2.8 NATURAL RESOURCES

2.8.1 INTRODUCTION

This chapter describes the natural resources within the Development Area of the Charleston Mixed Use Development project. As discussed in **Chapter 2**, "Project Description," the Development Area includes the proposed ~~location~~ locations of new retail, park, school and housing developments, along with the ~~mapping~~ area to be mapped and ~~completion of~~ completed as Englewood Avenue from Arthur Kill Road to Veterans Road West. Of particular importance to the analysis in this chapter is the segment of the proposed Englewood Avenue Corridor from Kent Street just east of the proposed school site to Veterans Road West, between the Clay Pit Ponds State Park Preserve ("CPPSPP") and the 20-acre Conservation Area. Natural resources ~~identified~~ discussed in this chapter include: existing topography, geology, soils, natural communities, floodplains, water bodies, wetlands, vernal pools, habitat, flora, and fauna (birds, insects, herptofauna, mammals).

~~An~~In 2007-2008, an evaluation of the natural resources found within the Development Area, the entire Conservation Area, and adjacent properties along Arthur Kill Road was conducted ~~from 2007 through 2008~~, the sampling areas, methodologies, and results of which are contained in the document ~~*Final*~~ *Draft Report: Natural Resources Assessment at Charleston, Staten Island* (AKRF, 2009 ~~Natural Resources Report~~), dated June 29, 2009, which is included in **Appendix C**. The 2007-2008 ~~survey conducted~~ assessment included a four-season survey of fauna and flora throughout the Development Area and Conservation Area and a wetland delineation ~~within~~ in the vicinity of Englewood Avenue.

Since the 2007-2008 survey occurred, several notable changes to the surveyed area's vegetation have occurred:

- The MTA built a bus annex facility along the eastern side of Arthur Kill Road just west of the Development Area, which resulted in the loss of established vegetation due to grading activities which replaced ground cover and grasses, and all vegetation in the area was removed; and

- In 2009, a fire burned approximately 10 acres within the Development Area, primarily in the southern portion of the proposed Fairview Park. This fire was a contributing factor in shaping the vegetative communities in the Development Area. from a wooded area to a field with dense growths of cat briar. This has likely lowered the ecological value of the parcel.

Due to these changes in vegetation and the four years that have elapsed since the previous survey, additional studies were performed ~~for this EIS~~ from June through late November 2012 and in April 2013, to identify natural resources in the Development Area. The studies were specifically targeted to document changes in onsite vegetation as a result of the 2009 fire and to perform a site-wide wetland ~~investigation~~ delineation, vernal pool survey, and tree survey~~, and update other findings regarding~~. Also, observations were performed to document the ~~site's~~ flora and fauna~~. With~~ species that occur on site to supplement the ~~existing natural resource inventory established~~ findings of the four-season survey conducted in 2007-2008. After the data were collected and analyzed, an assessment was performed of the potential for development associated with the Proposed Project to adversely impact natural resources within the Development Area and indirectly impact adjacent areas within the CPPSPP and the Conservation Area.

2.8.2 METHODOLOGY

The *CEQR Technical Manual* defines natural resources as ~~areas "capable of providing~~(i) plants, wildlife and other organisms, (ii) habitat ~~for plant~~ to sustain such organisms, and ~~animal species or~~(iii) areas capable of functioning ~~to~~in support ~~environmental~~ of ecological systems ~~and~~ that maintain ~~the City's~~ environmental ~~balance."~~ stability. In order to document the natural resources in the Development Area

~~and the proposed construction limits of Englewood Avenue~~, faunal surveys were conducted from June through November. Vegetation on site was documented through seasonal observations at 20 established study plots, a tree survey, and a threatened and endangered species search. A wetland delineation was also performed. A description of the methods ~~uses~~ used in these surveys is provided below. A glossary of technical terms is found in Appendix C.

Natural resource scientists performed natural resource surveys on approximately 45 individual days from June through late November 2012 and in April 2013. The scientists included certified ecologists, arborists, and wetland delineators with extensive experience designing and conducting natural resource surveys including performing avifauna, herptofauna, invertebrate (insect), mammal, threatened and endangered species, vegetation, wetland and/or vernal pool surveys in the tri-state area, as well as throughout the United States, Caribbean, and/or the south Pacific. The wetland delineation was lead by a state (Minnesota[1]) certified wetland delineator who has conducted numerous wetland delineations in New York and New Jersey. To aid scientists, temporary game cameras were also erected and deployed throughout the Development Area to collect photographs of fauna when the scientists were not on site.

In order to quantify the ecological value of the Development Area, faunal and floral surveys were conducted. A description of the methods used in these surveys is provided below.

2.8.2.1 Flora Studies

~~AECOM~~ Credentialed (as described above) scientists traversed the Development Area in late June/early July, and ~~again in mid-~~September ~~and identified~~ to early October to identify all observed plant species. ~~Also, the vegetation list~~ Vegetation on site was ~~supplemented~~ documented by~~: (1) vegetation sampling~~ mapping ecological communities, seasonal observations at 20 established study plots (see **Figure 2.8-1**); ~~(2)~~ a tree survey, a site-wide vegetation inventory, and a threatened and endangered ~~plant~~ species search~~; (3) observations performed during the~~ . A wetland delineation~~; and (4) other~~ and vernal pool survey were also performed.

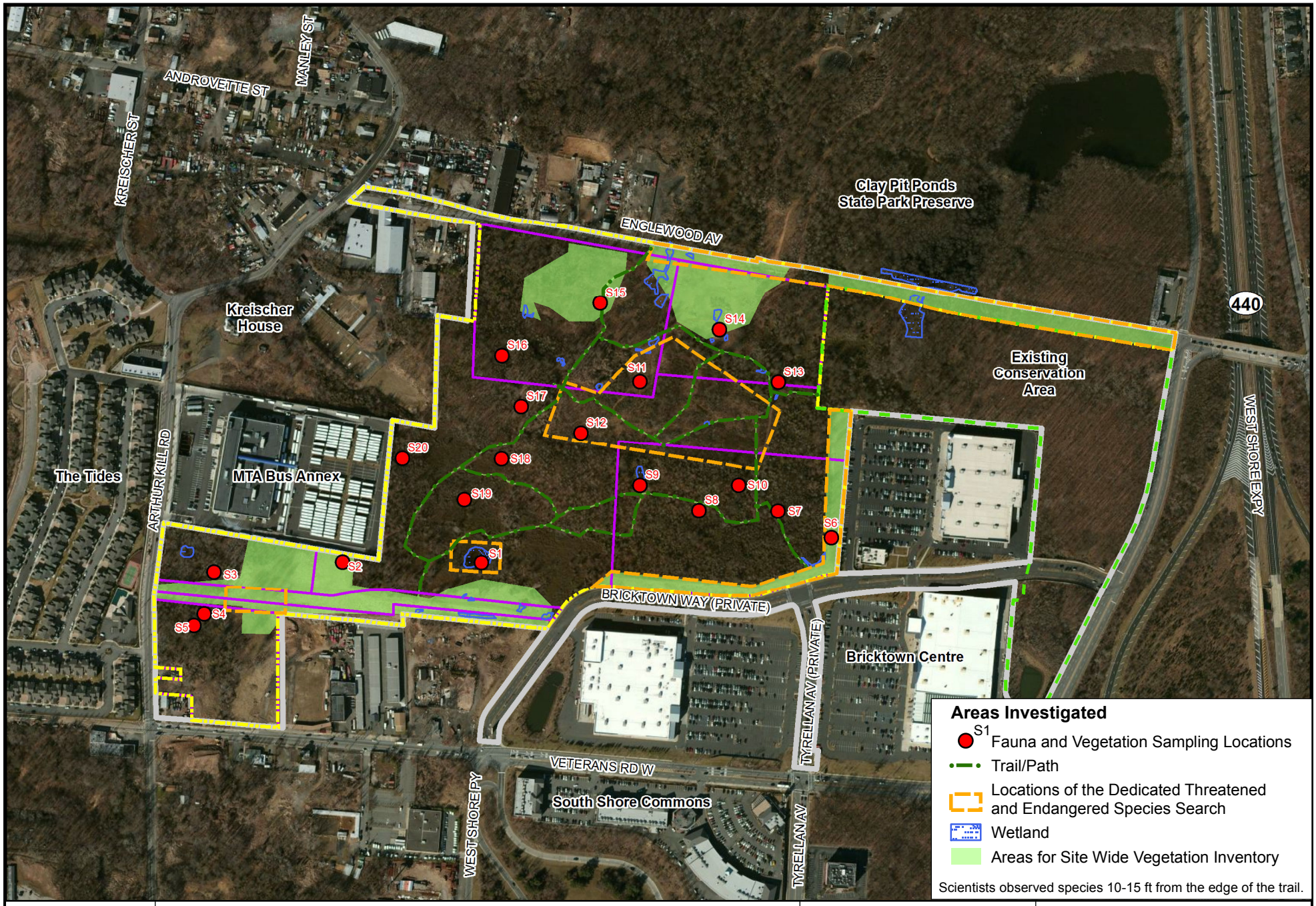
Mapping of Ecological Communities

All habitat boundaries (i.e., ecological communities[2]) were mapped and defined in accordance with the *Ecological Communities of New York State* (Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2002. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. (Draft for review). New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY. The boundaries of the ecological communities were identified based on areas of similar vegetation (e,g, canopy height, species, etc.) using information from detailed field observations ~~made during~~(described below). These collected data were then compared to the ~~fauna surveys~~ ecological communities' descriptions identified in Edinger et al., 2002.

Vegetation Sampling Plots

~~In order to identify the plant species on site, twenty (~~Within the Development Area's ecological communities, 2~~0)~~ vegetation sampling plots ~~(sample plots)~~ were located throughout the site (see **Figure 2.8-1**). ~~These plots~~ Plots were surveyed in the summer (July) and again in the fall (early October). ~~The vegetation analysis consisted of identifying all~~ Based on site visits, sample plot locations were selected in order to sample the various ecological communities on site. In June 2012, scientists traversed the site in order to identify the general covertypes on site. Scientists then reviewed the 2007-2008 report to note any substantial changes in covertypes. Sample locations were selected in order to characterize the various covertypes observed on site in 2012 as well as the area that burned in 2009. The vegetated sampling

[1] The state of New York does not have a wetland delineator certification.
[2] An ecological community is a variable assemblage of interacting plant and animal populations that share a common environment. (Edinger et al., 2002.)



AECOM

Legend

Project Area
Development Area
Conservation Area
Site Boundary

0 125 250 500 Feet

1 inch = 500 feet

N

Source: Bing Aerial Map.

Charleston Mixed-Use Development

Figure 2.8-1

Fauna and Vegetation Sampling Locations

methods selected were similar to those methods used in the 2007-2008 survey. These methods included the following:

• All tree species, including those with a diameter at breast height (dbh) of less than six inches or rare species, within a 30-~~foot~~ft radius of the center ~~point~~ of the sample ~~plots. Tree species~~ plot were identified by stem count, ~~diameter at breast height (dbh),~~dbh, and percent coverage. ~~Also,~~

• Shrubs and vines were identified by stem count and percent coverage within ~~the circular plot,~~ a random ~~2~~two meter by ~~5~~five meter sub-plot ~~was utilized to identify all shrubs and vines by stem count and percent coverage. Finally, nine~~ within the sample plot.

• Nine, one-square meter random sub-plots within the sample plot were selected to estimate percent coverage of herbaceous species.

Twenty vegetation sampling plots were located throughout Development Area (see **Figure 2.8-1**).

Development Area-wide Vegetation Inventory

On October 5, 2012, natural resource scientists conducted a vegetation inventory within the Development Area. During the inventory, the scientists traversed all trails, paths, former access roads, and open fields within the Development Area. While traversing the Development Area, the scientists noted every observed plant species and listed them according to location in the following areas:

- Footpaths, trails, Former Access Roads;
- Woodlands; 50 Percent of Canopy Less than 25 Feet;
- Woodlands; 50 Percent of Canopy Height Over 25 Feet;
- Open Fields;
- Wetlands; and
- Englewood Avenue Corridor between CPPSPP and the Conservation Area

Tree Survey

A tree-survey was performed in the Development area from December 2012 ~~and~~ to January 2013. ~~On site, a~~A licensed surveyor identified all trees greater than 6 inches dbh. Natural resource scientists then located every tree of ~~6~~ six-inches or greater dbh and identified the tree species and measured the dbh.

Threatened and Endangered Plant Species

Surveys were conducted to document the presence/absence of rare plants on site during the 2012 growing season. The search was conducted by natural resource scientists in the following areas: (1) the portion of the proposed Englewood Avenue between the CPPSSP and the Conservation Area, and extending west into a small portion of the proposed senior housing site; (2) successional old field habitat at the center of the Development Area (over the proposed development sites for Fairview Park, Retail Site "A", the senior housing and public school); (3) a narrow segment of successional old field just west of Bricktown Way; (4) the successional old field habitats located at the southwest corner of the Development Area (where Retail Site "B" is proposed), south of the MTA Bus Annex; and (5) a successional old field habitat north of Bricktown Way and extending north into the proposed site of Retail Site "A" (See **Figure 2.8-1** in **Section 2.8.3.6**). The surveys included: (1) observation of all ~~herbaceous~~ plants within the ~~20,~~twenty 30-ft diameter survey plots; (2) a ~~site~~ Project Area-wide tree survey, (3) a ~~site~~ Project Area-wide vegetation inventory; and (~~3~~4) a dedicated threatened and endangered species search that consisted of a new examination of areas identified in 2007-2008 that reportedly contained threatened and endangered species

During the search, scientists traversed each area in its entirety and identified each species they observed. If a threatened or endangered species was observed in an area, it was noted. The dedicated threatened species search was conducted on September 6, 2012, the height of the flowering period for many of the listed species previously identified in the 2007-2008 study.

~~For the dedicated threatened species search, resource scientists conducted a search within each of the previously identified sensitive areas. These areas included; (1) portions of the proposed Englewood Avenue between the CPPSSP and the Conservation Area; (2) successional old field habitat at the center of the Development Area; (3) a narrow segment of successional old field just west of Bricktown Way; and (4) the successional old field habitat located at the southwest corner of the Development Area, south of the MTA Bus Annex. Scientists collected information on dominant species within each area as well as any rare species observed.~~

Wetland Delineation

A wetland delineation was conducted within the ~~site~~ Development Area during the first two weeks of July 2012. The delineations were performed in accordance with the United States Army Corps of Engineers (USACE) wetland delineation criteria and methodology, and the *New York State Freshwater Wetlands Delineation Manual* (Browne et. al., 1995). The results of the delineation are discussed in this chapter and provided in the wetland delineation report (**Appendix C**). As part of the delineation, the project team also the boundaries of two wetlands partially within or adjacent to the Englewood Avenue and which extend outside the Development Area into the CPPSPP and the Conservation Area.

Vernal Pool Survey

During the wetland delineation surveys conducted in 2012, natural resource scientists identified areas that had the potential to function as vernal habitat. These areas were subsequently evaluated in the Spring of 2013 using techniques adapted from the New Jersey Department of Environmental Protection's (NJDEP) Land Use Regulation Program (LURP) Freshwater Wetlands Vernal Habitat Protocol[3]. Potential vernal pool ~~habitat was~~ habitats were evaluated to determine ~~whether or not~~ if they meet the following four determining criteria:

1. *Occurs in a confined basin depression without a permanent flowing outlet:* The scientists walked the circumference of the potential vernal habitat area to confirm the absence of an inlet or outlet.

2. *Features evidence of breeding by one or more species of fauna adapted to reproduce in ephemeral aquatic conditions:* Visual and ~~ocular observations~~ audio observations were made to identify presence of obligate or facultative species individuals, larvae, egg masses, or breeding chorus'.

3. *Maintains ponded water for at least two continuous months between March and September of a normal rainfall year:* Scientists made an assessment as to whether or not the studied area would maintain ponded water for two continuous months. Scientists used observations of hydrology during the 2012 wetland delineation and other cursory observations of hydrology to determine the likelihood of long-term ponding.

4. *Is free of fish throughout the year, or dries up at some time during the year:* ~~the area will be~~ areas were visually scanned for the presence of any fish species; for potential vernal pool areas contiguous with deep water habitats will require additional survey of the deep water habitats to determine the potential presence of fish species.

[3] NYSDEC does not have such a formal protocol. ~~New Jersey was selected as an example due~~ Due to its geographic proximity to southern Staten Island, the New Jersey protocol was adapted for use

All delineated wetlands within the entire ~~project area~~ Development Area were reviewed for the presence of vernal habitat. Also, several low depressions that were not wetlands were also evaluated, including two within the Englewood Avenue Corridor south of the existing dirt path. These depressions were located approximately 425 ~~ft~~ feet and 925 ~~ft~~ feet east of Wetland C, respectively.

Natural resource scientists conducted the vernal habitat investigation on April 16th and April 17th, 2013. The surveys were conducted during the optimum time to identify areas that function as vernal pools and/or amphibian breeding habitat i.e., (in the spring, when evening low temperatures remain in the ~~40s~~40 degree Fahrenheit range). The scientists ~~targeted~~ conducted their ~~search to start~~ searches before sunrise to identify vocalizations of amphibians and during mid-day to identify potential basking herptofauna. Both days were warm and sunny.

2.8.2.2 Fauna Studies

Fauna surveys were conducted throughout the Development Area. The surveys occurred within the twenty sampling plots, all wetland areas, the Englewood Avenue Corridor, and locations throughout the Development Area where game cameras were erected. Game cameras were placed within different ecological communities in order to maximize the potential of recording the greatest diversity of organisms. Up to three game cameras were utilized during the ecological surveys. Game cameras were placed within emergent wetlands, coastal oak variant forests, successional old field – variant I, successional shrubland, successional southern hardwoods, and successional northern hardwoods. Game cameras were positioned to capture organisms along game trails, sunning themselves on rocks, and or perching on branches. The game cameras' view sheds were baited with seeds, nuts, peanut butter, and raw meat in order to attract a variety of organisms.

Avian

The avifauna survey was designed to document the species using the Development Area outside the Englewood Avenue corridor. This survey was conducted from mid-June through November within the Development Area. Avian observations occurred during 2012 on June 12th, 14th and 15th, July 9th, August 25th and 27th, September 14th, October 12th and 25th, and November 6th, 14th, 21st, and 27th. The survey dates were selected to determine the avian usage of the area during the end of the spring migration, summer ~~residents~~ residential period, and through the fall migration.

Each survey day started shortly ~~before~~ after sunrise. Scientists traveled to each sample plot (see **Figure 2.8-1**) and recorded all observed (audio and visual) bird species for a five-minute period[4]. After the five-minute sampling period, scientists repeated the five-minute observation in the next location. ~~Any incidental bird species (i.e., species not previously recorded) observed during~~ Scientists traveled from one sample location to another on foot. Travel time between the locations was accomplished within several minutes. During travel in between each ~~five minute~~ survey location, any observed bird species not previously recorded were also recorded. Scientists usually started at Location S1 and surveyed locations in the southwest, northwest, northeast and southeast portions of the site. Also, during the vernal pool survey in April 2013, scientists noted any nesting or courtship behavior as well as walked the proposed 80-~~ft~~foot wide corridor of Englewood Avenue between CCPSPP and the Conservation Area and noted any nesting activity.

Herptofauna and Insects, and Mammals

Searches for herptofauna, insects, and mammals occurred within the Development Area in conjunction with the bird surveys as well as cursory observations for those animal types during wetland delineation, tree survey, and other on-site activities. In addition, as discussed below, cover boards, game cameras (with infrared capabilities), pit fall traps, and track plates supplemented the surveys.

[4] Five minute sampling methods were adapted from Ralph et. al.,(1995) and Huff et. al.(2000).

- Cover boards consisted of two-~~ft~~ foot square plywood sheets (*Photo 1*). At six of the sampling locations shown in **Figure 2.8-1**, two cover boards were placed on the ground. The cover boards were then lightly covered with leaves and sticks and left alone for several weeks. After that time period, the boards were picked up and living organisms (e.g., insects, rodents etc. underneath were documented.

- Game cameras (*Photo 2*) were utilized throughout the survey period (late June through November). Three game cameras were placed throughout the Development Area ~~and the proposed construction of Englewood Avenue~~ in different habitats, elevations and angles to capture avifauna, herptofauna, mammals, nocturnal organisms, etc. Game cameras were placed within different ecological communities in order to maximize the potential of recording the greatest diversity of organisms. Up to three game cameras were utilized during the ecological surveys. Game cameras were placed within emergent wetlands, coastal oak variant forests, successional old field – variant I, successional shrubland, successional southern hardwoods, and successional northern hardwoods. Photos from the game cameras were periodically checked and species noted. In addition, the view sheds of several cameras were baited (e.g., seeds, etc.) to further increase the potential sighting of ~~animals~~ avifauna, herptofauna and mammals that occur in these areas.

- Pit fall traps consisted of 10 smooth-sided plastic bowls that measured 6 inches in diameter. The bowls were placed ~~in~~ near sample locations S1, S2, S3, S17, and S19 in order to sample different habitats ~~and~~ on site. The bowls were buried into the earth so that the top of each bowl was flush with the land. Insects, walking on the ground surface would fall into the bowls and become trapped. These bowls were checked ~~periodically~~ in conjunction with avian surveys, and species documented.

- Track plates, which are used to obtain mammal footprints, were constructed out of laminated sheeting, graphite powder, isopropyl alcohol, and mineral oil. Track plates were placed in animal track paths and ~~investigated.~~ regularly reviewed. In addition to track plates, the trails that are present throughout the Development Area have a good deal of clay content. As such, when wetted, they preserved animal tracks. When ~~travelling through~~ surveying the site, the trails were frequently observed and mammal tracks were identified.

Threatened and Endangered Species

Observations were conducted to determine evidence of threatened and endangered species or habitats that may support them. The investigations included the following activities:

- Within the vegetation sampling plots, the area was visually searched for the evidence of NYSDEC-listed threatened and endangered fauna species. During the wetland delineations and vernal pool survey, the areas were searched for the presence of nest sites, tacks, and egg masses;
- Game camera footage was reviewed. No threatened or endangered fauna were captured on the game camera images.;

- Within the Englewood Area Corridor, searches were performed for evidence (e.g., nest sites, tracks, etc.) of threatened and endangered species. If the scientists observed potential evidence (e.g., nest, tracks, etc.) the evidence was compared to available field guides to make a determination of species. The searches of the area were conducted during initial site visits in June, wetland delineation activities in July and September, and during the vernal pool survey and tree survey.

2.8.2.3 Comparison to 2007-2008 Survey Methodology

As noted in section 2.8.1, a flora and fauna survey was conducted ~~on site~~ within the Development Area, the Conservation Area, and adjacent properties along Arthur Kill Road in 2007-2008. ~~Many of the fauna~~ The 2012 surveys ~~and vegetation surveys in 2012~~ were conducted in an identical manner to the 2007-2008 surveys~~. The~~ with the following differences ~~between the two surveys were as follows:~~:

- Seasonal Surveys: The 2007-2008 survey conducted fauna observations in winter and the entire spring season. The 2012 survey conducted studies from the late spring through the fall. Although, the 2012 survey used game cameras to record fauna when scientists were not present, the 2007-2008 survey did not use game cameras;
- The 2007-2008 survey conducted vegetation studies at sampling plots in early spring (March), early summer and early fall. The 2012 survey conducted vegetation surveys at sampling plots in early summer and early fall;
- The 2007-2008 survey conducted a wetland delineation only along Englewood Avenue. The 2012 survey conducted a wetland delineation throughout the entire Development Area;
- The 2012 survey conducted a ~~site~~ Development Area-wide tree survey, the 2007-2008 survey did not conduct a tree survey; and
- In April 2013, a survey of potential vernal pool habitat on ~~site~~ the Development Area was conducted.

The results of the flora and fauna surveys are presented in Section 2.8.3 of this chapter. The combination of the data from the 2007-2008 and 2012 surveys provide a four-season profile of fauna use of the site and an up-to-date picture of the vegetative coverage and wetland resources on site.

AECOM

PHOTOGRAPHIC LOG

Photo No. 1	Date: December 2012

Description:

Coverboard used in the fauna surveys.

Photo No. 2	Date: June 27, 2012

Description:

Example of a photograph obtained from a game camera on site.

~~The results of the fauna survey and analysis of impacts are presented in section 2.8.3 of this chapter. The combination of the data from the 2007-2008 and 2012 surveys, provide a four-season profile of fauna use of the site and an up-to date picture of the vegetative coverage and wetland resources on site.~~

2.8.3 EXISTING CONDITIONS

The Development Area is an approximately 66-acre undeveloped parcel, including the proposed Englewood Avenue, located in southwestern Staten Island, NY. The northwest, west, south, and southeast boundaries of this area border on roads and commercial properties. The northeast border of the site is contiguous with CPPSPP. As such, combined with the acreage of the CPPSPP and Conservation Area, the site is part of an approximately ~~350~~300 acre undeveloped natural area in New York City. Unlike the CPPSPP and Conservation Area, the Development Area (excluding the Englewood Corridor between CPPSPP and the Conservation Area) is largely dominated by successional vegetation and other conditions as discussed below within the topography, geology and soils; ecological communities; waterbodies, wetlands and vernal pools; flora and fauna surveys; and threatened and endangered species sub-sections.

2.8.3.1 Topography, Geology, and Soils

Elevations within the Development Area vary between 38 and 127 feet above mean sea level (AMSL), with the highest elevations occurring in its west-central portions ~~(see **Figure 2.8-2**).~~ , at the northwestern limit of the proposed Fairview Park. The topography of the area, as shown in **Figure 2.8-2**, is represented by a series of contour lines. The closer these contour lines are to each other, the steeper the terrain. Relatively flat terrain is represented with wide spaces between contours.

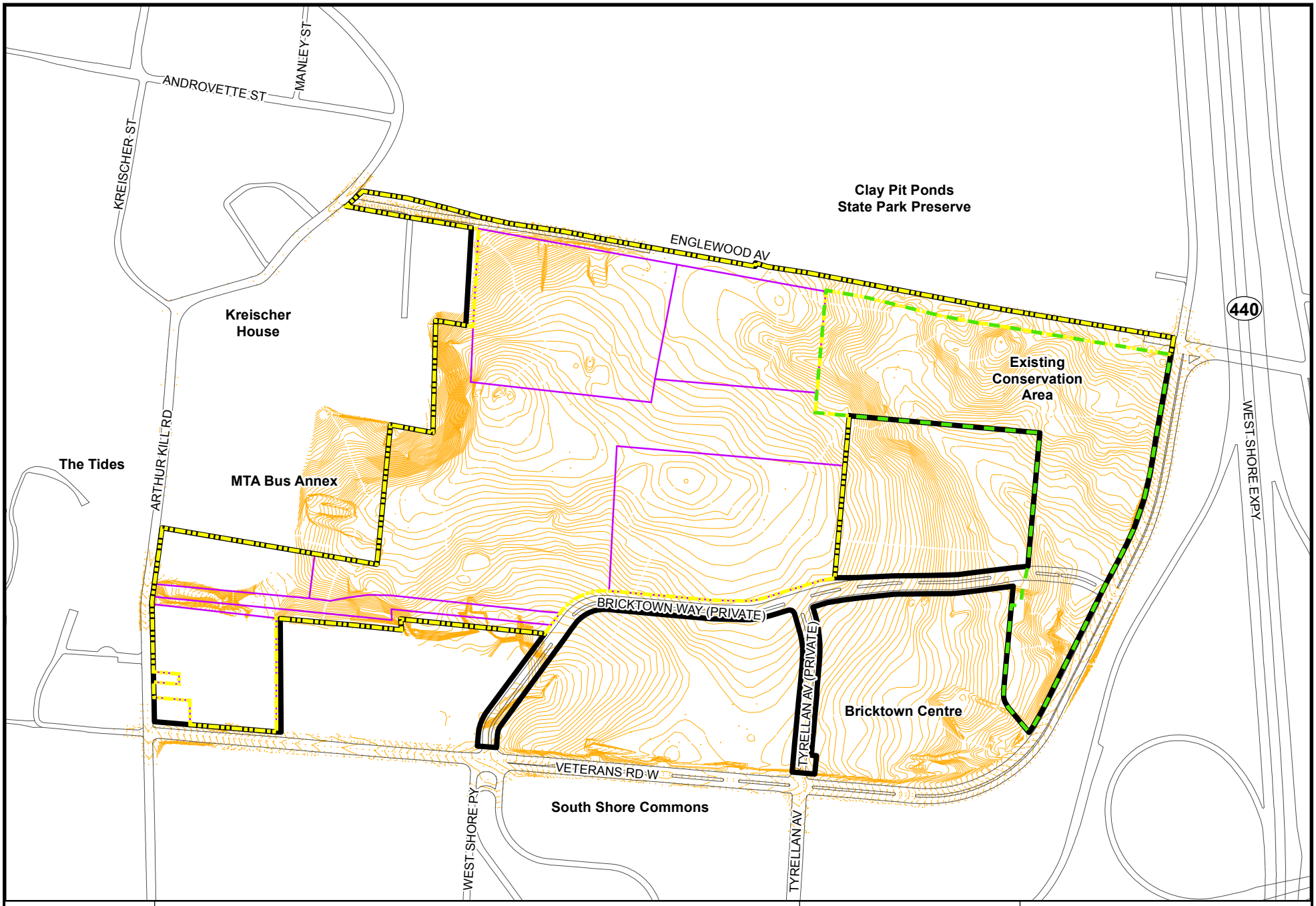
The geology of the ~~Development~~ Project Area is largely dominated by materials deposited during the last Ice Age~~. During the last Ice Age,~~, where the southern boundary of the glacier is represented by the terminal moraine, a line of undulating hills with minor steep slopes. The moraine crosses through Staten Island. After deglaciation, the moraine was covered by glacial till depositions – a layer of loose unconsolidated, poorly sorted material. No outcrops of bedrock were observed on ~~site.~~ the Development Area. A wide variety of soil types were observed (e.g., silty sand, silty clay loam, etc.) ~~During the site investigations, soils generally exhibited limited hydric features, had high clay content and were influenced by red parent material.~~

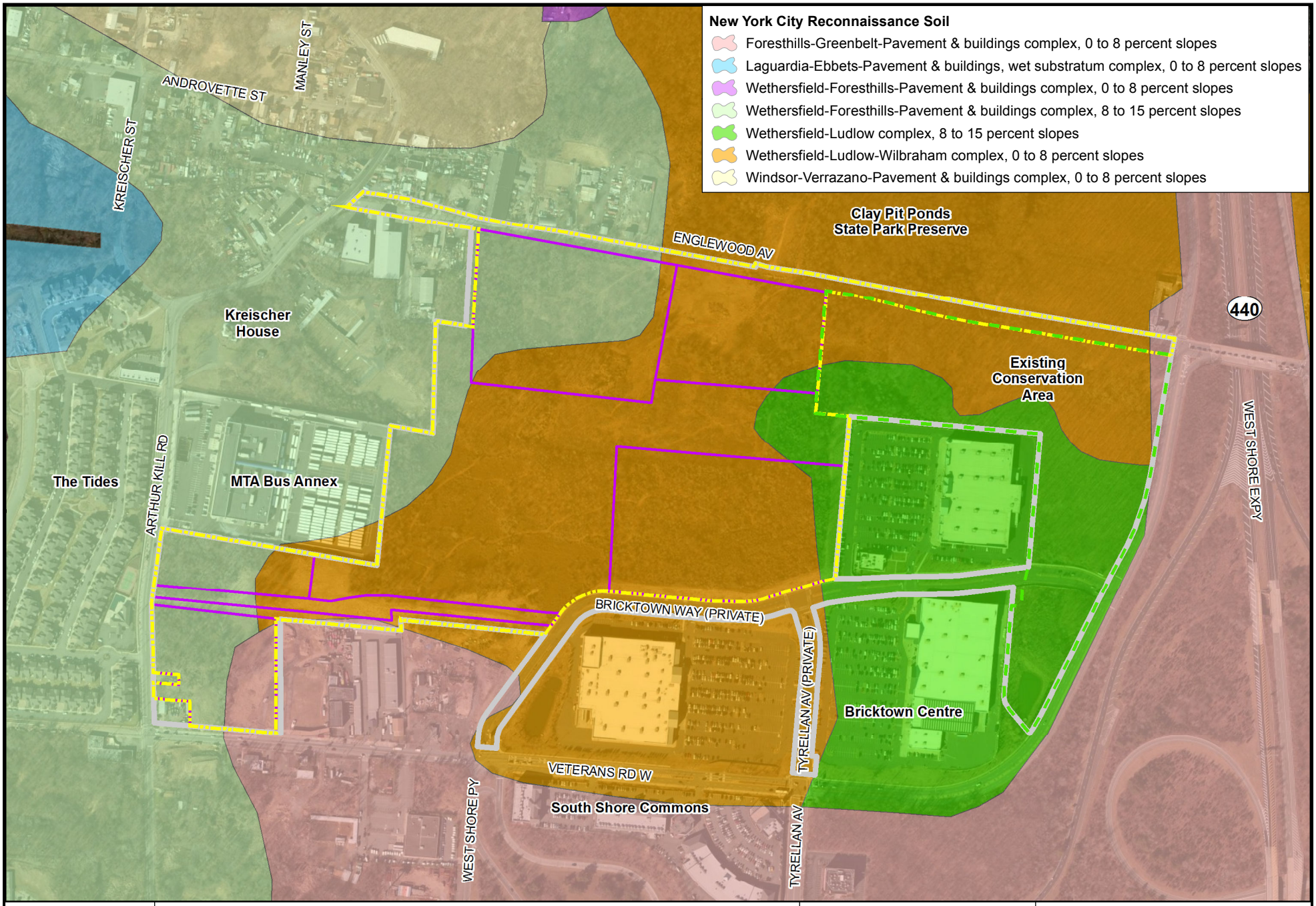
During the site investigations and wetland delineation, soils throughout the Development Area were examined and various soil properties were noted (e.g., texture, hue, value, chroma, hydric features, etc.). Soils generally exhibited a high clay content and were influenced by red parent material. Wetlands formed in low depressions that allowed for the collection and retention of rainwater; however, the presence of red parent material often obscured typical hydric features (e.g., soil color) typically observed in a wetland environment.

The *New York City Reconnaissance Soil Survey ("Soil Survey")*[5] was ~~obtained~~ consulted to determine the ~~mapped soils~~ soil map units within the ~~Development~~ Project Area (see **Figure 2.8-3).** Review of the soil survey indicates the presence of four mapped soil series ~~(see **Figure 2.8-3**).~~. that provided the following standard descriptions for the four mapped soil types:

- Foresthills-Greenbelt-Pavement & buildings complex, 0 to 8 percent slopes: Nearly level to gently sloping areas that have been filled with natural soil materials; a mixture of anthropogenic soils that vary in depth of fill, with more than 15 percent impervious pavement and buildings covering the surface. This soil type was mapped only on a small portion of the ~~southern~~ southwest boundary of the Development Area.

[5] New York City Soil Survey Staff. 2005. New York City Reconnaissance Soil Survey. U.S. Department of Agriculture, Natural Resources Conservation Service, Staten Island, NY.


ANDROVETTE ST
MANLEY ST
KREISCHER ST
ENGLEWOOD AV
Clay Pit Ponds
State Park Preserve
Kreischer
House
Existing
Conservation
Area
440
WEST SHORE EXPY
The Tides
ARTHUR KILL RD
MTA Bus Annex
BRICKTOWN WAY (PRIVATE)
TYRELLAN AV (PRIVATE)
Bricktown Centre
VETERANS RD W
WEST SHORE PY
South Shore Commons
TYRELLAN AV
Legend
Contour (1-foot)
Project Area
Development Area
Conservation Area
Site Boundary
0 125 250 500
Feet
1 inch = 500 feet
N
AECOM
Charleston Mixed-Use
Development
Figure 2.8-2
Site Topography


New York City Reconnaissance Soil
Foresthills-Greenbelt-Pavement & buildings complex, 0 to 8 percent slopes
Laguardia-Ebbets-Pavement & buildings, wet substratum complex, 0 to 8 percent slopes
Wethersfield-Foresthills-Pavement & buildings complex, 0 to 8 percent slopes
Wethersfield-Foresthills-Pavement & buildings complex, 8 to 15 percent slopes
Wethersfield-Ludlow complex, 8 to 15 percent slopes
Wethersfield-Ludlow-Wilbraham complex, 0 to 8 percent slopes
Windsor-Verrazano-Pavement & buildings complex, 0 to 8 percent slopes
ANDROVETTE ST
MANLEY ST
KREISCHER ST
ENGLEWOOD AV
Clay Pit Ponds
State Park Preserve
Kreischer
House
440
Existing
Conservation
Area
WEST SHORE EXPY
The Tides
ARTHUR KILL RD
MTA Bus Annex
BRICKTOWN WAY (PRIVATE)
TYRELLAN AV (PRIVATE)
Bricktown Centre
VETERANS RD W
South Shore Commons
WEST SHORE PY
TYRELLAN AV
Legend
Project Area
Development Area
Conservation Area
Site Boundary
0 125 250 500
Feet
1 inch = 500 feet
N
Source: New York City Reconnaissance Soil Survey, 4/7/2006 and Bing Aerial Map.
AECOM
Charleston Mixed-Use Development
Figure 2.8-3
Mapped Soils

- Wethersfield-Foresthills-Pavement & buildings complex, 8 to 15 percent slopes: Strongly sloping areas of till plains and hills that have been partially filled for residential use and cemeteries; a mixture of red till soils and anthropogenic soils, with more than 15 percent impervious pavement and buildings covering the surface; located in Staten Island. This soil series was mapped as occurring in the northwest and west portion of the Development Area.

- Wethersfield-Ludlow complex, 8 to 15 percent slopes: Strongly sloping to moderately steep areas of till plains and hills, relatively undisturbed and mostly wooded; a mixture of well drained and moderately well drained soils developed in red till; located in Staten Island. This soil type was mapped only along the eastern boundary of the Development Area.

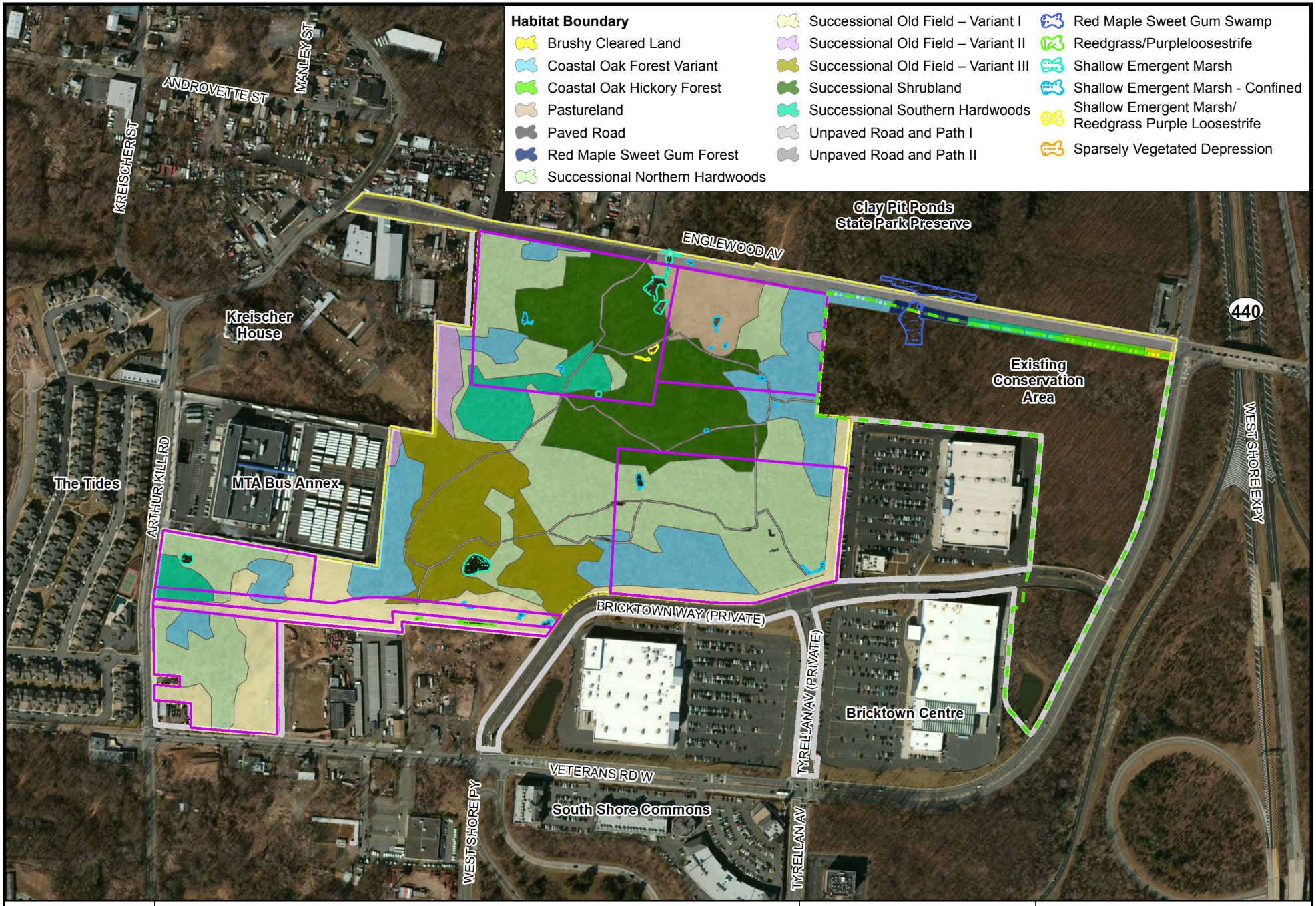
- Wethersfield-Ludlow-Wilbraham complex, 0 to 8 percent slopes: Nearly level to gently sloping areas of till plains, relatively undisturbed and mostly wooded; a mixture of well drained, moderately well drained, and poorly drained soils developed in red till; located in Staten Island. This soil type occurs throughout the vast majority of the Development Area

~~A wide variety of soil types were observed (e.g., silty sand, silty clay loam, etc.). During the wetland delineation, soils generally exhibited limited hydric features. Soils had high clay content and were influenced by red parent material. Often the wetlands formed in low depressions that allowed for the collection and retention of rainwater.~~

2.8.3.2 Ecological Communities

Using the data gathered during the various vegetation surveys in 2012, a map of ecological communities was developed. The communities were defined in accordance with the *Ecological Communities of New York State* (Edinger et al., 2002) by NYSDEC's ~~Natural Heritage Program (NHP).~~NYNHP. Thirteen communities—including three variants of successional old field--were identified (see **Figure 2.8-4**).

- **Brushy cleared land** - land that has been clearcut or cleared by brush-hog. There may be large amounts of woody debris such as branches and slashings from trees that were logged. Vegetation is patchy, with scattered herbs, shrubs, and tree saplings.
- **Coastal forests** - non-maritime areas within the Coastal Plain that are generally not in the immediate proximity to marine communities. Forests generally contain trees of normal stature with uncontorted branches and unwilted leaves and in addition, usually have at most a sparse vine layer (Edinger et al., 2002).
    - **Coastal ~~Oak~~ oak-hickory forest -** a hardwood forest with oaks (*Quercus sp*.) and hickories (*Carya sp*.) that occurs in dry loamy sand of morainal coves of the Atlantic Coastal Plain. There are relatively few shrubs and herbs. Typically there is also an abundance of tree seedlings, especially of beech; beech and oak saplings are often the most abundant 'shrubs' and small trees (Edinger et al., 2002). In the area south of CPPSPP, a habitat most closely resembling a Coastal-oak hickory forest is present.
    - **Coastal ~~Oak Variant (On Site)~~oak variant -** In some of the surveyed areas, the successional forests are dominated by oaks, and thus are referred to coastal oak variant forests. These variants are located throughout the site. Pin oak and white oaks were the most commonly observed oaks in these habitats. Big tooth aspen, quaking aspen, and grey birch are often subdominant species in this habitat type. It should be noted that this habitat type had dense growths of vines (Smilax sp.) throughout the mapped locations, which was beginning to impact the growths of oak trees and other species. Vegetation sample plots S5, S13, and S20 represent this habitat type.
- **Paved ~~Road/Path~~road/path** - This habitat includes roads or pathways of paved asphalt, concrete, brick, stone, etc. Vegetation is typically limited to cracks in the paved surface (Edinger



AECOM

Legend

Project Area
Development Area
Conservation Area
Site Boundary

Source: Bing Aerial Map.

0 125 250 500 Feet

1 inch = 500 feet

N

Charleston Mixed-Use Development

Figure 2.8-4

Mapped Ecological Communities

et al., 2002). This habitat was identified in the northwest portion of the Development Area along the existing built segment of Englewood Avenue.

- **Pastureland -** Agricultural land permanently maintained (or recently abandoned) as a pasture area for livestock (Edinger et al., 2002). In the northern portion of the Development Area, there is a horse pasture utilized by equestrians. Grazing and use of the field by horses has prevented woody vegetation from becoming established. Vegetation sample plot S14 represents this habitat type.

- **Red maple-sweetgum swamp** - A hardwood swamp that occurs on somewhat poorly drained seasonally wet flats, usually on somewhat acidic gleyed to mottled clay loam or sandy loam. Red maple-sweetgum swamps often occur as a mosaic with upland forest communities. Sweetgum is often the dominant tree or may be co-dominant with red maple. This habitat type is located adjacent to the pathway that separates the CPPSPP from the Conservation area. ~~The~~A variant of this habitat extends south along a drainage ditch into the Conservation Area. This area was surveyed during the wetland delineation. As discussed later in this chapter, ~~the wetlands located in that area occur~~Wetland AR-11 occurs in this habitat type. A description of these wetlands is provided in the Wetland Delineation Report (**Appendix C**). The uplands immediately adjacent to these wetlands also have numerous red maples and sweetgum trees in the overstory and are identified as red maple-sweetgum forests.

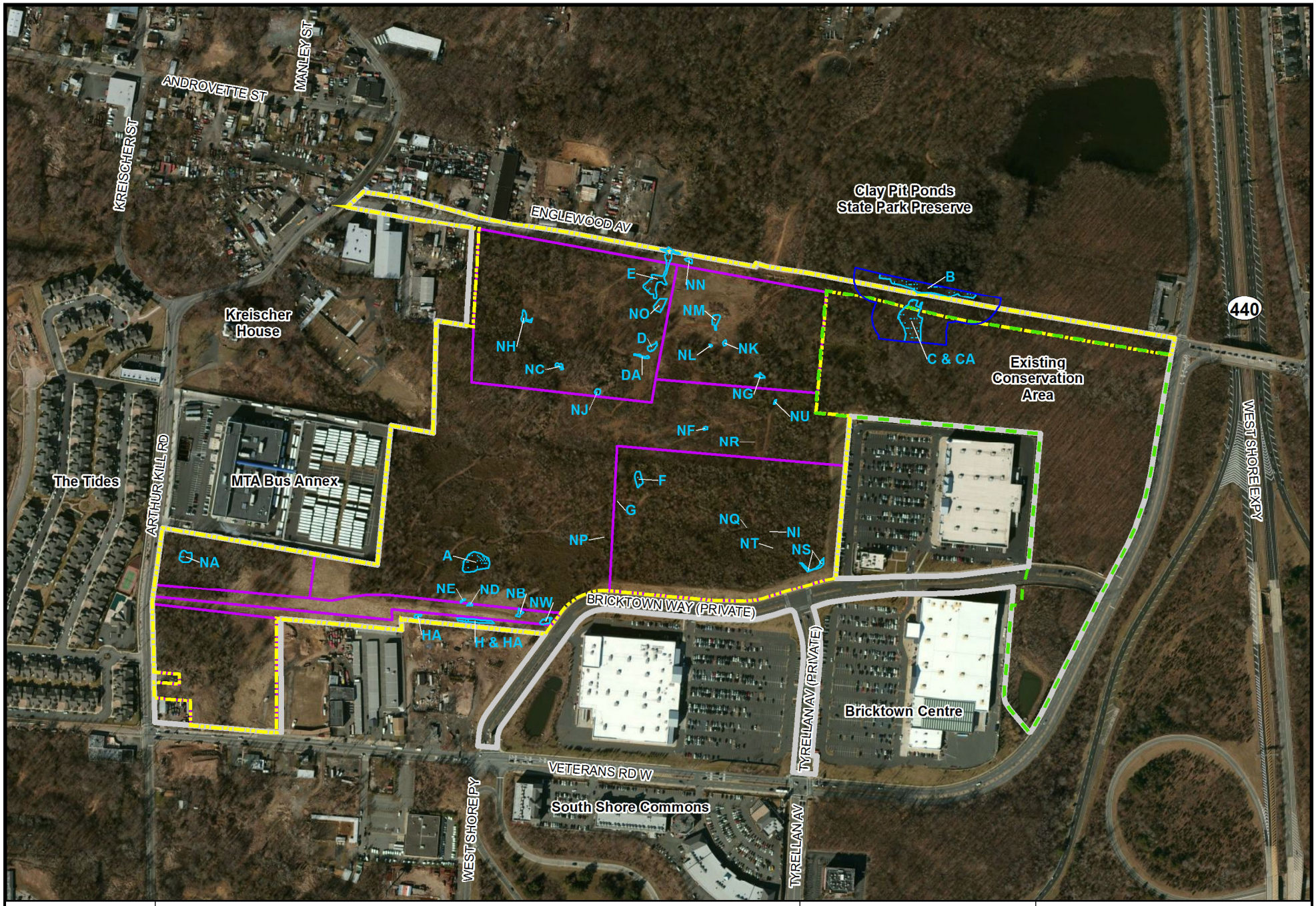
- **Reedgrass/~~Purple Loosestrife Marsh~~ purple loosestrife marsh**: A marsh that has been disturbed by draining, filling, road salts, etc., in which common reed or purple loosestrife (*Lythrum salicaria*) has become dominant. ~~On site~~ Within the Project Area, these wetlands were often very small, usually less than 0.01 acres in size. Wetland D, H and HA shown ~~later~~ in **Figure 2.8-5** encompass this habitat type.

- **Shallow ~~Emergent Marsh~~ emergent marsh**: A marsh meadow community that occurs on mineral soil or deep muck soils (rather than true peat) that is permanently saturated and seasonally flooded. (Edinger et al., 2002). These wetland types occurred in the remnants of onsite reflecting ponds and a few other wetlands. These wetlands were often dominated by hydrophytic grasses, rushes, and smartweeds. Vegetation sampling plot 1 identifies the vegetation characteristic of this plot while Wetlands A and E shown ~~later~~ in **Figure 2.8-5** identify this wetland type.

- **Shallow ~~Emergent Marsh~~ emergent marsh (Confined)**: These areas were mapped wetlands dominated by herbaceous vegetation and are not permanently saturated. Many of these wetlands were sparsely vegetated and may serve as vernal pools in the spring.

- **Successional ~~Southern Hardwoods~~ southern hardwoods**: A hardwood or mixed forest that occurs on sites that have been cleared or otherwise disturbed. Characteristic trees and shrubs include any of the following: American elm, white ash, red maple, box elder, choke-cherry, and sassafras. Any of these may be dominant or co-dominant in a successional southern hardwood forest. This is a broadly defined community and several and regional variants are known (Edinger et al., 2002). Within the southwest and central portion of the Development Area, successional forests dominated by sassafras are present and were mapped as successional southern hardwoods. Vegetation sample plots S3 and S17 ~~previously~~ shown in **Figure 2.8-1** represent this habitat type.

- **Successional ~~Northern Hardwoods~~ northern hardwoods**: A hardwood or mixed forest that occurs on sites that have been cleared or otherwise disturbed. Characteristic trees and shrubs include any of the following: quaking aspen, bigtooth aspen, balsam poplar (*Poplar balsamifera*), paper birch, or gray birch, pin cherry (*Prunus pensylvanicum*), black cherry, red maple, eastern white pine, with lesser amounts of white ash, green ash, and American elm (*Ulmus americana*). This is a broadly defined community and several and regional variants are known (Edinger et al., 2002). Much of the successional forests on site are dominated by bigtooth



AECOM

Legend

- Project Area
- Development Area
- Conservation Area
- Site Boundary
- Delineated Wetlands
- B Wetland Modifier
- Adjacent NYSDEC Regulated and USACE Jurisdictional Wetlands

0 125 250 500 Feet

1 inch = 500 feet

Source: Bing Aerial Map.

N

Charleston Mixed-Use Development

Figure 2.8-5

Delineated Wetlands

aspen. Within this habitat type oaks are often a subdominant species. These habitat types have been identified as ~~northern~~ successional northern hardwoods. Vegetation sample plots S7 and S8 ~~previously~~ shown in **Figure 2.8-1** represent this habitat type.

- **Successional ~~Shrubland~~ shrubland:** At least 50 percent of this habitat is dominated by shrubs that occur on sites that have been cleared (for farming, logging, development, etc.) or otherwise disturbed. (Edinger et al., 2002). This habitat type appeared in the north-central portion of the Development Area. This community is now a mosaic of grasslands and thickets of small tree saplings. A review of historical aerial photographs shows this area had been wooded and cleared since World War II. Vegetation Sample Plots S11, S12, and S15 ~~previously~~ shown in **Figure 2.8-1** represent this habitat type.

- **Successional ~~Old Field~~ old field:** Meadow-associated habitat dominated by forbs and grasses that occur on sites that have been cleared and plowed (for farming or development) and then abandoned. This habitat also includes areas adjacent to roadways cleared for line-of-sight or construction access and occasionally mowed (annually or less) for maintenance purposes; vegetation includes pioneering woody species at less than 50 percent cover (Edinger et al., 2002). Within the Development Area, the following three variants of successional old fields were observed:

  - Variant I - Located along the boundary of Bricktown Way and within the drainage and sewage easement in the southwest portion of the Development Area, and within some isolated open areas in the area's north-central portion. This habitat was dominated by grasses with sporadic deciduous shrubs. Vegetation sampling plots S2 and S6 ~~previously~~ shown in **Figure 2.8-1** ~~represents~~ occur in this habitat type.

  - Variant II – This variant occurred along slopes in the eastern and western portion of the Development Area. A thick carpet of smilax and small shrubs dominates this habitat (*Photo 3*).

  - Variant III – This variant occurs in the central portion of the site in an area that burned during 2009. A thick carpet of smilax dominates the habitat. Remnants of dead trees and shrubs are present in this habitat type. Vegetation sampling plots S18 and S19 ~~previously~~ shown in **Figure 2.8-1** ~~represen t~~occur in this habitat type.

- **Unpaved ~~Road/Path~~road/path**: This habitat includes areas of sparsely vegetated road or pathway of gravel, bare soil, or bedrock outcrop, maintained by regular use or grading. These roads or pathways are maintained by regular trampling or scraping of the land surface. Vegetative ground cover, where it exists, is limited to seedlings of common dandelion, common plantain, English plantain, path rush and other weedy herbaceous species (Edinger et al., 2002). Most of the unpaved road/path areas are located within larger habitats. Dirt paths approximately 5~~-20~~ to 20 feet in width traverse the Development Area, especially in the area of the planned Fairview Park. These paths are often sparsely vegetated. Within the paths several depressional areas have been vegetated with hydrophytic vegetation. Vegetation sampling plot S9 ~~previously~~ shown in **Figure 2.8-1** ~~represent s~~occur in this habitat type.

The total acreage of the mapped habitats within the Development Area ~~and the area of the proposed construction of Englewood Avenue~~ is approximately just over ~~65~~64 acres. **Table 2.8-1** identifies the mapped acreage of each community.

It is likely the Development Area was historically dominated by coastal oak-hickory forests. However, based on ~~the~~ field observations, tree surveys, and inventories in sample plots that were conducted in the 2012 growing season, the data indicate that much of the vegetation is dominated by successional vegetation. Also, many of the habitats are negatively impacted by the dense growths of vines that stress

on-site trees and shade out other herbaceous species. Dense vine growths were also noted in the 2007-2008 survey.

Wetland habitats in the Development Area west of the proposed Englewood Avenue are small in size and often disturbed. No permanent surface water features were observed in the 2012 survey. There are two man-made ponds, which during the 2012 survey period were observed to only hold water after a rain event. A Review of NOAA rainfall data indicates that the 39 inches of annual rainfall was recorded in 2012, a level lower than the annual average of 53 inches over the 2001-2012 period.[6] However, the New York City Department of Parks & Recreation (NYCDPR) noted that one of these ponds (Wetland A) has been observed to hold ~~sufficient~~ water throughout the entire growing season (NYCDPR, 2013). Also, no springs or seeps were observed in the Development Area. Waterbodies and wetlands are further discussed later in this chapter in Section 2.8.3.4.

As previously noted, fire appears to be a contributing factor in shaping the vegetative communities. A large fire was reported to have occurred on site in the mid-1960s (AKRF,2007-2008) and again in 2009 ~~(AKRF, 2009).~~. The recent fire is evident in a large area within the central and southern portions of the proposed Fairview Park with charred bark present on living trees and/or dead snags. The area (Successional ~~Old Field~~ old field – Variant III) is now dominated by a thick growth of smilax.

Table 2.8-1

Acreage of Mapped ~~habitats~~ Ecological Communities

~~Habitat~~Ecological Community	Acreage
Brushy Cleared Land	0.19
~~Coastal Oak Forest Variant~~	~~9.95~~
Coastal Oak Hickory Forest	0.54
Coastal Oak Forest Variant	9.95
Paved Road	1.41
Pastureland	2.27
~~Paved Road~~ Red Maple Sweetgum Swamp	~~1.41~~ 0.60
~~Red Maple Sweet Gum Forest~~ Reedgrass Purple Loosestrife	0.~~60~~02
Shallow Emergent Marsh	0.34
Shallow Emergent Marsh - Confined	0.18
~~Shallow Emergent Marsh / Reedgrass Purple Loosestrife*~~Successional Southern Hardwoods	~~0.02~~ 3.50
Successional Northern Hardwoods	18.41
Successional Shrubland	10.54
Successional Old Field - Variant I	5.41
Successional Old Field - Variant II	1.00
Successional Old Field - Variant III	6.67
~~Successional Shrubland~~	~~10.54~~
~~Successional Southern Hardwoods~~	~~3.50~~
Unpaved Road and Path I	2.99

[6] NOAA, 2013. http://www.erh.noaa.gov/okx/climate/records/monthannualpcpn.html

Table 2.8-2 identifies the dominant vegetation observed within the 20 study plots. Much of the woody vegetation within the Development Area is stressed due to previous fires and dense growth of vines (*Photo 4* and *Photo 5)*. Sample plots 18 and 19 represent the area that burned in 2009. In these plots, no living tree species are present, and the only shrubs growing are small specimens of big tooth aspen, a successional tree species. Cat briar (*Smilax sp.)* covered 85 to 90 and 70 to 75 percent of plots S18 and S19, respectively. It should be noted that habitats along the proposed Englewood Avenue between the CPPSPP and the Conservation Area have significantly less vine growth and exhibit signs of a healthy forest (*Photo 6*).

AECOM

PHOTOGRAPHIC LOG

Photo No. 3	Date: July 2012

Description:

Area that burned in 2009. Previously identified as a forested area in 2007-2008, the habitat is now a successional old field dominated by a dense carpet of catbriar.

Photo No. 4	Date: December 2012

Description:

Dense growths of vines are common throughout much of the site. The vines often formed an impenetrable barrier to movement.

AECOM

PHOTOGRAPHIC LOG

Photo No. 5	Date: July, 2012

Large wisteria vines have deformed and stressed onsite trees.

Photo No. 6	Date:

Description:

Area for expansion of Englewood Avenue. The existing road (dirt path) is visible in the right-hand side of the photograph. Mature forests associated with Clay Pit Ponds Park and the Conservation Area border the road.

Table 2.8-2

Dominant Species Observed in the Vegetation Sample Plots

Site	Mapped Ecological Communities	Vegetation			
		Dominant Trees	Dominant Shrubs / Vines	Dominant Herbaceous	Notes
S1	Shallow Emergent ~~wetland, ponded area~~Marsh Successional Northern Hardwood (portion of plot in Wetland A)	Sassafras	None / smilax	Smilax and rice cutgrass	Smilax covered 25-30 percent of plot that consisted of the Successional Northern Hardwoods.
S2	Successional Old Field – Variant I	None	None	Meadow fescue and bird's-foot trefoil	Meadow fescue covered 35-40 percent of plot.
S3	Successional Northern Hardwoods	Pin oak, red maple	Red mulberry / poison ivy, smilax	Smilax and Japanese honeysuckle	Smilax covered 5-10 percent of plot.
S4	Coastal Oak Forest Variant / Successional Old Field – Variant I	Bigtooth aspen, pin oak	Devil's walkingstick, black cherry / smilax	Smilax and redtop grass	Smilax covered 20-25 percent of plot.
S5	Coastal Oak Forest Variant	Pin oak, bigtooth aspen	None / smilax	Smilax	Smilax covered 15-20 percent of plot.
S6	Successional Old Field – Variant I	None	Baccharis, quaking aspen / smilax	Gramineae and smilax	Smilax covered 35-40 percent of plot.
S7	~~Northern~~ Successional Northern Hardwoods	Quaking aspen	Highbush blueberry / smilax	Smilax	Smilax covered 80-85 percent of plot.
S8	~~Northern~~ Successional Northern Hardwoods	Bigtooth aspen	None / smilax	Smilax	Smilax covered 55-60 percent of plot.
S9	Unpaved ~~Dirt~~ Road / Path Successional Northern Hardwoods	Bigtooth aspen, pin oak	Highbush blueberry / smilax	Smilax and broomsedge bluestem	Smilax covered 35-40 percent of plot.
S10	Coastal Oak Forest Variant	White oak	None / smilax	Smilax	Smilax covered 70-75 percent of plot.
S11	Sucessional Shrubland . Successional Nortern Hardwoods	Bigtooth aspen, quaking aspen, eastern cottonwood	Baccharis / smilax	Broomsedge bluestem, slender-leaved goldenrod and rough-leaved goldenrod	Smilax covered 25-30 percent of plot.
S12	Successional Shrubland	Bigtooth aspen, quaking aspen	Bigtooth aspen, quaking aspen / smilax	Smilax	Smilax covered 90-95 percent of plot.
S13	Coastal Oak Forest Variant	Pin oak, red maple	Highbush blueberry	Smilax	Smilax covered 35-40 percent of plot.

Site	Mapped Ecological Communities	Vegetation			
		Dominant Trees	Dominant Shrubs / Vines	Dominant Herbaceous	Notes
S14	Pastureland / Shallow Emergent ~~Wetland~~Marsh	None	None	Panicum species, slender-leaved goldenrod and broomsedge bluestem	Panicum species covered 20-25 percent of plot.
S15	Successional Shrubland	None	Quaking aspen	Redtop grass and broomsedge bluestem	Redtop grass covered 35-40 percentof plot.
S16	Successional Southern ~~hardwoods~~Hardwoods	Sassafras, bigtooth aspen	Highbush blueberry / smilax	Smilax and wisteria	Smilax covered 25-30 percent of plot.
S17	Successional Southern Hardwoods	Sassafras	None / smilax	Wisteria	Smilax covered 35-40 percent of plot.
S18	Successional Old Field – Variant III	None	Bigtooth aspen / smilax	Smilax	Smilax covered 85-90 percent of plot.
S19	Successional Old Field – Variant III	None	Bigtooth aspen / smilax	Smilax	Smilax covered 70-75 percent of plot.
S20	Coastal Oak Variant	Sassafras, pin oak	None / smilax	Smilax	Smilax covered 55-60 percent of plot.
~~Note: * Exotic refers to vegetation that originated as planted ornamentals (e.g., wisteria vines, trumpet vines, etc.) associated with the former Kreischer estate.~~					

2.8.3.3 Clay Pit Ponds State Park Preserve, Proposed Englewood Avenue Corridor, and the Conservation Area

Together, the CPPSPP, the mapped un-built portion of the proposed Englewood Avenue Corridor from paper Kent Street to Veterans Road West, and the Conservation Area form a contiguous natural area that is approximately 300 acres in size. Due to the highly developed character of the New York City area, large contiguous habitats, especially forested habitats are very rare. Large contiguous habitats provide habitats for certain species that prefer areas with limited human presence and associated perturbances (e.g., low noise and limited light pollution from streetlights). Numerous past studies and publications have identified a reduction in population of birds and other fauna due to fragmented habitats (Burke, et al. 2011; Kociolek et al, 2011; Kuitunen et al., 1998; Reijnen and Foppen, 1994).

The CPPSPP, proposed Englewood Avenue Corridor, and the Conservation area also support freshwater wetlands. Of an estimated 224,000 acres of freshwater wetlands in New York City in in the late 1700s, only one percent or about 2,000 acres remain today (Kiviat and Johnson, 2013). Moreover, some of the wetlands in the CPPSPP, proposed Englewood Avenue Corridor, and the Conservation Area are NYSDEC-regulated wetlands. NYSDEC regulates wetlands that are greater than 12.4 acres in size and classifies them on a scale of I- to V based on importance. The wetlands within the proposed Englewood Avenue and immediately adjacent area of CPPSPP and Conservation Area are Classified as I and II – the two highest NYSDEC classifications for wetlands,

A description of CPPSPP, the proposed Englewood Avenue Corridor and the Conservation Area is provided below.

Clay Pit Ponds State Park Preserve (CPPSPP)

CPPSPP, which borders the northeast portion of the Development Area, is a 260-acre nature preserve that contains a variety of unique habitats, such as wetlands, ponds, sand barrens, spring-fed streams and woodlands.

~~The NYSDEC website indicates that the~~ The entire CPPSPP has been identified as a NYSDEC Bird Conservation Area (BCA). ~~There are~~ 180 species of birds ~~that~~ have been identified within ~~this BCA~~ CPPSPP. Fifty-seven species of ~~Neotropical~~ neotropical migratory songbirds have been observed. Forest dwelling ~~Neotropical~~ neotropical migrants include broad-winged hawk, yellow-billed and black-billed cuckoos, great crested and olive-sided flycatchers, red-eyed vireo, blue-gray gnatcatcher, wood thrush, and Veery and Swainson's thrush. In addition, 31 species of warblers have been recorded including palm, bay-breasted and Wilson's warblers. Whip-poor-will (a species of special concern) has been confirmed as a breeder in the past and may continue to breed. Species of special concern are any native species for which a welfare concern or risk of endangerment has been documented in New York State as defined in Section 182.2(i) of 6NYCRR Part 182. Species of special concern warrant attention and consideration but current information, collected by NYSDEC, does not justify listing these species as either endangered or threatened (NYSDEC, 2013).

Ecological communities within the ~~BCA~~ CPPSPP include oak-tulip tree forest and successional southern hardwoods, together covering about 45 percent of the ~~BCA~~ CPPSPP. The ~~NY Natural Heritage Program~~ NYNHP has identified two significant natural communities. ~~One~~ The first significant community, the post oak-blackjack oak barrens, is the only confirmed occurrence of this community in the state. Breeding has been documented for several avian species associated with sandy barrens communities including the brown thrasher, common yellowthroat, indigo bunting, eastern towhee, and field sparrow (Edinger et al., 2002 *as cited in* NYSDEC, 2013).

The second significant community is the ~~r~~Red ~~m~~Maple-~~s~~Sweetgum ~~s~~Swamp. This is a dominant community and a central feature of the BCA (30 percent of the total acreage). It is the largest of seven documented examples of this community type in the state (Evans et. al., 2002 *as cited in* NYSDEC, 2013). Birds at CPPSPP associated with deciduous swamps include black-crowned night-heron, wood duck, red-bellied woodpecker and tufted titmouse (Smith and Gregory, 1998 *as cited in* NYSDEC, 2013). The presence of these communities as well as associated wetlands and fields contributes to the diversity of bird species and use of these areas as a migratory stopover.

The New York City Audubon identifies CPPSPP as one of the nine Important Bird Areas ("IBAs") in New York City. IBAs are sites that provide essential habitat for one or more species of bird. IBAs include sites for breeding, wintering, and/or migrating birds. IBAs may be a few acres or thousands of acres, but usually are discrete sites that stand out from the surrounding landscape. IBAs may include public or private lands, or both, and they may be protected or unprotected (Audubon, 2013).

To qualify as an IBA, sites must satisfy at least one of the following criteria (Audubon, 2013). The site must support :

- Species of conservation concern (e.g. threatened and endangered species);
- Restricted-ranges species (species vulnerable because they are not widely distributed);
- Species that are vulnerable because their populations are concentrated in one general habitat type or biome; or
- Species, or groups of similar species (such as waterfowl or shorebirds), that are vulnerable; and because they occur at high densities due to their congregatory behavior.

Due to the CPPSPP's large size and diversity of habitats, NYC Audubon includes it as one of the areas on Staten Island for the annual Christmas Bird Counts and other bird enhancement activities (e.g, construction of chimney swift nesting structure, etc.). (Audubon, 2013a).

Proposed Englewood Avenue and the Conservation Area

Both the CPPSPP~~, the mapped un-built portion of the proposed Englewood Avenue~~ and the Conservation Area ~~form a contiguous natural area that is approximately 300 acres in size. The Conservation Area contains~~ contain mature forests, Mill Creek, ~~and~~ NYSDEC Classified and Regulated Wetlands, and USACE jurisdictional wetlands. Within this mapped, but un-built segment of the proposed Englewood Avenue there is a ~~small,~~ 10~~-~~ to 25-foot wide dirt path that separates the Conservation Area from the CPPSPP. This pathway is small enough that it does not impede ~~mammals~~ faunal species from transiting ~~to and from~~between the Conservation Area and the CPPSPP. The pathway does not appear to limit avifauna from flying from one parcel to the other~~. In fact, in~~ and therefore, even though the Conservation Area is not part of the NYSDEC BCA, it serves a similar function. In some areas along the existing pathway, the canopies of the mature trees of each parcel are co-mingled.

Even in its current unpaved state, the pathway does serve as an impediment to hydrology between Wetlands B and C (**Figure 2.8-5**). During periods of high water, the water washes over the pathway. It is unclear what effect this may have on herptofauna or other organisms. During ~~the~~ surveys ~~on site~~of the Development Area, herptofauna were not observed crossing the pathway nor were the tracks of any herptofauna observed in that area. It is understood that while conditions in this area were observed extensively on a number of occasions, the generally secretive nature of ~~Herpetopauna~~ herptofauna can pose a challenge in documenting their presence.

The ~~eastern area of the proposed~~ Englewood Avenue Corridor from paper Kent Street to Veterans Road West is almost entirely vegetated by forested habitats: Coastal Oak Hickory Forest, Successional Southern Hardwoods, ~~red-maple~~ Red-Maple Sweetgum ~~swamp~~ Swamp and Coastal Oak Variant Forest. In the Coastal Oak Hickory Forest, Red Maple Sweetgum Swamp, and Successional Southern Hardwoods Swamp and adjacent uplands, there is little in the way of understory or herbaceous vegetation. ~~Numerous deer~~ Deer tracks and whitetail deer, in some instances herds of over 10 deer, were observed in the area along with deer browsing on vegetation over approximately 50 days of field observations.

2.8.3.4 Waterbodies, Wetlands and Vernal Pools

This subchapter identifies the waterbodies and wetlands that occur on and/or adjacent to the site. For an additional discussion of floodplains, please see **Chapter 2.1**, Land Use, Zoning and Public Policy.

Waterbodies

NYSDEC is charged with classifying all surface waters of the state pursuant to Article 17, Title 3, of the Environmental Conservation Law (ECL). To implement this charge, NYSDEC developed a surface-water classification system and promulgated a set of rules and regulations (6 NYCRR, Parts 800-940) under which to administer the surface water quality and purity program. Each part pertains to a specific drainage basin. As ~~a result~~ such, surface waters in the state are classified according to their "best usages" (e.g., drinking, bathing, level of recreational contact, and fish propagation and survival).

There are no naturally occurring permanent non-tidal waterbodies on and/or immediately adjacent to the Development Area, although ~~there~~ Wetlands A and NJ are ~~the~~ remnants of two, man-made ponds. These ponds hold water after a rain event; although, during the summer of 2012, long periods of no water within the ponds were observed. However, previous studies have indicated that Wetland A holds water throughout the growing season (NYCDPR, 2013)

Staten Island Bluebelt

The Staten Island Bluebelt is a stormwater management program that preserves the ability of natural drainage corridors such as streams, ponds, and wetlands to perform their natural functions of stormwater conveyance, storage, and filtration, while preserving open spaces and wildlife habitat and reducing

infrastructure costs. The Bluebelt consists of 16 watersheds located primarily on the South Shore of Staten Island. Each watershed flows into the Raritan Bay then to the Atlantic Ocean. The total area encompassed by the Bluebelt system is approximately 10,000 acres.

The NYCDEP administers the Bluebelt program and constructs facilities that implement best management practices at locations that connect the natural drainage corridors with conventional storm sewers for an integrated storm water management system. The NYCDEP is continually seeking to acquire publicly and privately owned wetland parcels for incorporation into the Bluebelt system. Projects are currently underway to incorporate three additional watersheds into the system (South Beach, New Creek, and Oakwood Beach).

The ~~Charleston site~~ Project Area is located between the northern reach of the Mill Creek Watershed and the southern reach of the Clay Pits Pond/Port Mobil Watershed. No streams or regulated drainages are located within the Project Area. Surface water runoff and groundwater within the CPPSPP and the Conservation Area primarily flow south into the Mill Creek approximately two-thirds of a mile south of the Development Area, then west into the Arthur Kill/Raritan Bay.

Groundwater

The ~~site~~ Project Area does not occur above and/or immediately adjacent to a USEPA-identified sole source aquifer. No natural springs or seeps were identified on site.

Wetlands

Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wetlands are regulated by both the federal agencies and state agencies. A regulatory distinction is made between freshwater and tidal wetlands. Freshwater wetlands, as the name suggests, are those ecological communities whose hydrologic inputs are derived from freshwater. These wetlands generally include swamps, marshes, bogs, and similar areas. Tidal wetlands are areas where the land meets the ocean, tidal estuary, or tidal river. There are no tidal wetlands within and/or adjacent to the ~~project area~~ Project Area.

Except for isolated wetlands[7], all other freshwater wetlands within the study area fall under the jurisdiction of the USACE, pursuant to Section 404 of the Clean Water Act (CWA). Freshwater wetlands also come under the jurisdiction of NYSDEC pursuant to Articles 24 and 25 of the NYS ECL. The state regulates freshwater wetlands 12.4 acres or greater in size, certain smaller wetlands of unusual local importance, and an adjacent area (buffer) around mapped wetlands. Typically, the regulated wetland buffer will cover a maximum of 100 foot extent from the jurisdictional freshwater wetland delineation and a maximum 150-foot extent from the jurisdictional tidal wetland delineation.

Regulatory Agency Mapped Wetlands in the Project Area

Preliminary investigations to determine the extent of freshwater wetlands in the study area included review of the following:

- US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Online Mapper, which identifies mapped federal wetlands; and
- NYSDEC Regulatory Freshwater Wetlands Maps.

[7] Isolated wetlands are those of any size that are not adjacent to or do not have a sufficient hydrologic connection to navigable waters.

Both the NWI and NYSDEC maps have cautionary notes indicating that mapped boundaries of wetlands are approximate. NWI and NYSDEC wetland mapping is prepared from the analysis of aerial imagery. As a margin of error is inherent when using imagery to map wetlands, the mapping only shows ~~only~~ the approximate locations of the actual boundaries. For this reason, detailed on-the-ground inspection of sites can result in revisions of wetland boundaries or classifications determined through image analysis. **Figure 2.8-6** identifies mapped federal and state wetlands ~~on~~ in the ~~site~~ vicinity of the Project Area.

Mapped NWI Wetlands

As per the USFWS' National Wetland Inventory online mapper, the Development Area is bordered by several palustrine wetlands. Palustrine wetlands include all non-tidal wetlands that are dominated by trees, shrubs, persistent emergent, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 percent (Cowardin et. al., 1979).

The wetland mapped on and/or immediately adjacent to the Development Area are following:

- PFO1 Palustrine forested broad-leafed deciduous
- PUBH Palustrine Unconsolidated bottom

Mapped NYSDEC Wetlands

Mapped wetlands have been classified by NYSDEC according to the system set forth in Title 6 of the New York ~~State~~ Codes, Rules and Regulations (6 NYCRR). The system classifies wetlands according to their ability to perform wetland functions and provide wetland benefits. Class I wetlands have the highest rank (benefit), and the ranking descends through Classes II, III, and IV. A brief summary of the differences of the four classes of wetlands follows:

- **Class I** wetlands are wetlands that provide habitat for state threatened and/or endangered species or are adjacent to a drinking water supply.

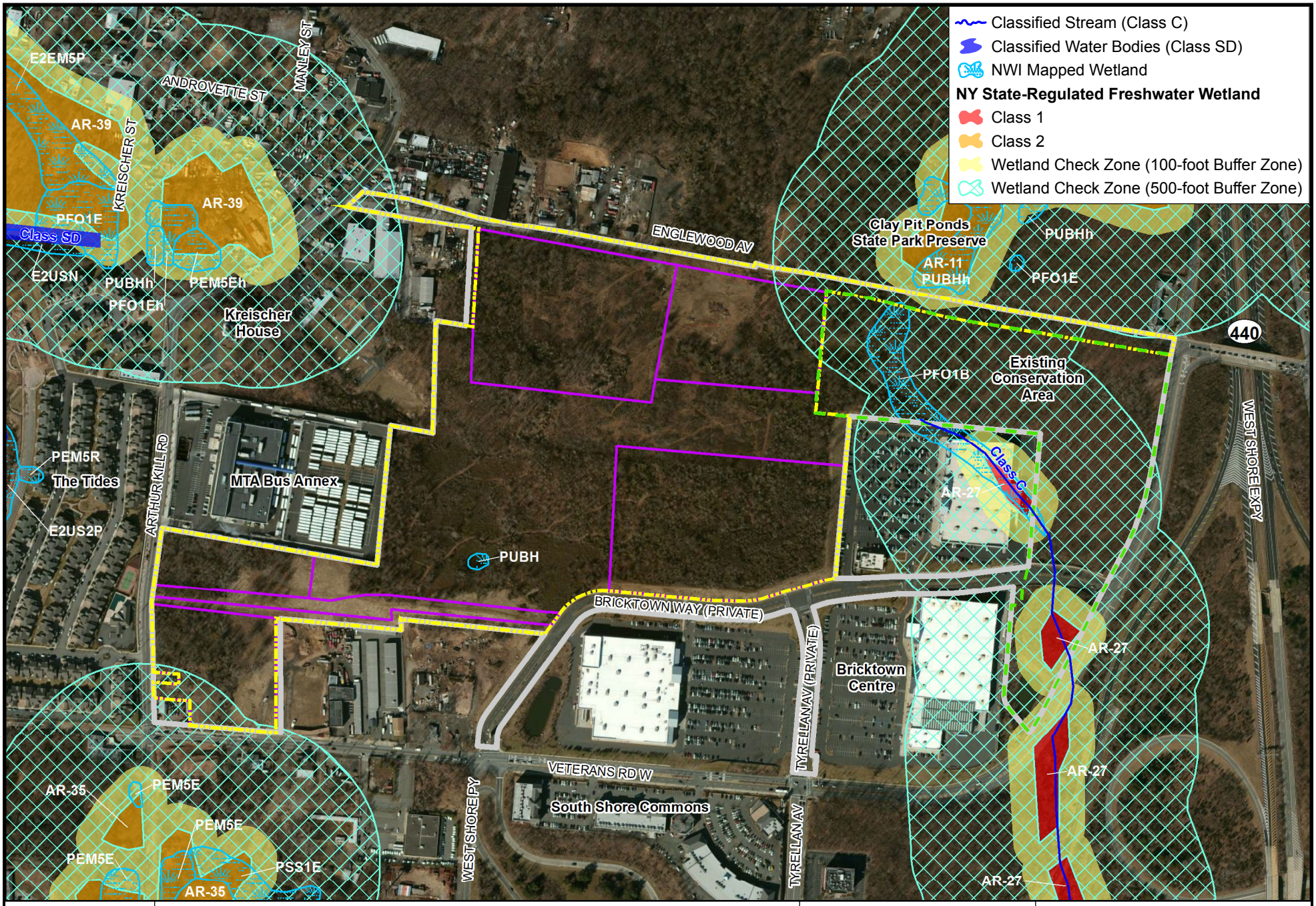
- A wetland is designated as **Class II** if:
  - It provides habitat for species that are vulnerable within the state.
  - It provides migratory routes for threatened and endangered species.
  - It may be in an urbanized area, or
  - It is one of the three largest wetlands in a community.

- A wetland is designated as **Class III** if:
  - It is the resident habitat of an animal species vulnerable in the major region of the state in which it is found, or
  - It is the traditional migration habitat of an animal species vulnerable in the state or in the major region of the state in which it is found. **Class III** wetlands may be covered by two-thirds of invasive species (e.g., purple loosestrife [*Lythrum salicaria*], common reed [*Phragmites australis*], etc.).

- **Class IV** wetlands are those wetlands that do not have any of the characteristics of Class I, II, or III wetlands.

Within or in the vicinity of the ~~Development~~ Project Area there are two mapped NYSDEC Classified Wetlands (**Figure 2.8-6**).

- ~~Wetlands~~ Wetland AR-11 is located ~~immediately~~ approximately 10 feet north of the eastern portion of the proposed Englewood Avenue, and within both the 100-foot and 500-foot buffer zones. Wetland AR-11 is classified by NYSDEC as a Class II wetland. This wetland ~~is red maple-sweetgum swamp and is~~ includes a Red Maple-Sweetgum Swamp community and may be utilized by a number of protected species. Portions of delineated wetlands B and C were



AECOM

Legend

- Project Area
- Development Area
- Conservation Area
- Site Boundary

Source: NWI, NYSDEC & Bing Aerial Map.

0 125 250 500 Feet

1 inch = 500 feet

N

Charleston Mixed-Use Development

Figure 2.8-6

NWI and NYSDEC Mapped Wetlands

determined by the NYSDEC to overlap with the NYSDEC mapped Wetland AR-11. See discussion of delineated Wetlands B and C below and in **Table 2.8-3** for further information about vegetation in these portions of AR-11.

- Wetland AR-27 is a Class I wetland, the nearest portion of which is located along Mill Creek approximately 500 feet south of this same eastern portion of the proposed Englewood Avenue. The cover type in the areas surrounding this wetland was identified as a Coastal Oak Hickory Variant (AKRF, 2009).

Delineated Wetlands

A wetland delineation was conducted by ~~AECOM~~ natural resource scientists, including a certified wetland delineator, over the entire Development Area during the first two weeks of July 2012. The results of the delineation are provided in a wetland delineation report (**Appendix C**). **Figure 2.8-5** identifies the delineated wetlands ~~on site~~ in, and adjacent to, the Development Area.

A total of 31 wetland parcels were delineated ~~on site~~ in, and adjacent to, the Development Area, of which 17 are less than 0.01 acres in size. None of the delineated wetlands within the Development Area are greater than 0.23 acres. Larger wetlands (see *Photo 7*) are labeled as wetlands A through HA in **Figure 2.8-5**. Wetlands that start with the letter "N" are very small parcels that often formed within the tire ruts and other small depressions within horse trails and other access ways (see Photo 8). Photographs of all delineated wetlands are provided (**Appendix C**).

There are no permanent flowing water courses on site. Within the Conservation Area south and east of the area of proposed development there is the Mill Creek. Wetlands B and C represent the upper drainages of the Mill Creek; however, flowing water is only present in Wetlands B and C during periods of extreme hydrology (Photos 9 and 10). Wetland C, which occurs in the Development Area (within the mapped un-built portion of Englewood Avenue) extends to the south, off-site for a considerable distance through the Conservation Area. Wetland B's southern border is a few feet north of the Englewood Avenue Corridor. This wetland extends to the north through CPPSPP. **Table 2.8-3** identifies each wetland's acreage and the vegetative species that were identified in each wetland area and surrounding upland area.

Wetlands H and HA are located in a man-made, rip-rap lined drainage feature in the southwest portion of the ~~site.~~Development Area. Wetlands H and HA are two discontinuous parcels that have formed in low areas in the bottom of the feature.

Wetlands A and NJ are located within the remnants of man-made ponds on site. Surveys in 2012 indicated that neither pond holds water throughout the growing season. However, previous studies have indicated that Wetland A holds water throughout the growing season (NYCDPR, 2013). Standing water is present in the ponds during the growing season after a rainfall event. During the 2012 survey, no dominant drainage channels were observed flowing to or from Wetlands A and NJ. Hydrology is conveyed to wetlands by rainwater from overland sheetflow. The results of further survey work on the presence of vernal pools within the Development Area and their value as habitat are presented later in this section.

Most of the other wetlands are in low areas in the landscape where sheetflow collects. Many of the wetlands are of anthropogenic origin as they formed in tire ruts in trails and existing road ways or along man-made berms that retard the flow of water and promote localized hydric conditions. Many of the wetlands on site were delineated under atypical conditions due to previous anthropogenic disturbance and/or the presence of red parent material in the soils. These wetlands were often sparsely vegetated, and ~~provided limited~~ due to their small size are subject to rapid desiccation. These properties would limit the ecological value to wildlife.

NYSDEC and USACE Wetland Review

The wetland delineation was field reviewed by the USACE during a January 17, 2013 field visit~~. AECOM is awaiting the results of the jurisdictional determination as to which wetlands would be regulated by the USACE.~~ and in numerous discussions with the project team over subsequent months. The USACE, in its Jurisdictional Determination dated August 2, 2013 (see Appendix C), indicated that two areas within the Development Area are considered wetlands under the jurisdiction of the USACE:

- Wetland C (0.24 acres), located along the northern edge of the Development Area within a portion of the proposed Englewood Avenue Corridor and extending south into the Conservation Area, and
- Wetland NB (0.009 acres) located along the south side of the Development Area approximately 125 feet west of Bricktown Way, within portions of the existing private sewer easement and the Proposed Utility Access Corridor.

See Table 2.8-3 for further information about the vegetation identified in each wetland and surrounding upland areas. The wetland delineation was field reviewed by NYSDEC in September 2012 (see discussion below) and approved by NYSDEC in a letter Dated December 5, 2012 (see **Appendix C**). Based on the letter, the NYSDEC has identified Wetlands B and C as being under their jurisdiction and that both ~~wetlands~~ Wetlands B and C are associated with Wetlands AR-11, a Class II wetland. By this action, NYSDEC classified the ~~wetland~~ Wetland B area delineated in the Charleston wetland survey as a new associated segment of its already mapped AR-11 Class II wetland. **Figure 2.8-5** defines the boundaries of the delineated Wetlands B and C in and near the proposed eastern portion of the proposed Englewood Avenue Corridor.

AECOM

PHOTOGRAPHIC LOG

Photo No. 7	Date: July, 2012

Description:

Wetland A – a larger wetland delineated on site. The wetland is the remnant of a man-made pond. In 2012, it was observed that the pond briefly holds water after a rain event in the growing season.

Photo No. 8	Date: July, 2012

Description:

Wetland NN – small emergent wetland located within an isolated depression. The wetland formed in a series of ruts associated with the undeveloped portion of Englewood Avenue (see right side of photo).

AECOM	PHOTOGRAPHIC LOG

Photo No. 9	Date: December 2012

Description:

Looking south at Conservation Area from dirt path. Note drainage channel incised into the road from site drainage and overwash from Wetland B. Overwash only occurs during periods of extreme hydrology (see photo 10).

Photo No. 10	Date: December 2012

Description:

Looking north at CPPSPP. Note water (Wetland B) that is impounded behind the road.

Table 2.8-3

Description of Delineated Wetlands

Wetland	Acreage	Description of Wetlands
A	0.136	Wetland is primarily a man-made pond. At the time of the delineation in early July 2012, the wetland is vegetated with rice cutgrass and other facultative herbaceous species. (Photo 5).
B*	n/a	Wetland is located at the south edge of a NYSDEC-regulated wetland located in CPPSPP. Wetland line B identifies the southern boundary of the wetland, which is demarcated by increase in elevation associated with a road embankment. Wetland B is dominated by red maple, sweetgum, pin oak, river birch, and smilax.
C*	0.239	The wetland line demarcates the northern line of a NYSDEC-regulated wetland in the Conservation Area. This wetland is dominated by red maple and green ash. Sporadically in the wetland, small patches of Pennsylvania smartweed are present.
D	0.024	This wetland is a small depression at the base of a slope dominated by soft rush and wool grass and a small narrow linear drainage way dominated by common reed.
E	0.126	This wetland is a large emergent wetland located adjacent to a horse pasture. The wetland is dominated by soft rush. Other species included spike rush, common reed Pennsylvania smartweed, water purslane, and goldenrods.
F	0.030	Located within the wooded portion of the site, this wetland is dominated by dense growths of smilax, which covers approximately 95 percent of the wetland. Other species in the wetland include gray birch, pin oak, and high bush blueberry.
G	0.017	Small wetland associated with depression in a horse trail. Dominant vegetation is pin oak, grey birch, and ~~highbush~~high bush blueberry.
H	0.035	This wetland is located within a man-made drainage feature. Wetland is dominated by soft rush and common reed.
HA	0.006	This wetland is located within the same man-made drainage feature as wetland H. Wetland is dominated by soft rush and common reed.
NA**	0.040	This wetland is located within the remnants of an old gravel road. Wetland is very sparsely vegetated with pin oak, smilax, arrowwood, soft rush, and willow.
NB	0.009	This wetland consists of a low area in a former drainage way. Wetland vegetated and dominated by smilax, soft rush and poison ivy.
NC	0.009	This wetland is a small depression located in the corner of a junction of two onsite roads. Wetland is sparsely vegetated with Pennsylvania smartweed and smilax. The wetland is surrounded by large coniferous trees.
ND	0.004	This wetland is a small roadside drainage swale dominated by soft rush and common reed.
NE	0.002	This wetland is a small pit receiving runoff from an adjacent dirt road, wetland is sparsely vegetated with soft rush
NF	0.004	This wetland is a small depression within an on-site path dominated by soft rush
NG	0.008	Located at the base of a slope, the wetland is confined by tire ruts and dominated by pin oak, Canada rush and soft rush.
NH	0.018	The wetland is an isolated depression located ~~with~~within a successional wooded area. The wetland is dominated by rough leaf goldenrod, arrowwood, umbrella sedge, and gray birch.
NI**	0.008	This wetland is a bare depression ringed by arrowwood, highbush blueberry, willow, pin oak buttonbush, and smilax.
NJ	0.009	This wetland is a small depression that is largely unvegetated. Observed species included umbrella sedge, common reed, soft rush, and ~~Spikerush~~spikerush.
NK	0.005	This wetland is a small depression within and access trail dominated by ~~Spikerush~~spikerush.
NL	0.002	This wetland consists of several tire ruts within a field. The wetland is dominated

Wetland	Acreage	Description of Wetlands
		by soft rush, umbrella sedge, and slender leaf goldenrod.
NM	0.023	Located within the middle of a horse pasture, wetland NM is an emergent wetland dominated by soft rush, spike rush, slender leaf goldenrod and path rush.
NN	0.008	This wetland is a small isolated wetland within a small depression adjacent to a horse pasture. The wetland was vegetated with soft rush and Pennsylvania smartweed (Photo 6).
NO	0.036	Wetland NO is similar to wetland E. The wetlands are separated by a small rise. No hydrologic connection between ~~wetland~~Wetland NO and Wetland E was observed.
NP**	0.007	This wetland is a small depression within a horse trail. Wetland sparsely vegetated with soft rush.
NQ**	0.007	This wetland consists of tire ruts within a horse trail. Wetland sparsely vegetated with dark green bulrush.
NR	0.007	This isolated wetland is located in an access way. Wetland vegetated with gray birch, wool grass, and soft rush.
NS	0.013	This wetland largely consists of a series of deep ruts in access trail dominated by dark green bull rush, wool grass, soft rush, and common reed.
NT	0.007	This wetland is a small linear depression within a wooded area on site. Dominant vegetation included pin oak, gray birch, and smilax.
NU	0.004	Wetland NU is a small depression in an access trail delineated with only five wetland flags. Dominant vegetation was wool grass and soft rush.
NW	0.017	This wetland consists of a confined depression and is dominated by soft rush, dog bane, and reed canary grass.
Notes: * Wetland continues outside of the ~~project area.~~ *Project Area. Species identified ~~for a portion~~ in portions of these wetlands also line portions of the ~~wetland line~~ adjacent ~~to road~~ embankment. ** At the time of the delineation, the wetland consisted of over 85 percent bare saturated ground. The wetland was located in an access trail or road and vegetation only grew along the edge of the wetlands		

Vernal Pools

Seasonal or “vernal” pools serve as “stepping stones” through the landscape for animals moving between and among wetlands. By providing feeding and watering opportunities, they support local and regional biodiversity. Seasonal pools’ periodic dry-downs exclude permanent populations of predatory fish. This reduced predator environment provides critical breeding habitat for certain species of amphibians whose eggs and larvae would be at increased risk of predation in more permanent waters.

Developing amphibian larvae and invertebrates in the pools are important prey for visiting turtles, snakes, birds and animals. Bordering and in-pool vegetation provide organic material to seasonal pools. Bacteria, algae, and fungi colonize this vegetative matter, supplying food for invertebrates and developing tadpoles. Invertebrates and amphibian larvae are, in turn, prey for predatory invertebrates and larger-sized amphibian larvae. Amphibians and some insect species eventually metamorphose, leaving the pools and providing a major source of biomass to the surrounding habitat. Seasonal pools are referred to by a variety of names including vernal pools, spring pools, ephemeral wetlands, autumnal pools, woodland ponds and temporary ponds. These unique areas fill with rainwater, surface runoff, snowmelt or groundwater in the fall, winter or spring and may completely dry out by the summer (Brown and Jung 2005).

Natural resource scientists conducted the vernal habitat investigation in previously delineated wetland areas within the Development Area on April 16th and April 17th, 2013. During this investigation, these scientists had copies of the delineated wetlands within the Development Area overlaid on topographic and aerial maps. A habitat was determined to be a vernal pool if it met the four criteria previously discussed in Section 2.8.2.1. If a habitat did not meet the four criteria, it was evaluated to determine if it could potentially meet the vernal pool criteria under various circumstances. These additional

examinations looked for any supporting evidence that a location that did not meet a vernal pool criterion (e.g., applicable fauna) could potentially do so in the future. Notes including a list of amphibians observed or heard and water depth was recorded. Photo documentation taken at each area with potential vernal habitat is included in **Appendix C**.

The following are the results of these investigations:

- During wetland delineation surveys in 2012, 16 wetlands (A, B, C, D, E, G, NA, NB, NI, NJ, NM, NP, NQ, NR, NS and NW) were identified as potential vernal pool habitats. Of these 16 wetlands, only Wetland B was identified as a vernal pool that met all four criteria (see Section 2.8.2.1).

- Wetland B, located within CPPSPP is a forested depressional wetland that receives intermittent flow from a nearby pond via a culvert located beneath the park preserve's well maintained trail. Based on field observations during two documented visits, Wetland B was identified to meet the four criteria for vernal pool habitat. No visual observations of obligate or facultative species' individuals, larvae, or egg masses were observed, although vocalizations of New Jersey chorus frogs and spring peepers were observed. A painted turtle was also seen basking on a log within the wetland. Maximum water depth was recorded at 12 to 24 inches and the water appearance was tannic. No fish were seen during the time of the survey. ~~Based on field observations within two documented visits, Wetland B was identified to meet the four criteria for vernal pool habitat.~~

- Wetland A did not meet all the criteria (specifically vernal pool criteria #2 and 3) during the 2013 survey; however, based on previously identified species at this location and evidence of hydrology early in the year (as seen in April 2013), it is anticipated that most years Wetland A would meet those criteria and would serve as vernal pool habitat. Wetland A is a depressional emergent wetland, highly vegetated with rice cutgrass. Standing water was recorded at 18 inches. A redback salamander was observed beneath a piece of ply wood. No vocalizations or evidence of egg masses or tad poles were observed during the time of survey. It is likely that amphibian species utilize this wetland as breeding habitat, although they were not observed during the time of the surveys.

- While Wetland NI did not meet all four criteria for vernal habitat during the 2013 surveys, it was identified as a likely location to support amphibian species at some time in the future (e.g., vernal pool criterion #2), which would qualify it as a vernal pool. Results of the April 2013, vernal pool survey are provided in **Table 2.8-4**. Wetland NI is a forested depressional wetland located within a successional forest. No vocalizations or evidence of egg masses or larvae were observed, although standing water was recorded at 24 inches. During the time of the 2012 surveys, Wetland NI was observed to maintain ponded water for at least two continuous months between March and September. This would support this location meeting vernal pool criterion #3 and its likelihood to support breeding habitat for amphibian species (criterion #2).

- Within the Development Area (exclusive of the Englewood Corridor that separates CPPSPP and the Conservation Area), the few potential vernal pool habitats are isolated. Also, the surrounding uplands do not have the high quality habitat to support herptofauna (e.g., moist woods, large logs, etc.). Uplands near the Wetland B and C complex contain higher quality upland habitats to support vernal pool herptofauna.

- During the 2013 vernal pool survey, wetlands C, D, E, G, NA, NB, NJ, NM, NP, NQ, NR, NS and NW were determined not to hold sufficient water to be vernal pools. However, in wetter springs they could hold enough water to serve as temporary habitat for frogs and other herptofauna species. During the 2012 survey, green frogs and spring peepers were often observed near wetlands G, NP, NQ, and NS.

Table 2.8-4

2013 Vernal Pool Survey

Wetland / Area	Vernal Pool Criteria Met at time of survey? Y/N	Maximum Depth of Water*	Vernal Pool Fauna Documented	Photos Taken? Y/N	Comments
A	N *(likely variable year to year)*	18”	redback salamander	Y	Heavily vegetated with rice cutgrass. No vocalizations, egg masses, tad poles etc. at time of survey. However, given past observations by Parks Department it is assumed this area serves as vernal pool habitat.
B	Y	12-24”	chorus frog, spring peeper, painted turtle	Y	Vegetation and pool characteristics consistent with vernal habitat. Large forested wetland complex. Water appearance tannic.
C	N	3”	redback salamanders	Y	Forested wetland complex. Likely too shallow to remain inundated long enough to support breeding vernal pool species.
D	N	5”	None	Y	Emergent wetland depression adjacent to horse trail/path. Likely too shallow to remain inundated long enough to support breeding vernal pool species; however, likely used as a habitat resource by herptofauna when wet..
E	N	3”	None	Y	Highly disturbed. Located in horse pasture. Likely too shallow to remain inundated long enough to support breeding vernal pool species; however, likely used as a habitat resource by herptofauna when wet.
F	-	-	-	N	-
G	N	4”	None	Y	Tire/path rut inundation. Likely too shallow to remain inundated long enough to support breeding vernal pool species; however, likely used as a habitat resource by herptofauna when wet.
H &HA	-	-	-	N	-
NA	N	4”	None	Y	Likely too shallow to remain inundated long enough to support breeding vernal pool species; however, likely used as a habitat resource by herptofauna when wet.
NB	N	6”	None	Y	Tire/path rut inundation. Likely too shallow to remain inundated long enough to support breeding vernal pool species; however, likely used as a habitat resource by herptofauna when wet.
NC	N	None	None	N	No evidence of vernal pool conditions
ND	N	None	None	N	No evidence of vernal pool conditions
NE	N	None	None	N	No evidence of vernal pool conditions
NF	N	None	None	N	No evidence of vernal pool conditions
NG	N	None	None	N	No evidence of vernal pool conditions
NH	N	None	None	N	No evidence of vernal pool conditions

Wetland / Area	Vernal Pool Criteria Met at time of survey? Y/N	Maximum Depth of Water*	Vernal Pool Fauna Documented	Photos Taken? Y/N	Comments
NI	N *(likely variable year to year)*	24”	Spring peeper, various	Y	Water tannic
NJ	N	4”	None	Y	Likely too shallow to remain inundated long enough to support breeding vernal pool species; however, likely used as a habitat resource by herptofauna when wet.
NK	N	None	None	N	No evidence of vernal pool conditions
NL	N	None	None	N	No evidence of vernal pool conditions
NM	N	3”	None	Y	Disturbed - Located in horse pasture. Likely too shallow to remain inundated long enough to support breeding vernal pool species; however, likely used as a habitat resource by herptofauna when wet.
NN	N	None	None	N	No evidence of vernal pool conditions
NO	N	None	None	N	No evidence of vernal pool conditions
NP	N	4”	None	Y	Tire/path rut inundation. Likely too shallow to remain inundated long enough to support breeding vernal pool species; however, likely used as a habitat resource by herptofauna when wet.
NQ	N	4”	None	Y	Tire/path rut inundation. Likely too shallow to remain inundated long enough to support breeding vernal pool species; however, likely used as a habitat resource by herptofauna when wet.
NR	N	4”	None	Y	Tire/path rut inundation. Likely too shallow to remain inundated long enough to support breeding vernal pool species; however, likely used as a habitat resource by herptofauna when wet.
NS	N	5”	None	Y	Tire/path rut inundation. Likely too shallow to remain inundated long enough to support breeding vernal pool species; however, likely used as a habitat resource by herptofauna when wet.
NT	N	None	None	N	Wet depression area in woods. No evidence of inundation.
NW	N	6”	None	Y	Likely too shallow to remain inundated long enough to support breeding vernal pool species; however, likely used as a habitat resource by herptofauna when wet.
Two areas in Englewood Avenue Corridor	N	-	None	N	Area closest to Wetland C, may provide limited vernal pool habitat in extremely wet years.
Notes: * Based on amount of standing water observed in April 2013.					

2.8.3.5 Flora Surveys

Resource scientists performed an inventory of vegetation within the Development Area and identified a total of 166 plant species. The flora surveys included a tree survey, a search for endangered plant species, species identified during the wetland delineation, and an inventory of all observed plants on site (see Section 2.8.2.1 of this chapter for survey methodology).

This subchapter identifies the plants (trees, shrubs, vines, grasses, and herbaceous vegetation) that were identified within the Development Area. A list of these plants is provided in **Tables 2.8-6, 2.8-7**, **2.8-8,** and **2.8-9**. As many plants occupy more than one of the mapped ecological communities on site, the ecological communities are grouped into seven general cover-types for presentation purposes in the tables. **Table 2.8-5** identified which mapped ecological community is included in each covertype.

Extensive plant and habitat information within the CPPSPP and the Conservation Area was available from NYSDEC publications (see Section 2.8.3.3 above) and from the 2007-2008 surveys of the Conservation Area. In addition, the team's resource scientists had extensive opportunities to observe habitat conditions in those portions of the CPPSPP and the Conservation Area surveyed as part of their threatened and endangered species investigations, tree surveys and wetland delineation surveys along and adjacent to the Englewood Avenue portion of the Development Area during 2012.

Table 2.8-5

Mapped Ecological Communities and Corresponding Development Area Covertypes

Mapped Ecological Community	Development Area Covertypes
Unpaved Road and Path I	Footpaths, trails, Former Access Roads
Coastal Oak Forest Variant, Successional Northern Hardwoods, Successional Southern Hardwoods	Woodlands 50 Percent of Canopy Height Over 25 Feet
Successional Shrubland,	Woodlands 50 Percent of Canopy ~~Height Over~~Below 25 Feet
Pastureland, Successional Old Field - Variant I, Successional Old Field - Variant II, Successional Old Field - Variant III	Open Fields
Shallow Emergent Marsh, Shallow Emergent Marsh – Confined, Shallow Emergent Marsh / Reedgrass Purple Loosestrife	Wetlands
Brushy Cleared Land, Red Maple ~~Sweet Gum~~Sweetgum Forest, Coastal Oak Hickory Forest, Coastal Oak Forest Variant	Englewood Avenue Corridor Between Clay Pit Ponds State Park Preserve and The Conservation Area

Trees

~~On site~~Within the Development, trees were identified by two surveys. The first survey included an inventory of all tree species within the Development Area. The second method was a survey of all trees on site greater than six inches diameter and breast height (DBH). The results of these two surveys are presented in the following sections.

All Tree Species Inventory

Table 2.8-6 identifies all the tree species on site and the habitats they were observed growing in. A tree is any non-climbing, woody plant that has a DBH of >3.0 inches regardless of height. A total of 42 different tree species were observed on site. Most of the species identified on site were those species common to forested and successional communities of southern New York State.

Saplings of most tree species were observed on site. Post oaks, tulip trees, and some eastern white pine trees were only observed as planted trees ~~and~~on Bricktown Way along the border of the Development Area. Generally, few conifers were observed on site.

Table 2.8-6

Tree Species Observed in the Development Area and the Area for Construction of the Englewood Avenue Corridor

Species		Habitats					
		Foot paths, Trails, Former Access Roads	Woodlands – 50 % of canopy height over 25 ft	Woodlands – 50 % of Canopy Height Under 25ft.	Open Fields	Wetlands	Englewood Avenue Corridor Between Clay Pit Ponds State Park Preserve and the Conservation Area
Norway maple	*Acer platanoides*		X				X
Red maple	*Acer rubrum*		X	X		X	X
Sugar maple	*Acer saccharinum*		X				
Tree-of-heaven	*Ailanthus altissima*		X	X			
River birch	*Betula nigra*		X			X	
Gray birch	*Betula populifolia*		X	X		X	
Mockernut ~~Hickory~~hickory	*Carya tomentosa*						X
Northern catalpa	*Catalpa speciosa*		X	X			
Russian-olive	*Elaeagnus angustifolia*				X		
American beech	*Fagus grandifolia*			X			X
Green ash	*Fraxinus pennsylvanica*		X	X			X
Honey locust	*Gleditsia triacanthos*			X			
Black walnut	*Juglans nigra*		X				
Sweetgum	*Liquidambar styraciflua*		X	X	X		X
Tulip Tree	*Liriodendron tulipifera*†				X		
White mulberry	*Morus alba*		X	X			
Red mulberry	*Morus rubra*	X	X				
Black gum	*Nyssa sylvatica*		X				X
Royal paulownia	*Paulownia tomentosa*	X	X	X			X
Norway spruce	*Picea abies*			X			
Red pine	*Pinus resinosa*		X				
Pitch pine	*Pinus rigida*		X				
Eastern white pine	*Pinus strobus*†				X		X
Eastern sycamore	*Platanus occidentalis*		X	X			
Eastern cottonwood	*Populus deltoids*		X	X	X	X	

Species		Habitats					
		Foot paths, Trails, Former Access Roads	Woodlands – 50 % of canopy height over 25 ft	Woodlands – 50 % of Canopy Height Under 25ft.	Open Fields	Wetlands	Englewood Avenue Corridor Between Clay Pit Ponds State Park Preserve and the Conservation Area
Bigtooth aspen	*Populus grandidentata*		X	X			X
Quaking aspen	*Populus tremuloides*			X	X	X	X
Black cherry	*Prunus serotina*	X	X	X			X
White oak	*Quercus alba*		X	X			X
Swamp white oak	*Quercus bicolor*		X	X			X
Blackjack oak (hybrid)	*Quercus marilandica*		X				
Pin oak	*Quercus palustris*		X	X		X	X
Chestnut oak	*Quercus prinus*						X
Red oak	*Quercus rubra*		X				X
Post oak	*Quercus stellata*†				X		
Black oak	*Quercus velutina*		X				
Black locust	*Robinia pseudoacacia*				X		X
Pussy willow	*Salix discolor*					X	
Black willow	*Salix nigra*					X	
Willow	*Salix* sp.					X	
Sassafras	*Sassafras albidum*		X	X			X
American basswood	*Tilia americana*		X				
Slippery elm	*Ulmus rubra*						X
Note: † Planted and/or staked tree.							

~~Tree Survey~~

Inventory of Trees Over 6-Inch Diameter

In the 2012 tree survey, scientists identified 39 tree species and 3,131 live trees within the Development Area. **Figure 2.8-7** identifies the number of trees per species that were surveyed as part of the study. **Table 2.8-7** identifies the number of trees surveyed by DBH and dominant species for the three following geographic areas:

- Total trees - the combined number of trees of the Development Area;
- Trees within the Development Area exclusive of the Englewood Avenue Corridor; and
- Trees within the Englewood Avenue ~~portion~~ Corridor of the Development Area between CPPSPP and the Conservation Area (Englewood Avenue Corridor).

Due to the observed differences in habitat and forest structure between the Englewood Avenue Corridor, particularly between Kent Street and Veterans Road West, and the rest of the Development Area that are discussed below, the results of the survey were segregated to reflect the differences.

Of the total trees surveyed, the majority of all surveyed trees (68.2 percent) were trees between the 6 to 10 inch DBH increments. As can be observed in previous **Table 2.8-~~3~~7**, there is a similar size distribution of trees between the Development Area and Englewood Avenue Corridor. However, there are notable changes in the composition of the woodlands with respect to species dominance. Within the Development Area (excluding Englewood Avenue), four of the five dominant species (bigtooth aspen, sassafras, black locust, and tree-of-heaven) are often associated with successional and/or disturbed environments. However, along Englewood Avenue south of CPPSPP four of the five dominant species (white oak, Sweetgum, red oak, and pin oak) are species associated with mature forests. Many of the bigtooth aspen trees identified along the Englewood Avenue Corridor were located immediately along the dirt track or in formerly disturbed areas.

Table 2.8-7

Distribution of Surveyed Trees by DBH and Species Dominance

	Diameter at Breast Height (inches)	Total Trees (Development Area and Englewood Ave Corridor)		Development Area (Exclusive of Englewood Ave.)		Englewood Avenue Corridor Between Clay Pit Ponds State Park Preserve and Conservation Area	
		Number of Trees	Percent	Number of Trees	Percent	Number of Trees	Percent
Size Distribution	under 6*	116	3.7%	116	4.3%	--	-
	6 to 8	1,262	40.3%	1,090	40.0%	1722	42.5%
	8 to 10	875	27.9%	755	27.7%	120	29.6%
	10 to 12	382	12.2%	329	12.1%	53	13.1%
	12 to 14	216	6.9%	186	6.8%	30	7.4%
	14 to 16	96	3.1%	77	2.8%	19	4.7%
	16 to 18	79	2.5%	72	2.6%	7	1.7%
	18 to 20	51	1.6%	49	1.8%	2	0.5%
	over 20	54	1.7%	52	1.9%	2	0.5%
		3,131		2,726		405	
	Species	**Number of Trees**	**Percent**	**Species**	**Percent**	**Species**	**Percent**
Dominant Species	Bigtooth ~~Aspen~~aspen	861	27.5%	Bigtooth ~~Aspen~~aspen	28.4%	Bigtooth ~~Aspen~~aspen	20.9%
	Pin ~~Oak~~oak	729	23.3%	Pin ~~Oak~~oak	25.4%	White ~~Oak~~oak	20.7%
	Sassafras	319	10.2%	Sassafras	10.9%	Sweetgum	19.0%
	Black ~~Locust~~locust	203	6.5%	Black ~~Locust~~locust	7.4%	Red ~~Oak~~oak	11.3%
	White oak	202	6.4%	Tree-of-heaven	5.5%	Pin ~~Oak~~oak	5.9%

Note: Number of trees does not include surveyed trees that were dead.
* Trees under six inches that were surveyed are those trees that were identified by the surveyor. Often these trees had a DBH of greater than 5.5 inches. There were many trees onsite that were slightly smaller than six inches DBH that were not surveyed.

To visually illustrate the location and distribution on tree species on site, **Figures 2.8-8** through ~~and~~ **Figures 2.8-10** show the location of each of the surveyed tree species. A description of the species presented on each figure is as follows:

- **Figure 2.8-8** identifies the location of all oak species and mockernut hickory. On the figure, each species is abbreviated by a three-letter code: black oak [BJK], chestnut oak [CTS], pin oak [Pin], red oak [ROK], swamp white [SWO], and white oak [WOK] and mockernut hickory [MOK].

  Oaks appear to be distributed throughout the site, although concentrations of the species occur along the eastern and western borders of the Development Area, including along the proposed Englewood Avenue Corridor. These areas roughly correspond to areas that have not ~~burned~~ experienced fire damage in the last 50 years. Mockernut hickory only occur in the eastern portion of the Englewood Avenue Corridor in the ~~Coastal Oak – Hickory~~ coastal oak – hickory forest.

- **Figure 2.8-9** identifies the location of Poplar species, red maple, Sweetgum, and sycamore. The species are abbreviated as the following: bigtooth aspen [BTA], eastern cottonwood [ETC], and quaking aspen [QKA], and red maple [RMP], and Sweetgum [SGM].

  Poplar species appear to exhibit a degree of zonation on site. Eastern cottonwoods appear in the western portion of the Development Area near Arthur Kill Road. Big tooth aspen and quaking aspen occur throughout the site, but are most prevalent in the southern and central portions of the site. Sweetgum occur in greatest concentrations along the eastern portion of the proposed Englewood Avenue. Red maple trees occur along the existing western and (proposed) eastern portions of Englewood Avenue, with a few individuals concentrated along the western boundary of the ~~site~~Development Area near Arthur Kill Road.

- **Figure 2.8-10** identifies the locations of black cherry [BCH], black gum [BGM], black locust [BLO], tree-of-heaven [TOH], sassafras [SAS] and all the other species.

  Black cherry trees and black locust trees occur in previously disturbed areas and are concentrated in the western portion of the Development Area in the habitats adjacent to Arthur Kill Road. Tree-of-heaven and sassafras trees are densely clustered in the west central portion of the site near the ruins of the former Balthasar Kreischer “Fairview” estate located in the northwest portion of the Development Area. Black gum species occur infrequently throughout the ~~site~~Development Area.

Shrubs and Vines

A shrub is any woody plant having a height ~~>~~greater than 3.2 ~~ft~~feet but a stem diameter of ~~<3~~less than3.0 inches, exclusive of woody vines. Vines are all climbing vegetation greater than ~~one meter~~ three feet in length. A total of 14 shrub species were recorded ~~on site~~ within the Development Area (**Table 2.8-8**~~). Shrubs~~)and were most prevalent in areas along trails and open areas within the woodlands throughout the Development Area.

Nine species of vines were identified in the Development Area. Trumpet creeper and wisteria were very prevalent near the ruins of the former Kreischer estate. These species are likely the remnants of ornamental plantings. Greenbriar is ubiquitous throughout wooded habitats on site and often forms dense growth that made movement through the wooded areas on site virtually impossible without the aid of cutting instruments.

Grasses and Herbaceous Plants

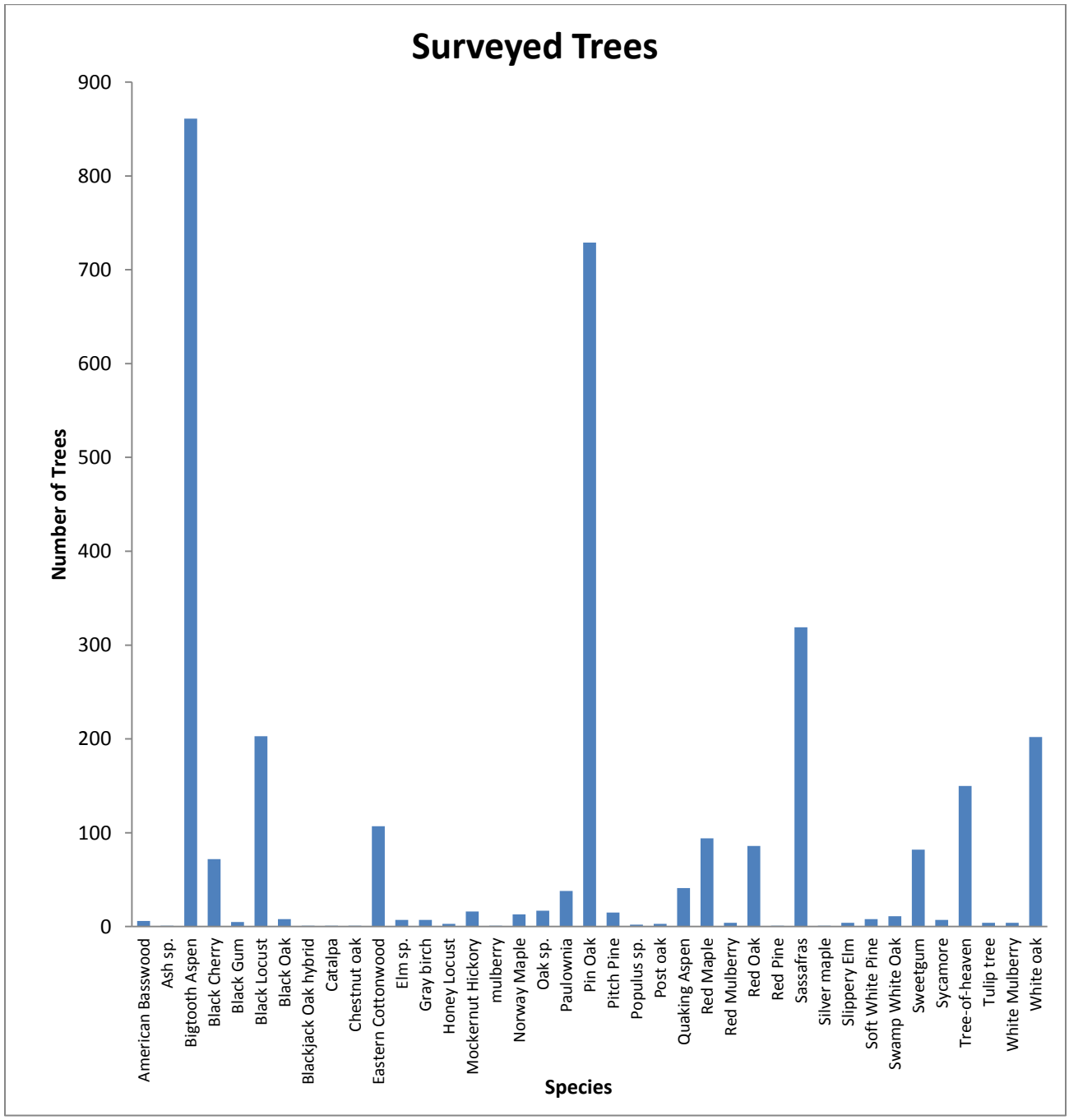
A total of 26 grass species and 74 herbaceous plan species were observed within the Development Area (**Table 2.8-9**). Generally, grasses and herbaceous plants were most prevalent in open fields, wetlands, and along footpaths and former access roads. Within the wooded environments, dense growth of vines and woody species limited the growth of grasses and vines. Often less than 5 percent of the wooded areas were covered by grasses and herbaceous plants. During the 2012 survey, ~~three~~ two species of

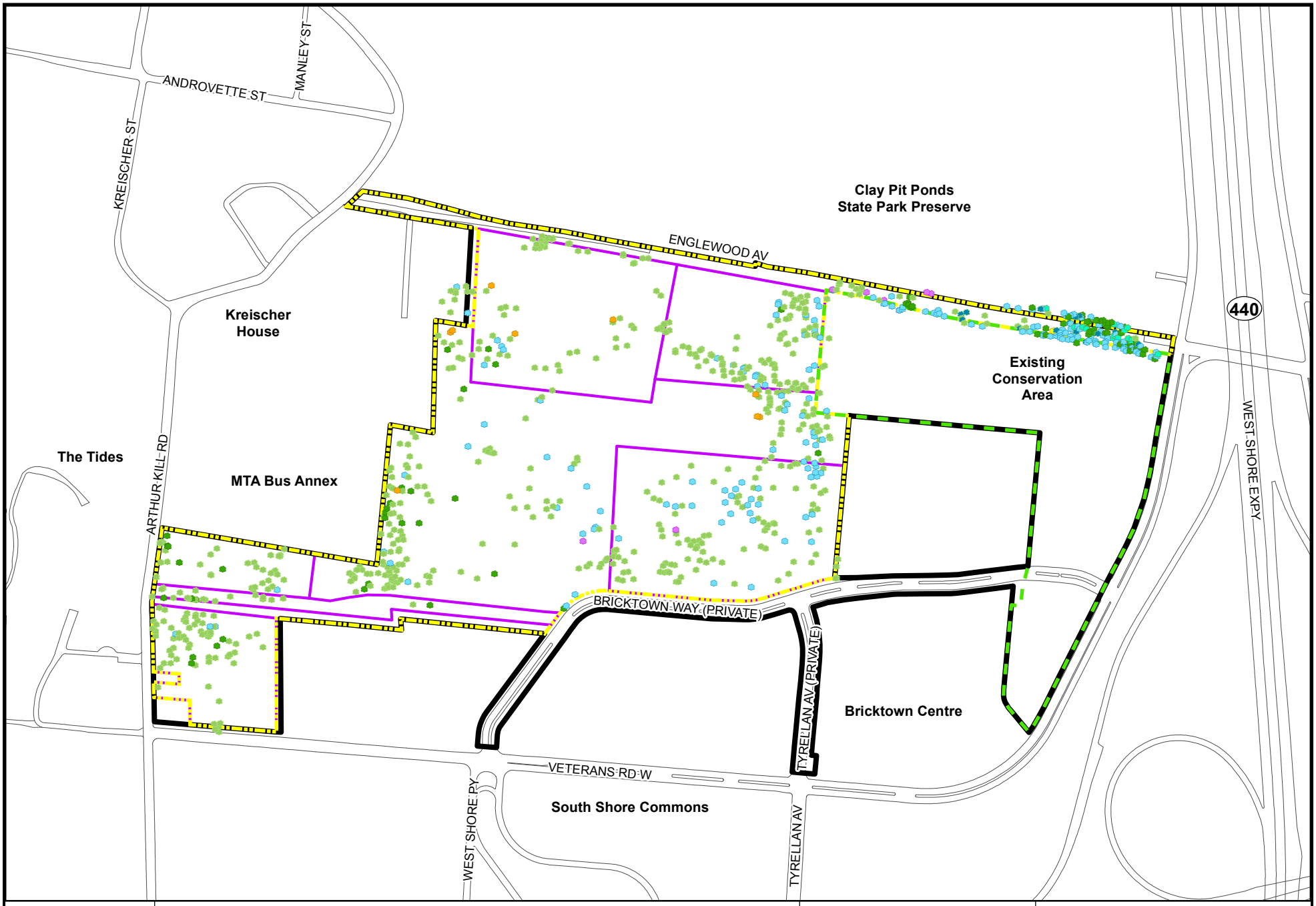
listed herbaceous plants were identified within the Development Area~~. The are~~: Torrey's ~~Mountain Mint, Fringed Boneset,~~mountain mint [endangered] and ~~Late Flowering Boneset~~fringed boneset [threatened]. (see **Table 2.8-9**).[8]

[8] The Late-flowering Boneset is no longer listed as a protected native plant by NYNHP.

Figure 2.8-7

Number of Surveyed Trees by Species





Legend

Surveyed Trees
- BJK
- CTO
- MOK
- OAK
- PIN
- ROK
- SWO
- WOK

Project Area
Development Area
Conservation Area
Site Boundary

0 125 250 500 Feet
1 inch = 500 feet

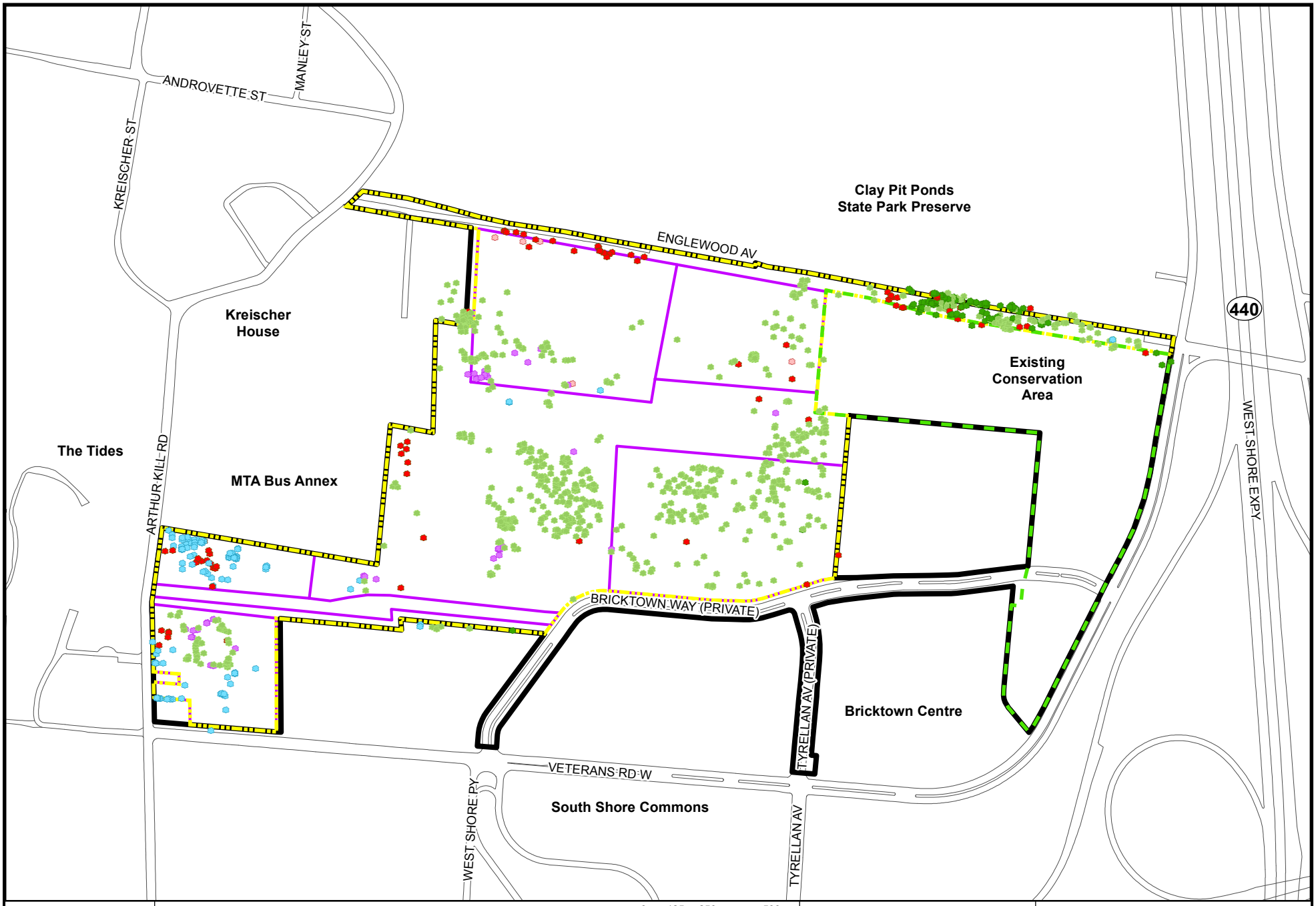
N

AECOM

Charleston Mixed-Use Development

Figure 2.8-8

Surveyed Oak and Hickory Species


ANDROVETTE ST
MANLEY ST
KREISCHER ST
ENGLEWOOD AV
Clay Pit Ponds
State Park Preserve
Kreischer
House
Existing
Conservation
Area
440
WEST SHORE EXPY
The Tides
ARTHUR KILL RD
MTA Bus Annex
BRICKTOWN WAY (PRIVATE)
TYRELLAN AV (PRIVATE)
Bricktown Centre
VETERANS RD W
WEST SHORE PY
South Shore Commons
TYRELLAN AV
Legend
Surveyed Trees
BTA
ECT
QKA
RMP
SGM
SYC
Project Area
Development Area
Site Boundary
Conservation Area
0 125 250 500
Feet
1 inch = 500 feet
N
AECOM
Charleston Mixed-Use Development
Figure 2.8-9
Surveyed Poplar Species, Sweetgum, and Red Maple Trees

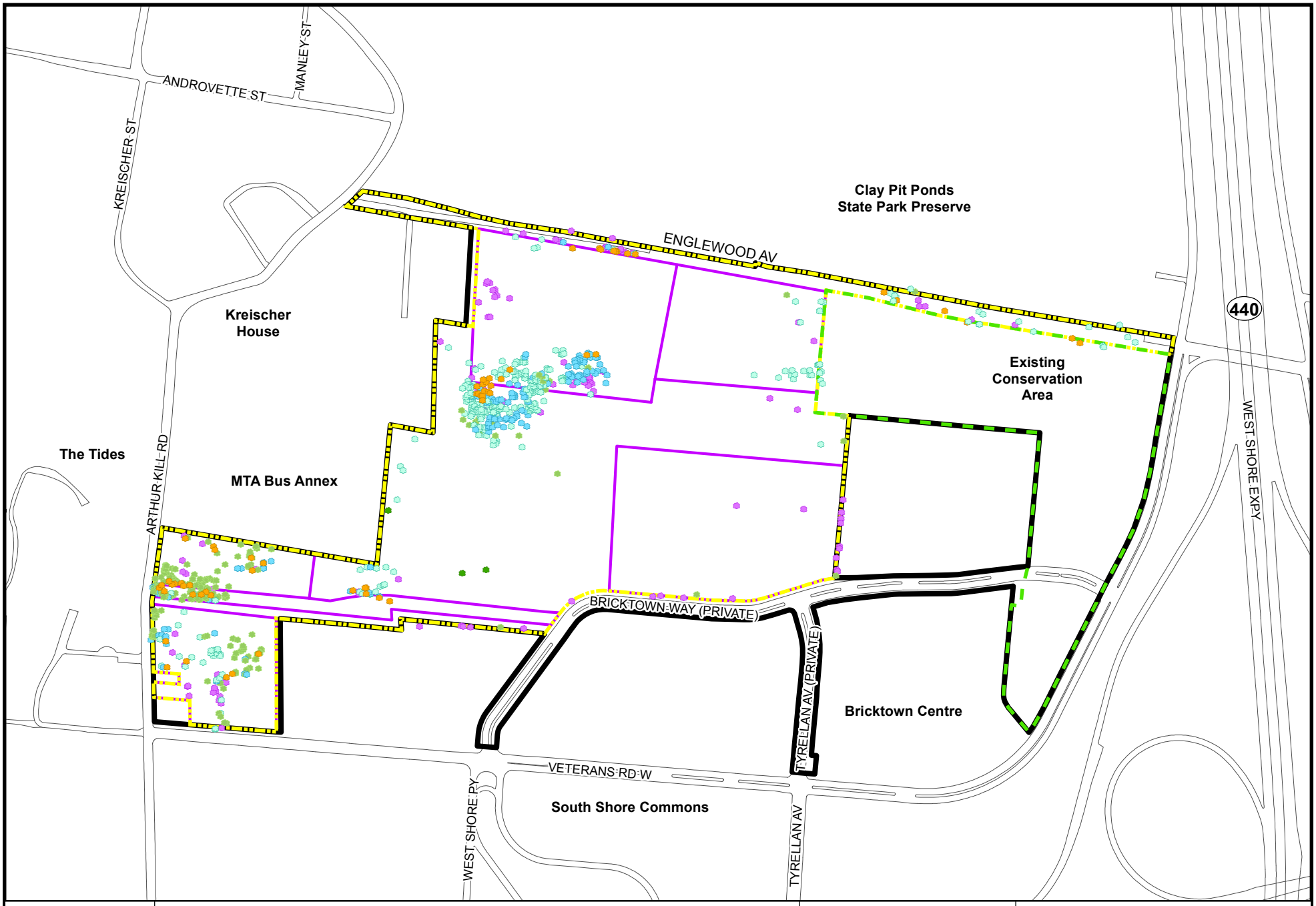

ANDROVETTE ST
MANLEY ST
KREISCHER ST
ENGLEWOOD AV
Clay Pit Ponds
State Park Preserve
Kreischer
House
Existing
Conservation
Area
440
WEST SHORE EXPY
The Tides
ARTHUR KILL RD
MTA Bus Annex
BRICKTOWN WAY (PRIVATE)
TYRELLAN AV (PRIVATE)
Bricktown Centre
VETERANS RD W
WEST SHORE PY
South Shore Commons
TYRELLAN AV
Legend
Surveyed Trees
BCH
BGM
BLO
SAS
TOH
Other Tree Species
Project Area
Development Area
Site Boundary
Conservation Area
0 125 250 500
Feet
1 inch = 500 feet
N
AECOM
Charleston Mixed-Use Development
Figure 2.8-10
Surveyed Sassafrass, Black Cherry, Black Locust, Tree-of Heaven and Other Tree Species

Table 2.8-8

Shrubs and Vines Identified in the Development Area and the Area for the Construction of Englewood Avenue

Common	Species*	Covertypes					
		Foot paths, Trails, Former Access Roads	Woodlands – 50 % of canopy height over 25 ft	Woodlands – 50 % or Greater of Canopy Height Under 25ft.	Open Fields	Wetlands	Englewood Avenue Corridor Between Clay Pit Ponds State Park Preserve and the Conservation Area
Devil's walkingstick	*Aralia spinosa*			X			X
Baccharis	*Baccharis halmnifolia*			X	X		
Buttonbush	*Cephalanthus occidentalis*				X		
American holly	*Ilex opaca*			X			
~~Common pear~~Pear	*Pyrus ~~cummunis~~sp.*				X		
Winged sumac	*Rhus copallina*			X			
Staghorn sumac	*Rhus typhina*			X			
Multiflora rose	*Rosa multiflora*			X			
Rubus sp.	*Rubus* sp.						X
Allegheny blackberry	*Rubus allegheniensis*		X	X			
Lowbush blueberry	*Vaccinium angustifolium*		X				
Highbush blueberry	*Vaccinium corymbosum*		X	X		X	X
Southern arrowwood	*Viburnum dentatum*	X		X		X	
Viburnum tomentosa	*Viburnum tomentosum*		X				
Trumpet creeper	*Campsis radicans*		X				
Oriental bittersweet	*Celastrus orbiculatus*			X			
Japanese honeysuckle	*Lonicera japonica*			X	X		X
Tartarian honeysuckle	*Lonicera tatarica*	X					
Virginia creeper	*Parthenocissus quinquefolia*		X	X	X		X
Greenbrier	*Smilax rotundifolia*	X	X	X	X	X	X
Poison Ivy	*Toxicodendron radicans*		X	X			X
Fox grape	*Vitis labrusca*		X	X			
Wisteria	*Wisteria sinensis*		X				

Notes: * Saplings of a woody tree species (e.g., pin oak) ~~was~~were observed, it was recorded in Table 2.8-7.

Table 2.8-9

Grasses and Herbaceous Plants Identified in the Development Area ~~and the Area for the Construction of Englewood Avenue~~

Species		Covertypes					
Common	**Scientific**	**Foot paths, Trails, Former Access Roads**	**Woodlands – 50 % of canopy height over 25 ft**	**Woodlands – 50 % or Greater of Canopy Height Under 25ft.**	**Open Fields**	**Wetlands**	**Englewood Avenue Corridor Between Clay Pit Ponds State Park Preserve and the Conservation Area**
Redtop grass	*Agrostis gigantea*	X			X		
Broomsedge bluestem	*Andropogon virginicus*	X			X		X
Bermuda grass	*Cynodon dactylon*	X					
Brome ~~Grass~~grass	*Bromus* sp.	X			X		
Umbrella sedge	*Cyperus* sp.					X	X
Orchard grass	*Dactylis glomerata*	X			X		
Deertongue witchgrass	*Dicanthanium clandestinum*				X		
Crab grass	*Digitaria sanguinalis*				X		
Barnyard grass	*Echinochloa crus-galli*	X			X	X	X
Meadow fescue	*Fescue elatior*				X		
Fowlmeadow grass	*Glyceria striata*	X					
Fescue grass	*Gramineae Family*				X		
Rice cut grass	*Leersia oryzoides*					X	
English rye grass	*Lolium perenne*	X			X		
Japanese stiltgrass	*Microstegium vimineum*	X					
Switchgrass	*Panicum virgatum*	X			X		
Reed canary grass	*Phalaris arundinacea*					X	
Timothy grass	*Phleum pretense*	X			X		
Common reed	*Phragmites australis*	X				X	
Kentucky bluegrass	*Poa pratensis*	X			X		
Potentilla sp.	*Potentilla* sp.			X			
Little bluestem	*Schizachyrium scoparium*	X			X		
Woolgrass	*Scirpus cyperinus*					X	
Faber's foxtail	*Setaria faberii*			X	X		
Yellow foxtail	*Setaria glauca*	X			X		
Green foxtail	*Setaria viridis*	X			X		
White snakeroot	*Ageratina altissima*		X	X			X

Species		Covertypes					
Common	**Scientific**	**Foot paths, Trails, Former Access Roads**	**Woodlands – 50 % of canopy height over 25 ft**	**Woodlands – 50 % or Greater of Canopy Height Under 25ft.**	**Open Fields**	**Wetlands**	**Englewood Avenue Corridor Between Clay Pit Ponds State Park Preserve and the Conservation Area**
Water plantain	*Alisma subcordatum*					X	
Common ragweed	*Ambrosia artemisiifolia*				X		
Pearly everlasting	*Anaphalis margaritarea*	X			X		
Hemp dogbane	*Apocynum cannabinum*				X	X	
Devil's walkingstick	*Aralia spinosa*		X				
Mugwort	*Artemisia vulgaris*	X			X		
White heath aster	*Aster palosus*	X				X	X

Species		Covertypes					
Common	**Scientific**	**Foot paths, Trails, Former Access Roads**	**Woodlands – 50 % of canopy height over 25 ft**	**Woodlands – 50 % or Greater of Canopy Height Under 25ft.**	**Open Fields**	**Wetlands**	**Englewood Avenue Corridor Between Clay Pit Ponds State Park Preserve and the Conservation Area**
Japanese barberry	*Berberis thunbergii*	X					
Beggars tick	*Bidens frondosa*					X	
Moss	*Bryophyta*		X	X		X	X
Carex scoparia	*Carex scoparia*					X	
Fox sedge	*Carex vulpinoidea*			X			
Chicory	*Cichorium intybus*	X					X
Canada thistle	*Cirsium arvense*	X			X		
Twig rush	*Cladium mariscoides*					X	X
Vetch	*Coronilla varia*	X			X		
Umbrella sedge	*Cyperus strigosis*					X	
Orchardgrass	*Dactylis glomerata*			X			
Queen Anne's lace	*Daucus carota*				X		X
Hayscented fern	*Dennstaedtia punctilobula*	X					
Deptford pink	*Dianthis armeria*	X					X
Spikerush	*Eleocharis obtuse*	X				X	
Fireweed/Pilewort	*Erechites hieracifolia*	X		X			X
Common boneset	*Eupatorium perfoliatum*				X	X	

Species		Covertypes					
Common	**Scientific**	**Foot paths, Trails, Former Access Roads**	**Woodlands – 50 % of canopy height over 25 ft**	**Woodlands – 50 % or Greater of Canopy Height Under 25ft.**	**Open Fields**	**Wetlands**	**Englewood Avenue Corridor Between Clay Pit Ponds State Park Preserve and the Conservation Area**
Boneset	~~*Eupatoriumsp.*~~*Eupatorium sp.*	X			X		
Fringed boneset**	*Eupatorium torreyanum*	X			X		
Late-flowering boneset‡	*Eupatorium serotinum*	X			X	X	X
Slender-leaved goldenrod	*Euthamia gramnifolia*	X			X		
Glyceria sp.	*Glyceria* sp.	X					
Rattlesnake plantain	*Goodyera pubescens*		X	X			
Smooth oxeye	*Heliopsis heliianthoides*	X	X	X			
Soft rush	*Juncus effuses*	X				X	
Path rush	*Juncus tenuis*	X			X	X	
Rice cutgrass	*Leersia oryzoides*			X			
Bush clover	*Lespedeza* sp.	X			X		
Bird's-foot trefoil	*Lotus corniculatus*				X		X
Water purslane	*Ludwigia palustris*					X	
Monarda sp.	*Monarda* sp.					x	
Sensitive fern	*Onoclea sensibilis*					X	
Cinnamon fern	*Osmunda cinnamomea*		X	X			
Bracked plantain	*Plantago aristata*				X		
English plantain	*Plantago lanceolata*	X			X		
Common plantain	*Plantago major*				X		
Japanese knotweed	*Polygonum cuspidatum*			X			X
Common	*Polygonum hydropiper*					X	

Species		Covertypes					
Common	**Scientific**	**Foot paths, Trails, Former Access Roads**	**Woodlands – 50 % of canopy height over 25 ft**	**Woodlands – 50 % or Greater of Canopy Height Under 25ft.**	**Open Fields**	**Wetlands**	**Englewood Avenue Corridor Between Clay Pit Ponds State Park Preserve and the Conservation Area**
smartweed							
Mild water pepper	*Polygonum hydropiperoides*					X	
Pennsylvania smartweed	*Polygonum pensylvanicum L*	X				X	
Dwarf cinquefoil	*Potentilla canadensis*	X					
Cinquefoil	*Potentilla* sp.			X	X		X
Torrey's mountain mint*	*Pycnanthemum torrei*	X					
Blackberry	*Rubus allegheniensis*			X	X		
Swamp dewberry	*Rubus hispidus*				X		
Common sheep sorrel	*Rumex acetosella*			X			
Curly dock	*Rumex crispus*					X	
Green bulrush	*Scirpus atrovirens*					X	
Scirpus sp.	*Scirpus* sp.	X					
Canada goldenrod	*Solidago canadensis*	X				X	
Late goldenrod	*Solidago gigantea*				X		
Goldenrod	*Solidago nemoralis*		X				X
Rough-leaved goldenrod	*Solidago rugosa*	X		X	X		
Goldenrod	*Solidago* sp.	X			X		
Showy goldenrod	*Solidago speciosa*						
Slender-leaved goldenrod	*Solidago tenuifolia*				X		
Sow thistle	*Sonchus oleraceus*				X		
Heath aster	*Symphyotrichum ericoides*		X				
New England aster	*Symphyotrichum novae-angliae*	X					

Species		Covertypes					
Common	**Scientific**	**Foot paths, Trails, Former Access Roads**	**Woodlands – 50 % of canopy height over 25 ft**	**Woodlands – 50 % or Greater of Canopy Height Under 25ft.**	**Open Fields**	**Wetlands**	**Englewood Avenue Corridor Between Clay Pit Ponds State Park Preserve and the Conservation Area**
New York fern	*Thelyperteris noveboracensis*	X					
Least hop clover	*Trifolium dubium*				X		
Red clover	*Trifolium pretense*	X			X		
White clover	*Trifolium repens*	X			X		
Common mullein	*Verbascum*	X					X
Cow vetch	*Vicia cracca*				X		

Notes:
* denotes those species listed on the NYS Endangered Species List (~~NYNHP, 2012~~ 6 NYCRR Part 182)
**denotes those species listed on the NYS Threatened Species List (NYNHP, 2012)
† NYSDEC, 2013, August 22, phone communication, regarding NYSDEC adopted revision to regulation 6 NYCRR Part 193.3 Protected Native Plants (May 2012), which included changes to incorporate information compiled by NYNHP and reflects changes in the scientific names of many plants. One of the updated changes was the removal of late-flowering boneset (*eupatorium serotinum)* which no long appears on any of the lists of protected plants set forth in 6 NYCRR Part 193.3, and therefore it has no regulatory status.

2.8.3.6 Fauna Surveys

Fauna surveys were conducted within the Development Area from June through November 2012. Scientists observed over 140 species of birds, insects, herptofauna, and mammals. The habitats observed within the Development Area generally provide habitat to animals common to suburban habitats (e.g., raccoon, squirrels). The sections below identify the fauna and their usage of the site. In order to provide an analysis of faunal usage ~~on site~~ within the Development Area year round, the 2012 survey data were supplemented with data from the 2007-2008 survey when appropriate.

Threatened and ~~Endangered~~ endangered species are discussed in the Threatened and Endangered Species subsection ~~on page~~ later in this chapter. .

Extensive fauna and habitat information within the CPPSPP and the Conservation Area was available from NYSDEC publications (see Section 2.8~~-43.~~.3.3 above) and from the 2007-2008 surveys of the Conservation Area. In addition, fauna surveys and wetland delineation surveys were completed by the team's natural resource scientists along and adjacent to Englewood Avenue between these two natural areas, during which the team's scientists had extensive opportunities to observe fauna-related conditions in those portions of the CPPSPP and the Conservation Area.

Avifauna

~~With respect to birds, the~~ The New York City area provides habitat for a wide variety of migratory birds because of its location within part of the Atlantic flyway (one of the major North American avian migration flyways). The major migration routes of the Atlantic flyway follow the Atlantic coast and Appalachian

Mountains. It is probable that most of the avifauna are protected by the Migratory Bird Treaty Act (MBTA) of 1918. The MBTA was enacted to conserve migratory birds and it prohibits the taking, killing or possessing of migratory birds unless permitted by regulation. Conservation of migratory birds by federal agencies and their consideration in the NEPA process is also mandated by Executive Order ~~(EO)~~ 13186, responsibilities of federal agencies to protect migratory birds.

Findings of 2007-2008 and 2012 Surveys

The 2007-2008 avian survey occurred over four seasons ~~and~~ throughout both the Development Area and the Conservation Area. The survey sighted 179 species. During the 2012 avian survey, scientists sighted 69 species. The smaller number of species sighted in 2012 survey is a result of the smaller sampling period and surveys not being conducted throughout the Conservation Area. For instance, there are permanent ponds in the Conservation Area, which would be attractive habitat to waterfowl and other species. The lack of these habitats on the Development Area would tend to preclude sightings of those species.

The species observed ~~species~~ in 2012 are presented in **Table 2.8-10**. Each of the species identified in was grouped into guilds (i.e., associations of species with similar habits and life requirements). The guilds used to describe the species are the following:

Table 2.8-10

Species Observed During the Avian Survey June 2012 through November 2012

Common Name	Scientific Name†
American crow	*Corvus brachyrhyncos*
American goldfinch	*Carduelis tristis*
American redstart	*Setophaga ruticilla*
American robin	*Turdus migratorius*
American tree sparrow	*Spizella arborea*
Baltimore oriole	*Icterus galbula*
Black-capped chickadee	*Poecile atricapilla*
Black-crowned night heron	*Nycticorax nycticorax*
Blue jay	*Cyanocitta cristata*
Brown headed cowbird	*Molothrus ater*
Brown thrasher	*Toxostoma rufum*
Canada goose	*Branta canadensis*
Carolina wren	*Thryothorus ludovicianus*
Cedar waxwing	*Bombycilla cedrorum*
Chipping sparrow	*Spizella passerina*
Common grackle	*Quiscalus quiscula*
Common yellowthroat	*Geothlypis trichas*
Cooper's hawk*	*Accipiter cooperii***
Dark-eyed junco (slate)	*Junco hyemalis*
Double-crested cormorant	*Phalacrocorax auritus*
Downy woodpecker	*Picoides pubescens*
Eastern bluebird	*Sialia sialis*
Eastern kingbird	*Tyrannus tyrannus*
European starling	*Sturnus vulgaris*
Field sparrow	*Spizella pusilla*
Flycatcher sp.	*Flycatcher* sp.
Gray catbird	*Dumetella carolinensis*
Great black-backed gull	*Larus marinus*

Common Name	Scientific Name†
Great blue heron	*Ardeo herodius*
Gull sp.	Gull sp.
Hairy woodpecker	*Picoides villosus*
Hawk sp.	Hawk sp.
Hermit thrush	*Catharus guttatus*
Herring gull	*Larus argentatus*
House wren	*Troglodytes aedon*
Indigo bunting	*Passerina amoena*
Lincoln's sparrow	*Melospiza lincolnii*
Mallard	*Anas platyrhynchos*
Mourning dove	*Zenaida macroura*
Northern cardinal	*Cardinalis cardinalis*
Northern flicker (yellow)	*Colaptes auratus*
Northern mockingbird	*Mimus polyglottos*
Olive-sided flycatcher	*Contopus cooperi*
Osprey	*Pandion haliaetus*
Philadelphia vireo	*Vireo philadelphicus*
Pine siskin	*Carduelis pinus*
Pine warbler	*Dendroica pinus*
Rail sp.	Rail sp.
Red-tailed hawk	*Buteo jamaicensis*
Ring-billed gull	*Larus delawarensis*
Rock dove	*Columba livia*
Ruby-crowned kinglet	*Regulus calendula*
Rufous-sided towhee	*Pipilo erythrophthalmus*
Sharp-shinned hawk*	*Accipiter striatus***
Song sparrow	*Melospiza melodia*
Sparrow sp.	Sparrow sp.
Tufted titmouse	*Baeolophus bicolor*
Turkey vulture	*Cathartes aura*
Vireo sp.	Vireo sp.
Warbler sp.	Warbler sp.
Warbling vireo	*Vireo gilvus*
White-breasted nuthatch	*Sitta carolinensis*
White-crowned sparrow	*Zonotrichia leucophrys*
White-throated sparrow	*Zonotrichia albicollis*
Wilson's warbler	*Wilsonia pusilla*
Woodpecker sp.	Woodpecker sp.
Wren sp.	Wren sp.
Yellow warbler	*Dendroica petechia*
Yellow-rumped warbler	*Dendroica coronata*

Notes

† Scientific names are provided for organisms that were identified to the species level.
* New York State Species of Special Concern
Source: NYSDEC (2012) website.

Gulls/Shorebird/Wader – Gulls/Shorebird/Wader species are mostly associated with wetland or coastal environments. The majority of the shorebird/wader species eat small invertebrates picked out of mud or exposed soil. Different lengths of the birds' bills enable different species to feed in the same habitat, particularly on the coast, without direct competition for food. Many waders have sensitive nerve endings at the end of their bills ~~which~~ that enable them to detect prey items hidden in mud or soft soil. Some larger

species, particularly those adapted to drier habitats, will take larger prey, including insects and small reptiles.

Passerines – Species belonging to the avian order Passeriformes. Passerine species make up more than half of all living birds. They are often small to medium size, have three toes pointing forward and one pointing back, and are often brightly colored. Many traditional song birds are passerines. Larks, swallows, jays, crows, wrens, thrushes, cardinals, finches, sparrows, and blackbirds are all passerine birds.

Raptors – Raptors are birds of prey that hunt for food primarily using their keen senses of hearing and vision. A raptor is defined as any bird that kills its prey with its talons. Their talons and beaks tend to be relatively large, powerful, and adapted for tearing and/or piercing flesh. In most cases, the females are considerably larger than the males. Species within this guild are birds of prey (e.g., eagles, hawks, falcons, and vultures).

Waterfowl – Waterfowl are of the order Anseriformes, especially members of the family Anatidae, which includes ducks, geese, and swans. They are strong swimmers with medium to large bodies. They have historically been an important food source for humans, and continue to be hunted as game, or raised as poultry for meat and eggs.

Other Non-passerines – The species included rock doves, woodpeckers, flickers, killdeer, and kingfishers.

Table 2.8-11 identifies the species observed ~~species on site~~ in the Development Area and their guild. The table below also identifies the frequency of the bird observation during each season. Review of the data presented in Table 2.8-1 indicates that many of the bird species observed on site were transient species identified in the fall migration. Species that were confirmed breeders on site included: northern flicker, gray catbird, northern cardinal, northern mockingbird, and song sparrow.

Table 2.8-11

Species Observed During the 2012 Avian Survey*

Guild	Common name	Frequency of Observation by Season			Notes
		Late Spring / Early Summer	Summer	Fall	
Gulls	Black-crowned night heron	R	NS	NS	Observed once on site.
	Canada goose	NS	NS	C	Observed either passively flying over the site or utilizing on site ponds when flooded.
	Double-crested cormorant	P	NS	P	Only observed passively flying over the site
	Great black-backed gull	NS	P	P	Only observed passively flying over the site
	Great blue heron	NS	NS	R	Only observed in fall.
	Gull sp.	P	NS	P	Observed passively flying over the site
	Herring gull	NS	NS	P	Observed passively flying over the site
	Mallard	R	NS	R	Observed either passively flying over the site or utilizing on site ponds when flooded
	Ring-billed gull	P	P	P	Observed passively flying over the site
Non - Passerines	Downy woodpecker	NS	R	C	Observed in wooded areas on site in the fall.
	Hairy woodpecker	NS	NS	R	Observed in wooded areas on site in the fall.
	Mourning dove	U	NS	U	Observed on site near boundaries of developed areas.
	Northern flicker (yellow)	C	F	F	Frequent observations throughout the site. Likely breeds on site.
	Rail sp.	R	NS	NS	Observed once on site; although, the species is cryptic and may occur in summer and fall.
	Rock dove	U	R	NS	Observed on site near boundaries of developed areas.
	Woodpecker sp.	R	R	C	Observed in wooded areas on site in the fall.
Passerines	American crow	C	C	C	Observed throughout site.
	American goldfinch	C	F	F	Often observed in grassy areas and along the edge of woods.
	American redstart	NS	NS	R	Observed once during fall migration.
	American robin	C	F	F	Observed throughout site.
	American tree sparrow	NS	NS	C	Observed during fall migration period.
	Baltimore oriole	C	NS	NS	Observed during end of spring migration.
	Black-capped chickadee	NS	NS	F	Observed in late fall, Possible winter resident.
	Blue jay	C	C	F	Observed throughout site.
	Brown headed cowbird	R	NS	NS	Only rarely observed in early summer.
	Brown thrasher	NS	R	NS	A cryptic species that may breed on site. Only observed in center of site in densely vegetated forest.
	Carolina wren	NS	NS	R	Observed during fall migratory period.
	Cedar waxwing	NS	NS	U	Observed during fall migratory period.

Guild	Common name	Frequency of Observation by Season			Notes
		Late Spring / Early Summer	Summer	Fall	
	Chipping sparrow	U	NS	R	Observed during migratory periods; although, may breed on site.
	Common grackle	C	U	C	Observed throughout site.
	Common yellowthroat	F	U	R	Observed near wet areas on site.
	Dark-eyed junco (slate)	NS	NS	C	Observed during fall migratory period.
	Eastern bluebird	R	NS	NS	Observed once
	Eastern kingbird	R	U	NS	Observed only a couple times early in the survey
	European starling	C	U	C	Observed flying over site numerous times
	Field sparrow	C	U	NS	Observed near edge of woods.
	Flycatcher sp.	NS	R	R	Observed only a couple times.
	Gray catbird	F	F	F	Breeds on site.
	Hermit thrush	NS	NS	U	Observed during fall migratory period
	House wren	NS	NS	R	Observed during fall migratory period
	Indigo bunting	R	NS	NS	Observed during the spring migratory period
	Lincoln's sparrow	NS	NS	U	Observed during fall migratory period
	Northern cardinal*	F	C	F	Observed numerous times throughout the site. Breeds on site. In April 2013, a pair was observed displaying courtship behavior on site.
	Northern mockingbird	C	C	C	Observed numerous times throughout the site. Breeds on site.
	Olive-sided flycatcher	R	NS	NS	Only observed during migratory periods.
	Philadelphia vireo	U	NS	NS	Observed a couple of times early in the survey.
	Pine siskin	NS	R	NS	Observed once on site
	Pine warbler	NS	NS	R	Observed during migratory periods
	Ruby-crowned kinglet	NS	NS	R	Observed during migratory periods
	Rufous-sided towhee*	U	NS	R	Observed during migratory periods. In April 2013, a pair was observed displaying courtship behavior on site.
	Song sparrow	R	U	C	Observed numerous times throughout the site. Likely breeds on site.
	Sparrow sp.	C	C	C	Observed numerous times throughout the site. Likely breeds on site.
	Tufted titmouse	R	NS	F	Observed numerous times throughout the site in the fall.
	Vireo sp.	NS	R	U	
	Warbler sp.	NS	NS	R	
	Warbling vireo	R	NS	NS	Only observed in spring
	White-breasted nuthatch	NS	NS	C	Observed during fall migratory period. Possible winter resident.
	White-crowned sparrow	NS	NS	R	Observed during fall migratory period
	White-throated sparrow*	NS	NS	F	Observed during fall migratory period. In April 2013, a pair was observed displaying courtship behavior on site.
	Wilson's warbler	U	NS	NS	Observed on a couple times during late spring/early summer.

Guild	Common name	Frequency of Observation by Season			Notes
		Late Spring / Early Summer	Summer	Fall	
	Wren sp.	C	U	NS	Observed during migratory period; although, may breed on site.
	Yellow warbler	C	NS	NS	Commonly observed in the spring.
	Yellow-rumped warbler	NS	NS	C	Observed during fall migration
Raptors	Cooper's Hawk**	NS	NS	~~C~~U	Observed hunting ~~on~~and passively flying over the site during fall migration.
	Hawk sp.	NS	NS	R	
	Osprey	NS	NS	R	Observed passively flying over site at high altitude.
	Red-tailed hawk	R	NS	R	Observed hunting on site during fall migration.
	Sharp-shinned hawk	NS	NS	R	Observed passively flying over site at high altitude.
	Turkey vulture	U	NS	NS	Observed passively flying over site at high altitude.

Notes:
F = Frequent – species of observed through the site in a variety of habitats
C = Common – species observed throughout the site; though less numerous times that species "frequently" observed
U = Uncommon – species that were only observed on a few occasions
R = Rare – species observed only one or two times
P = Passive
NS = Not Sighted

* Supplemented with additional information from April 2013 fieldwork
** Species only sighted three times

Based on the data collected during the 2012 ~~survey~~ and ~~the~~ 2007-2008 ~~survey~~ surveys, there is a distinct seasonal use of the ~~site~~ Development Area by avifauna. During the spring and fall migratory periods, some passerine and other species ~~use~~ were observed using the site as a resting place~~. However,~~ although large flocks of migrating passerine, waterfowl or other avian species were not observed on site.

During the late spring/early summer 2012 surveys, the species most frequently ~~encountered (species of~~ observed throughout the ~~site~~ Development Area in a variety of habitats~~)~~ were the common yellowthroat, gray catbird, and northern cardinal. Species commonly encountered (i.e., species observed throughout the ~~site~~ Development Area; though less numerous times than species "frequently" observed) were northern flicker, American crow, American goldfinch, American robin, Baltimore oriole, blue jay, common grackle, European starling, field sparrow, northern mockingbird, sparrow sp., wren sp., and yellow warbler. In April, 2013, the Englewood Avenue Corridor between CPPSPP and the Conservation Area was investigated as part of the vernal pool survey. Within the 80-~~ft~~foot wide corridor, no nests were observed in the trees.

During the summer 2012 surveys, the species frequently encountered were northern flicker, American goldfinch, American robin, and gray catbird. Many of the migratory passerine species were not observed during the summer.

During the fall 2012 surveys, species frequently encountered were northern flicker, American goldfinch, American robin, black-capped chickadee, blue jay, gray catbird, northern cardinal, tufted titmouse, and white-throated sparrow. Species commonly encountered were downy woodpecker, woodpecker sp., American crow, American tree sparrow, dark-eyed junco (slate), European starling, northern mockingbird, song sparrow, sparrow sp., white-breasted nuthatch, and yellow-rumped warbler. All of these frequently observed species are common to suburban environments of the region.

The 2012 survey was not conducted in the winter; however, based on the results of the 2007-2008 survey, use of the Development Area in the winter is limited to species that commonly occur in winter suburban environments~~: The 2007-2008 survey identified 21 species that winter on site that could utilize the habitats in the Development Area. These species include~~ such as: American goldfinch, American robin, black-capped chickadee, blue jay, Canada goose, common redpoll, fish crow, gray catbird, great blue heron, golden-crowned kinglet, house finch, house sparrow, northern harrier, peregrine falcon, pine siskin, purple finch, red-breasted nuthatch, ruby-crowned kinglet, sharp-shinned hawk, tufted titmouse, and white-breasted nuthatch.

The 2007-2008 survey identified five species of waterfowl (i.e., Atlantic Brant, Canada Goose, green-winged teal, snow goose, and wood duck) as wintering ~~on site~~ within the Development Area. Although Canada geese are ubiquitous in the region, the other four species need open water, which only occurs permanently in the Conservation Area. These species would not occur in the Development Area.

Two NYSDEC Species of Special Concern (Cooper's hawk and sharp-shinned hawk) were observed in the Development Area. The Cooper's hawk is a Species of Greatest Conservation Need and a Species of Special Concern in New York State. However, the NYS Breeding Bird Atlas data indicate a significant increase of the overall distribution, including in the Hudson River Valley in the past twenty years (Audubon, 2013b).

This species occupies deciduous and mixed forests as well as open woodland habitats such as woodlots and riparian woodlands. It generally prefers deep woods, using thick cover both for nesting and hunting. Openings, especially where hedgerows or windbreaks offer shelter for prey species, may also be used when foraging. The species builds a nest in a dense patch of trees, which are typically deciduous. The nest is generally located 20 to 60 feet up in a tree near the trunk, or on a horizontal branch. Nesting territories must be at least 1.5 acres in size (Audubon, 2013b), and the species is tolerant of human disturbance and habitat fragmentation (Audubon, 2013b). Once thought averse to towns and cities, Cooper's hawks are now fairly common urban and suburban birds. Some studies show their numbers are higher in towns than in forests, which are their natural habitat (CLO, 2013)

The sharp-shinned hawk breeds from Alaska through Mackenzie (Canada), to Newfoundland, and south to California, New Mexico, northern Gulf Coast states, and Carolinas. The species winters across the United States and north to British Columbia and Canadian Maritimes (Audubon 2013c). Throughout their range, sharp-shinned hawks favor conifer trees (pine, spruce, or fir) as nesting sites, but may also use aspens and hardwood trees. The nest is always placed under dense forest cover, usually toward the top of a tall tree, but well under the canopy. Most nests are anchored between horizontal limbs and the tree trunk (CLO, 2013a).

Avifauna Usage of the Site

Staten Island is located within the Atlantic Flyway, a coastal avian migration route along the eastern seaboard of the United States. Along the flyway natural areas (e.g., the Development Area, CPPSPP, and the Conservation Area, etc.) are important resources to migrating birds for resting and foraging.

The Development Area ~~does provide~~ provides habitat, nesting, and/or foraging opportunities for raptors, passerine, and non-passerine bird species. Waterfowl, such as gulls and waders, have limited habitat opportunities on site due to the lack of waterbodies on and/or immediately adjacent to the site. Several species common to the northeast United States (e.g., northern cardinal, grey catbird, etc.) were observed nesting on site during the 2012 survey. ~~Other woodland birds (e.g., brown thrasher, vireo, etc.) may also nest in the Development Area.~~ It should be noted that during surveys, the dense growth of vines in the wooded areas often hampered visual observations of some more cryptic bird species (i.e., hard to detect due to size, coloring, etc.); although the vines are primarily comprised of *Smilax* sp., which produces a fruit eaten by birds.

Grassland birds often require very large parcels of contiguous grassland for nesting, which the Development Area does not possess. However, also of interest were the relatively few observations of grassland passerine species utilizing the grassy habitats for foraging, resting, etc. ~~Open~~ The 2012 surveys showed open areas were utilized on occasion by raptors during hunting activities. While the ~~survey~~2012 surveys was not conducted in the winter or in portions of the spring season, the 2007-2008 survey identified in winter that the Development Area is utilized by overwintering birds common to woodlands on Staten Island (e.g., black-capped chickadee, etc.) and is utilized to varying degrees by raptors. Due to Staten Island's position in the ~~North~~ Atlantic Flyway, migratory species utilize the site during the spring and fall. All of the species identified in the Development Area in 2012 likely also occur in the habitats of the CPPSPP and Conservation Area based on previous survey data, the proximity of these areas, and the similarity of the habitats.

Within the eastern segment of the proposed Englewood Avenue, from Kent Street to Veterans Road West no endangered species were observed. However, the CPPSPP is a NYSDEC Designated BCA. During the 2012 surveys, birds (e.g., brown thrasher, downy woodpecker, mourning dove, etc.), were often observed flying to and from the CPPSPP and the Conservation Area. ~~It~~ Based on these observations and the fact that these two natural areas form a large continuous forested habitat, it is likely that these and other species that nest in either the CPPSPP or Conservation Area routinely cross between the two parcels to forage. The forest canopies of the Conservation Area and the ~~preserve~~ CPPSPP co-mingle; thus, ~~warblers or other~~ species that fly from tree to tree pass unencumbered between the two parcels. For forest dwelling species, contiguous forest canopies are an important habitat component.

Mammals

Findings of the 2007-2008 and 2012 Surveys

~~In 2012, resource scientists identified many of the same~~ The 2012 survey did not observe any new mammal species ~~that were identified in~~ compared to the 2007-2008 survey within the ~~previous surveys of these areas. Mammal~~ Development Area. In 2012, mammal observations were ~~accomplished~~ obtained through game camera footage, identification of tracks and scat, or visual observation of the organism~~. The 2012 survey did not observe any new mammal species compared to~~ within the ~~2007-2008 survey. Also, the~~ Development Area. The 2007-2008 survey performed observations throughout the Conservation Area as well, which may explain the additional sightings. All of the mammals identified in **Table 2.8-12** could occur in the Development Area throughout the year (horses and dogs were not included in the survey although the presence of feral cats in the area is noted).

Table 2.8-12

Observed Mammals During the 2007 -2008 and 2012 Surveys

Guild	Common name	Species	2007-2008*	2012
Bats	Little brown bat	*Myotis lucifugus*	X	X
	Big brown bat	*Eptesicus fuscus*	X	
	Red bat	*Lasiurus borealis*	X	
Canids	Feral dog	*Canis lupus familiaris*	X	X
Felids**	Feral cat	*Felis catus*	X	X
Marsupials**	Virginia opossum	*Didelphis virginiana*	X	X
Mustelids	Striped skunk	*Mephitis mephitis*	X	X
Rabbits and Hares**	Eastern cottontail	*Sylvilagus floridanus*	X	X
Raccoon**	Raccoon	*Procyon lotor*	X	X
Rodents	Eastern chipmunk	*Tamais striatus*	X	X
	Woodchuck	*Marmota monax*	X	X
	Gray squirrel**	*Sciurus carolinensis*	X	X
	White-footed mouse**	*Peromyscus leucopus*	X	
	Meadow vole**	*Microtus pennsylvanicus*	X	
	Muskrat	*Ondatra zibethica*	X	X
	Norway rat	*Rattus norvegicus*	X	X
	House mouse	*Mus musculus*	X	X
	Deer mouse	*Peromyscus maniculatus*		X
Shrews and Moles	Northern short-tailed shrew	*Blarina brevicauda*	X	X
	Eastern mole	*Scalopus aquaticus*	X	X
Ungulates	White-tailed deer**	*Odocoileus virginianus*	X	X

Notes:

* The 2007-2008 survey occurred throughout the Development Area and the Conservation Area, which would explain the additional sightings of mammals, especially species associated with aquatic habitats (e.g., muskrats, etc.) that do not occur within the 2012 survey area.

** Confirmed breeding on site, other identified species in the table likely breed on site too; however, confirmation of onsite breeding in either survey did not occur.

A summary of the mammal observations in 2012 are as follows:

- Bats – a bat (likely a little brown bat) was sighted during the early morning near Wetland A. Game cameras were placed randomly throughout the Development Area. No evening images recorded bat usage of the area. The Indiana Bat, a federally endangered species, was not observed.

  In addition, in the northwest portion of the Development Area archaeological remains of a house, a stone-lined well and other subterranean stone-lined features are present. During the 2007-2008 and the 2012 survey, bats were not observed to utilize these areas, and no roosting sites were observed; however, the dense carpets of catbriar that are present may obscure roost sites, if present. Bat usage of the Development Area is likely minimal as the number of flying insects observed on site was low. Large wetlands that are home to flying insect swarms are not present on site.

- Canids – No direct observation of feral dogs occurred within the Development Area. While dog tracks were often seen along the trails in the area's southern portion, it is unclear if these tracks were made by domesticated or feral dogs.

- Felids – Feral cats were observed in several locations. Tracks of cats were observed near several wetlands that held standing water. It is likely feral cats breed within the Development Area. Also,

at the eastern end of the existing Englewood Avenue, there are numerous man-made cat shelters, along with cans of food and water bowls. Signs on the shelters indicate they are Property of the Staten Island Feral Initiative (Photos 11 and 12). The Staten Island Ferial Initiative has a website that indicates the following: *Staten Island Feral Initiative is a registered 501(c)3 non-profit, no-kill, all volunteer organization providing TNR (Trap, Neuter, Return) education, equipment, and support primarily to the SI community, but available to animal advocates throughout NYC and beyond*

An artificially maintained high cat population may have an adverse impact on small terrestrial and flying mammals (e.g., mice and bats), songbirds, and other small fauna. During the 2012 survey, the carcasses of several short-tailed shrews were found in the middle of trails, un-consumed, with wounds consistent with a cat attack (puncture wounds around the head and neck).

- Marsupials – Opossums were recorded on game cameras within the woodlands in the Development Area. Tracks of opossums were observed near wetlands that contained standing water that are surrounded by woodlands (e.g., Wetlands NS, NQ, etc. in **Figure 2.8-5**). It is likely opossums breed in these areas.
- Mustelids – No direct observation of skunks occurred. In July, the smell of a skunk spray was detected near sample plot S13. However, it cannot be determined if the skunk was on or off the Development Area. Regardless, the fact that there were no recordings of skunks by the game cameras or identification of their tracks on site suggests that there is minimal usage of these areas by skunks.
- Rabbits and Hares – Eastern cottontail rabbits were observed throughout the Development Area, and this species likely breeds in the area.
- Raccoons – Raccoons were most often photographed by game cameras within the woodlands in the Development Area. Numerous raccoon tracks were observed within the existing trails, and it is likely that raccoons breed in the area.
- Rodents – Eastern chipmunk, squirrels and woodchucks (often referred to as ground hogs) occur throughout the Development Area and all breed on site. Norway rat, meadow vole, house mouse and deer mouse (*Peromyscus maniculatus*) were observed and all of these species likely breed on site. It should be noted that these rodent species were not observed in great numbers, suggesting natural predation is keeping their numbers in check.
- Shrews and moles – Two carcasses of the northern short-tailed shrew were observed in the Development Area. In addition, mounds which appeared to be the remnants of a mole hill were observed. Thus, both of these species continue to occupy the site and likely breed in the area as well.
- Ungulates - Whitetail deer were observed throughout the Development Area~~. The number~~ and routinely sighted during virtually all of ~~tracks identified suggests a large~~ the approximately 50 survey days, in some instances in herds of over 10 deer ~~population utilizes the area.~~. Also, game cameras observed deer as well. Deer counts were not conducted due to the very dense vine carpets throughout the Development Area which severely restricted visibility, However, evidence of deer browse and buck rub were observed on trees that were not covered in dense carpets of vines. Tracks were observed throughout the Development Area and several fawns were observed during field visits. Along the eastern portion of the proposed Englewood Avenue, from Kent Street to Veterans Road West, the forested areas of CPPSPP and the Conservation area had limited understory, which may be attributable to a large deer population. The study team did not estimate the approximate size of the deer population, other than providing observations on the number and frequency of tracks, evidence of deer browse and buck rub, the size of herds and frequency of sitings.

Mammal Usage of the Development Area

The mammals that were observed throughout the Development Area also likely occur throughout the Conservation Area and the CPPSPP based on the similarity of habitats in those proximate areas. No large predatory mammals (e.g. bears, coyotes etc) nor hibernacula for bats were observed in the Development Area in either the 2007-2008 or 2012 survey. Most of the mammal species observed within the Development Area in the 2012 and 2007-2008 surveys were those species common to a suburban environment (e.g., raccoon, squirrel, etc.) . No muskrats or any other aquatic mammals were observed in the Development Area, which is likely due to the lack of sufficient habitat to support such mammals. The sightings of deer, observation of their tracks, and evidence of deer browse and back rub suggest that deer regularly utilize the Development Area, CPPSPP and the Conservation Area.

AECOM	PHOTOGRAPHIC LOG

Photo No. 11	Date: December 2012

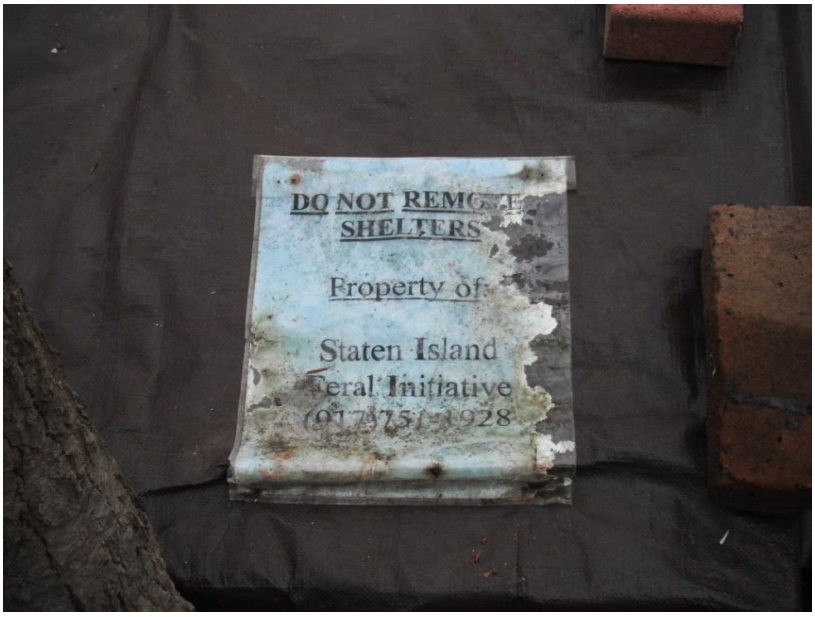
Description:

Man-made structures for cats.

Photo No. 12	Date: December 2012

Description:

Sign on top of cat structures indicating the structures are affiliated with the “Staten Island Feral Initiative”.



~~Mammal Usage of the Development Area~~

~~The mammals that occur throughout the Development Area also likely occur throughout the Conservation Area and the CPPSPP. No large predatory mammals (i.e., bears, coyotes or foxes) were observed in the Development Area in either the 2007-2008 or 2012 survey. Most of the mammal species observed within the Development Area in the 2012 survey and the 2007-2008 survey were those species common to a suburban environment. No muskrats or any other aquatic mammals were observed in the Development Area, which is likely due to the lack of sufficient habitat in the area. Evidence suggests that the deer population that utilizes the Development Area, CPPSPP and the Conservation Area is overpopulated. Also, no hibernacula for bats were observed during either the 2007-2008 or 2012 surveys.~~

Insects

Large emergent marshes that are often home to swarms of insects are not present on and/or immediately adjacent to the Development Area. Insects on ~~site~~ the Development Area are those species common to woodlands, fields, and small wet areas common to the southern New York State.

Findings of the 2007-2008 and 2012 Invertebrate Surveys

Invertebrate fauna were identified during the late spring, summer, and fall of 2012. Invertebrate observations occurred during inspections of coverboards and pitfall traps, overturning rocks and logs, and cursory observations of invertebrates that occurred during other fauna and flora surveys. Due to the potential presence of threatened and endangered species, sweep nets were not employed. Observations of butterflies, dragonflies, and damselflies occurred when an organism landed and the scientists were able to observe the species.

A total of 47 invertebrate species were observed during the 2012 survey. The 2007-2008 survey observed 73 species; however, that survey also included a larger survey area (i.e., the entire Conservation Area) and also occurred over a longer survey period, especially during the early spring when many insects who laid their eggs in wet ephemeral areas begin to hatch. **Table 2.8-13** identifies the invertebrates that were observed in the 2012 ~~survey~~ and ~~the~~ 2007-2008 ~~survey~~ surveys.

Insect Usage of the Site

Insects were observed throughout the Development Area. Butterflies, damselflies, and dragonflies were most often observed over areas dominated by herbaceous vegetation and near Wetlands A and NJ. These wetlands, two man-made ponds, likely serve as important habitat to ordonate (dragonfly) larvae in the spring. In October 2012, monarch butterflies were often seen on site in the successional old field habitats.

The insects that were observed in the Development Area also likely occur in the Conservation Area and CPPSPP based on previous surveys from 2007-2008, NYSDEC data on the CPPSPP and observed habitats in those areas. No rare or unique insect habitat occurs within the Development Area

Table 2.8-13

Insects Observed ~~Insects Within~~ within the Development Area – 2007 to 2008 and 2012

Common name	Species	2007-2008	2012
Dragonflies and damselflies			
Green darner	*Anax junius*	X	X
Comet darner*	*Anax longpipes*	X	
Azure bluet	*Enallagma aspersum*	X	
Eastern pondhawk	*Erythemis simplicicollis*	X	
Fragile forktail	*Ischnura posita*	X	X
Common forktail	*Ischnura verticalis*	X	X
Blue dasher	*Pachydiplax longipennis*	X	
Wandering globetrotter	*Pantala flavescens*	X	
Common whitetail	*Plathemis lydia*	X	X
Autumn meadowhawk	*Sympetrum vicinum*	X	
Carolina saddlebags	*Tramea carolina*	X	
Black saddlebags	*Tramea lacerata*	X	X
Red saddlebags	*Tramea onusta*	X	
Butterflies and moths			
Spring azure	*Celastrina neglecta*	X	X
Orange sulphur	*Colias eurytheme*	X	X
Monarch	*Danaus plexippus*	X	X
Silver spotted skipper	*Epargyreus clarus*	X	X
Hummingbird clearwing	*Hemaris thysbe*	X	
Grass skipper	*Hesperiinae sp.*	X	
Giant leopard moth	*Hypercompe scribonia*	X	
Viceroy	*Limenitis archippus*	X	X
Gypsy moth	*Lymantria dispar*	X	X
Eastern tent caterpillar moth	*Malacosoma americanum*	X	X
Little wood satyr	*Megisto cymela*	X	
Mourning cloak	*Nymphalis antiopa*	X	
Eastern tiger swallowtail	*Papilio glaucus*	X	X
Black swallowtail	*Papilio polyxenes*	X	X
Spicebush swallowtail	*Papilio troilus*	X	
Cloudless sulphur	*Phoebis sennae*	X	X
Pearl crescent	*Phycoides tharos*	X	X
Cabbage white	*Pieris rapae*	X	X
Zabulon skipper	*Poanes zabulon*	X	
Eastern comma	*Polygonia comma*	X	
Question mark	*Polygonia interrogationis*	X	
Wooly bear	*Pyrrharctia isabella*	X	X
Large lace border	*Scapula limboundata*	X	X
Painted lady	*Vanessa cardui*	X	X
American lady	*Vanessa virginiensis*	X	
Red admiral	*Vanessa atalanta*	X	X
Additional species			
Round-headed katydid	*Amblycorypha sp.*	X	X
Lone star tick	*Amblyomma americanum*	X	
Broad nosed weevil	*Aphrastus taeniata*	X	
Honey bee	*Apis mellifero*	X	X

Common name	Species	2007-2008	2012
Yellow garden spider	*Argiope aurantia*	X	X
Eastern boxelder bug	*Boisea trivittata*	X	X
Eastern bumblebee	*Bombus impatiens*		X
Blowfly	*Calliphoridae*	X	X
Carpenter ant	*Camponotus chromaiodes*	X	X
Black carpenter ant	*Camponotus pennsylvanicus*	X	
Lesser meadown katydid	*Conocephalus sp.*	X	
American dog tick	*Dermacentor variabilis*	X	X
Carolina grasshopper	*Dissosteira carolina*	X	
Crane fly	*Epiphragma solatrix*	X	X
Inchworm	*Geometridae sp.*		X
Leafhopper	*Graphocephala versuta*	X	X
Brown marmorated stink bug	*Halyomorpha halys*	X	X
Ground beetle	*Harpalus sp.*	X	X
Ichneumonid wasp	*Ichneumonidae*	X	
Deer tick	*Ixodes scapularis*	X	X
Leaf-footed bug	*Leptoglossus sp.*	X	X
Orchard orbweaver	*Leucauge venusta*	X	X
Spotted garden slug (egg masses and adults)	*Limax maximus*	X	X
Froghopper	*Machaerotidae sp.*		X
European mantis (egg masses)	*Mantis religiosa*	X	X
Red-legged grasshopper	*Melanoplus femurrubrum*	X	
Pine tree spurthroat grasshopper	*Melanoplus punctulatus*	X	
Grasshopper	*Melanoplus*	X	X
Large milkweed bug	*Oncopeltus fasciatus*	X	X
Common woodlouse	*Oniscus asellus*	X	
Nursery web spider	*Pisaurina mira*	X	X
European paper wasp	*Polistes dominula*	X	X
Eastern cidada killer	*Sphecius speciosus*	X	X
Chinese mantid	*Tenodera aridifolia sinensis*	X	
Orbweaver spider	*Tetragnatha sp.*	X	
Pygmy grasshopper	*Tetrix subulata*	X	
Swamp cicada	*Tibicen tibicen*	X	X
Yellow jacket	*Vespula sp.*	X	X

Notes: State Rank NYS-S2 = Imperiled in New York State

~~No rare or unique insect habitat occurs within the Development Area and the insects that were observed to occur in the Development Area also occur in the Conservation Area and CPPSPP.~~

Herptofauna

This subchapter identifies the herptofauna identified ~~on site~~ within the Development Area. Most of the species identified are those species common to southern New York State. No threatened and/or endangered herptofauna species were observed in the Development Area.

~~2007-2008 and 2012 Survey Results~~ Herptofauna Usage of the Development Area

The Development Area provides habitat for a variety of herptofauna species. During the 2007-2008 and 2012 survey, herptofauna were observed throughout the Development Area from the spring through the fall. No threatened or endangered species were observed in either survey, although a box turtle (species

of Special Concern) was observed in both surveys in the Development Area. The herptofauna observed in the Development Area likely occur throughout the CPPSPP and the Conservation Area based on the similarity and suitability of their habitats.

Within the Development Area, Wetland A and some of the small isolated wetlands provide habitat for water dependent herptofauna in the spring and early summer. In drier years, the habitat value of these small wetlands for herptofauna would be reduced. The large wetland complexes in the CPPSPP and the Conservation Area adjacent to the Development Area provide higher value habitat for herptofauna as they are larger wetlands and continuous to mature un-fragmented upland forest. Such mature woodlands provide resources such as travel corridors, refuge (fallen logs, stumps), and foraging habitat. Also, the large wetland complexes themselves are less likely to desiccate in the drier times of the year as opposed to the smaller wetlands within the Development Area.

Table 2.8-14 identified the herptofauna that were observed on site in 2007-2008 and the 2012 Surveys.

2007-2008 Herptofauna Survey

The results of the 2007-2008 ~~Survey~~ survey indicate that two salamander species (Red-backed ~~Salamander~~ salamander and Northern ~~Two~~ two-lined ~~Salamander~~ salamander) were observed within the ~~project site.~~ Development Area. Red-backed ~~Salamanders~~ salamanders were principally observed from May to October 2008 under bricks in surrounding ruins of the Kreischer estate. One Northern Two-lined ~~Salamander~~ salamander was observed under wood debris along the shoreline of a pond in the south-western portion of the site (AKRF, 2009).

Of the five frog species observed on site, spring peeper was the most commonly encountered. It was present in wet areas throughout the entire site during the spring, and was most often detected by vocalization. Other species included American and Fowler's toads, American ~~Bullfrog~~ bullfrog and ~~Northern Green Frog~~ northern green frog (AKRF, 2009).

Four turtle species were observed ~~on~~ in the ~~project site~~ Development Area in 2007-2008, including ~~Snapping Turtle, Eastern Box Turtle, Red~~ snapping turtle, eastern box turtle, red-eared ~~Slider~~ slider and ~~Painted Turtle~~ painted turtle. Individuals were observed during movement and egg laying. Nesting activity was confirmed for each of the above species, with egg laying most commonly observed along exposed soil trails that are located throughout the Development Area. One painted turtle was observed constructing a nest within the open area proposed as Fairview Park (AKRF, 2009).

Observations of turtles occurred throughout June and early July of 2008. Observation of live turtles at that time was limited to two observations of snapping turtles near Wetland A and in the southern portion of the Conservation Area.

Of the four species of snakes observed ~~on site~~ within the Development Area, Eastern ~~Garter Snake~~ garter snake was the most commonly encountered. DeKay's ~~Brownsnake~~ brownsnake, Eastern ~~Racer~~racer and ~~Milksnake~~ milksnake were encountered on one occasion each. No hibernacula or breeding activities were observed within the ~~project site~~ Development Area (AKRF, 2009).

Table 2.8-14

Reptiles ~~And~~ and Amphibians Observed ~~Within The~~ within the Project Site – Surveys 2007-2008 and 2012****

Guilds	Common name	Species	2007-2008	2012
Salamanders	Eastern red-back salamander*	*Plethodon cinereus*	X	X
	Northern two-lined salamander	*Eurycea bislineata*	X	X
Toads and Frogs	Eastern American toad*	*Bufo americanus*	X	
	Fowler's toad*	*Bufo woodhousii*	X	
	Spring peeper*	*Pseudacris crucifer*	X	X
	American bullfrog*	*Rana catesbeiana*	X	X
	Northern green frog*	*Rana clamitans*	X	X
Turtles	Snapping turtle**	*Chelydra serpentine*	X	
	Eastern box turtle	*Terrapene carolina*	X	X
	Red-eared slider*	*Trachemys scripta*	X	X
	Painted turtle*	*Chrysemys picta*	X	X***
Snakes	DeKay's brownsnake	*Storeria dekayi*	X	
	Eastern gartersnake*	*Thamnophis sirtalis*	X	X
	Eastern racer	*Coluber constrictor*	X	
	Milksnake	*Lampropeltis triangulum*	X	

Note: *Onsite ~~Breeding Confirmed~~breeding confirmed
** Detected in the Conservation Area.
*** Observed in Wetland B in April 2013.
**** Supplemented with additional information from April 2013 fieldwork.

2012 Herptofauna Survey

In 2012, the herptofauna observations occurred from late June through October. Descriptions of the herptofauna species observed during the 2012 survey are as follows:

- Salamanders - Eastern red-backed salamanders were observed under cover boards, fallen logs, and anthropogenic debris near site S17 (see **Figure 2.8-1**). There was one observation of a northern two-lined salamander near site S13.

- Toads and Frogs - An American bullfrog was observed at Wetland A (see **Figure 2.8-5**) in late June. Northern green frogs and/or spring peepers were routinely observed near Wetland A, E, G, NP, NQ, NS throughout the summer and early fall. Toads were not observed during the survey; however, it is likely they are present in the Development Area. During the survey period, the dense growth of cat briar likely precluded visual observation of toads.

- Turtles - A box turtle (Photo 13) was observed near Wetland NJ. Box turtles are New York State listed species of special concern. ~~Box turtles were sighted on site in the previous study between 2007 and 2008.~~ The eastern box turtle is generally found in upland habitats. It prefers woods and meadows. In hot, dry weather it may be found in muddy areas or shallow pools, or hiding under rotten logs or other decaying vegetation (NJDEP, 2013). The eastern box turtle ranges from southeastern Maine to southeastern New York, west to central Illinois, and south to northern Florida. From October to April, box turtles hibernate by burrowing into loose soil, decaying vegetation, and mud. They tend to hibernate in woodlands, on the edge of woodlands, and sometimes near closed canopy wetlands in the forest. Box turtles may return to the same place to hibernate year after year (CTDEP, 2013).

- The breeding season begins in April and may continue through fall. In mid-May to late June, the females will travel from a few feet to more than a mile within their home range to find a location to dig a nest and lay their eggs. The three to eight eggs are covered with dirt and left to be warmed bythe sun. Skunks, foxes, snakes, crows, and raccoons often raid nests (CTDEP, 2013). Boxturtles were sighted on the Project Area in the previous study between 2007 and 2008.

Near Wetland A, the remnants of a red-ear slider shell were also observed. No turtle nesting activity was observed in 2012; however, due to the start of the surveys in mid-June, it likely nesting may have already occurred in the surveyed areas. Along the eastern portion of the proposed Englewood Avenue, from Kent Street to Veterans Road West, painted turtles likely continue to nest near the wetlands, although in April 2013, no turtle nests were observed.

- Snakes - There were several observations of eastern garter snakes throughout the Development Area. No other snakes were observed; however, it is likely that the three species (DeKay's brownsnake, eastern racer, milksnake) previously observed in the 2007-2008 surveys in the Development Area ~~continue to occur~~ remain, as suitable habitat and prey resources are available.

~~Herptofauna Usage of the Development Area~~

~~The Development Area does provide habitat for a variety of herptofauna species. During the 2007-2008 and 2012 survey, herptofauna were observed throughout the Development Area from the spring through the fall. No threatened or endangered species were observed in either survey, although a box turtle (species of Special Concern) was observed in both surveys in the Development Area. The herptofauna observed in the Development Area likely occur throughout the CPPSPP and the Conservation Area.~~

~~Within the Development Area, Wetland A and some of the small isolated wetlands provide habitat for water dependent herptofauna in the spring and early summer. In drier years the habitat value of these small wetlands for herptofauna would be reduced. The large wetland complexes in CPPSPP and the Conservation Area adjacent to the Development Area provide higher value habitat to herptofauna.~~

Threatened and Endangered Species

This subchapter identifies the threatened and endangered flora and fauna species identified in the 2007-2008 and 2012 ~~Surveys.~~surveys, the details of which are presented in this section. The 2007-2008 surveys, which included the current Development Area as well as the entire Conservation Area, did locate rare, special concern, threatened and endangered species. Of note, rare and special concern species have more stable populations (e.g., more individuals and locations throughout the state, etc.) than threatened and endangered species.

- Several of the rare, special concern, threatened and endangered plant species found on the site were only located in the southeastern portion of the Conservation Area in 2007-2008 surveys and were not observed within the Development Area in the 2012.

- The only threatened or endangered species observed within the Development Area in 2012 were fringed boneset[9] and Torrey's mountain mint. No specimens of previously observed Virginia pine and willow oak were observed during the 2012 tree survey.

- Ten of the rare, special concern, threatened and endangered species identified in 2007-2008 are bird species. However, none of those species were observed to nest within the Development Area during either the 2007-2008 or 2012 surveys.

[9] NYSDEC, 2013, August 22, phone communication, regarding NYSDEC adopted revision to regulation 6 NYCRR Part 193.3 Protected Native Plants (May of 2012), which included changes to incorporate information compiled by NYNHP and reflects changes in the scientific names of many plants. One of the updated changes was the removal of late-flowering boneset (*eupatorium serotinum)* which no long appears on any of the lists of protected plants set forth in 6 NYCRR Part 193.3, and therefore it has no regulatory status.

- Several of the bird species observed during the 2007-2008 survey are species associated with open water environments (i.e., common tern, black skimmer, and osprey) and were only observed passively flying over the Development Area in the 2012 survey.

- A search was performed in 2012 at the eastern end of the proposed Englewood Avenue Corridor for tall lespedeza, which had been observed in the 2007-2008 survey. No specimens were found in the area, which is now heavily overgrown and has apparently suffered from illegal dumping (e.g., tires, leaf piles, etc.). It is likely the plant no longer exists in this area.
- No evidence of eastern mud turtle or comet darner as observed during the 2012 fauna surveys. Mud turtles were also not observed within the Development Area during the previous survey in 2007-2008. However, habitats that could support these organisms are located in CPPSPP and the Conservation Area. A comet darner was observed near Wetland A in the 2007-2008 survey.

AECOM	PHOTOGRAPHIC LOG

Photo No. 13	Date: June 2012

Description:

Eastern box turtle, sighted near Wetland NJ.

Photo No. 14	Date: July 2012

Description:

Constructed house on site used by homeless persons. Note the substantial construction, moveable windows, etc.

2007-2008 Survey

This section identifies the listed flora and fauna species that were observed within the Development Area and Conservation Area during the 2007-2008 ~~Survey~~ survey. The 2007-2008 survey did not ~~identify~~ delineate the Development Area, and as such, the geographic location of a species sighting (i.e. Development Area vs. Conservation Area) has been added where possible.

Listed Species - Flora 2007-2008

The following flora listed as rare, special concern, threatened or endangered in New York State were observed ~~on~~in the ~~project site~~ Development Area during the 2007-2008 survey (AKRF, 2009):

- American ~~Strawberry~~ strawberry-bush - *Euonymys americana*. Specimens were located within the Conservation Area.
- Torrey's ~~Mountain-~~mountain mint - *Pycnanthemum torrei*. Approximately 23 stems were found in old successional field habitats, including one sampling plot, along the southern and western border of the Development Area; these areas are closest to the existing Torrey's ~~Mountain-~~mountain mint ~~conservation~~ preservation area on Veterans Road at ~~Tyrelan~~Tyrellan Avenue on the southern edge of Bricktown Centre.
- Fringed ~~Bonese t~~boneset - *Eupatorium hyssopifolium var. laciniatum*. Roughly 20 specimens were identified within three study plots in the southern and central portion of the Development Area. Also, another 20-30 specimens were observed in the central successional old field. This field was part of the cleared area of the formerly proposed site for Fairview Park, which in 2012 is becoming overgrown with woody vegetation.
- Serrate ~~Round~~ round-leaf ~~Boneset,~~boneset - *Eupatorium rotundifolium var. ovatum*. One specimen was located along the south-central portion of the ~~project site~~Project Area adjacent to Bricktown Centre at Charleston.
- Round-leaf ~~Boneset~~ boneset - *Eupatorium rotundifolium var. rotundifolium*. Three examples were observed within the western and central portion of the Development Area.
- Late-flowering ~~Boneset~~ boneset - *Eupatorium serotinum*. This species was common in every part of the site not marked by human activity or other disturbance.[10]
- Tall ~~Lespedeza~~ lespedeza - *Lespedeza stuevei*. One plant was observed along the eastern end of the un-built portion of Englewood Avenue.

The following species were noted in NYNHP agency contact letters for previous examinations within the ~~project area~~ Project Area (NYSDEC, as reported in AKRF, 2009). These include:

- Black-jack ~~Oak~~ oak - *Quercus marilandica*. Mature specimens occurred in two plots, and saplings in three additional plots, all within the Development Area. No sign of pine barren communities populated by Black-jack and Post oaks were present within the Development Area or the Conservation Area.
- Rudkin's ~~Oak~~ oak - *Quercus rudkinii (phellos x marilandica*). Noted at two plots within the southeastern portion of the Conservation Area.
- American ~~Chestnut,~~ chestnut - *Castanea dentata*. Several specimens were located on sampling plots throughout the Conservation Area.

Listed Species - Fauna 2007-2008

The following fauna listed as rare, special concern, threatened or endangered in New York State was observed ~~on~~in the ~~project site~~ Development Area, as discussed above (AKRF, 2009).

[10] The late-flowering boneset was removed from the Endangered Species List in 2012

- Reptiles: ~~Eastern Box Turtle~~ eastern box turtle (special concern).
- Birds: ~~Peregrine Falcon~~ peregrine falcon (endangered), ~~Northern Harrier~~northern harrier (threatened), ~~Common Tern~~ common tern (threatened), Sharp-shinned ~~Hawk~~hawk (special concern), Cooper's ~~Hawk~~ hawk (special concern), ~~Black Skimmer~~black skimmer (special concern), ~~Common Nighthawk~~ common nighthawk (special concern), ~~Horned Lark~~horned lark (special concern), osprey (special concern) and ~~Yellow~~yellow-breasted ~~Chat~~chat (special concern).
- Insects. Comet ~~Darner~~ darner - *Anax longipes*. Although presently unlisted in New York State, one individual of this S2-ranked dragonfly species was observed in early July 2008.

2012 Survey

During the 2012 survey, ~~two~~ one state endangered plant species, the Torrey's ~~Mountain Mint and late-flowering boneset were~~ mountain mint was documented within the Development Area. Torrey's ~~Mountain Mint~~mountain mint was identified in one ~~discreet~~ discrete location near the ~~late-flowering boneset was observed throughout the open areas.~~southern border of Retail Site "A". Fringed boneset, a state threatened species, was also observed in the open areas throughout the Development Area. Three state species of special concern, box turtle (Photo 7), ~~coopers~~Cooper's hawk, and sharp-shinned hawk, were observed within the Development Area.

The sightings of the species are further identified below:

- Torrey's ~~Mountain Mint~~mountain mint: In ~~2013~~2012, 42 individuals of this species were identified in the proposed parking lot on ~~site in one discreet location in~~the southern portion of Retail Site "~~A." The individuals occurred~~," in a polygon approximately three feet wide and 100 feet long, located within a bed of a man-made drainage channel. The shallow drainage channel, ~~which is shallow and~~ about two to four feet wide, was cleared of woody vegetation when Bricktown Way was constructed ~~in~~ between 2004 and 2005~~. It~~, but is quickly becoming overgrown with pioneering woody species. The development of these woody species ~~may~~ would provide increasing shaded conditions that would ultimately impact the mountain mint, which prefers open areas along the edge of woods. Also, since the current location of the mountain mint is in a man-made drainage feature, it is unclear if the seed source was transported to the location via Aeolian and/or alluvial forces.

- ~~Late flowering and fringed bonesets: These~~ Fringed boneset: This species ~~belong~~belongs to the *Eupatorium* genus. ~~Individuals of this genus were~~The species was observed throughout the fields, trails, and other open areas in the Development Area~~. Four species of the genus were observed on site. Individuals of the Eupatorium genus were~~, estimated to cover approximately two percent of ~~the~~these open areas on site.

- Box ~~Turtle: The~~ turtle ~~has been documented previously in the 2007-2008 survey and~~: The eastern box turtle ~~habitat (woods and meadows) is present on site. The turtle~~ was observed once in June 2012, near wetland NJ within an area of successional shrubland.

- Sharp-shinned hawk ~~and Coopers Hawk~~: The sharp shinned hawk ~~and coopers hawk~~ were observed only once, flying over ~~the site,~~ during the fall migration and likely only passively use ~~these areas.~~ the Development Area.

- ~~Also a variant of a NY~~ The Cooper's Hawk was sighted three times during the fall migration. Once passively flying over proposed Retail Site "A" and once passively flying over and once hunting over proposed Retail Site "B" near the pastureland habitat.

State ~~-listed significant~~ *Listed Significant Plant Community*

Significant plant ~~community -- red maple/sweetgum swamp --~~communities are habitats, ecosystems, and ecological areas in New York State identified by the New York Natural Heritage Program[11]. AKRF (2009) identified that a S1-ranked Red Maple-Sweetgum Swamp was known from the adjacent CPPSPP. The rank of S1 is identified as "Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology making it especially vulnerable in New York State." AKRF noted a variant of this ecological community in the Development Area (Englewood Avenue Corridor) in 2007. In 2012, a variant of the Red Maple-Sweetgum Swamp was observed in the eastern portion of the proposed Englewood Avenue Corridor near ~~mapped~~delineated Wetlands B and C~~. This habitat was mapped in 2007/2008). The NYSEDC will forward the sighting information of these species to the Natural Heritage Program (NHP).~~ (**Figure 2.8-~~11~~** identifies~~4~~). **Figure 2.8-9** identified surveyed red maple and sweetgum trees in the ~~locations of the observed plant species.~~Development Area.

Both the ~~United States Fish~~ USFWS and ~~Wildlife Service and New York State Department of Environmental Conservation Natural Heritage Program (NHP)~~NYNHP on-line ~~data bases~~ databases were reviewed for potential species and habitats that occurred within and/or adjacent to the study area. In January 2013, an updated request for information letter was sent to the NHP for any recent sightings. In a letter dated February 13, 2013, the ~~NYSDEC NHP~~ NYNHP identified that threatened and endangered species have been previously identified on or ~~near~~ within one half-mile of the ~~site~~ Project Area (**Appendix C**). Those species are identified in **Table 2.8-15.**

Table 2.8-15

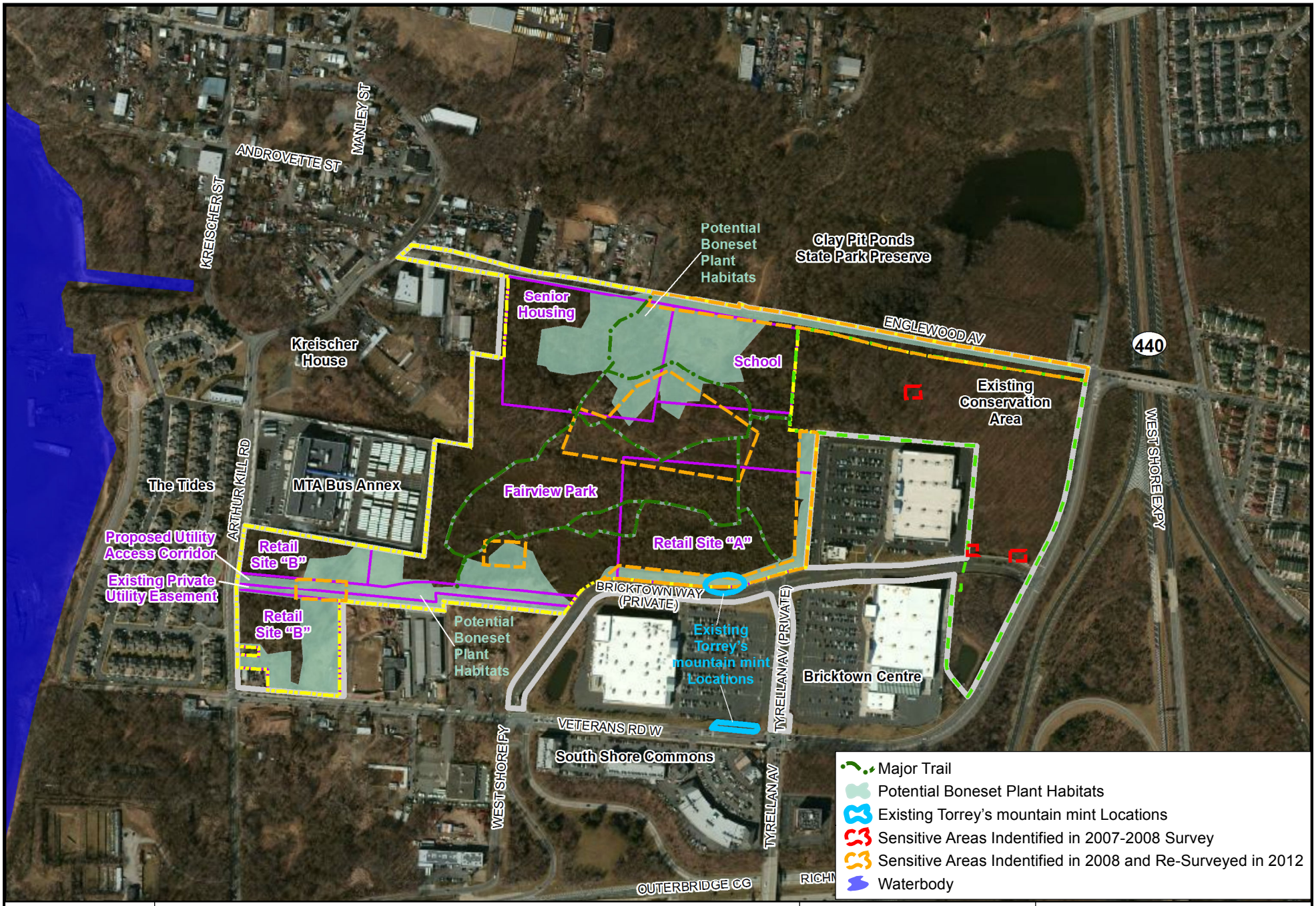
Threatened and Endangered Species Identified in NYSDEC ~~NHP~~NYNHP Correspondence

Common Name	Scientific name	Listing
Eastern Mud turtle	*Kinosternon subrubrum*	Endangered
Comet Darner	*Anax longipes*	Unlisted; however imperiled in New York State
Fringed Boneset	*Eupatorium torreyanum*	Threatened
Torrey's ~~Mountain Mint~~mountain mint	*Pycanthemum torrei*	Endangered
Virginia Pine	*Pinus virginia*	Endangered
Willow Oak	*Quercus Phellos*	Endangered
Notes: The ~~NNHP~~NYNHP identified seven other species; however, these species are historic and were last observed between 1869 and 1907. NYNHP data are for species identified within ½ mile of the Project Area.		

~~The study conducted in 2007-2008 performed surveys in the current Development Area as well as the entire Conservation Area. The study did locate rare, special concern, threatened and endangered species. Of note, rare and special concern species have more stable populations (e.g., more individuals~~

[11] Significant plant communities are rare or high-quality wetlands, forests, grasslands, ponds, streams, and other types of habitats, ecosystems, and ecological areas. NY Natural Heritage calls these different types of habitats or ecosystems "natural ecological communities." NY Natural Heritage's classification of natural communities recognizes 174 distinct natural community types. NY Natural Heritage documents only those locations of natural communities where the community type is rare in New York State; or, for more common community types, where the community at that location is a high-quality example and meets specific, documented criteria for state significance in terms of size, undisturbed and intact condition, and the quality of the surrounding landscape (NYSDEC, 2013a)

NY Natural Heritage keeps track of locations of significant natural communities because they serve as habitat for a wide range of plants and animals, both rare and common; and because natural communities in good condition provide ecological value and services. The conservation of high-quality examples of all the natural community types in each region of New York State will help ensure that all New York State's plants and animals are preserved (NYSDEC, 2013a).



AECOM

Legend

Project Area
Development Area
Site Boundary
Conservation Area

0 150 300 600 Feet

1 inch = 600 feet

N

Source: NYSDEC and Bing Aerial Map.

Charleston Mixed-Use Development

Figure 2.8-11

Areas Identified On Site that Support Listed Species

~~and locations throughout the state, etc.) than threatened and endangered species. Several of the rare, special concern, threatened and endangered plant species found on the site were only located in the southeastern portion of the Conservation Area, and, in 2012, were not observed within the Development Area. Moreover 10 of the rare, special concern, threatened and endangered species are bird species. None of these species were observed to nest within the Development Area during the 2007-2008 or 2012 surveys. Also, several of the species observed during the 2007-2008 survey are species associated with open water environments (i.e., common tern, black skimmer, and osprey) and were only observed passively flying over the Development Area.~~

~~Although not listed species, specimens of either Rudkin's Oak or American Chestnut were not identified in the Development Area. Also, a search was performed at the eastern end of the proposed Englewood Avenue for Tall Lespedeza. No specimens were found, the area is now heavily overgrown and has witnessed a good deal of illegal dumping (e.g., tires, leave piles, etc.) in the last few years. Thus, it is likely the plant no longer exists in this area.~~

~~As identified earlier, only fringed boneset and Torrey's mountain mint were observed on site. No specimens of Virginia Pine and Willow oak were observed during the tree survey. Also, no evidence of eastern mud turtle or comet darner were observed during the fauna surveys. Mud turtles were also not observed during the previous survey in 2008-2009; however, habitats that could support these organisms are located in CPPSPP and the Conservation Area. A comet darner was observed near Wetland A in the 2007-2008 survey.~~

Human Habitation On Site

~~As identified previously~~ As noted in Section 2.8.3.2, the pastureland ecological community in the north-central portion of the Development Area is used by equestrians. Also, the main trails throughout the Development Area are frequently used by recreational horseback riders. ~~Equestrian~~ Based on field observations, these equestrian-related activities do not appear to have an adverse impact on ~~other~~important ecological communities within the Development Area.

~~Homeless persons appear to utilize the Development Area, with four~~ Four structures (Photo 14) observed in the south-central and western ~~portion~~ portions of the ~~area.~~Development Area suggest that homeless persons may utilize the Development Area. Evidence of ~~current~~ recent habitation was observed from June through December. It does not appear that the presence of these structures or inhabitants has substantially altered the ecological community.

2.8.3.7 Summary of Existing Conditions

The ecological value of the habitats within the Development Area is variable. The eastern portion of the proposed Englewood Avenue, from Kent Street to Veterans Road West, serves as a transit corridor for fauna travelling ~~to and from~~ between the CPPSPP and the Conservation Area. The habitats adjacent to this segment of the proposed Englewood Avenue are high-value mature developed woodlands, with limited vine growth. Also, a Red Maple-~~sweet gum~~ Sweetgum swamp, which is a New York State-listed ~~s~~Significant ~~p~~Plant ~~c~~Community, is present adjacent to this segment of the proposed Englewood Avenue.

The remainder of the Development Area largely consists of a mosaic of successional woodlands, small, isolated wetlands, and old fields of moderate to low ecological value. Almost all of the woodlands and approximately half of the fields are impacted by dense carpets of catbriar and other vines. Many of trees on site exhibited signs of stress (e.g., trunk and branch deformities, etc.) due to the heavy vine growth.

Many of the wetlands in the Development Area are small and isolated; although, some of these wetlands serve as vernal pool habitat in the late winter and spring. Other smaller wetlands serve as herptofauna habitat during wet conditions. The surrounding uplands do not support habitat favored by vernal pool

fauna, although the area does provide some habitat. No vernal pool complexes were observed in or near the Development Area west of the Conservation Area/CPPSPP.

~~Two~~One endangered plant species, the Torrey's ~~Mountain Mint and late-flowering boneset were~~ mountain mint was documented ~~on site.~~within the Development Area. Torrey's ~~Mountain Min t~~mountain mint was identified in one ~~discreet~~ discrete location~~, the late-flowering boneset was observed throughout the open areas in the Development Area.~~ on Retail Site "A", Fringed boneset, a state threatened species, was also observed in the open areas throughout the Development Area.

Three state species of special concern, box turtle, coopers hawk, and sharp-shinned hawk, were observed in the Development Area. The turtle has been documented previously in the 2007-2008 survey and box turtle habitat (woods and meadows) are present in the Development Area. The hawks were observed once during the fall migration over Development Area A. The Cooper's Hawk was observed twice Over Development Area B. Neither of these species were observed nesting on site.

Comparing the results of the 2007-2008 survey to the 2012 survey identifies that some changes have occurred in the Development Area. Notably, the 2009 fire ~~changed a wooded parcel of~~ burned approximately ~~12~~10 acres~~ to a disturbed successional old field dominated by a dense carpet of cat briar. In the previously presented~~. **Figure 2.8-4**, Successional Old Field habitat – Variant III, identifies a habitat that was once a wooded area that burned and is now a field with dense growths of cat briar. This has likely lowered the ecological value of the parcel. Also, in the north-central portion of the Development Area, an area that had been cleared prior to the 2007-2008 survey has since had much growth of woody successional vegetation. The area now largely consists of several dense thickets of grey birch and aspens.

~~Species that occur within the Development Area could also occur throughout the CPPSPP and the Conservation Area. The Development Area does not contain any rare or unique habitats that do not occur either in CPPSPP or the Conservation Area.~~

2.8.4 FUTURE NO-ACTION CONDITIONS

Under the Future No-Action Condition, the Proposed Project would not be constructed and the Development Area is expected to remain in ~~its existing condition.~~ a natural state. However, many of the ecological communities in the Development Area that are currently dominated by herbaceous vegetation (e.g., the successional old fields, pasturelands, etc.), could convert, in whole or in part, to wooded habitats through natural succession by 2020 as has been observed to be occurring in the previously cleared area in the north-central portion of the Development Area. This natural conversion may alter or reduce the amount of suitable habitat within the Development Area capable of supporting the existing plant species observed in those areas in 2012. If the pastureland habitat continues to be utilized by equestrians, it is anticipated that this ecological community would persist through 2020.

No other projected development is planned or considered likely to occur in the Project Area by the 2015 or 2020 analysis years of the proposed Charleston Mixed-Use Development. Therefore, understanding the possibility of natural succession from herbaceous to wooded areas as noted above, there would be no anticipated impacts to natural resources under the Future No-Action Condition.

2.8.5 FUTURE WITH-ACTION CONDITIONS

As discussed in **Chapter 1**, the Proposed Project consists of a number of discrete project elements to be undertaken by different entities. Overall, the Development Area is divided into smaller ~~sites for future~~ development sites. In addition, areas adjacent to the Development Area (within the overall Project Area) include areas for street mapping and construction. The Project Area includes the Development Area, Conservation Area, ~~and~~ all of the areas for street mappings, and the two parcels at the southwest corner of the Project Area that would be rezoned, but are not included in the Development Area.

~~The NYC Department of Parks and Recreation~~NYCDPR would develop an approximately 23-acre park site with active and passive recreational space by the 2015 analysis year. This new park would be mapped along with the adjacent approximately 20-acre Conservation Area to create ~~a new,~~ approximately 43-~~acre~~acres of contiguous mapped parkland. The preliminary site concept places the proposed approximately 23-acre Fairview Park within the western and central portion of the Development Area, adjacent to Retail Site "A." ~~The park~~The new park would connect to the existing Conservation Area and would contain approximately 15.5 acres of passive open space and approximately, 7.5 acres of active open space. A passive trail system (an unpaved system generally following existing paths through these areas) would be located within the western portions of the proposed park. This portion of the park includes building foundations and other elements of the former Kreischer Estate Site, and these potential archaeological resources limit the amount of disturbance planned within that sensitive area (see **Figures 2.6-3** and **2.6-4** in **Chapter 2.6**). Natural resources in these areas would generally not be altered. East of the passive trail system would be a proposed multi-purpose field, followed to the east by a park comfort station, court sport areas and ballfields. Overall, the trail system, driveway and a parking lot for park users would be the only park facilities planned in the western and southern portions of the park, except for the multi-purpose field, leaving existing natural areas in those sections undisturbed. The park would include 60 parking spaces (in a separate lot) for visitors in the southeast corner of the park. An additional 30 parking spaces would also be provided for shared-use between the retail stores and park visitors on the northwest corner of Retails Site "A."

A private developer has been selected to develop the approximately 11-acre Retail Site "A" by the year 2015 with up to approximately 195,000 square feet of commercial space for medium- and large-format retail stores (based on an expected reasonable worst case development scenario), along with a new maximum 15,000 square foot library branch that will share parking with the retail stores.

By the year 2020, ~~an additional~~a 7.3-acre site along Arthur Kill Road would be developed as Retail Site "B" with an anticipated 90,000 square feet of neighborhood retail space. Along Englewood Avenue, the City will offer an approximately 9.1-acre site to developers for senior housing ~~in the future~~ for up to 162 units, consisting of 80 affordable multi-family rental units and 82 age-restricted for-sale detached units. To the east of the senior housing site, the NYC School Construction Authority would construct a combined elementary/middle school on the approximately 5.9-acre site with a 750-seat capacity for kindergarten through 8th grade.

Englewood Avenue would be mapped from Arthur Kill Road to Kent Street and constructed across the northern border of the Project Area ~~and would connect~~, connecting Veterans Road West on the east to Arthur Kill Road on the west. The fully constructed length of Englewood Avenue would include bicycle and pedestrian facilities.

The Proposed Project also includes the mapping ~~as public streets~~of portions of two privately-owned roadways ~~of portions of~~ , Bricktown Way and Tyrellan Avenue within the Project Area, both of which would provide access to Retail Site "A," the public library, and the proposed park. No physical changes to these roadways would occur.

Combined, these developments and new street construction would convert approximately ~~65~~64 acres of vegetated areas to 37.5 acres of structures and parking and approximately 23.5 acres to parkland.

The elements of the Proposed Project are being assessed over two analysis years. The first year for analysis includes the construction of Retail Site "A," the public library and Fairview Park, which are expected to be completed by the year 2015. Construction of the remaining sites is expected to be completed by the year 2020, including the developments of Retail Site "B," the school, the senior housing, and Englewood Avenue. Both analysis years are discussed below.

2.8.5.1 Year 2015 Analysis

Topography, Geology, and Soils

Impacts to topography, geology, and soils would be limited to grading and filling associated with earthmoving for construction of Retail Site "A," the library, and developments associated with the park (e.g., ballfields, parking etc.), within this approximately 34-acre area. ~~For development of the proposed park area, the program calls for continuance of most of the~~ The existing passive walking/riding paths through the western half of the park which would be left relatively unchanged, ~~Grading will~~but grading would be required to establish the flat areas for the park's multi-purpose field and to a lesser extent for the tennis courts and baseball fields. Retail Site "A" would require ~~some~~ substantial changes in topography to create the relatively flat shopping and parking areas, although the proposed plan uses steeper edges to reduce the overall amount of grading and minimize differences with the adjacent park areas to the north and west. It is anticipated that bedrock is at a sufficient depth so that no blasting would be required. Future contractors would need to adhere to a soil erosion control plan during construction.

Wetlands and Waterbodies

Implementation of the Proposed Project by the year 2015 would impact approximately 0.107 acres of wetland habitats~~. The wetlands that would be impacted by the 2015 development include~~ including: Wetlands F, G, NF, NI, NP, NQ, NR, NS, NT, and NU. Many of these wetlands are less than 0.01 acres in size and consist of sparsely vegetated depressions within onsite trails. Wetland NI is deep enough to potentially serve as vernal pool habitat. The other wetlands serve as habitat for herptofauna when wet, but do not stay wet enough throughout the year to serve as vernal pool habitat. ~~The other wetlands serve as habitat for herptofauna when wet, but do not stay wet enough throughout the year to serve as vernal pool habitat.~~

Wetland A (just over one acre), one of the larger wetlands mapped within the Development Area, would be preserved within the proposed Fairview Park and in most years could continue to serve as a potential vernal pool habitat. No impacts to NYSDEC regulated wetlands or USACE jurisdictional wetlands would occur by the 2015 ~~build~~ analysis year (**Table 2.8-16**). Wetland A serves as vernal pool habitat.

Wetlands H, HA, NB, ND, NE and NW occur in the existing private utility easement, with portions of some of these small wetland areas potentially extending into the Proposed Utility ~~Easement~~Access Corridor. Combined, these wetlands total just under 0.1 acres. There are no plans to develop these wetlands in 2015.

Table 2.8-16

Estimated impacts to Wetland Habitats and Regulated Wetlands in the 2015 Analysis Year

Wetlands	Impacted Wetlands (acres)
Non-regulated Wetland Habitats (isolated wetlands)	0.107
NYSDEC-Regulated Wetlands and USACE Jurisdictional Wetlands [1]	0.000

[1] ~~Awaiting concurrence from the~~The USACE ~~on the wetland delineation. It is assumed the USACE will identify~~has identified wetlands ~~B~~, C, ~~H, HA,~~ NB, and ~~NW~~ as jurisdictional.

No impacts to surface waters would occur from development by the 2015 analysis year. Wetland A, which is a man-made pond in the southern portion of the proposed park, is located in the passive recreation section of the proposed park and is not anticipated to be significantly impacted by future ~~developments~~ development.

Habitats and Fauna and Flora ~~and Fauna~~

Habitats

The developments from the 2015 analysis year would remove or alter approximately 20.5 acres of habitat for flora and fauna on site. Conversely, establishment of the park would preserve 13.7 acres of vegetated habitats in perpetuity. **Table 2.8-17** identifies the acreage of habitats ~~what~~ that would be removed by implementation of the 2015 development.

Approximately 85 percent of the lost habitats are largely successional woodlands and fields.

Table 2.8-17

Impacted and Preserved Habitats in the Development Area in the 2015 Analysis Year

Habitats	Impacted	Preserved
Coastal Oak Forest Variant	3.802	2.121
Successional Northern Hardwoods	8.875	2.305
Successional Old Field - Variant I	1.361	1.190
Successional Old Field – Variant II	-	0.931
Successional Old Field - Variant III	1.013	5.652
Successional Shrubland	4.806	-
Successional Southern Hardwoods	0.068	1.089
Shallow Emergent Marsh	0.001	0.136
Shallow Emergent Marsh - Confined	0.106	0.003
Unpaved Road and Path I	0.417	0.267
	20.449	**13.695**

~~These habitats are largely successional woodlands and fields.~~ None of the habitats are rare or unique and are common in southern New York State.

Fauna

The Development Area supports a variety of mammals (e.g., mice, voles, raccoons, deer, etc.). Displacement of wildlife in 2015 within the constructed portions of the Development Area ~~would~~ could be ~~either temporary or~~ permanent, depending upon ~~whether~~ the extent to which the construction would ~~permanently~~ alter the existing landscape and remove sufficient habitat to render the remaining habitat unsuitable for some species. Visual and noise disturbances during the construction phase may cause these animals to relocate to the undisturbed suitable habitats adjacent to the newly built areas.

Where habitats would be permanently impacted, motile species would likely relocate to contiguous tracts of land adjacent to or near the Development Area, thereby putting additional pressure on these habitats due to the over population of some species. Once construction is complete, ~~it is anticipated that~~ the fauna utilizing the Development Area would have to adapt to the available habitats. While species already relatively adapted to an urban environment (e.g., squirrels, opossum, deer, etc.). can more easily adapt to these types of change, anthropogenic encroachment and disturbances (e.g., noise, light, etc.) into what is now a low-noise environment would make portions of the Development Area an unattractive habitat to organisms intolerant of urban disturbances (e.g., forest birds better suited to larger continuous wooded areas).

The year 2015 construction activities would result in some habitat fragmentation of contiguous habitat of CPPSPP, the Conservation Area, and remaining portions of the Development Area. Fragmentation would impact the mammals, birds and some reptiles that would normally use the contiguous habitat for migration, feeding, foraging and/or breeding. The impacts of habitat fragmentation would be minimized because the development of Retail Site "A" and Fairview Park would leave a vegetated corridor (north of these parcels) that is contiguous with the CPPSPP, the Conservation Area, preserved area of the proposed park, and other undeveloped portions of the Development Area.

Wetland A, the man-made pond in the proposed parkland, would not be impacted in the 2015 analysis. A sensitive dragonfly species, the comet darner, as well as other water dependent species (e.g. herptofauna) has been observed near this pond in 2007-2008. This pond and a surrounding undisturbed vegetated buffer would be maintained under the proposed plans for Fairview Park.

Flora

In order to identify the number and species of trees impacted by this project, the areas of development were overlaid upon the surveyed trees (**Figures 2.8-8, 2.8-9** and **2.8-10**) and the number of trees within developed areas was calculated. Within the park, tree impacts are primarily expected to occur in the areas slated for active recreation and parking. Trees not located within the footprints of these areas are not anticipated ~~not~~ to be significantly impacted.

Development by the year 2015 would impact 538 of the surveyed trees within the Development Area, including approximately 208 trees impacted by the development of Fairview Park and 330 that would be impacted on Retail Site "A.". **Table 2.8-18** identifies the number of trees, by species that would be impacted.

Where applicable, Local Law 3 (*Local Laws of the City of New York for the Year 2010*), requires trees in public property under the jurisdiction of the ~~New York City Parks Department (~~NYCDPR~~)~~ to be mitigated (replaced) if removed. The amount of mitigation (number of trees needed to replace each tree approved for removal) is determined by calculating the size, condition, species and location rating of the tree proposed for removal. Mitigation may be accomplished by replanting trees or monetary compensation. NYCDPR controls all trees growing in the public right-of-way and on land mapped as City

parkland. As such, it is expected that the 208 trees impacted in the 2015 year analysis due to the development of Fairview Park may require mitigation per Local Law 3 of 2010.

~~Local Law 3 of 2010, which was enacted on March 18, 2010, which amended § 18-107 of the Administrative Code of the City of New York, codifies the NYCDPR ability to regulate the replacement of trees on or within jurisdiction of NYCDPR. The NYCDPR controls all trees growing in the public right-of-way and on land mapped as City parkland. Moreover, Parks' jurisdiction often does not end at the sidewalk but may extend across a front yard or lawn all the way to the building line, depending on the size of a street. As such, the 538 trees impacted in the 2015 year analysis appear to require mitigation per Local Law 3 of 2010.~~

Table 2.8-18

Impacted Surveyed Trees in the 2015 Analysis Year

Species	Number
Black Oak	3
Black Locust	2
Big tooth Aspen	291
Grey Birch	3
Unknown [1]	38
Pin Oak	141
Poplar sp.	1
Post Oak	1
Quaking Aspen	3
Red maple	4
Sassafras	1
Sweetgum	2
Swamp White Oak	2
White oak	46
Total	**538**

[1]Unknown refers to trees whose location was surveyed by a licensed ~~surveyed~~surveyor but could not be located during the tree survey. Note Hurricane Sandy felled many trees on site, which may account for the inability to locate the trees.

The Development Area is approximately one ~~forth~~ fourth the size of the CPPSPP and impacts would result in further encroachment ~~in~~ into that preserve. The removal of the habitats within the Development Area may have indirect impacts to CPPSPP, as they serve as a vegetated buffer to the preserve. In the last century, the development of Staten Island, especially southern Staten Island, has removed large parcels of vegetated land. The removal of additional vegetated areas would further reduce available habitats for species that ~~are~~ do not ~~adapted~~ easily adapt to disturbed environments (e.g., forest birds).

Threatened and Endangered Species

~~Two endangered and one threatened plant species were observed within the proposed footprints of the 2015 year developments. Two species, the bonesets (one threatened and one endangered), were observed in open areas (e.g., successional old fields Variants I and II, and unpaved paths) throughout the Development Area. On site, there are approximately 22 acres of habitat that can support the bonesets.~~

~~Implementation of the 2015 developments would remove approximately 2.1 acres or 9.4 percent of potential boneset habitat. As such, the removal and/or disturbance of open areas would impact the bonesets through habitat loss and direct removal of individual plants. Conversely, the establishment of the parkland would preserve approximately 2.3 acres or 10.4 percent of the available habitat. Moreover, almost the entire utility/roadway easement corridor south of the MTA bus annex and proposed park is potential boneset habitat, and if not developed, would preserve an additional 2.5 acres or 11.4 percent of habitat. Due to the observed prevalence of bonesets throughout the site and the limited amount of open area habitat to be removed, it is not anticipated that the removal of some of the on-site open area habitats as part of the 2015 year analysis would pose a significant impact to the species. (See discussion under summary of Year 2020 impacts regarding the greater impact to boneset habitat projected to occur after full development of the Proposed Project.)~~

~~Torrey's Mountain Mint, an endangered species, occurs~~ Two protected plant species, Torrey's mountain mint [Endangered] and fringed boneset [Threatened] were observed in the 2012 surveys within the proposed 2015 year developments.[12] The potential impacts to these species by the 2015 analysis year are as follows:

Torrey's mountain mint

Torrey's mountain mint, an endangered species, was identified in the 2012 survey in one ~~discreet~~ discrete location ~~on~~in the parking lot near the southern border of Retail Site "A." Review of the ~~NYS NHP~~NYNHP website indicates "*There are three existing populations in New York but all of them are small or highly threatened"* and *"A recently discovered population on Staten Island was almost destroyed by the construction of a shopping center*." ~~NYS NHP~~[13] NYNHP conservation and management strategies for the species identify that "open areas need to be maintained without directly damaging existing plants." The shopping center location noted by NYNHP is the Bricktown Centre retail complex located directly south of the Project Area (See **Figure 2.8-12** for existing mountain mint locations). The two other locations of Torrey's mountain mint in New York State (Rockland and Dutchess Counties) mentioned by NYNHP are located outside of the Project Area and have not been further identified on NYNHP's website. The Bricktown Centre preserved mountain mint area is located approximately 700 feet south of the Retail Site "A" mountain mint and is outside of the Project Area. [14] However, the proximity of the Retail Site "A" and Bricktown Centre mint colonies suggests they are both part of the larger Charleston site in Staten Island identified by the NYNHP.[15]

~~The removal of one of the remaining three sites for this species would be a significant adverse impact.~~

~~Wetland A, the man-made pond in the parkland, would not be impacted in the 2015 analysis. A sensitive dragonfly species has been observed near this pond in 2007-2008 as well as other water dependent species (e.g. herptofauna). This pond and an undisturbed vegetated buffer would be maintained around this pond under the proposed plans for Fairview Park.~~

[12] NYSDEC, 2013, August 22, phone communication, regarding NYSDEC adopted revision to regulation 6 NYCRR Part 193.3 Protected Native Plants (May of 2012), which included changes to incorporate information compiled by NYNHP and reflects changes in the scientific names of many plants. One of the updated changes was the removal of late-flowering boneset (*eupatorium serotinum)* which no long appears on any of the lists of protected plants set forth in 6 NYCRR Part 193.3, and therefore it has no regulatory status.

[13] http://www.acris.nynhp.org/report.php?id=9144

[14] Internal morphological research recently completed for the Greenbelt Native Plant Nursery suggests that the mountain mint within the Bricktown Centre preserve area, previously considered to be Torrey's mountain mint, may be Whorled mountain mint (*Pycnanthemum.verticillatum*), which is also an endangered species. (Kelly/Native Plant Nursery, March 2013). The two plant species are closely related to one another. Accordingly, it is anticipated that similar methodologies would be utilized for preserving, cultivating or propagating either type of mint.

[15] New York State Register and Official Compilation of Codes, Rules and Regulations of the State of New York (NYCRR), Section 193.3 defines "site" as "a colony or colonies of plants separated from other colonies by at least one-half mile." http://www.dec.ny.gov/regs/15522.html

AECOM

0 1,500 3,000 6,000 Feet

1 inch = 3,000 feet

Charleston Mixed-Use Development

Figure 2.8-12

Current Locations of Torrey's mountain mint sites in Staten Island

As a result of the mitigation efforts for the Bricktown Centre project, there are now numerous additional mountain mint sites in Staten Island that were not identified by NYNHP. Mitigation for the Bricktown Centre project included a preservation and propagation plan (the "Bricktown Plan") implemented in 2006 by the City under the direction of NYCDPR's Natural Resources Group and NYCDPR's Greenbelt Native Plant Center (GNPC), with assistance from other expert ecologists. The Bricktown Plan included: (1) creation of the preserved area along Veterans Road West (just west of Tyrellan Avenue) to protect the existing mountain mint population; (2) trans-location of stock, cuttings and seeds from the Bricktown Centre population to the GNPC for propagation; and (3) the establishment and monitoring of outplanting sites within Staten Island.

Over 500 pots of greenhouse-grown Torrey's mountain mint plants were outplanted to approximately 15 sites in Staten Island. Due to the sensitive nature of the locations of endangered plants and the potential for unauthorized takings and harm to the plants, the locations of the outplanting parcels have been disclosed to NYSDEC but are not included in this analysis. Of the outplanting sites that showed "high" indications of success, as evaluated in subsequent studies, two sites were ranked amongst the highest success indicator sites, Outplanting Parcel A and B, as shown in **Figure 2.8-12**. From 2006 to 2011, 20 individual plants were established in Outplanting Parcel A and 72 individual plants were established in Outplanting Parcel B. Internal monitoring studies performed for the GNPC indicate that based on the success of these and other NYCDPR-owned mountain mint outplanting sites in fostering high survivorship, vigor, and apparent reproduction suggest that there is not a need for new outplanting sites.

The development of Retail Site "A" would remove a colony of mountain mint from the Charleston site, which would be considered a significant adverse impact. However, the Bricktown Centre colony along Veterans Road West within the Charleston site would remain preserved in its protected habitat area. Therefore, the Charleston site mentioned by NYNHP above would be impacted, but will not be removed in its entirety. Proposed mitigation measures for the Retail Site "A" mountain mint removal are discussed **in Chapter 4**.

Fringed Bonesets

In 2012, fringed boneset was observed in open areas dominated by herbaceous growth throughout the Development Area. Currently, approximately 22 acres of habitat can support the bonesets. The development of Retail Site "A" and the recreational areas of the proposed Fairview Park by 2015 would remove approximately 2.2 acres or 10. percent of potential boneset habitat through habitat loss and/or direct removal of individual plants. It is not anticipated that this level of potential habitat loss and direct plant removal due to the Proposed Project in 2015 would pose a significant impact to the boneset species. Of the 19.8 acres of remaining boneset habitat in 2015, approximately 2.7 acres would be located in the open areas of the proposed Fairview Park, and another 1.8 acres would be in the Proposed Utility Access Corridor, which if not developed could remain as potential habitat for boneset.

Box Turtle, Coopers Hawk and Sharp-Shinned Hawk

The box turtle is a largely terrestrial species. There was only one observation of a box turtle during the 2012 survey. It is likely the turtle may nest in the Development Area; however, suitable nesting habitat also occurs in the CPPSPP, The Conservation Area, and Fairview Park. The 2015 development would also remove habitat for the box turtle; however, similar suitable habitat would remain in the CPPSPP, the Conservation Areas and Fairview Park.

The Cooper's Hawk was not observed to nest on the site in either the 2007-2008 or 2012 survey,. In 2012, the species was only observed three times,, two of which the species passively flew over the site. Although the species is found in forest and forest edge habitat, the species can also live in suburban habitats, In fact as stated earlier in section 2.8.3.6, studies have shown their numbers may increase near developed areas (Cornell Lab of Ornithology, 2013); therefore, although habitats that could be potentially used by Cooper's hawks will be impacted, research indicates that they can adapt to similar habitats in the

neighboring CPPSPP, Conservation Area, Fairview Park, and other suitable habitats surrounding the area.

The Sharp-shinned Hawk was not observed to nest on the site in either the 2007-2008 or 2012 survey,. In 2012 survey, the species was only observed once passively flying over the site. The species preferred nesting habitat is in conifer forests, which do not occur on site. Although 2015 will remove some habitat that could be used by the species for resting, hunting, etc. there will be suitable habitats in the CPPSPP, Conservation Area, Fairview Park, and the surrounding the area.

Although, the implementation of the 2015 year development sites would remove potential habitat for these species, there is considerable suitable habitat for these species in the surrounding parcels. Thus, according to the *CEQR Technical Manual* this impact is not considered significant because suitable habitat parcels would remain in the CPPSPP, the Conservation Area and the proposed Fairview Park.

Summary of Impacts in the 2015 Analysis Year

In the past decade, ~~organisms in this area have had to adapt to~~ extensive reductions in habitat adjacent to the Development Area~~. In 2005, development~~ have occurred due to the developments of ~~the~~ Bricktown Centre in 2005 which removed 43 acres of vegetated habitats to the south and east of the Development Area~~. In 2009,~~ and the MTA Bus Annex in 2009, which removed approximately 9 acres along the Development Area's western boundary.

The proposed removal of an additional 20.5 acres in 2015 would place further stress on the habitats within the Development Area and adjacent vegetated parcels. After the 2015 build out, and until the Proposed Project's elements planned for development by 2020, the ~~mapped but unbuilt section of~~ Englewood Avenue corridor from Kent Street to Veterans Road West and the habitats north of Retail Site "A" and Fairview Park would continue to function as a vegetated corridor between the large habitat complex of the CPPSPP and Conservation Area and the westernmost portion of Fairview Park, which is largely expected to remain vegetated in a natural state. This vegetated corridor would allow for organisms to transit east and west within vegetated habitats. However, build out of ~~the~~ Retail Site "A" and the active recreation portions of the proposed park would allow anthropogenic encroachment and disturbances (e.g., noise, light, etc.) to impact the center of the Development Area, which now is a low-noise environment. This development could make portions of the Development Area an unattractive habitat to organisms that are intolerant of urban disturbances (e.g., forest birds). However, it should be mentioned again that during the fauna surveys, many of the species observed within the Development Area were those common to suburban environments (e.g., squirrels, raccoons).

Within portions of Fairview Park and Retail Site "A" the habitats are largely successional, and are heavily influenced by the presence of vines. The impacted wetlands in that area are very sparsely vegetated shallow depressions within on-site trails. It is unlikely the same organisms that utilize the large wetlands in the CPPSPP and Conservation Area utilize the small isolated wetlands within Retail Site "A," due to the slopes, dense upland vegetation and the distance between Site "A" and those areas. While a total of approximately 0.1 acres of wetlands would be removed by the Proposed Project by 2015, Fairview Park would preserve approximately 0.1 acres of wetlands – including Wetland A, which is one of the largest wetlands in the Development Area and ~~will~~during the late winter and spring seasons of most years would continue to provide a vernal pool habitat.

The ~~implementation~~ development of Retail Site "A" would remove ~~one of three remaining populations of~~ Torrey's ~~Mountain Mint in the State of New York~~mountain mint plants and approximately 10.~~4~~ percent of available boneset habitat in the ~~development area.~~Development Area. The removal of the Torrey's ~~Mountain Mint and reduction in boneset habitat~~mountain mint would be a significant adverse impact. ~~Future mitigation efforts would look to create wetlands and area for transplant of endangered species~~

~~within the parkland and/or to suitable locations elsewhere if applicable (See subchapter 2.8.3 for mitigation).~~

2.8.5.2 Year 2020 Analysis

The following analysis of the potential impacts of development associated with the Proposed Project in 2020, including the elements of the Proposed Project that would be completed by 2015, as analyzed in the previous section. The 2020 assessment first defines the additional incremental impacts due to development of the Proposed Project's elements scheduled for completion by 2020 – i.e., the proposed school, senior housing, Retail Site "B" and Englewood Avenue – and then the analysis provides a cumulative and complete assessment for the ~~2020 year analysis~~full development of the Proposed Project by 2020.

~~By the year 2020, along Arthur Kill Road,~~ Retail Site "B" consists of approximately 7.3 acres that would ~~also~~ be privately developed by the year 2020. The City would also provide an approximately 9.1-acre site for senior housing along Englewood Avenue. To the east of the housing site, a combined elementary/middle school on an approximately 5.9-acre site would be constructed with up to a 750-student capacity.

Included in the impact analysis for this section are improvements to Englewood Avenue, which would be ~~mapped and~~ constructed as a four-lane roadway (two lanes in each direction) from Arthur Kill Road on the west to Veterans Road West on the east. The following section presents the potential natural resource ~~impact~~impacts of this full build-out of Englewood Avenue within an 80-foot right-of-way especially in the eastern portion of this roadway between CPPSPP and the Conservation Area.

Topography, Geology, and Soils

As previous discussed above in Section 2.8.5.1, by 2015, impacts to topography, geology, and soils would be limited to grading and filling associated with earthmoving for construction of Retail Site "A," the library, and developments associated with Fairview Park. ~~These~~Within these proposed development areas ~~presently include a total of~~, approximately ~~34~~20.5 acres of land would be subject to grading and topographical changes.

Under this 2020 year analysis, approximately ~~25.7~~29.6 acres of land would further be subject to earthmoving and filling associated with construction of the school, senior housing, and Retail Site "B" ~~development,~~", for a total of nearly ~~60~~50 acres that would be altered by 2020. Impacts under this analysis would be similar to those described under the 2015 analysis. For development of the school facilities, limited grading would be required to provide relatively flat areas for the parking and student drop-off, school yard and outdoor recreation areas associated with the school. The ~~Senior Housing area~~senior housing site would require significant grading to provide vehicular and pedestrian access to all dwelling units without creating impacts to adjacent properties in the form of steep slopes or retaining walls along the property edges. For Retail Site "B" substantial changes in topography would be required to create a relatively flat shopping and parking area with steeper vehicular approaches provided to minimize the overall amount of grading and reduce changes in topography between adjacent sites.

For the construction of Englewood Avenue, the current topography may require substantial earthmoving activities in certain segments to create a road embankment capable of supporting the proposed city street. The future contractor would need to comply with a sediment and erosion control plan during the construction activities.

Wetlands and Waterbodies

~~As previously discussed above in Section 2.8.5.1, those elements of the Proposed Project completed by the year 2015 would impact approximately 0.1 acres of wetland habitats. No impacts to NYSDEC~~

~~regulated wetlands or USACE jurisdictional wetlands would occur by the 2015 year (**Table 2.8-15**).~~ Full implementation of the remaining development sites completed by 2020 (Englewood Avenue, Retail Site "B" and the Senior Housing and School sites) would impact approximately 0.3 additional acres of unregulated/non-jurisdictional wetland habitats, for a total of approximately 0.4 acres~~. None of these wetland areas has been determined to be NYSDEC regulated.~~. The impacted wetlands involved include: Wetlands D, DA, E, NA, NC, NH, NL NK, NM, NN, and NO. These wetlands may provide some degree of habitat for herptofauna, insects, and other species. While their low level of inundation would not quality them as vernal pool habitat, ~~they will~~are likely ~~be~~ used as a habitat resource by herptofauna when wet.

~~By~~In addition, by 2020 the construction of Englewood Avenue, and specifically the segment between CPPSPP and the Conservation Area, would impact about 0.07 acres of USACE jurisdictional wetlands and NYSDEC-regulated wetlands (Wetlands C), included in the total above. ~~As there are no designs for this roadway, for~~This wetland impact ~~analysis it was conservatively assumed that~~area is based on a worst case scenario in which the ~~roadway's eventual~~ construction footprint would occupy ~~equal~~ the full 80-foot width of the existing mapped right-of-way. This construction area footprint would end several feet from the delineated boundary of Wetland B (also regulated by the NYSDEC). Approximately 0.89 acres of NYSDEC-regulated Adjacent Areas (Wetlands B and C) would also be impacted. (**Table 2.8-19**). Actions to mitigate the impacts to these regulated and jurisdictional wetlands would likely be required by the two regulatory agencies. Representatives of the USACE noted during a field visit in January 2013 that impacts to these types of jurisdictional forested wetlands should be reduced to the greatest extent practicable and that unavoidable impacts would require mitigation. Mitigation is discussed in **Chapter 4.0, Mitigations**, and additional measures would also be discussed with the regulating agencies as the roadway goes through the design and approval processes.

~~Wetland B serves as high value vernal pool habitat, and future construction efforts should employ robust protection efforts to ensure sediment, runoff, construction vehicles, etc. do not impact this wetland. Construction activities in the vicinity of wetlands could cause short-term impacts, such as siltation due to increased erosion from clearing and grading activities. Erosion and siltation would be minimized through implementation of best management practices (BMPs), such as use of silt fences and stormwater management structures, in accordance with an NYCDEP-approved Erosion and Sedimentation Control Plan.~~

~~Construction activities in the vicinity of~~As discussed in **Chapter 2.19, Construction**, construction activities in the vicinity of these wetlands could cause short-term impacts, such as siltation due to increased erosion from clearing and grading activities. ~~Erosion~~Measures that could reduce those erosion and siltation impacts as discussed in Chapter 2.19 would be minimized through implementation of best management practices (BMPs), ~~such as use of silt fences and stormwater management structures,~~ in accordance with an NYCDEP-approved Erosion and Sedimentation Control Plan.

Wetlands H, HA, NB (a USACE jurisdictional wetland), ND, NE, and NW occur just west of Bricktown Way in the area set aside as a ~~proposed utility access corridor~~Proposed Utility Access Corridor and within the adjacent existing private sewer easement to Bricktown Centre. There are presently no plans to develop in the areas where these wetlands are located in 2020. No impacts to surface waters would occur under the 2020 year analysis.

Table 2.8-19

Estimated impacts to Wetland Habitats and Regulated Wetlands and NYSDEC-Regulated Adjacent Areas under the 2020 Development

Wetlands	2015 Year ~~Development~~ Analysis	2020 Year ~~Development~~ Analysis	Englewood Avenue (2020)	Total Impacts:
Non-regulated Wetland Habitats (isolated wetlands)	0.107	0.30	-	0.407
NYSDEC-Regulated Wetlands and USACE Jurisdictional Wetlands	-	-	0.07	0.07
Total Wetland Impacts	*0.107*	*0.30*	*0.07*	*0.414*
*Total Impacts to NYSDEC Regulated Wetland Adjacent Area (Wetlands B and C)***	*-*	*-*	*0.89*	*0.89*

Notes: * ~~Awaiting concurrence from the~~ USACE ~~on the wetland delineation. It is assumed the USACE would identify~~has identified wetlands ~~B,~~ C, ~~H, HA, NB,~~ and ~~NW~~NB as jurisdictional. The only wetlands to be impacted are Wetlands B (regulated only by NYSDEC) and C~~, which are both~~ (a NYSDEC-regulated and USACE-jurisdictional ~~wetlands.~~wetland).

~~**Wetlands H (0.035 ac), HA (0.006 ac),~~ **Wetland NB~~, (0.009 ac) and NW (0.017) total 0.067 acres. If these wetlands are deemed~~ has also been identified as jurisdictional by the USACE, and if plans are modified and the ~~utility easement is~~proposed Utility Access Corridor were developed, mitigation for ~~these wetlands~~that wetland would be required by the USACE~~. Wetlands H, HA, NB, and NW are all emergent wetlands.~~.

Habitats and Fauna and Flora ~~and Fauna~~

The developments from the 2015 analysis year would remove or alter approximately 20.5 acres of habitat for flora and fauna on site. Conversely, establishment of the park is expected to permanently map approximately 43 acres of parkland, including the existing 20-acre Conservation Area and 23 acres of new parkland, a sizable portion of which is expected to be set aside for habitat preservation and passive recreation opportunities. By the year 2020, additional changes to the habitats for flora and fauna would occur within the Development Area~~ and the area for the construction of Englewood Avenue~~.

Construction by the 2020 analysis year would remove additional 29.6 acres of habitat within the Development Area, ~~consisting of approximately 27 acres of additional habitat to the existing 20.5 acres by the 2015 year,~~ for a sub-total of approximately ~~47.5~~50 acres. The amount of impacted habitats due to the Proposed Project's development in 2020 is presented in **Table 2.8-20**. There is the potential for some of the mapped ecological habitats dominated by herbaceous vegetation (e.g., old fields, etc.) to convert to habitats dominated by woody vegetation by 2020 through natural succession. However, since the total acreage of conversion for each habitat is unknown, **Table 2.8-20** makes the reasonable worst-case assumption that none of this open field habitat would be lost to succession by 2020, with all loss of habitat then attributable to the Proposed Project.

Table 2.8-20

Impacted Habitats 2020

Habitats	Impacted Acreage			
	2015 Year ~~Development~~ Analysis	2020 Year ~~Development~~Analysis (Excluding Englewood Ave.)	Construction of Englewood Avenue	Total Proposed Project
Brushy Cleared Land	-	-	0.095	0.095
Coastal Oak Forest Variant	3.802	3.537	0.311	7.65
Coastal Oak Hickory Forest	-		0.269	0.269
Pastureland	-	2.274	-	2.274
Paved Road	-	1.409		1.409
Red Maple ~~Sweet Gum~~Sweetgum Forest	-	-	0.258	0.258
Red Maple ~~Sweet Gum~~Sweetgum Swamp	-	-	0.068	0.068
Shallow Emergent Marsh	-	0.203	-	0.203
Shallow Emergent Marsh - Confined	-	0.074	-	0.074
Shallow Emergent Marsh/Reed grass Purple Loosestrife	-	0.024	-	0.024
Successional Northern Hardwoods	8.875	7.792	-	16.667
Successional Old Field - Variant I	1.361	3.23	-	4.591
Successional Old Field - Variant II	-	0.076	-	0.076
Successional Old Field - Variant III	1.013	-	-	1.013
Successional Shrubland	4.806	5.73		10.536
Successional Southern Hardwoods	0.068	1.76	0.301	2.129
Shallow Emergent Marsh	0.001	-	-	0.001
Shallow Emergent Marsh - Confined	0.106	-	-	0.106
Unpaved Road and Path I	0.417	0.913	1.311	2.641
	20.449	**27.023**	**2.612**	**50.084**

Approximately 1,156 of the surveyed trees would be impacted by the developments of the school, senior housing, and Retail Site "B," which are in addition to the 538 of the surveyed trees that would be impacted by the Proposed Project elements completed by 2015. In addition, the construction of Englewood Avenue by 2020 would impact an additional 319 trees, as well as 2.6 acres of additional habitats. In total, approximately 2,013 surveyed trees and 50.1 acres of habitats would be impacted by the Proposed Project by 2020. **Table 2.8-21** identifies the number of trees by species that would be impacted on the Proposed Project's development sites in 2015 and 2020 and by the construction of Englewood Avenue in 2020.

Table 2.8-21

Trees within the footprints of the 2020 Analysis

Species	2015 Year Development	2020 Year Development (Excluding Englewood Ave.)	Construction of Englewood Avenue (2020)	Total Tree Removal
Ash sp.			1	1
Black ~~Cherry~~cherry		43	6	49
Black oak	3	3		6
Black ~~Locust~~locust	2	171		173
Big ~~Tooth Aspen~~tooth aspen	291	143	74	508
Catalpa		1		1
Chestnut ~~Oak~~oak			1	1
Dead trees		3	1	4
Eastern ~~Cottonwood~~cottonwood		83		83
Elm sp.		4		4
Grey Birch	3	2		5
Honey locust		1		1
Unknown	38	53		91
Mockernut ~~Hickory~~hickory			14	14
Norway maple		12		12
Oak sp.			11	11
Paulownia		22	4	26
Pin ~~Oak~~oak	141	273	24	438
Pitch ~~Pine~~pine		11		11
Poplar sp.	1			1
Post ~~Oak~~oak	1			1
Quaking ~~Aspen~~aspen	3	24		27
Red ~~Mulberry~~mulberry		4		4

Red maple	4	44	16	64
Red oak		14	26	40
Sassafras	1	123	18	142
Silver ~~Maple~~maple		3		3
Swamp ~~White Oak~~white oak	2		4	6
Sweetgum	2		50	52
Sycamore		5		5
Tilia		4		4
Tree of ~~Heaven~~heaven		79		79
White ~~Mulberry~~mulberry		2		2
White ~~Oak~~oak	46	29	69	144
Total	**538**	**1,156**	**319**	**2,013**
Note: Unknown refers to trees whose location was surveyed by a licensed surveyed but could not be located during the tree survey. Note Hurricane Sandy felled many trees on site, which may account for the inability to locate the trees.				

Construction by the 2020 analysis year would divide or fragment the remaining undeveloped habitats within the Development Area from the CPPSPP and the Conservation Area. Although many of the directly impacted habitats are generally successional habitats that are common to New York State, the proposed uses within the Development Area would have further indirect impacts on the CPPSPP and Conservation Area through removal and bifurcation of a large contiguous vegetated buffer area.

Englewood Avenue

For purposes of analysis, ~~it is conservatively~~ assumed worst-case development scenario assumes that all natural resources within the roadway's proposed 80-~~ft~~foot wide right-of-way (including the already mapped portion between Kent Street and Veteran's Road West) would be removed or substantially altered during construction in 2020.

The construction of the proposed Englewood Avenue would result in substantial direct impacts to wildlife that uses the CPPSPP and the Conservation Area, which together with the Englewood Avenue corridor comprise a large forested parcel with mature trees. Within the footprint of Englewood Avenue, ~~a~~the existing dirt path ~~is~~ located adjacent to the southern boundary of the CPPSPP and within the northern boundary of the Conservation Area is relatively narrow and the trees on both sides provide a relatively undisturbed canopy. A key component of the CPPSPP's southern boundary is the low-noise environment provided by the buffering effect of the Conservation Area. Construction and operation of ~~a city street (i.e.,~~an 80-foot wide roadway such as the ~~future~~ proposed Englewood Avenue in this area would ~~result in~~ bifurcate a ~~degree of~~ valuable habitat ~~fragmentation~~ and ~~change~~ adversely impact fauna within CPPSPP and the ~~character of~~ Conservation Area. During the ~~habitats along~~ 2012 survey no listed species or evidence of listed species (e.g., nests, tracks, etc.) were observed in the ~~southern boundary of the CPPSPP~~ Englewood Avenue corridor.

~~The existing dirt path is not an impediment to fauna moving between the CPPSPP and the Conservation Area. Moreover, the canopies of the trees in both parcels intermingle in some locations, which provides an undisturbed continuous canopy.~~ As mentioned earlier, CPPSPP is a NYSDEC BCA, and bird species, including listed species that live in the preserve, likely transit to the Conservation Area for usage of the habitat~~. Removal of the undisturbed continuous canopy for the~~ – a movement that would be restricted by construction of an 80-foot wide ~~road would result in bifurcating valuable habitat and would have~~ roadway, resulting in significant adverse impacts on fauna within the ~~preserve~~ CPPSPP and the Conservation Area. Avifauna may be impacted within the area of Englewood Avenue during the construction phase as a result of direct loss of habitat and visual and noise disturbances. Avifauna would also be adversely impacted by displacement from the construction area. Also, after construction, forest birds would continue to be impacted from operational impacts of the road. Past studies (Kociolek et al, 2011; Kuitunen et al., 1998; Reijnen and Foppen, 1994) have shown that bird density is reduced close to the roadways and highways due to noise, pollution and/or bird strikes from vehicles. The development of Englewood Avenue from dirt path to paved road could reduce the co-mingling of some trees and thereby impact the ability of some avifauna to travel between CPPSPP and the NYCDPR Conservation Area thus adversely impacting the NYSDEC-designated CPPSPP BCA.

Mammals, herptofauna, insects and other organisms, utilize the habitats within the construction footprint of a future Englewood Avenue. ~~No~~ While none of these species are solely dependent on the resource within the construction footprint~~; however~~, the removal of these parcels would require organisms present within these habitats to relocate to adjacent parcels and result in less habitat for the organisms of the Conservation Area and CPPSPP to utilize. ~~In chapter 2.21.3, mitigation measures are described for fauna crossing of the roadway in order to reduce wildlife mortality. Regardless of mitigation methods that may be selected, some fauna may inevitably choose to cross the road. As such, these individuals~~In addition, some fauna that cross the paved road may suffer injury or mortality.

With respect to vegetation, unlike the Development Area, the forest habitats in the CPPSPP and Conservation Area have fully developed mature canopies, which have limited the undergrowth of dense vines that are stressing trees within the ~~Site.~~Development Area. The ~~opening~~ construction of ~~the proposed roadway~~ Englewood Avenue through this forested area would create an "edge effect" on both sides of the road and would likely contribute to localized increases of dense understory vegetation, which would further impact the value of the habitat on the parcels. Often, this edge effect provides for the growth of invasive and nuisance species. Due to the mature canopy structure of CPPSPP and the Conservation Area, it is anticipated that invasive or nuisance species, if they become established, would largely be limited to the sides of the road. ~~Also~~With the construction of Englewood Avenue, 319 of the surveyed trees would be impacted ~~under this option~~ (see **Table 2.8-13**).

~~Also, a~~A variant of Red Maple-Sweetgum Swamp, a New York State-listed ~~rare red-maple sweetgum swamp habitat~~Significant Plant Community, is present within the proposed Englewood Avenue's build footprint. The ~~implementation of this option~~street construction would remove approximately 0.3 acres of this habitat type. ~~This r~~Removal would result in further encroachment to this ~~rare habitat~~community ~~and~~but would not result in a significant adverse impact.

~~In addition to noise impacts to wildlife, other operational~~ Operational impacts of the new road would include stormwater runoff, pollution, noise, and the effects of road salt. The methods of treating and conveying stormwater have not yet been developed; however, it is anticipated that stormwater would be managed so as not to increase erosion of on-site habitats, especially the red-maple sweetgum swamp and other wetlands. With respect to removing oils and other materials from runoff, it is anticipated that future designs would include oil water separators and/or other similar devices to treat stormwater runoff. Finally, road salts can result in impacts to vegetation along the edge of a roadway. A buildup of sodium and lime from concrete can alter soil chemistry, which could harm native species. Deer are often attracted to vegetation along the edge of the roads due to the increased sodium, which in turn increases the risk of collisions with vehicles. Also, some amphibians will not travel through areas with high salt contents. ~~As stated previously,~~ Based on the estimated footprint of Englewood Avenue ~~would only be constructed in 2020 and the anticipated amount of road salt to be used cannot be estimated as~~under the ~~road design~~

has not been completed; however, due the probable size of the road Proposed project and climate of southern Staten island Island, it is assumed that road salt usage would be infrequent. It is also likely thatIf stormwater would beis treated and/or conveyed offsite in future designs, thus limiting potential impacts from road salt could be minimized.

A potential positive impact to Wetland B and C is that the current dirt path's embankment serves as an impediment to hydrologic flow from Wetland B to Wetland C. It is likely that future construction designs would place the roadway on structures whichthat may allow for an unimpeded flow of hydrology from Wetlands B to C.

Threatened and Endangered Species

Flora

As previously stated, two one endangered and one threatened plant species were observed within the proposed footprints of the 2015 developments that would be impacted by the Proposed Project. Two species, the bonesets (one Fringed boneset (threatened and one endangered), were) was observed in open areas, and as per the 2012 surveys, there are approximately 22 acres of habitat that can support the bonesets within this portion of the Development Area. Implementation of the 2015 developments would remove approximately 2.12 acres or 9.4approximately 10 percent of potential boneset habitat. The establishment of the parkland would permanently preserve approximately 2.3 acres or 10.4 percent of the available habitat.

Of note, almost the entire utility/roadway easement corridor south of the MTA bus annex and south of the proposed park is potential boneset habitat. This area is not proposed to be developed under the Proposed Project. As such, this approximately 2.5 acres or 11.4 percent of this habitat would continue to be preserved under the Proposed Project.

Construction of the remaining portions of the Development Area by 2020 would remove an additional 14.2 acres or 64.3 percent of the current mapped habitat that could support Observations of growth patterns within the Development Area indicate the potential for portions of the open field and pasture areas identified on site in 2012 to convert to habitats dominated by woody species. Comparisons by NYCDPR staff of conditions in 2012 and 2013 in formerly open field areas within the proposed Fairview Park showed a considerable succession in those areas of dense woody growth. (Personal communication, NYCDPR, August 2013). Therefore, a reduction or alteration in the amount of available boneset habitat by 2020 is likely. However, under worst-case assumptions, development of the entire Proposed Project by 2020 would remove approximately three quarters of the available habitat for bonesets, which would constitute a significant adverse impact.

Large portions of the Proposed Utility Access Corridor could serve as potential boneset habitat independent of the development scenario. The open space within the proposed Fairview Park could potentially support 2.7 acres or 13 percent of the available boneset habitat identified in 2012.

Fauna

Although no threatened andor endangered bonesets, for a sub-total of approximately 16.3 acres or 73.7 percent of this current mapped habitat. Due to natural succession, it is unknown what percent of the open areas would be wooded by 2020, if left undisturbed. (see **Chapter 4.0**: Mitigation, for further discussion of potential actions to maintain open areas in the future.) During the 2012 survey, bonesets species were observed in open areas within the existing utility easement south of the 2007-2008 or 2012 surveys within the MTA bus annex; these habitats would not be developed and would continue to serve as potential habitat.

~~Approximately one acre, or 4.5 percent of additional potential boneset habitat, would be removed by the construction of Englewood Avenue, for a total of 17.3 acres or 78.2 percent of this habitat by the Proposed Project. Listed species occur~~ Development Area, listed species (e.g. mud turtle, etc.) have been observed in the CPPSPP and the Conservation Area. Many of these species either move between these two areas, or do depend on the contiguous habitats within the Development Area to provide a vegetated buffer from anthropogenic disturbance. The bifurcating of habitats would have a negative effect on wildlife. However, according to the CEQR Technical Manual this impact is not considered significant because suitable habitat parcels would remain in the CPPSPP, the Conservation Areas and Fairview Park.

Although, there were no direct observations of listed species within the roadway's footprint, the adjacent Wetlands B and C and ~~adjacent parcels~~ their surroundings provide habitat conditions favorable to listed species that occur within ~~that area.~~these two preserves. Under this scenario, portions of these habitats would be impacted and removed by the construction of this roadway.

Impacts to box turtles, Cooper's Hawk, and Sharp-shinned Hawks would be similar to those impacts described in 2015. Although, the implementation of the 2020 year development would remove potential habitat for these species, there is considerable suitable habitat for these species in the surrounding parcels. Thus, according to the CEQR Technical Manual this impact is not considered significant because suitable habitat parcels would remain in the CPPSPP, the Conservation Areas and the proposed Fairview Park.

Direct/Indirect Impacts to CPPSPP and Conservation Area

Removal of an additional 29.5 acres of habitat in 2020 from the Development Area, including construction of Englewood Avenue between the CPPSPP and Conservation Area, would result in direct and indirect impacts to Fairview Park, CPPSPP and the Conservation Area. The undisturbed vegetated travel corridor currently located in the future senior housing and school sites north of Fairview Park would be removed in 2020. Removal of this area would eliminate the vegetative buffer adjacent to the CPPSPP and Conservation Area and isolate the Fairview Park's habitats, which would now be surrounded by anthropogenic disturbances. Impacts to fauna would be variable. Medium- to large-size mammals (e.g., raccoon, deer, etc.) would likely still travel between the parcels (i.e. Fairview Park, CPPSPP and Conservation Area) using greenways (e.g., lawns) and/or the new roadways. However, smaller species of amphibians, mammals, reptiles, or forest birds that prefer contiguous forested habitats would ~~see~~ experience a reduction in the amount of available habitat.

A key component of the CPPSPP's southern boundary is the low-noise environment provided by the buffering effect of the Conservation Area ~~from CPPSPP by the construction of the extension~~. Construction and operation of an 80-foot wide roadway such as the proposed Englewood Avenue in this area would ~~result in~~bifurcate a ~~degree of~~valuable habitat ~~bifurcation and have some negative impacts on the functional ecology of~~and adversely impact fauna within CPPSPP and the Conservation Area ~~and CPPSPP.~~ ., The bifurcation of the habitat and illumination by street lights could impact nocturnal species by disrupting biological rhythms and nocturnal behavior for these species. Artificial lighting can affect migratory, foraging, and reproductive behavior and can result in disorientation and fatal collisions with vehicles.

These impacts would be most realized by avifauna that depend on dense forest canopies. Moreover, ~~it has been~~ as noted previously regarding the construction of Englewood Avenue, studies have documented that bird species, especially some forested bird species, are intolerant of elevated noise. The placement of a street through this parcel would increase noise levels in a quiet environment. ~~It is envisioned that the new roadway would be designed in a manner that would accommodate the travel of mammals, amphibians and other fauna between the CPPSPP and Conservation Area (see Mitigation, subchapter 2.8.3).~~

Within the 2020 development areas, the habitats are largely successional, and except for the pastureland and wetlands, are heavily influenced by the presence of vines. Except for Wetland E, most of the impacted wetlands are essentially very sparsely vegetated depressions within on site trails and field, and provide limited resources to wildlife. Given the distance these small wetlands are to the large wetlands in the CPPSPP and Conservation area (500+ feet), it is highly unlikely these wetlands are utilized by organisms that utilize the much more developed and larger wetlands within CPPSPP and the Development Area. Wetland E is a small, well-vegetated emergent marsh. This wetland would be completely removed in the 2020 development.

Summary of Impacts Under the 2020 Year Analysis

Construction of the Proposed Project by 2020 would remove a substantial amount of habitat and natural resources within the Development Area. Approximately 0.4 acres of wetlands and 50.1 acres of upland habitats would be removed due to development by the 2020 analysis year. Upon completion of the Proposed Project in 2020, including Englewood Avenue, the current contiguous vegetated parcel of CPPSPP, the Conservation Area, and the Development Area would experience a degree of habitat fragmentation. Although only minor direct impacts are anticipated to the southern boundary of the CPPSPP, the Conservation Area would be separated from CPPSPP by an 80-ft wide road corridor. Construction of a paved roadway of this size~~, in the absence of appropriate mitigation in its design,~~ would increase the mortality of amphibians, reptiles and small mammals, resulting in their potential decline in this area. ~~It is anticipated that mitigation measures would be employed to provide wildlife the ability to cross under the roadway between the CPPSPP and Conservation Area, thereby reducing some of these impacts of fragmentation. However, as~~ As stated previously the proposed 80-ft wide roadway corridor would be impactful to forest birds. The remaining habitats within the Development Area would be substantially isolated from the Conservation Area by Retail Site "A," the school and senior housing sites, and the ball fields and courts within the proposed Fairview Park. This level of isolation and absence of a natural corridor would especially isolate herptofauna and other species. Opportunities to minimize impacts to natural resources will be explored through the permitting process and mitigation measures.

Of the impacted wetlands acres, approximately 0.07 ~~0.01 acre~~ acres of regulated wetlands and 0.89 acres of regulated-adjacent area~~s~~ deemed to be jurisdictional by the USACE and regulated by NYSDEC would be impacted by the Proposed Project. Also, a total of approximately 2,013 trees would be removed as a result of the total construction and development from the Proposed Project, consisting of 538 trees impacted by the developments under the 2015 year analysis, 1,156 trees impacted by the retail, school and housing development sites by 2020, along with 319 trees impacted by the construction of Englewood Avenue.

~~As described previously, bonesets were observed growing in the open fields throughout the Development Area.~~The Torrey's mountain mint observed on Retail Site "A" would be removed in 2015. Completion of the Proposed Project by 2020 would remove 17.3 acres or 78.2 percent of available boneset habitat observed in the open fields throughout the Development Area. However, ~~it should be noted that~~ observations in the 2012 survey visits identified successional vegetation patterns within ~~previously mowed~~ the open field. Based on these observations, continued succession by woody species in these areas ~~and open fields were identified in the 2012 survey, it unclear how much of the~~ could reduce the identified boneset habitat ~~would remain by 2020 if woody species were left to continue to establish themselves and grow. The small area where Torrey's Mountain Mint was observed on Retail Site "A" would be removed in 2015~~by 2020 in the absence of the Proposed Project.

Taken in whole, the cumulative impacts of the 2020 development would have significant adverse impacts on the flora and fauna of CPPSPP and the Conservation Area and habitats and threatened and endangered species within the Development Area. ~~The impacts to the CPPSPP are significant, and removal of most of the potential boneset habitat in the Development Area would also be viewed as significant.~~ Potential actions to reduce or mitigate these impacts are presented in **Chapter 4.0**: Mitigation Measures.

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