

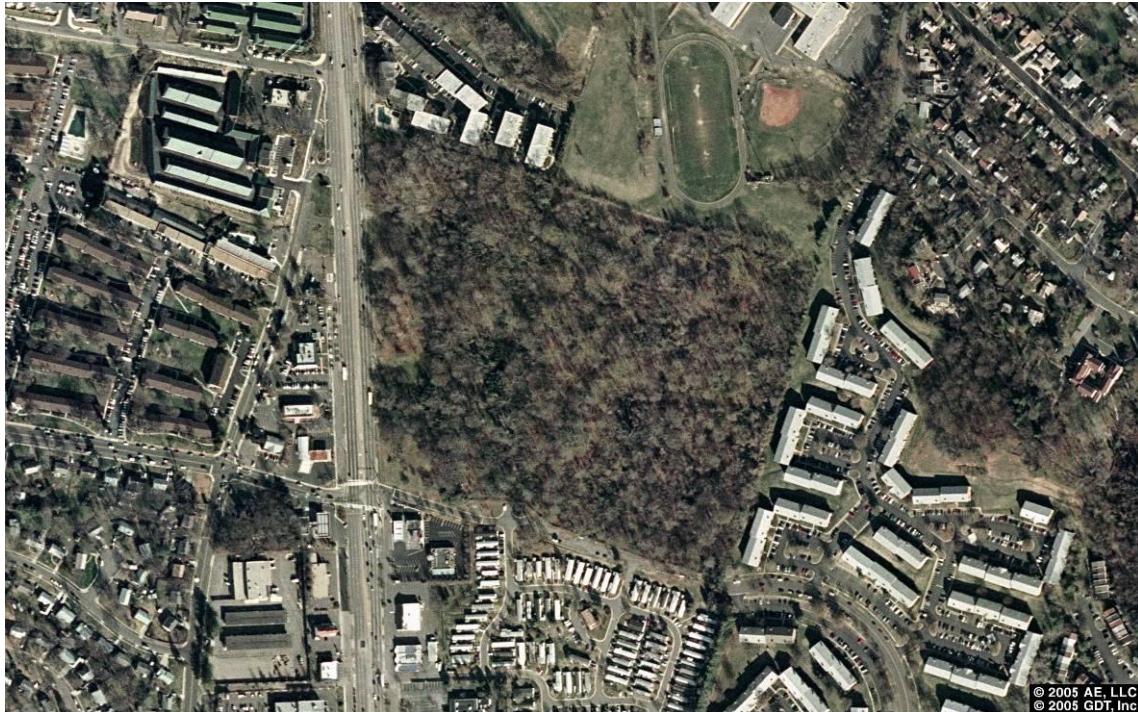
NATURAL RESOURCES REPORT

Final

North Hill

Fairfax County, Virginia

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1.0 Summary

The approximately 33-acre subject property, referred to as the North Hill site, is located on Richmond Highway (US Route 1) in Fairfax County, Virginia. The main purpose of this study is to identify and analyze the quality of the existing natural resources located on the North Hill site. Based on the field investigations, no wetlands or streams exist on the site. The North Hill site is primarily undeveloped and contains a wide variety of young trees with scattered mature trees. Approximately 40 different tree species were observed on the site. Within the North Hill site, there are 1,427 trees that are greater than 7.0 inches in diameter at breast height (dbh). Typical of disturbed sites, seven invasive plant species are present on the site, of which the greatest quantity is English ivy (*Hedera helix*). During the field investigations, 19 different bird species were observed. For the most part, suitable habitat for threatened and/or endangered species is not present on the North Hill site.

2.0 Description of the Project Area

The approximately 33-acre North Hill site is located on Richmond Highway (US Route 1) in Fairfax County, Virginia (Figure 1). The site is bounded by Dart Drive and Woodley Estates Mobile Home Park to the south, residential development to the east, residential development and an outdoor track to the north, and Richmond Highway to the west. The North Hill site is located at latitude 38°45.71'N and longitude 77°05.00'W. Huntly Meadows Park is located approximately ½-mile southwest of the site. The Potomac River is located approximately 1 ½-miles east of the site. The North Hill site is located within the Middle Potomac-Anacostia-Occoquan Watershed, HUC # 02070010 (EPA, 2007).

Figure 1. Vicinity Map



Source: ADC, 2002

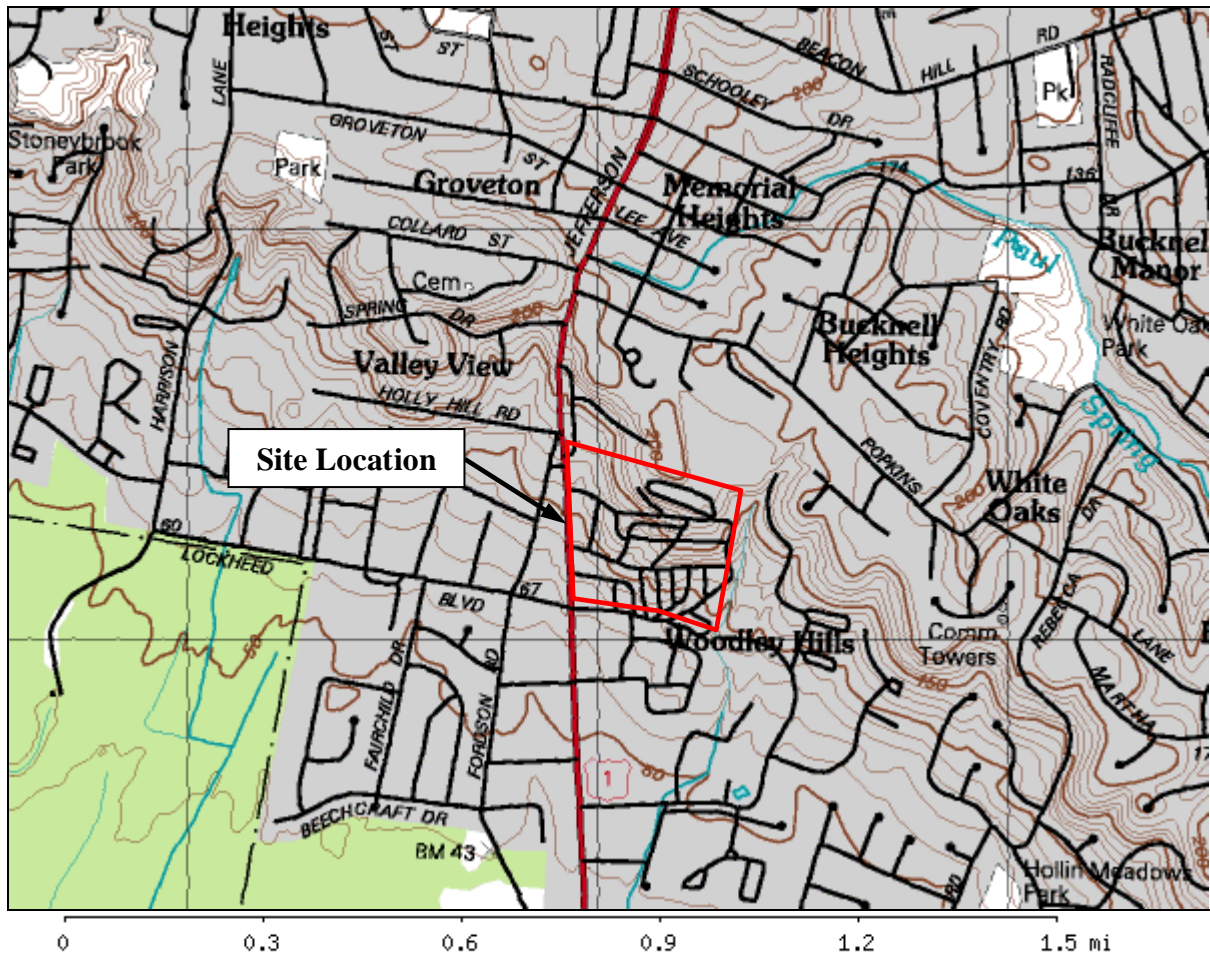
3.0 Natural Resources within the Project Area

3.1 Geology, Topography, and Soils

The North Hill site is located in the Coastal Plain Physiographic Province. Occupying approximately 26 percent of Fairfax County, the Coastal Plain province consists of unconsolidated sand, clay, silt, and gravel strata (Fairfax County, 2007). The topography

at the North Hill site is characterized as gentle to mildly steep slopes. The topography ranges from approximately 80 feet above mean sea level (msl) to approximately 200 feet above msl in the northeast region of the site. In general, the site slopes downward in a northeast to south/southwest direction. Fairly level topography exists adjacent to the northeastern site boundary. Figure 2 shows the topography of the North Hill site.

Figure 2. USGS Quadrangle Map

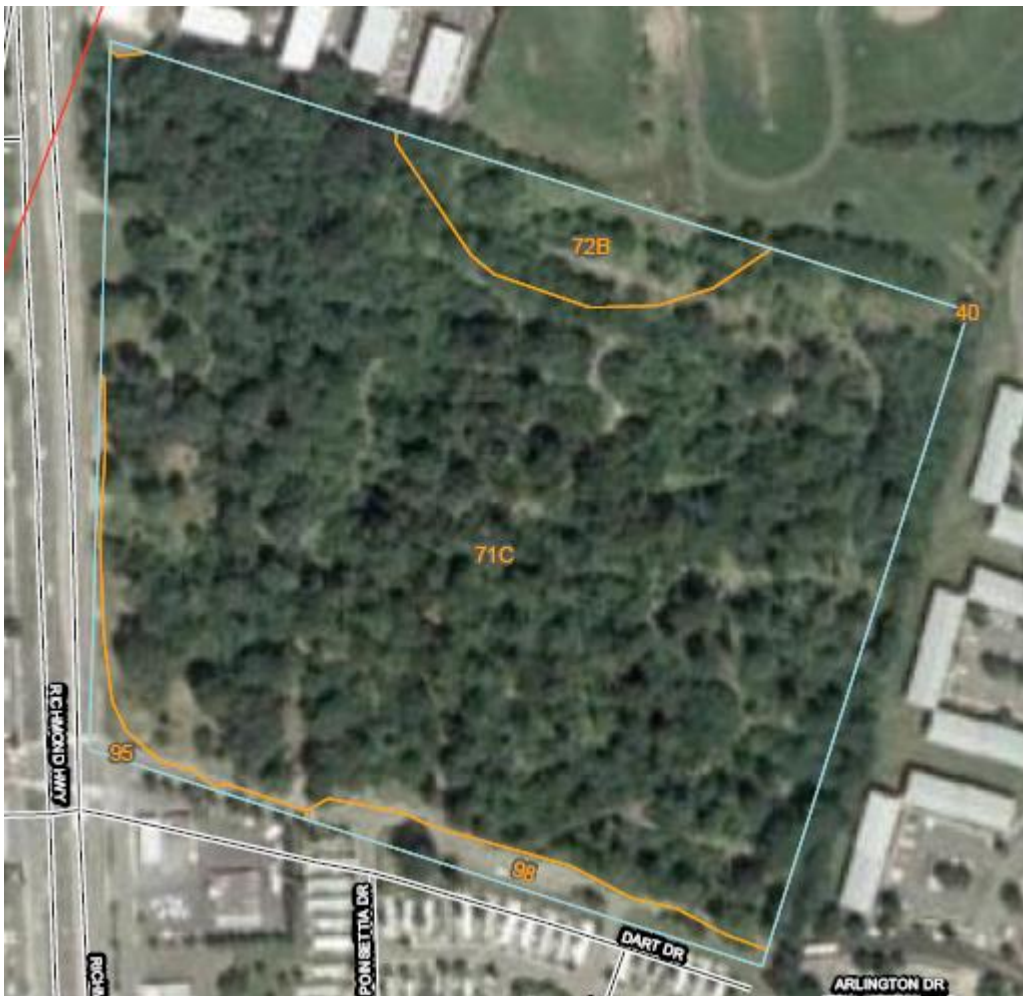


Source: Topozone, 2008

According to the U.S. Department of Agriculture (USDA) Soil Conservation Service Soil Survey (1963), the North Hill site is located within an “Unsurveyed Area.” Most of the Coastal Plain province was not included in the 1963 Soil Survey of Fairfax County (Fairfax County, 2007). Based on Fairfax County Real Property Identification Maps, the site contains marine clay soil (Map Unit 118). Marine clay soils typically occur on hilltops and side-slopes. Depth to hard bedrock is commonly greater than 50 feet for this soil type. Marine clay soil is known to have slope instability problems, high shrink-swell potential, and a poor foundation support potential (Fairfax County, 2007).

As of 2008, new soil data for the North Hill site is available from the USDA Web Soil Survey. Figure 3 shows the soil map unit types on the North Hill site. The majority, approximately 90 percent, of the North Hill site consists of Kingstowne-Sassafras-Marumsc complex (Map Unit Symbol 71C) soil. Map Unit 71C is well drained to moderately well drained soil with 7 to 15 percent slopes. Lesser amounts of Kingstowne-Sassafras-Neabsco complex (72B), Urban land (95), Urban land-Grist Mill (98), and Grist Mill sandy loam (40) soils exist on the site. All of the soils located on the North Hill site are identified as not hydric, except for the Urban land types, which are listed as unknown hydric.

Figure 3. Soil Map



Source: USDA, Web Soil Survey, 2008

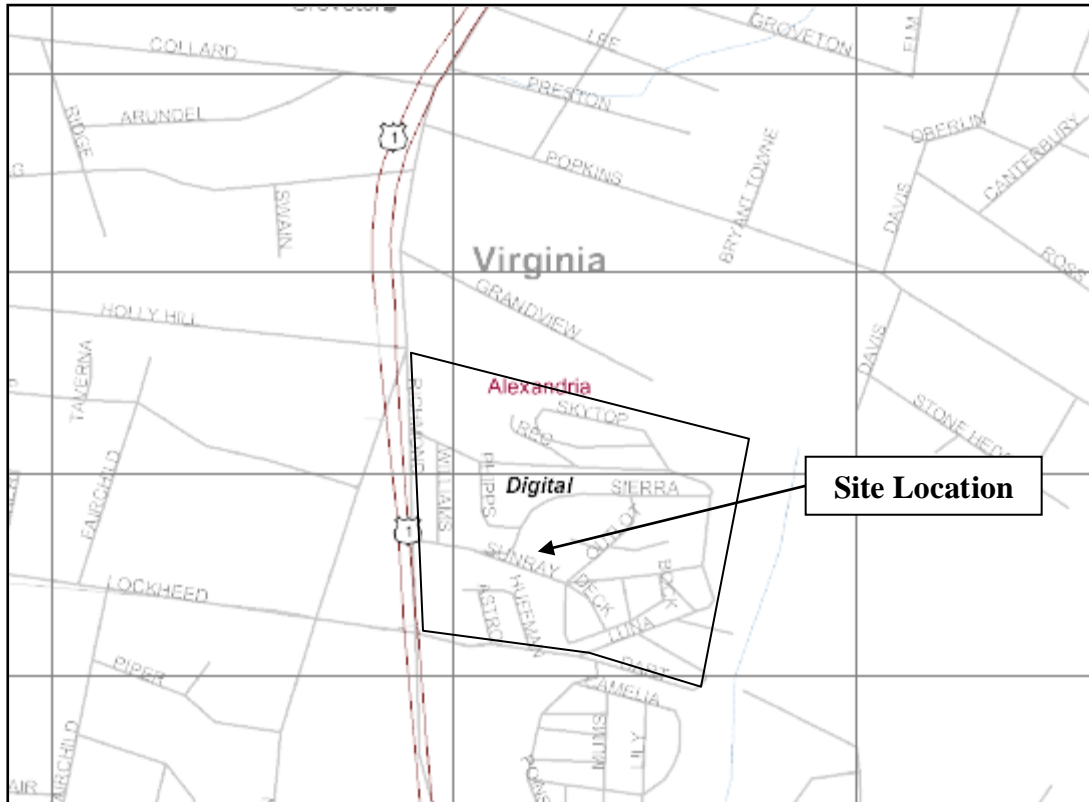
3.2 Wetlands and Streams

Wetlands are defined by the U.S. Army Corps of Engineers (USACE) in the 1987 Wetlands Delineation Manual as, “those 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 generally include swamps, marshes, bogs, and similar areas.” A wetland delineation entails identifying wetlands by analyzing the presence of hydrophytic (water-tolerant) vegetation, hydric soils, and hydrology. A hydric soil is defined by the U.S. Department of Agriculture as a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (USACE, 1987). According to the USACE Wetland Delineation Manual, common hydric soil indicators include a gleyed or low chroma color (chroma < 2) of the soil matrix, concretions, mottling, and/or listing on the local or national hydric soils lists. Wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils that are saturated to the surface at some time during the growing season. Hydrologic indicators include, but are not limited to, sediment deposits, visual inundation, drift lines, water marks, soil erosion, oxidized root channels, and water stained leaves. In general, hydrophytic vegetation, hydric soils, and hydrology must be present for an area to be considered a wetland under the USACE jurisdiction in accordance with Section 404 of the Clean Water Act.

Preliminary background information on water resources was collected prior to the field investigation through an examination of the National Wetlands Inventory (NWI) map and the USGS Quadrangle map. Figure 4 below shows the NWI map for the North Hill site. According to the NWI map, no wetlands or streams exist on the site.

Figure 4. National Wetlands Inventory Map



Source: USFWS, 2008

Plant species observed within potential wetland areas were identified and the wetland indicator status for each species was determined from the National List of Plant Species That Occur in Wetlands: National Summary (1988). An indicator status of “NI” represents No Indicator status is available. The indicator status of a certain species indicates the probability that it will occur in a wetland of the northeast region of the United States:

| <u>Indicator Category</u> | <u>Indicator Symbol</u> | <u>Definition</u> |
|----------------------------|-------------------------|---|
| Obligate Wetland Plants | OBL | Occur almost always (estimated probability >99%) under natural conditions in wetlands |
| Facultative Wetland Plants | FACW | Usually occur in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands |
| Facultative Plants | FAC | Equally likely to occur in wetlands and non-wetlands (estimated probability 34%-66%) |
| Facultative Upland Plants | FACU | Usually occur in non-wetlands (estimated probability 67%-99%) but occasionally found in wetlands (estimated probability 1%-33%) |

| <u>Indicator Category</u> | <u>Indicator Symbol</u> | <u>Definition</u> |
|---------------------------|-------------------------|---|
| Obligate Upland Plants | UPL | Occur in wetlands in another region, but occur almost always (estimated probability >99%) under natural conditions in non-wetlands in the region specified. |

As shown in Figure 2, the USGS map does not show any on-site water bodies. According to the USGS map, an unnamed tributary that flows to Little Hunting Creek is located adjacent to, but outside of, the North Hill eastern site boundary. This preliminary background information was verified by an on-site wetland investigation conducted on the North Hill site in accordance with the 1987 Wetlands Delineation Manual. Based on the 1987 Wetlands Delineation Manual, there are no wetlands or streams that would likely be considered jurisdictional by the USACE. Verification from the USACE is pending, as further discussed in Section 5.0 of this report.

Four routine wetland determination data points were taken at select locations on the North Hill site, primarily where hydrology was present, in order to determine if the area is a wetland. All four data points lacked hydric soil (chroma < 2) and hydrophytic (wetland) vegetation; however, the four sampling locations had sufficient hydrology. Hydrology indicators at all four datapoints included soil saturation at the surface. The surface hydrology within these areas appeared to be from on-site drainage pipes, probably installed for the previous development. In several instances, the drainage patterns appeared man-made. Because only one out of the three required parameters was present, these areas were determined to be upland and would likely not be considered jurisdictional.

The soil at all four data points did not exhibit gleyed or low chroma colors. The soil consisted of primarily clay. The soil at Data Point (DP)-1 was 10 YR 4/3 in the upper 0-4 inches of soil (A horizon) and 10 YR 5/6 from 4-18 inches of soil (B horizon). The area near where DP-1 is located is shown in Photographs 15 and 16 in Appendix E. The soil at DP-2 was 10 YR 3/4 in the upper 0-4 inches of soil (A horizon) and 10 YR 5/4 from 4-18 inches of soil (B horizon). Underlain fill material and concrete appeared to exist at DP-2 and in the vicinity. The area near where DP-2 is located is shown in Photographs 17 and 18 in Appendix E. The soil at DP-3 was 10 YR 5/4 in the upper 0-6 inches of soil (A horizon) and 10 YR 7/4 from 6-18 inches of soil (B horizon). The soil at DP-4 was 10 YR 6/4 from 0-18 inches. The area near where DP-4 is located is shown in Photograph 20 in Appendix E.

Vegetation at the data points consisted of primarily upland (non-hydrophytic) species. DP-1 contained Japanese honeysuckle (*Lonicera japonica*), black locust (*Robinia pseudoacacia*), and an upland grass, with wetland indicator statuses of FAC+, FACU-, and UPL, respectively. DP-2 contained box elder (*Acer negundo*), black locust, English ivy, field garlic (*Allium vineale*), Japanese honeysuckle, and multiflora rose (*Rose multiflora*), with wetland indicator statuses of FAC+, FACU-, UPL, FACU-, FAC-, and FACU, respectively. DP-3 contained eastern red cedar (*Juniperus virginiana*), Bradford

pear (*Pyrus calleryana*), Japanese honeysuckle, and an upland grass species, with wetland indicator statuses of FACU, NI, FAC-, and UPL, respectively. DP-4 contained Bradford pear, black locust, common greenbrier (*Smilax rotundifolia*), Japanese honeysuckle, and box elder, with wetland indicator statuses of NI, FACU-, FAC, FAC-, and FAC+, respectively.

3.3 Vegetation

The North Hill site is forested with a wide variety of trees, shrubs, and vines. During the field investigations, a total of 40 tree species were identified on the site. The most abundant tree species within the North Hill site include black locust, willow oak, red maple, white oak, American elm, black cherry, and sweet gum. The site contains an abundance of numerous vine species, which is discussed in more detail in the Invasive Species section of this report. Table 1 below contains a list of the tree species observed on the site. Table 2 contains a list of vine and shrub species observed within the North Hill site during the field investigations.

Table 1. Tree Species Observed within the Site

| Scientific Name | Common Name |
|--------------------------------------|-----------------------|
| <i>Fagus grandifolia</i> | American beech |
| <i>Ulmus americana</i> | American elm |
| <i>Ilex opaca</i> | American holly |
| <i>Plantanus occidentalis</i> | American sycamore |
| <i>Fraxinus sp.</i> | ash sp. |
| <i>Carya cordiformis</i> | bitternut hickory |
| <i>Prunus serotina</i> | black cherry |
| <i>Nyssa sylvatica</i> | black gum |
| <i>Robinia pseudoacacia</i> | black locust |
| <i>Juglans nigra</i> | black walnut |
| <i>Salix nigra</i> | black willow |
| <i>Acer negundo</i> | box elder |
| <i>Pyrus calleryana</i> ¹ | Bradford pear |
| <i>Prunus sp.</i> | cherry sp. (domestic) |
| <i>Celtis occidentalis</i> | common hackberry |
| <i>Diospyros virginiana</i> | common persimmon |
| <i>Populus deltoides</i> | eastern cotton-wood |
| <i>Tsuga canadensis</i> | eastern hemlock |
| <i>Cercis canadensis</i> | eastern red bud |
| <i>Juniperus virginiana</i> | eastern red cedar |
| <i>Pinus strobus</i> | eastern white pine |
| <i>Ulmus sp.</i> | elm sp. |
| <i>Cornus florida</i> | flowering dogwood |
| <i>Carya tomentosa</i> | mockernut hickory |

| | |
|---|------------------|
| <i>Morus sp.</i> | mulberry sp. |
| <i>Quercus rubra</i> | northern red oak |
| <i>Carya glabra</i> | pignut hickory |
| <i>Quercus palustris</i> | pin oak |
| <i>Paulownia tomentosa</i> ² | princess tree |
| <i>Acer rubrum</i> | red maple |
| <i>Quercus coccinea</i> | scarlet oak |
| <i>Acer saccharinum</i> | silver maple |
| <i>Quercus falcata</i> | southern red oak |
| <i>Liquidambar styraciflua</i> | sweet gum |
| <i>Ailanthus altissima</i> ² | tree-of-heaven |
| <i>Liriodendron tulipifera</i> | tulip poplar |
| <i>Pinus virginiana</i> | virginia pine |
| <i>Quercus alba</i> | white oak |
| <i>Quercus phellos</i> | willow oak |
| <i>Salix sp.</i> | willow sp. |

¹ Identified as invasive in the Mid-Atlantic States by the U.S. Fish and Wildlife Service and National Park Service (USFWS and NPS, 2003)

² These species are identified as invasive alien plants in the state of Virginia by the Department of Conservation and Recreation, Division of Natural Heritage (2003).

Table 2. Non-woody Plant Species Observed within the Site¹

| Common Name | Scientific Name |
|--------------------------------|------------------------------------|
| Virginia creeper | <i>Parthenocissus quinquefolia</i> |
| Allegheny blackberry | <i>Rubus allegheniensis</i> |
| Common greenbrier | <i>Smilax rotundifolia</i> |
| Japanese honeysuckle | <i>Lonicera japonica</i> |
| Trumpet creeper | <i>Campsis radicans</i> |
| English ivy ² | <i>Hedera helix</i> |
| Poison ivy | <i>Toxicodendron radicans</i> |
| Multiflora rose | <i>Rose multiflora</i> |
| Japanese wisteria ² | <i>Wisteria floribunda</i> |
| Field garlic | <i>Allium oleraceum</i> |
| Forsythias | <i>Forsythia sp.</i> |
| Daffodils | <i>Narcissus pseudonarcissus</i> |
| Juniper sp. | <i>Juniperus sp.</i> |
| Common periwinkle ² | <i>Vinca minor</i> |
| Bamboo sp. ² | <i>Phyllostachys sp.</i> |

¹ Because field work was completed in the winter, some plant species found during the growing season may not have been observed and therefore, would not be listed in Table 2.

² These species are identified as invasive alien plants in the state of Virginia by the Department of Conservation and Recreation, Division of Natural Heritage (2003).

3.3.1 Vegetative Communities

The North Hill site does not readily fit any of the conventional vegetative community descriptions, primarily because of its previous use as a residential trailer site. The current presence of asphalt roadways and concrete pads exert limitations on the growth of many vegetative species. For these reasons only an approximation of community types can be made.

The southwest corner of the North Hill site with the scattered, large trees and mowed grasses can best be described as a parkland type of community. The northwest corner of the site is the only area that approaches a conventional forest description. This area apparently was not used for trailers and only a few paved areas are found along its perimeter. This northwest portion approximates a late successional stage of hardwood forest regrowth characterized by large oak, hickory, and beech trees scattered throughout with more moderate-age trees of those species and others forming a subcanopy. A somewhat similar vegetative type is found along most of the south edge of the property and extends up into the center of the site in a somewhat broadly, irregular triangular configuration. This area differs in that it is dominated by large oaks and sweetgums in the canopy with a more patchy distribution of understory species. This patchy distribution is the direct result of the paved areas found in this part of the site which limit the regrowth of trees.

Most of the remainder of the site consists of relatively young successional regrowth of hardwoods with pioneering species such as sweetgum and black locust dominating. Most of these younger regrowth areas are heavily invaded by English ivy and wisteria, as well as other invasive species including tree-of-heaven. Some fairly large canopy trees are scattered throughout even these areas where they were probably left as shade trees when the site was used for trailers.

Most of the evergreen species such as the pines and larger cedars were undoubtedly planted since they occur in neat rows. The few hemlocks fall into this group as well. Other anomalous species such as cultivated junipers and forsythias (*Forsythia* sp.), as well as daffodils (*Narcissus pseudonarcissus*) are found scattered throughout the site. This is clearly the result of ornamental plantings associated with the previous form of residential use.

3.3.2 Invasive Species

Invasive species, as listed by the Virginia Department of Conservation and Recreation, existing on the North Hill site were noted during the field investigations. The most common invasive species present on the site is English ivy (*Hedera helix*). English ivy is excessive in certain locations and is common almost over the entire site. In many locations, English ivy has grown up to the top of trees, which poses serious problems to the longevity of the tree (Photographs 3 and 6, Appendix E). Common periwinkle (*Vinca minor*) and Japanese wisteria (*Wisteria floribunda*) are also prevalent within the site.

In addition, several stands of bamboo (*Phyllostachys sp*), which is likely golden bamboo (*Phyllostachys aurea*), exist on the site (Photograph 12, Appendix E). These bamboo stands are approximately 100 to 200 square feet in size. The thick bamboo stands may provide habitat cover for deer, which were observed near one stand.

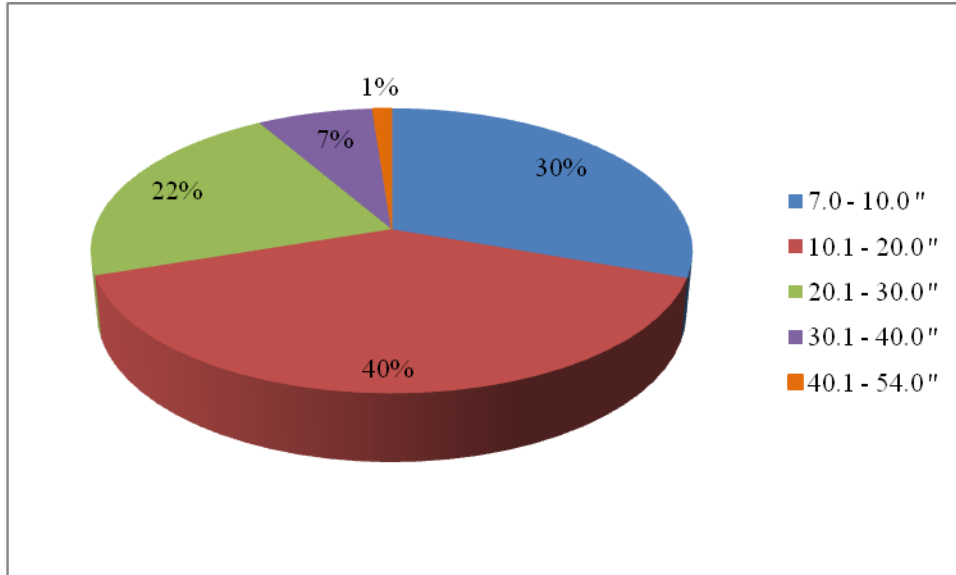
Three invasive tree species were noted on the North Hill site, which includes tree-of-heaven (*Ailanthus altissima*), Bradford pear (*Pyrus calleryana*), and princess tree (*Paulownia tomentosa*). The Bradford pear is listed as an invasive species in the Mid-Atlantic States by the U.S. Fish and Wildlife Service and National Park Service (USFWS and NPS, 2003). There are 50 tree-of-heaven trees and 20 Bradford pear trees larger than 7 inches in dbh on the site.

3.3.3 Tree Inventory

A tree inventory was conducted on the North Hill site during the months of December 2007 through February 2008. All trees with a diameter at breast height (dbh) of 7.0 inches or greater were flagged, given an identification number, GPS surveyed using a Trimble GeoXH handheld capable of sub-foot accuracy, and evaluated for condition. Tree condition was noted as dead, very poor, poor, fair, good, very good, or excellent. Other descriptive notes regarding the trees' condition were recorded. All of the surveyed trees are shown on the Tree Inventory Map in Appendix B. An Excel spreadsheet containing of the Tree Inventory Results is provided in Appendix C.

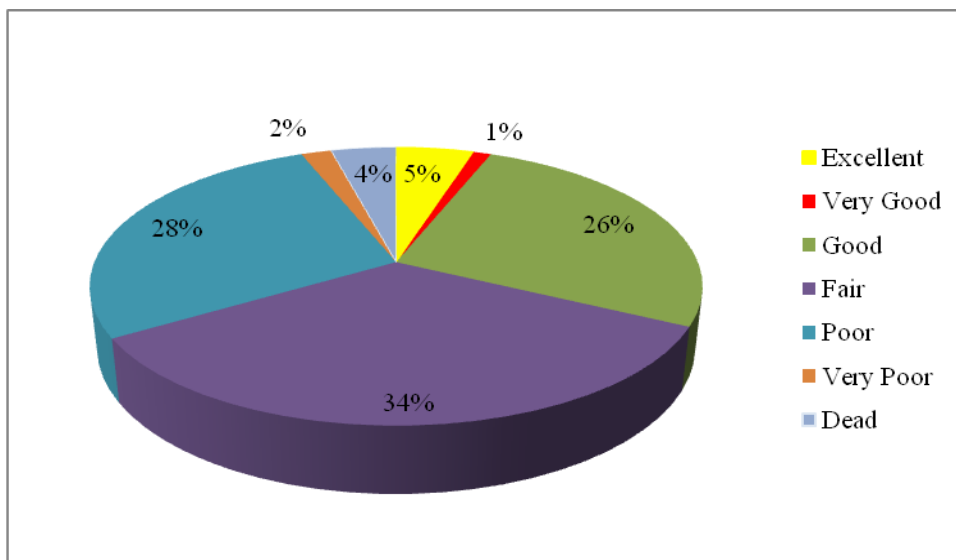
Within the North Hill site, there are 1,427 trees that are greater than 7.0 inches in dbh. Two additional trees, an eastern red cedar and flowering dogwood, each having a dbh of 6, were surveyed (but not included in the 1,427 total) due to their good condition. The most common trees surveyed, along with their respective quantities, included: American elm (41), black cherry (103), black locust (397), box elder (110), red maple (119), sweet gum (180), tree-of-heaven (50), white oak (92), and willow oak (67). There are 434 trees with a dbh between 7.0 and 10.0 inches; 563 trees with a dbh between 10.1 and 20.0 inches; 310 trees with a dbh between 20.1 and 30.0 inches; 103 trees with a dbh between 30.1 and 40.0 inches; and 17 trees with a dbh between 40.1 and 54.0 inches. As illustrated in Figure 5, the majority of the trees (40 percent) are within the dbh range from 10.1 – 20.0 inches. The largest tree was a willow oak (Tree #726), having a dbh of 54 inches. Although not at dbh level, this willow oak has three main stems, which probably does not make it the best “excellent” tree on-site (Photograph 14, Appendix E). The largest single trunk tree in excellent condition is also willow oak (Tree #913), having a dbh of 47.5 inches. The next largest excellent tree with a single trunk is a white oak (Tree #343), having a dbh of 44 inches.

Figure 5. Percentage of Trees Greater than 7 " dbh (Per dbh Range)



The majority of the trees on the North Hill site are in poor, fair, and good condition, which in total makes up 88 percent of the trees. Of the total number of surveyed trees, there are 69 trees in excellent condition, 16 trees in very good condition, 376 trees in good condition, 486 trees in fair condition, 395 trees in poor condition, 27 trees in very poor condition, and 58 trees are dead. The majority of those trees in excellent condition include white oak, willow oak, and American beech. Figure 6 illustrates the condition of the trees on the North Hill site.

Figure 6. Percentage of Surveyed Trees by Condition



3.4 Wildlife

During the field investigations, 19 different bird species were observed. The most common bird species observed to be utilizing the site included the Carolina wren (*Thryothorus ludovicianus*), white-throated sparrow (*Zonotrichia albicollis*), American robin (*Turdus migratorius*), northern cardinal (*Cardinalis cardinalis*), European starling (*Sturnus vulgaris*), cedar waxwing (*Bombycilla cedrorum*), dark-eyed junco (*Junco hyemalis*), blue jay (*Cyanocitta cristata*), Carolina chickadee (*Poecile carolinensis*), red-bellied woodpecker (*Melanerpes carolinus*), and eastern towhee (*Pipilo erythrophthalmus*). Other bird species observed in lesser numbers included the mourning dove (*Zenaidura macroura carolinensis*), downy woodpecker (*Picoides pubescens medianus*), northern flicker (*Colaptes auratus*), northern mockingbird (*Mimus polyglottos*), Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus lineatus*), and red-tailed hawk (*Buteo jamaicensis*). A total of four bald eagles (*Haliaeetus leucocephalus*) were observed circling the site above; however, no bald eagle nests were observed on-site.

White-tailed deer (*Odocoileus virginianus*) are utilizing the site, as inferred from rub marks found on numerous trees around the site, observed deer tracks, and direct observation of four to six deer on-site. Evidence of raccoon (*Procyon lotor*) and eastern cottontail rabbit (*Sylvilagus floridanus*) was also observed. Several groundhog (*Marmota monax*) dens were also observed on-site. Numerous domestic cats were observed on the site. Although no species were observed, suitable habitat exists for the southern flying squirrel (*Glaucomys volans*). Southern flying squirrels are nocturnal and sleep during the day within cavities of dead or dying trees. Northern gray squirrels (*Sciurus carolinensis pennsylvanicus*) are abundant within the site. One red fox (*Vulpes vulpes*) was observed on the site. A smooth green snake (*Opheodrys vernalis*) was observed in the northeast area of the site. A possible fox den, which could have also been created by a domestic cat, was observed on the site as shown in Photograph 19 in Appendix E.

3.5 Threatened and Endangered Species

During the field investigation, no federally threatened and/or endangered species were observed. A generated database report from the Virginia Department of Game and Inland Fisheries (VDGIF) produced a list of species (including endangered, threatened, and special concern species) known or likely to occur within a three-mile radius of the North Hill site (Appendix F). The federal and/or state listed threatened and/or endangered species include: bald eagle, migrant loggerhead shrike (*Lanius ludovicianus migrans*), henslow's sparrow (*Ammodramus henslowii*), Appalachian grizzled skipper (*Pyrgus wyandot*), brook floater (*Alasmodonta varicose*), loggerhead shrike (*Lanius ludovicianus*), wood turtle (*Clyptemys insculpta*), and upland sandpiper (*Bartramia longicauda*) (VDGIF, 2008a). In general, suitable habitat for these threatened and/or endangered species is not present on the North Hill site.

During two field visits, a total of four bald eagles were observed circling the site above. However, no bald eagle nests were observed on-site. Bald eagles, although removed from the federal List of Endangered and Threatened Wildlife (effective July 28, 2007), are still protected at the state level. Bald eagles are classified as a Threatened Species under Virginia state law and VDGIF regulations. In addition, bald eagles will remain federally protected under the Bald and Golden Eagle Protection Act and under the Migratory Bird Treaty Act (VDGIF, 2008b).

4.0 Aesthetic and Visual Resources

The North Hill site is relatively typical for a disturbed site surrounded by development and located in an urban setting. The site contains pockets of trash and debris (Photographs 9 and 10, Appendix E). Invasive species are present, and quite often excessive, throughout the site (Photograph 6). The site contains old paved roadways, remains of concrete trailer pads/bases, a concrete drainage structure, and utility poles (Photographs 7, 11, and 13). In addition, there are numerous locations with evidence of human habitants (i.e. shelters, sleeping bags, tarps).

However, the North Hill site does contain a large number of bird species and appears to be suitable habitat for small mammals. The site is located approximately ½-mile away from Huntly Meadows Park, which could be one reason for the site's diversity of bird species. The site appears to be providing shelter and food for a considerable number of species, as noted from direct observation of the species and from evidence of their presence/habitat.

The North Hill site also contains a diversity of tree species and numerous large healthy trees. In particular, the site contains healthy, large, and visually appealing willow oaks and white oaks.

5.0 Conclusions and Recommendations

As shown in the Tree Inventory Results (Appendix C), tree condition and recommendations on tree removal have been provided. At a minimum, it is recommended that all trees in excellent and very good condition be preserved, especially those that are greater than 20 inches in dbh. It is recommended that invasive trees, such as the tree-of-heaven, Bradford pear, and princess tree be removed on the North Hill site, where feasible. In some instances, hollow trees appear to be utilized by wildlife and are providing habitat. Therefore, some small dead or dying trees were not recommended for removal. Conversely, it is recommended that large unhealthy trees that are dying and/or dead be removed as a public safety precaution.

Recommendations of tree preservation have also been provided on the Tree Inventory Results in Appendix C. In general, large and healthy trees should be preserved where allowable. Any tree in good, very good, or excellent condition should be preserved

where feasible. Many smaller trees that are in good condition and/or are providing food for resident wildlife are also recommended for preservation. For those trees that are to be preserved, it is recommended that the English ivy, poison ivy, utility wires, and/or other foreign objects (if present) be removed from the trees.

The presence of a diverse population of trees on the North Hill site ranging from saplings to old, mature, canopy trees provides a rich habitat for many bird species. The bird species observed during the natural resources inventory were primarily permanent and winter resident species due to the season when the field work was conducted. Undoubtedly, there is an equally rich mixture of permanent and breeding summer resident birds during the breeding season. The presence of younger, understory trees and shrubs augments the habitat provided by the larger, canopy tree species. Areas such as the North Hill site also increasingly function as urban islands, providing cover and resting areas for many migrating songbirds.

Much of the currently useful vegetative cover in the lower forest layers is actually provided by the invasive plant species that are prevalent on the North Hill site. There are relatively dense patches of multiflora rose in several areas of the site, particularly in the northeast corner of the site. Although it is an invasive, non-native species, multiflora rose provides very good cover for many species of birds. Multiflora rose also provides good cover for small mammals, such as the eastern cottontail rabbit. The dense growth of English ivy on many of the trees provides a similar cover component at a greater height, which is also used by birds and the gray squirrel. Ivy also has the distinction of being an evergreen; therefore, it provides a valuable winter shelter for many birds.

There are also some native evergreens on the site such as white pine, eastern red cedar, and American holly, which are also providing winter shelters for birds. However, most of these native species are relatively scarce on the site and consist largely of scattered plantings dating back to the period when the site was actively used as a trailer park. In a few areas, primarily in the southeastern region of the site where sunlight can penetrate to the understory, the eastern red cedar has begun to naturally reproduce. Eastern red cedar seedlings are fairly abundant in this region. These native evergreen trees should be preserved to the greatest extent feasible regardless of their size.

A basic management guideline for the North Hill site would be to replace any invasive species removed with native species of comparable habitat value. This should include an emphasis on native evergreen species, which provide shelter throughout the year, especially during winter storms. In more open areas such as in the northeastern corner of the site, pine species such as white pine would probably be successful. In addition, white pine planted in this area would also be an adjunct to the row of existing white pine along the eastern property boundary. In the more shady areas of the North Hill site, planting coniferous evergreens may not be successful due to the shade from the existing deciduous trees. In those cases, two native evergreens which would be valuable are the American holly and mountain laurel (*Kalmia latifolia*). Both of these latter species are quite shade tolerant.

Another good management guideline is the inclusion of movement corridors for both birds and mammals. If vegetation is completely removed from some areas, it would be helpful to ensure there are at least some contiguous vegetated areas along the boundaries of those cleared areas that connect to the existing vegetation on the rest of the site. Preserving vegetated corridors allows protective cover for species moving from one area to another and minimizes fragmentation.

In some areas on the North Hill site, poison ivy is becoming problematic. Although this is a native species, it has been noted to act in an invasive manner when a site has been heavily disturbed by human activities as is the case of the North Hill site. It would probably be advisable to remove thickets of shrubby poison ivy growth, as well as any large vines that are on large, mature, healthy trees. The long-term impacts of large poison ivy vines on such trees may be detrimental to their health. On the other hand, for younger trees leaving large poison ivy vines may have an overall habitat benefit. Poison ivy provides thick seasonal coverage. In addition, poison ivy berries serve as a food source for many birds. The presence of poison ivy vines may eventually be detrimental to the health of those young trees; however, in the broader terms of habitat leaving some poison ivy can be beneficial. It is a normal ecological process for some trees in a forest to die and persist for years as snags, which provides habitat for many animal species. In this case, the key to successful management is to strike a balance between preserving large, healthy trees whose canopy provides a tremendous amount of habitat for many birds and allowing other, less aesthetically pleasing smaller trees to eventually succumb thus providing additional habitat for woodpeckers and other cavity nesting species.

Care should be exercised during any removal of debris, concrete, and asphalt. Some areas of asphalt could remain and serve as trails. Where this is not desirable, the removal process should be conducted in a manner consistent with minimizing damage to the adjacent vegetation, particularly large, healthy trees. Minimizing damage to vegetation includes not digging any deeper than necessary to remove the foreign materials, limiting the intrusion of equipment into healthy vegetated areas, and replanting disturbed areas with native vegetation as quickly as possible. All personnel involved in the removal of debris should be thoroughly briefed on the goals of the project and the need to minimize impacts on desirable vegetation. The staging of any debris removal activities is an important consideration. Larger equipment should be limited to specific areas, such as the existing paved areas along the north edge of Dart Drive. In addition, the debris located in the northern region of the site could be removed first, utilizing the existing paved areas for transport to the loading area for the larger equipment. This type of staging eliminates the need to cut any new access roads or to bring larger equipment any further into the site than absolutely necessary.

Numerous methods for the removal of invasive species are available and practiced. Young tree-of-heaven seedlings may be successfully removed manually by hand when the soil is moist. Small infestations, resprouts, and large tree-of-heaven trees can be repeatedly cut for several summers to reduce seed spread and exhaust the root reserves (NISS, 2008). For larger stands of tree-of-heaven and other invasive species such as the princess tree, removal is probably most effective by carefully cutting them down and

immediately applying a 25% solution of glyphosate, a non-selective herbicide, on the freshly cut stump (NPS, 2008; NISS, 2008). This method should only be done during the growing season and when the temperature is low but the ground is not frozen (NPS, 2008). This is a technique that the National Park Service has found to be successful for some invasive species removal and has less impact on adjacent desirable vegetation than simply spraying glyphosate.

Larger vines such as English ivy and poison ivy may be removed by cutting the vine and applying the glyphosate solution to the bottom, rooted portion. To the extent possible, the upper portion of the vine may be pulled off the tree. Manually removing vines in this manner will not be possible in all cases. In such cases, there will be trees with dead vines clinging to them for some time after the removal process. For extensive patches of ivy on ground areas, spraying a foliar herbicide (under controlled conditions in accordance with herbicide application guidelines) may be more effective. For the English ivy, it will be necessary to mix a surfactant/detergent into the glyphosate solution since this plant has a very waxy leaf surface that must be penetrated in order for the herbicide to be effective (NPS, 2008).

Although field investigations revealed that no jurisdictional wetlands or waterways are present on the North Hill site, a Jurisdictional Determination (JD) from the USACE is needed to verify this statement. A JD verifies the existence or nonexistence of on-site jurisdictional wetlands or waterways. In this instance, a JD from the USACE would provide a means of security validating the lack of jurisdictional wetlands and streams on the site. Concurrence with the USACE regarding the lack of jurisdictional wetlands and streams is currently being sought.

It is recommended that coordination with the VDGIF regarding state listed threatened or endangered species occur. Although no nests were observed on the site, a total of four bald eagles were observed circling above the site during two different occasions. For this reason and due to the site's proximity to the Potomac River and to Huntly Meadow Park, coordination regarding threatened and endangered species is being initiated.

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Appendix A
Natural Resources Map

Appendix B
Tree Inventory Map

Appendix C
Tree Inventory Results

Appendix D
Tree Condition Map

**Appendix E
Photographs**



Photograph 1. Grassed area with scattered trees located in the southwestern region of the North Hill site. Photograph direction: Northeast



Photograph 2. View of a culvert with silt fencing directly adjacent to Route 1. Photograph Direction: East



Photograph 3. View of tree number 204. Photograph Direction: North



**Photograph 4. Drainage pattern created from a culvert, located near Route 1.
Photograph Direction: East**



Photograph 5. Underground concrete culvert which empties into the drainage pattern, as shown in Photograph 4. Photograph Direction: Northeast



**Photograph 6. Typical view of vine-covered trees on site. Photograph Direction:
East**



**Photograph 7. View of tree number 339 with broken limbs and adjacent utility pole.
Photograph Direction: West**



Photograph 8. View from upslope looking towards Route 1. Photograph Direction: Southwest



Photograph 9. Shopping carts and debris located along the northern site boundary. Photograph Direction: North



Photograph 10. Oil tank located on-site. Photograph Direction: South



**Photograph 11. View of a concrete drainage, which leads into a ground grate.
Photograph Direction: Northeast**



Photograph 12. View of one of the on-site bamboo stands adjacent to an old paved roadway. Photograph Direction: North



Photograph 13. View of the central region of the site. Photograph Direction: Northwest



Photograph 14. View of the largest tree on site, willow oak (number 726) having a dbh of 54. Photograph Direction: North



Photograph 15. View of an on-site drainage swale near the eastern property boundary at DP-1. Photograph Direction: Northeast



Photograph 16. Down-gradient view of the on-site drainage swale near the eastern property boundary at DP-1. Photograph Direction: Southwest



Photograph 17. View of on-site drainage swale at DP-2. Photograph Direction: North



Photograph 18. View of on-site drainage swale at DP-2. Photograph Direction: South



Photograph 19. Den created by possibly a red fox or domestic cat, located near the northeast property boundary. Photograph Direction: North



Photograph 20. Surface hydrology located near the northeast property boundary at DP-4. Photograph Direction: West

Appendix F
List of Threatened and Endangered Species for Fairfax County, Virginia