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THREATENED & ENDANGERED SPECIES HABITAT EVALUATION

CENTER STREET PROJECT
BLOCK 286 & 287 * LOTS 3, 5, 6; 5 & 7
LITTLE EGG HARBOR TOWNSHIP, OCEAN COUNTY, NJ

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1.0 INTRODUCTION

DuBois and Associates (DuBois) has conducted a *Threatened and Endangered Species Habitat Evaluation* on and within the vicinity of a site situated along Center Street, identified as Block 286, Lots 3, 5 and 6 and Block 287, Lots 5 and 7; located within Little Egg Harbor Township, Ocean County, New Jersey (herein termed 'the site'). DuBois performed field habitat evaluations along and in the vicinity of the proposed project in August and September of 2024 to identify any potentially suitable habitat characteristics for the fauna or flora listed within the NJDEP Landscape Maps of Habitat for Endangered, Threatened and Other Priority Wildlife (version 3.3). Where applicable, the habitat evaluation incorporated the assessment of hydrology, freshwater wetlands, soil composition, vegetation assemblages, ecotone areas and surrounding land uses in direct relation to the habitat requirements of addressed species and the results of such were used to determine whether or not the subject site provides all the components necessary to sustain the subject threatened and endangered species. The goal of this *Threatened and Endangered Species Habitat Evaluation* is to provide life history and habitat information on each faunal and floral species that resulted in identification of the site and an evaluation of existing habitat conditions in relation to each identified species.

The site is contained within the Coastal Area Facilities Review Act (CAFRA) boundary. Accordingly, this *Endangered & Threatened Species Habitat Evaluation* has been conducted in accordance with the regional standards set forth at N.J.A.C. 7:7-11 – *Standards for Conducting and Reporting the Results of an Endangered or Threatened Wildlife Species Habitat Evaluation* and has been utilized to evaluate whether suitable habitat is present on the site pursuant to the endangered and threatened species protection standards of the Coastal Zone Management Rules (N.J.A.C. 7:7), Freshwater Wetlands Protection Act Rules (N.J.A.C.7:7A) and Flood Hazard Area Control Act Rules (N.J.A.C.7:13).

2.0 PROPOSED PROJECT

The applicant plans to redevelop the site with a residential development. The project includes 414 total units including 213 single family detached homes and 201 triplex units and associated site amenities, including a clubhouse building, pool, tennis courts, stormwater management facilities, etc. The proposed project is depicted on the conceptual plan prepared by ARH Associates entitled "Concept Plan for Major Subdivision; Block 286, Lots 3, 5 & 6; Block 287, Lot 7; Little Egg Harbor Township, Ocean County, New Jersey", dated March 22, 2024.

3.0 SITE LOCATION & EXISTING LAND-USE/LAND-COVERAGE

The site is located at as Block 286, Lots 3, 5 and 6 and Block 287, Lots 5 and 7. The project site is in the western portion of Little Egg Harbor Township, with approximately 2,400-feet of frontage along Center Street (refer to *Figure 1: New Jersey Road Map*). The site can be found on the NW Tuckerton NJ United States Geological Survey (USGS) Quadrangles with NAD 1983 state plane coordinates (feet) of E(x) 530,304 and N(y) 277,198 at the approximate center of the site (refer to *Figure 2: NW Tuckerton NJ U.S.G.S Quadrangle Map*).

The site can be characterized as an undeveloped oak-pine upland community. Freshwater wetlands can be found in the southern and western central portion of the site. Several dirt paths are intermixed throughout the forested land. Historical excavation in several areas associated with mining operations remain along the western property boundary. Refer to *Appendix A: Site Photographs* and *Figure 3: Aerial Map* for a depiction of the proposed project area and surrounding landscape. Surrounding land use is dominated by single family residential developments but includes a Tractor Supply Co. to the north and forested land to the west.

4.0 SITE ECOLOGICAL CHARACTERISTICS

An inventory of existing ecological conditions within the project site has been prepared through a combination of Geographic Information Systems (GIS) desktop analysis and direct field observation. Refer to *Appendix A: Site Photographs* for a photographic depiction of the site and communities described below.

4.1 Vegetation Communities

Based on the field investigations the following vegetation communities have been identified to be present within the project site:

The site is characterized as an oak-pine upland biotic community that is relatively uniform of local region. The forest is canopy stratum is dominated by black oak (*Quercus velutina*) and white oak (*Quercus alba*), pitch pine (*Pinus rigida*), and also contains additional species such as sassafras (*Sassafras albidum*). The understory and subcanopy is dominated by dense swathes of mountain laurel (*Kalmia latifolia*) but includes additional species such as lowbush blueberry (*Vaccinium angustifolium*), oak saplings (*Quercus spp.*), pine saplings (*Pinus spp.*), American holly (*Ilex opaca*), black huckleberry (*Gaylussacia baccata*), bayberry (*Myrica*) and roundleaf green briar (*Simlax rotundifolia*).

The wetland areas in the southern and western portions of the site are emergent areas consisting of herbaceous vegetation that includes common reed (*Phragmites australis*), woolgrass (*Scirpus cyperinus*), switchgrass (*panicum virgatum*), little blue stem (*Schizachyrium scoparium*) and soft rush (*Juncus effusus*).

4.2 Hydrology & Freshwater Wetlands

According to the geographic information systems (GIS) data layer entitled "NJDEP Wetlands 2012", published by the NJDEP, freshwater wetlands are mapped along the southern property boundary of the site (refer to *Figure 5: NJDEP Freshwater Wetland Map*). A field investigation revealed that this area does consist of freshwater wetlands more extensive than what is mapped by DEP. Freshwater Wetlands were also found along the western site boundary in the central portion of the site. The site is located in the Barnegat Bay Watershed Management Area (WMA 13), the Lower Little Egg Harbor Bay tribs watershed, and the Tuckerton Creek (below Mill Branch) sub watershed (HUC 14: 02040301140030). The nearest mapped waterway is the Wills Creek located 40-feet to the south of the site.

4.3 Soils

According to the GIS digital data layer entitled "Soil Survey Geographic 2005 (SSURGO) Database for Ocean County, New Jersey", originated by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), five (5) soil map units of five (5) soil series underlie the project site (refer to *Figure 6: Ocean County Soil Survey Map*). The following soil descriptions have been referenced directly from the USDA NRCS Soil Data Mart (USDA NRCS 2022).

DocBO - Downer loamy sand, 0 to 5 percent slopes, Northern Tidewater Area
The Downer component makes up 80 percent of the map unit. Slopes are 0 to 5 percent. This component is on low hills, knolls, coastal plains. The parent material consists of loamy fluviomarine deposits and/or gravelly fluviomarine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the

surface horizon is about 1 percent. Nonirrigated land capability classification is 2s. This soil does not meet hydric criteria.

HbmB - Hammonton loamy sand, 0 to 5 percent slopes
The Hammonton component makes up 80 percent of the map unit. Slopes are 0 to 5 percent. This component is on coastal plains, depressions, flats. The parent material consists of coarse-loamy fluviomarine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during January, February, March, April. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

KemA - Keyport sandy loam, 0 to 2 percent slopes
The Keyport component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on knolls on coastal plains. The parent material consists of silty and clayey eolian deposits and/or silty and clayey fluviomarine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 24 inches during January, February, March, April, May, November, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

MakAd - Manahawkin muck, 0 to 2 percent slopes, frequently flooded, Northern Tidewater Area
The Manahawkin, frequently flooded component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains, swamps on coastal plains. The parent material consists of organic, woody material over sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is frequently flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April. Organic matter content in the surface horizon is about 55 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria.

PHG – Pits, sand and gravel
The Pits, sand and gravel is a miscellaneous area.

5.0 THREATENED & ENDANGERED SPECIES RECORDS REVIEW

An endangered species is a species or subspecies of wildlife whose prospects for survival or recruitment are in jeopardy or are likely within the foreseeable future to become so due to any of the following factors: (1) the destruction, drastic modification, or severe curtailment of its habitat, or (2) its over-utilization for scientific, commercial or sporting purposes, or (3) the effect on it of disease, pollution, or predation, or (4) other natural or manmade factors affecting its prospects of survival or recruitment within the State, or (5) any combination of the foregoing factors. Threatened species are generally defined to be species that may become endangered if conditions surrounding them begin or continue to deteriorate (N.J. Division of Fish and Wildlife 2012).

5.1 NJDEP Landscape Project Mappings

To determine whether any potential threatened or endangered wildlife species habitat exists on or in the vicinity of the project site, DuBois reviewed the NJDEP Landscape Maps of Habitat for Endangered, Threatened and Other Priority Wildlife (version 3.3). The Landscape Project was developed by the NJDEP, Division of Fish and Wildlife, Endangered and Non-Game Species Program (ENSP) as a wildlife-habitat mapping program that is used to identify and map critical habitats for endangered, threatened, and special-concern wildlife. The Landscape Project applies a species-based habitat layer which identifies imperiled and special concern wildlife within each Landscape Region of New Jersey; Atlantic Coastal, Delaware Bay, Piedmont Plains, Pinelands, Skylands and Marine. The Landscape Project uses documented sightings of listed wildlife and, based on a species-specific model, designates areas of suitable habitat contiguous to the sighting as critical habitat. Each species has a specific set of land use/land cover (LU/LC) classes that are combined into a potential layer relating to that species' habitat requirements. The Landscape Project also provides detailed information on the type of occurrence, called a feature label, which includes foraging, breeding, nest, occupied habitat, etc..., as well as the last year of documented occurrence. The Landscape habitat patches are ranked based on the status of a species record, if present, within or near a polygon. The ranking system applied is as follows:

> Rank 1: assigned to species-specific habitat patches that meet habitat-specific suitability requirements such as minimum size or core area criteria for endangered, threatened or special concern wildlife species, but that do not intersect with any confirmed occurrences of such species.
>
> Rank 2: assigned to species-specific habitat patches containing one or more occurrences of species considered to be species of special concern.
>
> Rank 3: assigned to species-specific habitat patches with one or more occurrences of State-threatened species.
>
> Rank 4: assigned to species-specific patches containing one or more occurrences of State-endangered species.
>
> Rank 5: assigned to species-specific habitat patches containing one or more occurrences of wildlife listed as endangered and threatened pursuant to the Federal Endangered Species Act of 1973.

The Project is located within the Pinelands Landscape Region. According to NJDEP Landscape Project mappings, Rank 4 wildlife habitat patches for the red-shouldered hawk (*Buteo lineatus*) and black skimmer (*Rynchops niger)* and Rank 3 wildlife habitat patches for the Rank 3 Pine Barrens treefrog (*Hyla andersonii*) and black-crowned night-heron (*Nycticorax nycticorax*) are located on site (refer to *Figure 4: Landscape Project (v 3.3) Map*). The following table is a breakdown of species occurrences documented on and in the vicinity of the project site according to the Landscape Project mapping:

Table 1: Landscape Project Mapping Present on and In the Vicinity of the Project Site

Common Name	Taxonomic Name	State-Status	Habitat Type(s)	Feature Label/Year
Pine Barrens Treefrog	*Hyla andersonii*	T	Mixed Wooded Wetlands; Mixed forest (50% deciduous/with 10-50% crown closure);	Occupied Habitat/2007 Breeding Sighting/2007
Black Skimmer	*Rynchops niger*	E	Artificial Lakes	Foraging / 2014

Common Name	Taxonomic Name	State-Status	Habitat Type(s)	Feature Label/Year
Black-crowned Night-heron	*Nycticorax nyticorax*	T	Coniferous Wooded Wetlands	Foraging / 2014
Red-shouldered Hawk	*Buteo lineatus*	E	Coniferous forest (50% crown closure)	Breeding Sighting/ 2005

DuBois also reviews the USFWS "New Jersey Municipalities with Hibernation or Maternity Occurrence of Indiana Bat or Northern Long-eared Bat" last revised February 14, 2023, which indicates potential range occurrences in Little Egg Harbor Township for northern long-eared bat.

5.2 New Jersey Natural Heritage Database Review

A request was made to the NJDEP Office of Natural Lands Management Natural Heritage Program (NHP) for a search of its database for records of any threatened or endangered faunal or floral species occurrences or their habitat on the project site, within the vicinity (0.25-mile) of the project site, or within one (1) mile of the project site. The September 23, 2024 NHP response letter lists potential occurrences of pine barrens treefrog, black skimmer, black crowned night-heron and red-shouldered hawk on the project site. Additionally, the letter lists barred owl (*Strix varia*), northern pine snake (*Pituophis m. melanoleucus*) and timber rattlesnake (*Crotalus horridus*) within the immediate vicinity of the site (refer to *Appendix B* for a copy of the NHP letter).

DuBois also reviewed the NJDEP GIS Natural Heritage Grid Map for data on rare plant species and ecological communities. The Natural Heritage Grid Map divides each USGS quadrangle map into 100 cells, with each cell ranging from 358 to 372 acres in size. If a rare plant or ecological community is documented anywhere within a cell, then the entire cell will be coded for the occurrence. Each grid cell is coded into one of four categories: 1) S – the location is precisely known within the cell; 2) M – the location is not precisely known but the documented location is only known to within 1.5 miles; 3) BOTH – both precisely known and less precise occurrences are found within the same cell; and 4) NONE – the cell does not contain any aforementioned documented records. The project site is located within an "BOTH" grid cell according to the Natural Heritage Grid Map for New Jersey rush (*Juncus caesariensis*). DuBois has addressed this species in the following sections.

6.0 THREATENED & ENDANGERED SPECIES HABITAT EVALUATION

Threatened and endangered wildlife or plant species habitats are areas known to be inhabited on a seasonal or permanent basis by or be critical at any stage in the life cycle of any wildlife or plant identified as endangered or threatened species on official Federal or State lists of endangered or threatened species. The wildlife species subject of this evaluation was derived from review of the Landscape Project mapping and the NHP request.

Field evaluations to determine whether suitable habitat to support the subject threatened and endangered faunal and floral species were conducted in August and September of 2024 by Mr. Bryon DuBois and Mr. Ethan DuBois of DuBois, for a total of ten (10) person-hours evaluating and visually surveying potential habitat types within the project site. The habitat evaluation methodology included evaluating characteristics of the project site and vicinity in relation to the habitat requirements of each species. Habitat requirements were derived from the life history of each particular species, review of scientific literature and experience of DuBois biologists. As applicable, the habitat evaluation incorporated the evaluation of hydrology, freshwater wetlands, soil composition, vegetation assemblages, ecotone areas and surrounding land uses in relation to the habitat requirements of each species. The results of such were used to evaluate whether or not the project site provides all the components necessary to sustain the subject threatened and endangered

faunal and floral species. The following wildlife and plant species have been identified by the mapping and NHP correspondence on and in the vicinity of the site for evaluation in connection with the project site. Descriptions of suitable habitats required by these species are presented followed by species-specific habitat evaluations

6.1 Pine Barrens Treefrog (*Hyla andersonii*), State Threatened

6.1.1 Species Narrative

Pine Barrens treefrogs are known to prefer acidic waters associated with Atlantic white-cedar wetlands of the New Jersey Pine Barrens. Maple-gum wetlands with favorable water chemistry (pH) may also harbor breeding Pine Barrens treefrogs. Early successional wetlands and vernal pools are preferred breeding habitat where specimens typically call from trees standing in or near water. Following breeding, they return to a more terrestrial environment. This species is mainly restricted to core Pine Barrens habitat within Burlington, Ocean, Atlantic, Gloucester, and Camden counties.

Pine Barrens treefrogs require both aquatic and terrestrial habitats. Generally, Pine Barrens treefrogs have been reported to breed in seepage bogs, cranberry bogs, small and ephemeral ponds, streamlets, Atlantic white cedar (*Chamaecyparis thyoides*) swamps, and pitch pine (*Pinus rigida*) lowlands (NJDEP 2008). Plant species found at breeding sites include those mentioned above as well as highbush blueberry (*Vaccinium corymbosum*), greenbriar (*Smilax* ssp), red maple (*Acer rubrum*), swamp azalea (*Rhododenron viscosum*), swamp magnolia (*Magnolia virginiana*), viburnums (*Viburnum* spp.), inkberry (*Ilex glabra*), mountain laurel (*Kalmia latifolia*), sheep laurel (*Kalmia angustifolia*), blackjack oak (*Q. marilandica*), scrub oak (*Q. ilicifolia*), sundew (*Drosera* ssp.), pitcher plant (*Sarracenia purpurea*), sweet pepperbush (*Clethra alnifolia*), and various orchids (*Habaneria* ssp). Structural characteristics of preferred habitats include an open canopy, a dense shrub layer, and heavy ground cover. Soil types include sands and muck. (Liguori 2003)

Pine Barrens treefrogs move into upland areas adjacent to breeding ponds during July and August. The species has been identified while calling from pitch pines, cedars, oaks (*Quercus* ssp.), and highbush blueberry thickets (Hulmes et al. 1980).

6.1.1 Habitat Evaluation

The Pine Barrens treefrog is a wetland dependent species that utilizes southern New Jersey wetland complex habitat and vernal pools for breeding. Immediate surrounding terrestrial habitat will be used outside of the breeding timeframe. The Landscape Project mapping identifies the documentation as vernal pool breeding, and is associated with the NJDEP mapped located along the southern site boundary. The nearest vernal pool is mapped within the wetland complex located to the south of the site. The wetland area along the western property boundary is not mapped as a vernal pool, however the wetland exhibits characteristics of a vernal area. During the site visits in August and September 2024, DuBois personnel observed several inches of standing water within the wetlands in the western and southern portions of the site. These wetland areas itself could be vernal, creating habitat features for the Pine Barrens Treefrog.

Although vernal habitats are critical breeding features for the Pine Barrens Treefrog, the species will also utilize adjacent uplands during various portions of the year. Based on the presence of potential critical habitat features on and within the vicinity of the site, it is the opinion of this firm that further investigation is required to determine whether or not the site provides critical habitat for the state-threatened species.

6.2 Red-shouldered Hawk (*Buteo lineatus*), Breeding Population, State Threatened

6.2.1 Species Narrative

Mature wet woods such as hardwood swamps and riparian forests typify red-shouldered hawk breeding habitat. Nesting territories, which occur in deciduous, coniferous, or mixed woodlands, are typically located within remote and extensive old-growth forests containing standing water. This species selects large, deciduous, and, to a lesser extent, coniferous trees for nesting. Documented nests have occurred in oak (Quercus ssp.), pine (Pinus ssp.) and maple (Acer ssp.) (Liguori 2003). Vegetative communities associated with 1991-1992 surveys of southern New Jersey were typified by Atlantic white cedar (Chamaecyparis thyoides), red maple (Acer rubrum), black tupelo (Nyssa sylvatica), sassafrass (Sassafras albidum) and sweetbay magnolia (Magnolia virginiana) with surrounding habitats of oak-pine forest and agricultural field (Dowdell and Sutton 1992).

Red-shouldered hawks are an area-dependent species and evidence suggests that sizeable tracts of mature forest (in excess of 400 ha/1000 ac) are required for successful reproduction. In addition, the species is extremely sensitive to disturbance, predation, and competition during the breeding season (NJDEP 2008). Red-shouldered hawks are also an area-sensitive species that typically nest away from residences, roads, and development (Liguori 2003). Nest sites are often located near a body of water, including swamps, ponds, rivers and streams and are usually located below the canopy, but more than halfway up the tree in a crotch of the main trunk. These trees most often have at least a 15-inch dbh and are deciduous (occasionally coniferous).

During the non-breeding season, red-shouldered hawks are less restrictive in their habitat use. They inhabit the traditional wetland forests occupied during the breeding season as well as uplands, fragmented woods, smaller forests, open areas and edges. Red-shouldered hawks will prey upon frogs, snakes, lizards, insects, salamanders, crayfish, small turtles, and, to a lesser extent, birds and mammals (Liguori 2003).

6.2.2 Habitat Evaluation

The NJDEP landscape mapping and NHP has documentation of red-shouldered hawk breeding sighting occurring immediately off-site to the northwest of the project site. Red-shouldered hawk is listed endangered for the breeding population only, and special concern for the non-breeding population. In southern New Jersey, this species prefers extensive tracts of mature, mixed deciduous-coniferous, mixed hardwoods, bottomland hardwoods, riparian woodlands, wooded swamps with varying densities of understory vegetation. Despite the presence of the smaller wetland features on site, DuBois noted only a few trees which exceeded the 15-inch dbh mark.

Additionally, red-shouldered hawks are also an area-sensitive species that typically nest away from residences, roads, and development (Liguori 2003). The mapped habitat area is located where a Tractor Supply was constructed in recent years. The wetland complex along the southern boundary is situated within a smaller forest patch adjacent to a large residential subdivision. The complex is not connected to a larger wetland complex, it is the opinion of this firm that critical breeding and nesting habitat for the red-shouldered hawk is not present on site. This conclusion is based on the surrounding land use and limited nature of large trees typically associated with nest sites.

6.3 Black Skimmer (*Rynchops niger*), State Endangered

6.3.1 Species Narrative

Black skimmers are colonial seabirds that nest in groups. They inhabit ocean beaches, saltwater bays, and other tidal waters, such as inlets and estuaries, where they feed on fish and crustaceans. Breeding occurs primarily on sandbars and beaches. They are highly attracted to sand fill of newly dredged areas but abandon these areas when too much vegetation appears. Eggs are laid in a simple scrape on bare sand usually amongst shell fragments and scattered grass clumps. Black skimmers forage in shallow-water tidal creeks, inlets and ponds. Similar coastal and estuarine habitats are used throughout the year (Liguori et al. 2003). Nesting habitat is highly sensitive to human activity.

6.3.2 Habitat Evaluation

Black skimmers are associated with coastal and estuarine habitats along the eastern coast of the United States. All habitat criteria associated with the species is absent from the project site. The pine-oak upland community on site does not meet support the black skimmer at any life stage. Therefore, it is the opinion of DuBois that the project does not pose any adverse impacts to the black skimmer.

6.4 Black-crowned Night-heron (*Nycticorax nyticorax*), State Threatened (Breeding Population Ony)

6.4.1 Species Narrative

Black-crowned night-herons are colonial breeders, choosing to build their nests in heronries or rookeries. This species arrives at the colonies in late March and early April and begins egg-laying late in April (Harbor Herons Subcommittee 2010). In New Jersey, the heronries are typically found in coastal areas, and the black-crowned night-heron nests are found in shrubs and trees near water or in reed beds near the ground (Walsh et al. 1999). Cover and proximity to foraging habitat seem to be the primary drivers of black-crowned night-heron nest-site selection. They will build nests in a variety of vegetation and cover types including mixed hardwood forests and salt marsh communities.

Black-crowned night-herons require wetland habitat for breeding, resting and feeding. They prefer vegetated sites that provide cover. These include forest, scrub/shrub, marsh and pond habitats. The plant species characteristic of black-crowned night-heron forest habitat include red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), black gum (*Nyssa sylvatica*), and blueberry (*Vaccinium spp*.). Commonly found plant species observed in heron scrub/shrub habitat are red cedar (*Juniperus virginiana*), holly (*Ilex opaca*), greenbriar (*Smilax spp*.), and poison ivy (*Toxicodendron radicans*). Marsh heron-related habitat is mainly composed of *Phragmites communis* and marsh elder (*Iva frutescens*) (Liguori 2003). Black-crowned night-herons prefer, but do not limit themselves to, marshes greater than 20 ha in size (Brown and Dinsmore 1986).

The preferred feeding habitat of the black-crowned night-heron is along the edges of tidal creeks and ponds, and within marshes and estuaries. They are generalist predators that will feed on fish and crustaceans in coastal marsh systems, and earthworms, mollusks, frogs, toads, tadpoles, salamanders, lizards, snakes, eggs and young of other birds, in freshwater wetland systems (Liguori 2003). Tidal cycles affecting the availability of prey species and human disturbance may determine the foraging patterns and behavior of the herons in these habitats. Black-crowned night-herons will choose a nesting habitat based on its close proximity to good foraging habitat (Bent 1926).

6.4.2 Habitat Evaluation

Black-crowned night-heron is listed as state threatened for the breeding population only; the NJDEP NHP does not document any nesting colony occurrences associated with the project site or vicinity. The NJDEP NHP has foraging documentation of black-crowned night-heron, occurring within the vicinity of the project site.

Similar to the other avian species presented above, the black-crowned night-heron utilizes open water systems and wetland habitats for various life stages. The project area consists of a pine-oak upland community with dense swathes of mountain laurel throughout the understory. This vegetation composition is inconsistent with all habitats utilized by the black-crowned night-heron.

6.5 Northern Long-eared Bat (*Myotis septentrionalis*), State & Federal-endangered

6.5.1 Species Narrative

Northern long-eared bats spend the winter hibernating in caves and abandoned mines. These caves or mines typically have large passages and entrances with constant temperatures and high humidity with no air currents. Specific areas where they hibernate have very high humidity, so much so that droplets of water are often seen on their fur (USFWS, 2014). Edge habitat (transition zone between two types of vegetation) is important for northern long-eared bats as they migrate and forage. When bats migrate from wintering caves to summer habitat or commute from roosts to feeding grounds, they move through the landscape in a manner that protects them from wind and predators. Instead of flying the shortest distance across a field, bats will take longer routes that follow edge habitat (WDNR, 2013).

During the summer months, northern long-eared bats roost singly or in colonies underneath bark, in cavities of trees, or in crevices of both live and/or dead trees. They have also been known to roost in man-made structures as well. Northern long-eared bats prefer to roost in tall trees with a dynamic forest structure including old growth and some young trees (Foster and Kurta, 1999). This bat seems opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices (USFWS, 2014). Females form small maternity colonies which are located in trees, under shingles, and in buildings. Northern long-eared bats mostly forage within the forest and below the canopy mainly in upland forests on hillsides and ridges (Owen et al., 2003), but have also been noted to forage along paths, ponds and streams, at forest edges and rarely in barns and sheds. Foster and Kurta (1999) found all roost trees to be close to wetlands.

6.5.2 Habitat Evaluation

The site is absent of potential wintering habitat (i.e., caves, mines, artificial structures) for northern long-eared bat (NLEB). The site lies in the potential summer range for this species, however. NLEB are known to roost in a variety of tree species with dbh >/= 3-inches. The outward appearance of a tree, however, is more important than the species of tree. Our field evaluation resulted in the observation of several snags with exfoliating bark, crevices, hollows and cavities that could feasibly be used by roosting bats. The variety of habitats and water regimes in the surrounding area provide a healthy prey base of invertebrates such as mosquitoes. Overall, forested portions of the site provide suitable roosting and foraging habitat for NLEB.

While the site may contain potential foraging and roosting habitat, habitat for this species is not currently mapped on-site by the Landscape Project or Natural Heritage Program. Should the project require wetland permits from the NJDEP, it may trigger a review from the USFWS which does not rely on the Landscape Project. Instead, USFWS rely on the IPaC consultation process which identifies the northern long-eared

based on occurrences in these municipalities. To protect the potential habitat on-site, USFWS may require a seasonal restriction for clearing of trees greater than three inches dbh from April 1 to September 30. This mitigative action should eliminate negative impacts to potential habitat critical to the survival of the northern long-eared bat.

6.6 New Jersey Rush (*Juncus Caesariensis*), State & Federal-endangered

6.6.1 Species Narrative

New Jersey Rush is a perennial found in the Juncaceae family. It is found in New Jersey, Maryland, Virginia, and North Carolina. The majority of known occurrences in New Jersey are found in the Pine Barrens on wet, sandy, peaty substrate dominated by Sphagnum. New Jersey Rush is usually found in or near Atlantic white-cedar swamps in open or somewhat shaded areas. Human-disturbed areas within and near wetlands may also contain New Jersey Rush. The stem grows in tufts from rhizomes, up to nine-tenths (0.9) of a meter in height. The leaves are blades and are up to thirty (30) centimeters long at the base and become shorter at the top. The seeds are two (2) to three (3) millimeters in length with long white to reddish tails.

Juncus caesariensis occurs on the Atlantic Coastal Plain in New Jersey, Maryland, and Virginia. It grows in sphagnous bogs and swamps, often with or in close proximity to *Alnus serrulata*, *Chamaecyparis thyoides*, and *Magnolia virginiana*. Ware and Wieboldt (1981) described its Virginia habitat as "very acidic, usually sphagnous, extremely wet, springy or seepy areas with perennially reliable flow, but without standing water". At all Virginia stations, they found it growing with or very near *Juncus canadensis*. Most of the New Jersey sites are in the Pine Barrens on wet sandy peaty substrate dominated by *Sphagnum*. Conditions are usually wet enough for people to sink ankle to knee deep. The plants are frequently found in open or somewhat shaded places in or near white cedar swamps (NJNHP, 1989a). A few sites are in areas disturbed by humans: ditch along railroad siding, borders of channelized stream, thicket in powerline opening, and logged cedar swamp (in Schuyler 1990).

6.6.2 Habitat Evaluation

The Natural Heritage Grid Maps, list New Jersey Rush located within 1.5 miles of the project site. The mixed coniferous/deciduous upland forest of the site does not offer the qualities needed to support the New Jersey Rush which typically inhabits Atlantic white-cedar swamps in open or somewhat shaded areas. The wetlands observed along the southern and western property boundary are composed of small emergent wetland areas that are not characterized as cedar swamps or bogs. Based on these factors, it is the opinion of DuBois that the project will not have any adverse impacts to New Jersey Rush.

6.7 Northern Pine Snake (*Pituophis melanolecucus*), State Threatened

6.7.1 Species Narrative

The northern pine snake is found in the northern and eastern-central regions of the country, in areas with sandy soils and dry upland forests. They occur in the southern portion of the state in the Pine Barrens, where they are isolated from other conspecifics much farther south in Tennessee, Virginia, Kentucky and the Carolinas (Burger and Zappalorti 2011). They are a fossorial species limited to sandy soil habitats of the New Jersey Pine Barrens. This species of snake, which rarely climbs vegetation and prefers to be on the ground, has the ability to tunnel underground and excavate its own nests, summer dens and places to hibernate.

In mid spring, usually April in New Jersey, northern pine snakes begin emerging from their hibernacula. Hibernacula are generally located at the edges of clearings, in areas with sparse vegetation, and in places with sparse tree cover to allow sun penetration, although some are in denser cover (Burger and Zappalorti 2011). Dens may be dug at the bases of old decaying stumps, in abandoned mammal burrows, or other suitable refugia. Dry, sandy, pine-oak to oak-pine woodlands with open canopy areas are indicative of potential foraging habitat for this species. Northern pine snakes are known to eat mammals as large as rabbits, as well as small rodents and birds. They are usually most active in early morning or late afternoon when they leave their burrows to hunt. Later in the spring and even into early summer, males may actively seek out females laying pheromone trails and attempt to mate with them (Zappalorti and Torocco 2002).

Northern pine snakes are egg-layers and typically lay their eggs in underground nests that they excavate in open sandy areas. Sandy, infertile soil provides areas with limited vegetation and is a necessary medium for potential nesting sites. Nesting areas are most often characterized by open, treeless landscapes with bare loose sand and scattered ground vegetation. Both human-caused and natural disturbances are typically involved in creating the types of openings important for nesting and basking (Golden and Jenkins 2003). Eggs are usually laid in mid-summer (June and early July), and adult females have the tendency to re-use their nest sites year after year. The female may lay three to 16 eggs in the nesting chamber and then leaves the nest.

During early fall, northern pine snakes may follow scent trails back to their original overwintering sites or seek out another suitable hibernaculum. Cold weather in mid-October or early November will promote the descent of the snakes into the hibernacula, where they will remain until spring emergence (Zappalorti and Torocco 2002).

The following factors should be considered when evaluating habitat for pine snake:

- Proximity to suitable nesting habitat and potential hibernacula
- Overall area of contiguous upland forest/undeveloped land
- Vegetation community characteristics such as species composition, strata structure and variation, and canopy closure

6.7.2 Habitat Evaluation

Nesting Habitat: The most important characteristic when assessing the suitability of an area as pine snake nesting habitat is the presence of open sunny locations with exposed, loose sands. Loose sands are a requirement for successful burrow excavation and the open canopy conditions permit the heat of the sun to successfully incubate eggs. Based on field evaluation, features which display these characteristics are absent from the project site. Areas of absent canopy cover are limited on site, however those that were observed are covered with dense swathes of mountain laurel. Nonetheless, adjacent to the western property boundary is an old gravel pit with open, sandy areas. In theory, this area could support nesting for the northern pine snake although the area appears to be frequently utilized by off-road vehicles making it suboptimal.

Foraging Habitat: Pine snakes inhabit sandy, upland pine-oak forest, successional forest, brushlands and sparsely vegetated clearings that are contiguous with and part of the overall complex utilized for nesting and denning. The surrounding vicinity of the site is dominated by undeveloped forest to the west, route 9 to the north and single-family homes to the east and south. While the feature does provide the necessary criteria to be considered suitable foraging habitat for the species, the fragmentation by and proximity to major roadways including NJ Route 9 and Center Street along with the dense mountain laurel understory make the project area suboptimal in accordance to surrounding land. Despite the project area meeting the

minimum requirements to be considered suitable foraging habitat, it is the opinion of DuBois that the quality of it is suboptimal based on surrounding anthropogenic features.

6.8 Timber Rattlesnake (*Crotalus horridus horridus*), State Threatened

6.8.1 Species Narrative

Timber Rattlesnakes are a heavy-bodied venomous snake, averaging in length from thirty-six (36) to sixty (60) inches, with a maximum recorded length of seventy-four (74) inches. This snake is highly variable in color throughout its range. In the northeast, the two (2) common color phases are yellow and black, with the yellow phase being much more prevalent in the Pine Barrens of New Jersey. These snakes display black or dark brown cross bands, often v-shaped, on a ground color of yellow, light brown, or grey. Towards the head, the bands are often broken into lateral and dorsal blotches. As its name suggests, the snake has a conspicuous rattle on its tail. Scales are keeled and the anal plate is single.

The Timber Rattlesnake ranges as far north as northern New York in the east and southeastern Minnesota in the west. It ranges eastward to western Massachusetts, south to northern Florida, and west to eastern Texas. In New Jersey, there is a disjunct population located in the Pine Barrens; the next nearest population occurs in the mountainous region of northwestern New Jersey.

The Timber Rattlesnake is one (1) of two (2) venomous snakes found in New Jersey. The other, the Northern Copperhead, is found only in the northern part of the state. During September, when the day length shortens and the evenings begin to cool, timber rattlesnakes make their way to their hibernation sites. Timber Rattlesnakes in the Pine Barrens enter hibernation in mid to late October, while those types of northern New Jersey and New York may enter several weeks earlier due to the cooler temperatures of these areas. The disjunct populations of Timber Rattlesnakes in the Pine Barrens of southern New Jersey are known to hibernate along cedar streams rather than in rocky outcroppings used by their northern New Jersey relatives. In the coastal plain, the absence of rocky outcroppings necessitates a different hibernation strategy. The Pine Barrens rattlesnakes position themselves in underground flowing water at the base of cedar trees, where the root system of the trees provides protection. The constantly flowing water provided by a nearby stream prevents the snakes from freezing, enabling these ectothermic animals to remain relatively close to the surface of the ground. Warming water temperatures stimulate the snakes to emerge from hibernation, with first emergence occurring in mid to late April. The excessive shading, caused by increased tree and shrub growth over time, eliminates many basking areas surrounding a den, and may ultimately force the snakes to find more suitable areas along road edges. The snakes in both areas of New Jersey do not remain in their denning areas for long, but quickly migrate to active season foraging areas.

Small rodents and chipmunks are hunted with the aid of a keen sense of smell as well as infrared or heat sensing pits located on the snakes face. Timber Rattlesnakes are not active hunters, however, but are termed "sit and wait predators." This name is derived for their strategy of positioning themselves along mammal runways (often for days at a time) and waiting for prey to run past. Once potential prey comes within close proximity to the snake, a strike is made and venom injected. The snake releases the prey immediately and then follows the scent of the dying animal, which may have wandered several feet away. After consuming a meal, as with other snakes, the Timber Rattlesnake remains sedentary in a warm location until digestion is complete.

Mating takes place in late July, August, and early September, occurring annually for males, whereas females are receptive only every few years. Rattlesnakes have been reported to reach sexual maturity at four (4) to eleven (11) years of age, although an age of nine (9) to eleven (11) years is more typical in the northern

portion of its range. In addition to its late age of reproduction, the frequency of reproduction is only once every two (2) years for rattlesnakes in the Pine Barrens of southern New Jersey.

6.8.2 Habitat Evaluation

The disjunct populations of Timber Rattlesnakes in the Pine Barrens of southern New Jersey are known to hibernate along cedar streams. The project site consists of small pockets of wetlands, however there are no large cedar streams on or in the vicinity of the site. The Willis Creek is located along the southern property boundary but is a small stream associated with an emergent area on site. Additionally, vegetation on site, both canopy and understory, is dense and lacks openings suitable for gestating or basking timber rattlesnakes. Similar to the conditions for the northern pine snake, cleared areas with open canopy cover were only observed on the adjacent property, which make the subject site less than ideal for basking.

Due to the absence of a large cedar stream on site and significant distance from a suitable waterway and wetland complex, it is the opinion of DuBois that no critical habitat for the timber rattlesnake is present within the site boundaries.

6.9 Barred Owl (*Strix varia*), State Threatened

6.9.1 Species Narrative

Barred owls are forest dwellers which rarely stray from forested swamps, or other mature old growth woodlands. Nesting habitat for this species requires extensive contiguous forests containing large, mature trees and snags for suitable cavity nests. Barred owls typically shun human activity by avoiding residential, agricultural, or commercial areas (Liguori 2003). Typical nesting trees are large, greater than 20 inches, live or dead (NJDEP 2013). Foraging usually occurs in and along open areas where prey can be easily seen, but because of the ability to pounce on prey rather than swoop, barred owls are able to forage in dense Pine Barrens habitats.

In their analysis of barred owl habitat use in southern New Jersey, Laidig and Dobkin (1992) found barred owls to be primarily associated with three habitat types; Atlantic white cedar (*Chamaecyparis thyoides*) swamp, pitch pine lowland habitat, and hardwood swamp. Cedar swamp habitats featured typical understory vegetation of sweetbay (*Magnolia virginiana*) and highbush blueberry (*Vaccinium corymbosum*), while pitch pine lowlands featured inkberry (*Ilex glauca*) and highbush blueberry. Overstory tree species in hardwood swamps included tulip-tree (*Liriodendron tulopifera*), sweet gum (*Liquidambar styraciflua*), black gum (*Nyssa sylvatica*), and red maple (*Acer rubrum*). Understory species were the same as those in the softwood swamps. In both cases, understory vegetation was considered dense and often contained large amounts of catbriar (*Smilax* spp.).

The diet of the barred owl consists of predominantly small mammals such as mice, voles, shrews, squirrels, rabbits, moles, rats and chipmunk. Barred owls may also consume frogs, lizards, small snakes, salamanders, spiders, crayfish, snails, slugs, fish, oppossums, bats or small birds.

The following factors should be considered when evaluating a property for potentially critical barred owl habitat:

- Locational factors, such as proximity to development, density of development, other human factors, and agricultural lands
- Forest block size and community
- Vegetative factors such as forest age, canopy height, species composition, stem density

- Competitor influences

6.9.2 Habitat Evaluation

Barred owls are primarily forested wetland dependent species in the southern portion of the state given the structural characteristics of the vegetation communities these habitat types provide. Many wetland areas have been avoided during historical logging in New Jersey and the larger caliper of tree species present in these areas may provide suitable substrate to support breeding by barred owls. Freshwater wetland habitats typically provide larger diameter trees, both live and dead, that more often feature open cavities necessary to support nesting. Barred owls are primarily associated with three habitat types; Atlantic white cedar swamp, pitch pine lowland habitat, and hardwood swamp (Laidig and Dobkin 1992). Foraging habitat may be in the vicinity of open areas in the vicinity of bogs and in oak-pine habitat that has a less dense understory than forested wetland habitat (NJDEP, 2013).

As presented above, the site is comprised of mostly of uplands. The wetland areas on site are small emergent areas. Based on the absence of expansive wetland habitat on or in the vicinity of the site, it is the determination of DuBois that the site does not exhibit suitable barred owl nesting habitat. Barred owls typically prefer to forage in forests with few branches and an open understory; however, can forage within a forest with a dense understory. The subject site contains a fairly closed canopy with a dense understory dominated by mountain laurel. Typically, barred owls will avoid areas of human disturbance. The site has frontage along the NJ Route 9 and Center Street which are both associated with heavy traffic. Based on these the absence of critical habitat features necessary for the life history requirements of the barred owl and the surrounding anthropogenic features; it is the opinion of DuBois that the property does not contain habitat critical for the survival of barred owl.

7.0 DISCUSSION

The goal of this *Threatened and Endangered Species Habitat Evaluation* was to provide life history and habitat information on each wildlife and plant species identified by the NJDEP Landscape Project with potential to occur on the site and an evaluation of existing habitat conditions in relation to each identified species. The field habitat evaluation incorporated the evaluation of soil composition, vegetation assemblages, ecotone areas and existing land uses in direct relation to the habitat requirements of addressed species. The results of such were used to determine whether or not the project site provides all the components necessary to sustain the subject threatened and endangered species.

It is the opinion of DuBois that based on the presence of potentially vernal wetlands onsite, further investigation is required to determine whether or not inclusion suitable habitat exists on site for the Pine Barrens Treefrog.

The site does not provide critical habitat for the red-shouldered hawk. The site is characterized as an upland pine-oak forest which lacks the large contiguous interior wetland community typically associated with documented red-shouldered hawk nesting habitat. It is therefore the opinion of DuBois that the project will not create any adverse impacts for red-shouldered hawk.

Habitat features associated with the black-crowned night-heron and black skimmer were not observed on or in the immediate vicinity of the site. The nearest large open water feature is located over 3,000 feet east of the site and is additionally bisected by residential communities and roadways. Coastal ecological communities which would support these species are absent from the upland oak-pine composition observed on the project site. Therefore, it is the opinion of DuBois that the project does not impose any adverse impacts to these avian species.

While the site may contain potential northern long-eared bat foraging and roosting habitat, habitat for this species is not currently mapped on-site by the Landscape Project or Natural Heritage Program. Should the project require wetland permits from the NJDEP, it may trigger a review from the USFWS which does not rely on the Landscape Project. Instead, USFWS rely on the IPaC consultation process which identifies the northern long-eared based on occurrences in these municipalities. To protect the potential habitat on-site, USFWS may require a seasonal restriction for clearing of trees greater than three inches dbh from April 1 to September 30. This mitigative action should eliminate negative impacts to potential habitat critical to the survival of the northern long-eared bat.

NHP grid mapping indicated occurrences of one state-listed plant species in the vicinity of the site. New Jersey rush is located within 1.5 miles of the subject site. Habitat characteristics associated with the plant species were not observed on or in the vicinity of the project site, as the plant is dependent on swamp and bog wetland features. It is the opinion of DuBois that suitable habitat for the state-listed plant species is absent from the project site.

Due to the significant anthropogenic features that border the project area and the dense understory observed on site, it is the opinion of DuBois that site offers suboptimal habitat for the northern pine snake. However, in the immediate vicinity of the project site there are open sandy areas of an old sand and gravel pit, which could in theory provide marginal nesting habitat for the northern pine snake. However, the site is surrounded by development and roadways in all directions, which reduces the suitability. While the habitat appears to be suboptimal and unlikely utilized, it does meet the minimum requirements to support the northern pine snake, therefore further investigation on site may be required.

Based on the absence of a large wetland complex and stream corridor on site, it is the opinion of this firm that the timber rattlesnake and its habitat will not be adversely impacted by the project.

The site does not provide critical habitat for the barred owl. The site is characterized as an upland pine-oak forest which lacks the large contiguous interior wetland community typically associated with documented barred owl nesting habitat. It is therefore the opinion of DuBois that the project will not create any adverse impacts for barred owl.

This report and conclusions stated herewith should be provided to the appropriate regulatory agencies for consideration of project site habitat conditions and concurrence of the determinations made herewith.

8.0 REFERENCES

Bat Conservation International. 2014. BCI Species Profiles Myotis septentrionalis. Available online at http://www.batcon.org/index.php/all-about-bats/species-

Bent, A.C. 1926. Life Histories of North American Marsh Birds. Dover Publications, Inc. pp. 197-213.

Burger, J. and R.T. Zappalorti. 2011. The Northern Pine Snake (*Pituophis m. melanoleucus*) in New Jersey: It's Life History, Behavior and Conservation. In Reptiles: Biology, Behavior and Conservation. ISBN 978-1-61122-856-4.

DeGraaf, R.M., G.M. Witman, J.M. Lancier, B.J. Hill and J.M. Keniston. 1980. Forest habitat for birds of the Northeast. U.S. For. Serv., Northeast For. Exp. Stn. Broomall, PA. 589 pp.

Flora of North America Association. 2006. The Flora of North America available Online at http://www.efloras.org.

Foster, R. W., A. Kurta. 1999. Roosting ecology of the northern bat (Myotis septentrionalis) and comparisons with the endangered Indiana bat (Myotis sodalis). Journal of Mammalogy 80: 659-672

Golden, D.M. and D. Jenkins. 2003. Northern Pine Snake in Endangered and Threatened Wildlife of New Jersey. eds. Beans, B.E. and Niles, L. Rutgers University Press. New Brunswick, New Jersey and London. 2003.

Harbor Herons Subcommittee. S. B. Elbin and N.K. Tsipoura (Editors). 2010. Harbor Herons Conservation Plan – NY/NJ Harbor Region. NY-NJ Harbor Estuary Program.

Hulmes, D., P. Hulmes, and R.T. Zappalorti. 1980. An ecological study of the Pine Barrens treefrog (*Hyla andersonii*) Baird. In southern New Jersey, with especial notes on habitat description. Part II. Unpublished report to the NJDEP, Division of Fish, Game, and Wildlife, Endangered and Nongame Species Program. by Herpetological Associates. 42pp.

Laidig, K.J. and D. Dobkin. 1992. Habitat overlap and population persistence of barred owls and great horned owls in southern New Jersey. Unpublished report to the NJDEPE, Division of Fish, Game and Wildlife, Endangered and Nongame Species Program. 33 pp.

Liguori, et al., Beans, Bruce E. and Larry Niles (Eds). 2003. Endangered and Threatened Wildlife of New Jersey. Rutgers University Press. New Brunswick, New Jersey and London. 2003.

Liguori, Sherry. Beans, Bruce E. and Larry Niles (Eds). 2003 Endangered and Threatened Wildlife of New Jersey. Rutgers University Press. New Brunswick, New Jersey and London.

NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: November 1, 2016).

New Jersey Department of Environmental Protection, Bureau of Geographical Information Systems. Maps and map data available online at http://www.nj.gov/dep/gis/.

New Jersey Department of Environmental Protection, Division of Land Use Regulation, Office of Natural Lands Management Division of Parks and Forestry and Endangered and Nongame Species Program Division of Fish and Wildlife. 2013. *Protocols for the Establishment of Exceptional Resource Value Wetlands Pursuant to the Freshwater Wetland Protection Act (N.J.S.A. 13:9B-1 Et Seq.)*.

New Jersey Department of Environmental Protection, Office of Natural Lands Management, Natural Heritage Program. 2014. Rare Plant Species and Ecological Communities Presently Recorded in the NJ Natural Heritage Database for Atlantic County, New Jersey. Trenton, NJ.

New Jersey Division of Fish and Wildlife. 2012. New Jersey Landscape Project, Version 3.3. New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program. pp. 36.

New Jersey Pinelands Commission. 2006. General Guidelines for Conducting Threatened and Endangered Species Surveys in the Pinelands Area. New Lisbon, New Jersey

New Jersey Pinelands Commission. 2012. Protection of Threatened & Endangered Plants in the New Jersey Pinelands. (Revised July 2012).
Owen, S.F., M. Menzel, W.M. Ford, B.R. Chapman, K.V. Miller, J.W. Edwards., P.B. Wood. 2003. Home-range size and habitat used by the northern Myotis (Myotis septentrionalis). American Midland Naturalist 150: 352-359.

Sutton, C. and J. Dowdell. 2001. Woodland raptor surveys in the Bellplain State Forest Region and elsewhere in Cape May, Cumberland, and Atlantic Counties, New Jersey. Spring 2001. pp. 7 plus appendices.

USDA NRCS Web Soil Survey (USDA NRCS 2022).

U.S. Fish and Wildlife Service. 2015. IPaC Information for Planning and Conservation System. Available online at https://ecos.fws.gov/ipac/

Walsh, J., V. Elia, R. Kane and T. Halliwell. 1999. Birds of New Jersey. New Jersey Audubon Society. Bernardsville, NJ.

Wisconsin Department of Natural Resources, Bureau of Natural Heritage Conservation. 2013. Northern-long-eared bat Species Guidance. PUB ER-700. September 10, 2013.

Zappalorti, R.T. and M. E. Torocco. 2002. A Standardized Protocol for Sampling Rare Snakes in the New Jersey Pine Barrens: Critical Habitat Assessment, Survey Techniques, and Trapping Methods. Submitted to Carleton Montgomery, Executive Director The Pinelands Preservation Alliance 114 Hanover Street, Pemberton, New Jersey 08068.

FIGURES

DuBois & ASSOCIATES

New Jersey Road Map

Block 286 * Lots 3, 5 & 6; Block 287 * Lot 7
Little Egg Harbor Township, Ocean County, NJ

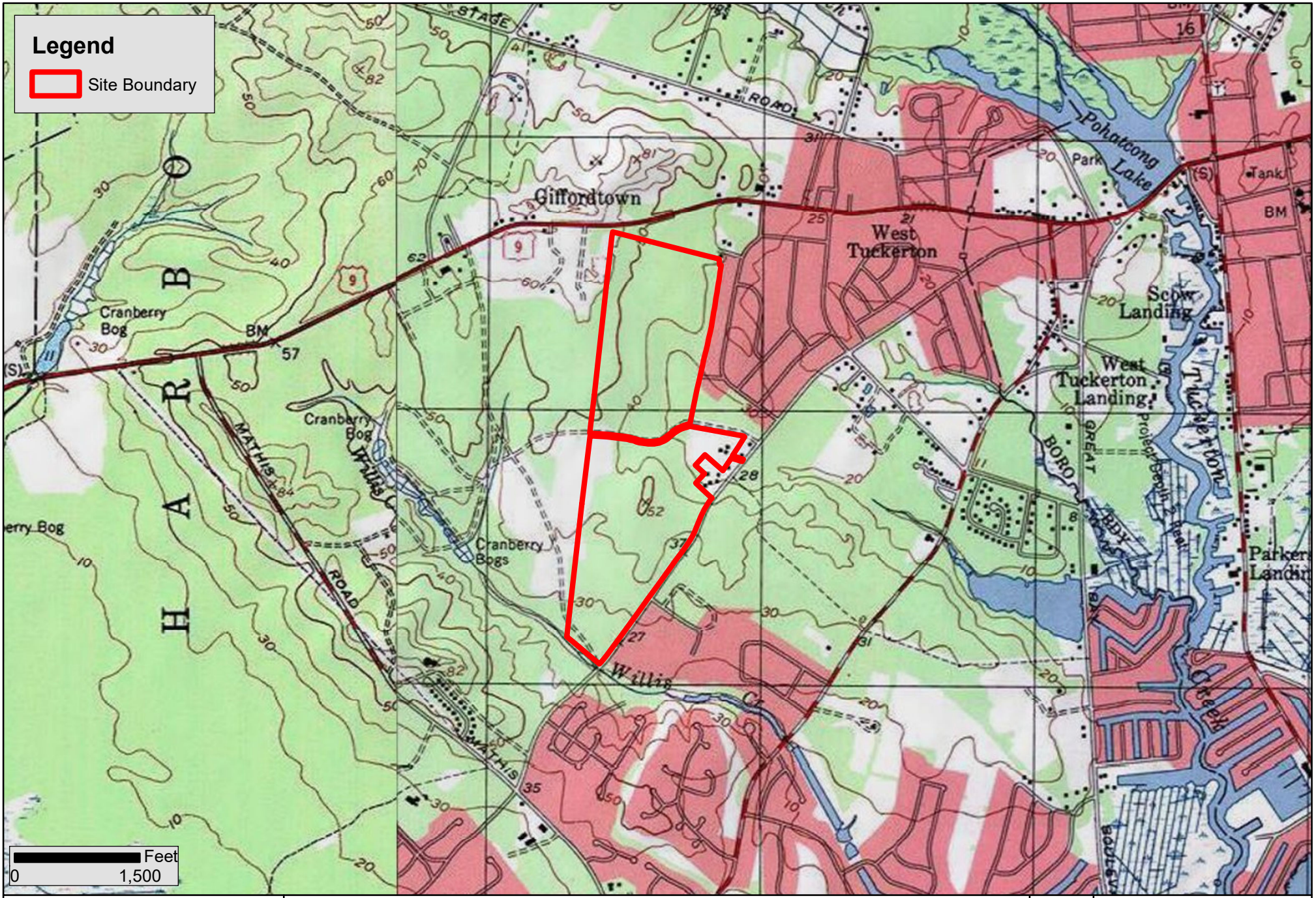
NORTH

Figure 1

Job No.: D1531.018
Scale: 1 in = 1,500 ft
Date: 3/29/2022
Drawn By: HJ

Document Path: S:\JOBS NUMBERS\D1531.018\Road.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.



DuBois & ASSOCIATES

NW Tuckerton NJ USGS Quadrangle Map

Block 286 * Lots 3, 5 & 6; Block 287 * Lot 7
Little Egg Harbor Township, Ocean County, NJ

NORTH

Figure 2

Job No.: D1531.018
Scale: 1 in = 1,500 ft
Date: 3/29/2022
Drawn By: HJ

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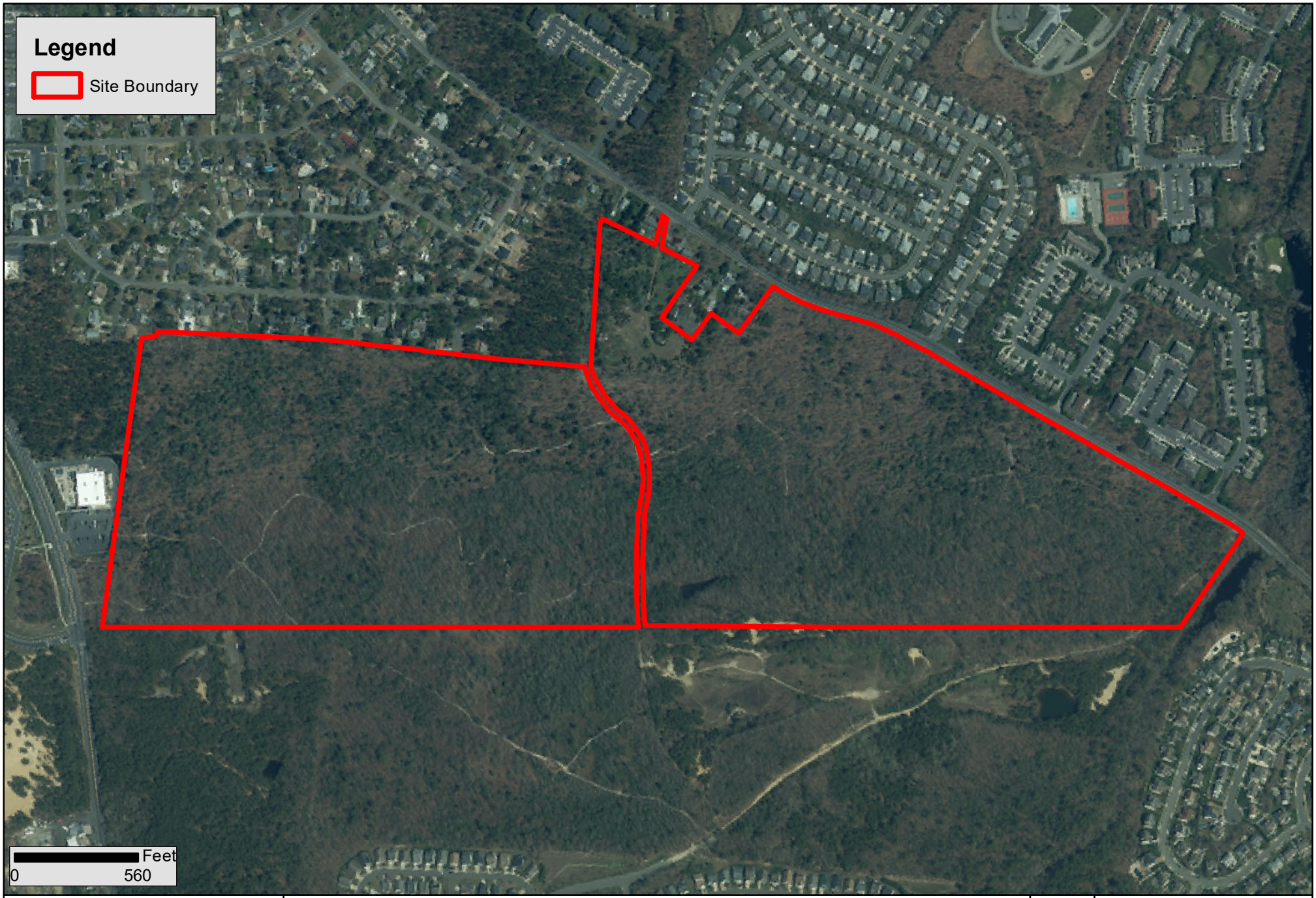

DuBois & ASSOCIATES

Aerial

Block 286 * Lots 3, 5 & 6; Block 287 * Lot 7
Little Egg Harbor Township, Ocean County, NJ

NORTH

Figure 3

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Date: 7/23/2024
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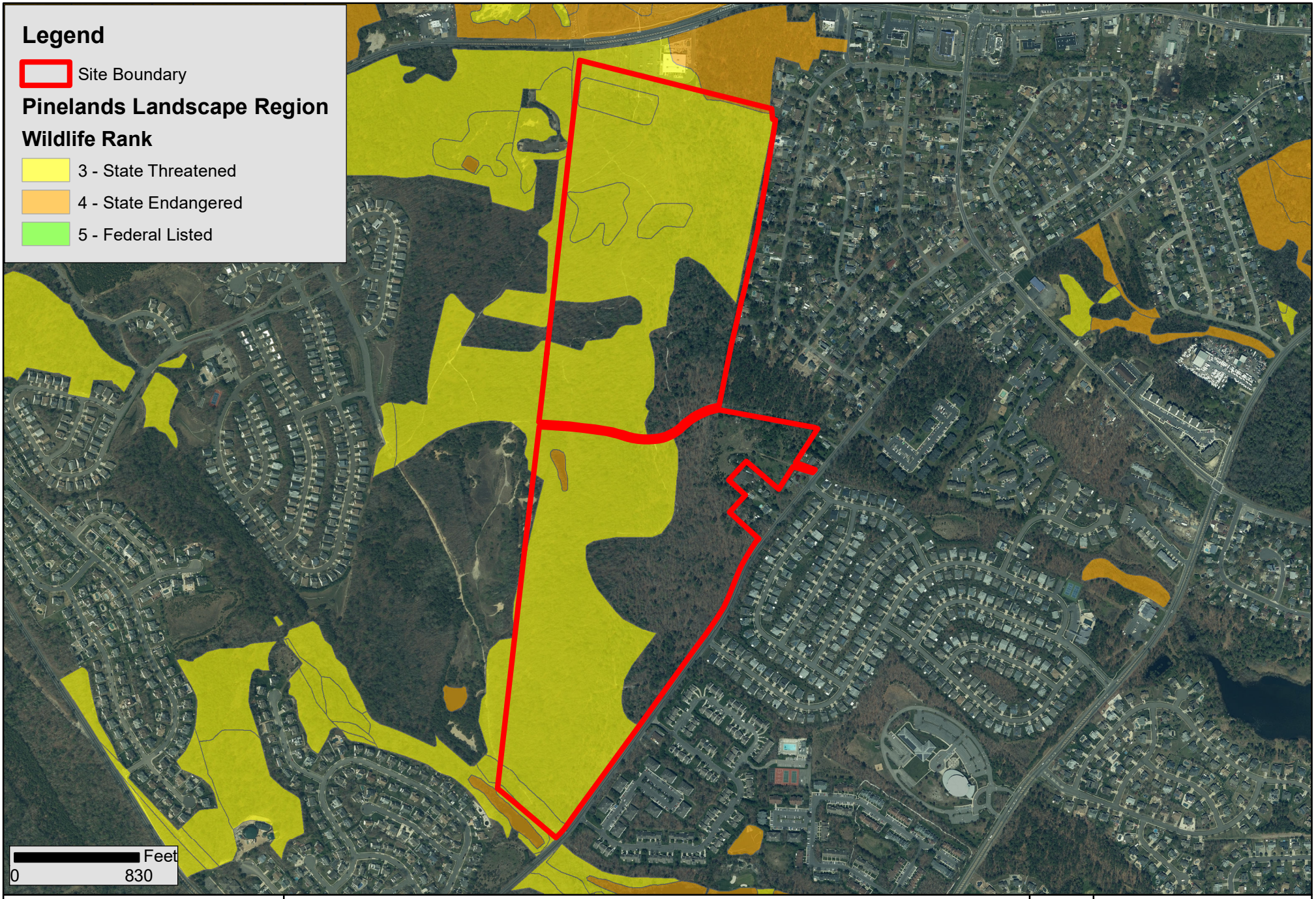

DuBois & ASSOCIATES

NJDEP Landscape Project Map

Block 286 * Lots 3, 5 & 6; Block 287 * Lot 7
Little Egg Harbor Township, Ocean County, NJ

NORTH

Figure 4

Job No.: D1531.018
Scale: 1 in = 833 ft
Date: 9/14/2023
Drawn By: HJ

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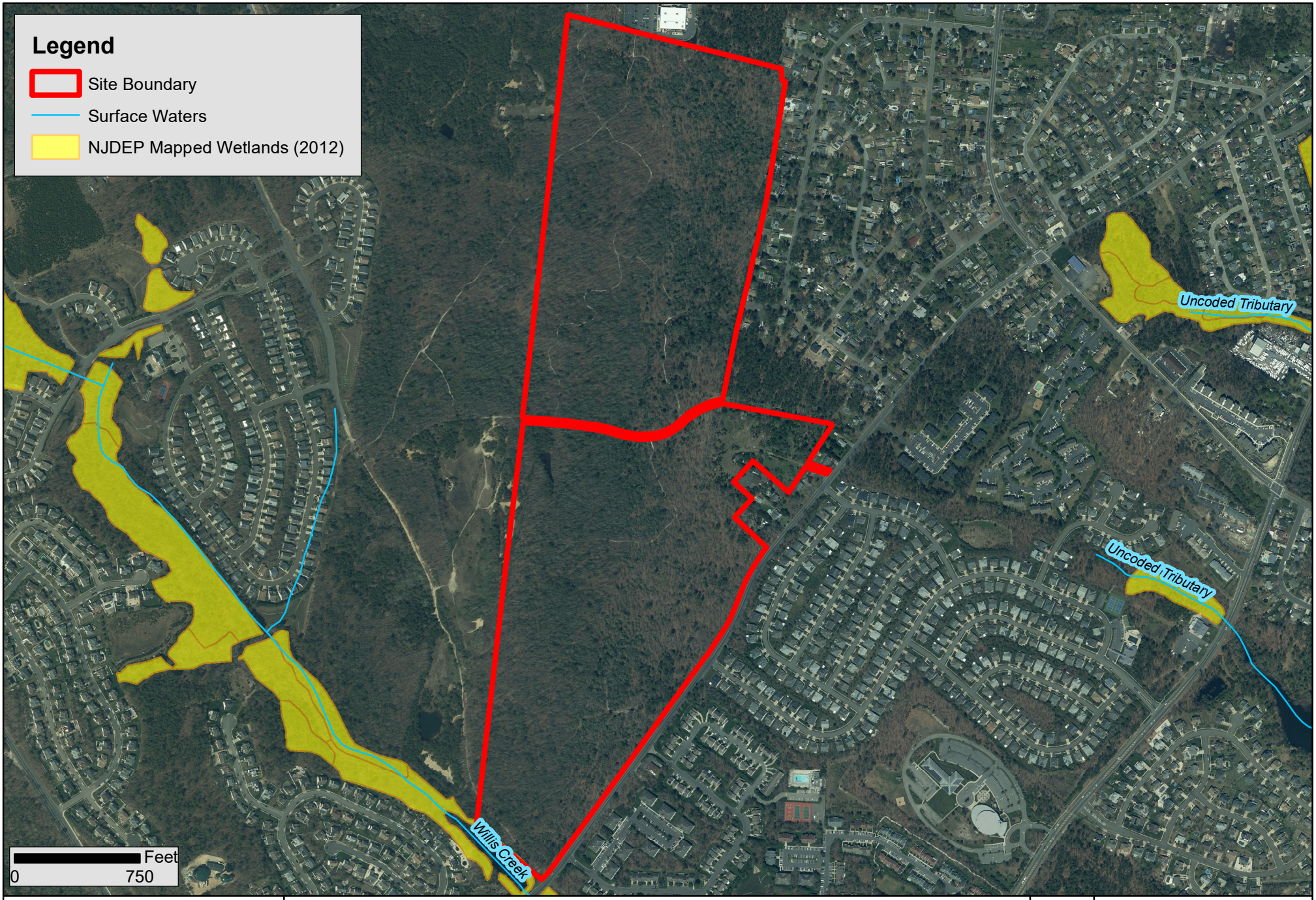

NJDEP Freshwater Wetlands Map

Block 286 * Lots 3, 5 & 6; Block 287 * Lot 7
Little Egg Harbor Township, Ocean County, NJ

DuBois & ASSOCIATES

NORTH

Figure 5

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Scale: 1 in = 750 ft	
Date: 3/29/2022	
Drawn By: HJ	

Document Path: S:\JOBS NUMBERS\D1531.018\Wet.mxd

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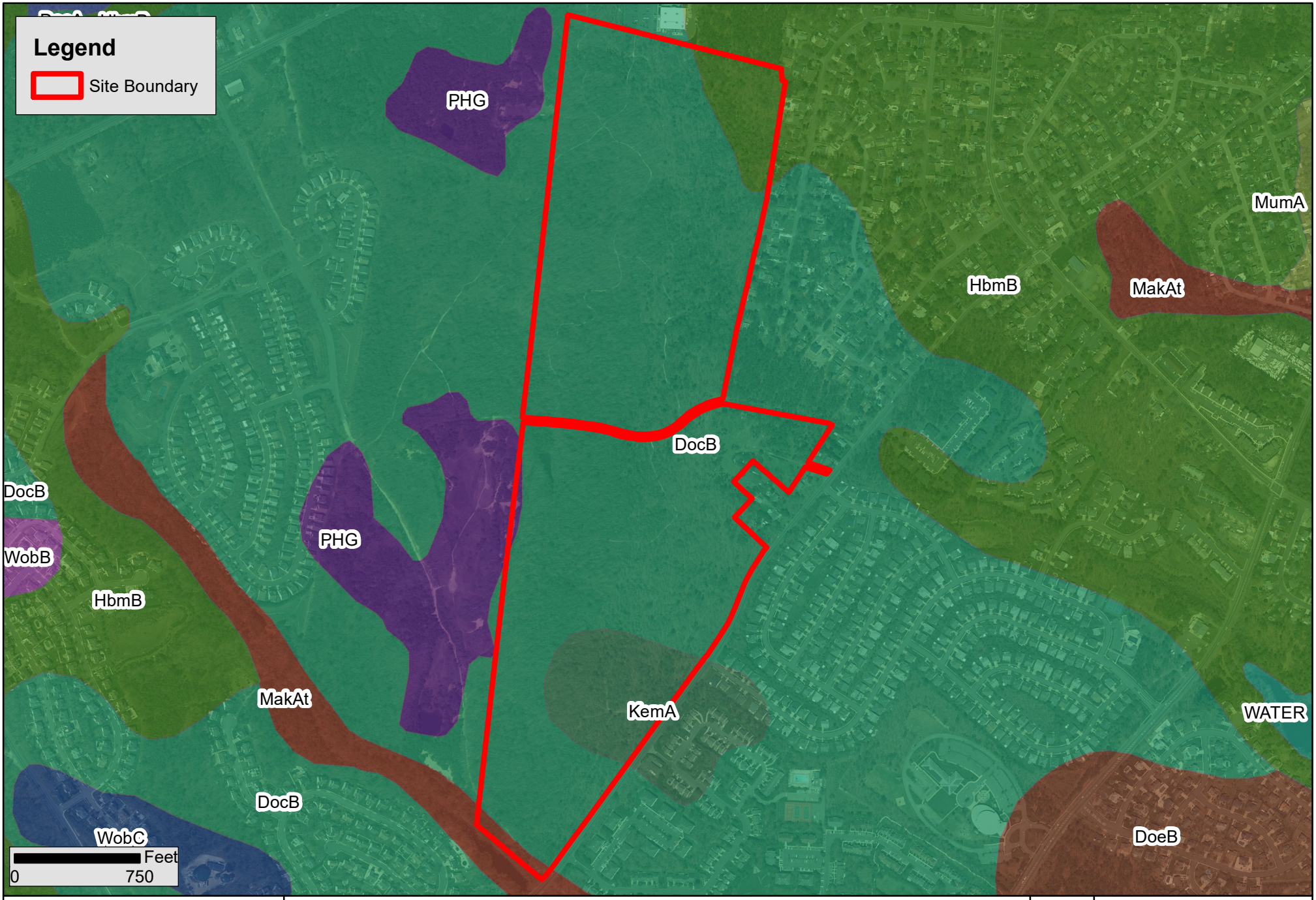

DuBois & ASSOCIATES

Ocean County Soil Survey Map

Block 286 * Lots 3, 5 & 6; Block 287 * Lot 7
Little Egg Harbor Township, Ocean County, NJ

NORTH

Figure 6

Job No.: D1531.018
Scale: 1 in = 750 ft
Date: 3/29/2022
Drawn By: HJ

Document Path: S:\JOBS NUMBERS\D1531.018\Soil.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.

APPENDIX A

SITE PHOTOGRAPHS

Site Photographs
Center Street Project
Little Egg Harbor Township, Ocean County, New Jersey

Photo 1: View of the forested uplands in the central portion of the site.

Photo 2: View of the forested uplands in the northern portion of the site.

Photo 3: View of the forested uplands in the southern portion of the site.

Photo 4: View of the emergent wetland areas in the western central portion of the site.

Photo 5: View of the open emergent wetland area in the southern portion of the site.

Photo 6: Additional view of the open emergent wetland area in the southern portion of the site.

Photo 7: View of the forested upland sin the northeastern portion of the site.

Photo 8: View of the forested uplands in the central eastern portion of the site.

APPENDIX B

NATURAL HERITAGE PROGRAM RESPONSE

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE PARKS, FORESTS & HISTORIC SITES
OFFICE OF NATURAL LANDS MANAGEMENT
501 East State Street
P.O. Box 420, Mail Code 501-04
Trenton, New Jersey 08625-0420
Tel. (609) 984-1339 * Fax (609) 984-1427
https://www.nj.gov/dep/parksandforests/natural/index.html

PHILIP D. MURPHY
Governor

TAHESHA L. WAY
Lt. Governor

SHAWN M. LATOURETTE
Commissioner

September 23, 2024

Abigail Spagnola
DuBois & Associates
190 North Main Street
Manahawkin, NJ 08050

Re: Center Street
Block(s) - 286; 287, Lot(s) - 3, 5, 6; 7
Little Egg Harbor Township, Ocean County

Dear Abigail Spagnola:

Thank you for your data request regarding rare species information for the above referenced project site.

Searches of the Natural Heritage Database and the Landscape Project (Version 3.3) are based on a representation of the boundaries of your project site in our Geographic Information System (GIS). We make every effort to accurately transfer your project bounds from the map(s) submitted with the Natural Heritage Data Request Form into our GIS. We do not typically verify that your project bounds are accurate, or check them against other sources.

We have checked the Landscape Project habitat mapping and the Biotics Database for occurrences of any rare wildlife species or wildlife habitat on the referenced site. The Natural Heritage Database was searched for occurrences of rare plant species or ecological communities that may be on the project site. Please refer to Table 1 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented on site. A detailed report is provided for each category coded as 'Yes' in Table 1.

We have also checked the Landscape Project habitat mapping and Biotics Database for occurrences of rare wildlife species or wildlife habitat in the immediate vicinity (within ¼ mile) of the referenced site. Additionally, the Natural Heritage Database was checked for occurrences of rare plant species or ecological communities within ¼ mile of the site. Please refer to Table 2 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented within the immediate vicinity of the site. Detailed reports are provided for all categories coded as 'Yes' in Table 2. These reports may include species that have also been documented on the project site.

The Natural Heritage Program reviews its data periodically to identify priority sites for natural diversity in the State. Included as priority sites are some of the State's best habitats for rare and endangered species and ecological communities. Please refer to Tables 1 and 2 (attached) to determine if any priority sites are located on or in the immediate vicinity of the site.

A list of rare plant species and ecological communities that have been documented from the county (or counties), referenced above, can be downloaded from https://nj.gov/dep/parksandforests/natural/heritage/database.html. If suitable habitat is present at the project site, the species in that list have potential to be present.

Status and rank codes used in the tables and lists are defined in EXPLANATION OF CODES USED IN NATURAL HERITAGE REPORTS, which can be downloaded from https://nj.gov/dep/parksandforests/natural/docs/nhpcodes_2010.pdf.

NHP File No. 24-3907453-31391

Beginning May 9, 2017, the Natural Heritage Program reports for wildlife species will utilize data from Landscape Project Version 3.3. If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend that you visit the interactive web application at the following URL, https://njdep.maps.arcgis.com/apps/webappviewer/index.html?id=0e6a44098c524ed99bf739953cb4d4c7, or contact the Division of Fish and Wildlife, Endangered and Nongame Species Program at (609) 292-9400.

For additional information regarding any Federally listed plant or animal species, please contact the U.S. Fish & Wildlife Service, New Jersey Field Office at http://www.fws.gov/northeast/njfieldoffice/endangered/consultation.html.

Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements (species and/or ecological communities) or their locations. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,

Robert J. Cartica
Administrator

c: NHP File No. 24-3907453-31391

Table 1: On Site Data Request Search Results (6 Possible Reports)

Report Name	Included	Number of Pages
1. Possibly on Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites On Site	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.3 Species Based Patches	Yes	1 page(s) included
4. Vernal Pool Habitat on the Project Site Based on Search of Landscape Project 3.3	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.3 Stream Habitat File	No	0 pages included
6. Other Animal Species On the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	No	0 pages included

Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.3 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Amphibia								
	Fowler's Toad	Anaxyrus fowleri	Occupied Habitat	2	NA	Special Concern	G5	S3
	Pine Barrens Treefrog	Hyla andersonii	Breeding Sighting	3	NA	State Threatened	G4	S2
	Pine Barrens Treefrog	Hyla andersonii	Occupied Habitat	3	NA	State Threatened	G4	S2
Aves								
	Black Skimmer	Rynchops niger	Foraging	4	NA	State Endangered	G5	S1B,S1N
	Black-crowned Night-heron	Nycticorax nycticorax	Foraging	3	NA	State Threatened	G5	S2B,S3N
	Caspian Tern	Hydroprogne caspia	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Common Tern	Sterna hirundo	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Cooper's Hawk	Accipiter cooperii	Breeding Sighting	2	NA	Special Concern	G5	S3B,S4N
	Cooper's Hawk	Accipiter cooperii	Nest	2	NA	Special Concern	G5	S3B,S4N
	Glossy Ibis	Plegadis falcinellus	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Little Blue Heron	Egretta caerulea	Foraging	2	NA	Special Concern	G5	S3B,S3N
	Red-shouldered Hawk	Buteo lineatus	Breeding Sighting	4	NA	State Endangered	G5	S1B,S3N
	Snowy Egret	Egretta thula	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Tricolored Heron	Egretta tricolor	Foraging	2	NA	Special Concern	G5	S3B,S3N

Vernal Pool Habitat on the Project Site Based on Search of Landscape Project 3.3

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Potential vernal habitat area	598

Total number of records: 1

Table 2: Vicinity Data Request Search Results (6 possible reports)

Report Name	Included	Number of Pages
1. Immediate Vicinity of the Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites within the Immediate Vicinity	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Species Based Patches	Yes	2 page(s) included
4. Vernal Pool Habitat In the Immediate Vicinity of Project Site Based on Search of Landscape Project 3.3	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat In the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Stream Habitat File	No	0 pages included
6. Other Animal Species In the Immediate Vicinity of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	No	0 pages included

Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Amphibia								
	Fowler's Toad	Anaxyrus fowleri	Occupied Habitat	2	NA	Special Concern	G5	S3
	Pine Barrens Treefrog	Hyla andersonii	Breeding Sighting	3	NA	State Threatened	G4	S2
	Pine Barrens Treefrog	Hyla andersonii	Occupied Habitat	3	NA	State Threatened	G4	S2
Aves								
	Barred Owl	Strix varia	Breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Barred Owl	Strix varia	Non-breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Black Skimmer	Rynchops niger	Foraging	4	NA	State Endangered	G5	S1B,S1N
	Black-crowned Night-heron	Nycticorax nycticorax	Foraging	3	NA	State Threatened	G5	S2B,S3N
	Caspian Tern	Hydroprogne caspia	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Common Tern	Sterna hirundo	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Cooper's Hawk	Accipiter cooperii	Breeding Sighting	2	NA	Special Concern	G5	S3B,S4N
	Cooper's Hawk	Accipiter cooperii	Nest	2	NA	Special Concern	G5	S3B,S4N
	Glossy Ibis	Plegadis falcinellus	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Little Blue Heron	Egretta caerulea	Foraging	2	NA	Special Concern	G5	S3B,S3N
	Red-shouldered Hawk	Buteo lineatus	Breeding Sighting	4	NA	State Endangered	G5	S1B,S3N
	Snowy Egret	Egretta thula	Foraging	2	NA	Special Concern	G5	S3B,S4N

Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
	Tricolored Heron	Egretta tricolor	Foraging	2	NA	Special Concern	G5	S3B,S3N
Reptilia								
	Eastern Box Turtle	Terrapene carolina carolina	Occupied Habitat	2	NA	Special Concern	G5T5	S3
	Northern Pine Snake	Pituophis melanoleucus melanoleucus	Occupied Habitat	3	NA	State Threatened	G4T4	S2
	Timber Rattlesnake	Crotalus horridus horridus	Occupied Habitat	4	NA	State Endangered	G4T4	S1

Vernal Pool Habitat
In the Immediate Vicinity of
Project Site Based on Search of
Landscape Project 3.3

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Vernal habitat area	2695
Potential vernal habitat area	598

Total number of records: 2

APPENDIX C

STATEMENT OF QUALIFICATIONS

Kristin Wildman
Sr. Environmental Consultant/Project Manager
kwildman@denviro.com

190 North Main Street
Manahawkin, NJ 08050
609-488-2857

Education:

B.S. Environmental Science
Concentration: Atmospheric Science
University of Delaware – 2002

Certifications:

Professional Wetland Scientist-
Society of Wetland Scientists

Continuing Education:

Rutgers University
Methodology for Delineating Wetland, Hydric Soils & Wetland Vegetation Identification

The Role of the Environmental Consultant in Litigation

NJDEP Coastal Project Review

NJDEP Flood Hazard Area Control Act Rules

Environmental Audits & Site Assessments

Environmental Data Resources
Vapor Intrusion Risk & Due Diligence Challenges in the Real World

MAPPS Training Workshop
Hydric Soils

Professional Affiliations:

The Society of Wetland Scientists
- Member

New Jersey Chapter of the Society of Women Environmental Professionals
- Member

Environmental Assessment Association
-Certified Environmental Inspector
2007 – present

Fields of Competence:

Kristin Wildman has over 20 years of experience in the fields of land use regulatory compliance, wetland science, soil science, biology and ecology. She has extensive experience in managing a variety of projects from the initial field study stage through various regulatory application and approval processes, including coordination with regulatory personnel. Mrs. Wildman has the knowledge and experience to identify applicable regulations, develop appropriate permitting strategies, prepare required permit applications and oversee NJDEP, NJPC and USACE application review. Mrs. Wildman has a respected professional relationship with various municipal and county agencies, NJDEP, NJPC, USFWS and USACE personnel. She conducts various environmental site assessments, development feasibility studies, dune delineations, wetland delineations, rare species habitat evaluations and population surveys.

Professional Experience:

Mrs. Wildman is a senior environmental consultant and project manager with the firm of DuBois and Associates. She manages all aspects of a project and coordinates specifically with a variety of clients to organize projects and proposals. Mrs. Wildman manages each individual project to ensure all appropriate and applicable regulations and tasks are implemented to facilitate successful completion/approval of the project.

Mrs. Wildman coordinates directly with professional engineers, attorneys, clients, and regulatory agencies to evaluate compliance and design of projects pursuant to various environmental regulations, inclusive of the Coastal Zone Management Rules, Freshwater Wetlands Protection Act Rules, Flood Hazard Area Control Act Rules, Pinelands Comprehensive Management Plan, Section 10 of the River and Harbors Act and Section 404 of the Clean Water Act. Mrs. Wildman works diligently on behalf of our clients, to obtain regulatory approvals and permits related to activities and projects involving the CAFRA Area, Waterfront Area, wetlands and waterways and their regulated buffer zones and other environmentally sensitive areas. Based on the permit analyses and project designs, she prepares compliance statements and provides all logistical and technical support to obtain environmental permits pursuant to the NJDEP and USACE regulations. She also prepares and oversees applications for NJDEP Bureau of Tidelands Management conveyance instruments. Mrs. Wildman continuously stays up to date with changing environmental regulations.

Mrs. Wildman is responsible for performing wetland delineations under the jurisdiction of multiple agencies, which are conducted pursuant to the interagency evaluation procedures. This includes expertise in analyzing the vegetation and technical indicators of hydrology and soils. She authors Freshwater Wetland Delineation Reports and prepares Freshwater Wetland Letter of Interpretation applications for submittal to the NJDEP for verification of the delineated wetland limits. Mrs. Wildman is also responsible for conducting subaquatic vegetation inventories and shellfish habitat evaluations and surveys.

Mrs. Wildman is responsible for conducting development feasibilities, wetland delineations, natural resource inventories, threatened/endangered species habitat assessments and directed surveys, and monitoring activities. Mrs. Wildman has experience with the survey and sampling protocols required under the jurisdiction of the USFWS, NJDEP, and Pinelands Commission for threatened and endangered species surveys. Mrs. Wildman also conducts vegetation inventories within a variety

Kristin Wildman
Sr. Environmental Consultant/Project Manager
kwildman@denviro.com

190 North Main Street
Manahawkin, NJ 08050
609-488-2857

Career Positions:

The Lomax Consulting Group, LLC
Cape May Court House, NJ-
Environmental Analyst 2004-2007
Environmental Consultant 2007-2010
Senior Consultant / Director of Technical Services 2010-2016

DuBois and Associates, LLC
Manahawkin, NJ –
Sr. Environmental Scientist / Project Manager
2017 – Present

of biotic communities throughout New Jersey. These have included species specific surveys for numerous target plants considered rare State and/or Federally listed.

Mrs. Wildman has prepared lectures and presented to numerous local and state agencies. These presentations include *Amphibian/Reptiles of the New Jersey Coastal Plains* to local schools, *New Jersey Department of Environmental Protection Division of Land Use Regulation Regulatory Reform* to the New Jersey Department of State Red Tape Review Commission and *Environmental Constraints at the Cape May and Millville Airports* to the Delaware River & Bay Authority.

Mrs. Wildman has also conducted numerous volunteer survey efforts in coordination with the USFWS. These survey efforts include federally directed amphibian / reptile surveys and swamp pink population surveys.

Representative Projects of Relevance:

Atlantic Capes, Lund's Fisheries and Cold Spring Fish & Supply Co. Ports Rehabilitation
Ecological and environmental work was completed to assist commercial fisheries clients in conducting environmental constraints evaluations and permit analyses for improvements to their commercial facilities. Mrs. Wildman works directly with the engineers in assisting with design of the project to ensure compliance of proposed improvements pursuant to State waterfront development, CAFRA, freshwater wetlands, and flood hazard regulations. Mrs. Wildman also coordinates with the NJDEP and USACOE with regard to permit requirements and to ensure no adverse impacts to documented state and federal threatened and endangered species habitat. Mrs. Wildman prepared all necessary permit applications and ensured continued cooperative coordination with the regulatory agencies to ensure receipt of the applicable permit approvals for the port projects.

Nichomus Run Solar and Sheep Farm
Provided environmental and ecological support to a major development firm to assist in the state and local approvals of a large scale solar energy project. Mrs. Wildman prepared an Environmental Impact Report upon land proposed for the construction of a 150 Megawatts photovoltaic (PV) facility. She supervised site investigations of the entire site to observe and inventory hydrology, freshwater wetlands, soils, vegetation communities, wildlife, ecotone areas, and existing and surrounding land uses. Mrs. Wildman was also responsible for the delineation of on-site wetlands, testimony at the municipal zoning board use variance hearing, preparation of an application report and environmental report for a Flood Hazard Verification and a Freshwater Wetland Letter of Interpretation Line Verification application to New Jersey Department of Environmental Protection.

First Energy X-50 Submarine Cable Crossing Repair
Prepared and submitted several NJDEP Waterfront Development Individual Permits pursuant to the Coastal Zone Management Rules and Flood Hazard Area Control Act Rules, as well as (USACE) Department of Army Permits for proposed utility route repairs between Berkeley Township and Seaside Park Borough in Ocean County. DuBois was also responsible for conducting submerged aquatic vegetation (SAV) surveys along the project route consistent with National Marine Fisheries Service conditions. Survey methods utilized two-tiered approach pursuant to the Joint Federal Agency Submerged Aquatic Vegetation Survey Guidance for the New England Region. DuBois worked with a subcontractor and utilized side scan sonar as an alternative method for measuring seagrass cover in this shallow environment.

Abigail Spagnola
Environmental Scientist
aspagnola@denviro.com

190 North Main Street
Manahawkin, NJ 08050
609-488-2857

Education:

B.S. in Environmental Science
Stockton University -- 2019

P.S.M in Environmental Science with a Concentration in Ecology
Stockton University
2020

Certifications:

Delaware DNREC Sediment & Stormwater Program Blue Card Certification B 2019/12/12 000

Continuing Education:

Bats and Bridges Survey Training hosted by USFWS and NJDEP

NJ Boating Safety Certificate

Career Positions:

DuBois & Associates, Manahawkin, NJ – Environmental Scientist, 2019 – Present

Professional Experience:

Mrs. Abigail Spagnola is an Environmental Scientist with the firm of DuBois & Associates. She is responsible for faunal and floral sampling investigations, environmental site assessments and on-site soil analysis. She also handles any technical support needed in various rare, threatened and endangered species studies. Since starting at DuBois & Associates, Mrs. Spagnola has assisted with studies on several species such as Northern Red-bellied Cooter, Red Shouldered Hawks, Pine Snakes, Corn Snakes, Barred Owls, Indiana Bats, Northern Long Eared Bats, Ospreys, and Bald Eagles. These activities include helping with directed visual surveys, implementation of data collection and habitat analysis.

Mrs. Spagnola has assisted in habitat and visual surveys for Bog Turtles in New Jersey and Pennsylvania. She has also assisted with the maintenance and operation of multiple ecological trapping arrays, including drift fence-box funnel traps designed to capture threatened and endangered snake species.

Mrs. Spagnola is also responsible for the organization and execution of various environmental reports including Preliminary Assessments, Phase I environmental assessments, Letter of Interpretation (LOIs), feasibility studies, site assessments, CAFRA permits, and various State General Permits for submittal to the New Jersey Department of Environmental Protection (NJDEP).

In conjunction with performing surveys for a variety of environmental/ecological assessments, Mrs. Spagnola has gained extensive experience using ESRI Arc Map Geographic Information Systems (GIS) software and global positioning systems (GPS). Maps are created to depict a visual representation for clients of site-specific characteristics in relation to various projects. These tools are also used in mapping species such as turtles, bats and snakes.

Mrs. Spagnola also performs biological/environmental construction monitoring associated with utility right-of-way's throughout New Jersey. Environmental oversight ensures the project is conducted in an environmentally responsible manner and in accordance with all applicable SESC standards and best management practices. Biological oversight in and around sensitive habitats ensures that the project does not have any adverse impacts to sensitive habitats or rare faunal and floral species.

Projects of Relevance:

Phase 1 and Phase 2 Bog Turtle Surveys along Several Transmission Line Upgrade Projects within Lancaster, Northampton, Lebanon, Adams and Berks Counties, PA: Performed phase 1 and phase 2 bog turtle surveys under the supervision of a qualified bog turtle surveyor. Assessed numerous wetlands for bog turtle habitat suitability and performed phase 2 surveys within wetlands determined to contain suitable habitat parameters. These surveys were coordinated with the USFWS, the PA Fish and Boat Commission, and the NJDEP.

Abigail Spagnola
Environmental Scientist
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609-488-2857

Education:

Mrs. Spagnola received a Bachelor of Science degree from Stockton University in Environmental Science in May of 2019. While attending Stockton University, Mrs. Spagnola selected upper-level classes including freshwater ecology, wildlife management, soil science, ecological forest management, and geographic information systems. All classes were supplemented with hands-on laboratory experience using professional techniques, as well as site-specific trips for fieldwork.

Mrs. Spagnola received a Professional Science Master degree from Stockton University in Environmental Science in May of 2020. Mrs. Spagnola selected ecological classes including ecosystem ecology, wetlands ecology, plant ecology, land use planning and environmental quality. Mrs. Spagnola conducted research on the federally endangered bog turtle during her Masters' program.