, including tributaries to Long Marsh/Mason Branch stream system and Tubmill Branch, but did not name the species. Surveys were not recommended for fish or mussel species, but the project should adhere to strict sediment and erosion control best practices to minimize impacts to fish and shellfish. The two damselfly species, sparkling jewelwing (*Calopteryx dimidiata*) and blackwater bluet (*Enallagma weewa*), were noted to occur within the headwaters of the Upper Choptank River, but farther from the project site, and DNR-WHS did not recommend surveys for these species. Of the 11 listed plant species, seven are typically associated with Delmarva bay habitats or other seasonal wetlands. The DNR-WHS response letter also indicated the potential presence of other, unnamed, T&E or watchlist species. The two amphibian species, eastern tiger salamander (*Ambystoma tigrinum tigrinum*) and barking treefrog (*Hyla gratiosa*), were also noted to occur within Delmarva bays crossed by or immediately adjacent to the project study area. The DNR-WHS response letter indicated that surveys for these species may be considered.


Kent County
Queen Anne's County
Talbot County
Caroline County
DE
Church Substation
Oil City Substation
Steele Substation
Millington
Sudlersville
Barclay
Templeville
Church Hill
Ingleside
Henderson
Marydel
Goldsboro
Greensboro
Hartly
Ridgely
Denton
Cordova
Queen Anne
Hillsboro
Tuckahoe State Park
delmarva power
A Pepco Company
Church to Steele 138kV Rebuild Project
Figure 1
Project Location Map
N
0
2.5
5
Miles

During the wetland review process in Maryland, the Maryland Department of Environment (MDE) considers impacts to state-listed species, through consultation with the DNR-WHS during its wetlands permitting process. The MDE may require presence/absence surveys for listed species if they determine that their issuance of a wetlands permit could result in adverse impacts to listed species. Species with status designations of threatened or endangered are legally protected in Maryland under the Nongame and Endangered Species Conservation Act (§ 10-2A-01). Under this Act, it is illegal to "take" threatened or endangered species. A "take" is defined as, "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

Based on the results of the wetland delineation and habitat characterizations, the study area contains eight (8) Delmarva bay areas of sufficient size to potentially support the T&E amphibian species. Other Delmarva bays and wetlands within the study area were also identified as potentially supporting some listed T&E plant species. Targeted plant and amphibian species surveys were conducted to determine the presence and extent of these species within the Church to Steele study area.

B. Project Description

Delmarva Power proposes to rebuild the existing 138kV transmission Line 13701 structures from the Church-Millington Substation to the Steele-Denton Substation primarily in proximity to existing structures on the existing 300-foot right of way that contains two transmission lines, the 138 kV Church to Steele Line and a double circuited 23OkV Line (Circuits 23001 and 23009). The Project involves replacing the existing 138 kV (Circuit 13701) H-frame wood structures and installing new overhead circuit and static wire on steel monopoles within the existing ROW. The transmission line (Circuit 13701) generally runs north to south from Millington, Maryland to Denton, Maryland (**Figure 1, Project Location Map**). The Project ROW is 25.5 miles long and 300 feet wide, with the exception of a 775-foot section outside the Church Substation where it is 150 feet wide. The ROW contains three transmission circuits: the 138 kV Church-Steele wood H-frame Circuit (Circuit 13701), and two 230 kV circuits (Circuits 23001 and 23009), which are supported on lattice towers. Delmarva Power has submitted an application to the Maryland Public Service Commission for a Certificate of Public Convenience and Necessity (CPCN) pursuant to Section 7-207 PUC of the Maryland Annotated Code (2007) and Title 20, Subtitle 79 of the Code of Maryland Regulations (COMAR). The application requests authorization to rebuild the Church-Steele Line, including its structures, wires (conductors), and other facilities related to the interconnections of the Church-Steele Line.

C. Site Description

The northern third of the transmission line occurs within Queen Anne's County and falls within the Chester River watershed, while the remainder of the study area occurs within Caroline County and lies within the Choptank watershed (**Figure 1, Project Location Map**). Land use throughout the area generally consists of cropland, agroforestry, naturally-occurring woodland, and low-density residential. Stream crossings, proceeding from north to south, include Unicorn Branch, Broadway Branch, Chapel Branch, Choptank River, Little Gravelly Branch, Oldtown Branch, Spring Branch, and Tubmill Branch.

Due to its location on the Delmarva Peninsula, the study area is entirely within the Atlantic Coastal Plain physiographic province and is characterized by flat topography with intermittent sloping landforms typified by gradients less than five percent. Soil series throughout the study area are predominantly well drained loams and sandy loams, occurring on upland terraces. Hydric soils are restricted to drainage ways and larger floodplains of non-tidal streams, shallow depressions, and broader interstream flats. The DNR has mapped portions of the study area as wetland (see **Appendix B – Church to Steele Threatened & Endangered Species Survey Map**). All such wetlands are classified as non-tidal palustrine, spanning temporarily to seasonally flooded hydrologic regimes.

Land use within and adjacent to the study area is primarily cropland and managed coniferous forest with areas of natural mixed woodland and low-density residential. Within the study area, vegetation management ensures trees do not violate required Federal Energy Regulatory Commission (FERC) vegetation to conductor clearances. Consequently, vegetation within the study area is generally composed of wetland and upland meadows with varying degrees of shrub cover. In some areas, specific plant species may be unidentifiable due to mowing or agricultural tillage and crop plantings.

D. Species Descriptions

This section provides a brief description of each of the listed T&E species addressed during this targeted species survey. This includes the two amphibian species, the 11 plant species noted in the DNR-WHS response letter, and eight (8) additional state listed plant species, not referenced in the DNR-WHS response letter, but found during fieldwork for the Church to Steele project (See Section E, Results). Amphibian species descriptions were obtained from Stranko et al. (2010). Plant species descriptions are based on information from Brown and Brown (1984), Gleason and Cronquist (1991), and Weakley et al. (2012). These species, their regulatory statuses, habitat preferences, and flowering/activity periods are listed in **Table 1**.

Eastern Tiger Salamander (*Ambystoma tigrinum tigrinum*) – The Eastern tiger salamander is Maryland's largest terrestrial salamander, measuring up to 30 centimeters (cm) in length. The dorsal coloration varies, but typically consists of a dark background color with patches of cream to yellowish green blotches, often forming bands that extend down along the sides. Some individuals lack these dorsal markings. Eggs are deposited in small, gelatinous masses (5-7 cm) to a depth of about one meter on twigs, weed stems, and other support structures in ponds. Egg masses start out firm, but become loose with age. Larval tiger salamanders have an immaculate chin and throat. The digits are broad at the base and flattened. Larvae do not undergo metamorphosis until they reach a relatively large size. Adults spend most of the year in underground burrows in forested habitat. Breeding typically takes place in temporary ponds from November to March. Larva transform to adults between May and August.

Table 1. T&E species referenced by DNR-WHS or documented by CRI within the study area.

Scientific Name	Common Name	Legal Status[1]	State Rank[2]	Habitat	Breeding/ Flowering Period	Documented in/near Study Area by CRI (Map Sheet)	Documented in/near Study Area by DNR-WHS
Ambystoma tigrinum tigrinum	Eastern Tiger Salamander	SE	S1	Underground in mixed deciduous forest; Delmarva bays and other vernal pool habitat – breeding	November-March	None	Delmarva bay immediately north of Busic Church Road
Hyla gratiosa	Barking Treefrog	SE	S1	Moist refugia; Delmarva bays and other vernal pool habitat - breeding	April-May	None	Delmarva bay immediately north of Busic Church Road
Carex bullata	Button Sedge	-	S3	Swamps and bogs	June-October	Barclay Wet3, (Sheet 4)	N/A
Carex gigantea	Giant Sedge	-	S3	Swamps and wet woods	May-July	Delmarva Bay 2, 7, & 8, (Sheets 1,5)	N/A
Carex lupuliformis	False Hop Sedge	-	S2	Wet woods and swamps	July-October	Basic Wet2, Kibler Wet1, Burrsville Wet1, (Sheets 2,7,8)	Delmarva bay immediately north of Busic Church Road
Carex vesicaria	Inflated Sedge	ST	S1	Depression ponds	June-August	Delmarva Bay 2 (Sheet 1)	N/A
Cyperus refractus	Reflexed Cyperus	-	S2	Moist to dry soils of woods and fields	July-October	None	Upper Choptank River
Echinodorus cordifolius	Upright Burhead	SE	S1	Swamps, ponds and shallow, quiet streams	July - October	Banks of Choptank River (Sheet 6)	South of Lake Bonnie in Upper Choptank River

Scientific Name	Common Name	Legal Status[1]	State Rank[2]	Habitat	Breeding/ Flowering Period	Documented in/near Study Area by CRI (Map Sheet)	Documented in/near Study Area by DNR-WHS
Fimbristylis perpusilla	Harper's Fimbristylis	SE	S2	Bogs, Delmarva bays	Fall	Jackson Lane Wetland (Sheet 5)	East Melville Pond, Persimmon Preserve and Jackson Lane Wetland
Hottonia inflata	Featherfoil	SE	S1	Shallow, slow flowing water; Delmarva bays	April-June	Delmarva Bay 8 (Sheet 5)	N/A
Hypericum adpressum	Creeping St. John's-wort	SE	S1	Swamps and wet meadows	July-September	Barclay Wet2 (Sheet 3)	Delmarva bay immediately north of Busic Church Road; Persimmon Preserve
Hypericum denticulatum	Coppery St. John's-wort	ST	S2	Wet woods, ditches, marshes or wet meadows	June-August	Duhamel Wet7 (Sheet 1)	N/A
Ilex decidua	Deciduous Holly	-	S2	Swamps and wet woods	May	Red Bridges Wet1 and Wet2 (Sheet 6)	Upper Choptank River
Iris prismatica	Slender Blue Flag	SE	S1	Marshes and wet soils	May-June	Duhamel Wet7 (Sheet 1)	N/A
Muhlenbergia torreyana	Torrey's Dropseed	SE	S1	Wet soils, usually in open woods	August-November	None	Persimmon Preserve
Paspalum dissectum	Walter's Paspalum	ST	S2	Shallow water or wet soils	July-October	Delmarva Bay 1, 7 (Sheet 5)	East Melville Pond, Persimmon Preserve

Scientific Name	Common Name	Legal Status[1]	State Rank[2]	Habitat	Breeding/ Flowering Period	Documented in/near Study Area by CRI (Map Sheet)	Documented in/near Study Area by DNR-WHS
Platanthera blephariglottis	Small White Fringed Orchid	ST	S2	Swamps and bogs	June-July	Burrsville Wet2 (Sheet 9)	N/A
Sagittaria engelmanniana	Engelmann's Arrowhead	ST	S2	Bogs and acidic waters of streams and ponds	July-October	None	Persimmon Preserve
Scleria reticularis	Reticulated Nutrush	-	S2S3	Wet, sandy shores	August-October	Delmarva Bay 8 (Sheet 5)	Persimmon Preserve
Scleria triglomerata	Tall Nutrush	-	S1S2	Low, moist, sandy soils	June-September	Delmarva Bay 1 (Sheet 1)	N/A
Thysanthella difformis aka *Trachelospermum difforme*	Climbing-Dogbane	SE	S1	Twining over shrubs of moist woods	June-July	None	Upper Choptank River

[1]Legal Status

SE – State-endangered; a species whose continued existence as a viable component of the State's flora or fauna is determined to be in jeopardy.

ST – State-threatened; a species of flora or fauna which appears likely, within the foreseeable future, to become endangered in the State.

[2]State Rank

S1 – Highly state-rare. Critically imperiled in Maryland because of extreme rarity (typically 5 or fewer estimated occurrences or very few remaining individuals or acres in the State) or because of some factor(s) making it especially vulnerable to extirpation. Species with this rank are actively tracked by the Natural Heritage Program.

S2 – State-rare. Imperiled in Maryland because of rarity (typically 6 to 20 estimated occurrences or few remaining individuals or acres in the State) or because of some factor(s) making it vulnerable to becoming extirpated. Species with this rank are actively tracked by the Natural Heritage Program.

S3 – Rare to uncommon with the number of occurrences typically in the range of 21 to 100 in Maryland. It may have fewer occurrences but with a large number of individuals in some populations, and it may be susceptible to large-scale disturbances. Species with this rank are not actively tracked by the Natural Heritage Program.

Barking Treefrog (*Hyla gratiosa*) – The barking treefrog is Maryland's largest treefrog. Dorsal coloration is green with dark brown blotches. The skin also appears slightly rough. Barking treefrogs have jagged white stripes along the sides of the body and their toes are flattened into suction cup disks. The 1-1.5 millimeter (mm) gelatinous eggs are laid singly on the bottom of shallow ponds. Barking treefrog larvae are up to 70 mm in length with a tail tip that ends in a whip like flagellum. The body is brownish in color and the chin and throat are typically immaculate. In Maryland, the barking treefrog can be found within moist woodlands of the Eastern Shore. Breeding occurs in temporary ponds during the spring. During the remainder of the year, adult treefrogs live underground or in moist refugia. Mating calls resemble the bark of a hound.

Button Sedge (*Carex bullata* Schkuhr ex Willdenow) – Button sedge is a tufted perennial plant with erect, slender stems to a meter in height. Leaves are flat or grooved, 2-4 dm long by 2-5 mm wide. Staminate spikes 1-3 on a long peduncle that exceeds the pistillate spikes. Pistillate spikes 1-3; when more than one, spikes are well separated. Spikes are 1-5 cm long by 1-2 cm thick, generally erect and sessile or short peduncled. Perigynia are many on each spike, becoming divergent at maturity. Perigynia range from 6-10 mm long by 3-5 mm wide, are typically yellowish green with a serrulate, bidentate beak that is half to two-thirds as long as the body. Achenes are trigonous and about 2 mm long. Plants flower between June and October. Button sedge occurs in swamps and bogs of the Coastal Plain and Piedmont.

Giant Sedge (*Carex gigantea* Rudge) – Giant sedge is a loosely tufted perennial plant with stout stems to 12 dm in height. The leaves are flat, 3-5 dm long by 6-16 mm wide. Staminate spikes are 2-5 in number on short peduncles with a few perigynia at the base. Pistillate spikes are also 2-5 in number, and scattered throughout the inflorescence. Spikes are yellowish green, cylindrical, 3-8 cm long by 2.3 cm thick, and occur on peduncles of varying lengths. Perigynia are widely divergent at maturity, forming almost a 90 degree angle with the base. Perigynia are 12-18 mm long with long tapering beaks. Achenes are as long as wide (2.2-3 mm) with concave faces and thickened angles. Plants flower from May to July. Giant sedge occurs in swamps and wet woods of the Coastal Plain.

False Hop Sedge (*Carex lupuliformis* Sartwell ex Dewey) - The false hop sedge is a perennial sedge that grows as a solitary plant or in loose clusters. Plants can reach a height of 1.2 meters (m) in flower. Leaves range from 5-10 decimeters (dm) in length and 5-15 mm in width. Terminal staminate spikes (1-2) occur on short peduncles. Pistillate spikes range from 3-5 on ascending peduncles. Perigynia are numerous and somewhat relaxed on the spikelet, ranging from 12-20 by 3.8-6 mm in size. They are lance ovoid in shape, strongly nerved, and glabrous. Achenes are 3-4.5 mm in size, nearly as wide as long, diamond-shaped, with strongly concave faces. The lateral points are often bulbous or knobbed. Plants typically grow in swamps or pond edges from July to October.

Inflated Sedge (*Carex vesicaria* Linnaeus) – Inflated sedge is a densely tufted perennial plant with sharply angled, slender stems reaching a meter in height. Leaves are flat and 3-4 dm long by 2-7 mm wide. The staminate spikes are 2-4 in number, and situated well above the pistillate spikes. Pistillate spikes are 1-3 in number, cylindrical, and 1-7.5 cm long by 4-15 mm thick, either sessile or on short peduncles. Perigynia are ovoid to globose-ovoid and somewhat

inflated. They are 3-9 mm long with a tapering beak that is one-third to half as long as the body. Achenes are trigonous and about 2.5 mm in length. Plants flower from June to August. Inflated sedge has a disjunct distribution in the Mid-Atlantic region; occurring in mountainous areas to the west and in Delmarva bays of the Coastal Plain.

Reflexed Cyperus (*Cyperus refractus* Engelmann ex Boeckeler) - The reflexed cyperus is an erect, smooth herbaceous perennial plant. Plants grow between 3-9 dm in height. Leaves are between 4-10 mm wide and slightly rough. The inflorescence is comprised of loose spikes in an umbel of 4-16 rays up to 25 centimeters (cm) long. Spikelets are slender and linear, 2-6 flowered and 10-28 mm long. Stigmas three. Achenes 2.5-3 mm long. It typically grows in moist to dry soils of woods and fields and flowers from August to September.

Creeping Burhead (*Echinodorus cordifolius* (Linnaeus) Grisebach) – Creeping Burhead is a perennial plant that grows either prostrate or erect with flowering stalks or scapes over a meter in length. Leaves are erect, blades broad ovate 5-20 cm long and 3-18 cm wide on long petioles. Flowers are long petioled in whorls of 5-15 along the scape. Petals are white, obovate in shape, and 6-12 mm long. Stamens 15-20. Achenes numerous, 0.8-2.2 mm in length, short beaked, and ribbed. It grows within swamps, ponds, shallow, quite streams, and flowers from July to October.

Harper's Fimbristylis (*Fimbristylis perpusilla* Harper ex Small & Britton) – Harper's fimbristylis is an annual plant with slender stems. Stems range in height from 3-20 cm, but are mostly less than six cm. Leaf blades are up to one mm wide. Bracts are thin and generally exceed the spikelets. Heads 3-10 mm in diameter comprised of 3-10 spikelets. Spikelets are 4-8 mm long and greenish to pale brown in color. Scales are narrow and acute with green midribs. Achenes are about 0.5 mm in size, obovoid in shape, straw-colored, and glossy. The flowering period is fall. Harper's fimbristylis inhabits seasonal ponds in the Coastal Plain.

Creeping St. John's-wort (*Hypericum adpressum* Rafinesque ex Barton) – Creeping St. John's-wort is an erect perennial herbaceous plant that grows between 3-8 dm in height. It colonial and spreads by underground rhizomes. Submerged stems are often spongy near the base, and can be somewhat four-angled. The numerous leaves are 3-6 cm by 0.5-2 cm in size, acute to elliptical, and generally pointed upward. Cymes are open, numerous, and leafy at the base. Bracts are awl-like. The yellow flowers range from 1.5-2 cm wide, with petals 6-8 mm long. The capsule is ovoid, 4-6 mm long, and tapering to the beak. The flowering period is from July to September. Creeping St. John's-wort prefers swamps and wet meadows of the Coastal Plain.

Coppery St. John's-wort (*Hypericum denticulatum* Walter) – Coppery St. John's-wort is an erect, glabrous perennial flowering plant arising from basal offshoots. Plants range in height from 2-7.5 dm. The stems are slender and four-angled. The opposite, sessile leaves are linear to obovate, 0.5-6 cm long by 0.5-1.5 cm in width, and slightly ascending along the stem. The inflorescence is terminal on compound cymes with few to many flowers. The five petals are coppery yellow to orange in color and 3-10 mm long with numerous stamens. Capsules are ovoid, and the tiny seeds brown in color. Plants flower between June and August. Coppery St. John's-wort is found in wet woods, ditches, marshes, or wet meadows of the Coastal Plain.

Featherfoil (*Hottonia inflata* Elliott) – Featherfoil is an aquatic perennial or winter annual plant. Flowering stems can be up to 1.5 m long. Stems contain varying densities of leaves. Leaves can be either opposite, alternate, or in whorls, and contain short branching segments. The inflorescence is an erect umbel of 1-15 inflated racemes, each of which is constricted at various points along its length forming joints. Each joint bears a whorl of small, white flowers 2-10 in number. The fruit is a round capsule to three mm in diameter. The wrinkled, reddish seeds are 1.4-1.6 mm in length. Plants flower from April to June, but flowers may not form every year. Featherfoil prefers shallow, slow flowing water, and in Maryland is almost exclusively associated with Delmarva bays of the Coastal Plain.

Deciduous Holly (*Ilex decidua* Walter) – Deciduous holly is a shrub or small tree up to 10 m in height. Twigs and upper leaf surfaces are glabrous. The undersides of leaves are pubescent at least along the mid vein. Leaves are oblanceolate to narrowly obovate, 3-7 cm in length, rounded at the tip, and cuneate at the base. Flowers form on short peduncled fascicles, often on dwarf branches. Fruits are red. Nutlets are grooved on the back. The flowering period is typically May. Deciduous holly prefers swamps and wet woods on the Coastal Plain.

Slender Blue Flag (*Iris prismatica* Pursh) – Slender blue flag is a perennial plant with creeping rhizomes and stolons. Slender, erect stems range in height from 3-10 dm. Leaves are erect, 5-7 dm long and 3-7 mm wide. Blue to violet flowers are 6-8 cm wide and occur on long pedicels. Sepals are spreading or reflexed, the base or claw greenish in color and the outer portion or blade with dark purple veins and white markings. The shorter petals are erect with a slender claw. The 2.5-5 cm long capsule is narrowly oblong, sharply thre-angled, and pointed at both ends. Seeds are about 2 mm wide. Plants flower from May to June. Slender blue flag occurs in marshes and wet soils on the Eastern Shore of Maryland.

Torrey's Dropseed or New Jersey Muhly (*Muhlenbergia torreyana* (Schultz.) Hitchc.) – This perennial grass has erect stems 3-7 dm tall. The flattened stems arise from scaly rhizomes. Leaf sheaths are glabrous, the ligule occurring as a ring of short hairs. Leaf blades are elongate and overlapping, 1-3 mm wide. The panicle is 1-3 dm long, open and slender. Spikelets are generally one-flowered and 1.5-2 mm long. The glumes are about equal and the acute, puberulent lemmas are slightly longer than the glumes. Plants flower between August and November. Torrey's Dropseed or New Jersey Muhly prefers wet soils, usually in open woods.

Walter's Paspalum (*Paspalum dissectum* Linnaeus) – Walter's paspalum is a mat-forming perennial grass with stems 1-5 dm long. Leaf sheaths are loose and purplish in color. Leaf blades are thin and range in size from 2-10 cm long to 0.1-0.5 cm in width. Panicles are numerous, arising both from the leaf axils and terminally, often exceeded by the uppermost leaf blades. Panicles consist of 2-5 erect racemes that are 2-3 cm long. The rachis is 2-4 mm wide and partially folded over the densely crowded spikelets. The singly occurring spikelets are elliptic to obovate, 1.7-2.2 mm long. Glume and sterile lemma are each 3-5 nerved. Walter's paspalum flowers between July and October. Typical habitat includes interdunal swales and ponds with shallow water and wet shores.

White Fringed Orchid (*Platanthera blephariglottis* (Willdenow) Lindley) – White fringed orchid is an erect perennial plant with stems ranging in height from 0.8-8 dm. The 2-4 linear-lanceolate leaves occur on the lower stem and are up to 20 cm long and two cm wide. Smaller bract-like leaves occur on the upper portion of the stem. The spike of white flowers is 4-18 cm long and 2.5-7 cm in diameter. The sepals are round to ovate and 5-9 mm long. The petals are spatulate and shorter than the sepals, toothed or entire at the tip. The 8-11 mm long lip is oblanceolate and fringed. The spur is 1-2.5 cm long and curved. Plants flower from June to July. White fringed orchid prefers swamps and bogs.

Englemann's Arrowhead (*Sagittaria englemanniana* J.G. Smith) – Englemann's arrowhead is an erect perennial 2.5-8 dm tall with long-petioled, arrow-shaped leaves. Leaves range from 8-25 cm long and up to 10 cm wide with long-tapering terminal and basal lobes. Scape with 2-4 whorls of white flowers 8-12 mm long. The prickly fruiting heads are 12-23 mm in diameter. The winged achenes are cuneate to obovate, 3.5-4.5 mm long, and with raised surfaces and a curved or erect beak. Englemann's arrowhead flowers between July and October. Typical habitat includes bogs and acidic waters of streams and ponds.

Reticulated Nutrush (*Scleria reticularis* Michaux) – Reticulated nutrush is a soft-based annual with one or two stems ranging from 1-6.5 dm in height. Leaves are 1-4 mm wide. The inflorescence occurs on terminal or axillary cymes, those arising from the axils on long peduncles. The olive-brown achene is globose-ovoid to obovoid, 1.8-2.2 mm in size, and with vertical rows of reticulations. Flowering occurs between August and October. Reticulated nutrush prefers sandy, wet shores.

Tall Nutrush (*Scleria triglomerata* Michaux) – Tall nutrush is a clustered or tufted perennial plant arising from thick rhizomes. Stems are 3-10 dm tall and three-angled. Leaves are 4-9 mm wide and typically pubescent. Leaf sheaths are often reddish in color. The inflorescence can be both terminal and axillary, the lateral clusters on short peduncles. The 2-2.5 mm long by 2-2.7 mm wide achene is subglobose to oblate in shape and shining white in color. The achene is supported by a three-lobed hypogynium. Plants flower from June to September. Tall nutrush prefers low, moist, sandy soils.

Climbing Dogbane (*Thrysanthella difformis* aka *Trachelospermum difforme* Walter) – Climbing dogbane is a climbing woody vine that grows high into vegetation. Stems are thin, reddish, and glabrous. The oppositely arranged, deciduous leaves are 4-12 cm by 0.3-6 cm in size and quite variable in shape. Leaf petioles are 2-15 mm long. The many flowered, axillary inflorescence is a corymbose cyme. The funnelform yellow or greenish flowers are 7-11 mm long. The follicles are slender and cylindrical 15-25 cm long. Flowering typically occurs between June and July. Climbing dogbane can be found twining over vegetation in moist woods.

E. Methodology

The survey entailed both background research and field investigations. The objective of the survey was to assess the presence or absence of the subject species within the known occurrence locations and within other areas identified as suitable habitat. Suitable habitat was initially identified as Delmarva bays or other vernal pools, as the listed amphibian species were known to use that habitat type for breeding, and many of the listed plants also are commonly associated with seasonal ponds. **Figure 2** provides a map of the eight (8) major Delmarva bays identified within or immediately adjacent to the study area. Surveyed Delmarva bays include several that only slightly overlap the project right of way. However, because Eastern tiger salamanders and barking treefrogs can move throughout the ponds, the entire pond was surveyed. The areas of suitable habitat were later expanded to include riparian wetlands, interdunal swales, wetland forested edges, and other wetland depressions and flats characteristic of some of the listed species noted by the DNR-WHS. Background research included review of standard herpetofaunal and botanical references to determine identifying and habitat characteristics of targeted species. References used included Conant and Collins (1998), Gregoire (2005), Stranko et al. (2010), Brown and Brown (1984), Gleason and Cronquist (1991), Holmgren (1998), Jones and Hatch (1990), Knapp et al. (2011), and Weakley et al. (2012). Research also included consultation with DNR-WHS personnel and other regional botanists to obtain more specific information regarding the targeted T&E species.

Eastern Tiger Salamander

Egg Mass Surveys – Eastern tiger salamander egg mass surveys were performed within the eight numbered Delmarva bays identified within the study area. Surveys were carried out using a standardized protocol developed by the DNR-WHS (Smith 2012), which involved walking parallel transects across each bay, scanning the submerged vegetation and other debris for the presence of egg masses. An underwater viewscope was also used to aid in the survey. Eastern tiger salamander egg masses typically are attached to submerged vegetation or other debris to a depth of up to a meter. The DNR-WHS recommends completing four surveys spaced about two weeks apart starting after February 1 and extending through April 1, depending upon the presence of ice. Initial surveys of the first five Delmarva bays were conducted on 14 March 2014 when a thin sheet of ice was present on most ponds. On March 20, 2014, the CRI survey team met a representative of the DNR-WHS at a known Eastern tiger salamander breeding pond near Massey, Maryland in the morning to determine the status of tiger salamander breeding for the year. Numerous egg masses of Eastern tiger salamanders were found, some newly laid and others apparently much older (see **Appendix C**, Photo 1). Thus, the timing of the Church to Steele surveys was appropriate to determine presence/absence of Eastern tiger salamander breeding. The remaining three Delmarva bay sampling sites at Church to Steele were then sampled. One additional survey effort of all eight sites was conducted on 26 March 2014. Any amphibian egg masses observed were documented, and any Eastern tiger salamander egg masses were surveyed using a handheld Global Positioning System (GPS). General characteristics of each surveyed pond were noted in a field notebook.

COASTAL RESOURCES INC.

Figure 2: Delmarva Bay Location Map

Church to Steele

Caroline County, MD
Queen Anne's County, MD

October 2014

N

0 0.25 0.5 1 Miles

1 inch= 1/2 mile

Legend

- Alignment
- Delmarva Power & Light ROW
- Delmarva Bay
- County Boundary

Larval Dipnet Surveys – Eastern tiger salamander larval dipnet surveys were also carried out at any of the Delmarva bays where egg masses were not documented. Again, the DNR-WHS maintains a standardized protocol for completing dipnet surveys (Smith 2012). Typically four surveys are completed during May and June, each separated by seven to fourteen days. Surveys were initiated on 21 May 2014, during which Delmarva Bays 1-5 were surveyed. On 22 May 2014, the CRI survey team visited the reference site, Massey Pond, to survey for Eastern tiger salamander larvae within the known site that contained eggs earlier in the season. No larval tiger salamanders were found. Following this effort, the remaining Delmarva bays at Church to Steele were sampled. Additional surveys for Eastern tiger salamanders were carried out on 3 and 4 June, 18 and 19 June, and 9 July 2014. Surveys were completed using a standard D-frame net with dimensions of 25 cm by 30 cm. The net mesh is 500 microns. The dipnet was swept along the pond bottom around the perimeter shallows in all four cardinal directions of each pond. Bottom sweeps were also carried out along transects through deeper portions, attempting to cover each pond. Contents of each sweep were dumped into a 500 micron mesh bucket and sifted. Any amphibian larvae were collected and identified to species if possible. Non-target species were immediately released. Larvae not identifiable to species were photographed for later identification. Other common pond animals, mostly invertebrates, were also identified and recorded. General pond characteristics at the time of the surveys were also documented.

Barking Treefrog

Larval Dipnet Surveys – Barking treefrog larval dipnet surveys were performed on the Church to Steele Delmarva bays using the DNR-WHS standard larval dipnet protocol described above (Smith 2012). Surveys were conducted on 9, 23, and 29 July 2014. The Massey Pond reference site was also surveyed on 10 July 2014. Numerous barking treefrog larvae and a transforming adult were found within the reference site (**Appendix C**, Photos 2 and 3). During this survey, many of the Church to Steele Delmarva bay sites were dry or nearly dry, and could not be sampled.

Plants

Targeted plant surveys were conducted on July 11, 15, 24, and 29; August 26 and 29; September 4; and October 8, 2014. The dates coincided with the flowering times of the various plant species targeted for the survey. The entire study area was searched at least once for T&E species, but areas of more highly suitable habitat, such as Delmarva bays, were surveyed more frequently. Some T&E species, not documented in the DNR-WHS response letter, were found during survey work within Delmarva bays for barking treefrog larvae.

All T&E plant species of concern for this project were found in wetlands or wetland edges. Therefore, the targeted species search areas were first identified by reviewing wetland mapping for the project. Two observers then searched appropriate areas by slowly traversing each wetland habitat area and visually scanning the vegetation for the presence of the targeted T&E plants. Habitat areas were searched for 8-9 hours each day. All confirmed T&E species occurrences were surveyed using a handheld GPS. For single individuals or very small clumps of individuals, a single GPS survey point was taken at the center of the population. For larger populations, the perimeter of the population was surveyed and a polygon was created. In all

cases, the numbers of individual plants of the identified targeted species were counted or estimated for each population encountered, and general notes were taken on the habitat and common plant associates.

F. Results

Eastern Tiger Salamander

Egg Mass Surveys – No Eastern tiger salamander egg masses were found within any of the selected Delmarva bay sample sites within the project study area. As noted above, Eastern tiger salamander egg masses were found within a nearby reference site by all members of the CRI survey team. Therefore, the likelihood that egg masses were missed during the Church to Steele surveys is low. Rather, it is more likely that no tiger salamanders used the Church to Steele Delmarva bays during the 2014 breeding season. Egg masses of other amphibians were found within some of the sampled ponds, including those of southern leopard frog (*Lithobates sphenocephala utricularius*) and New Jersey chorus frog (*Pseudacris kalmi*).

Larval Dipnet Survey – No Eastern tiger salamander larvae were encountered during the dipnet survey period in any of the sampled Delmarva bay sites. Likewise, no tiger salamander larvae were found within the reference site, though DNR-WHS indicated that they have rarely found larval tiger salamanders in known sites when dipnetting (Scott Smith, personal communication October 10, 2014). While no tiger salamander larvae were found, there were numerous other salamander larvae found within several of the surveyed ponds, including individuals of marbled salamander (*Ambystoma opacum*) and red-spotted newt (*Notophthalmus viridescens viridescens*).

Barking Treefrog

Larval Dipnet Survey – No barking treefrog tadpoles were found within any of the sampled Delmarva bay sites. During the initial barking treefrog larvae survey on 9 July 2014, Delmarva Bays 3, 5, 6, and 7 were completely dry and Bay 1 had only a small puddle in the center and no tadpoles. Water levels were also much reduced in Delmarva Bays 2, 4, and 8. Numerous tadpoles were captured at these ponds, including representatives of southern leopard frog, northern green frog (*Lithobates clamitans*), and American bullfrog (*Lithobates catesbeianus*). On 10 July 2014, the team surveyed the Massey Pond reference site. Numerous barking treefrog larvae were found during a very brief sampling period. Following periods of rain in subsequent weeks, ponds that had been dry during the initial survey were once again filled, and although no barking treefrogs were found, other tadpoles were captured, including those of Cope's gray treefrog (*Hyla chrysoscelis*), southern leopard frog, northern green frog, and American bullfrog.

Plants

Six (6) of the 11 T&E plants referenced in the DNR-WHS letter were observed during the targeted plant species surveys. These included hop-like sedge, upright burhead, creeping St. John's-wort, deciduous holly, Walter's paspalum, and reticulated nutrush. An additional eight (8) state listed plant species were also found, either during the targeted plant species surveys or during barking treefrog dipnet surveys. The additional eight species included giant sedge, button

sedge, inflated sedge, featherfoil, coppery St. John's-wort, slender blue flag, white fringed orchid, and tall nutrush.

Information about each of the species found within and adjacent to the study area and a brief description of their corresponding habitat is discussed below.

Button Sedge (*Carex bullata* Schkuhr ex Willdenow) – A single population of greater than 500 individuals of the state rare button sedge was identified in Wetland Barclay Wet3 north of Woodyard Road (**Appendix B**, Sheet 4). The plants were clumped within an area approximately 46 by 69 m in size within a shallow depression on an inter-stream flat. Photos 4-5 in **Appendix C** depict this species, as well as its associated habitat. Species associated with button sedge included lamp rush, tall horned beak sedge (*Rhynchospora macrostachya*), bearded beggarticks (*Bidens aristosa*), Virginia marsh St.John's-wort (*Triadenum virginicum*), knotty-leaf rush, red-top cut-throat grass (*Coleataenia rigidula*), horsebrier, and seedling sweet-gum and red maple (*Acer rubrum*). Representative specimens collected from the site were verified by William Sipple (Sipple, Personal Communication, July 26, 2014).

Giant Sedge (*Carex gigantea* Rudge) – Three populations of the state rare giant sedge were documented within or adjacent to the project study area, one associated with Delmarva Bay 2 just north of Busic Church Road and the other two located within Delmarva Bay 7 and Delmarva Bay 8, respectively (**Appendix B**, Sheets 1 and 5). The population at the edge of Delmarva Bay 2 was represented by one or two individuals. The population within Delmarva Bay 7 contained approximately 14 clumps along the western edge of the right of way. The population in Delmarva Bay 8 was comprised of greater than 100 individuals. This population was located along the western edge of the right of way and continued outside the right of way around the perimeter of the bay. Photos 6-7 in **Appendix C** depict this species as well as its associated habitat. This plant appeared to prefer the perimeter of Delmarva bays within shallow depressions that are seasonally inundated, but dry out by late summer. Species associated with giant sedge included hop sedge, cottongrass bulrush (*Scirpus cyperinus*), rice cut grass (*Leersia oryzoides*), globe-fruit primrose-willow (*Ludwigia sphaerocarpa*), marsh mermaidweed (*Proserpinaca palustris*), swamp smartweed (*Persicaria hydropiperoides*), common buttonbush (*Cephalanthus occidentalis*), and sapling river birch (*Betula nigra*). Representative specimens collected from the site were verified by DNREC (McAvoy, Personal Communication, July 15, 2014).

False Hop Sedge (*Carex lupuliformis* Sartwell ex Dewey) – Three separate populations of the state rare false hop sedge were found along the Church to Steele alignment; one in Queen Anne's County about 0.7 mile south of the DNR-WHS documented site and two in the southern third of the alignment in Caroline County (**Appendix B**). No false hop sedge plants were found within the previously documented site just north of Busic Church Road (Delmarva Bay 2). The northernmost population, found within Wetland Basic Wet2, contained approximately 10 plants within an area about 2.4 by 3.0 m in size (**Appendix B**, Sheet 2). The population is represented by a single point on the Targeted Species Survey Location Map. The plants were located on the east side of the alignment within an area that occasionally receives overbank flooding from a nearby drainage ditch. The other two populations in Caroline County were larger in size, and are represented by polygons (**Appendix B**, Sheets 7-8). One population is located between Garey

Road and Kibler Road within Wetland Kibler-Wet1. Approximately 43 clumps of false hop sedge were counted within the approximately six by 21 m area along the western edge of the right of way. The farthest south population was located within the center of the right of way just south of Burrsville Road. This population contained approximately 85 clumps of false hop sedge plants. All three populations occurred within a landform of shallow depressions or swales on inter-stream flats. Representative specimens collected from the sites were verified by DNR-WHS (Knapp, Personal Communication, July 17, 2014). Photos 8-9 in **Appendix C** depict this species as well as its associated habitat. Species associated with false hop sedge included hop sedge (*Carex lupulina*), broom rosette grass (*Dichanthelium scoparium*), brownish beak sedge (*Rhynchospora capitallata*), knotty-leaf rush (*Juncus acuminatus*), lamp rush (*Juncus effuses*), marsh primrose-willow (*Ludwigia palustris*), horsebrier (*Smilax rotundifolia*), and seedling sweet-gum (*Liquidambar styraciflua*).

Inflated Sedge (*Carex vesicaria* Linnaeus) – Three sub-populations of the state threatened inflated sedge were found along the perimeter of Delmarva Bay 2 just north of Busic Church Road (**Appendix B**, Sheet 1). Two sub-populations were located on a shallow bench at the southern edge of the bay. The other sub-population was located on the northeastern side of the bay within a sparsely forested canopy. The northeastern sub-population contained about 100 individuals, while the southern sub-populations contained 50 and 20 individuals, respectively. Photos 10-11 in **Appendix C** depict this species as well as its associated habitat. This species was not previously known to occur contemporarily within the Coastal Plain of Maryland, but rather only within a montane population in Western Maryland, though Coastal Plain populations have been documented in Delaware (McAvoy, Personal Communication, July 14, 2014). Confirmation of the species was obtained from the DNR-WHS (Frye, Personal Communication, July 11, 2014). Species closely associated with the inflated sedge populations included reed canary grass (*Phalaris arundinacea*), hop sedge, giant sedge, floating manna grass (*Glyceria septentrionalis*), cottongrass bulrush, knotty-leaf rush, globe-fruit primrose-willow, common buttonbush, red maple, sweet-gum, and common persimmon (*Diospyros virginiana*).

Creeping Burhead (*Echinodorus cordifolius* (Linnaeus) Grisebach) – Two subpopulations of this state endangered species were discovered within the project study area, one along a stretch of the south bank of the Choptank River and one smaller population on the north bank of the Choptank River (**Appendix B**, Sheet 6). Two other sites were found on the north bank with one and two individuals, respectively (**Appendix B**, Sheet 6). A fourth reference population was found about 50 m east of the project study area. The south bank population contained 59 plants, while the north bank population contained 13 plants. Photos 12-13 in **Appendix C** depict the species and its associated habitat. The plants were found on open, muddy depositional areas of the stream banks. Species closely associated with the creeping burhead populations included spotted lady's-thumb (*Persicaria maculosa*), white grass (*Leersia virginica*), small-spike false nettle (*Boehmeria cylindrical*), lizard's-tail (*Saururus cernuus*), marsh primrose-willow, many-flower marsh-pennywort (*Hydrocotyle umbellata*), crimson-eyed rose-mallow (*Hibiscus moscheutos*), and clammy hedge-hyssop (*Gratiola neglecta*).

Harper's Fimbristylis (*Fimbristylis perpusilla* Harper ex Small & Britton) – No populations of this state endangered plant were found within the project study area. However, a large population was discovered within the Jackson Lane Wetland WSSC approximately 145 m

northeast of Delmarva Bay 6 (**Appendix B**, Sheet 5). The dry bay contained approximately 1,000 to 2,000 individual plants. Photos 14-15 in **Appendix C** depict the species and its associated habitat. Photographs of the plant were verified by DNR-WHS (Knapp, Personal Communication, October 9, 2014).

Featherfoil (*Hottonia inflata* Elliott) – Two individuals of this state endangered plant were found on 3 June 2014 within Delmarva Bay 8 during dipnet surveys for Eastern tiger salamanders (**Appendix B**, Sheet 5). The plants were located within the forested portion of the Delmarva bay to the west of the transmission line right of way in 15 cm of standing water adjacent to a fallen tree. Photos 16-17 in **Appendix C** depict the species and its associated habitat. Plant species closely associated with the featherfoils included sweet-gum, common persimmon, river birch, willow oak (*Quercus phellos*), and red maple in the canopy. Understory species included common persimmon, common buttonbush, horsebrier, giant sedge, water smartweed (*Persicaria amphibia*), fowl manna grass (*Glyceria striata*), and common duckweed (*Lemna minor*). Photographs of the plants were verified by William Sipple (Sipple, Personal Communication, May 22, 2014).

Creeping St. John's-wort (*Hypericum adpressum* Rafinesque ex Barton) – A single, large population of this state endangered plant was found within the study area along the perimeter of a man-made impoundment within Wetland Barclay Wet2 just south of Barclay Road (**Appendix B**, Sheet 3). The population contained more than 200 individual plants within an area about 1,785 square meters in size. Most of the plants had thickened, spongy stems and were growing within 2.5 to 15.0 cm of water. Photos 18-19 in **Appendix C** depict the species and its associated habitat. Plant species closely associated with the creeping St. John's-wort included lamp rush, seedling sweet-gum, northern water-horehound (*Lycopus uniflorus*), knotty-leaf rush, and a species of iris (*Iris* sp.). Representative specimens collected from the site were verified by William Sipple (Sipple, Personal Communication July 26, 2014).

Coppery St. John's-wort (*Hypericum denticulatum* Walter) – A single, large population of this state threatened plant was found within a shallow, isolated depression located north of Busic Church Road (**Appendix B**, Sheet 1). This wetland was identified as Duhamel Wet7. About a third of the historic Delmarva bay overlaps the eastern edge of the study area. The wetland is surrounded by crop fields, and is comprised of mostly native herbaceous plants. The coppery St. John's-wort population contained between 200-300 individual plants within an area about 6,900 square meters in size. One additional outlier plant was found approximately 25 meters northeast of the main population. Photos 20-21 depict the species and its associated habitat. Plant species associated with the coppery St. John's-wort included loose-head beak sedge (*Rhynchospora chalarocephala*), tall horned beak sedge, globe-fruit primrose-willow, green-white sedge (*Carex albolutescens*), red-top cut-throat grass (*Coleataenia rigidula*), and marsh mermaidweed.

Deciduous Holly (*Ilex decidua* Walter) – Five individuals of this state rare shrub were found in two clumps in the floodplain of the Choptank River, one on the north side and one on the south side (**Appendix B**, Sheet 6). The plants were located within the forested edge immediately adjacent to the cleared transmission line. The two plants north of the Choptank River were located on the east side of the right of way in Wetland Red Bridges Wet1, while the three plants on the south side of the Choptank River were located on the west edge of the right of way in

Wetland Red Bridges Wet2. Photos 22-23 depict the species and its associated habitat. Plant species associated with the deciduous holly included swamp chestnut oak (*Quercus michauxii*), green ash (*Fraxinus pennsylvanica*), red maple, sweet-gum, smooth blackhaw (*Viburnum prunifolium*), American holly (*Ilex opaca*), poison ivy (*Toxicodendron radicans*), horsebrier, sweet wood-reed (*Cinna arundinacea*), and jumpseed (*Persicaria virginiana*). Representative specimens collected from the site were verified by William Sipple (Sipple, Personal Communication, July 12, 2014).

Slender Blue Flag (*Iris prismatica* Pursh) – Two populations of this state endangered plant were found within the same wetland depression as the coppery St. John's-wort population (**Appendix B**, Sheet 1). The larger of the two populations occurred within the transmission right of way along the west edge of Wetland Duhamel Wet7. This population contained 200-300 plants. The smaller population (30 individuals) occurred to the southeast of the larger population on the right of way edge. The wetland contained 10-15 cm of water at the time of the survey. Photos 24-25 depict the species and its associated habitat. Plant species associated with the slender blue flag included globe-fruit primrose-willow, knotty-leaf rush, marsh mermaidweed, lamp rush, and New York ironweed (*Vernonia noveboracensis*). Representative specimens collected from the site were verified by William Sipple (Sipple, Personal Communication, May 22, 2014).

Walter's Paspalum (*Paspalum dissectum* Linnaeus) – Two populations of this state threatened grass were found within the study area, one within Delmarva Bay 1 (Wetland Duhamel Wet6) (**Appendix B**, Sheet 1) and one within Delmarva Bay 7 (Wetland Henderson Wet4) (**Appendix B**, Sheet 5). The northernmost site located in Delmarva Bay 1 is approximately 670 square meters (sqm) in size and contained more than 1,500 individual plants. The southernmost population located within Delmarva Bay 7 is slightly smaller than the other population, but was much denser, containing between 500-1,000 plants. Both populations occurred on the muddy edges of the bays. Photos 26-27 depict the species and its associated habitat. Plant species associated with Walter's paspalum included common buttonbush, lamp rush, floating manna grass, stalk-grain sedge (*Carex stipata*), knotty-leaf rush, tall horned beak sedge, cottongrass bulrush, beaked cut-throat grass (*Coleataenia anceps*), marsh mermaidweed, globe-fruit primrose-willow, and golden hedge-hyssop (*Gratiola aurea*). Representative specimens collected from the site were verified by William Sipple (Sipple, Personal Communication, August 30, 2014).

White Fringed Orchid (*Platanthera blephariglottis* (Willdenow) Lindley) – One scattered population of this state threatened orchid was observed at the southern end of the study area within Wetland Burrsville Wet2 (**Appendix B**, Sheet 9). A total of 41 plants were identified within an area approximately 25 by 55 m in size. The plants were growing within an emergent wetland meadow on an interstream flat. Photos 28-29 depict the species and its associated habitat. Plant species growing with the white fringed orchid included bushy bluestem (*Andropogon glomeratus*), broom rosette grass, slender wood-oats (*Chasmanthium laxum*), sweet-gum seedlings, deer-tongue rosette grass (*Dichanthelium clandestinum*), loblolly pine (*Pinus taeda*) seedlings, lamp rush, Virginia wild rye (*Elymus virginicus*), and horsebrier. Representative specimens collected from the site were verified by DNR-WHS (Fry, Personal Communication July 29, 2014).

***Scleria reticularis* Michaux (Reticulated Nutrush) –** One small area of this state rare plant was observed within the cleared right of way of Delmarva Bay 8 (Wetland Henderson Wet4) (**Appendix B**, Sheet 5). While the size of the area was only about six sqm, the population contained 150-200 individual plants. The plants were growing along the eastern edge of the Delmarva bay near some giant sedge. Photos 30-31 depict the species and its associated habitat. Plant species growing with the reticulated nutrush included bearded beggarticks, beaked cut-throat grass, common buttonbush, reed canary grass, rough cocklebur (*Xanthium strumarium*), and globe-fruit primrose-willow. Representative specimens collected from the site were verified by William Sipple (Sipple, Personal Communication August 30, 2014).

***Scleria triglomerata* Michaux (Tall Nutrush) –** One small area of this highly state rare plant was observed along the east side of the cleared right of way just north of Delmarva Bay 1 and within Wetland Duhamel Wet6 (**Appendix B**, Sheet 1). The 63 sqm area contained 115 individual tall nutrush plants growing within a slightly drier portion of the wetland. Photos 32-33 depict the species and its associated habitat. Plant species growing with the rare nutrush included bushy bluestem, Nuttall's reed grass (*Calamagrostis coarctata*), broom rosette grass, slender wood-oats, sweet-gum seedlings, Japanese honeysuckle (*Lonicera japonica*), horsebrier, and wrinkle-leaf goldenrod (*Solidago rugosa*). Representative specimens collected from the site were verified by William Sipple (Sipple, Personal Communication August 30, 2014).

During the survey, five of the 11 plants noted in the DNR-WHS letter were not found within suitable habitat within the study area. These species included Engelmann's arrowhead, Torrey's dropseed, climbing-dogbane, reflexed cyperus, and Harper's fimbristylis. None of these four species were known to occur within the transmission line right of way, but were noted to occur outside the right of way, either within the Persimmon Preserve Wetland of Special State Concern, East Melville Pond Wetland of Special State Concern, Jackson Lane Wetland of Special State Concern, or within the headwaters of the Upper Choptank River. Harper's fimbristylis was found within a reference Delmarva bay within the Jackson Lane site (see **Appendix B**, Sheet 5, Photos 31-32).

G. Conclusions

Targeted species surveys were conducted within suitable Delmarva bay and wetland habitat within the study area between 14 March and 8 October 2014. Eastern tiger salamander egg mass surveys were conducted between 14 and 26 March. Tiger salamander larval dipnet surveys were conducted between 21 May and 9 July. No egg masses or larvae were found within the surveyed Delmarva bays within the study area. Barking treefrog dipnet surveys were conducted between 9 and 29 July. No larval barking treefrogs were found within the surveyed Delmarva bays within the study area. Both Eastern tiger salamander egg masses and larval barking treefrogs were found within a reference Delmarva bay north of the study area.

Plant surveys were conducted between 11 July and 8 October for species listed in the DNR-WHS response letter. However, other non-targeted T&E plant species were also found during dipnet surveys for barking treefrogs or targeted plant species surveys. Six (6) of the 11 DNR-WHS documented T&E plant species were found within the study area during targeted plant species

surveys. Eight (8) additional T&E plant species were found during barking treefrog dipnet surveys or targeted plant species surveys. All identified T&E plant species were verified by DNR-WHS botanists or other state recognized botanists.

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Appendix A

DNR-WHS Correspondence

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Martin O'Malley, *Governor*
Anthony G. Brown, *Lt. Governor*
Joseph P. Gill, *Secretary*
Frank W. Dawson III, *Deputy Secretary*

February 5, 2014

Mr. Jim Hunt
Delmarva Power
Environmental Planning
P.O. Box 9239
Newark, DE 19714-9239

RE: Environmental Review for Pepco Holdings, Inc. – Church Substation (Millington) to Steele Substation (Denton) Transmission Line Project, Existing 138kV Line rebuild with 230kV Line, Queen Anne's and Caroline Counties, Maryland.

Dear Mr. Hunt:

The Wildlife and Heritage Service's database indicates that there are areas of potential concern along the project route that are associated with rare, threatened and endangered (RT&E) species. Further consultation with WHS is recommended to develop avoidance and minimization measures for possible impacts to these areas:

- South of Millington Substation approximately 750 feet, the project route overlaps in part with a portion of a wetland that is designated in state regulations as a Nontidal Wetland of Special State Concern (NTWSSC). This wetland is associated with a tributary to Unicorn Millpond and such NTWSSCs are regulated, along with their 100-foot upland buffer, as such by Maryland Department of Environment. Your project may need review by Maryland Department of Environment for any necessary permits associated with this wetland. We would encourage stringent adherence to all appropriate best management practices for sediment and erosion control during all work at this site, in order to reduce the likelihood of adverse impacts to the RT&E species occurring downstream in Unicorn Branch.

- Approximately 1990 feet south of Hackett Corner Road, the project route crosses another tributary to Unicorn Branch. Although this portion of Unicorn Branch is not designated as a NTWSSC, we would still encourage stringent adherence to all appropriate best management practices for sediment and erosion control during all work at this site.

- Approximately 350 feet south of Sudlersville Cemetery Road, the project route crosses another tributary to Unicorn Branch. Although this portion of Unicorn Branch is not designated as a NTWSSC, we would still encourage stringent adherence to all appropriate best management practices for sediment and erosion control during all work at this site.

- South of Duhamel Corner Road, extending to Anderson Corner Road, is a wetland complex which overlaps this portion of the project route. Due to the RT&E species in this wetland system, we would again encourage stringent adherence to all appropriate best management practices for sediment and erosion control during all work at this site.

- Immediately north of Anderson Corner Road, there is a portion of the project route that supports occurrences of these RT&E plant and animals species:

Scientific Name	Common Name	State Status
Carex lupuliformis	Hop-like Sedge	Rare
Hypericum adpressum	Creeping St. John's-wort	Endangered
Ambystoma tigrinum	Eastern Tiger Salamander	Endangered
Hyla gratiosa	Barking Treefrog	Endangered

  They occur in a nontidal wetland habitat within the actual transmission line right-of-way itself, and may be directly impacted by the proposed project. Further evaluation of this part of the project is recommended.

- Immediately south of the Queen Anne's/Caroline County line, the project route crosses two tributaries to Long Marsh/Mason Branch stream system which is known to support several species of RT&E fish and freshwater mussels. As these species are especially susceptible to changes in water quality and hydrology, we would emphasize the need for stringent adherence to all appropriate best management practices during all work at these sites.

- North of Bee Tree Road the project route overlaps in part with a wetland complex which is known to support numerous occurrences of RT&E species associated with its many Delmarva bays. Due to the RT&E species in this wetland system, we would again encourage stringent adherence to all appropriate best management practices for sediment and erosion control during all work at this site.

- Immediately south of Bee Tree Road the project route comes very close to the East Melville Pond site, which is designated in state regulations as an NTWSSC. It supports occurrences of state-listed threatened Walter's Paspalum (*Paspalum dissectum*) and state-listed endangered Harper's Fimbristylis (*Fimbristylis perpusilla*), as well as species considered watchlist in Maryland. The project route appears to be located farther than 100 feet from the mapped boundary of the NTWSSC, but we would still encourage stringent adherence to all appropriate best management practices for sediment and erosion control, and caution the applicant to avoid any changes in hydrology of this seasonal pond.

- The project route passes through the Persimmon Preserve site at a location extending from approximately 2500 feet to 4600 feet south of Bee Tree Road. The wetland here is designated as an NTWSSC on either side of the transmission line right-of-way. There is a population of Creeping St. John's-wort that is known to occur in the right-of-way itself at this location. Other RT&E species that occur in this NTWSSC outside of the actual right-of-way include:

Scientific Name	Common Name	State Status
Sagittaria engelmanniana	Engelmann's Arrowhead	Threatened
Scleria reticularis	Reticulated Nutrush	Rare/watchlist
Rana virgatipes	Carpenter Frog	Watchlist
Muhlenbergia torreyana	Torrey's Dropseed	Endangered
Paspalum dissectum	Walter's Paspalum	Threatened
Fimbristylis perpusilla	Harper's Fimbristylis	Endangered

- The project route crosses through the Jackson Lane wetland site which is located approximately 3000 feet southeast of MD Route 311 (where the project route turns sharply south) and the wetland located here for approximately 3500 feet south of MD Route 311 is designated in state regulations as an NTWSSC. In this NTWSSC immediately adjacent to the powerline right-of-way is an occurrence of Harper's Fimbristylis, described as occurring in an open seasonal pond. Impacts to this occurrence need to be avoided and all appropriate best management practices for sediment and erosion control should be stringently enforced here.

- South of Lake Bonnie the project route crosses through the headwaters of the Upper Choptank River which supports numerous RT&E species, the closest occurrences being:

Scientific Name	Common Name	State Status
Alasmidonta heterodon	Dwarf Wedge Mussel	Endangered, also federally endangered
Trachelospermum difforme	Climbing Dogbane	Endangered
Echinodorus cordifolius	Upright Burhead	Endangered

Other records in the Upper Choptank River in the vicinity but not as closely located, are:

Scientific Name	Common Name	State Status
Calopteryx dimidiate	Sparkling Jewelwing	Rare
Ilex decidua	Deciduous Holly	Rare
Cyperus refractus	Reflexed Cyperus	Rare
Enallagma weewa	Blackwater Bluet	Rare

- At the junction of the project route with Red Bridges Road, there is an NTWSSC which may be located close enough to fall within the regulated 100-foot buffer.

- At the edge of the powerline cut in Myrtle Simon Pelot MOS Sanctuary there are records for RT&E freshwater mussels documented in close proximity to the project route. As freshwater mussels require fish hosts for part of their life cycle, and are filter-feeders, they are extremely susceptible to changes in water quality and hydrology. We would like to emphasize the need for stringent adherence to all appropriate best management practices for sediment and erosion control during work at this site.

- Immediately adjacent to the river bank on the north and south side of Red Bridges Road along the project route, there is a population of Upright Burhead. It is described in old muddy flood channel habitat here, so impacts to this habitat here should be avoided to the extent practicable, and all appropriate best management practices for sediment and erosion control should be stringently enforced.

- Where the project route crosses Tubmill Branch, south of MD Route 314, there are records for RT&E fish. We would like to emphasize the need for stringent adherence to all appropriate best management practices for sediment and erosion control during work at this site.

There are several wetland sites within the vicinity of this project route that have been known to support the state-listed endangered Eastern Tiger Salamander (*Ambystoma tigrinum*). Vernal pools and Delmarva bays, both wetland types that typically dry up during the summer months, are important breeding sites for tiger salamanders as they do not harbor predatory fish populations.

Adjacent forested lands are important for the adult life stages. Activities that would result in erosion, sediment deposition, draining, filling, or diking within any such wetland basins should be avoided. Surveys for the Eastern Tiger Salamander and state-listed endangered Barking Treefrog (*Hyla gratiosa*) may be considered for portions of this project route where suitable habitat has been identified. Scott A. Smith is the contact for the specifics of these efforts. He can be contacted at (410) 827-8612 or by email at sasmith@dnr.state.md.us .

If any of the upgrades will require clearing of vegetated portions of the existing right-of-way, then we may have additional comments regarding RT&E species or potential Forest Interior Dwelling Birds habitat for this project route.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,

Lori A. Byrne

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2013.1740.qacn
Cc: W. Knapp, DNR
S. A. Smith, DNR
S. Patty, DNR

U.S. Fish and Wildlife Service

Natural Resources of Concern

This resource list is to be used for planning purposes only — it is not an official species list.

Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:

CHESAPEAKE BAY ECOLOGICAL SERVICES FIELD OFFICE
177 ADMIRAL COCHRANE DRIVE
ANNAPOLIS, MD 21401
(410) 573-4500

Project Name:

DPL - Church to Steele

U.S. Fish and Wildlife Service

Natural Resources of Concern

Project Location Map:

Project Counties:

Caroline, MD | Kent, MD | Queen Anne's, MD

Geographic coordinates (Open Geospatial Consortium Well-Known Text, NAD83):

MULTIPOLYGON (((-75.8507054 39.2543567, -75.8272908 39.2511664, -75.8194224 39.2039377, -75.7895427 39.1279054, -75.7704735 39.0691317, -75.7671261 39.0465778, -75.782013 38.9824169, -75.7943318 38.9271334, -75.8013152 38.9004674, -75.8066368 38.8928121, -75.8133144 38.8867059, -75.8170394 38.8938809, -75.8115806 38.9006811, -75.8095207 38.9073872, -75.7937656 38.9890966, -75.781715 39.019498, -75.7790072 39.0430303, -75.7837965 39.0627063, -75.7937362 39.0825689, -75.8107429 39.1226053, -75.831164 39.1779805, -75.8507054 39.2543567)))

U.S. Fish and Wildlife Service

Natural Resources of Concern

Project Type:

Transmission Line

Endangered Species Act Species List (USFWS Endangered Species Program).

There are a total of **3** threatened, endangered, or candidate species, and/or designated critical habitat on your species list. Species on this list are the species that may be affected by your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Please contact the designated FWS office if you have questions.

Species that may be affected by your project:

Clams	Status	Species Profile		Contact
Dwarf wedgemussel (*Alasmidonta heterodon*) Population: Entire	Endangered	species info		Chesapeake Bay Ecological Services Field Office
Mammals				
Delmarva Peninsula fox squirrel (*Sciurus niger cinereus*) Population: Entire, except Sussex Co., DE	Endangered	species info		Chesapeake Bay Ecological Services Field Office
Florida panther (*Puma (=felis) concolor coryi*) Population: U.S.A.(LA and AR east to SC and FL)	Endangered	species info		Chesapeake Bay Ecological Services Field Office

FWS National Wildlife Refuges (USFWS National Wildlife Refuges Program).

There are no refuges found within the vicinity of your project.

FWS Migratory Birds (USFWS Migratory Bird Program).

Most species of birds, including eagles and other raptors, are protected under the Migratory Bird Treaty Act (16 U.S.C. 703). Bald eagles and golden eagles receive additional protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668). The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional

conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

NWI Wetlands (USFWS National Wetlands Inventory).

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

Appendix B

T&E Species Survey Map

Sheet 9 Boundary

Duhamel WET9

Duhamel WET7

Duhamel WET6

Duhamel WET6

Duhamel WET8

Duhamel WET7

Delmarva Bay 1

Delmarva Bay 2

358

357

356

Iris prismatica
200-300 individuals

Iris prismatica
Approx. 30 individuals

Scleria triglomerata
115 individuals

Paspalum dissectum
>1,500 individuals

Carex gigantea
2 individuals

Carex vesicaria
Approx. 100 individuals

Carex vesicaria
Approx. 50 individuals

Carex vesicaria
Approx. 20 individuals

Hypericum denticulatum
200-300 individuals

Hypericum denticulatum
1 individual

Busic Church Rd

N

COASTAL RESOURCES INC.

Appendix B

Church to Steele Threatened & Endangered Species Survey Map

Queen Anne's and
Caroline Counties, MD

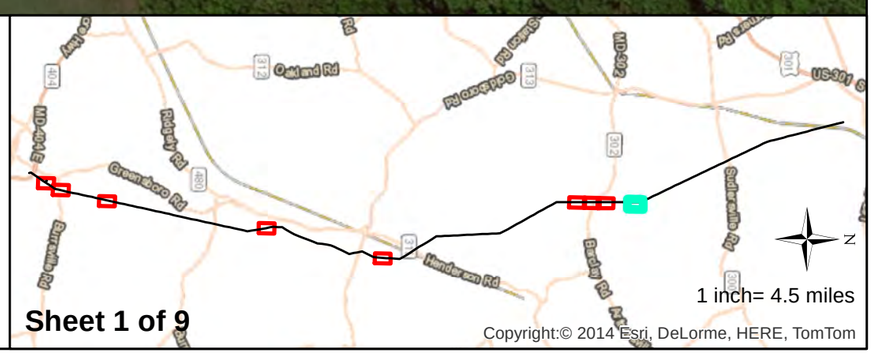
October 2014

0 75 150 300 Feet

1 inch= 150 feet

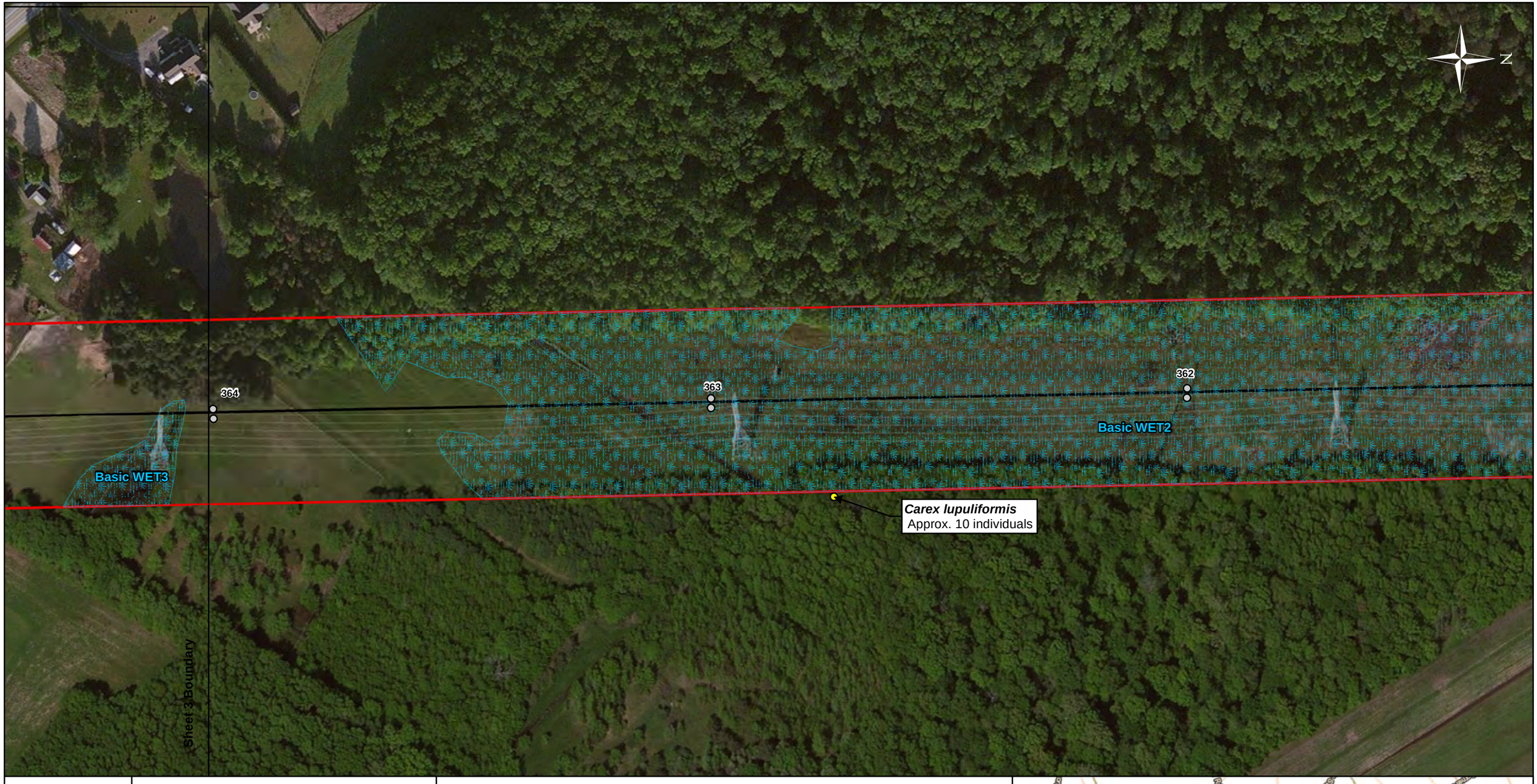
Legend

- Alignment
- Delmarva Power & Light ROW
- T&E Species Individual
- T&E Species Population
- Existing Structure (To be Removed)
- Delmarva Bay
- Delineated Wetland
- Delineated Waterway



1 inch= 4.5 miles

Sheet 1 of 9



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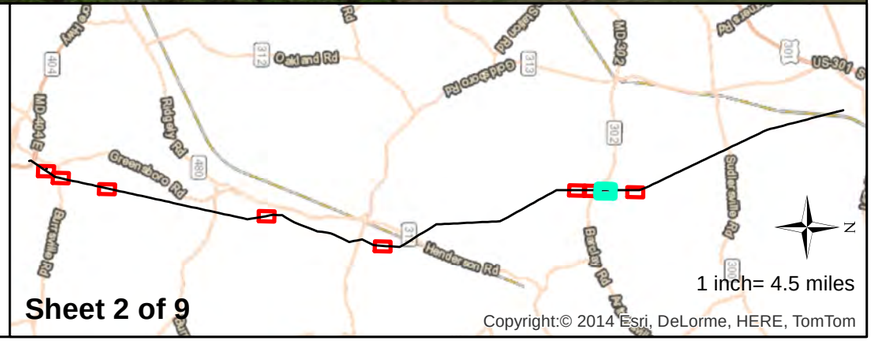

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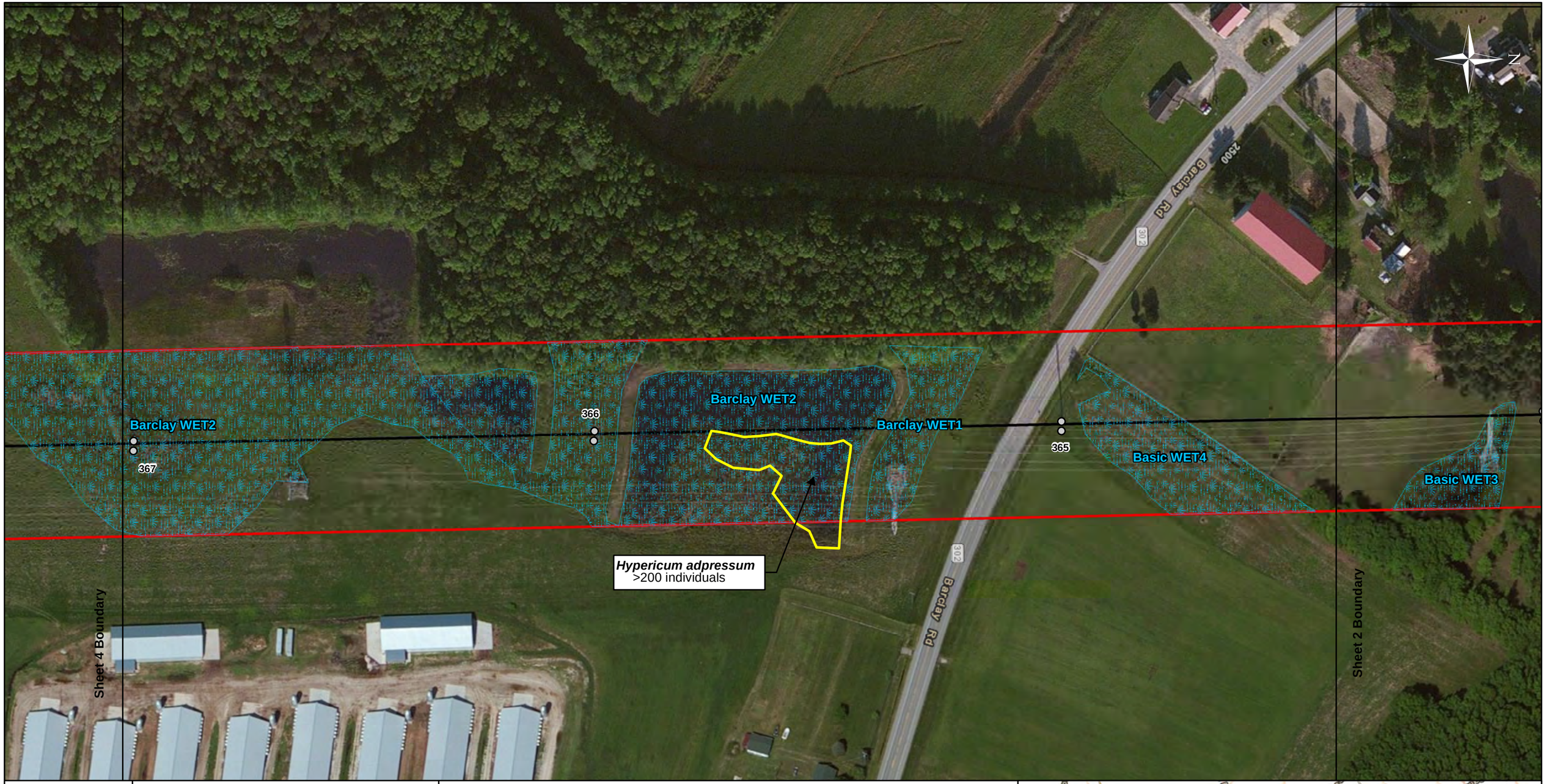

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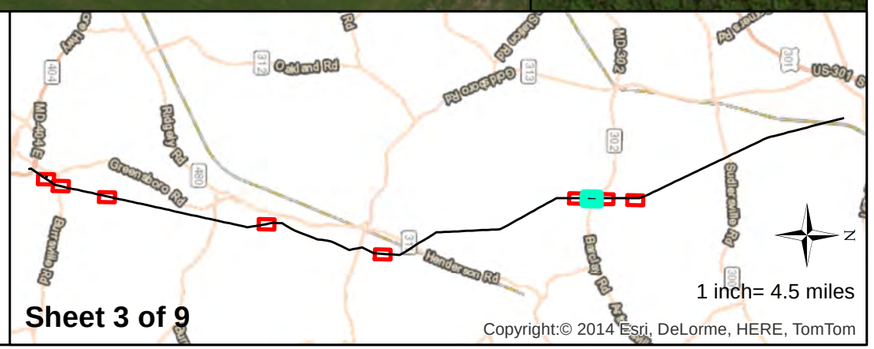

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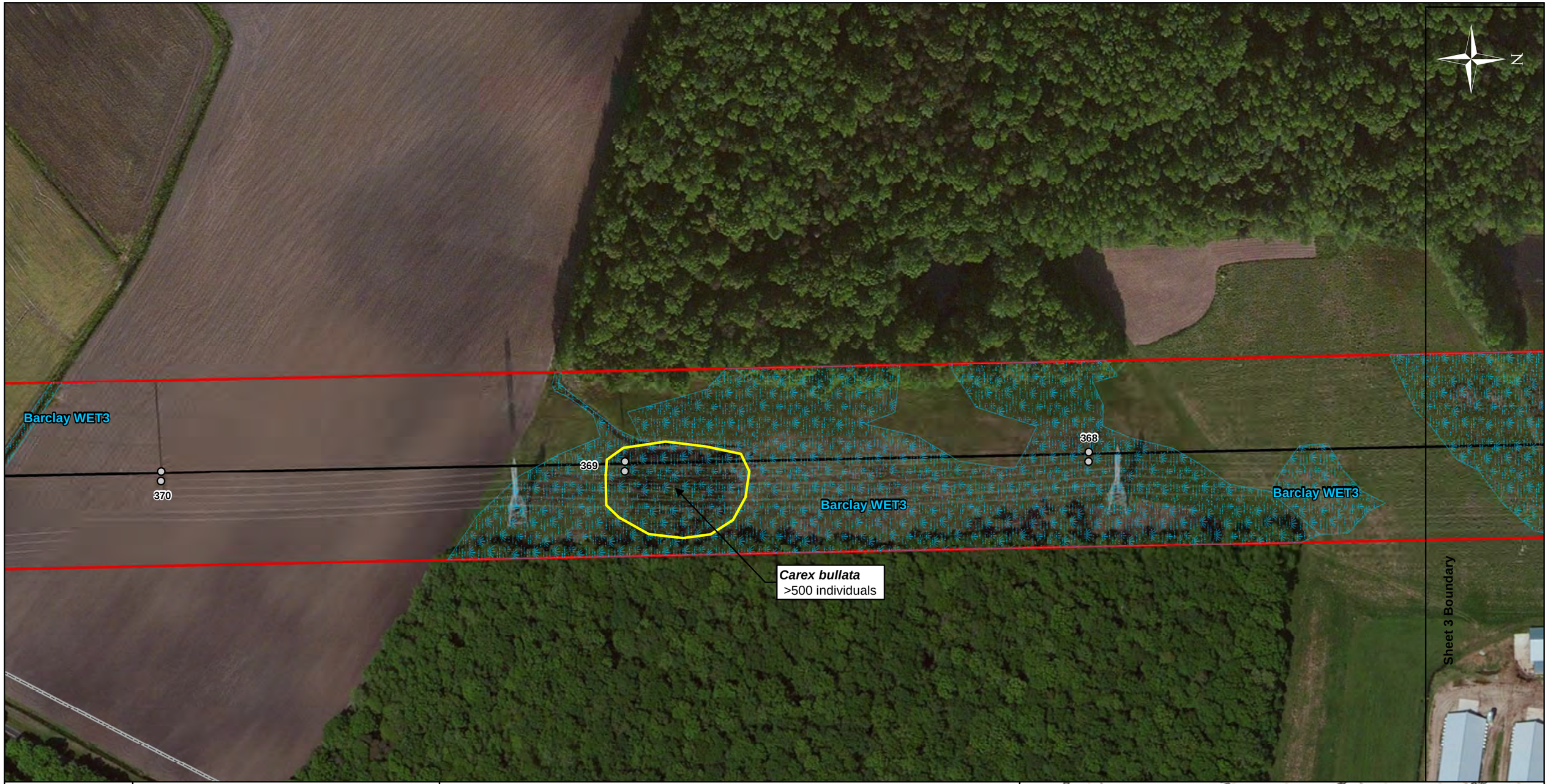

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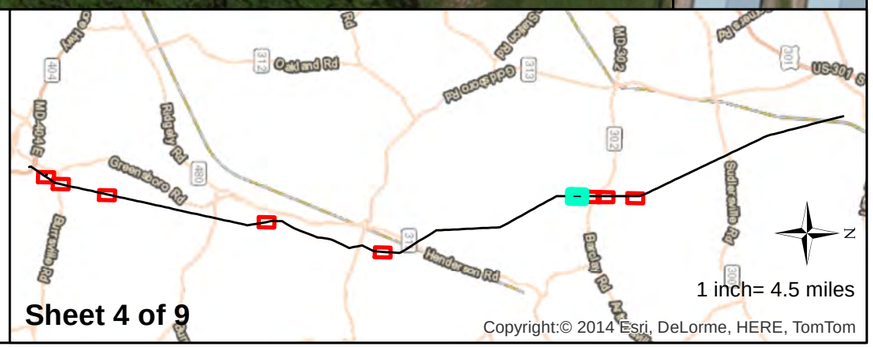

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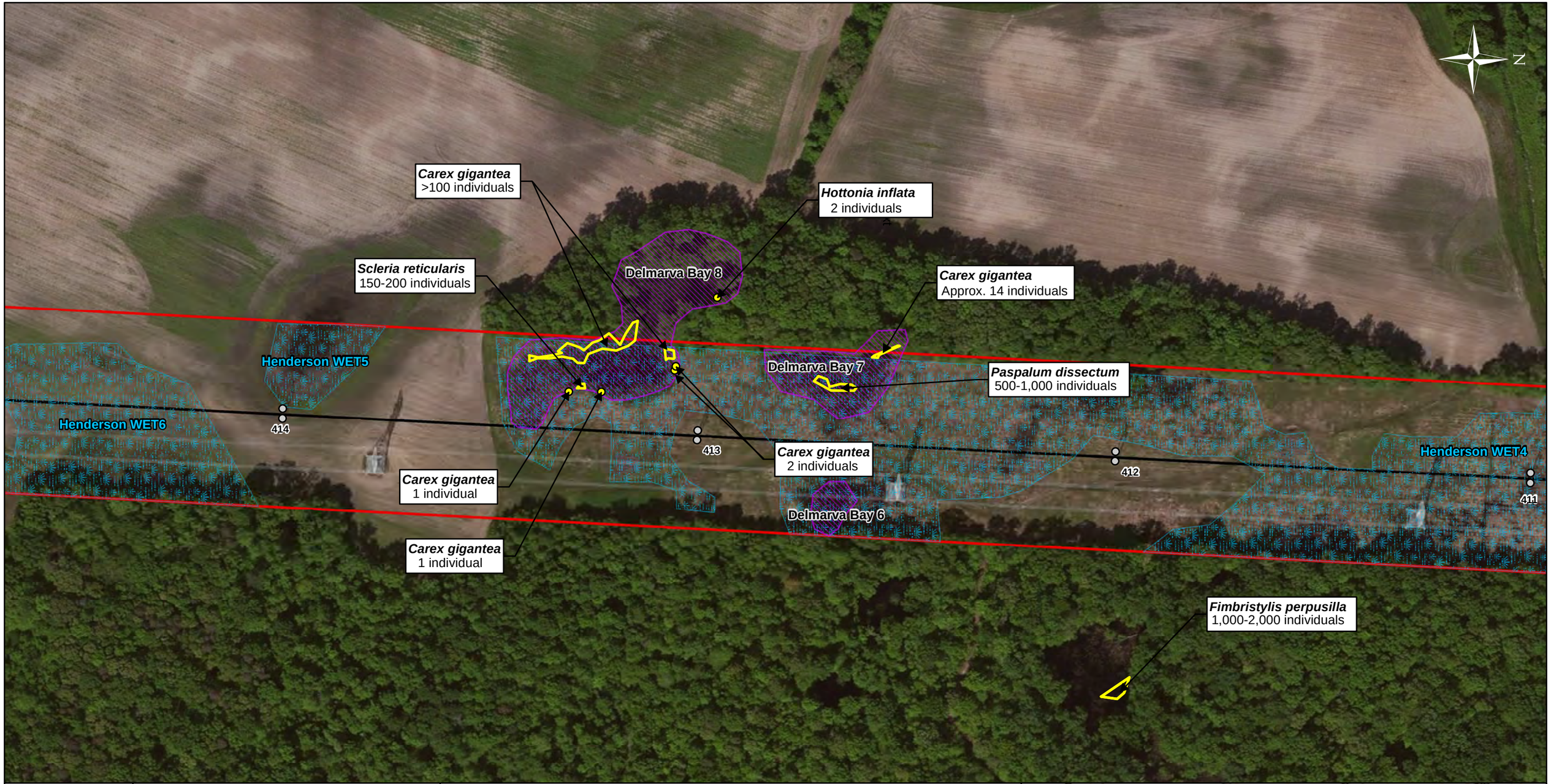

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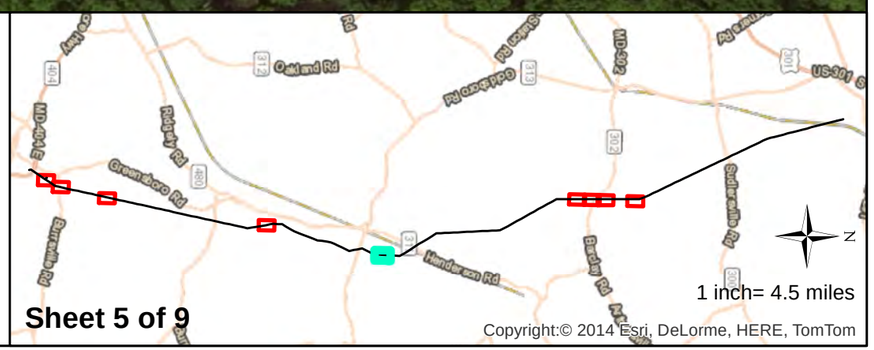

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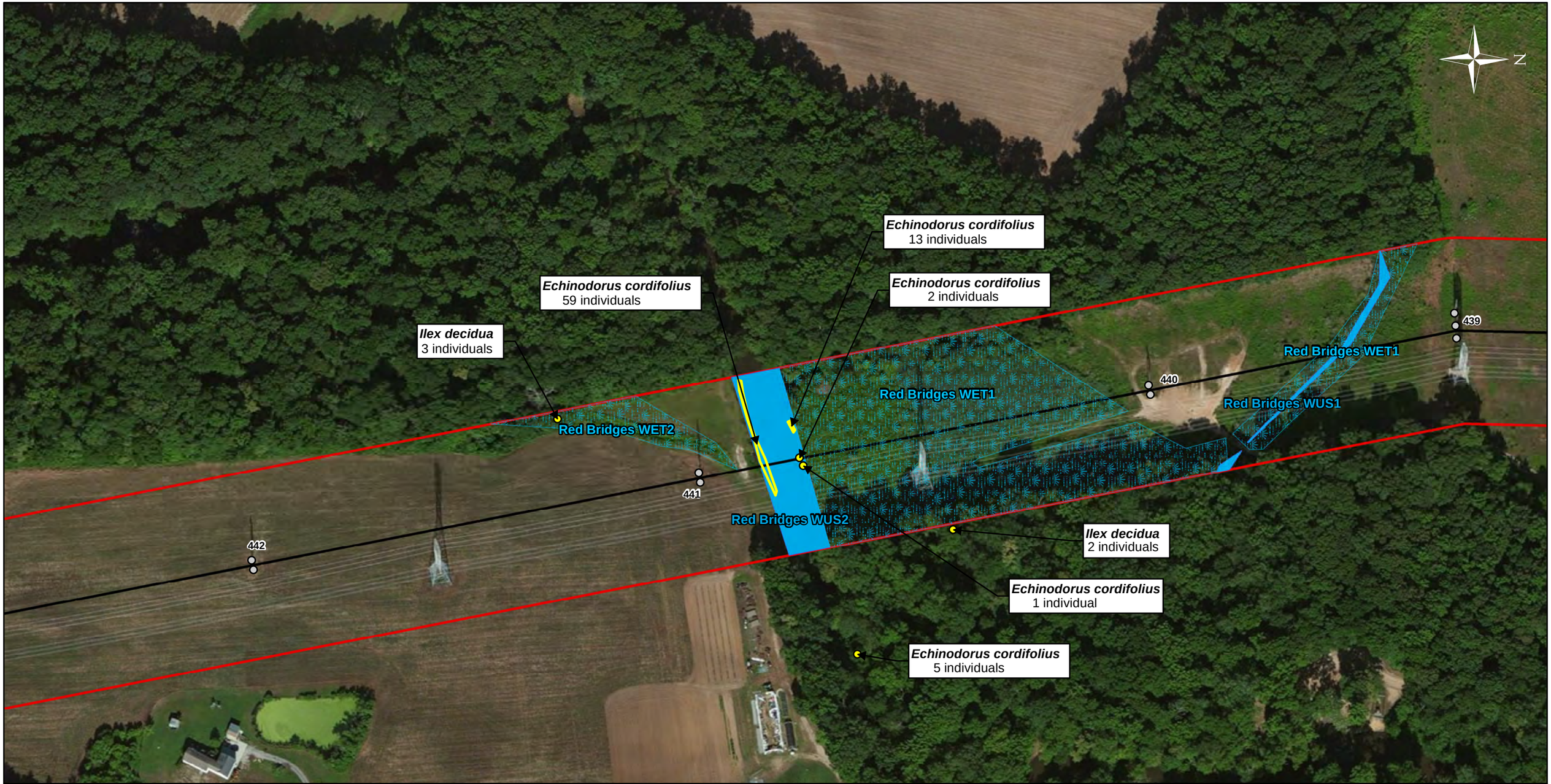
Sheet 5 of 9



COASTAL RESOURCES INC.

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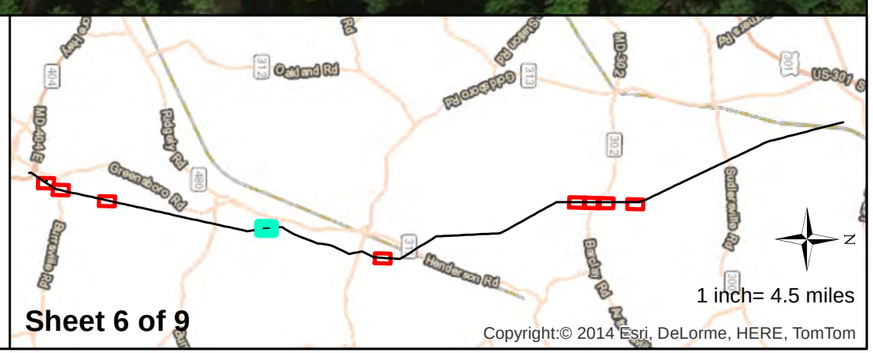

Sheet 6 of 9

476

475

474

Kibler WUS3

Kibler WET1

Carex lupuliformis
Approx. 43 individuals

N

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Appendix B

Church to Steele Threatened & Endangered Species Survey Map

Queen Anne's and
Caroline Counties, MD

October 2014

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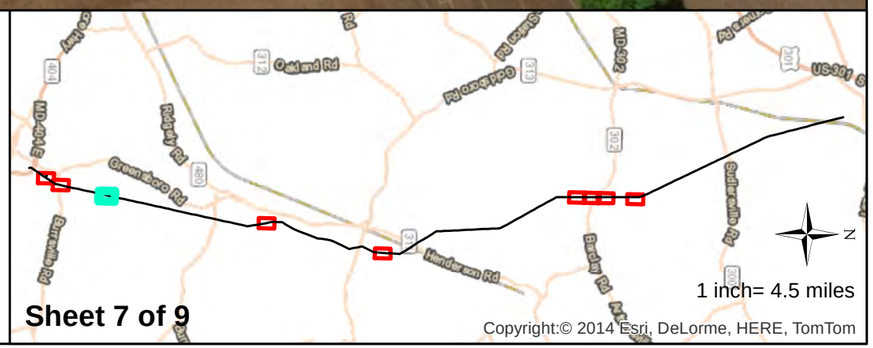

Sheet 7 of 9

Sheet 9 Boundary

Burrsville Rd
25786
317

Burrsville WUS1

486

485

Burrsville WET1

Carex lupuliformis
Approx. 85 individuals

Gary WET3

484

483

Gary WUS5

317 Burrsville Rd
25898

N

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Appendix B

Church to Steele Threatened & Endangered Species Survey Map

Queen Anne's and
Caroline Counties, MD

October 2014

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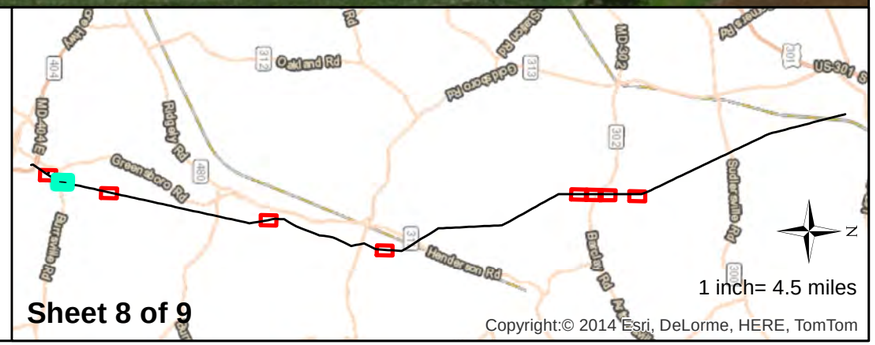

1 inch= 4.5 miles

Sheet 8 of 9

Burrsville WET4

Burrsville WUS3

489

Burrsville WUS3

OIL CITY DE

488D

488C

Burrsville WET2

488B

488

Platanthera blephariglottis
41 total individual

Text

Text

Burrsville WUS2

487

Sheet 8 Boundary

N

COASTAL RESOURCES INC.

Appendix B

Church to Steele Threatened & Endangered Species Survey Map

Queen Anne's and
Caroline Counties, MD

October 2014

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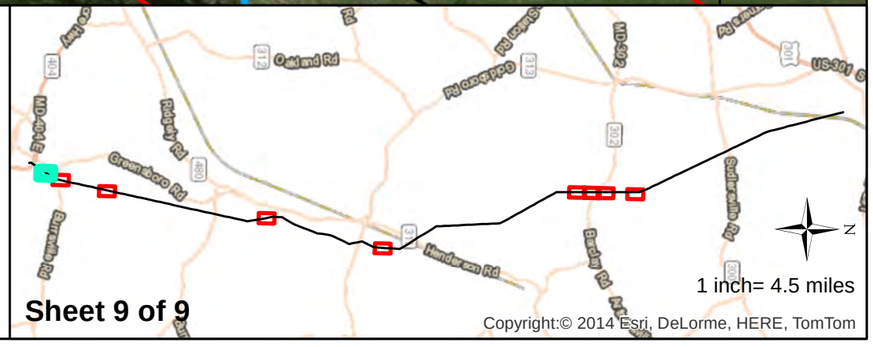

1 inch= 4.5 miles

Sheet 9 of 9

Appendix C

Photographs

Appendix C:
Church to Steele
Photographs

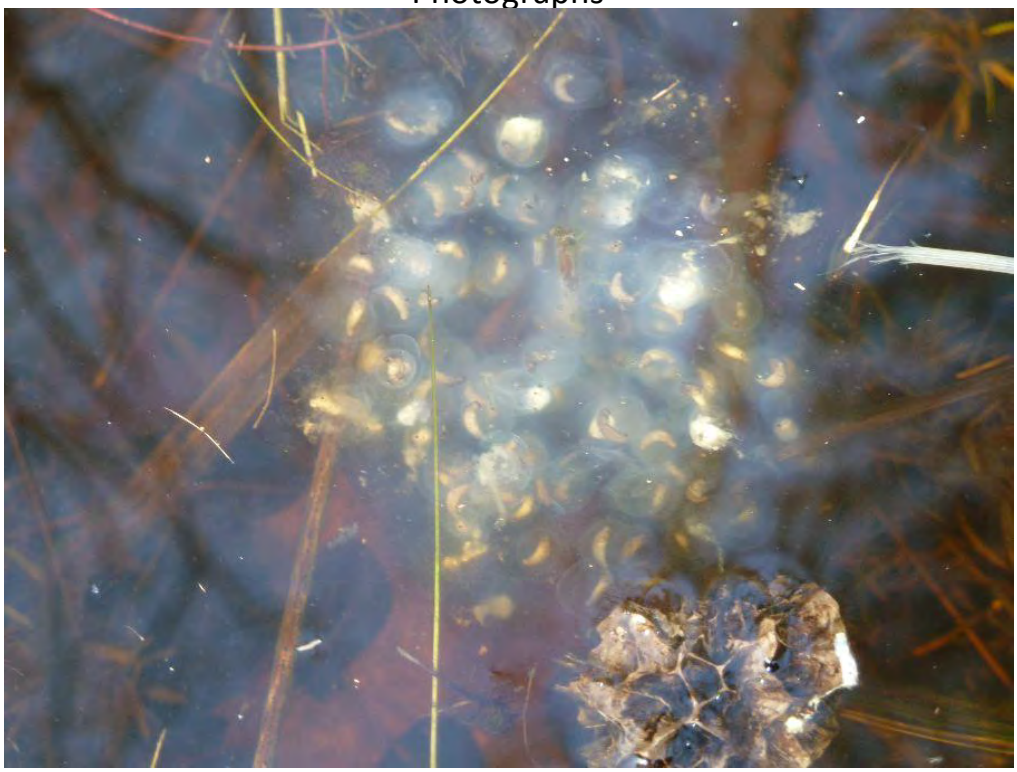

Photo #1 – Eastern tiger salamander (*Ambystoma tigrinum tigrinum*) egg mass in Massy Pond

Photo #2 – Barking treefrog (*Hyla gratiosa*) tadpole collected in Massey Pond.

Appendix C:
Church to Steele
Photographs

Photo #3 – Barking treefrog (*Hyla gratiosa*) from Massey Pond transforming into an adult.

Photo #4 – Button sedge (*Carex bullata*) collected in Barclay Wet3.

Appendix C:
Church to Steele
Photographs

Photo #5 – Button sedge (*Carex bullata*) habitat from Barclay Wet3.

Photo #6 – Giant sedge *(Carex gigantea)* collected in Delmarva Bay 2, 7, and 8.

Appendix C:
Church to Steele
Photographs

Photo #7 – Giant sedge *(Carex gigantea)* habitat in Delmarva Bay 8.

Photo #8 – False hop sedge (*Carex lupuliformis*) collected in Basic Wet2, Kibler Wet1, and Burrsville Wet1.

Appendix C:
Church to Steele
Photographs

Photo #9 – False hop sedge (*Carex lupuliformis*) habitat in Kibler Wet1.

Photo #10 – Inflated sedge (*Carex vesicaria*) collected in Delmarva Bay 2.

Appendix C:
Church to Steele
Photographs

Photo #11 – Inflated sedge (*Carex vesicaria*) habitat in Delmarva Bay 2.

Photo #12 – Upright burhead (Echinodorus cordifolius) collected along the banks of the Choptank River.

Appendix C:
Church to Steele
Photographs

Photo #13 – Upright burhead (Echinodorus cordifolius) habitat along the banks of the Choptank River.

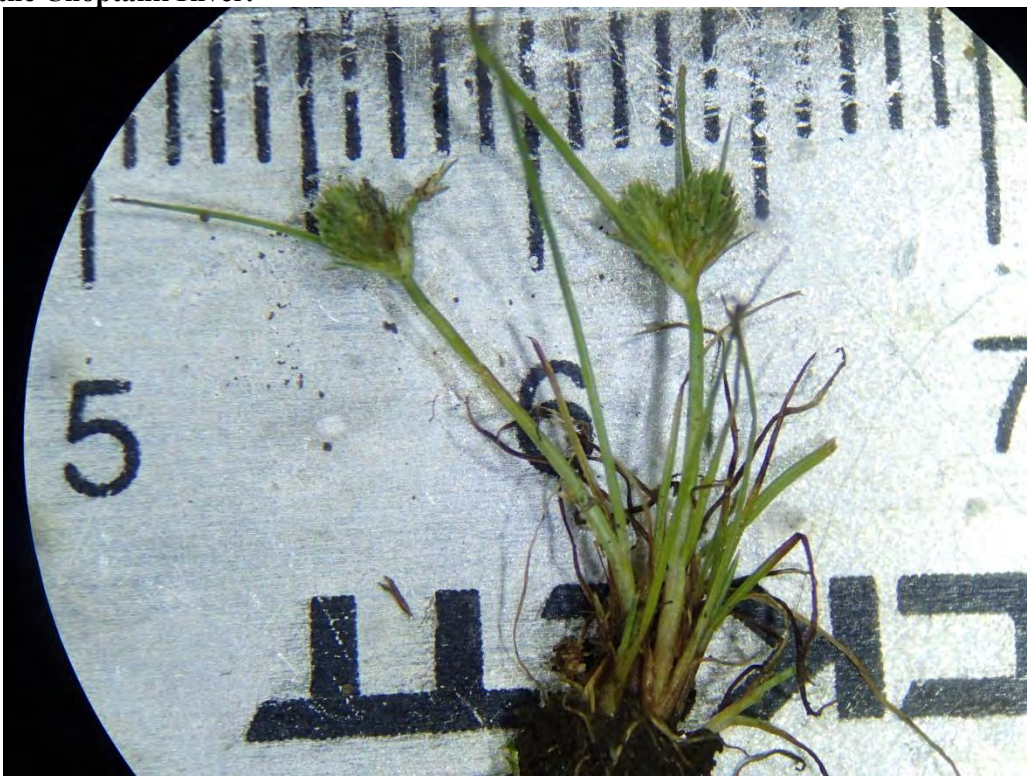

Photo #14 – Harper's fimbristylis (*Fimbristylis perpusilla*) collected in the Jackson Lane Wetland.

Appendix C:
Church to Steele
Photographs

Photo #15 – Harper's fimbristylis (*Fimbristylis perpusilla*) habitat in the Jackson Lane Wetland.

Photo #16 – Hottonia (*Hottonia inflata*) collected in Delmarva Bay 8.

Appendix C:
Church to Steele
Photographs

Photo #17 – Hottonia (*Hottonia inflata*) habitat in Delmarva Bay 8.

Photo #18 – Creeping St. John's-wort (*Hypericum adpressum*) in Barclay Wet2

Appendix C:
Church to Steele
Photographs

Photo #19 - Creeping St. John's-wort (*Hypericum adpressum*) habitat in Barclay Wet2

Photo #20 – Coppery St. John's-wort (*Hypericum denticulatum*) flower in Duhamel Wet7

Appendix C:
Church to Steele
Photographs

Photo #21 – Coppery St. John's-wort (*Hypericum denticulatum*) and habitat in Duhamel Wet7

Photo #22 – Deciduous Holly (*Ilex decidua*) at edge of ROW near Choptank River

Appendix C:
Church to Steele
Photographs

Photo #23 – Deciduous Holly (*Ilex decidua*) habitat at edge of ROW near Choptank River

Photo #24 – Slender Blue Flag (*Iris prismatica*) flower from Duhamel Wet7

Appendix C:
Church to Steele
Photographs

Photo #25 – Slender Blue Flag (*Iris prismatica*) habitat in Duhamel Wet7

Photo #26 – Walter's Paspalum (*Paspalum dissectum*) in Delmarva Bay 1

Appendix C:
Church to Steele
Photographs

Photo #27 – Walter's Paspalum (*Paspalum dissectum*) habitat in Delmarva Bay 1

Photo #28 – White Fringed Orchid (*Platanthera blephariglottis*) flower in Burrsville Wet2

Appendix C:
Church to Steele
Photographs

Photo #29 – White Fringed Orchid (*Platanthera blephariglottis*) habitat in Burrsville Wet2

Photo #30 – Reticulated Nutrush (*Scleria reticularis*) in Delmarva Bay 8

Appendix C:
Church to Steele
Photographs

Photo #31 – Reticulated Nutrush (*Scleria reticularis*) habitat in Delmarva Bay 8

Photo #32 – Tall Nutrush (*Scleria triglomerata*) just north of Delmarva Bay 1

Appendix C:
Church to Steele
Photographs

Photo #33 – Tall Nutrush (*Scleria triglomerata*) habitat just north of Delmarva Bay 1