

Greenbelt City Council Work Session

Forest Preserve Health Assessment

July 31, 2017
8:00 PM

Council Room

Agenda

- Consultant Presentation
- Forest Preserve Board Comments
- City Staff Comments
- Council Discussion
- Citizen Comments
- Other

Forest Health Assessment Volume I

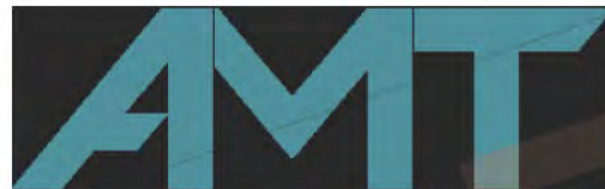
for the
North Preserve & South Preserve
of the
Greenbelt Forest Preserve

Prepared for:



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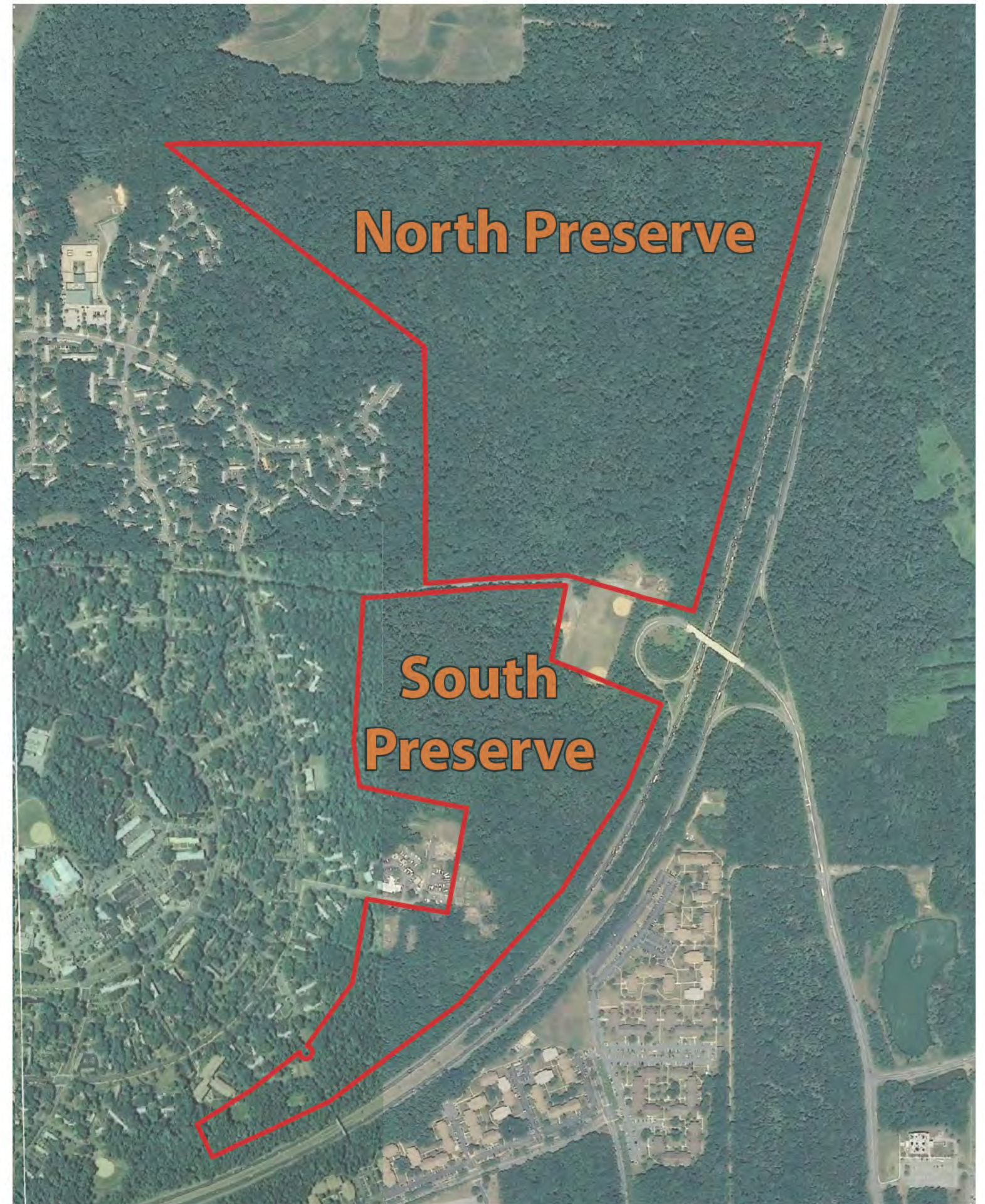
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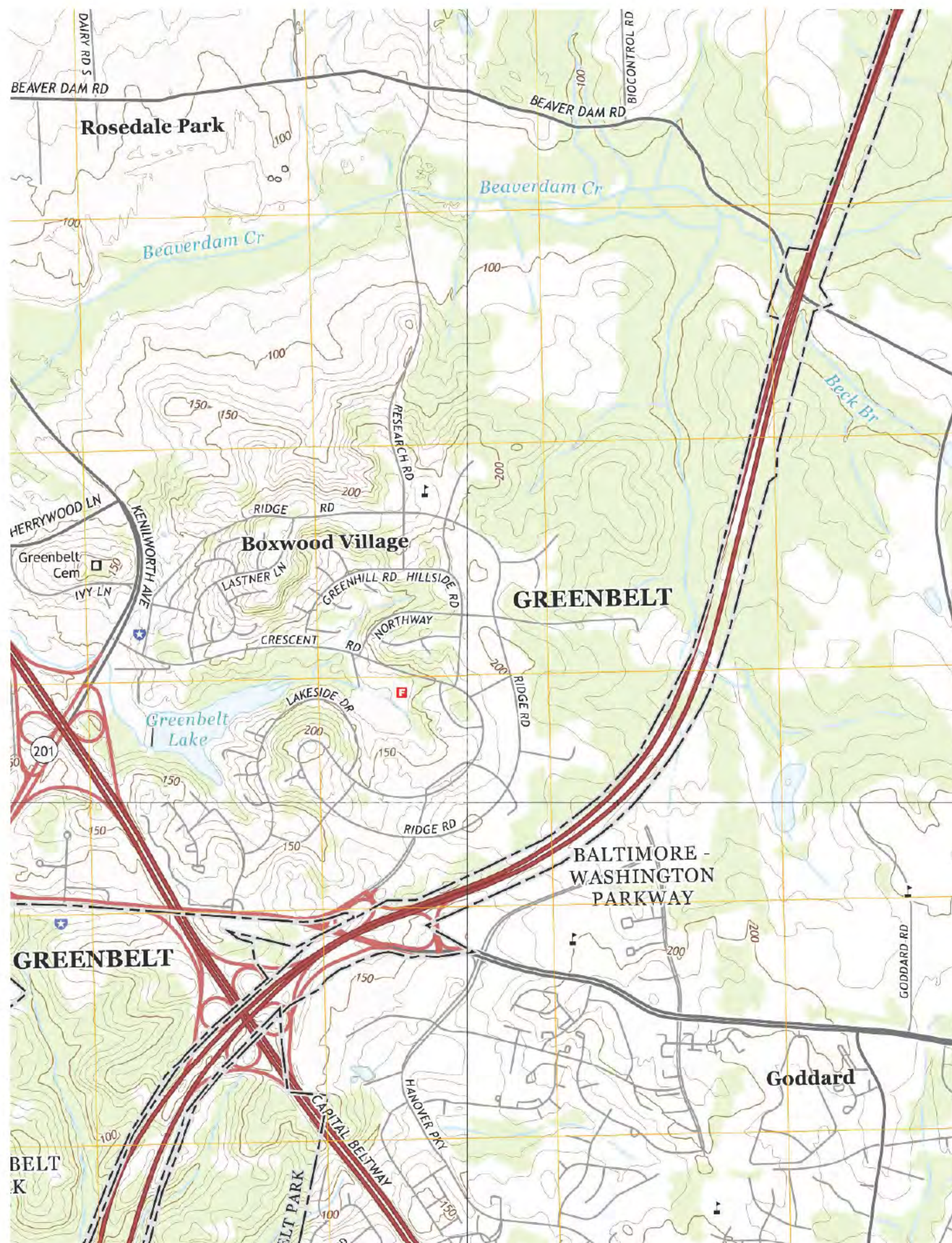


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Goals & Recommendations

See Forest Health Assessment Volume II

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EXECUTIVE SUMMARY

The approximate 236-acre Study Area, part of the Greenbelt Forest Preserve, consists of a largely deciduous forest with a variety of native plant communities forming the canopy, understory, shrub and herbaceous layers. This forest ecosystem also plays an important role in serving as habitat for native wildlife, which find refuge there from encroaching urbanization. Adjacent to its northern boundary, the open land and forests of the Beltsville Agricultural Research Center link the Forest Preserve with the region's green infrastructure. This infrastructure reaches from the Patuxent Research Refuge to the Northeast Branch of the Anacostia River. The Preserve offers many ecosystem services that are beneficial to the environment, as well as passive recreational opportunities for the community.

Three forest associations commonly found within the Piedmont region are evident within the Study Area, including white and red oak, tulip poplar, and red maple and sweet gum dominated stands. Overall, the stands appear healthy with a diversity of flora found throughout each forest stratum. The presence of different plant species throughout a forest stratum allows for a wide variety of wildlife to benefit from the Forest Preserve, including birds, mammals, reptiles and amphibians. As expected, a number of wildlife species evident on site are common edge dwelling species that thrive along the ecotones between suburban habitat (lawns, fields) and the forest edge. Yet, the size of the forest, particularly the North Preserve still allows for modest forest interior dwelling bird (FIDS) habitat, a habitat in need of conservation throughout Maryland. In combination with forest cover to the north associated with BARC, the Forest Preserve is part of an even larger area of FIDs habitat. There are limited aquatic features associated with the Study Area, namely a larger tributary flowing north to Beaverdam Creek on the eastern side of the North Preserve, and some smaller tributaries that also flow northward from the site to Beaverdam Creek. These tributaries do play a role for some wildlife benefiting from water sources. The few fish species evident are likely to be found within the tributary to Beaverdam Creek.

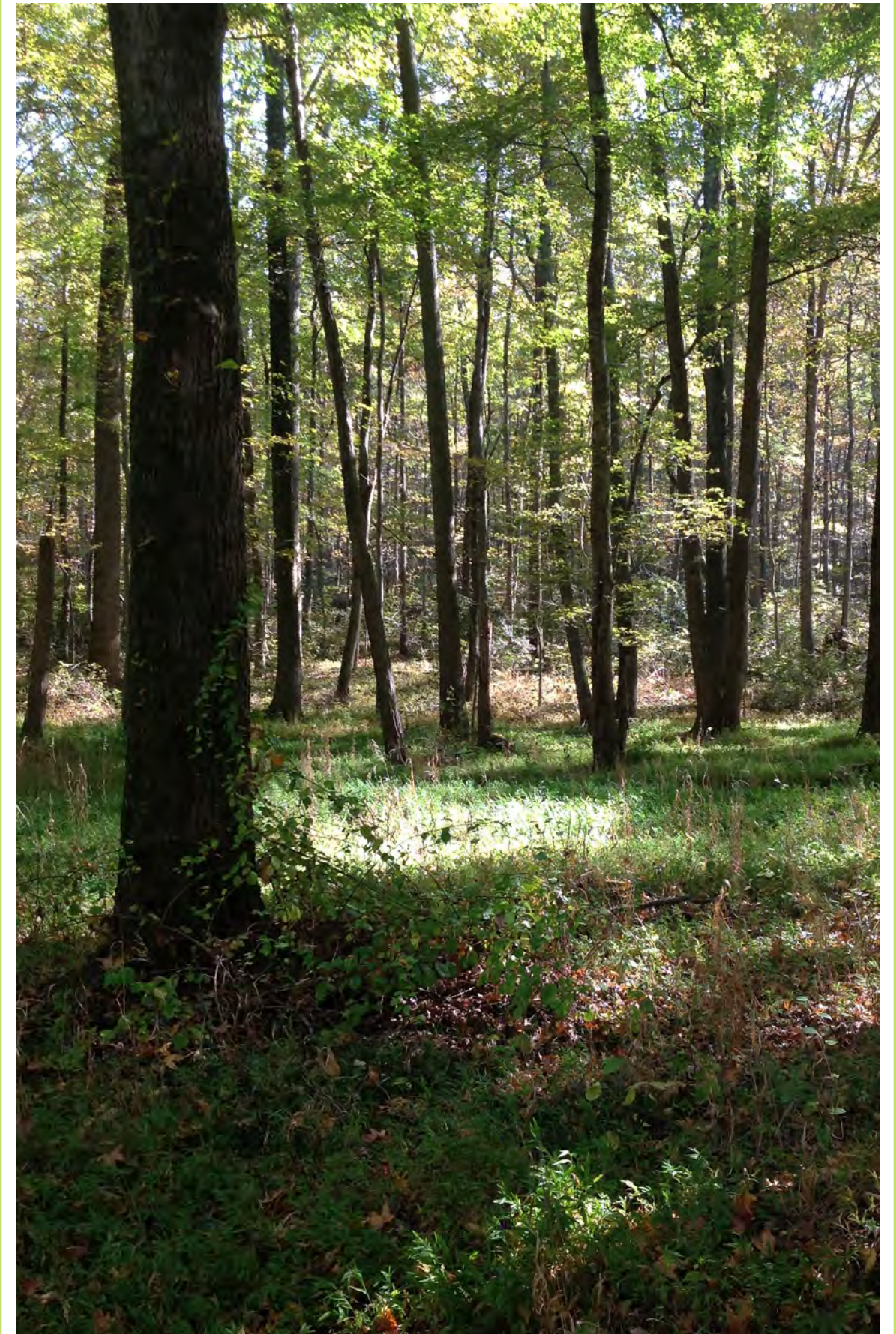
However, the Preserve is not without biotic and abiotic stresses that affect the health of the forest. The Study Area is largely surrounded by urban pressures, including I-295 and the surrounding Greenbelt communities. The more visible pressures include stormwater runoff, trash, dumping and promotion and spread of non-native invasive plant species along and within the forest. The few stream channels within the study area, situated within highly erodible soils, have become incised undoubtedly from stormwater runoff from the adjacent Greenbelt communities. Trash from the surrounding area, passing cars along I-295, as well as dumping off of Northway Road appears to be an ongoing problem.

As shown within the report, the forest has numerous stands of invasive plant species, typically along developed areas and intruding into the forest. In addition, scattered pockets of invasives are found within the interior of the forest, often in close proximity to the trails evident through the study area. These species, increasingly common to many natural areas, include multiflora rose, Japanese stilt grass, barberry, and oriental bittersweet. In smaller

numbers, these species can be tolerated; however, many of the species have aggressive growth patterns, at times growing to the exclusion of other species. One of our forest recommendations focuses on the control of these non-native species.

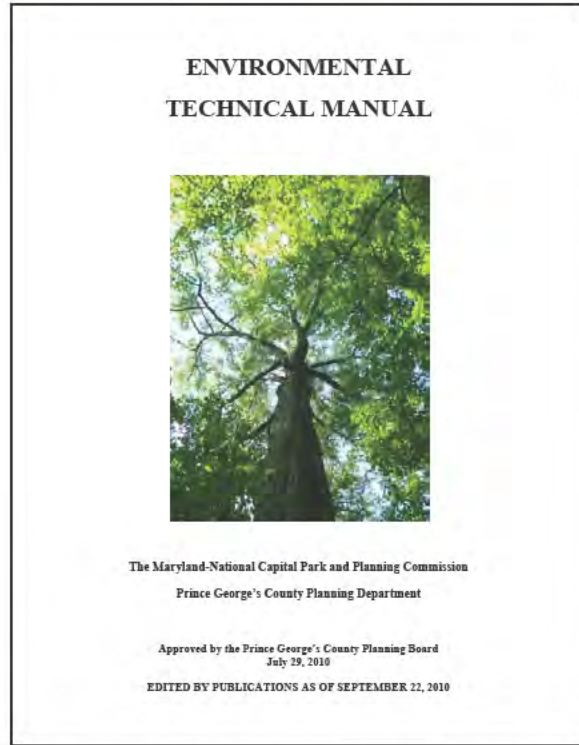
There is an extensive trail system through both preserves that allows for users to safely traverse the forest ecosystem. In addition, the use of the trails minimizes the trampling of small herbaceous species, saplings as well as some wildlife. The trails do however allow for the introduction of trash, invasive plant species and easy access for those users who may manipulate the forest in a way counter to forest protection (removal of plants, dumping, removal of trees for firewood or hut construction). Our recommendations provide opportunities to continue to encourage proper access and usage of the forest through the trails. There are opportunities to provide education through signage, brochures and other forms of outreach to minimize unintended or unwanted usage of the forest.

The long term health of the Greenbelt Forest Preserve, and its ability to provide habitat and foraging opportunities for a variety of wildlife will benefit from ongoing maintenance and protection. All opportunities to preserve into perpetuity any adjacent forest, either the BARC property or the Greenbelt Development forest immediately west of the Study Area are critically important. In addition, opportunities to minimize trash, dumping and the stormwater runoff should be given high priority. Finally, an annual invasive species eradication program should be developed. Plans to develop a trail maintenance program, including signs, will help to promote passive recreational activities compatible with forest health and protection.

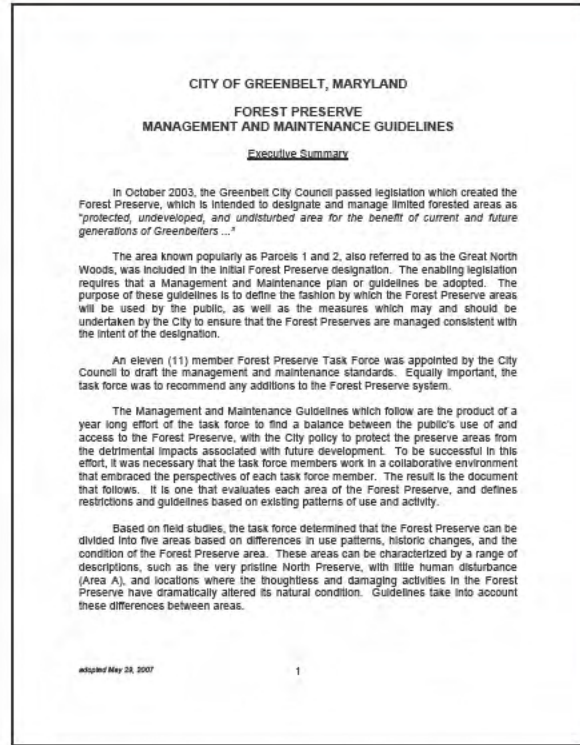




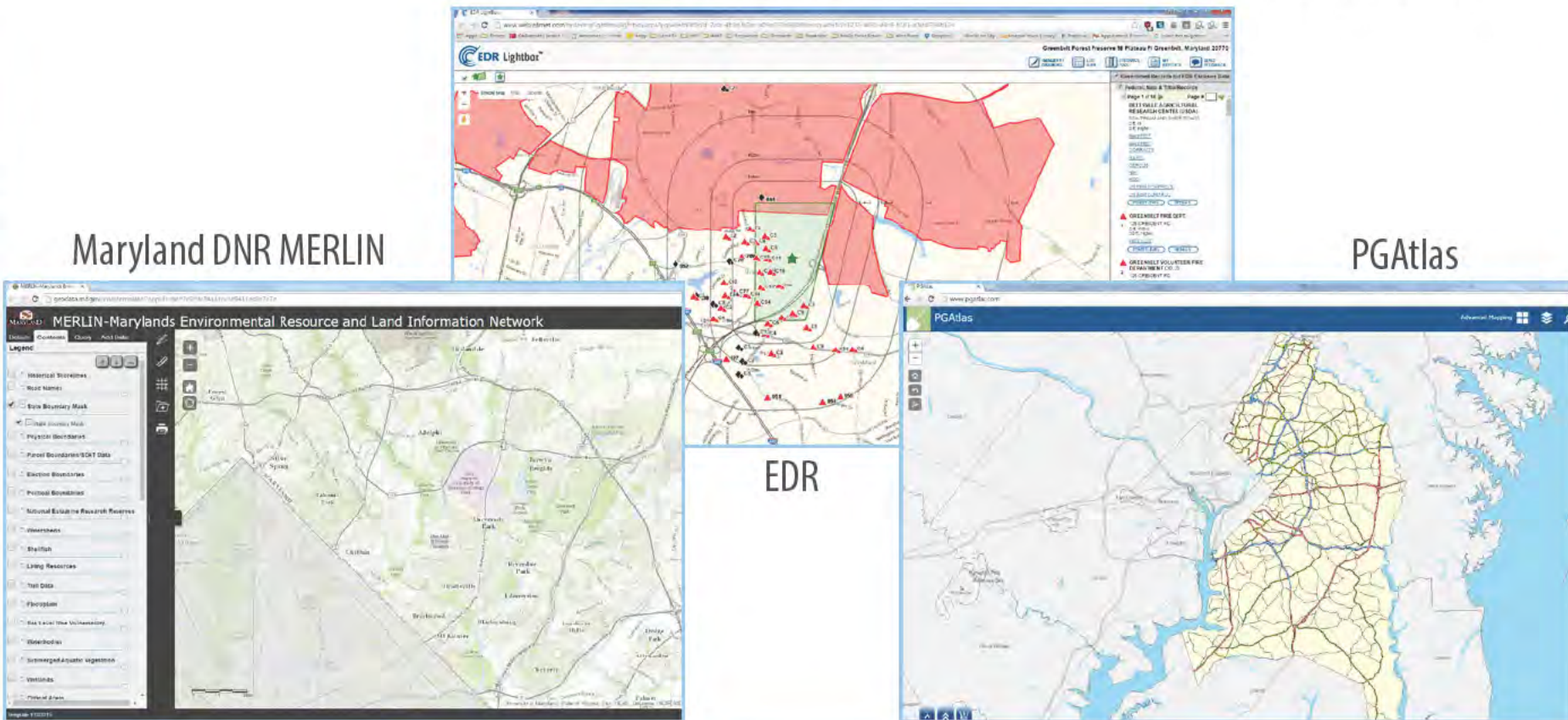
Greenbelt City Code Chapter 12



M-NCPPC Prince George's County
Environmental Technical Manual



Forest Preserve Management &
Maintenance Guidelines



METHODOLOGY

The method used for this forest health inventory was derived from an approach originally developed by Prince George's County, and subsequently adopted by the State of Maryland upon passage of the Forest Conservation Act in 1992. A description of Natural Resource Inventory / Forest Stand Delineation (NRI/FSD) procedures can be found in the *Maryland-National Capital Park and Planning Commission, Prince George's County Planning Department Environmental Technical Manual (2010)*.

DESKTOP REVIEW

Prior to field investigation, AMT compiled available records of "mappable" features from sources such as PGAtlas, Maryland's Environmental Resource and Land Information Network (MERLIN) and a search of environmental databases performed by Environmental Data Resources, Inc. (EDR). This information was used to create base maps for use during the field investigation. The maps include:

- ecological features:** Land use, forest cover, soil types, topography, hydrogeological features (e.g. streams, wetlands, hydraulically adjacent steep slopes)
- man-made elements:** Roadways, buildings, athletic fields, trails, clearing and land disturbance
- aerial photography:** current aerials, historic aerials, color infrared aerials
- environmental records:** Potential locations of hazardous substances or contaminants as listed in environmental databases

Additional sources: 2013 DNR Forest Stewardship Plan for the Greenbelt Forest Preserve; City of Greenbelt Forest Preserve Management and Maintenance Guidelines; Greenbelt City Code Chapter 12 Articles VII, VIII, and IX.

ON-SITE ASSESSMENTS

During the data collection period, members of the AMT team initially visited various portions of the forest and the adjacent community to form general impressions of the forest. Then, during October and November of 2015, the team assessed all areas of the North and South Tracts of the Forest Preserve. We recorded 56 sample plots according to the prescribed methods for NRI/FSDs. In addition to recording the location of these sample plots on the base maps, we made additional notes about forest conditions and mapped notable features that we observed. These features included:

- vegetation:** "Wolf trees" (an indicator of previously open land), special floral composition (i.e. Ground cedar (*Lycopodium clavatum*), Skunk cabbage (*Symplocarpus foetidus*), Ostrich fern (*Matteuccia struthiopteris*), Spicebush (*Lindera benzoin*)
- important habitats:** Forest Interior Dwelling Species (FIDS) habitat, hydrological systems (seeps, intermittent and perennial streams, wetlands)
- abiotic conditions:** Erosion, damage from windstorms, open canopy area (from fallen trees), major disturbed areas and trash (e.g. around the athletic complex, compost pile, I-295 and exit ramp, dumps).
- cultural features:** Historic road beds, fence lines, Cub Scout "stick huts", invasive species that have escaped from adjacent developed areas, remnants of previous agricultural uses, outdoor classroom, trails, community gardens.

Examples of these features are shown on the next pages.

ON-SITE FIELD ASSESSMENTS (continued)

Assessing the features of each forest stand - its landscape position, composition, diversity, size, age, and health of each species, provides evidence of what occurred in the past as well potential changes in the future.

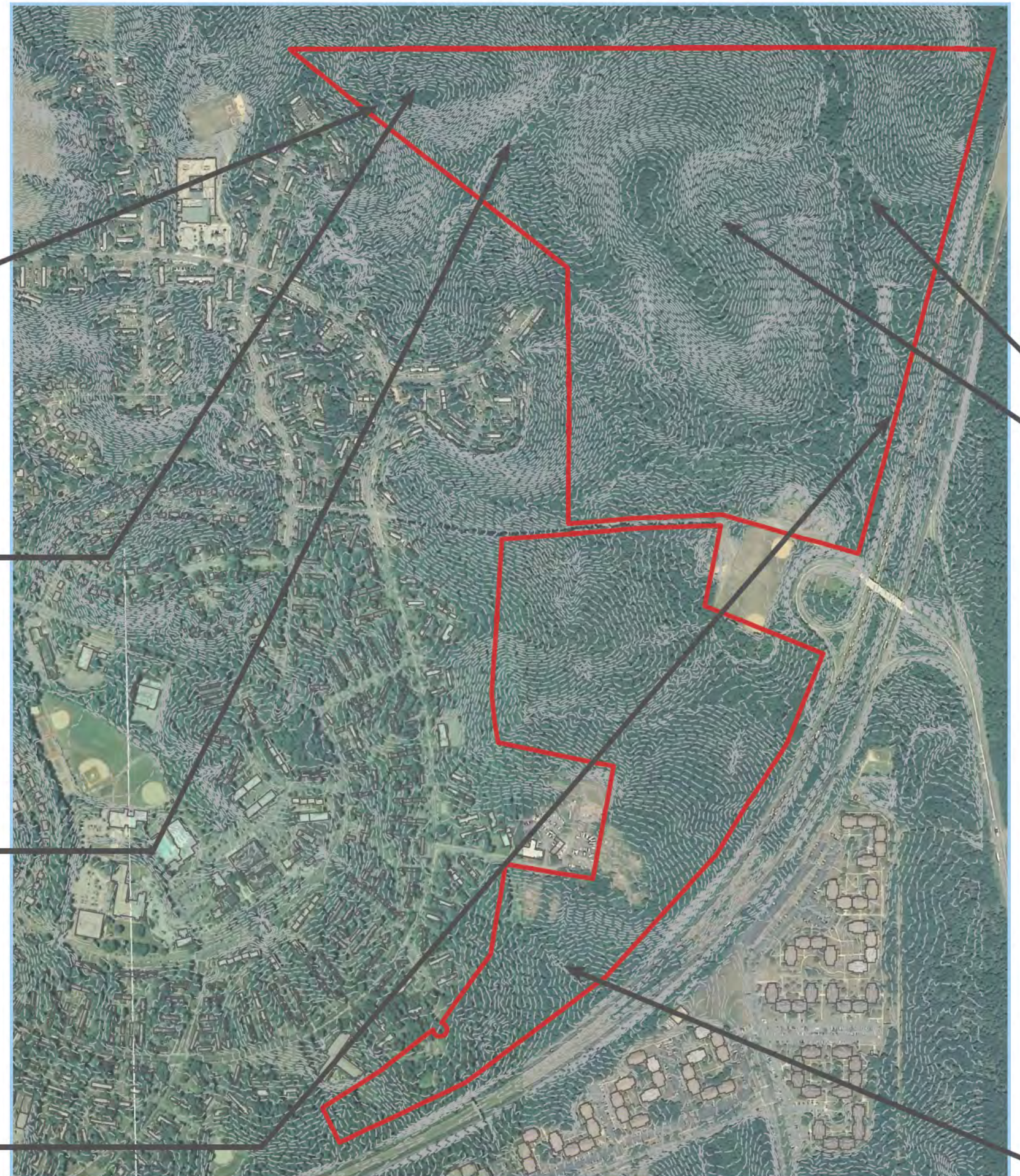
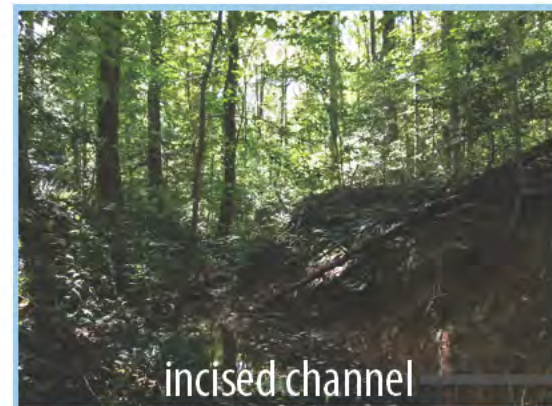
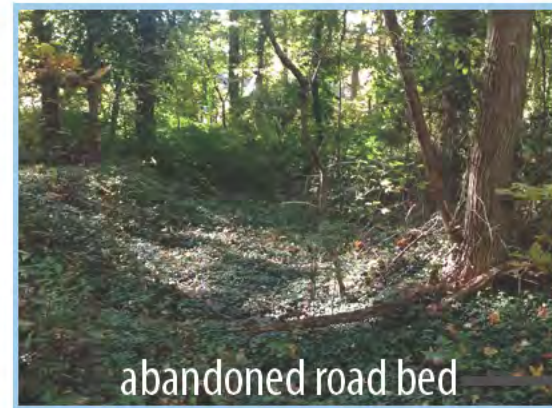
The assessments identified sixteen (16) individual forest stands. They were delineated according to sometimes subtle differences as well as distinct characteristics found in each forest stand. Their boundaries are based upon ecological and geographical judgments of the immediate forest area – including, the prevalence/dominance/sizes of certain tree species, topography, orientation, aspect and elevation. Stand boundaries (as well as all other collected data) were accurately noted on topographic maps by using GPS equipment where practical, and aerial photographic mapping when canopy density prevented the use of GPS. Because of the vastness of the survey area, individual trees were only surveyed, assessed, and measured when occurring within a sample plot.

One-tenth of an acre (1/10 ac.) sample plots were conducted to summarize forest stand areas using qualitative and quantitative data. This sampling of on-site forest resources is conducted by establishing a circle with a 37.5' radius around a fixed sample point. Like the boundaries of the individual forest stands, the fixed sample point (center point of the circle) is shown on the subsequent maps. The plots are representative and indicative of the larger forest stand. Plot data collected included:

- dominant canopy tree species, codominant canopy tree species, size classes and quantities of all canopy trees, common understory species, common herbaceous species, common invasive species, number of standing dead trees $\geq 6"$ dbh
- forest association, successional stage, basal area in square feet per acre (a measure of forest density)
- percent canopy closure, percent cover of understory species 3'-20' tall, percent cover of herbaceous/woody plant 0' to 3' tall, percent cover invasive species

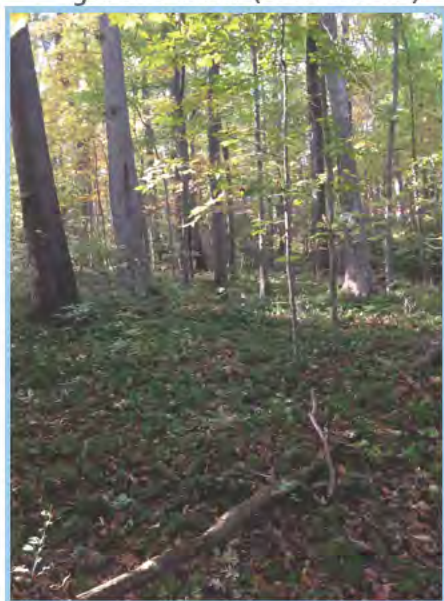
At least two (2) sample plots were prepared across each stand to collect data that accurately reflected the composition of each stand. A Cruiser's Crutch (10 BAF) was used to collect basal area data for each sample plot. Descriptions of each stand are included in this report. The forest sample data sheets and photographs are included in the appendix of this report.

Lastly, streams and wetlands were mapped because of their importance to forest ecosystems. This information included perennial and intermittent streams, ephemeral drainage channels, stream condition, quality of riparian buffers and springs/seeps. Evidence of human activity and other disturbances were noted for their impacts on stream and water quality.





skunk cabbage (*S. foetidus*) &
sphagnum moss
ground cedar (*L. clavatum*)



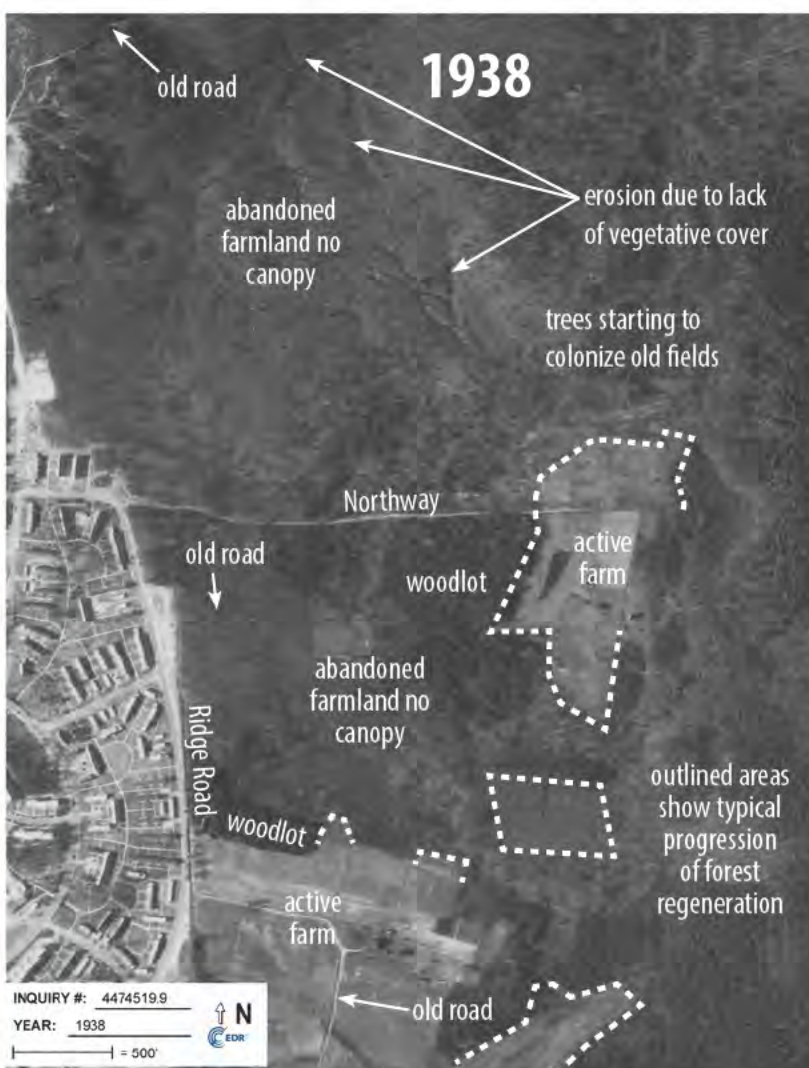
remnants of
agricultural past

FOREST DYNAMICS

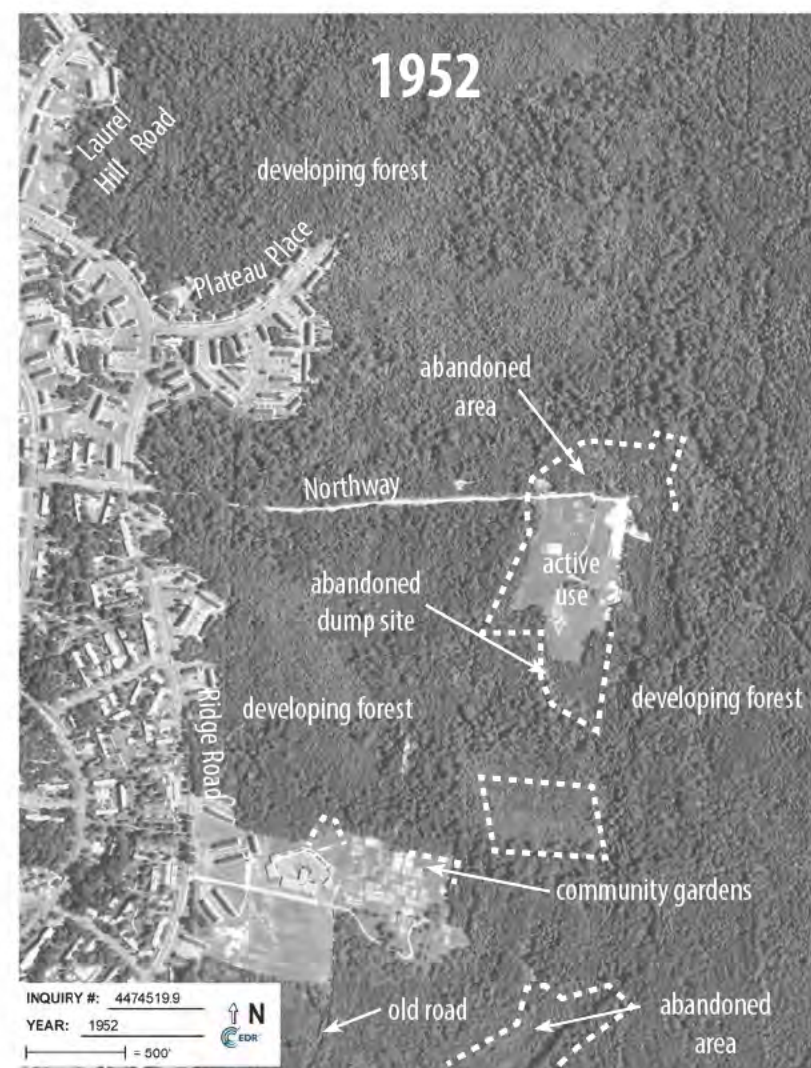
Walking through the forest, it is not uncommon to see dead or fallen trees. Sometimes this is due to a windstorm. A large tree may bring down one or more of its neighbors with it. When they occur, these windthrows leave various size gaps in the canopy, allowing more sunshine to reach the forest floor. These locations bring a flush of new growth, increased diversity, and successional changes to the forest's composition.

In these sunnier locations, where the roots and soil have been disturbed, you sometimes find seedlings of plants that are alien to forests but common in open, sunny fields and meadows. The wonder is how they got there, with a seed source too far away for them to have been carried here by wind or animals? The explanation is that the seeds are from a former era, when this was farmland, not forest. They have lain dormant for decades and, due to a random event, have encountered the right conditions to germinate and grow.

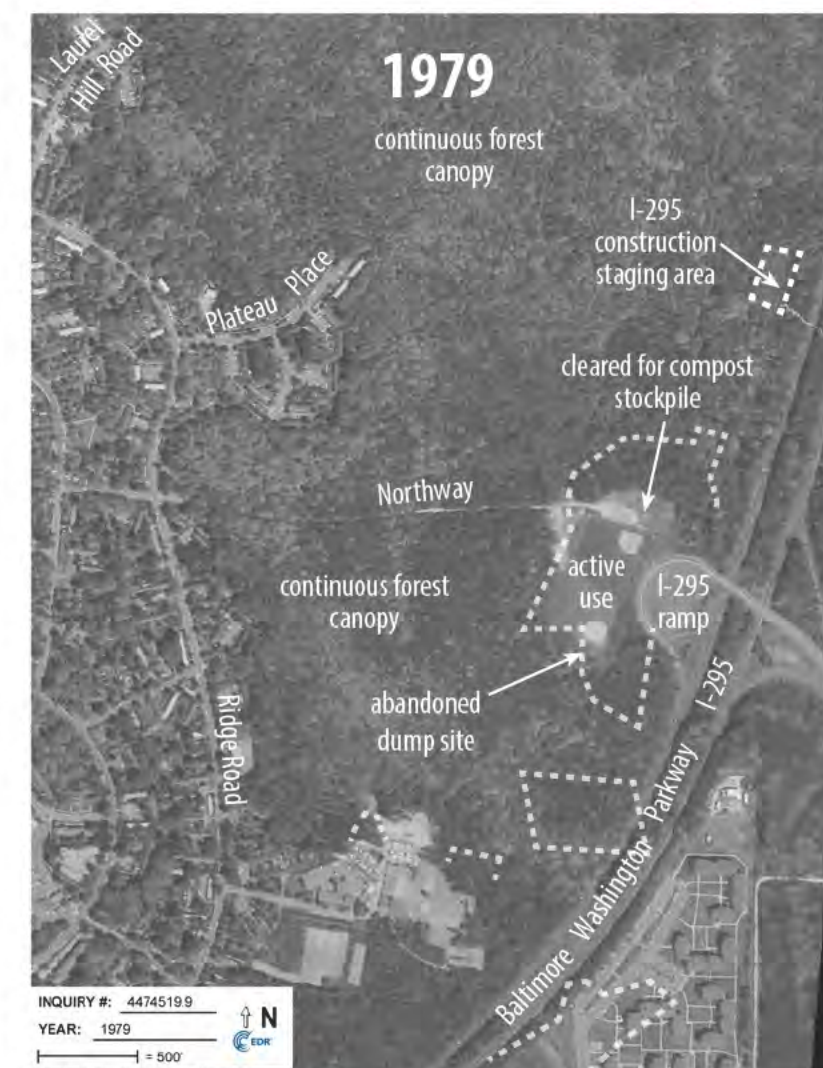
Most of the forests in the Mid-Atlantic today grow on land that was cleared during colonial times and used for agriculture. After its peak in the 19th Century, the agricultural era waned during the late 1800's and the first few decades of the 20th Century. As shown in the aerial photographs below, when the City of Greenbelt was founded, the land within the Forest Preserve was a combination of active and recently abandoned farmland. Since then, the processes of natural regeneration and succession have led to the forest there now.



*abandonment of agricultural fields
& natural regeneration of forest
ecosystems (early seral species)*



*City of Greenbelt expansion & continued
succession of forest ecosystems (early
and mid-seral species)*



*I-295 construction, associated
development & maturation of forest
(early, mid- and late seral species)*

FOREST COMPOSITION AND HEALTH

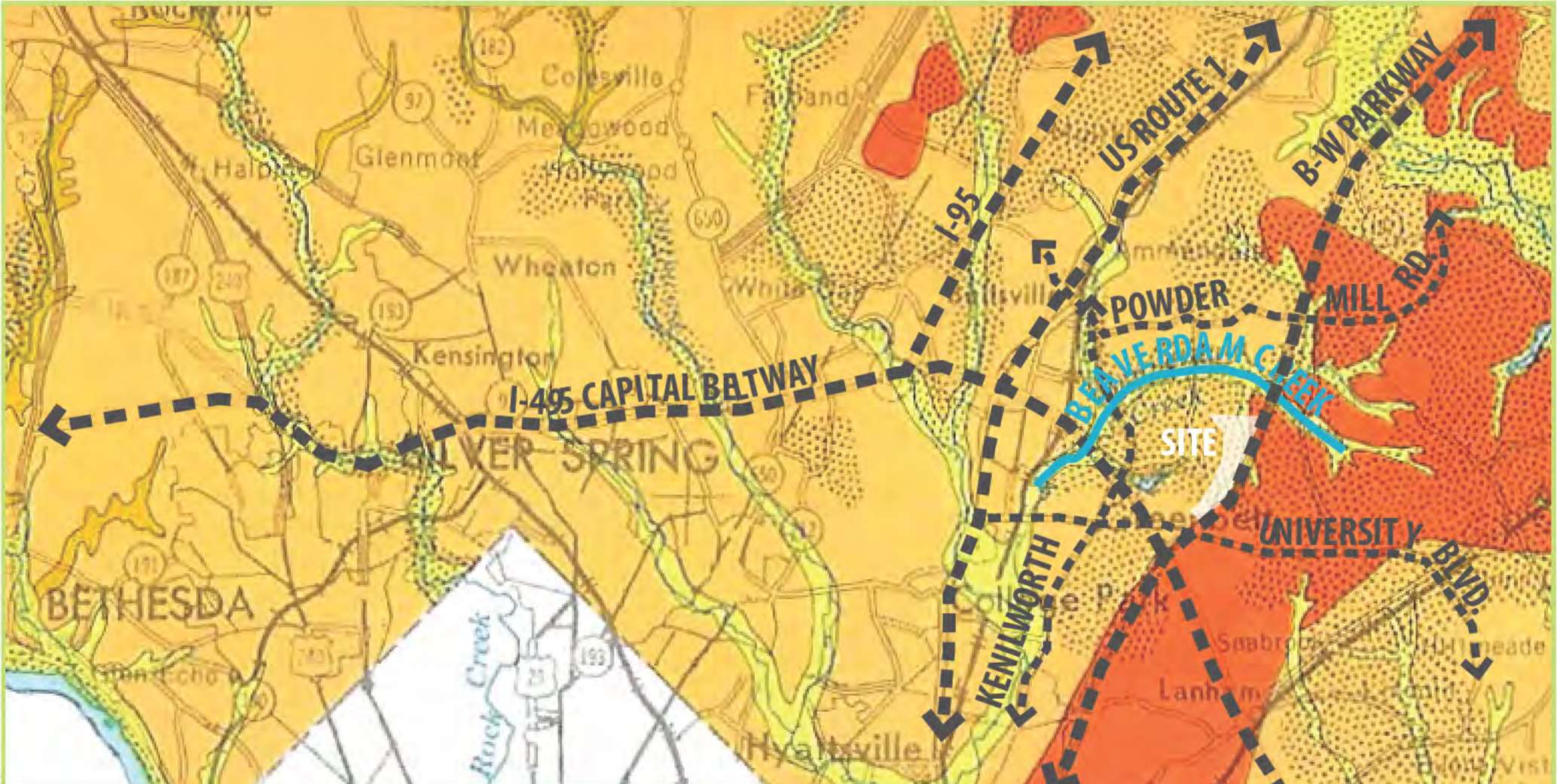
In our forest assessment we identified three forest associations, comparable to those shown on the 1980 Vegetation Map of Maryland (VMM): A White Oak - Red Oak Association (most closely resembles the Chestnut Oak - Post Oak - Blackjack Oak Association), a Tulip Poplar Association; and a Red Maple-Sweetgum Association (most closely resembles the River Birch - Sycamore Association). In addition, a Highly Disturbed and Invasive Species Association was created to identify areas where the forest is largely dominated by non-native invasive species.

The Greenbelt Forest Preserve is approximately 237 acres in size (233 acres are forested). As part of the forest stand delineation, 56 sample plots were conducted. Overall, with the exception of the invasive stands, the forest data plots show an average canopy closure of 70 percent and good diversity in the number of tree species within each plot. Many stands also include some invasives, typically either shrub or herbaceous species. See Appendix H for a list of common invasive species.

The White Oak - Red Oak Association is the most common forest type in the study area, accounting for approximately 131.9 acres. This association grows on well-drained higher areas and on xeric slopes. The Tulip Poplar Association occupies approximately 71.9 acres. It is more commonly found on mesic slopes and in low areas with deep, moist soils. Tulip poplar association is frequently in valleys and on transitional slopes near streams and floodplains. It is also a common early to mid-successional forest in formerly cleared or disturbed areas with mesic soils. Dominant size classes for both of these associations varied considerably within the stands, ranging from 10 to 30 inches dbh, where the forest is in early to mid-successional stages, to more mature, later successional stands with dominant and codominant trees between 18 to 30 inches dbh.

Approximately 19 acres of Red Maple - Sweetgum Association is located along the stream within the North Preserve that flows to Beaverdam Creek. The dominant size class is between 10 and 18 inches dbh. There are approximately 10 acres of Highly Disturbed and Invasive Species Association, most of which, is located around the observatory, composting area and athletic fields. There is another small stand on a site within the North Preserve that was a former construction staging area for I-295. Smaller concentrations of invasive species can be found throughout the entire project area, but they are not of sufficient size to be considered a separate forest or vegetative stand.

The maps on the following pages show the locations of these forest associations and their underlying features. The associations are further divided into individual forest stands, which we describe later in this chapter.



VEGETATIVE MAP OF MARYLAND

(see appendix for full version)
by Grace Somers Brush, Cecilia Lenk, Joanne Smith (July 1976, Revised 1980)
Department of Geography and Environmental Engineering, Johns Hopkins University, Baltimore, MD 21218

VMM ASSOCIATIONS IN GREENBELT FOREST PRESERVE

TULIP POPLAR ASSOCIATION: red maple, flowering dogwood, Virginia creeper, black gum, white oak, sassafras, black cherry, grape, mockernut hickory, southern arrowwood, Japanese honeysuckle, pignut hickory, black oak, poison ivy, greenbriers, beech, spicebush, northern red oak, mapleleaf viburnum, early low blueberry, choke cherry, brambles

CHESTNUT OAK-POST OAK-BLACKJACK OAK ASSOCIATION: red maple, black gum, white oak, sassafras, greenbriers, American holly, Virginia pine, black oak, Japanese honeysuckle, beech, early low blueberry, flowering dogwood, sweet gum, scarlet oak, Spanish oak, mockernut hickory, Virginia creeper, black cherry, sweet pignut hickory, dwarf huckleberry, mountain laurel, souther arrowwood, tall

RIVER BIRCH-SYCAMORE ASSOCIATION: red maple, poison ivy, Virginia creeper, greenbriers, sweet gum, Japanese honeysuckle, southern arrowwood, tulip poplar, spicebush, black gum, grape, ironwood, American holly, flowering dogwood, American holly, flowering dogwood, black cherry, green ash, white oak, brambles, elderberry, slippery elm, sassafras

FOREST STAND ASSOCIATIONS

TULIP POPLAR ASSOCIATION (most closely represents VMM's "Tulip poplar association")

STAND #	2	5	9	10	13	14	TOTAL
ACRES	7.8	9.4	22.8	4.6	5.3	22	71.9

WHITE OAK-RED OAK ASSOCIATION (most closely represents VMM's "Chestnut oak-Post Oak-Blackjack Oak association")

STAND #	1	3	4	7	8	11	12	16	TOTAL
ACRES	10.8	15	70.6	3.5	10.1	8.1	9.2	4.6	131.9

RED MAPLE-SWEET GUM ASSOCIATION (most closely represents VMM's "River birch-Sycamore association")

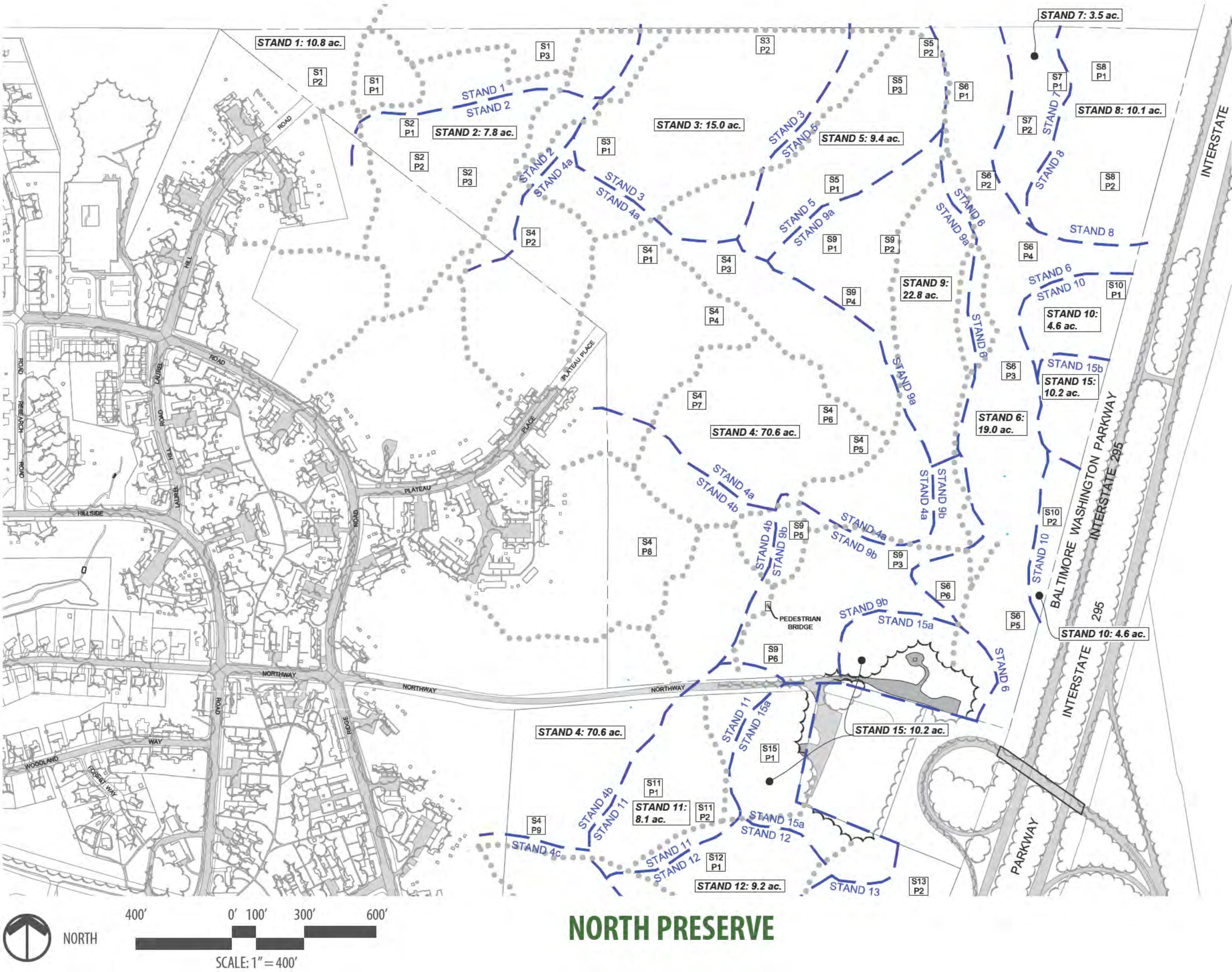
STAND #	6	TOTAL
ACRES	19	19

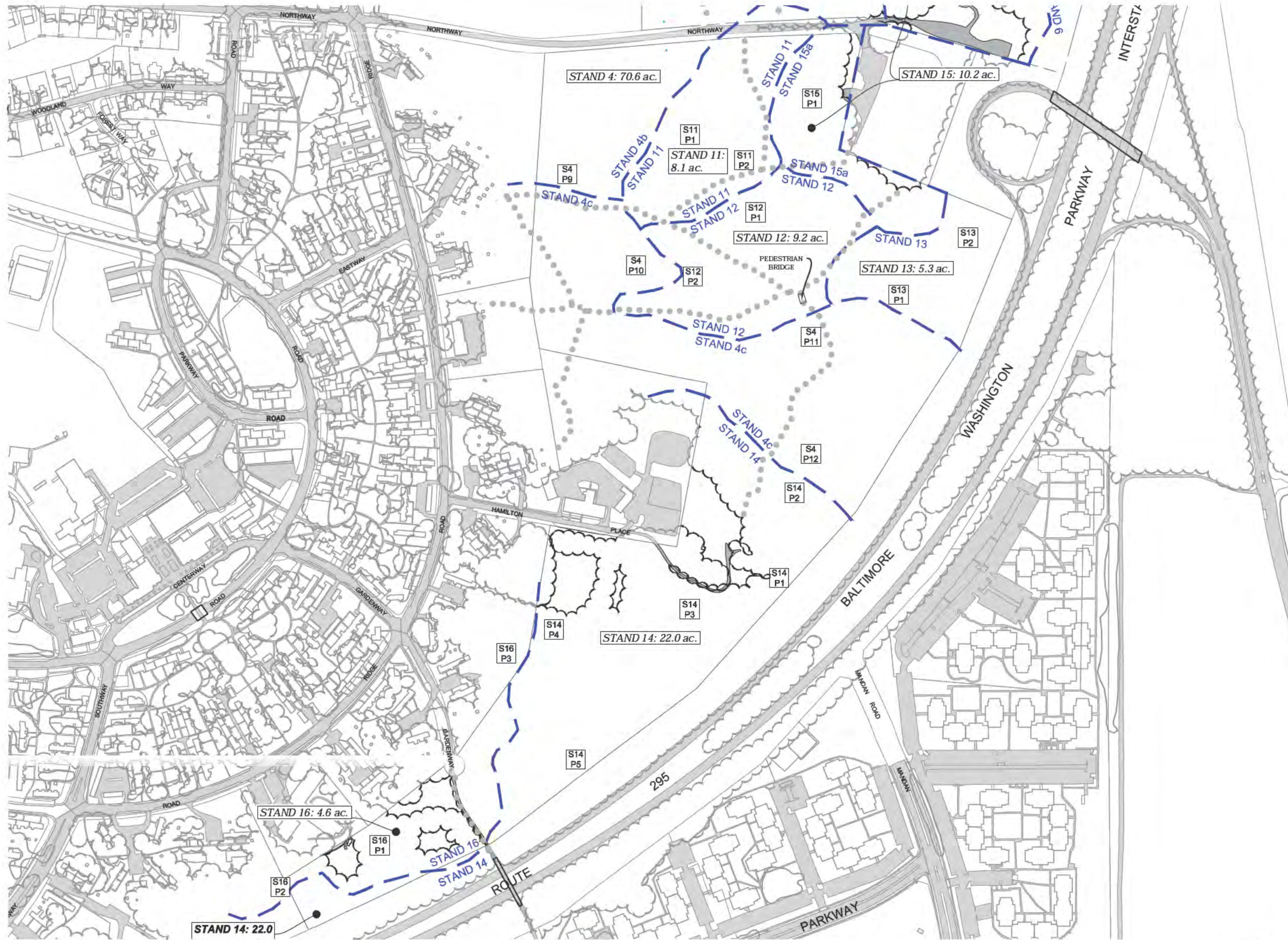
HIGHLY DISTURBED & INVASIVE SPECIES ASSOCIATION (not included in VMM)

STAND #	15	TOTAL
ACRES	10.2	10.2

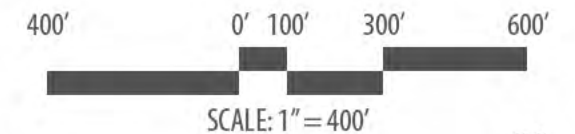
LEGEND

- PROPERTY LINE
- TRAIL
- FOREST STAND BOUNDARY
- FSD SAMPLE POINT





SOUTH PRESERVE



FOREST DISTURBANCE MAPPING

AMT mapped forest areas that were damaged or disturbed by users of the site, deposited waste, and biotic factors such as non-native vegetation and open canopy areas.

Invasives species cover approximately 76 acres of the forest.

Invasive species that were identified include: *Smilax*, *Hedera helix*, *Berberis thunbergii*, *Microstegium vimineum*, *Rosa multiflora*, *Celastrus orbiculatus*, *Alliaria petiolata*, *Morus alba*, *Lonicera japonica* and many others. More information on these species can be found in the Appendix.

LEGEND

PROPERTY LINE

TRAIL

EXISTING TREE LINE

BROKEN FENCE OPENING

CANOPY OPENING

TRASH PILE

INVASIVE SPECIES CONCENTRATION

EXISTING FOREST DISTURBANCES MAP
NORTH PRESERVE

NORTH

400'

0'

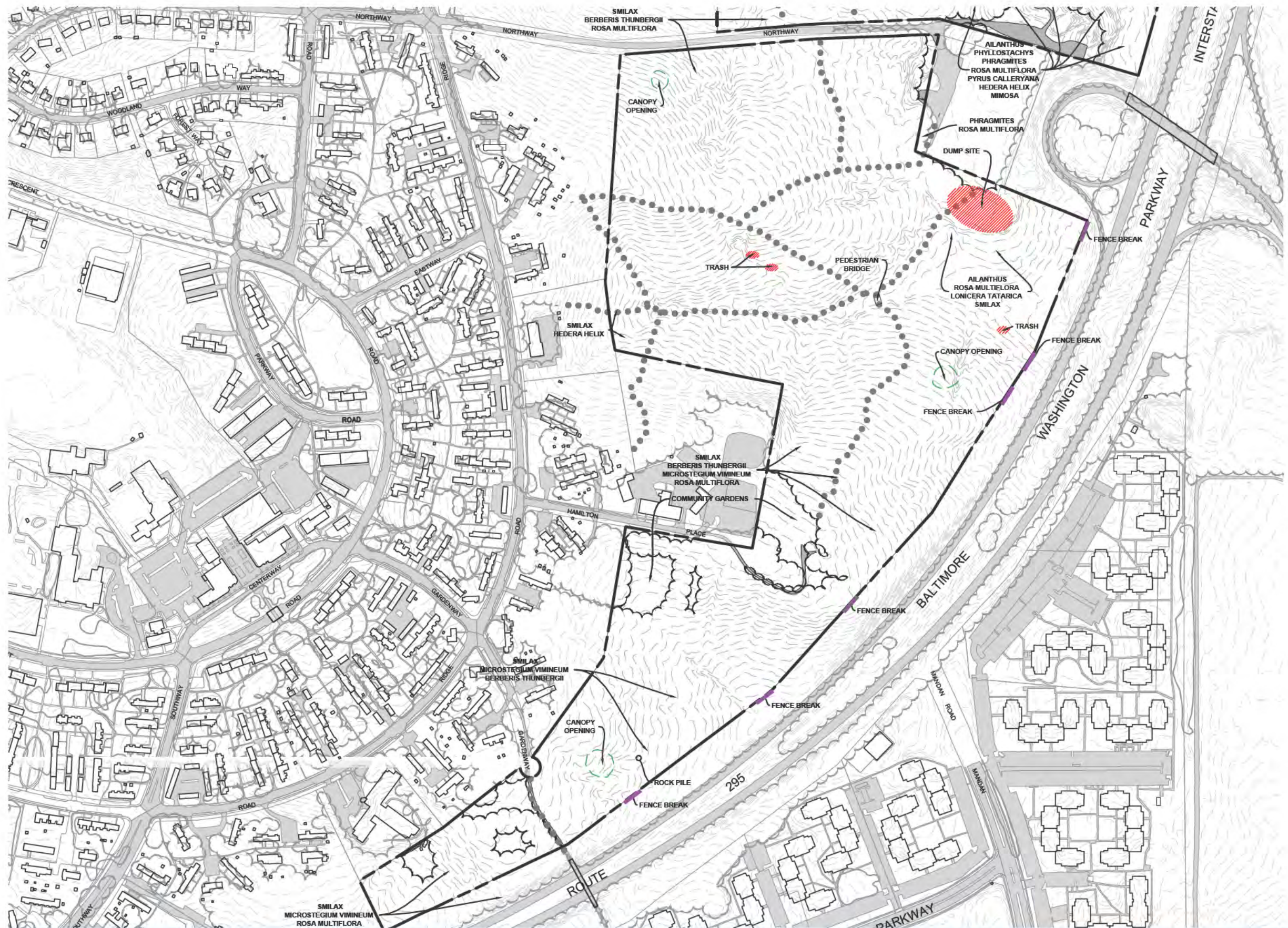
100'

300'

600'

SCALE: 1" = 400'

12

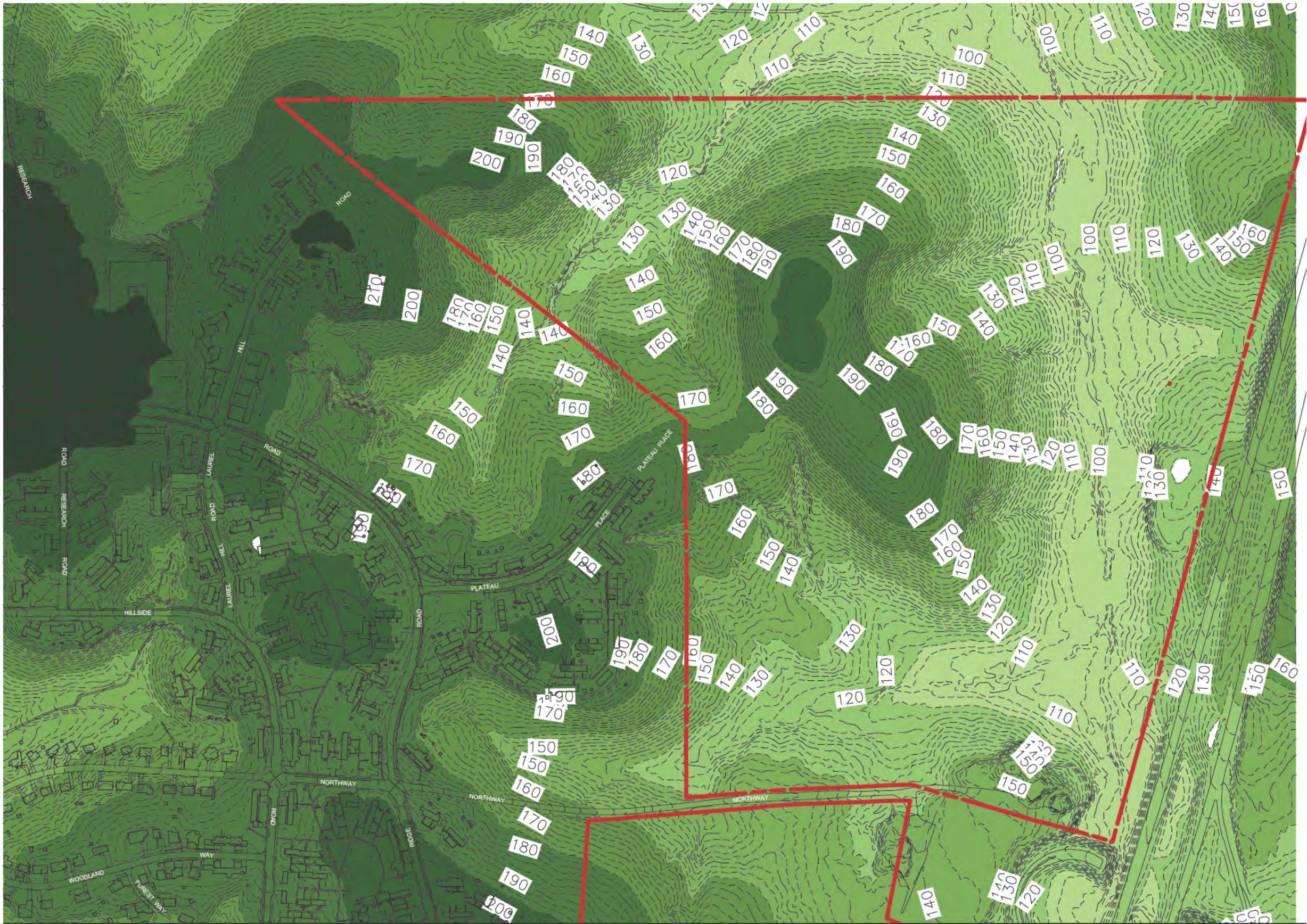
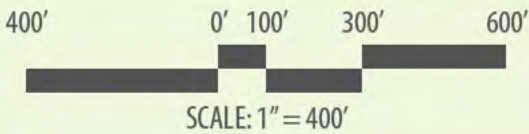


EXISTING FOREST DISTURBANCES MAP SOUTH PRESERVE

PHYSICAL FEATURES

The shades of green correspond to the elevation on the site, shown at 20' intervals. The darker the color, the higher up the surface is. The map reveals higher elevations at developed areas and neighborhoods surrounding the forest preserve with lower channels and wetlands within the Study Area.

LEGEND

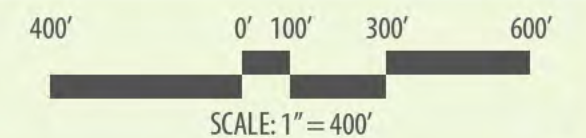
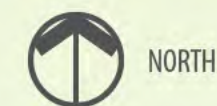


CONTOUR ELEVATION MAP
NORTH PRESERVE



CONTOUR ELEVATION MAP

SOUTH PRESERVE



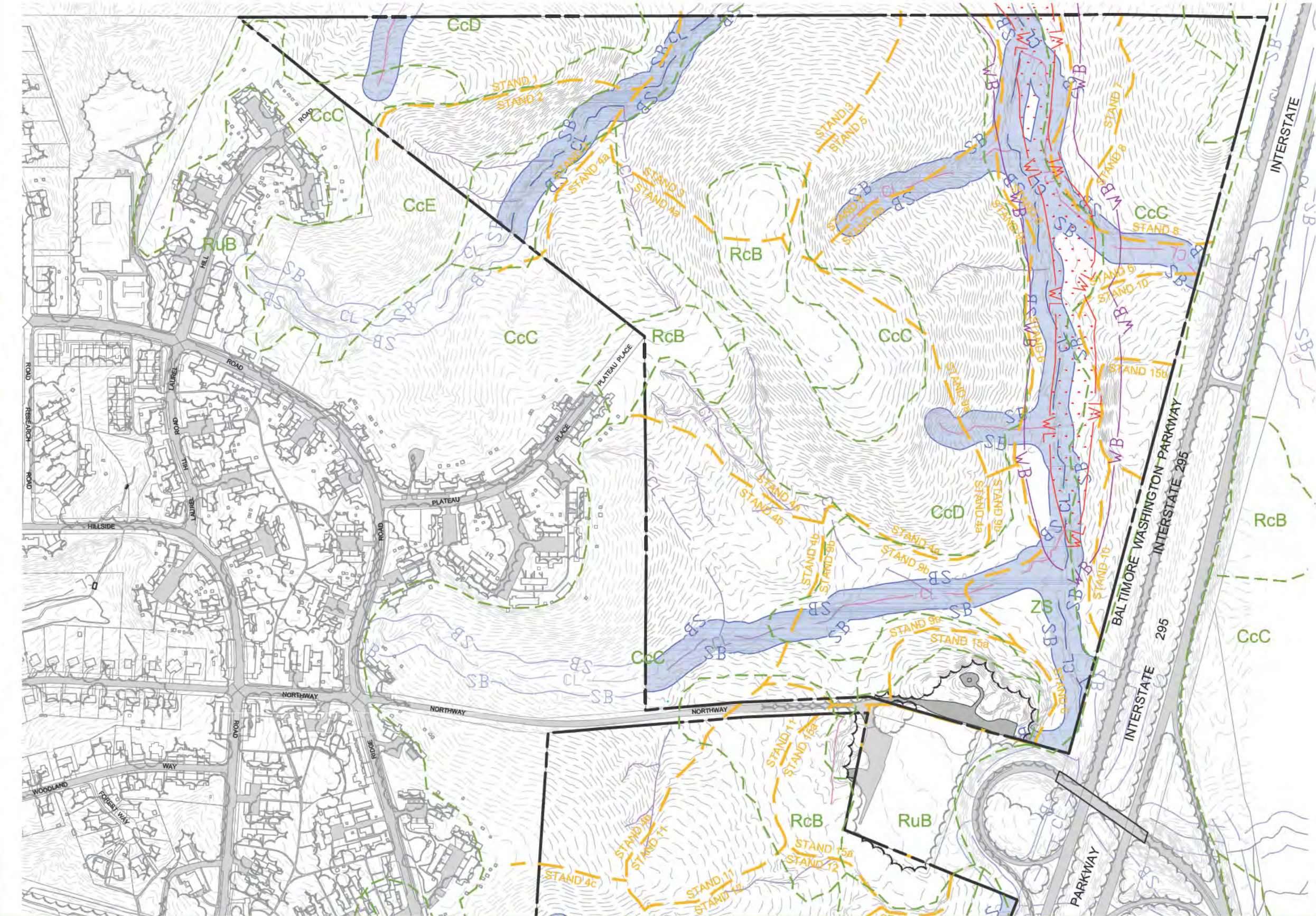
HYDROLOGICAL FEATURES

These exhibits show the existing hydrology and soils within the Study Area. Except for a very small piece of forest in the southern tip, water drains northward to Beaverdam Creek. The majority of the soils are highly erodible and the land and streams are heavily eroded.

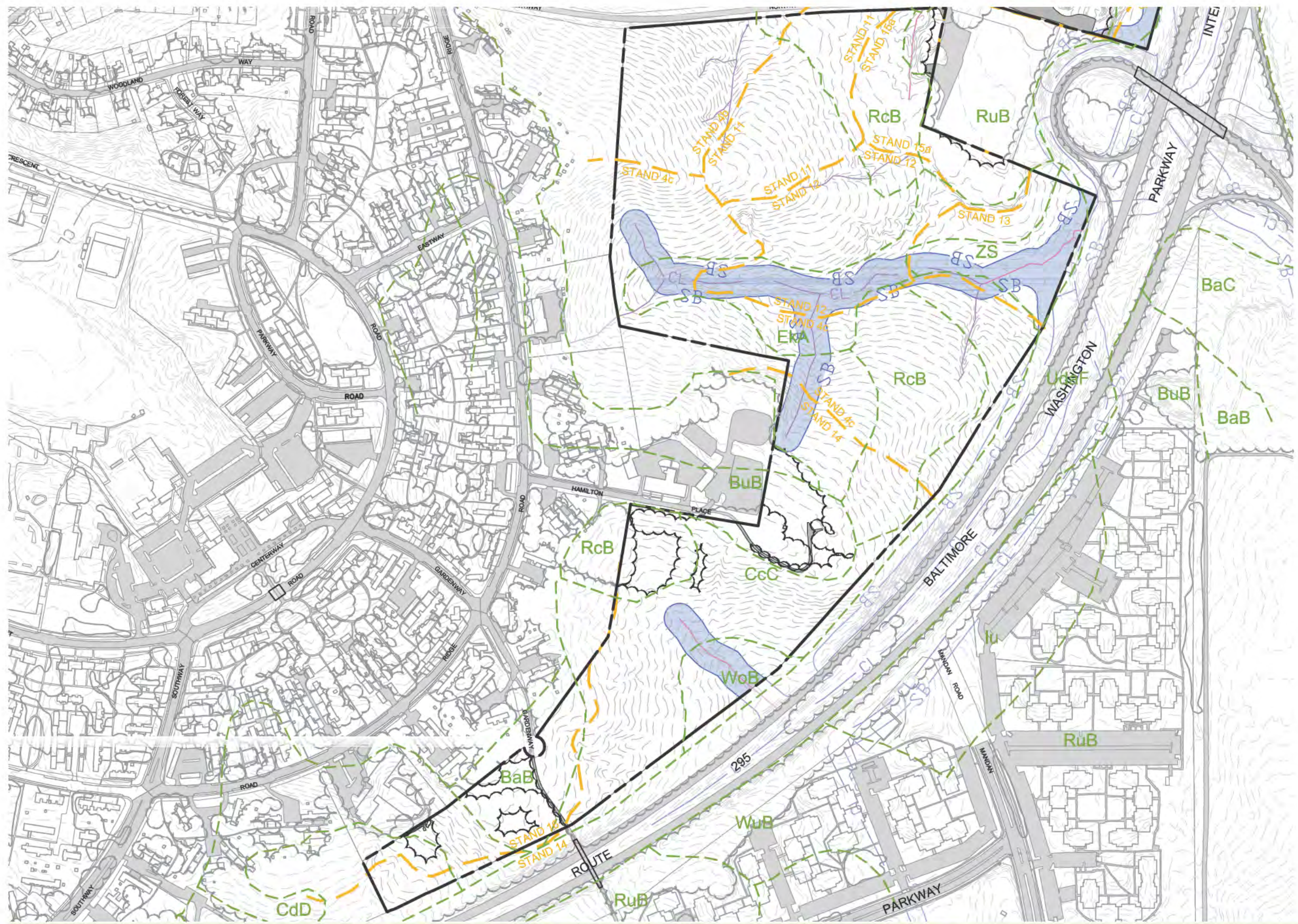
The state of Maryland classifies wetlands into two categories, tidal and non-tidal. Tidal wetlands are found along coastlines whereas non-tidal wetlands are commonly known as marshes, swamps, bogs or bottomland forests. The state has identified Wetlands of Special State concern, which contain rare, threatened or endangered species or unique habitats. These wetlands are non-tidal habitats that are under special protection through the state's wetlands regulations. Any development activity which involve clearing of vegetation or grading are regulated within a 100' buffer surrounding the wetlands of special state concern. Other wetlands not deemed a wetland of special state concern require a 25' buffer. These buffers, including the stream buffer for intermittent streams, are established in order to protect Maryland's last remaining wetlands, which according to the Chesapeake Bay Foundation, has seen a loss of almost 60%.

LEGEND

- PROPERTY LINE
- EXISTING 2' CONTOUR
- EXISTING TREE LINE
- WB 100' WETLAND BUFFER
- WL WL WETLANDS OF SPECIAL STATE CONCERN
- SB SB 60' STREAM BUFFER
- CL PERENNIAL STREAM
- CL INTERMITTENT STREAM
- CL EPHEMERAL CHANNEL
- RcB CcC SOIL TYPE BOUNDARY
- STAND # FOREST STAND BOUNDARY

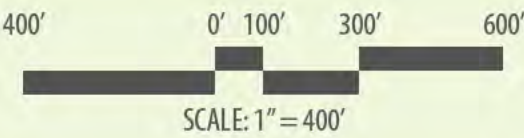


HYDROLOGICAL CONDITIONS MAP
NORTH PRESERVE



HYDROLOGICAL CONDITIONS MAP

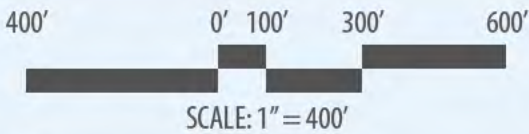
SOUTH PRESERVE



STEEP SLOPES

The shades of blue correspond to the steepness of the topography. The steeper the slope, the darker the color. Slope steepness can be linked to erosion and incised channels. This map can be used to identify areas that are highly susceptible to erosion. The state designates areas greater than 15% to be steep slopes that require measures to limit disturbance and minimize impacts.

LEGEND

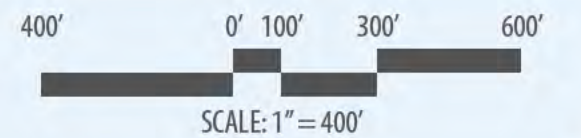


STEEP SLOPES MAP
NORTH PRESERVE



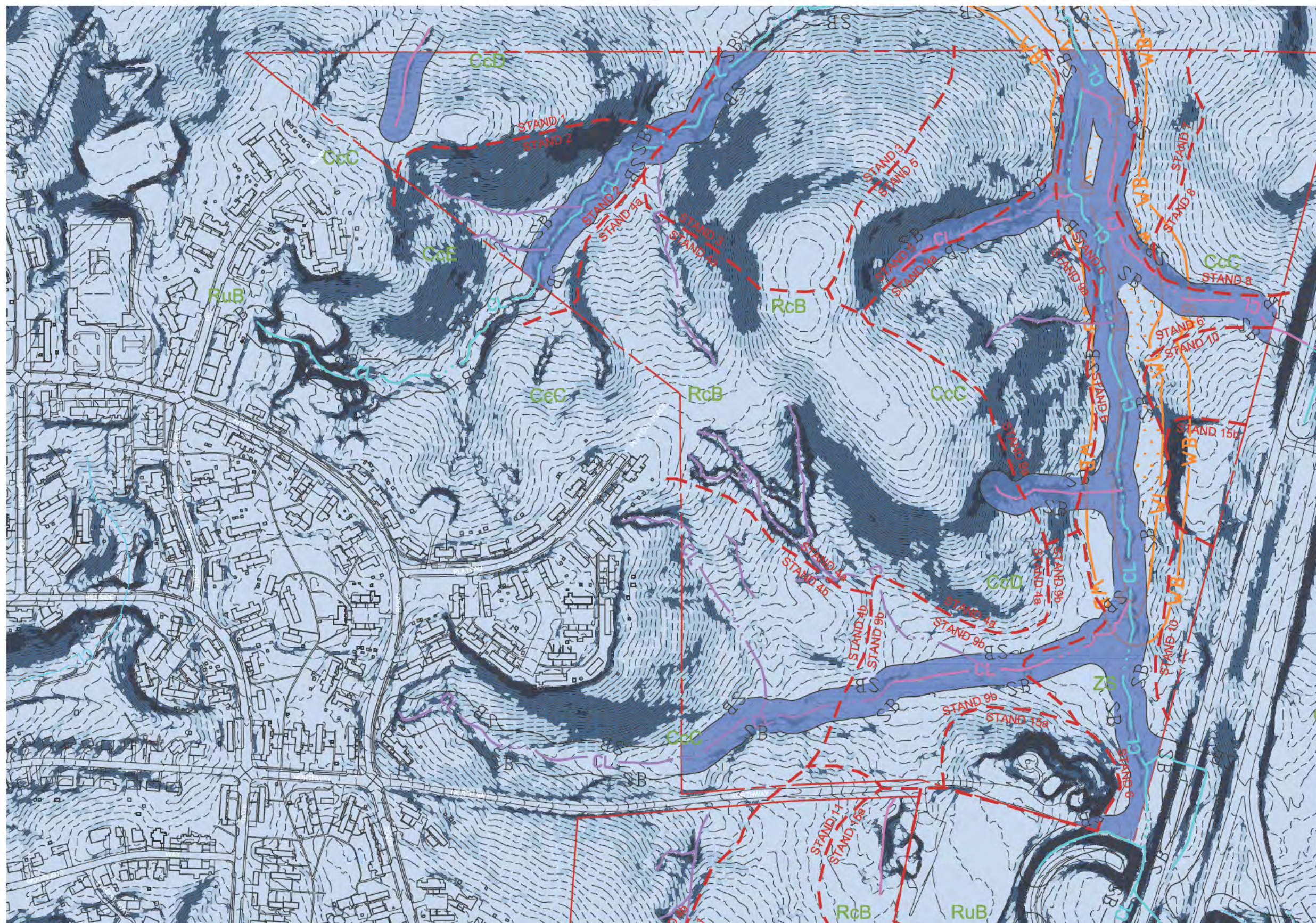
STEEP SLOPES MAP

SOUTH PRESERVE

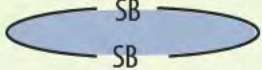
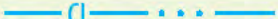


SUMMARY FOREST STAND MAPPING

The topography, soils and land use patterns of the North and South Preserve significantly influence the location of forest stands. For example, some stand lines closely follow areas of upland elevations and lowland elevations; other stands are defined by north-, south-, east- or west-facing slopes. Steep side slopes and shallow flat slopes define other stands. Lastly, some stand boundaries closely follow streams and other hydrological features.



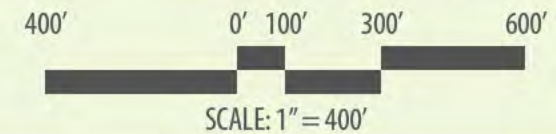
LEGEND

- | | |
|--|-----------------------------------|
|  | PROPERTY LINE |
|  | EXISTING 2' CONTOUR |
|  | 100' WETLAND BUFFER |
|  | WETLANDS OF SPECIAL STATE CONCERN |
|  | 60' STREAM BUFFER |
|  | PERENNIAL STREAM |
|  | EPHEMERAL STREAM |
|  | INTERMITTENT STREAM |
|  | SOIL TYPE BOUNDARY |
|  | FOREST STAND BOUNDARY |

NORTH PRESERVE

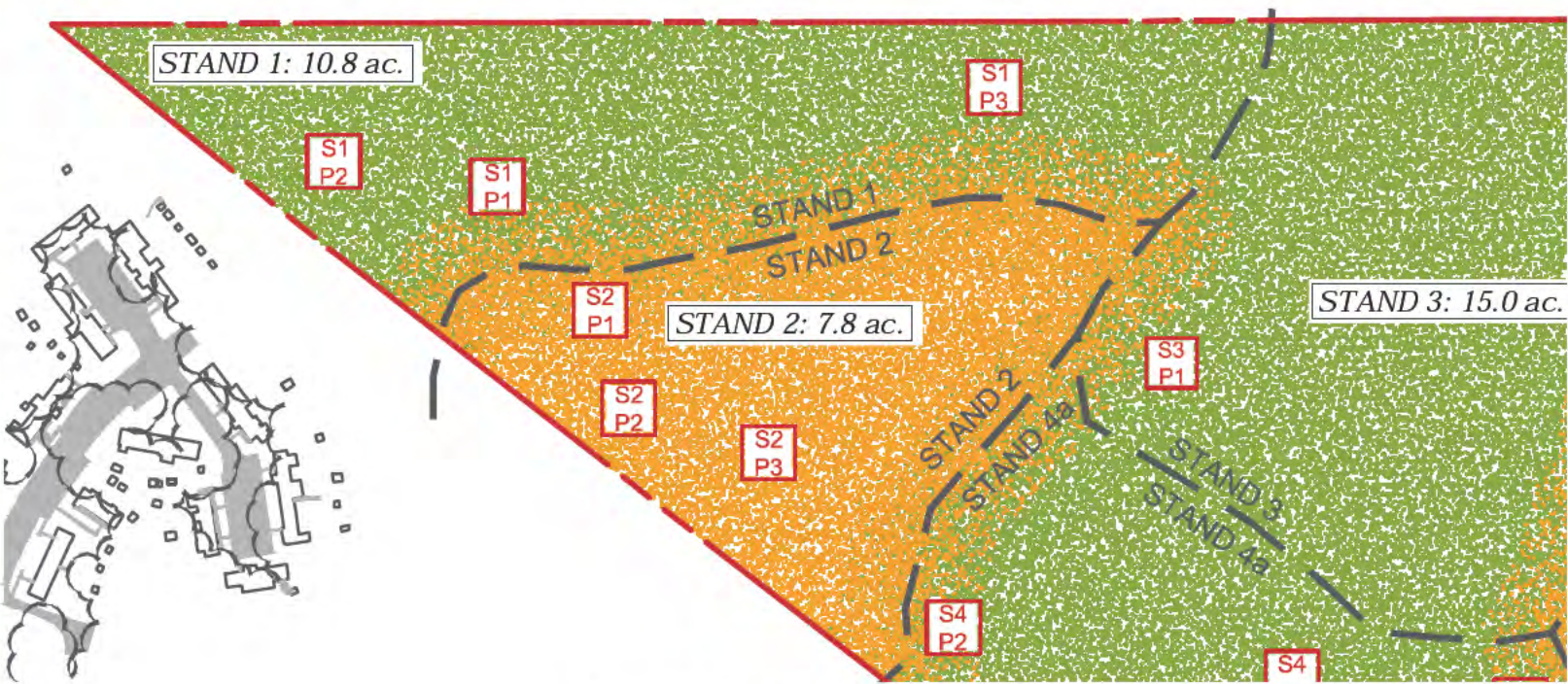


NORTH



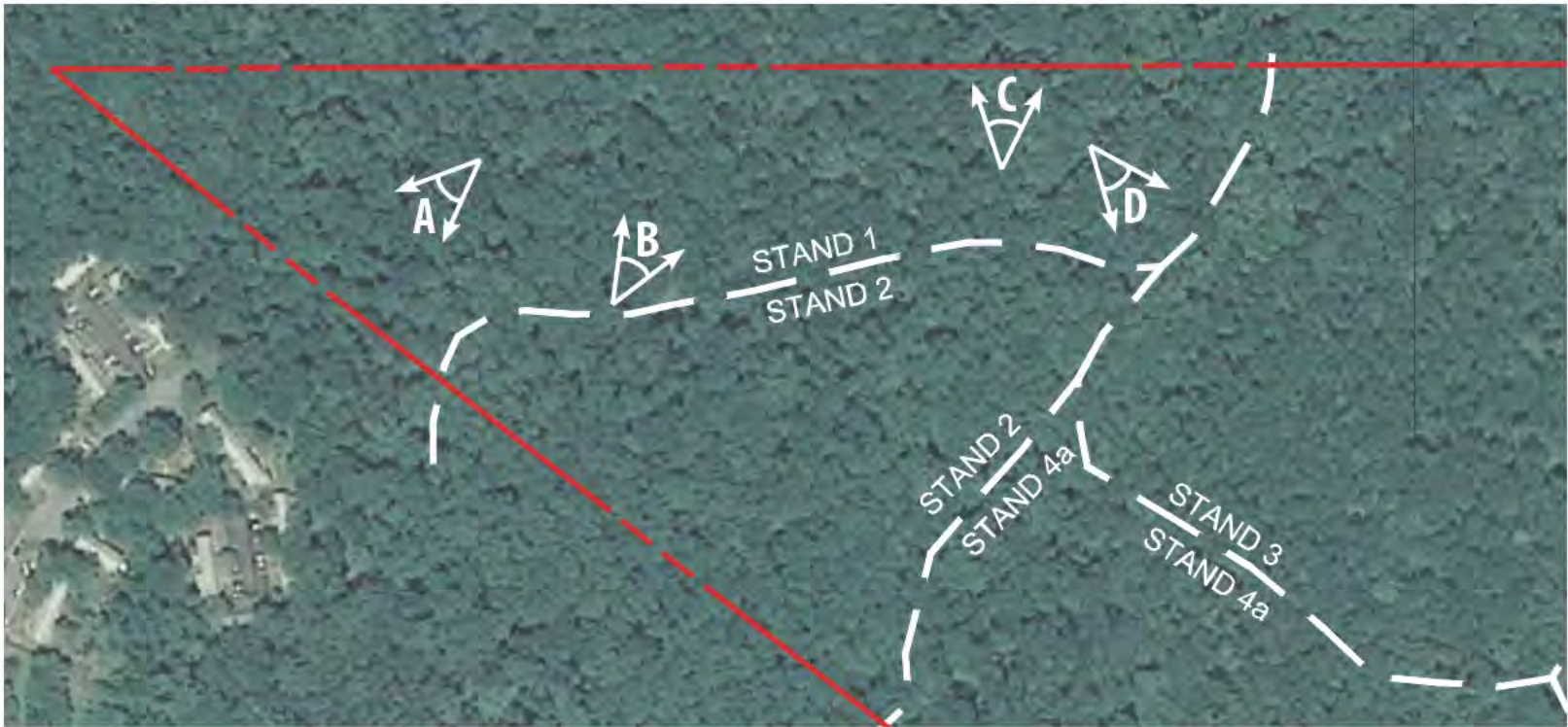
FOREST STAND 1:

- Topography:** slopes are fairly uniform throughout S1 and are primarily <15%
- Elevation:** 116' to 202' ± above sea level; upland forest; highest point in Northern Preserve is in S1
- Aspect:** fairly uniform North-facing slopes (although some East-facing slopes are also present); S1 also includes an East-West ridge aligned with Laurel Hill Road; another ridge is present near the western-most property corner of the North Preserve
- Hydrology:** Although on a ridge, residences and Laurel Hill Road are at elevations higher than S1. Consequently, the S1 forest is subject to impervious area runoff from uphill. Minimal signs of erosion. No wetlands or seeps were observed in the field. A perennial channel (tributary of Beaverdam Creek) originates at Laurel Hill Road, flows through S2 and ultimately extends into the eastern extent of S1. This channel has deeply incised banks. An intermittent channel is also present in S1.
- Historic imagery notes:** A road is visible in the 1938 photograph. Part of this road was abandoned and has since succeeded with forest species. The presence of this abandoned road bed was confirmed during field investigations. Other, non-abandoned portions of this road eventually became Laurel Hill Road.
- FIDS habitat:** Present
- Abiotic factors:** trails, abandoned road, several breaks in BARC fence, stick huts
- Invasives:** *Wisteria*, English ivy, greenbriar creep in from backyards; forest edge (sunlight) created by Laurel Hill Road creates opportunity for invasives to thrive; other invasives present at the abandoned road and in "open canopy areas" where sunlight reaches the forest floor.
- Unique habitat notes:** several very dense patches of *Lycopodium*; one *Lycopodium* patch (at eastern edge of S1) includes low/bottomland topography and wet soils, prime for not only *Lycopodium* but also Ostrich fern and Willow oak (*Quercus phellos*).
- Adjacent uses:** bound by an East-West ridge and S2 to the south; Laurel Hill Road properties to the west; BARC to the north; S3 to the East
- Forest Structure Value:** 46/60

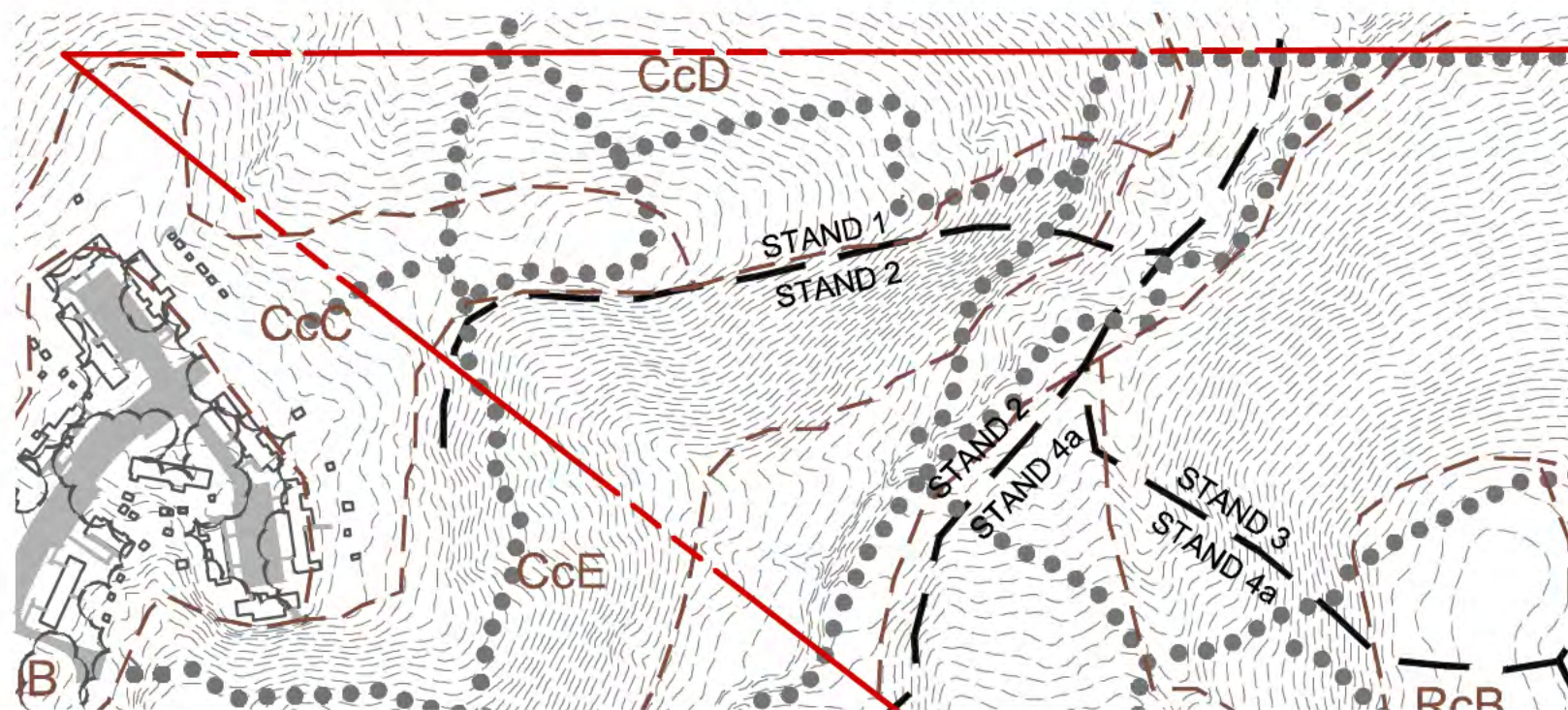


Forest stand boundaries

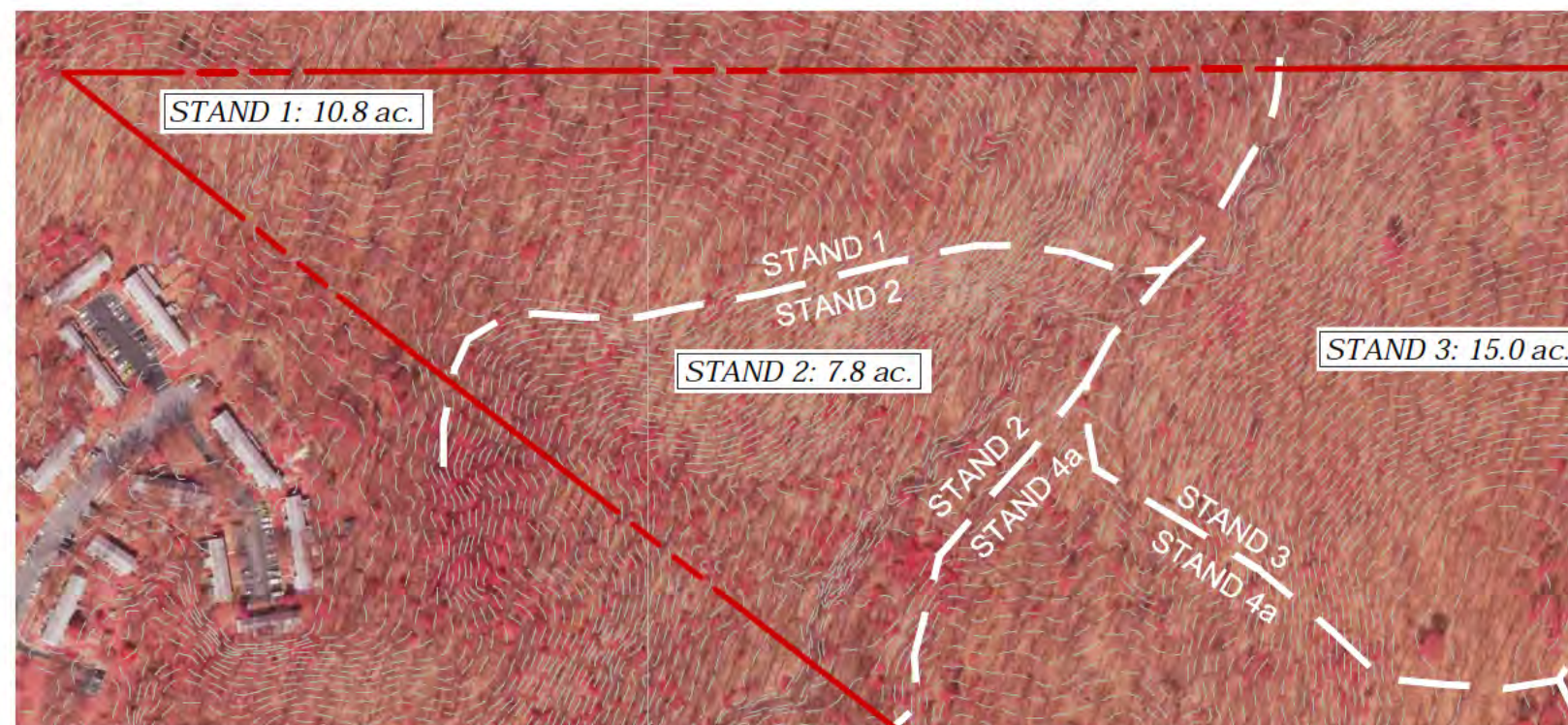
Forest Stand Summary Sheet	
Property Name:	Greenbelt Forest Preserve
Location:	Greenbelt, MD
Prepared By:	CML
Date:	2016-10-16
Stand Variable	Stand # 1
1. Dominant species/Codominant species	<i>Quercus alba</i> , <i>Quercus rubra</i> , <i>Carya tomentosa</i> , <i>Liquidambar styraciflua</i> , <i>Liriodendron tulipifera</i>
2. Forest Association	White oak-Red oak association
3. Successional stage	Mid-successional upland forest
4. Basal area in s.f. per acre	83
5. Size class of dominant species	18-29.9" dbh
6. Percent of canopy closure	78%
7. Number of tree species	10
8. Common understory species	<i>Quercus prinus</i> , <i>Ilex opaca</i> , <i>Cornus florida</i> , <i>Carya tomentosa</i> , <i>Vaccinium angustifolium</i> , <i>Nyssa sylvatica</i> , <i>Liquidambar styraciflua</i> , <i>Liriodendron tulipifera</i> , <i>Kalmia latifolia</i>
9. Percent of understory cover 3' to 20' tall	18%
10. Number of understory species 3' to 20' tall	9
11. Common herbaceous species	<i>Mitchella repens</i> , <i>Lycopodium</i>
12. Percent of herbaceous & woody plant cover 0' to 3' tall	21%
13. List of major invasive plant species & percent of cover	<i>Euonymus</i> , <i>Smilax</i> , <i>Hedera helix</i> , <i>Vinca</i> , 3%
14. Number of standing dead trees 6" dbh or greater (average per plot)	1
15. Comments	Evidence of deer



Color photograph



Contours, trails & soil boundaries



Color infrared photograph



A – Taken at end of Laurel Hill Road, looking back towards Laurel Hill Road. Changes in grade (and the historic aerial photo shown previously) confirm the presence of a road that previously existing in this area.



B – One of several “stick huts” on the plateau within Stand 1.



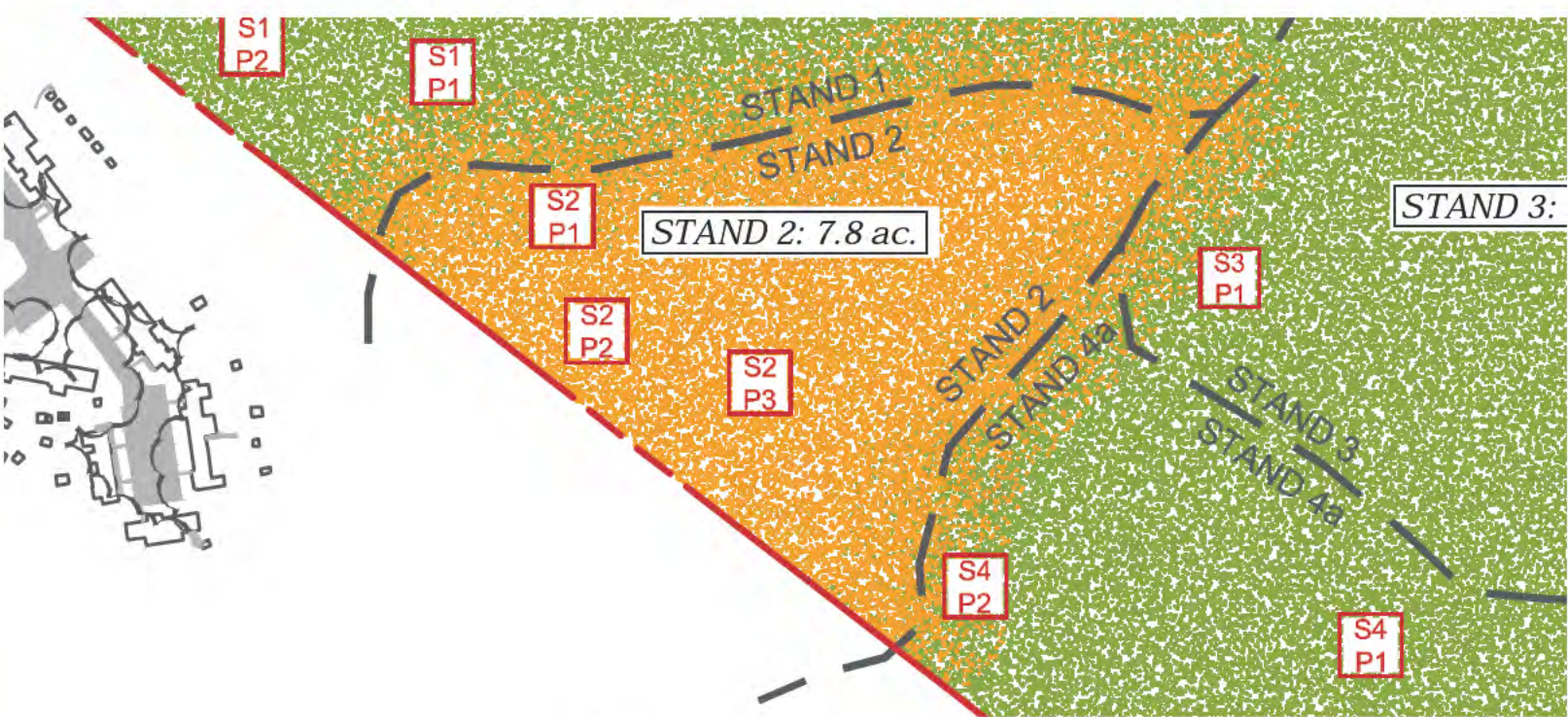
C – Damage to the fence separating the BARC property and the North Preserve of the Greenbelt Forest Preserve.



D – *Matteuccia struthiopteris* (Ostrich fern) thrives in this unique habitat area.

FOREST STAND 2:

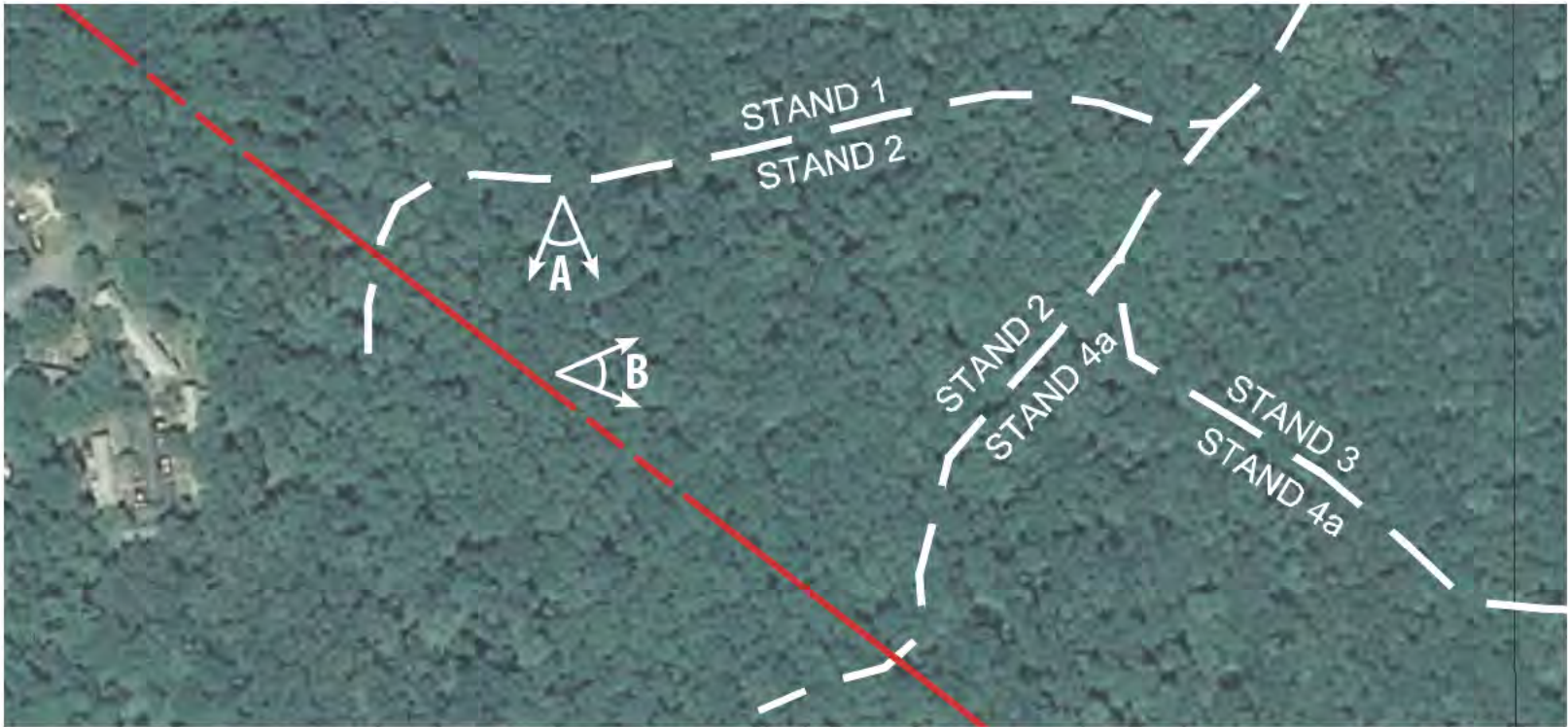
- Topography:** slopes are primarily either 10-15% (at bottomland locations) or 15-25% (on the south-facing slopes); due to erosion, the channel includes incised banks with >25% slopes
- Elevation:** 116' to 196' ± above sea level; upland forest
- Aspect:** about 1/2 of S2 includes south-facing slopes; the other 1/2 is a lowland area that receives drainage (drains to the NE)
- Hydrology:** Receives drainage from areas between Laurel Hill Road and Plateau Place. Concentrated runoff from uphill impervious areas has resulted in the severely-eroded banks of a perennial stream. This tributary of Beaverdam Creek flows from the SW to SE. This channel originates at Laurel Hill Road.
- Historic imagery notes:** The stream that essentially serves as the boundary between S2 and S4 is visible in the 1938 photograph.
- FIDS habitat:** Present
- Abiotic factors:** Deeply incised channel (eroded stream banks) likely caused by increased stormwater runoff originating at upstream impervious areas
- Invasives:** relatively few invasives comparable to entirety of Preserve
- Unique habitat notes:** very distinctive stand of Tulip poplar (*Liriodendron tulipifera*) and American holly (*Ilex opaca*); stand includes a channel (flows to the northeast) that increases habitat diversity
- Adjacent uses:** Stand 2 is bound by S1's ridge to the north, S3 to the east and S4 to the SE.
- Forest Structure Value:** 45/60



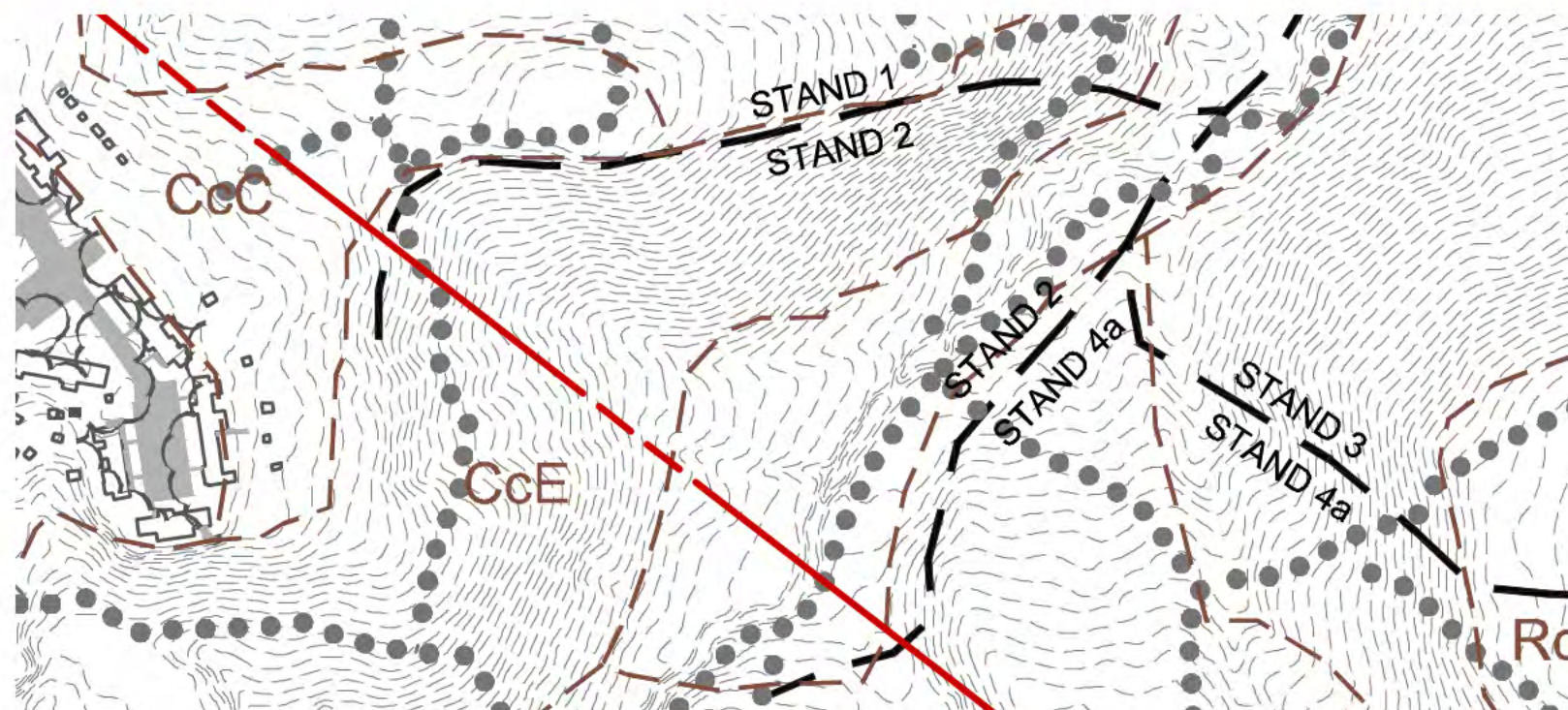
Forest stand boundaries

Forest Stand Summary Sheet	
Property Name:	Greenbelt Forest Preserve
Location:	Greenbelt, MD
Prepared By:	CML
Date:	2016-10-16
Stand Variable	Stand # 2
1. Dominant species/Codominant species	Liriodendron tulipifera, Liquidambar styraciflua, Ilex opaca
2. Forest Association	Tulip poplar
3. Successional stage	Mid-successional upland forest
4. Basal area in s.f. per acre	97
5. Size class of dominant species	18-29.9" dbh
6. Percent of canopy closure	77%
7. Number of tree species	5
8. Common understory species	Carya tomentosa, Liquidambar styraciflua, Ilex opaca, Quercus alba, Quercus prinus, Quercus phellos, Toxicodendron radicans
9. Percent of understory cover 3' to 20' tall	21%
10. Number of understory species 3' to 20' tall	7
11. Common herbaceous species	Polystichum acrostichoides, Rubus flagellaris, Solidago caesia
12. Percent of herbaceous & woody plant cover 0' to 3' tall	16%
13. List of major invasive plant species & percent of cover	Berberis thunbergii, Hedera helix, Slimax, 14%
14. Number of standing dead trees 6" dbh or greater (average per plot)	0.7
15. Comments	-

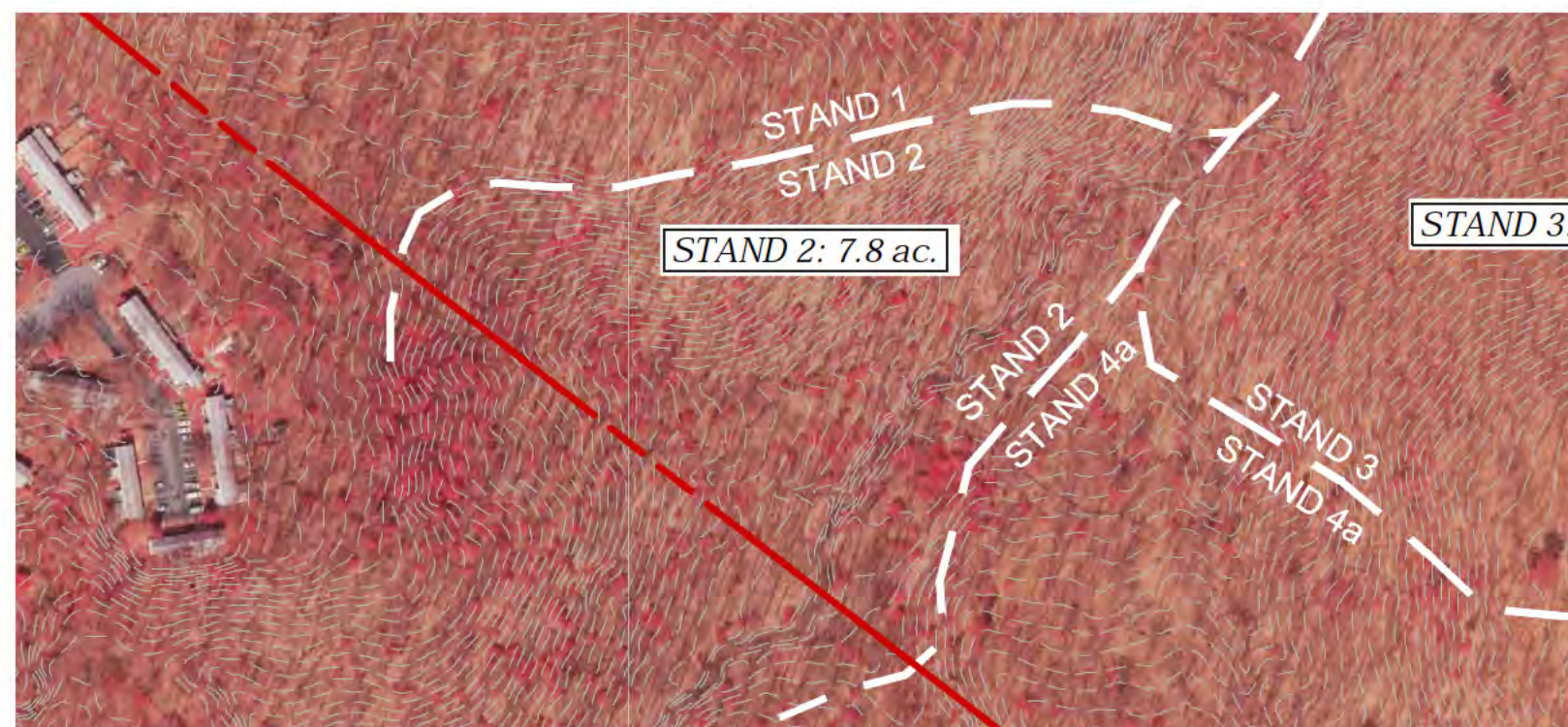
Sheet 1 of 1



Color photograph



Contours, trails & soil boundaries



Color infrared photograph



A – Stand 2 is defined by a dense coverage of *Ilex opaca* (American holly) in the understory and *Liriodendron tulipifera* (Tulip poplar) in the canopy.



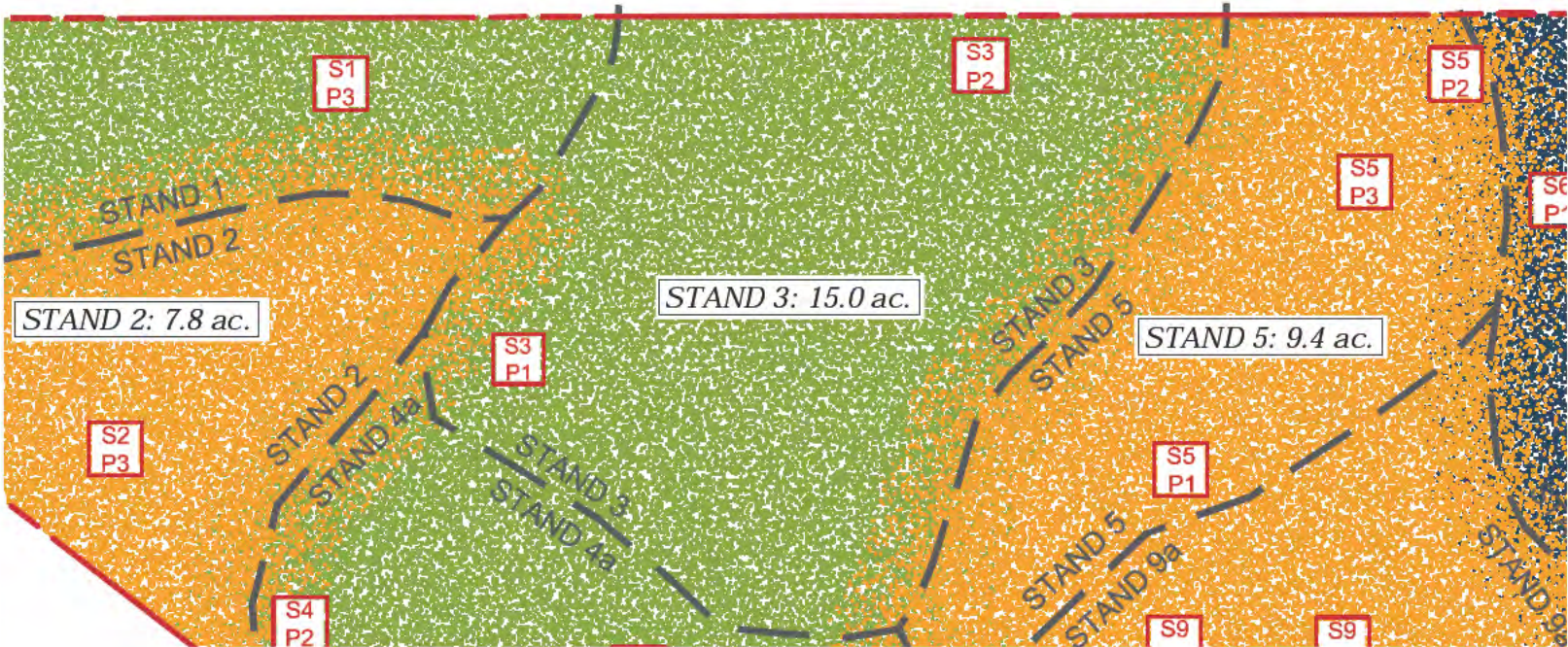
B – Tulip poplars in forests are often characterized by their distinctive arrow-straight trunks.

FOREST STAND 3:

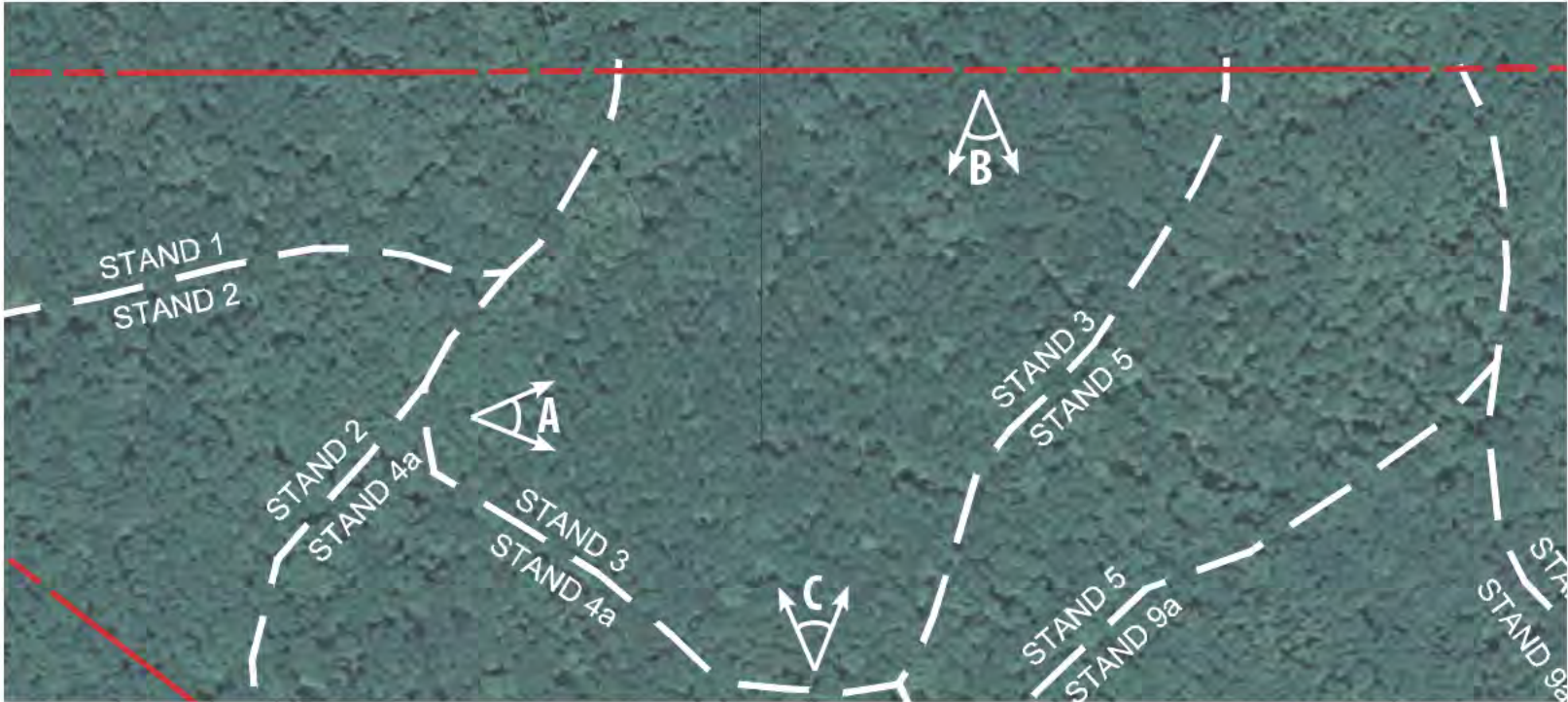
- Topography:** The slopes around the high point and North-facing slopes of S3 are primarily <15%; the western-facing slopes of S3 are as steep as 25%; due to erosion, the channel that divides S3 from S1 includes incised banks with >25% slopes
- Elevation:** 112' to 198' ± above sea level; upland forest
- Aspect:** primarily North-facing or NW-facing slopes; S3 also includes some of the highest elevations within the Northern Preserve
- Hydrology:** High elevations, minimal disturbance and dense canopy/understory/ground-level vegetation keeps erosion potential low. The perennial channel between S3 and S1 includes incised banks - however, this erosion is caused by concentrated stormwater runoff far upstream of S3. An incised ephemeral channel is present near S3's western extent.
- Historic imagery notes:** Erosion is readily apparent in the 1938 photograph near the intersection of S2, S3, and S4. The results of this erosion are still very much evident, as evidenced by topographic maps and field observations. Fortunately, vegetation has stabilized such eroded areas. The 1938 photograph also reveals very sparse vegetative cover in stand 3. Today, field investigations revealed very small trees relative to other areas of the property.
- FIDS habitat:** Present
- Abiotic factors:** It appears that this stand was cleared, used (for perhaps agricultural purposes) and abandoned. After abandonment, this stand is in the process of potentially transitioning back to a forest. The unusually high presence of small-sized (2-5.9" dbh) Black gums (*Nyssa sylvatica*) seems to indicate that this stand was abandoned more recently than other previously farmed areas of the preserve, which have much larger trees present.
- Invasives:** relatively few invasives comparable to entirety of Preserve
- Unique habitat notes:** High abundance of small Black gums defines this stand.
- Adjacent uses:** Stand 3 is bound by S1 and S2 to the west, S4 to the south, S5 to the north.
- Forest Structure Value:** 44/60



KEY MAP

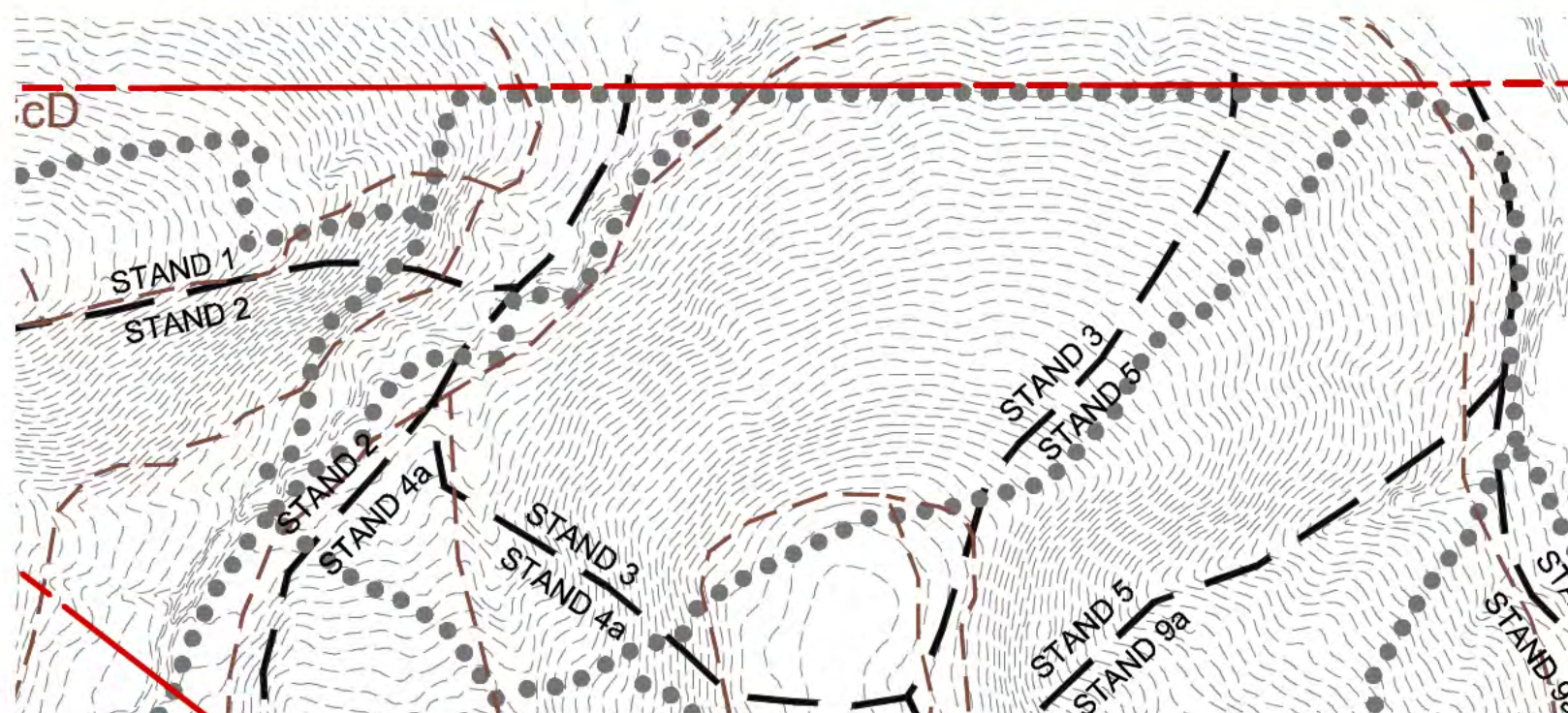


Forest stand boundaries

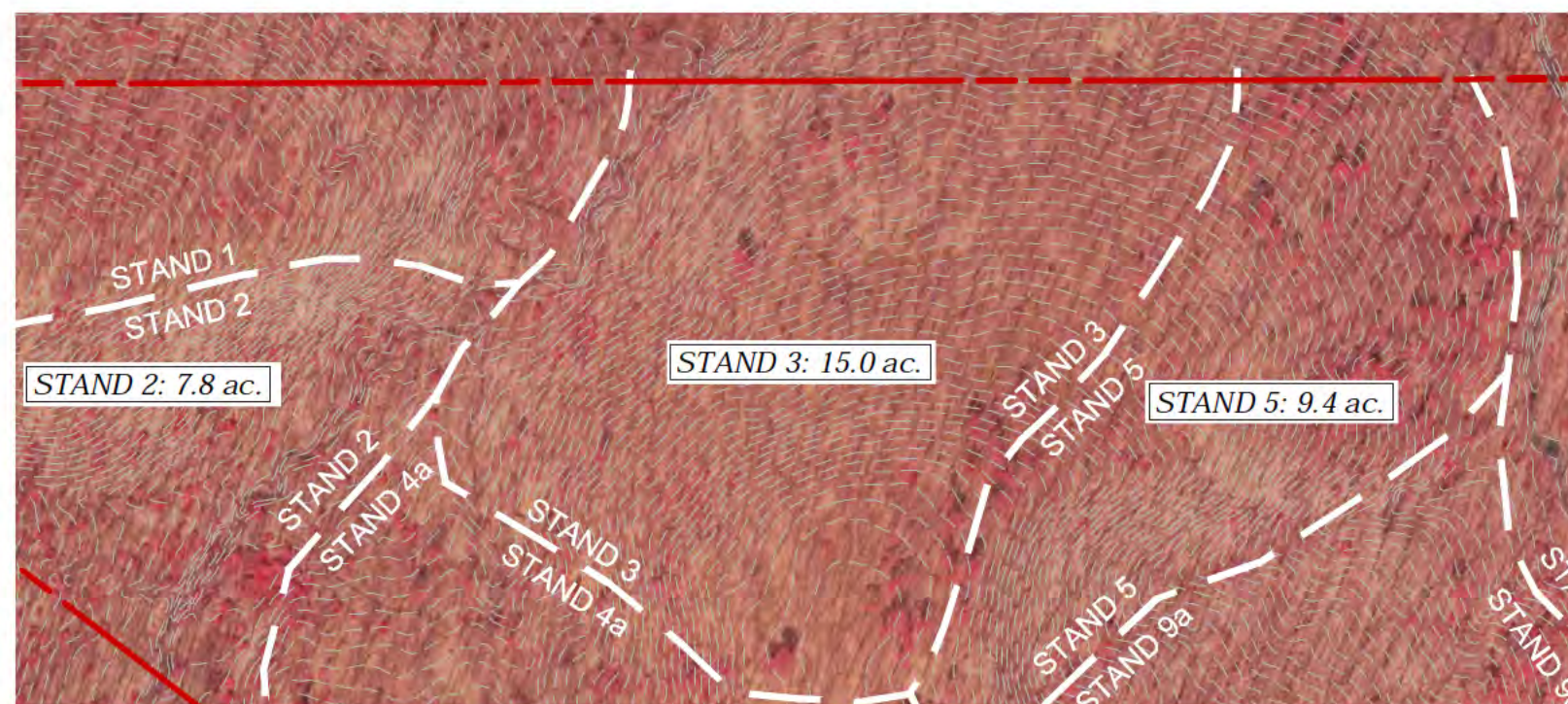


Color photograph

Forest Stand Summary Sheet	
Property Name:	Greenbelt Forest Preserve
Location:	Greenbelt, MD
Prepared By:	CML
Date:	2015-10-16
Stand Variable	Stand # 3
1. Dominant species/Codominant species	Nyssa sylvatica, Quercus rubra, Quercus alba
2. Forest Association	White oak-Red oak association
3. Successional stage	Early/Mid-successional upland forest
4. Basal area in s.f. per acre	105
5. Size class of dominant species	10" – 29.9" dbh
6. Percent of canopy closure	77%
7. Number of tree species	5
8. Common understory species	Vaccinium angustifolium, Quercus alba, Liquidambar styraciflua, Kalmia latifolia, Nyssa sylvatica, Ilex opaca, Sassafras albidum, Vaccinium corymbosum
9. Percent of understory cover 3' to 20' tall	16%
10. Number of understory species 3' to 20' tall	8
11. Common herbaceous species	n/a
12. Percent of herbaceous & woody plant cover 0' to 3' tall	17%
13. List of major invasive plant species & percent of cover	n/a
14. Number of standing dead trees 6" dbh or greater (average per plot)	1.5
15. Comments	-



Contours, trails & soil boundaries



Color infrared photograph



A – The prevalence of *Nyssa sylvatica* (Black gum) and their consistently small size in this area indicate an early successional stage.



B – Several older trees are scattered throughout the stand and amongst the smaller Black gums. *Vaccinium angustifolium* (Lowbush blueberry) is also prevalent.



C – This >30" *Liriodendron tulipifera* (Tulip poplar) exists on the flat plateau within Stand 3. A girdle mark is present on the trunk and is a sign of previous use. The tree is also unique because of its relative size – it is the largest tree in the immediate area, and has a canopy/branching structure that indicates it previously grew in an open area, not a forest.

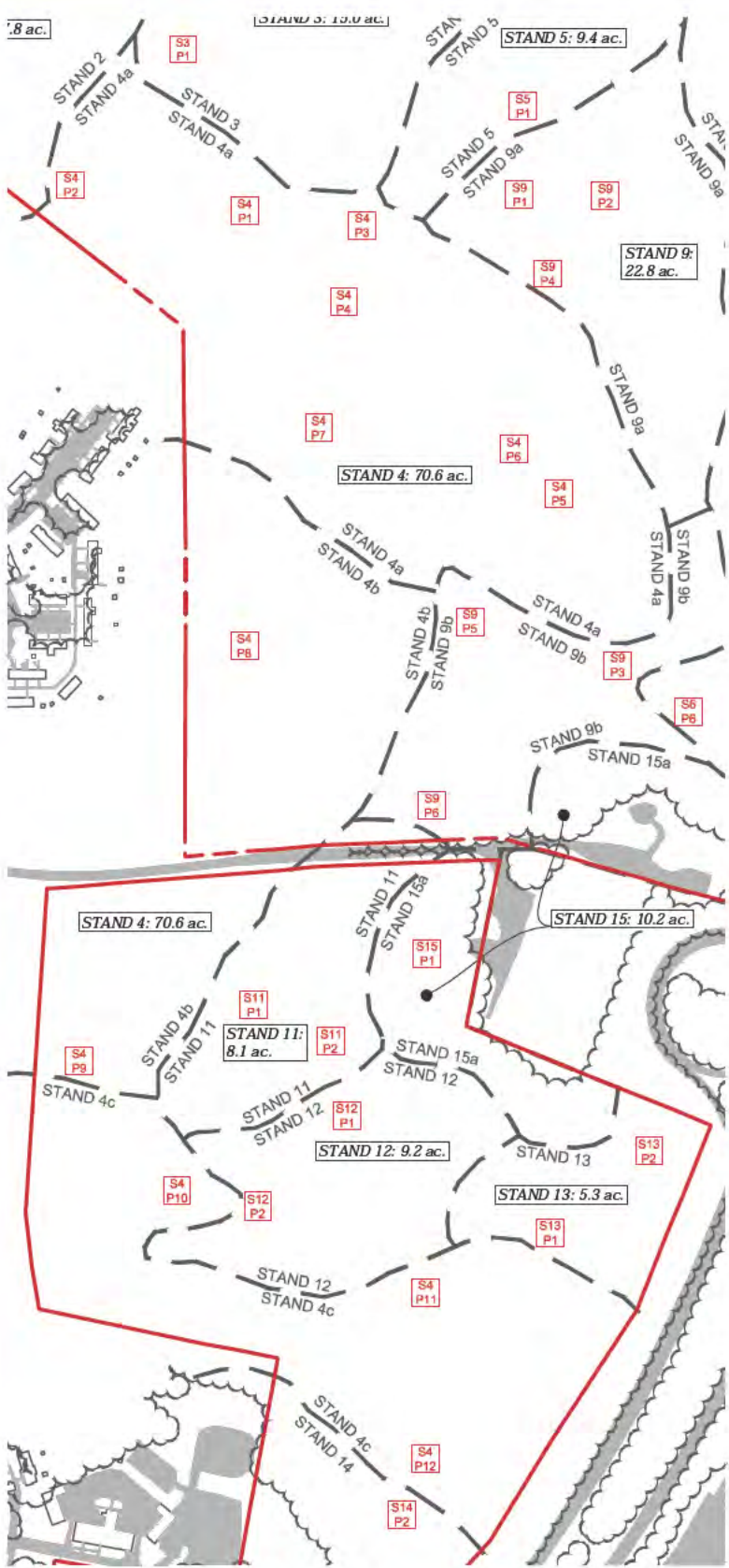
FOREST STAND 4:

- Topography:** The vastness of this stand makes it difficult to categorize the slopes of this area. However, S4's slopes are primarily <15%. There are a few areas of upland slopes that are between 15-25%. Some areas exceed 25% because of erosion.
- Elevation:** highly variable due to the vast size of this stand; 115' to 198' ± above sea level; upland forest
- Aspect:** Majority of S4 includes south- or east-facing slopes. A small amount of S4 includes north-facing slopes.
- Hydrology:** Impervious areas on/around Ridge Road and Plateau Place are causing erosion impacts within this stand. S4 includes several intermittent/ephemeral channels, a seep (near the S4/S9 boundary) and a perennial stream (originating at Ridge Road).
- Historic imagery notes (S4 within the northern parcel):** Erosion is evident throughout the stand (confirmed in field, although former eroded areas are now stabilized by vegetation). The 1938 photo reveals that the western facing slope of S4 appears as a lighter gray color relative to the eastern facing slope of S4 (near the S4/S9A boundary). The agricultural use of this west-facing slope contributed to the aforementioned erosion in the stand. The east-facing slope was likely abandoned at an earlier time, hence the slightly darker gray. The plateau (for which Plateau Place was named) was extensively farmed as evidenced by the 1938 photograph.
- Historic imagery notes (S4 within the southern parcel):** The 1938 photo reveals an old road which eventually transformed into a walking trail that is still present today.
- FIDS habitat:** Present
- Abiotic factors:** trails abundant throughout stand; concrete post found northeast of Plateau Place; several deeply incised eroded areas caused by uphill impervious areas (to the northeast and east of Plateau Place); outdoor classroom in South Preserve; trash present in a few locations throughout the stand; several locations where perimeter fence is broken
- Invasives:** English ivy, *Wisteria*, *Green briar*, *Rosa multiflora*, *Berberis thunbergii*, *Smilax* abundant; several openings in forest canopy (caused by fallen trees) allow sunlight to penetrate to forest floor and provide opportunity for non-native invasive species to thrive; invasives are encroaching into the stand from private backyards, Northway, and BW Parkway.
- Unique habitat notes:** very diverse stratification of native understory and canopy species; dense clusters of *Lycopodium*; formerly eroded areas have been stabilized by American holly (*Ilex opaca*), Mountain laurel (*Kalmia latifolia*), and other various native northern hardwoods (*Quercus* sp., *Pinus* sp., *Liquidambar styraciflua*, *Liriodendron tulipifera*); some exceptional areas of very large oaks that contrast typical Stand 4 tree sizes; one area in South Preserve includes Pawpaw (*Asimina triloba*), not found typically throughout the rest of the property; a lowland channel flowing from west to east (north of Northway) increases habitat value, as do two separate channels south of Northway
- Adjacent uses:** S4 is bound by S2, S3 and S5 to the north; S9, S11 and S12 to the east; and S14 to the south.
- Forest Structure Value:** 44/60



Forest Stand Summary Sheet	
Property Name:	Greenbelt Forest Preserve
Location:	Greenbelt, MD
Prepared By:	CML
Date:	10/30/2016
Stand Variable	Stand # 4
1. Dominant species/Codominant species	<i>Quercus falcata</i> , <i>Quercus rubra</i> , <i>Quercus alba</i> , <i>Pinus virginiana</i> , <i>Liriodendron tulipifera</i> , <i>Nyssa sylvatica</i>
2. Forest Association	White oak-Red oak association
3. Successional stage	Mid-successional upland forest
4. Basal area in s.f. per acre	108
5. Size class of dominant species	18-29.9" dbh
6. Percent of canopy closure	79%
7. Number of tree species	14
8. Common understory species	<i>Kalmia latifolia</i> , <i>Sassafras albidum</i> , <i>Vaccinium angustifolium</i> , <i>Quercus alba</i> , <i>Acer rubrum</i> , <i>Ilex opaca</i> , <i>Nyssa sylvatica</i> , <i>Carya tomentosa</i> , <i>Liquidambar styraciflua</i> , <i>Vaccinium corymbosum</i> , <i>Quercus prinus</i> , <i>Viburnum dentatum</i> , <i>Betula nigra</i> , <i>Quercus rubra</i> , <i>Carpinus caroliniana</i> , <i>Liriodendron tulipifera</i>
9. Percent of understory cover 3' to 20' tall	22%
10. Number of understory species 3' to 20' tall	16
11. Common herbaceous species	<i>Mitchella repens</i> , <i>Lycopodium</i> , <i>Polystichum acrostichoides</i>
12. Percent of herbaceous & woody plant cover 0' to 3' tall	24%
13. List of major invasive plant species & percent of cover	<i>Smilax</i> , <i>Microstegium vimineum</i> , <i>Rosa multiflora</i> , 11%
14. Number of standing dead trees 6" dbh or greater	0.9
15. Comments	Although S4 varies significantly in topography, elevation and aspect, species density and other factors remain consistent throughout despite the aforementioned differences.

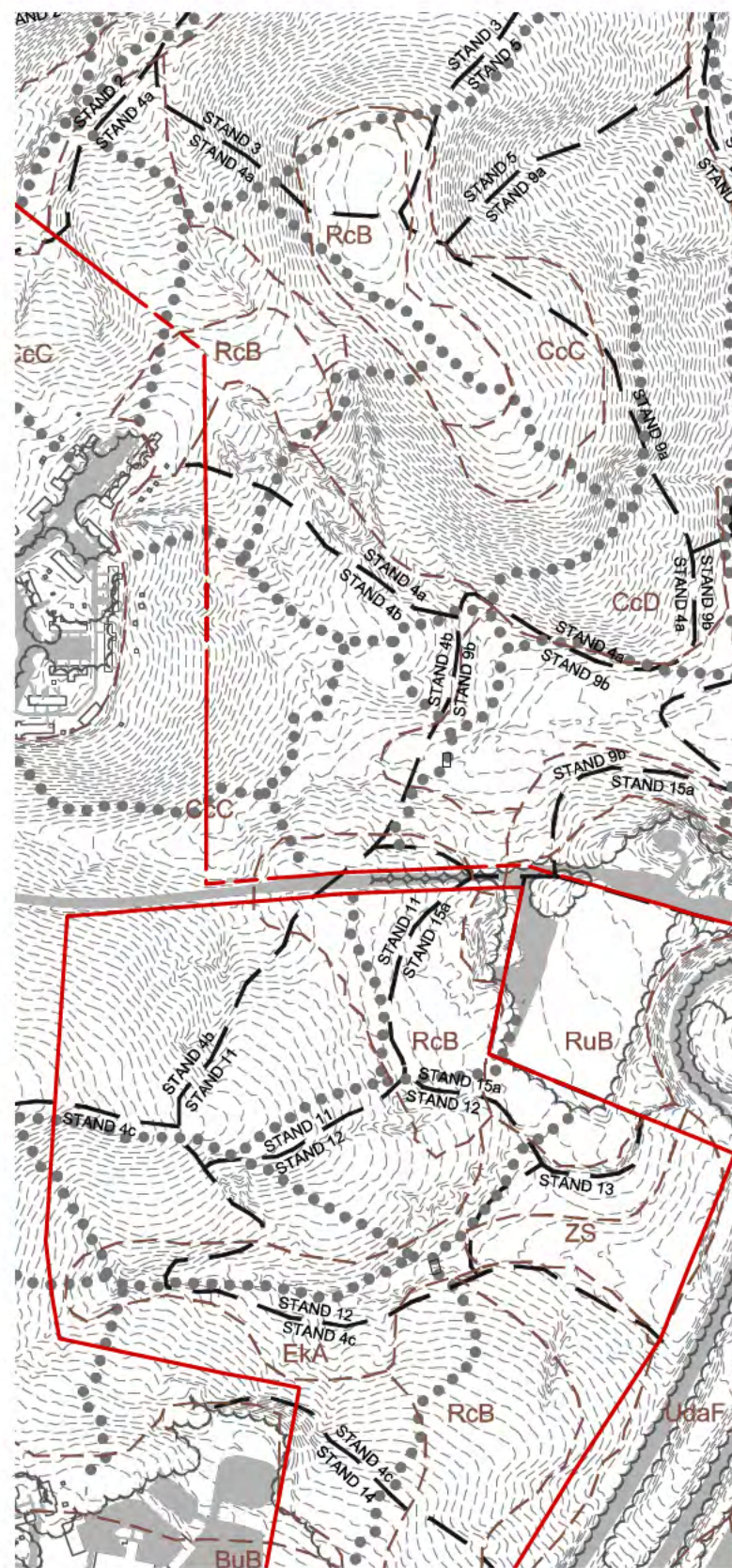
Sheet 1 of 1



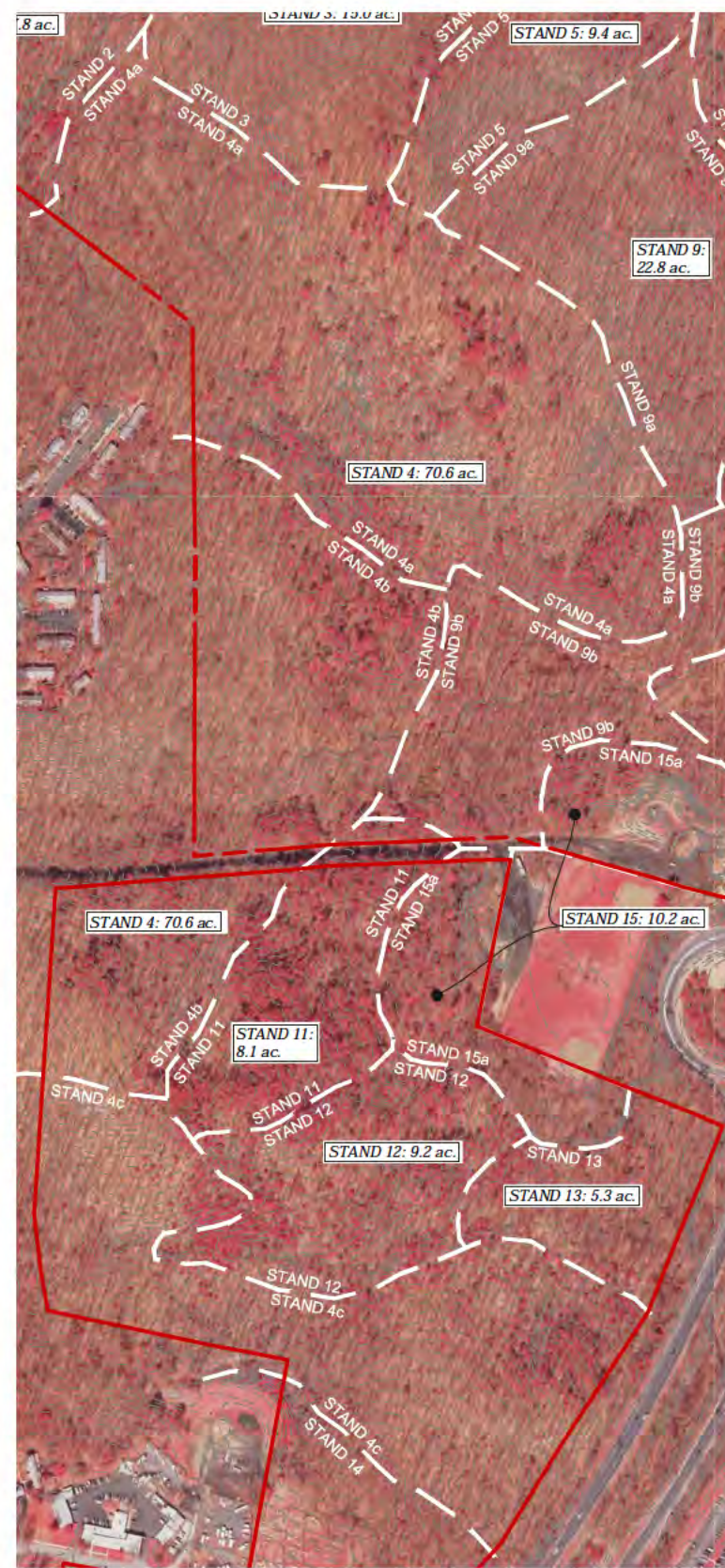
Forest stand boundaries



Color photograph



Contours, trails & soil boundaries



Color infrared photograph



A - This stand includes a very diverse species palette, as well as highly variable topography.



B - *Kalmia latifolia* (Mountain laurel) is common in S4's understory.



C - Abundance of oak saplings represent future growth within S4.



D - incised channel taken near S4P10. This erosion is a result of concentrated stormwater runoff from uphill impervious areas.

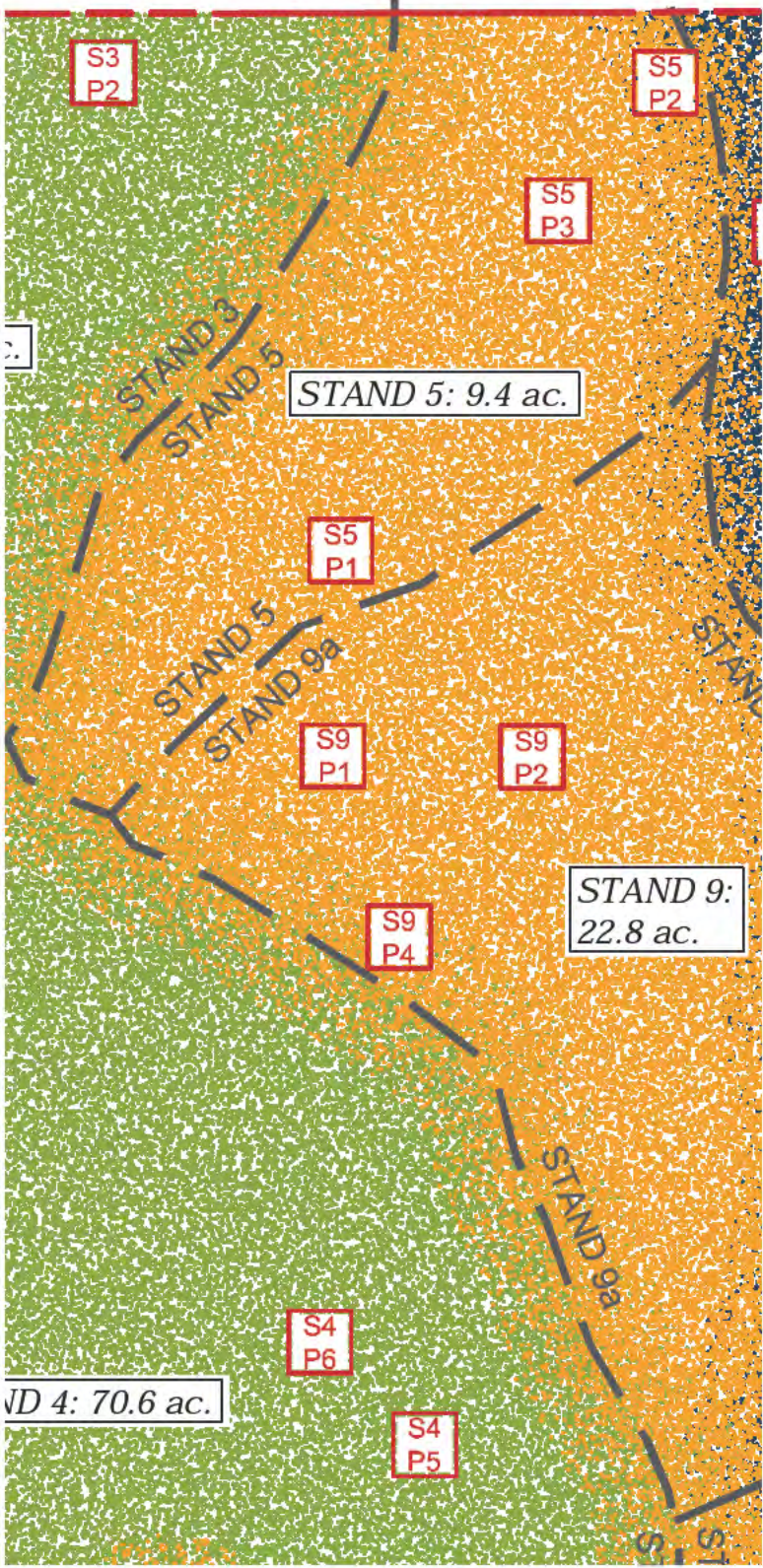
FOREST STAND 5:

- Topography:** about 2/3 of this stand is comprised of <15% slopes; the remaining 1/3 is 15-25%
- Elevation:** 104' to 195' ± above sea level; upland forest
- Aspect:** slopes very uniformly to the east
- Hydrology:** S5 receives runoff from the ridge/high point within S3. Erosion is not an issue because of high elevations, minimal disturbance and dense canopy/understory/ground-level vegetation. An intermittent channel is present near the boundary between S5 and S9.
- Historic imagery notes:** n/a
- FIDS habitat:** Present
- Abiotic factors:** Trails present. Few signs of human impact.
- Invasives:** very few invasives as this stand is well protected from exterior threats (i.e., backyards, roads, etc.)
- Unique habitat notes:** S5 is a "transitional" stand between S4 (upland topography, young trees) and S6 (lowland topography). Includes species similar to S4, but larger in size, indicating older individuals. One area, near the BARC property, includes a very unique cluster of *Lycopodium*, Hay-scented ferns, and young oak saplings. Lower elevations of this stand transition to more similarly represent species found in S6. A small tributary is present and increases habitat value.
- Adjacent uses:** S5 is bounded by S3 to the east, S4 to the SW, S9 to the SE and S6 to the east.
- Forest Structure Value:** 45/60



Forest Stand Summary Sheet	
Property Name:	Greenbelt Forest Preserve
Location:	Greenbelt, MD
Prepared By:	CML
Date:	2015-10-21
Stand Variable	Stand # 5
1. Dominant species/Codominant species	<i>Liriodendron tulipifera</i> , <i>Quercus alba</i> , <i>Liquidambar styraciflua</i> , <i>Acer rubrum</i>
2. Forest Association	Tulip Poplar
3. Successional stage	Mid-successional upland forest
4. Basal area in s.f. per acre	110
5. Size class of dominant species	18-29.9" dbh
6. Percent of canopy closure	76%
7. Number of tree species	8
8. Common understory species	<i>Nyssa sylvatica</i> , <i>Quercus alba</i> , <i>Liquidambar styraciflua</i> , <i>Vaccinium angustifolium</i> , <i>Carpinus caroliniana</i> , <i>Quercus phellos</i> , <i>Acer rubrum</i> , <i>Quercus rubra</i> , <i>Vaccinium corymbosum</i> , <i>Kalmia latifolia</i> , <i>Carya tomentosa</i> , <i>Toxicodendron radicans</i>
9. Percent of understory cover 3' to 20' tall	24%
10. Number of understory species 3' to 20' tall	12
11. Common herbaceous species	<i>Mitchella repens</i> , <i>Lycopodium</i> , <i>Fragaria vesca</i> , <i>Dennstaedtia punctilobula</i>
12. Percent of herbaceous & woody plant cover 0' to 3' tall	27%
13. List of major invasive plant species & percent of cover	<i>Smilax</i> , <i>Microstegium vimineum</i> , 17%
14. Number of standing dead trees 6" dbh or greater (average per plot)	1.7
15. Comments	-

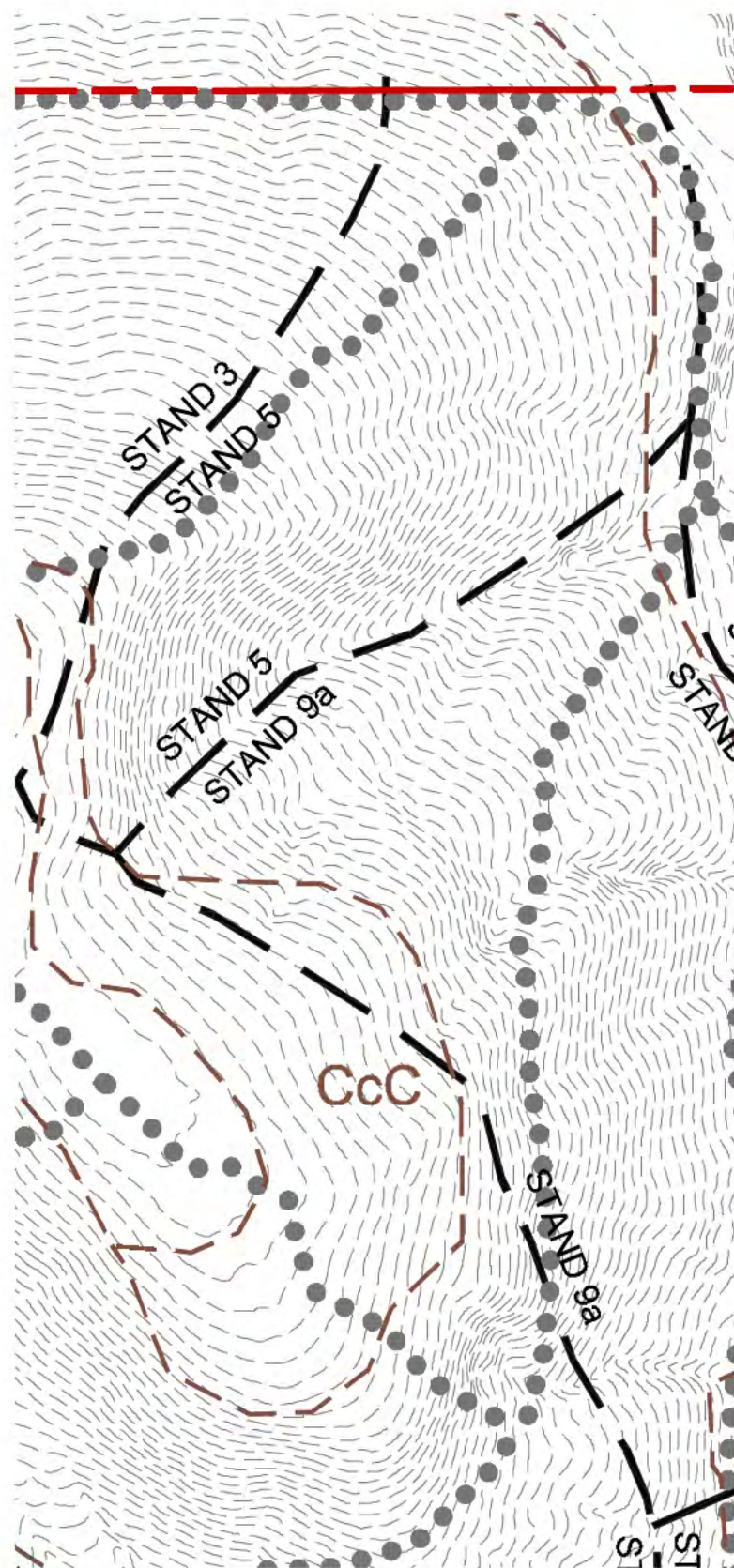
Sheet 1 of 1



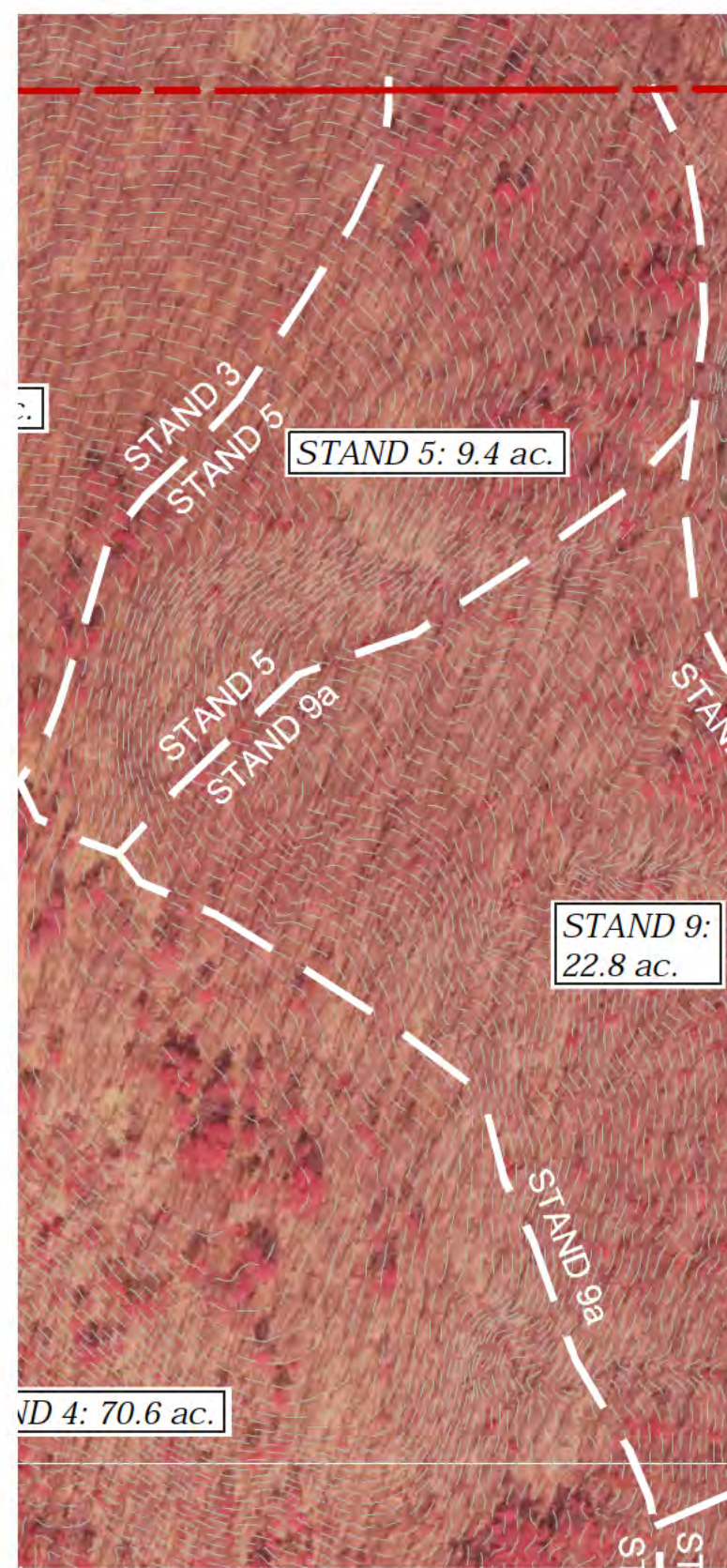
Forest stand boundaries



Color photograph



Contours, trails & soil boundaries



Color infrared photograph



A - The highly invasive *Microstegium vimineum* (Japanese stilt grass) thrives in many areas through the preserve, but especially in areas where sunlight hits the forest floor and in disturbed areas, such as trails. Both occur here.



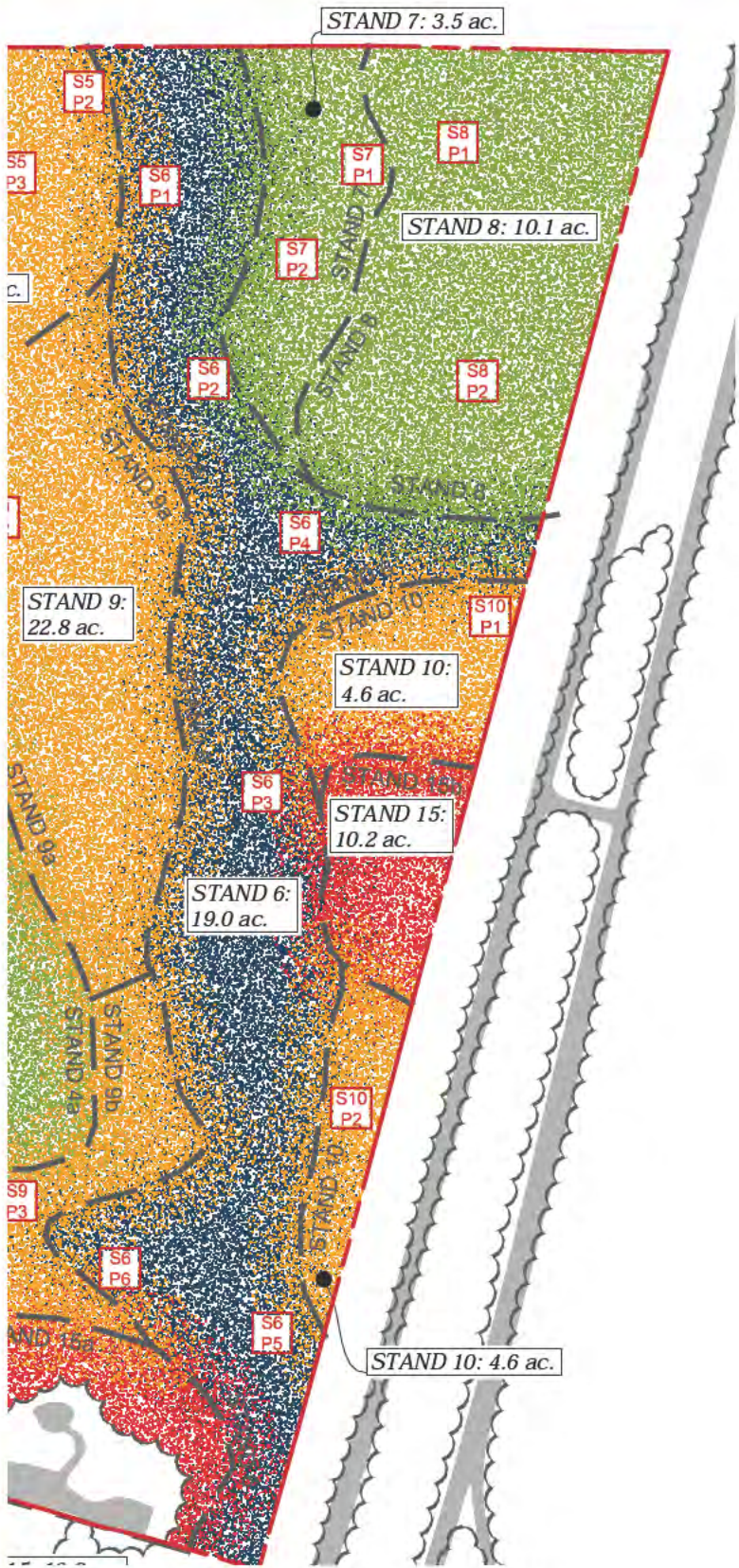
B - (Ground cedar) is present in many areas throughout the preserve, and especially in this area. Deadwood, whether still standing or fallen onto the ground, provides habitat value but also increases the amount of sunlight on the forest floor. New species (invasive and native) benefit from the new abundant sunlight.

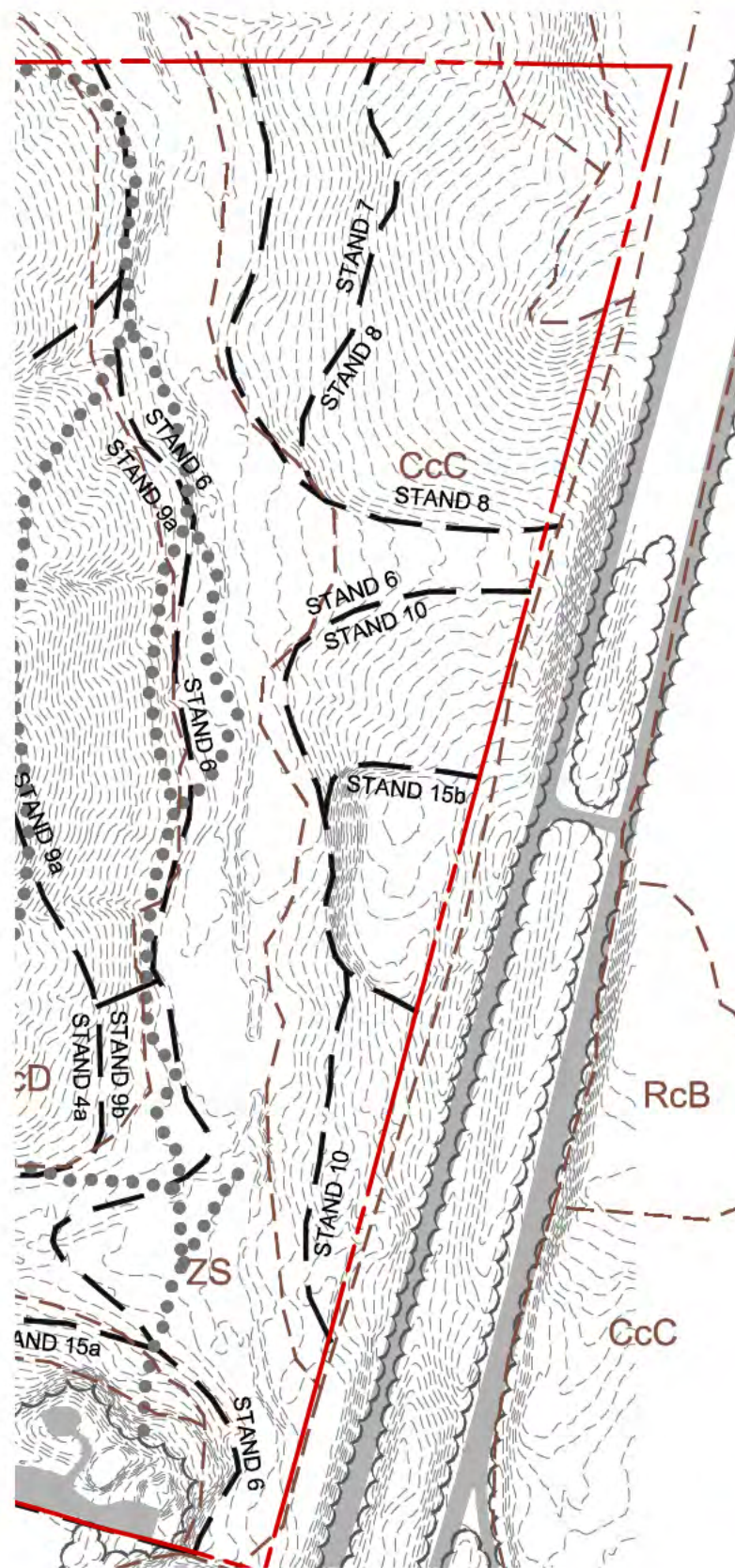
FOREST STAND 6:

- Topography:** vast majority of slopes are <10%; due to erosion of the channel, this stand also includes some slopes between 15-25% and some slopes that exceed 25%
- Elevation:** 94' to 120' ± above sea level; lowland forest
- Aspect:** this exceptionally-broad bottomland drains to the North
- Hydrology:** S6 includes a severely eroded perennial stream that drains to the north to Beaverdam Creek. Stands 4, 5, 7, 8, 9a, 9b, 10, and 15 (and the ephemeral/intermittent channels within these stands) drain into S6 and the aforementioned stream.
- Historic imagery notes:** Although difficult to assess, the 1938 photograph appears to reveal very little forest coverage, especially relative to the apparently increased forest coverage shown in the 1952 photograph.
- FIDS habitat:** Present
- Abiotic factors:** Incised channel likely caused by upstream impervious areas that erode stream banks
- Invasives:** Japanese stilt grass thrives in shady, wet lowlands and covers virtually the entirety of S6's floor; other invasives are also present.
- Unique habitat notes:** This lowland stand is dominated by Red maple (*Acer rubrum*) and Sweet gum (*Liquidambar styraciflua*); the channel flows to the north, is a tributary of Beaverdam Creek, and includes very incised side slopes. This stand also includes what is typically considered a low, flat floodplain, but because of the channels very high banks, the floodplain likely doesn't flood during notable storms. Wetlands are present west of BW Parkway and include Skunk cabbage, Ostrich fern, and a ~45" DBH Tulip poplar. Wetlands of special state concern are present throughout the entirety of S6.
- Adjacent uses:** S6 is bound by S5, S9, and S15 to the west; S7, S8, S10, and S15 to the east.
- Forest Structure Value:** 42/60

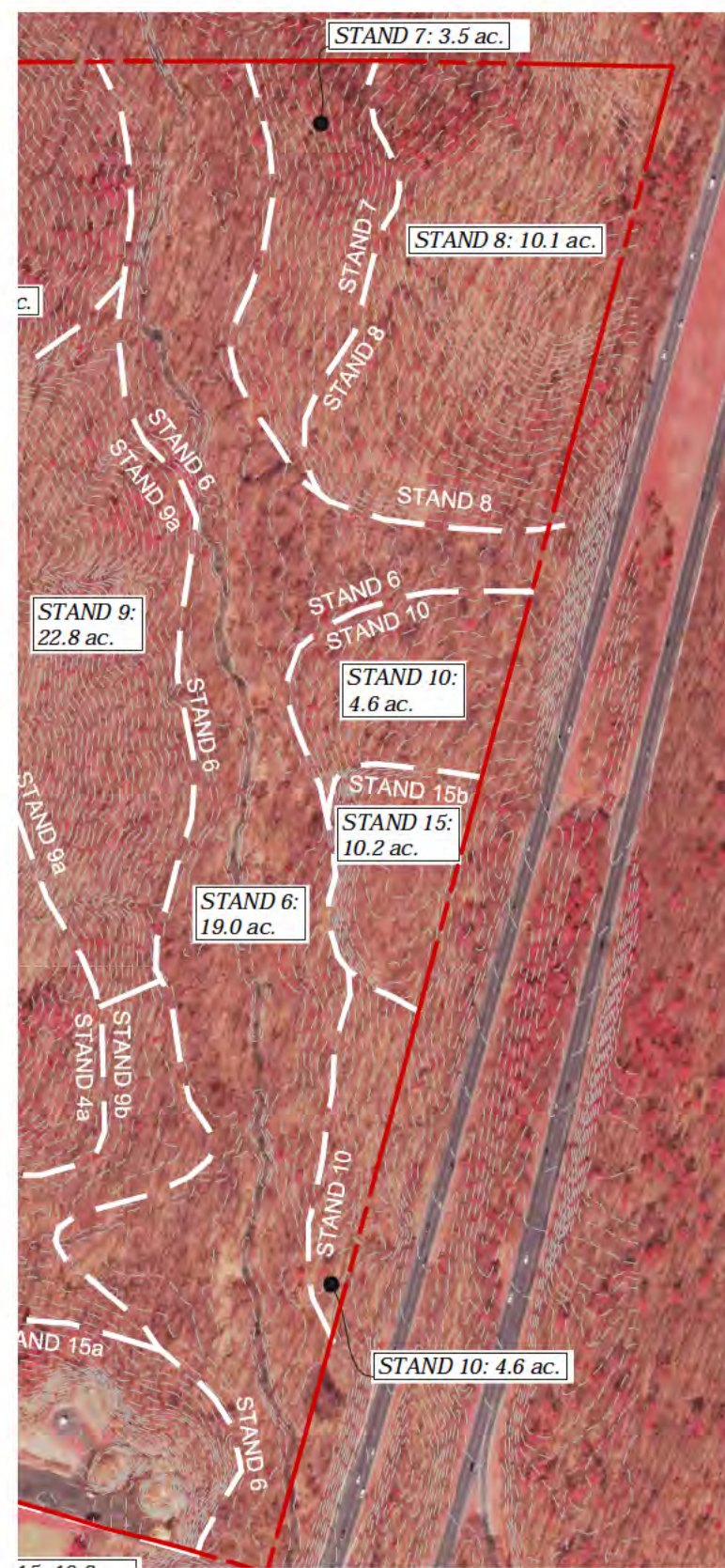


Forest Stand Summary Sheet	
Property Name:	Greenbelt Forest Preserve
Location:	Greenbelt, MD
Prepared By:	CML
Date:	2015-10-23
Stand Variable	Stand # 6
1. Dominant species/Codominant species	<i>Acer rubrum</i>
2. Forest Association	Red maple-Sweet gum association
3. Successional stage	Mid-successional lowland forest
4. Basal area in s.f. per acre	98
5. Size class of dominant species	18-29.9" dbh
6. Percent of canopy closure	76%
7. Number of tree species	7
8. Common understory species	<i>Carya tomentosa</i> , <i>Quercus alba</i> , <i>Lindera benzoin</i> , <i>Quercus phellos</i> , <i>Quercus rubra</i> , <i>Ilex opaca</i> , <i>Liquidambar styraciflua</i> , <i>Toxicodendron radicans</i> , <i>Vaccinium corymbosum</i>
9. Percent of understory cover 3' to 20' tall	10%
10. Number of understory species 3' to 20' tall	9
11. Common herbaceous species	<i>Cinna arundinacea</i> , <i>Dichanthelium clandestinum</i> , <i>Carex lurida</i> , <i>Mitchella repens</i> , <i>Symplocarpus foetidus</i> , <i>Matteuccia struthiopteris</i> , <i>Dennstaedtia punctilobula</i> , <i>Peltandra virginica</i> , <i>Pilea pumila</i> , <i>Woodwardia areolata</i> , <i>Sphagnum</i> , <i>Fragaria vesca</i> , <i>Phytolacca americana</i> , <i>Parthenocissus quinquefolia</i> , <i>Juncus sp.</i> , <i>Carex. sp.</i>
12. Percent of herbaceous & woody plant cover 0' to 3' tall	23%
13. List of major invasive plant species & percent of cover	<i>Microstegium vimineum</i> , <i>Smilax</i> , <i>Celastrus orbiculatus</i> , <i>Berberis thunbergii</i> , <i>Alliaria petiolata</i> , <i>Hedera helix</i> , <i>Morus alba</i> , 68%
14. Number of standing dead trees 6" dbh or greater (average per plot)	1.3
15. Comments	Ground densely covered by stiltgrass





Contours, trails & soil boundaries



Color infrared photograph



A - This picture is very typical of S6 - *Microstegium vimineum* (Japanese stilt grass) and other invasives cover the floor; *Liquidambar styraciflua* (Sweet gum) and *Acer rubrum* (Red maple) are the most prevalent tree species.



B - Stormwater runoff from impervious upstream development incises stream channels. Stream banks are eroded and sediment carried downstream.



C - Broken fence atop Beaverdam Creek tributary



D - Japanese stilt grass covers the floodplain.

FOREST STAND 7:

- Topography:** slopes are primarily <10% or 10-15%; ~5% of this stand includes 15-25% slopes
- Elevation:** 101' to 133' ± above sea level; upland forest
- Aspect:** slopes very uniformly to the west
- Hydrology:** S7 receives runoff from Stand 8. Erosion is not an issue because of high elevations, minimal disturbance and dense canopy/understory/ground-level vegetation. No streams, channels, wetlands, or seeps are present.
- Historic imagery notes:** n/a
- FIDS habitat:** Present
- Abiotic factors:** Very few signs of human disturbance.
- Invasives:** Very few invasives, despite the proximity to BW Parkway and the highly-invasive S6.
- Unique habitat notes:** Like S5, S7 is a "transitional stand" between S6 and S8. This area stands in stark contrast to the low species diversity of lowland S6 but not quite as diverse as the upland S8. S7 contains wetland buffers of the wetlands of special state concern.
- Adjacent uses:** S7 is bound by S6 to the west and S8 to the east.
- Forest Structure Value:** 42/60



Forest Stand Summary Sheet	
Property Name:	Greenbelt Forest Preserve
Location:	Greenbelt, MD
Prepared By:	CML
Date:	2015-10-21
Stand Variable	Stand # 7
1. Dominant species/Codominant species	Liquidambar styraciflua, Nyssa sylvatica, Pinus virginiana, Quercus alba
2. Forest Association	White oak-Red oak association
3. Successional stage	Mid-successional upland forest
4. Basal area in s.f. per acre	105
5. Size class of dominant species	10" – 29.9" dbh
6. Percent of canopy closure	60%
7. Number of tree species	9
8. Common understory species	Quercus rubra, Ilex opaca, Kalmia latifolia, Vaccinium angustifolium, Liriodendron tulipifera, Quercus phellos, Liquidambar styraciflua, Nyssa sylvatica, Quercus prinus
9. Percent of understory cover 3' to 20' tall	17%
10. Number of understory species 3' to 20' tall	9
11. Common herbaceous species	Lycopodium, Mitchella repens
12. Percent of herbaceous & woody plant cover 0' to 3' tall	31%
13. List of major invasive plant species & percent of cover	Smilax, 12%
14. Number of standing dead trees 6" dbh or greater (average per plot)	4
15. Comments	-

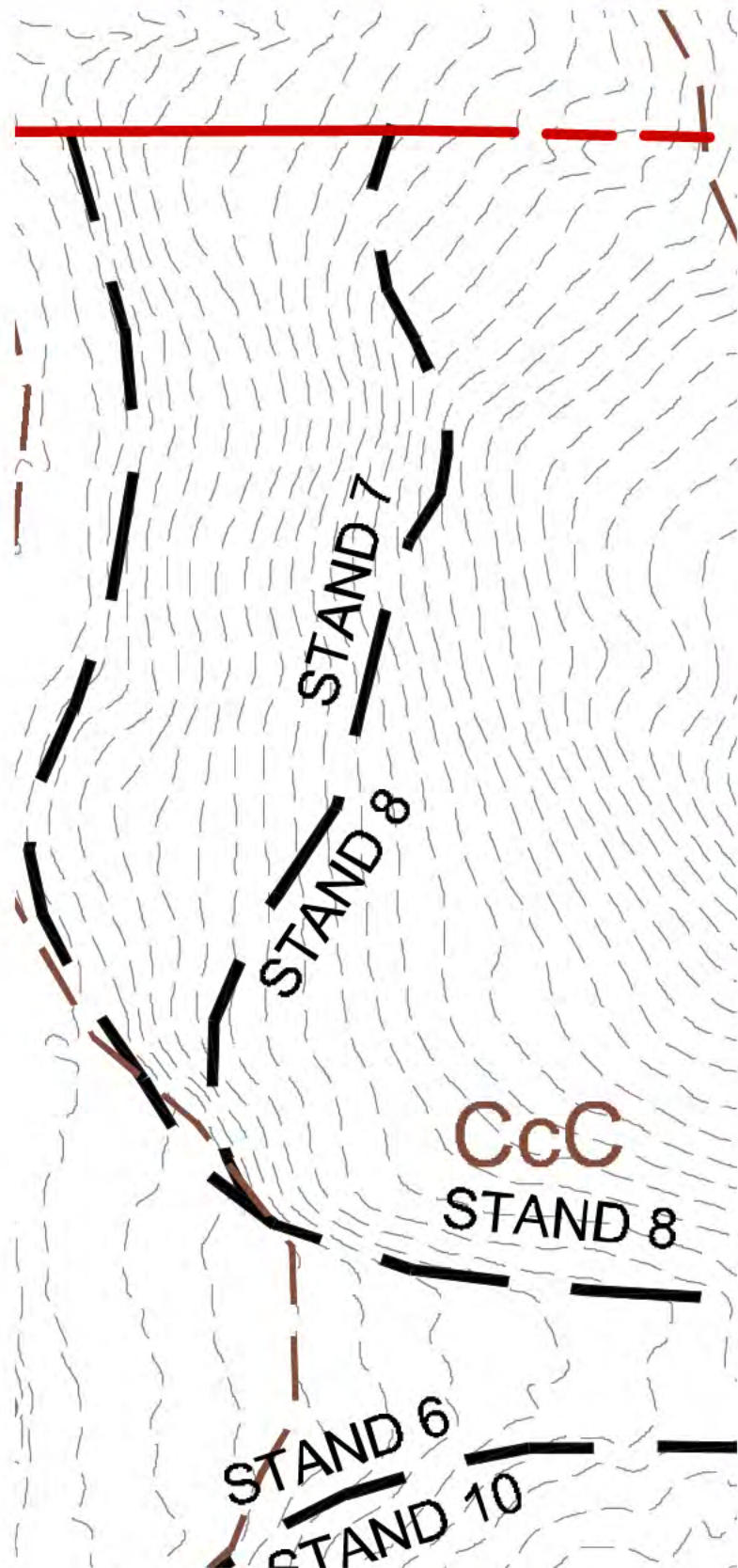
Sheet 1 of 1



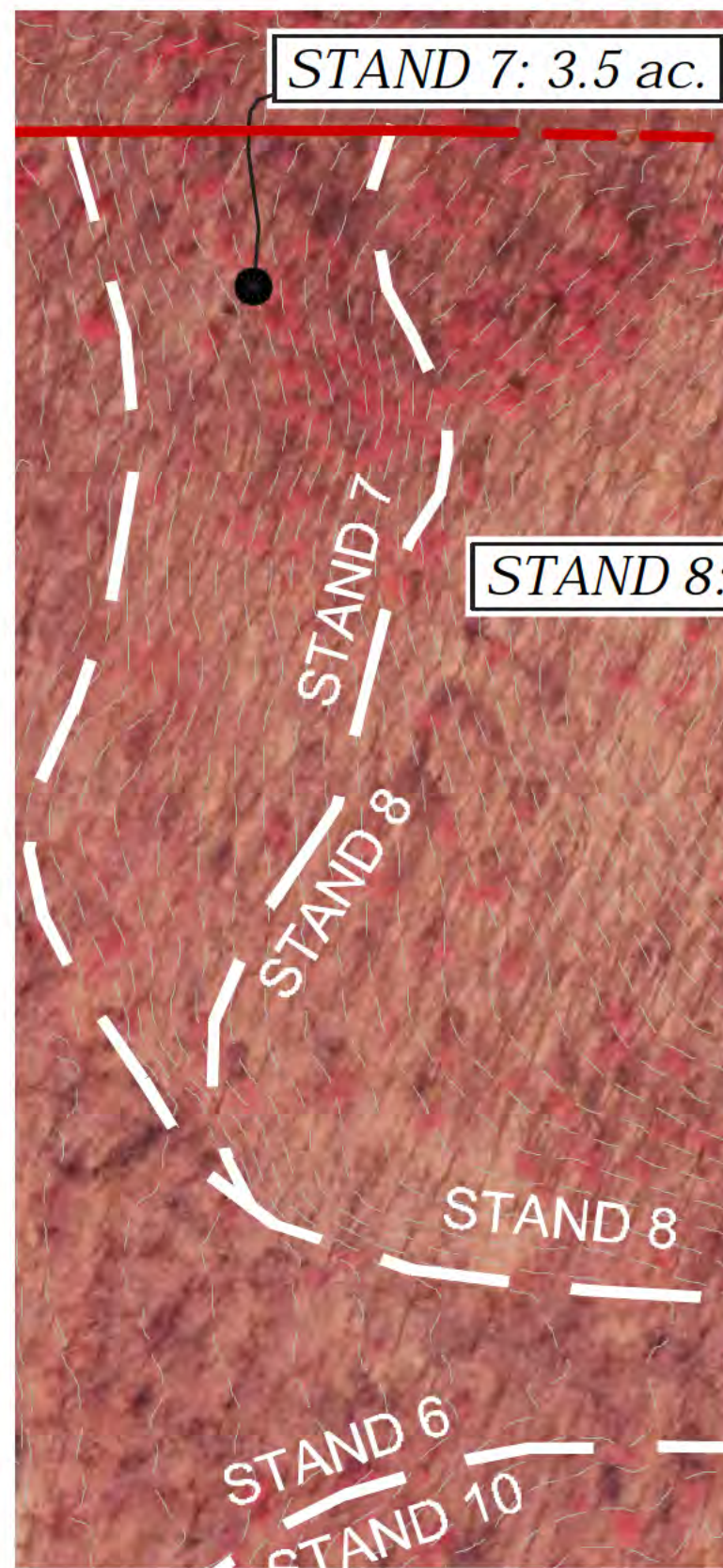
Forest stand boundaries



Color photograph



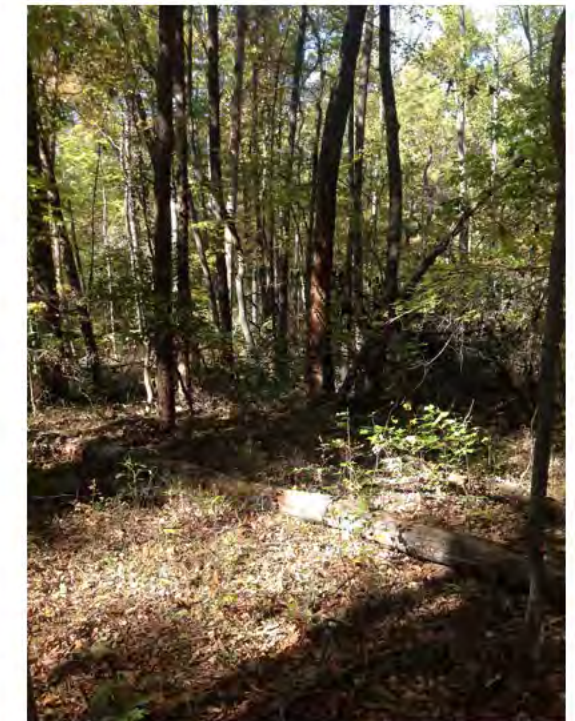
Contours, trails & soil boundaries



Color infrared photograph



A - Very dense understory of several native species.



B - This picture, looking towards S6, shows the "fuzzy edge" between S6 and S7. Some invasives are creeping up the hill from S6 towards S7. Tree species have changed from Red maple and Sweet gum (in S6) to Oaks and Pines in S7.

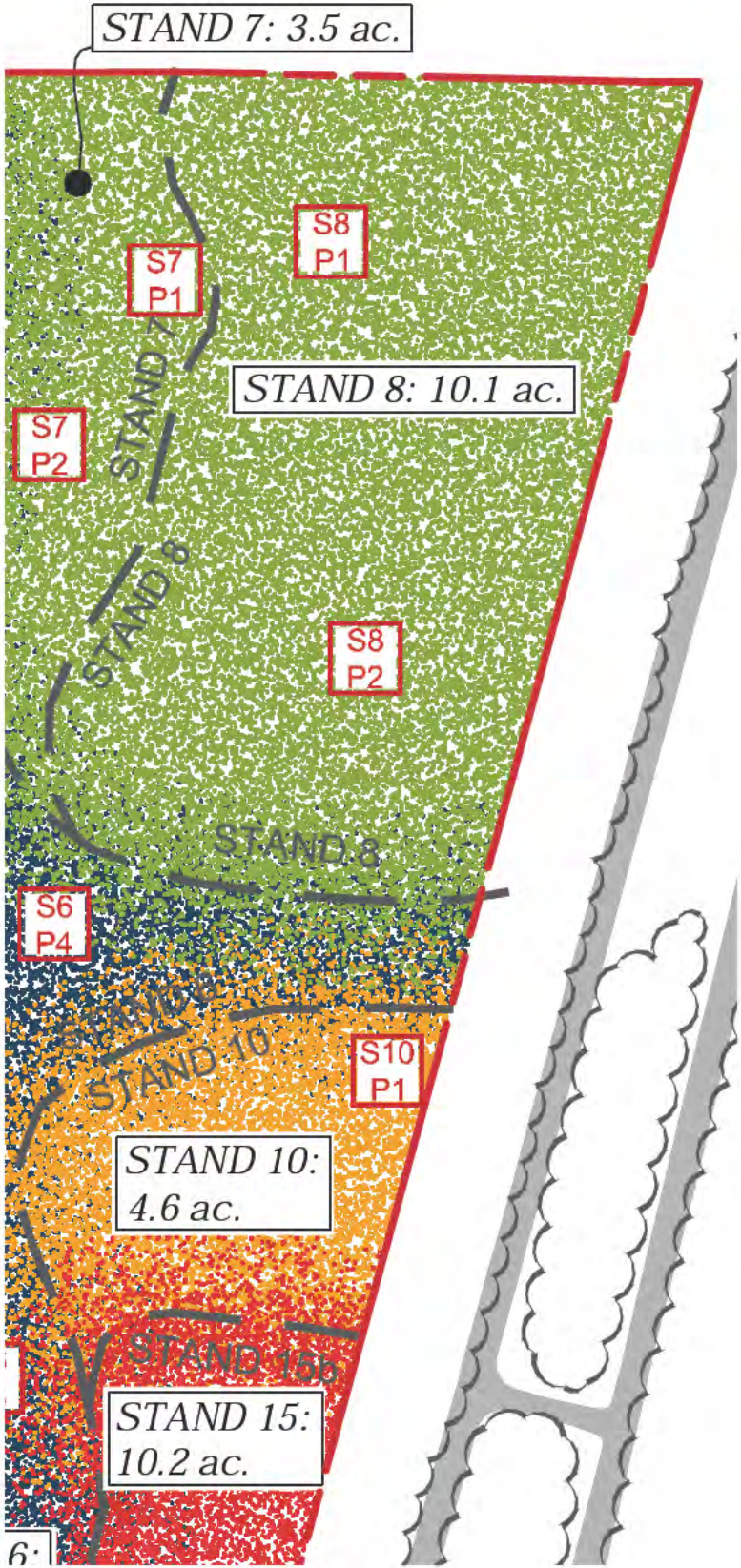
FOREST STAND 8:

- Topography:** like Stand 7, this stand includes fairly consistent slopes, mostly <10% or 10-15%; although rare, 15-25% slopes are also present in this stand
- Elevation:** 107 to 162' ± above sea level; upland forest
- Aspect:** slopes mostly uniformly to the west; some south-facing slopes
- Hydrology:** Erosion is not an issue because of high elevations, minimal disturbance and dense canopy/understory/ground-level vegetation. No streams, channels, wetlands, or seeps are present.
- Historic imagery notes:** n/a
- FIDS habitat:** Present
- Abiotic factors:** trails; maintenance access along BW Parkway ROW fence
- Invasives:** invasive species (primarily Greenbriar) creeping into S8 from the BW Parkway
- Unique habitat notes:** Similar to S7; very robust understory of native species; some areas dominated by Oaks (*Quercus sp.*) and Lowbush blueberry (*Vaccinium angustifolium*)
- Adjacent uses:** S8 is bound by S7 to the west, S6 to the south and the BW Parkway to the east.
- Forest Structure Value:** 45/60

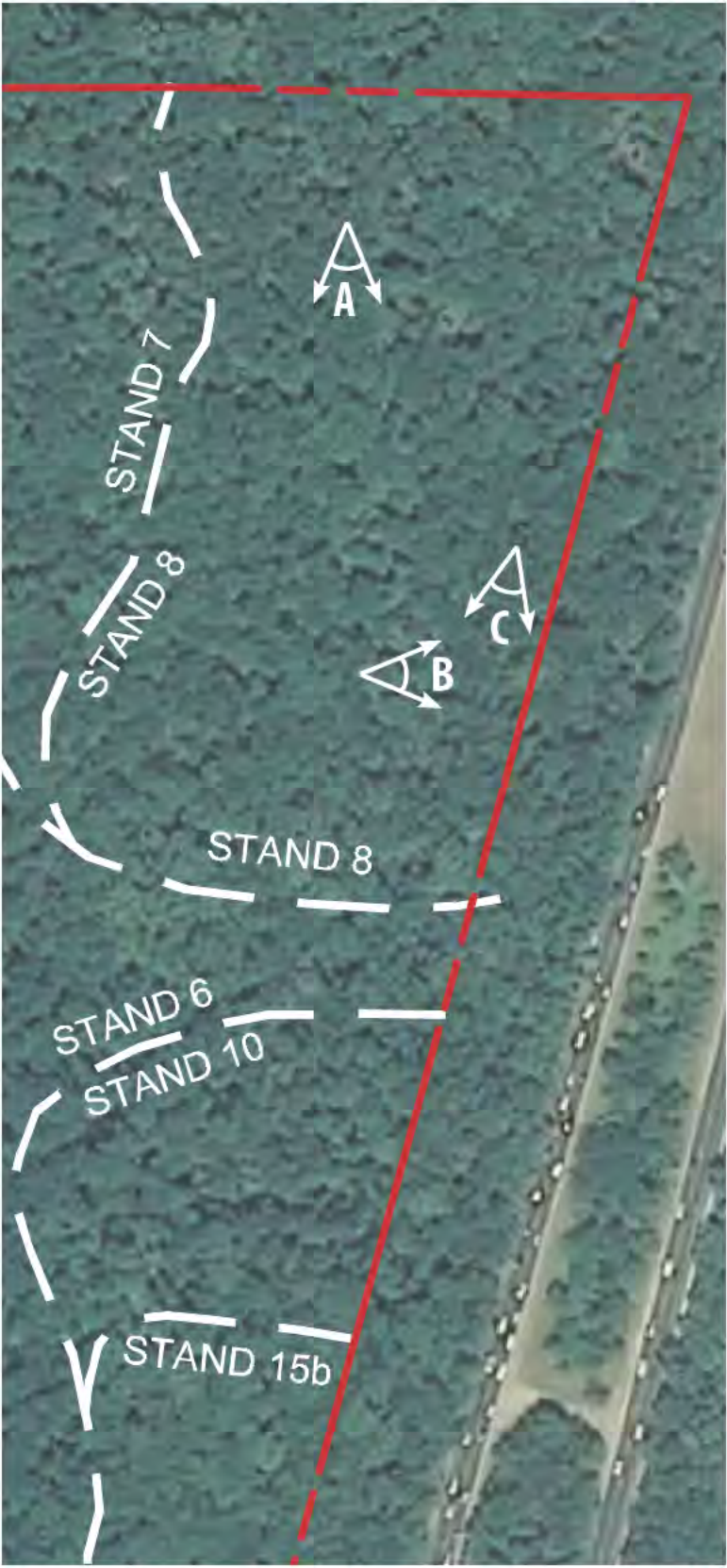


Forest Stand Summary Sheet	
Property Name:	Greenbelt Forest Preserve
Location:	Greenbelt, MD
Prepared By:	CML
Date:	2015-10-21
Stand Variable	Stand # 8
1. Dominant species/Codominant species	<i>Quercus rubra</i> , <i>Quercus alba</i>
2. Forest Association	White oak-Red oak association
3. Successional stage	Mid-successional upland forest
4. Basal area in s.f. per acre	105
5. Size class of dominant species	10" – 29.9" dbh
6. Percent of canopy closure	77%
7. Number of tree species	6
8. Common understory species	<i>Vaccinium angustifolium</i> , <i>Quercus alba</i> , <i>Quercus rubra</i> , <i>Liquidambar styraciflua</i> , <i>Sassafras albidum</i> , <i>Quercus prinus</i> , <i>Ilex opaca</i>
9. Percent of understory cover 3' to 20' tall	10%
10. Number of understory species 3' to 20' tall	7
11. Common herbaceous species	<i>Mitchella repens</i>
12. Percent of herbaceous & woody plant cover 0' to 3' tall	36%
13. List of major invasive plant species & percent of cover	<i>Smilax</i> , 1%
14. Number of standing dead trees 6" dbh or greater	1
15. Comments	-

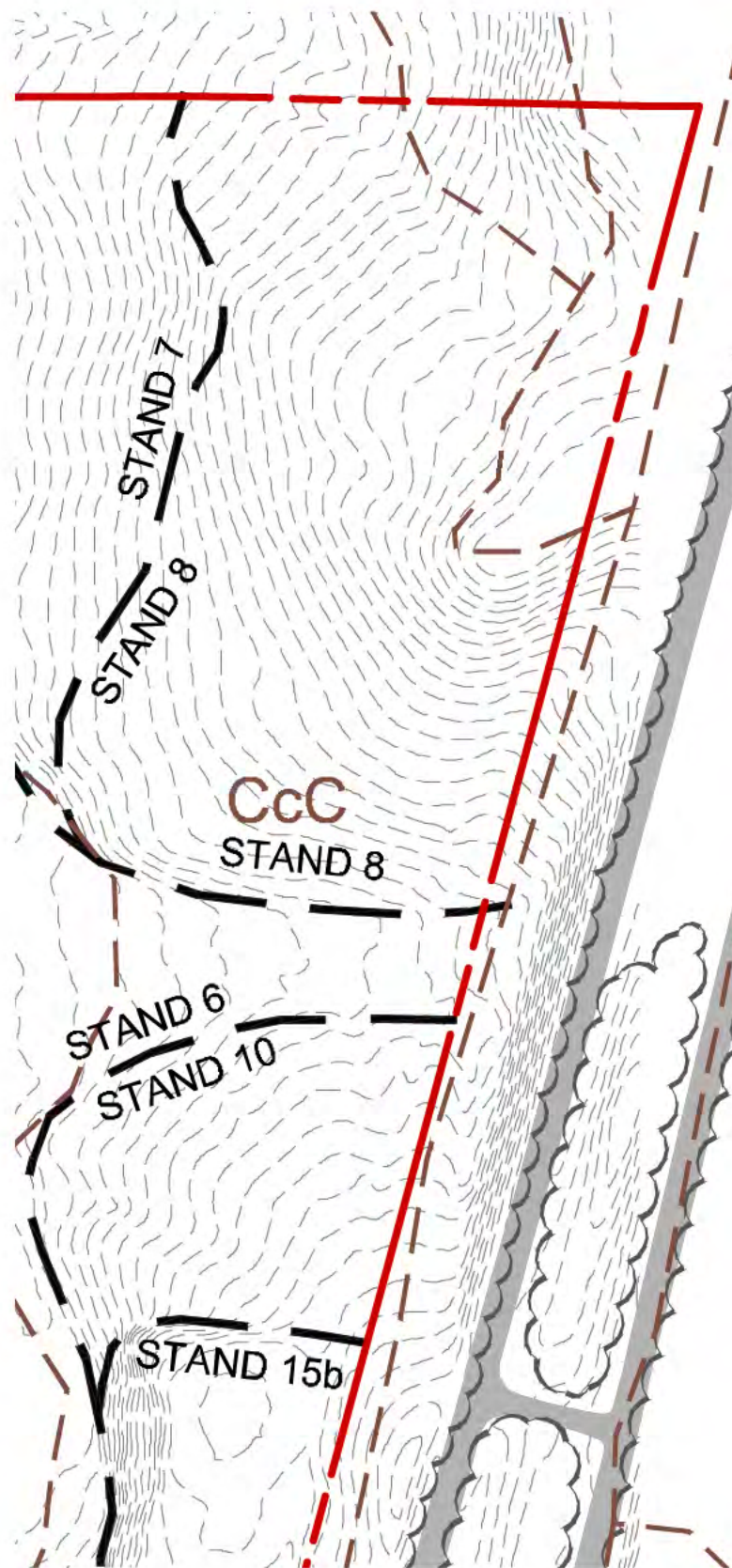
Sheet 1 of 1



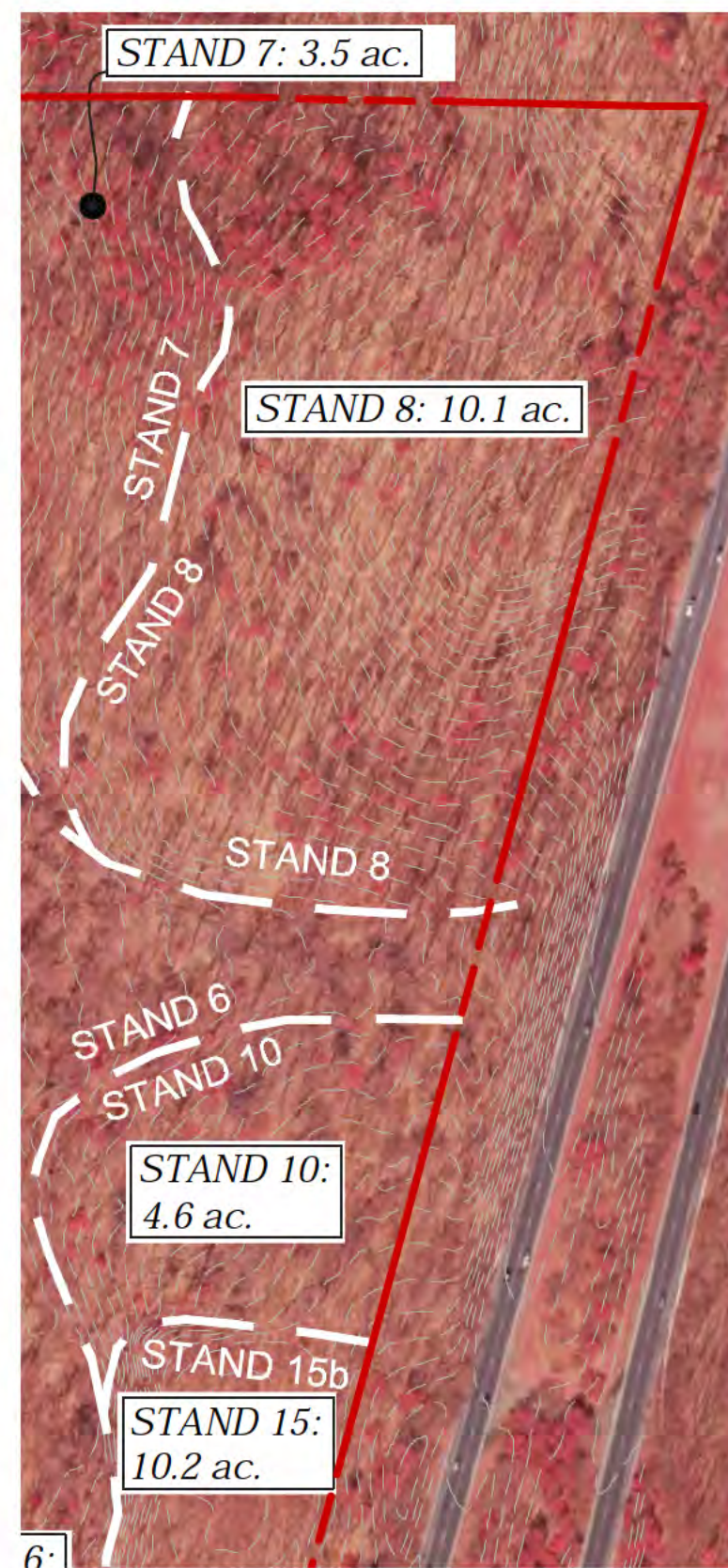
Forest stand boundaries



Color photograph



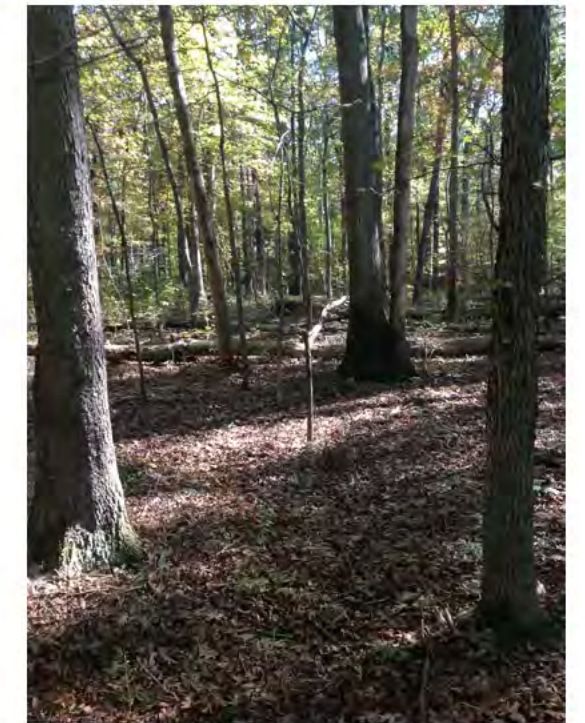
Contours, trails & soil boundaries



Color infrared photograph



A - Stand 8 rises uphill towards the BW Parkway.



B - The understory greenery in the background of the above picture are invasive species encroaching into the preserve from the BW Parkway right-of-way.



C - Access road that parallels the BW Parkway right-of-way.

FOREST STAND 9:

Topography: About 1/3 of Stand 9A is comprised of 15-25% slopes; the remaining 2/3 of Stand 9A include <10% slopes or 10-15% slopes. In the lowlands of Stand 9B, slopes are primarily <10%.

•**Aspect:** Stand 9A slopes very uniformly to the east; the broad bottomland of 9B drains to the east

-Hydrology: Stand 9A receives runoff from the Stand 4 ridge. Erosion is not an issue because of high elevations, minimal disturbance and dense canopy/understory/ground-level vegetation. Stand 9B, receives a very large drainage area, but like 9A, includes well-established vegetation that manages runoff and reduces erosion. S9 includes several intermittent and ephemeral channels and seeps.

•Historic imagery notes: n/a

•FIDS habitat: Present

- **Abiotic factors:** trails, foot bridge, minor signs of erosion

-Invasives: few invasives are currently present (the highest abundance of invasives currently within S9 are near the S9/S6 boundary. However, invasives are threatening to “creep into” S9 from S15, S4 and Northway.

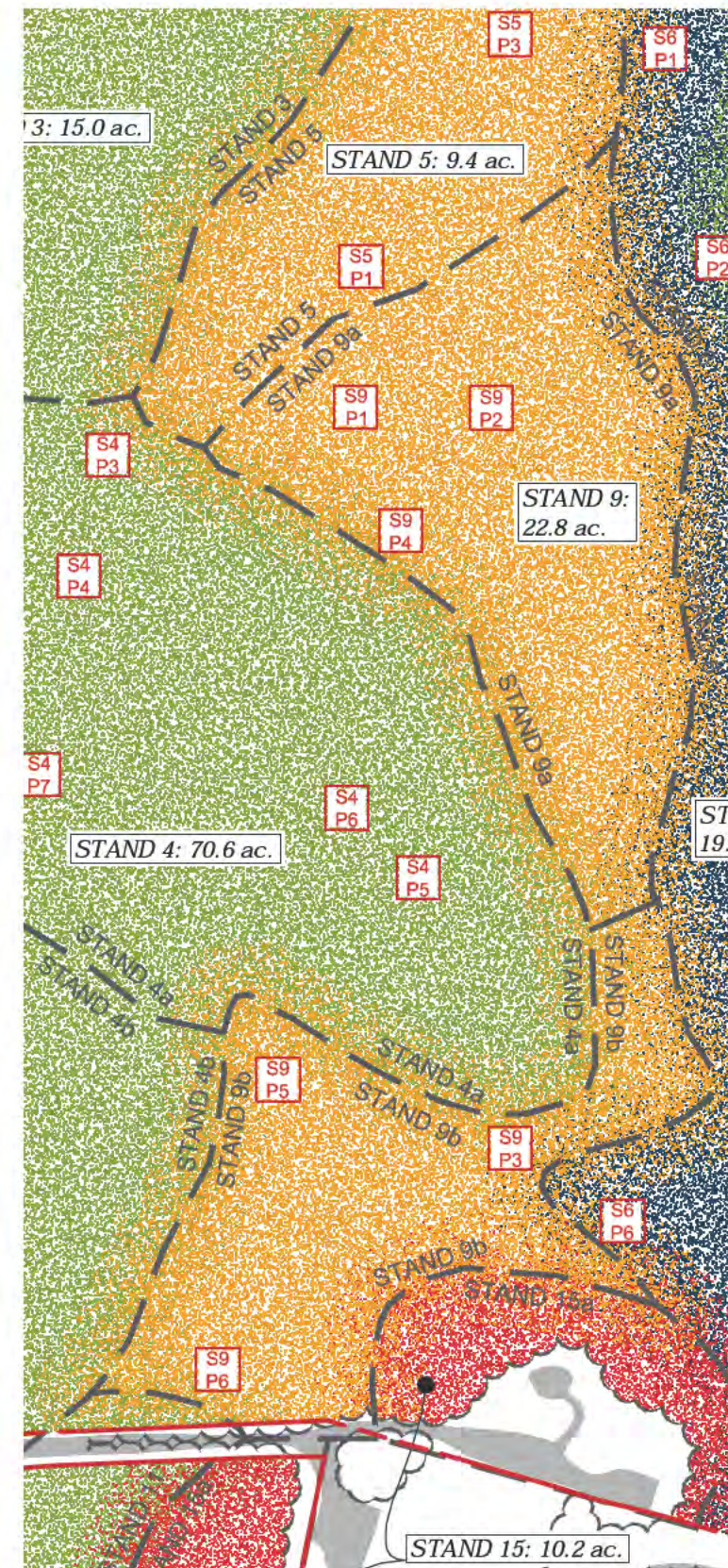
-Unique habitat notes: S9 represents a vegetation transitional area between S4 (to the north and west) and S6 (to the east). The change in topography also defines S9 from the upland S4 and lowland S6. While S9B and S6, as well as S9A and S4, are similar in terms of topography/elevation, their differences in vegetation discern each stand from the other. The majority of S9 was quite dry during the time of assessment. S9B includes an abundance of Sweet gum and Red maple; S9A includes a higher abundance of Oaks and Tulip poplar. Spicebush is prevalent near the S9/S6 border.

• **Adjacent uses:** S9 is bound by S5 to the north; S4 to the west; S11 and S15 to the south; and S6 to the east

•Forest Structure Value: 44/60



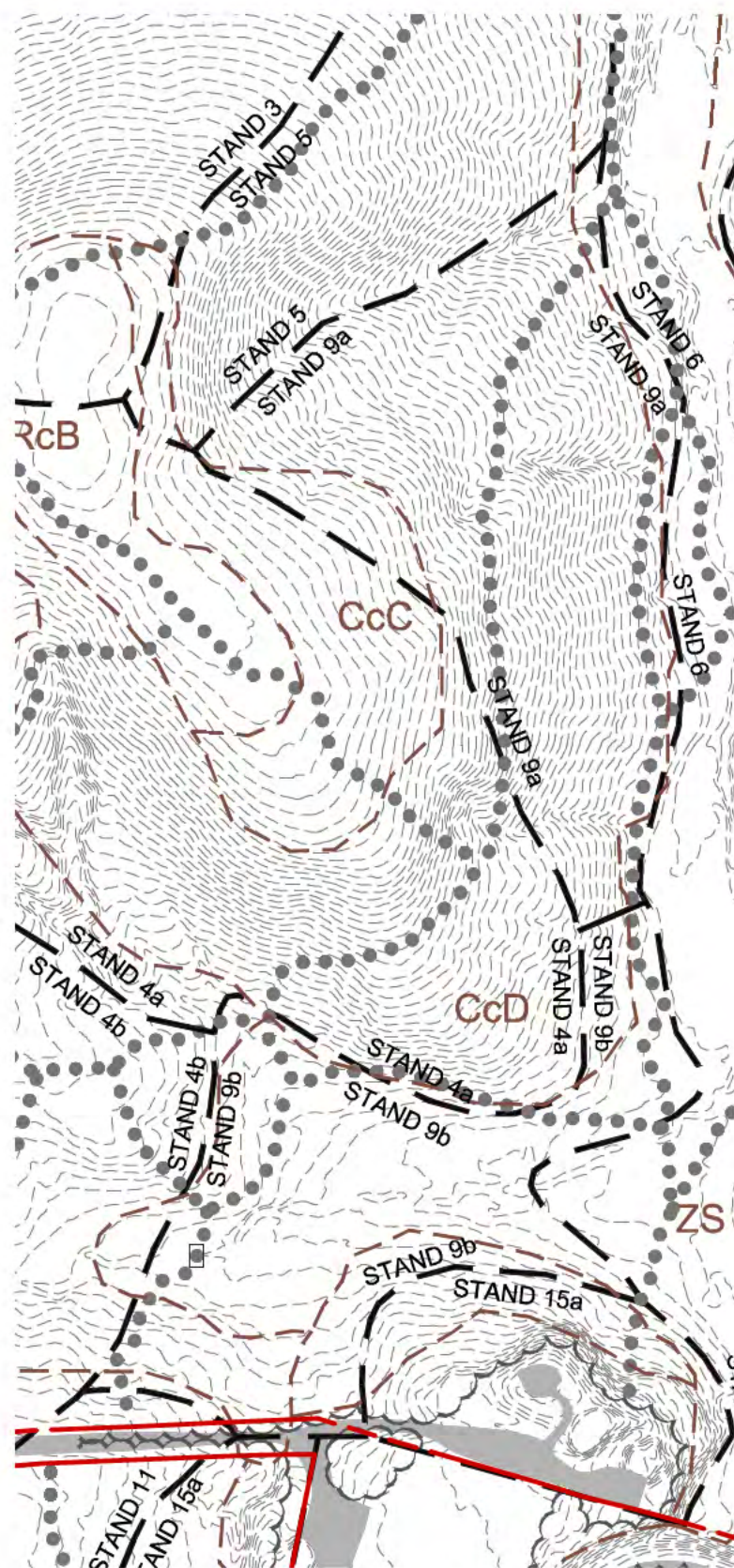
Forest Stand Summary Sheet	
Property Name:	<u>Greenbelt Forest Preserve</u>
Location:	<u>Greenbelt, MD</u>
Prepared By:	<u>CML</u>
Date:	<u>2015-10-21</u>
Stand Variable	Stand # <u>9</u>
1. Dominant species/Codominant species	<i>Liriodendron tulipifera</i> , <i>Quercus alba</i> , <i>Quercus rubra</i> , <i>Liquidambar styraciflua</i>
2. Forest Association	<i>Tulip poplar</i>
3. Successional stage	<i>Mid-succesional upland/lowland forest</i>
4. Basal area in s.f. per acre	107
5. Size class of dominant species	18-29.9" dbh
6. Percent of canopy closure	74%
7. Number of tree species	12
8. Common understory species	<i>Quercus alba</i> , <i>Quercus rubra</i> , <i>Quercus phellos</i> , <i>Liquidambar styraciflua</i> , <i>Ilex opaca</i> , <i>Nyssa sylvatica</i> , <i>Carya tomentosa</i> , <i>Carpinus caroliniana</i> , <i>Vaccinium angustifolium</i> , <i>Fagus grandifolia</i> , <i>Acer rubrum</i> , <i>Viburnum dentatum</i> , <i>Kalmia latifolia</i> , <i>Vaccinium corymbosum</i> , <i>Lindera benzoin</i> , <i>Toxicodendron radicans</i>
9. Percent of understory cover 3' to 20' tall	28%
10. Number of understory species 3' to 20' tall	16
11. Common herbaceous species	<i>Lycopodium</i> , <i>Polystichum acrostichoides</i> , <i>Mitchella repens</i> , <i>Fragaria vesca</i> , <i>Dennstaedtia punctilobula</i>
12. Percent of herbaceous & woody plant cover 0' to 3' tall	43%
13. List of major invasive plant species & percent of cover	<i>Smilax</i> , <i>Microstegium vimineum</i> , <i>Rosa multiflora</i> , 17%
14. Number of standing dead trees 6" dbh or greater (average per plot)	1.2
15. Comments	Many young juvenile sweet gum saplings and dense <i>lycopodium</i> floor (P4) Although S9 varies significantly in topography, elevation and aspect, species density and other factors remain consistent throughout despite the aforementioned differences
Sheet 1 of 1	



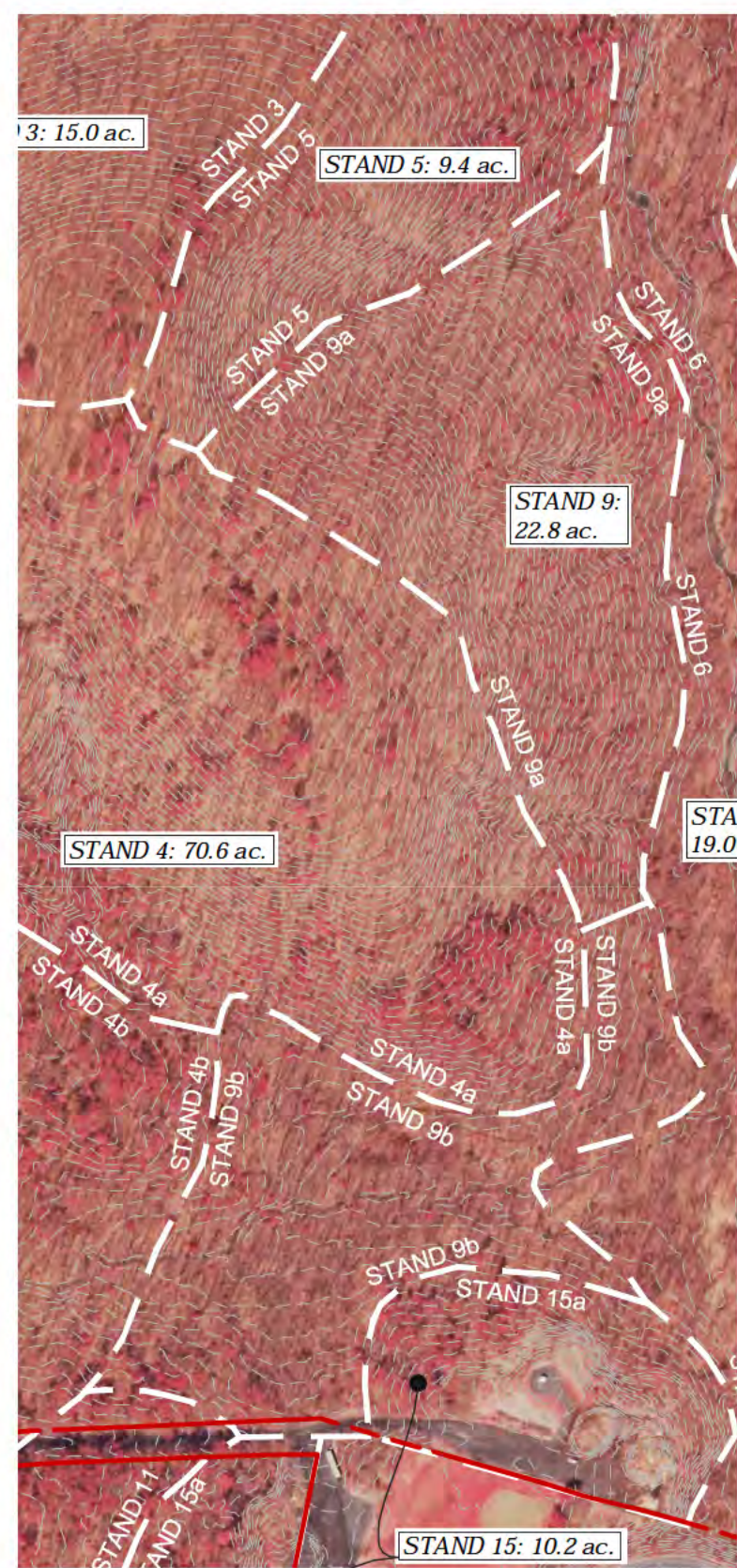
Forest stand boundaries



Color photograph



Contours, trails & soil boundaries



Color infrared photograph



A - *Lycopodium* sp. (ground cedar) on the forest floor.



B - S9 includes very flat topography and especially high species diversity in this area. This picture is taken lowland (valley) near the transition between S9 and S6.



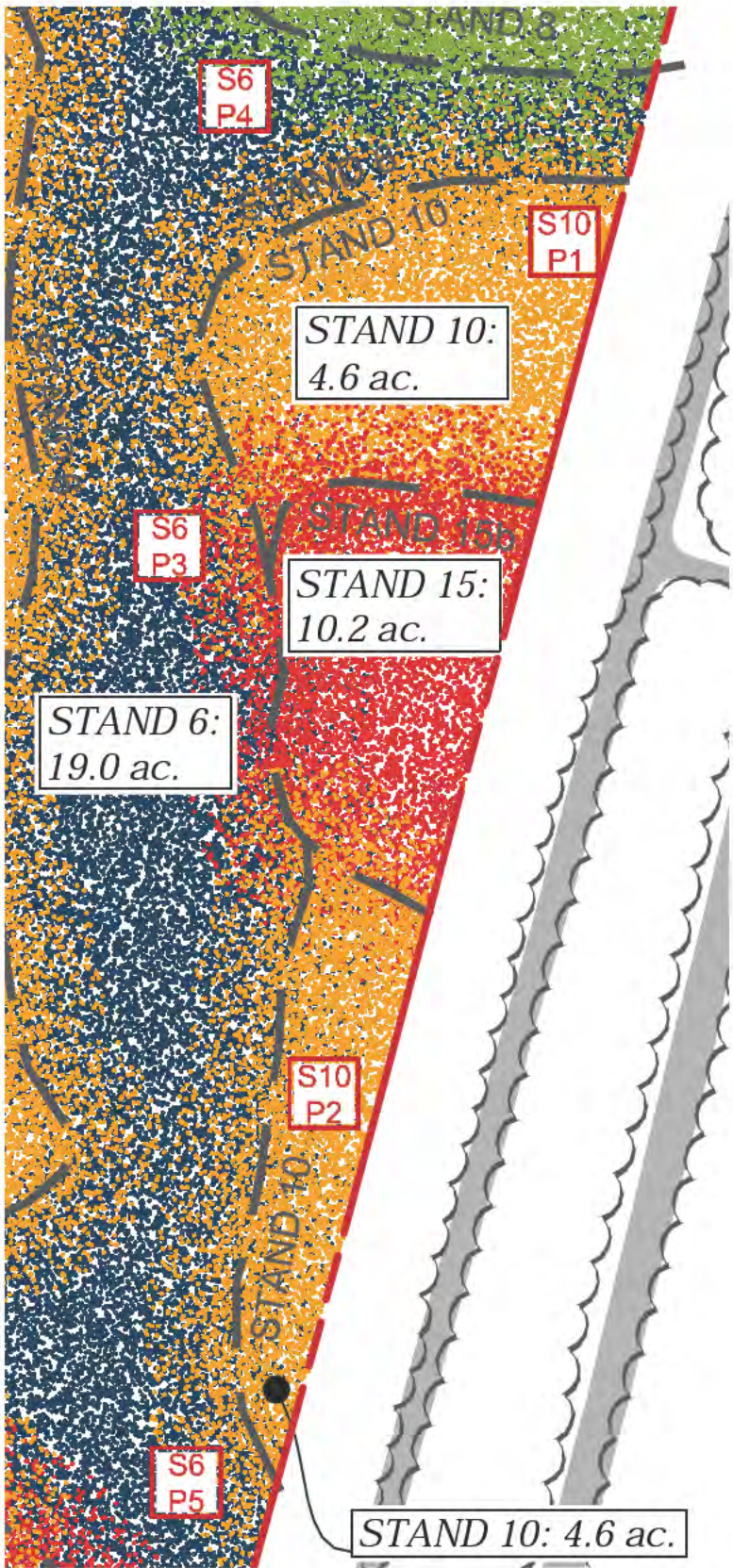
C - Bridge over channel in lowland of S9.

FOREST STAND 10:

- Topography:** Primarily <10% or 10-15%; slopes increase to 15-25% near the Stand 15 boundary
- Elevation:** 110' to 132' ± above sea level; upland forest
- Aspect:** slopes from the high elevations of the adjacent BW Parkway downhill to the west
- Hydrology:** Erosion is not an issue because of high elevations, minimal disturbance and dense canopy/understory/ground-level vegetation. No streams, channels, wetlands, or seeps are present.
- Historic imagery notes:** The dark gray color in the 1938 color indicates older trees and more extensive canopy coverage than adjacent stands. This corresponds to the field-delineated stand line.
- FIDS habitat:** Not present
- Abiotic factors:** Trash from BW Parkway, mass land grading disturbances from adjacent BW Parkway construction stockpile/staging area within S15. Maintained fenceline along BW Parkway right-of-way.
- Invasives:** The current presence of invasive species (Japanese stilt grass, *Smilax sp.*) in S10 was likely exacerbated by the construction of the BW Parkway and its construction stockpile/staging area, which includes *Rosa multiflora*, *Microstegium vimineum*, *Berberis thunbergii*, and *Ailanthus altissima*, among others. These invasive species will continue to spread into S10. Japanese stilt grass likely also spread into S10 from S6.
- Unique habitat notes:** S10 is bisected into a northern section and a southern section by S15. Prior to the construction of the BW Parkway, S10 likely continued along the higher elevations east of S6 to include present-day S10 and S15. This is evidenced by the similar species/forest composition on S10 north and south of S15.
- Adjacent uses:** S10 is bounded by S6 to the west and south, S15 to the north, and the BW Parkway to the east.
- Forest Structure Value:** 44/60



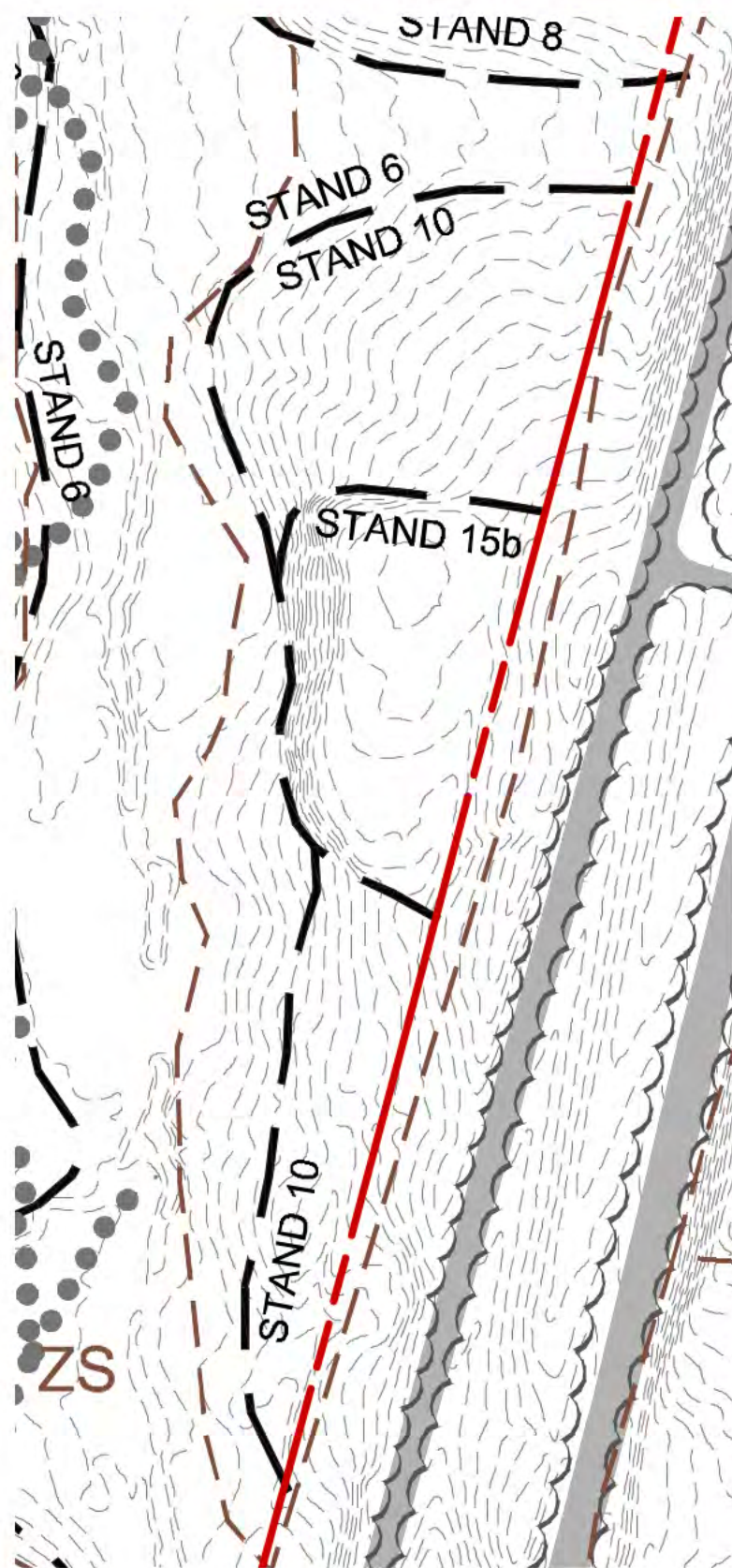
Forest Stand Summary Sheet	
Property Name:	Greenbelt Forest Preserve
Location:	Greenbelt, MD
Prepared By:	CML
Date:	2015-10-23
Stand Variable	Stand # 10
1. Dominant species/Codominant species	<i>Liriodendron tulipifera</i> , <i>Acer rubrum</i> , <i>Liquidambar styraciflua</i> , <i>Nyssa sylvatica</i> , <i>Pinus virginiana</i>
2. Forest Association	Tulip Poplar
3. Successional stage	Mid-successional upland forest
4. Basal area in s.f. per acre	90
5. Size class of dominant species	18-29.9" dbh
6. Percent of canopy closure	71%
7. Number of tree species	11
8. Common understory species	<i>Quercus alba</i> , <i>Quercus rubra</i> , <i>Quercus phellos</i> , <i>Vaccinium angustifolium</i> , <i>Sassafras albidum</i> , <i>Ilex opaca</i> , <i>Kalmia latifolia</i> , <i>Viburnum dentatum</i> , <i>Carpinus caroliniana</i> , <i>Betula nigra</i> , <i>Sassafras albidum</i>
9. Percent of understory cover 3' to 20' tall	30%
10. Number of understory species 3' to 20' tall	11
11. Common herbaceous species	<i>Mitchella repens</i> , <i>Lycopodium</i>
12. Common herbaceous & woody plant cover 0' to 3' tall	30%
13. List of major invasive plant species & percent of cover	<i>Microstegium vimineum</i> , <i>Smilax</i> , <i>Berberis thunbergii</i> , 14%
14. Number of standing dead trees 6" dbh or greater (average per plot)	1.5
15. Comments	-



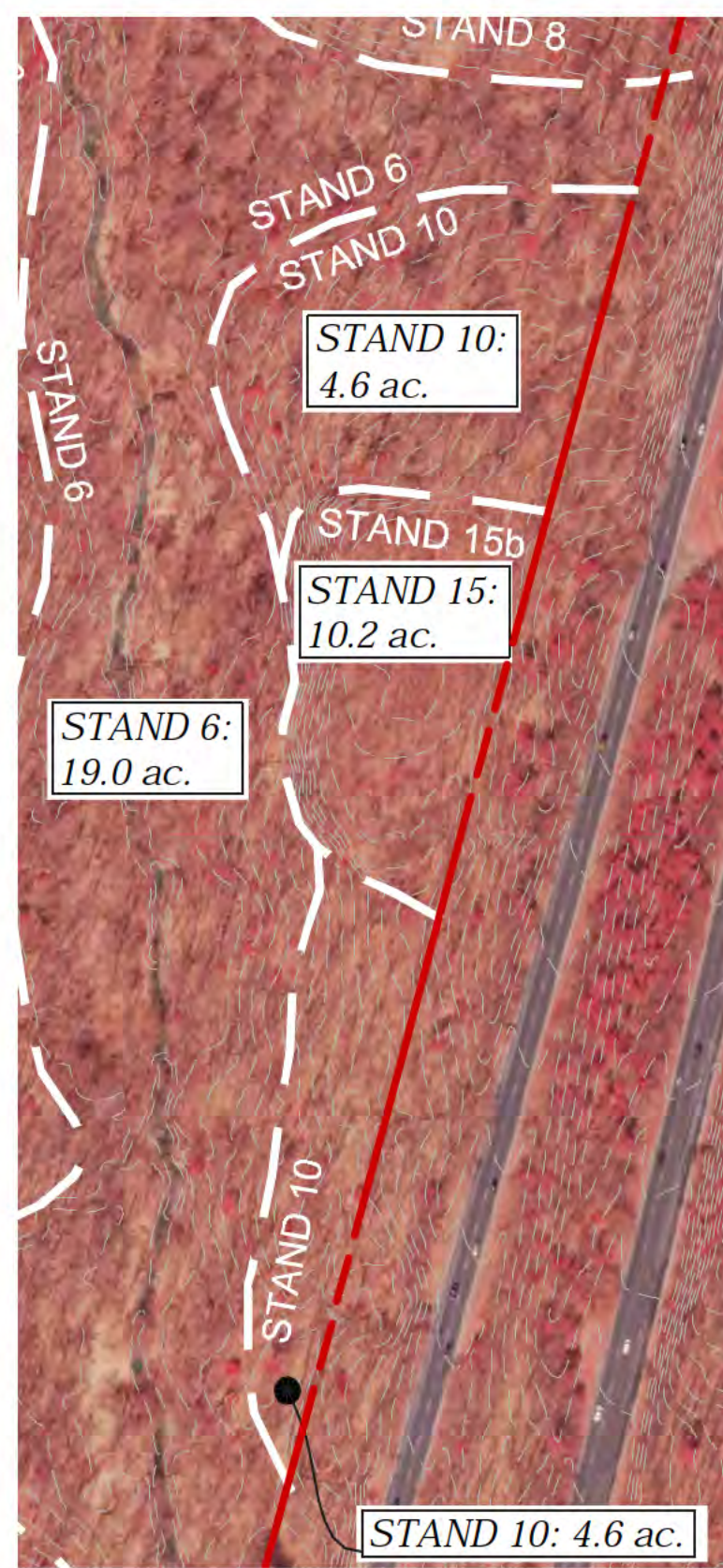
Forest stand boundaries



Color photograph



Contours, trails & soil boundaries



Color infrared photograph



A - Invasives are prevalent at this stand, partly because of the stand's proximity to the BW Parkway. Coniferous trees are also in abundance here.



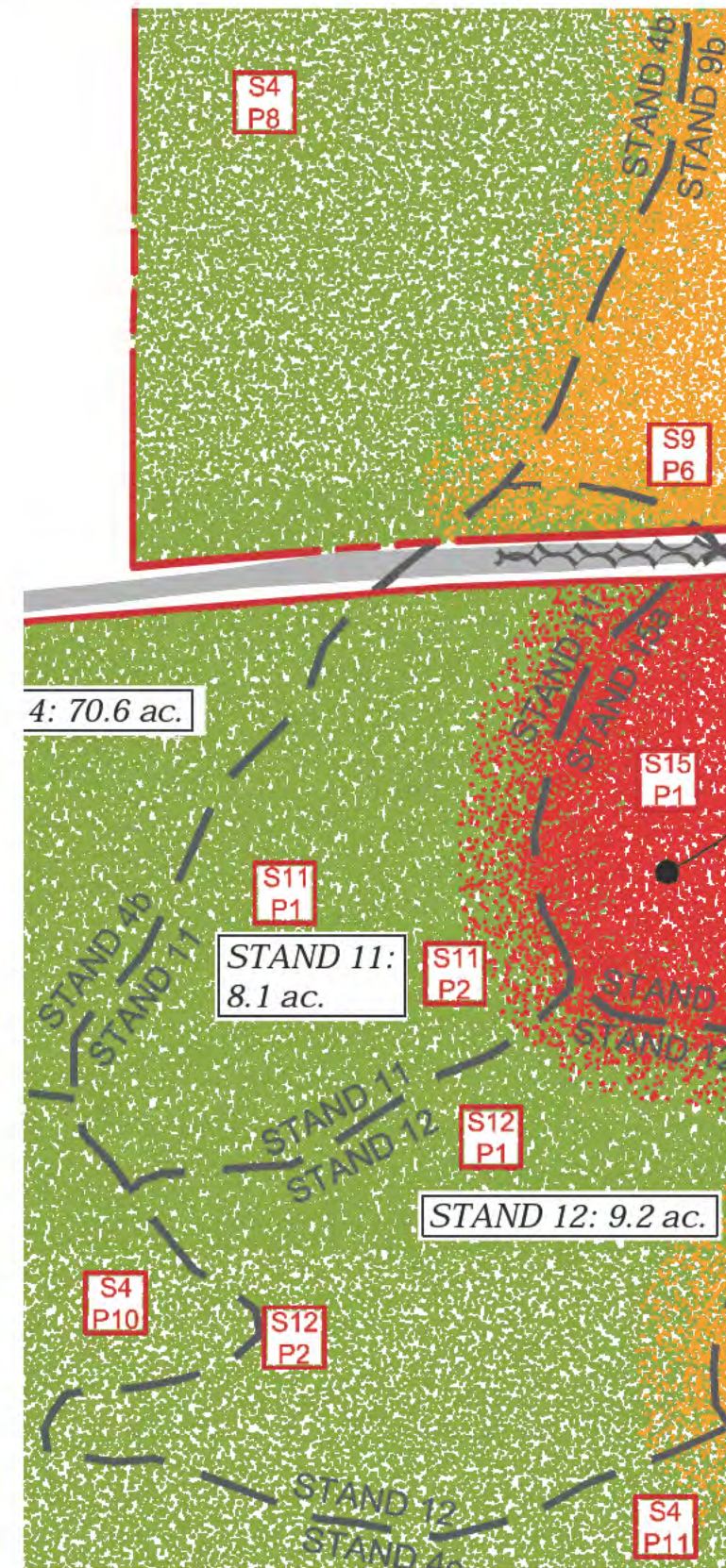
B - This sample plot location was previously "connected" to S10P1. However, a construction staging area was established during the the construction of the BW Parkway. This staging area included mass grading and clearing and eventually became the highly disturbed S15. As a result, S10P1 and S10P2 are physically separated but are otherwise quite similar in structure, health, species and the like.

FOREST STAND 11:

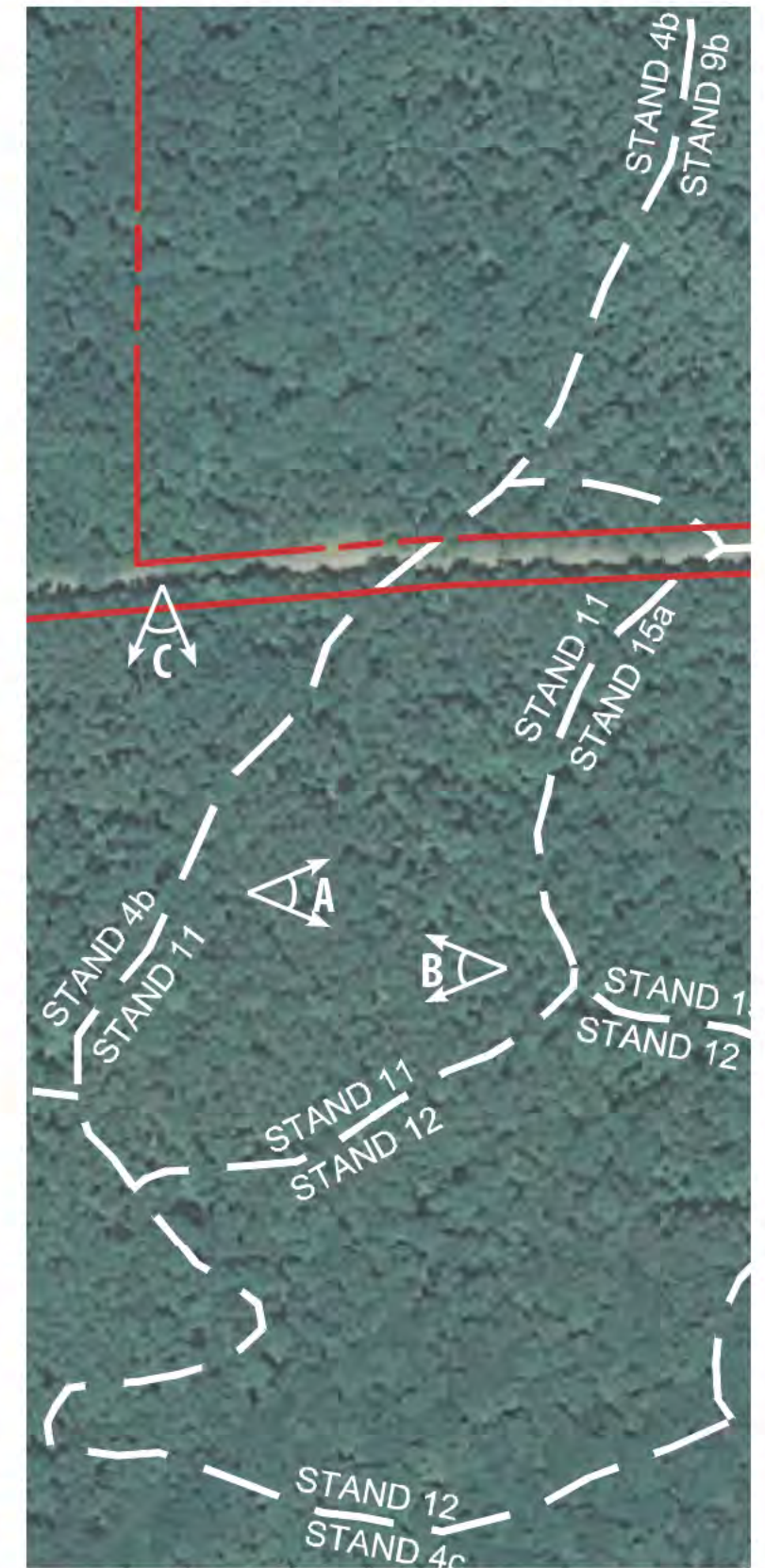
- Topography:** primarily <10%
 - Elevation:** 130' to 178' ± above sea level; upland forest
 - Aspect:** slopes primarily to the NE
 - Hydrology:** S11 receives runoff from the Stand 4. Erosion is not an issue because of high elevations, minimal disturbance and dense canopy/understory/ground-level vegetation. No streams, channels, wetlands, or seeps are present.
 - Historic imagery notes:** The 1938 photo reveals an old road which eventually transformed into a walking trail that is still present today.
 - FIDS habitat:** Present
 - Abiotic factors:** n/a
 - Invasives:** *Smilax*, *Berberis thunbergii*, *Rosa multiflora* are creeping into S11 from forest edge associated with Northway Road.
 - Unique habitat notes:** S11 is defined by an abundance of native coniferous tree species that distinguish the stand against the deciduous dominated surrounded stands. Stand also contains a slightly eroded channel that drains to the north, towards Northway Road (this channel was dry during time of assessment).
 - Adjacent uses:** S11 is bound by S9 to the north, S4 to the west, S15 to the east, and S12 to the south.
 - Forest Structure Value:** 45/60
- 
- KEY MAP**



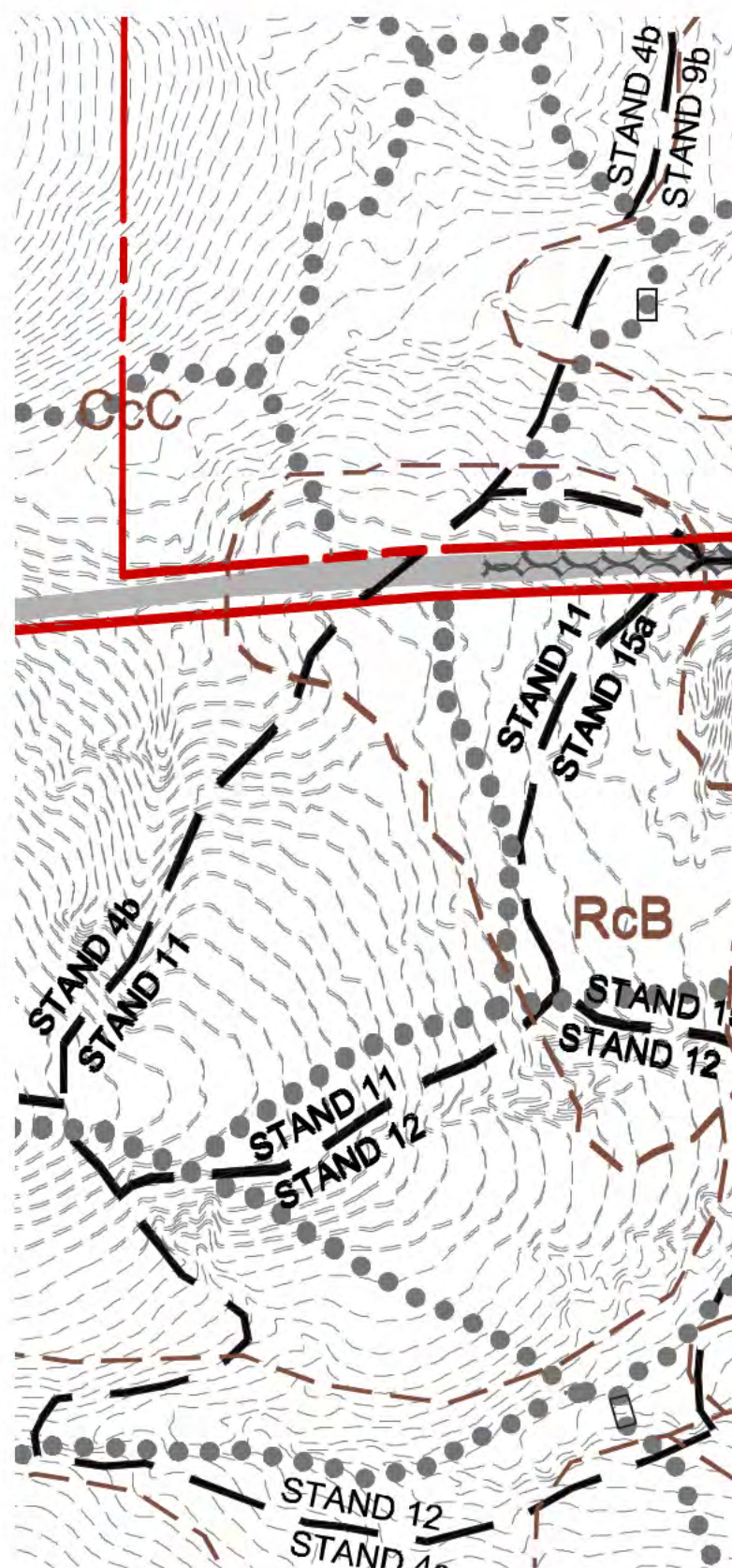
Forest Stand Summary Sheet	
Property Name:	<u>Greenbelt Forest Preserve</u>
Location:	<u>Greenbelt, MD</u>
Prepared By:	<u>CML</u>
Date:	<u>2015-10-30</u>
Stand Variable	Stand # <u>11</u>
1. Dominant species/Codominant species	<i>Pinus virginiana</i>
2. Forest Association	<i>White oak-Red oak association</i>
3. Successional stage	<i>Mid-successional upland forest</i>
4. Basal area in s.f. per acre	145
5. Size class of dominant species	18-29.9" dbh
6. Percent of canopy closure	58%
7. Number of tree species	8
8. Common understory species	<i>Liquidambar styraciflua, Ilex opaca, Quercus rubra, Quercus phellos, Vaccinium angustifolium, Carpinus caroliniana, Quercus alba, Toxicodendron radicans</i>
9. Percent of understory cover 3' to 20' tall	26%
10. Number of understory species 3' to 20' tall	8
11. Common herbaceous species	<i>Lycopodium</i>
12. Common herbaceous & woody plant cover 0' to 3' tall	42%
13. List of major invasive plant species & percent of cover	<i>Smilax, Rosa multiflora, 32%</i>
14. Number of standing dead trees 6" dbh or greater (average per plot)	1
15. Comments	-
Sheet 1 of 1	



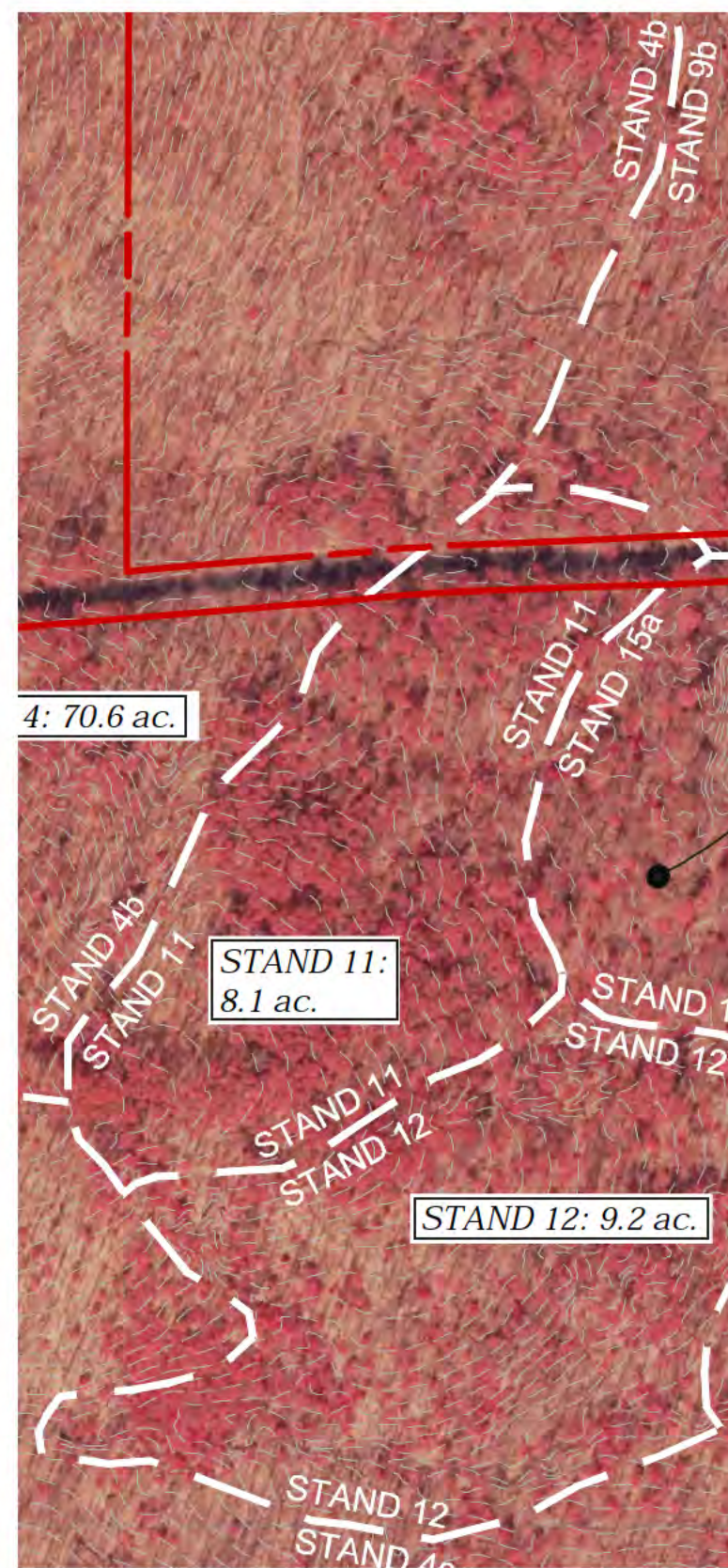
Forest stand boundaries



Color photograph



Contours, trails & soil boundaries



Color infrared photograph



A - This stand is characterized by an abundance of coniferous trees, as indicated by the infrared photograph and verified in the field.

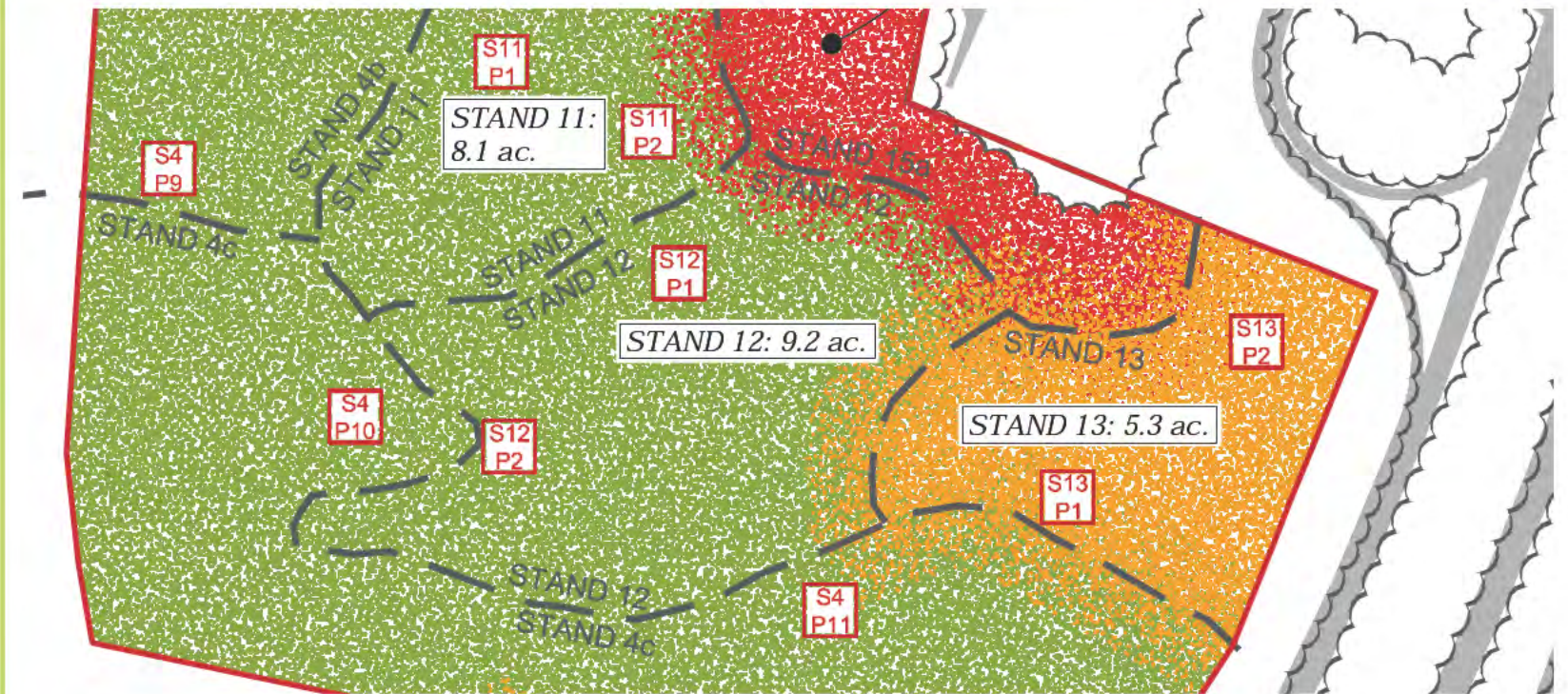


B - As with most stands near areas of prior human disturbance, this stand includes some areas with a forest floor covered in invasive species.



C - This photo, actually taken within Stand 4, is indicative of Northway's typical roadside condition within Stand 11. The roadside ditch isn't stabilized with vegetation, which otherwise would provide erosion control and runoff control.

- Topography:** at the higher elevations of this stand, slopes are <10% or 10-15%; due to erosion, some drainage channels include eroded banks with 15-25% slope or slopes that exceed 25%
- Elevation:** 125' to 168' ± above sea level; upland forest
- Aspect:** higher elevations within this stand are east- or southeast-facing slopes; lower elevations, including drainage channels drain to the east
- Hydrology:** Erosion issues associated with impervious runoff coming from Ridge Road. Runoff from Hamilton Place may also be contributing to erosion of low-lying valleys. S12 includes several ephemeral channels.
- Historic imagery notes:** n/a
- FIDS habitat:** Present
- Abiotic factors:** Several eroded areas likely caused by this area's agricultural past; two distinct piles of trash within one such eroded area
- Invasives:** This interior stand does not include an abundance of invasive species.
- Unique habitat notes:** Stand is defined by a dense understory created by *Ilex opaca* and dense canopy. Previously eroded areas are stabilized by dense native vegetation and create interested "micro-habitats."
- Adjacent uses:** S12 is bound by S11 and S15 to the north, S4 to the west and south and S13 to the east.
- Forest Structure Value:** 44/60



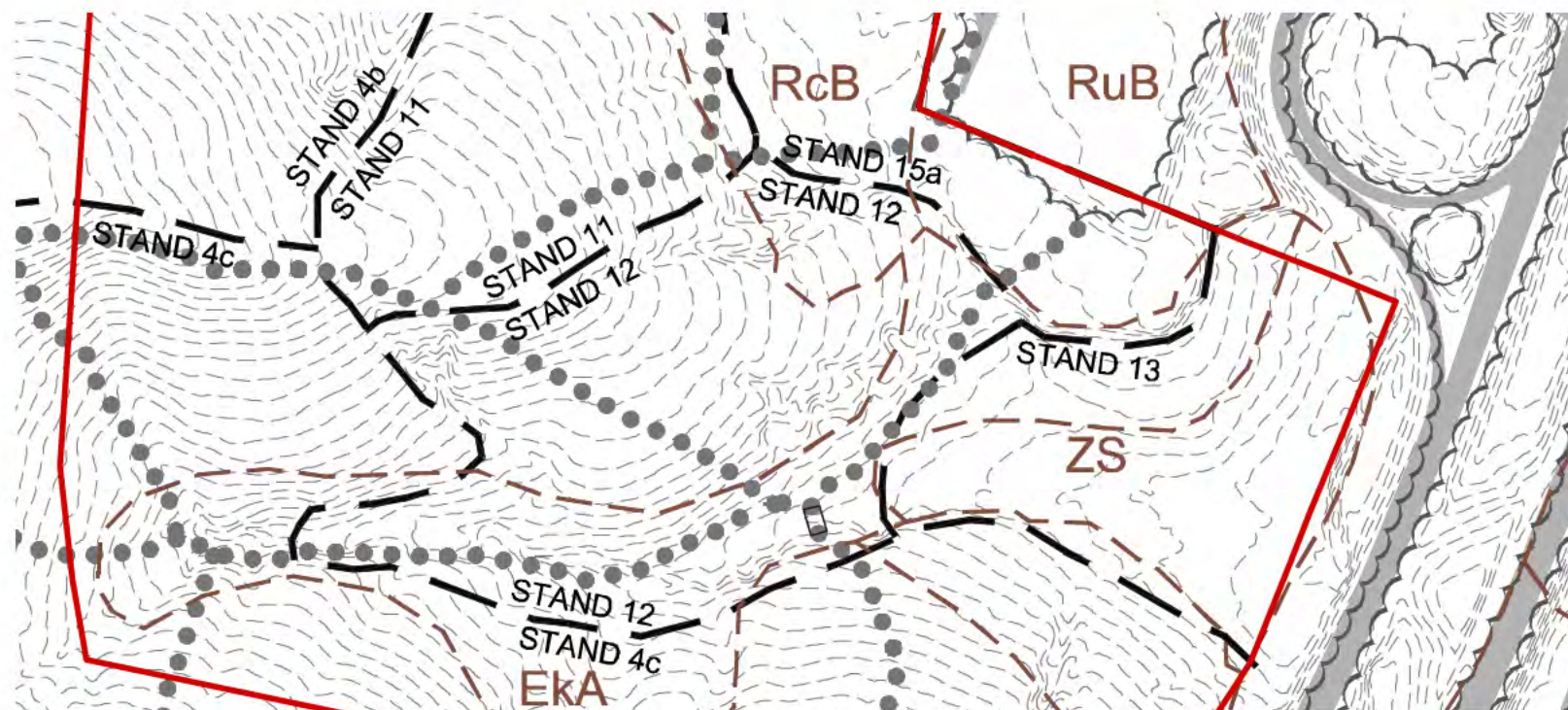
Forest stand boundaries

Forest Stand Summary Sheet	
Property Name:	<u>Greenbelt Forest Preserve</u>
Location:	<u>Greenbelt, MD</u>
Prepared By:	<u>CML</u>
Date:	<u>2015-10-30</u>
Stand Variable	Stand # <u>12</u>
1. Dominant species/Codominant species	<i>Pinus virginiana, Quercus alba, Quercus rubra</i>
2. Forest Association	<i>White oak-Red oak association</i>
3. Successional stage	<i>Mid-successional upland forest</i>
4. Basal area in s.f. per acre	125
5. Size class of dominant species	10" - 29.9" dbh
6. Percent of canopy closure	74%
7. Number of tree species	10
8. Common understory species	<i>Sassafras albidum, Quercus rubra, Nyssa sylvatica, Ilex opaca, Quercus alba, Vaccinium angustifolium, Carya tomentosa, Liquidambar styraciflua, Cornus florida, Fagus grandifolia</i>
9. Percent of understory cover 3' to 20' tall	55%
10. Number of understory species 3' to 20' tall	10
11. Common herbaceous species	<i>Lycopodium, Mitchella repens, Dennstaedtia punctilobula</i>
12. Common herbaceous & woody plant cover 0' to 3' tall	16%
13. List of major invasive plant species & percent of cover	<i>Smilax</i> , 4%
14. Number of standing dead trees 6" dbh or greater (average per plot)	1
15. Comments	<i>Dense Ilex opaca understory and Quercus canopy</i>

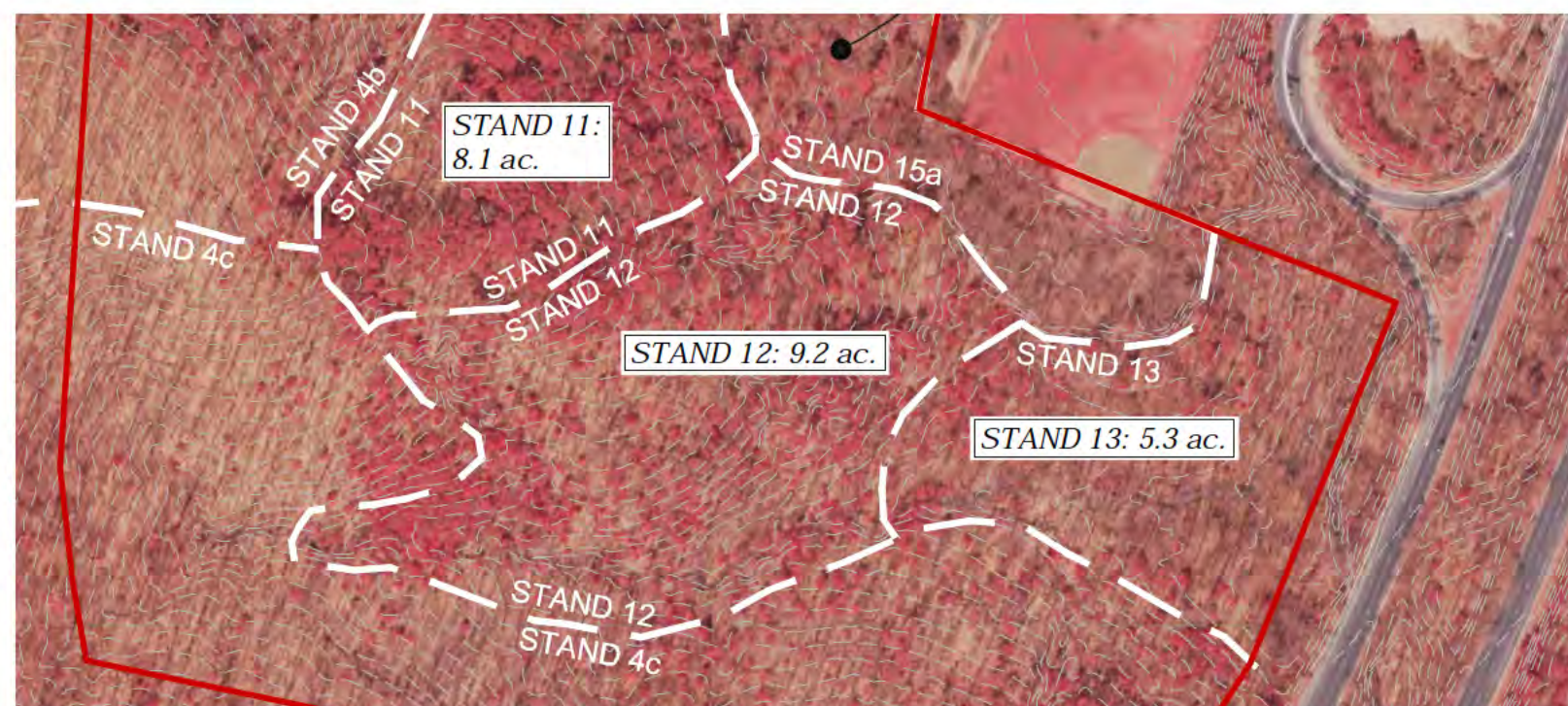
Sheet 1 of 1



Color photograph



Contours, trails & soil boundaries



Color infrared photograph



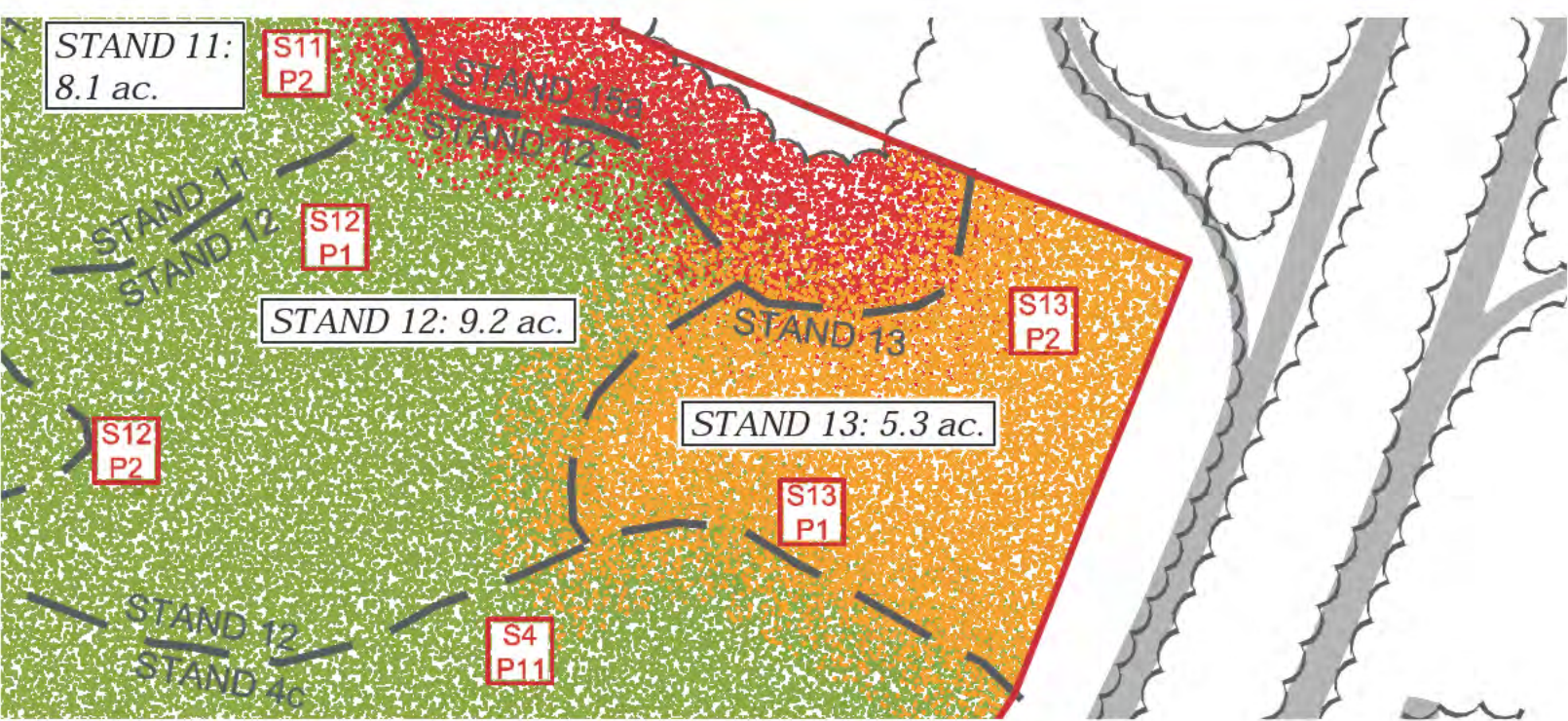
A - This stand includes several deep channels that were likely created during/after the area's agricultural past. However, American hollies (*Ilex opaca*) and other conifers have since stabilized such eroded areas.



B - The density of hollies often obscures the presence of eroded channels.

FOREST STAND 13:

- Topography:** primarily <10%
- Elevation:** 110 to 128' ± above sea level; upland/lowland forest
- Aspect:** broad bottomland area drains to the east
- Hydrology:** S13's drainage area includes parts of S4, 11, 12, 14, and 15. Runoff drains towards the ephemeral channel running through S13. This channel has a very broad floodplain.
- Historic imagery notes:** n/a
- FIDS habitat:** Present
- Abiotic factors:** BW Parkway right-of-way fence; bank erosion/highly incised channel that parallels the BW Parkway; pile of palettes are present near the S13/S4 boundary.
- Invasives:** *Ailanthus altissima*, *Rosa multiflora*, *Lonicera tatarica*, *Smilax* sp. are spreading into S13 from the dump site area within S15.
- Unique habitat notes:** Outstanding habitat of *Lindera benzoin* (Spicebush) in S13's lowland area. Sweet gum, Red maple are also highly prevalent. Very flat bottomland area includes an especially shallow channel that flows from west-east. S13 receives drainage from S4, S11, S12, S13, and S14.
- Adjacent uses:** Bound by S15 and the BW interchange ramp to the north, S12 to the west, S4 to south and the BW Parkway to the east.
- Forest Structure Value:** 43/60



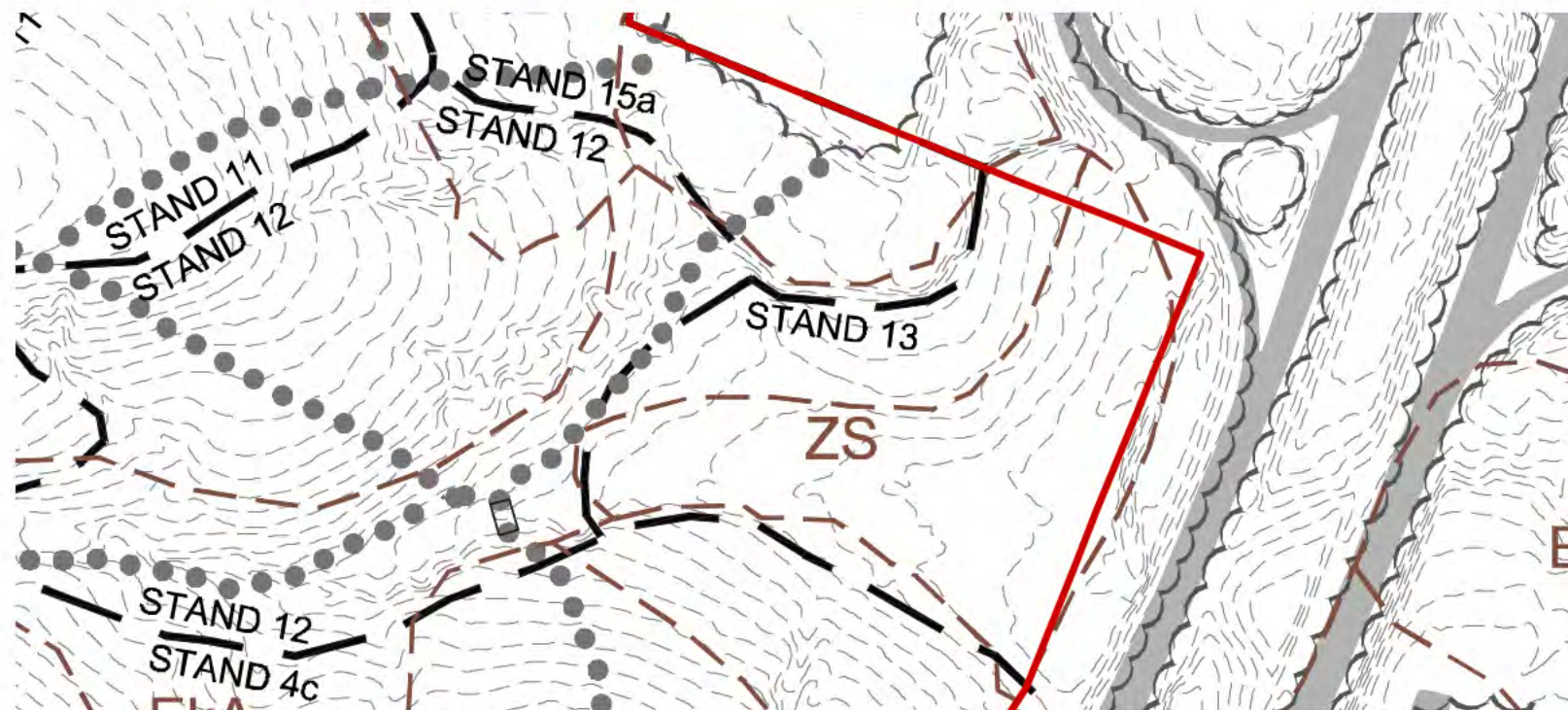
Forest stand boundaries

Forest Stand Summary Sheet	
Property Name:	Greenbelt Forest Preserve
Location:	Greenbelt, MD
Prepared By:	CML
Date:	2015-10-30
Stand Variable	Stand # 13
1. Dominant species/Codominant species	Acer rubrum, Liquidambar styraciflua
2. Forest Association	Tulip Poplar
3. Successional stage	Mid-successional upland/lowland forest
4. Basal area in s.f. per acre	135
5. Size class of dominant species	18-29.9" dbh
6. Percent of canopy closure	83%
7. Number of tree species	6
8. Common understory species	Ilex opaca, Viburnum prunifolium, Lindera benzoin, Toxicodendron radicans
9. Percent of understory cover 3' to 20' tall	32%
10. Number of understory species 3' to 20' tall	4
11. Common herbaceous species	Fragaria vesca, Dennstaedtia punctilobula, Polystichum acrostichoides
12. Common herbaceous & woody plant cover 0' to 3' tall	4%
13. List of major invasive plant species & percent of cover	Microstegium vimineum, Berberis thunbergii, Smilax, Hedera helix, 12%
14. Number of standing dead trees 6" dbh or greater (average per plot)	0.5
15. Comments	Understory is predominantly Lindera benzoin (P1) Although S13 varies in topography, elevation and aspect, species density and other factors remain consistent throughout despite the aforementioned differences

Sheet 1 of 1



Color photograph



Contours, trails & soil boundaries



Color infrared photograph



A - This bottomland stand includes a dense cover of Spicebush (*Lindera benzoin*) with yellow leaves in the fall. The open sky in the background of this picture is the "break" in the canopy provided by the BW parkway.



B - Several clusters of large trees are present in this stand, here shown in an area slightly uphill from Photo A. The BW Parkway right-of-way chain link is visible in the background of this photograph.



C - An incised channel flows from the Preserve, beneath the chain-link fence and into the BW Parkway right-of-way fence.

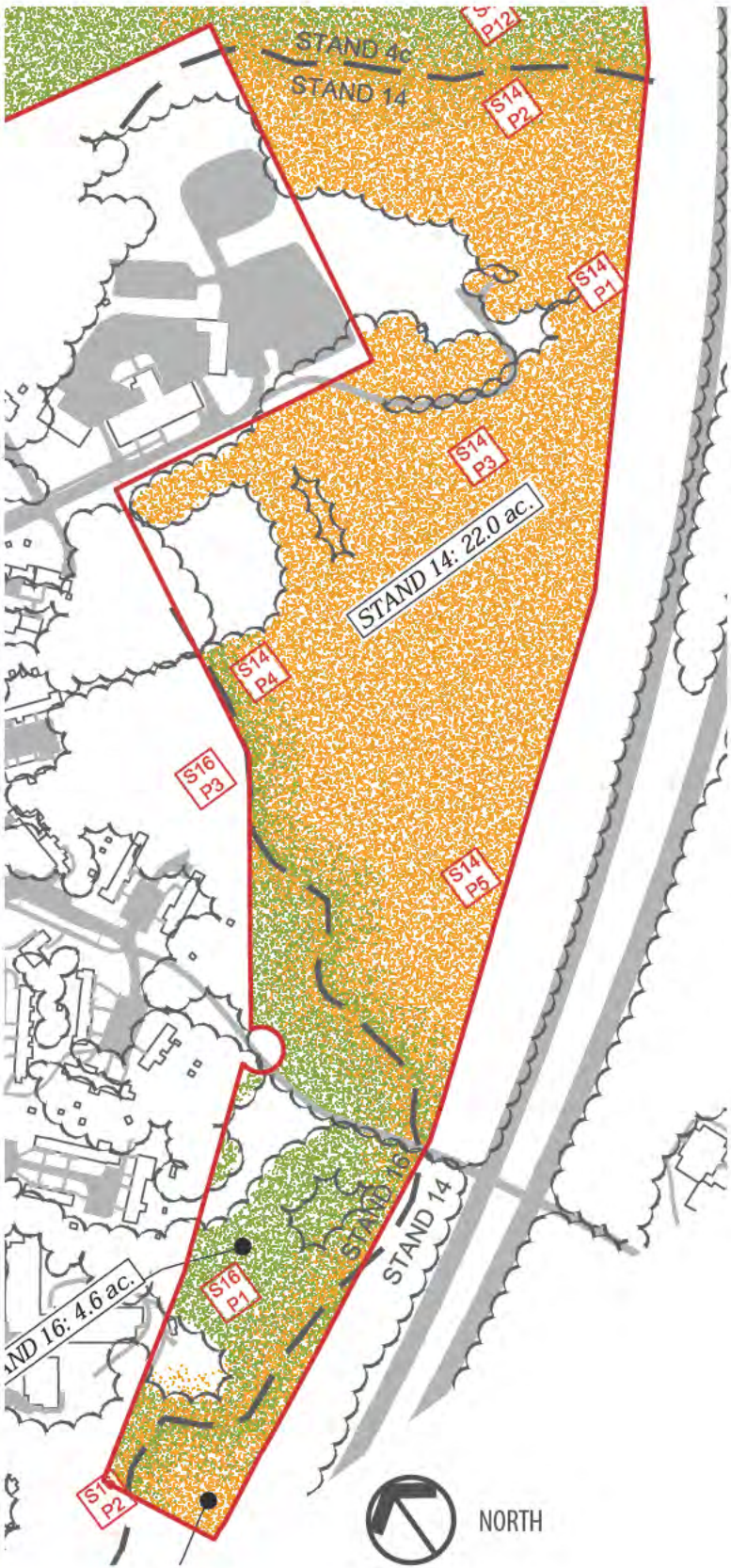
FOREST STAND 14:

- Topography:** primarily <10%; some slopes are 10-15% on the south-facing slope immediately south of the community garden area; a drainage channel (draining to a culvert under I-295) includes some slopes 15-25% or >25% due to erosion
- Elevation:** 150' to 194' ± above sea level; upland forest
- Aspect:** primarily south- or southeast-facing slopes
- Hydrology:** Although in very close proximity to the community garden, very few signs of erosion are present. A culvert extends beneath the BW Parkway receives water from an intermittent stream. S14 receives drainage from Hamilton Place and the northeast-facing slopes of S16.
- Historic imagery notes:** The 1938 photo reveals that S14 is almost entirely agriculture. The 1952 photo reveals the abandonment of such agriculture and the resulting coverage of early seral species. Today, S14 is dominated by Sweet gums and Red maples, two species that frequently "pioneer" abandoned fields. A north-south road is visible in the 1938 photograph. This road is obscured by increased canopy coverage in the 1952 photo; however, the "scar" of this road is still visible, both in the 1952 photograph and present day field investigations. Cleared areas in the 1938 photo made was for community gardens by 1952. By 1979, forest succession occurred in some areas south and west of community gardens.
- FIDS habitat:** Not present
- Abiotic factors:** Trash associated with the community garden. S14 includes disturbance/evidence associated with a former road (since abandoned), as well as agricultural relics (concrete, farm equipment, rock piles). Highly disturbed stand.
- Invasives:** Very high abundance of invasive species are spreading into S14 as a result of the forest edge condition created by the community garden. Areas further away from the community garden (to the north) are less impacted by invasive species. Invasives are also creeping in from the BW Parkway.
- Unique habitat notes:** North of the community garden and Hamilton Cemetery, the understory is dominated by many young, juvenile Red maples and Sweet gum; some larger Black gum, Oak and Red maple canopy trees, as well. The forest south of the community garden is more diverse and more representative of the species associated with the entirety of the Southern and Northern Preserves (includes Oaks, Red maple, American holly, Sweet gum, and Beech).
- Adjacent uses:** S14 is bound by S4 to the north, community association buildings to the west, BW Parkway to the E/SE and S16 to the west.
- Forest Structure Value:** 40/60



Forest Stand Summary Sheet	
Property Name:	Greenbelt Forest Preserve
Location:	Greenbelt, MD
Prepared By:	CML
	Date: October/November 2015
Stand Variable	Stand # 14
1. Dominant species/Codominant species	Acer rubrum, Liquidambar styraciflua
2. Forest Association	Tulip Poplar
3. Successional stage	Early/Mid-successional upland forest
4. Basal area in s.f. per acre	122
5. Size class of dominant species	18-29.9" dbh
6. Percent of canopy closure	75%
7. Number of tree species	9
8. Common understory species	Fagus grandifolia, Prunus serotina, Liquidambar styraciflua, Vaccinium angustifolium, Vaccinium corymbosum, Ilex opaca, Quercus alba, Prunus serotina, Quercus prinus, Quercus rubra, Toxicodendron radicans, Vitis sp.
9. Percent of understory cover 3' to 20' tall	10%
10. Number of understory species 3' to 20' tall	12
11. Common herbaceous species	Allium sp., Mitchella repens
12. Common herbaceous & woody plant cover 0' to 3' tall	5%
13. List of major invasive plant species & percent of cover	Wisteria, Microstegium vimineum, Berberis thunbergii, Smilax, Rosa multiflora 55%
14. Number of standing dead trees 6" dbh or greater (average per plot)	0.8
15. Comments	Area seems highly disturbed. Many small standing trees attribute to a higher basal count; however it appears to be less dense (P3)

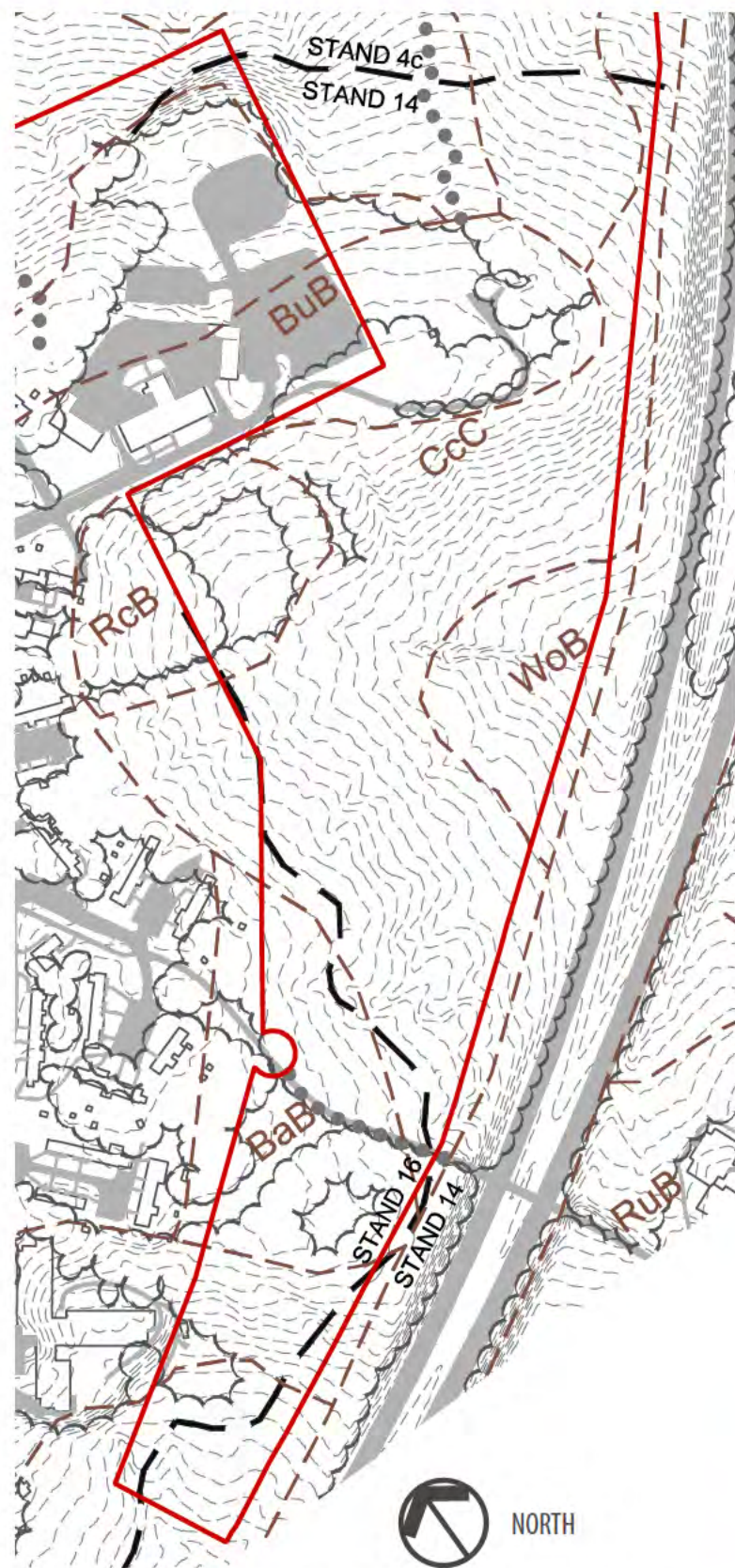
Sheet 1 of 1



Forest stand boundaries



Color photograph



Contours, trails & soil boundaries



Color infrared photograph



A - Invasive species creep into the preserve after establishing in disturbed areas. Invasive species take advantage of sunlight on the forest floor, provided canopy openings provided by the community garden and the BW parkway.



B - S14 includes several indications of the prior use and the resulting impacts on the landscape. This erosion is located in close proximity to abandoned agricultural relics.



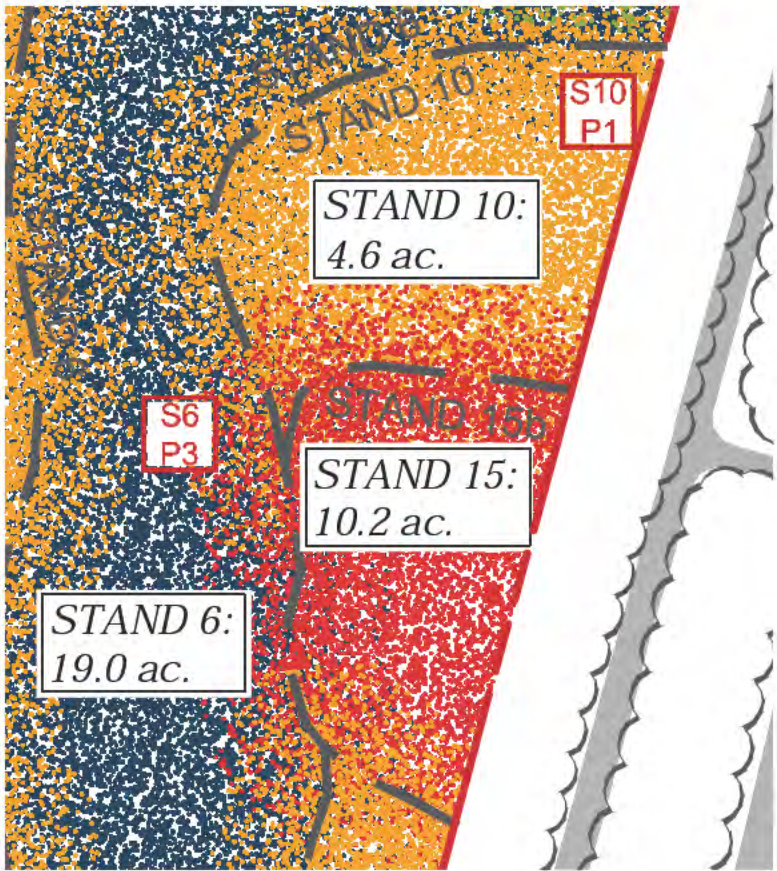
C - The unnatural topography seems to indicate an abandoned road that once ran through this area. Historic aerial photographs confirm the presence of old farm roads.



D - Abandoned concrete, metal and tools, in addition to eroded channels, similarly indicate prior uses and human impacts on the landscape. Such insights reveal glimpses into the Preserve's cultural history.

FOREST STAND 15:

- Topography:** irregular landforms and highly variable slopes due to destructive nature of prior uses
- Elevation:** 108 to 154' ± above sea level; upland forest
- Aspect:** irregular landforms and highly variable slopes due to destructive nature of prior uses; western-facing slopes at the BW Parkway construction staging site; north-facing slopes at the composting area; west facing-slopes at the asphalt millings stockpile; south-facing slopes at the trash dump south of the athletic fields
- Hydrology:** Erosion potential is very high due to the destructive past/present uses. Runoff from the compost pile is particularly harmful for the adjacent channel within S6. Standing water present west of the asphalt millings stockpile. Runoff from the dump site (south of the athletic facility) drains directly into Stand 13. An incised channel is present west of the asphalt millings pile.
- Historic imagery notes (near I-295 construction stockpile):** S15 in this area is defined by the construction staging/stockpile visible in the 1979 photograph. An access road leads from I-295 to this staging area. A change in forest structure is clearly visible in the 1979 photograph.
- Historic imagery notes (near present-day compost pile & athletic fields):** Agriculture shown in the 1938 photograph (farm buildings, clearing, farm pond) contributed to highly disturbed areas still evident today. Forest was cleared towards S13, eventually making way for the trash dump pile and a severely disturbed landscape that still exists today. A woodlot is visible in the 1938 photograph (west of the 1938 farm pond), as evidenced by dark gray color. The 1979 photograph reveals forest clearing that would ultimately make way for composting visible in the 2011 photograph. See the following pages for more information.
- FIDS habitat:** Not present
- Abiotic factors:** highly disturbed - BW Parkway stockpile/staging area, dump site, abandoned farm pond, erosion, mass grading, BW Parkway fence and maintained edge
- Invasives:** major abundance of invasives (Green briar, Japanese stilt grass, *Ailanthus altissima*, *Pyrus calleryana*, *Hedera helix*, *Mimosa*, *Berberis thunbergii*, Tartarian honeysuckle, *Rosa multiflora*, *Phragmites*, among others). Invasives have thrived on past land disturbances and forest edges.
- Unique habitat notes:** n/a
- Adjacent uses:** In the BW Parkway staging/stockpile area, S15 is bound by S10 to the north and south, the BW Parkway to the east, and S6 to the west. When adjacent to the athletic fields, S15 is bound by S11 to the west, S12 and S13 to the south, the BW Parkway interchange ramps to the east, and S6 to the north.
- Forest Structure Value:** 43/60



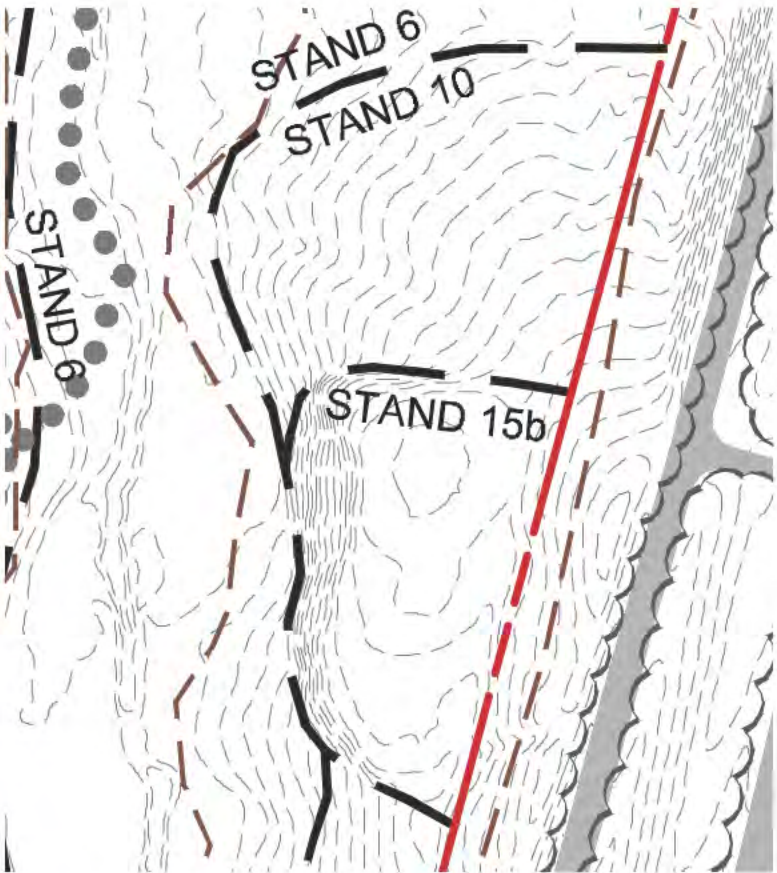
Forest stand boundaries



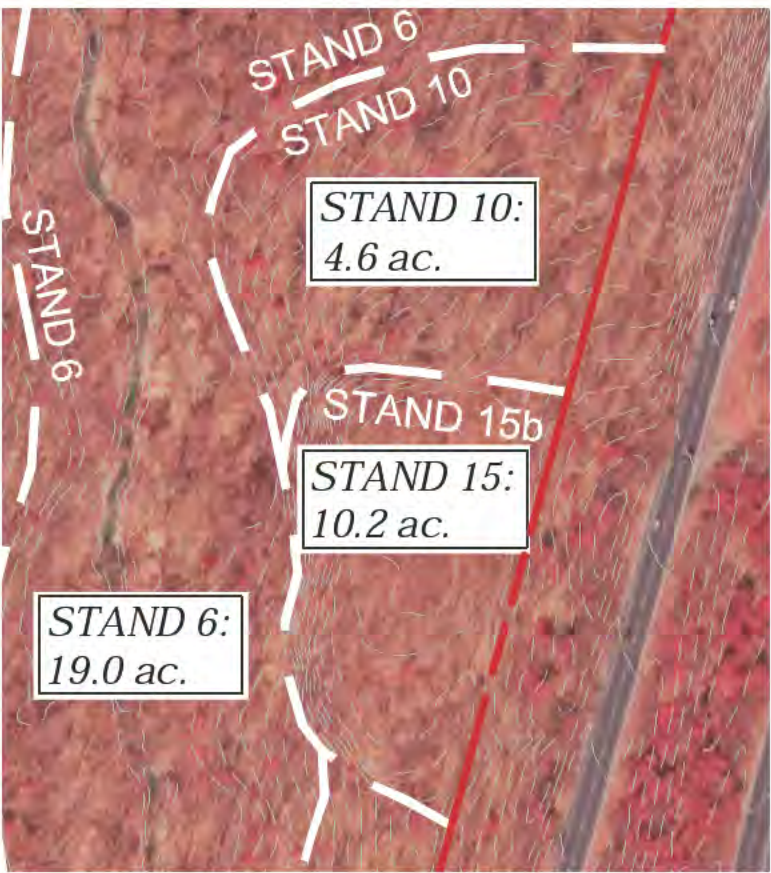
Color photograph

Forest Stand Summary Sheet	
Property Name:	Greenbelt Forest Preserve
Location:	Greenbelt, MD
Prepared By:	CML
Date:	2015-10-30
Stand Variable	Stand # 15
1. Dominant species/Codominant species	<i>Acer rubrum</i>
2. Forest Association	Highly disturbed-highly invasive association
3. Successional stage	Mid-successional upland forest
4. Basal area in s.f. per acre	110
5. Size class of dominant species	10-17.9" dbh
6. Percent of canopy closure	78%
7. Number of tree species	5
8. Common understory species	<i>Ilex opaca</i> , <i>Sassafras albidum</i> , <i>Prunus serotina</i> , <i>Viburnum dentatum</i> , <i>Liriodendron tulipifera</i> , <i>Vaccinium corymbosum</i> , <i>Liquidambar styraciflua</i> , <i>Toxicodendron radicans</i>
9. Percent of understory cover 3' to 20' tall	28%
10. Number of understory species 3' to 20' tall	8
11. Common herbaceous species	<i>Lycopodium</i> , <i>Polystichum acrostichoides</i> , <i>Mitchella repens</i>
12. Common herbaceous & woody plant cover 0' to 3' tall	24%
13. List of major invasive plant species & percent of cover	<i>Smilax</i> , <i>Rosa multiflora</i> , 26%
14. Number of standing dead trees 6" dbh or greater (average per plot)	1
15. Comments	This stand includes sites that are adjacent to the athletic facility, composting area and the asphalt millings stockpile. This stand also encompasses the area previously used as a farm pond and a BW Parkway construction stockpile/staging area. The landscape, and consequently the forest stand/forest structure is highly disturbed throughout the area. For example, the area south of the athletic fields is a dump site for non-biodegradable waste.

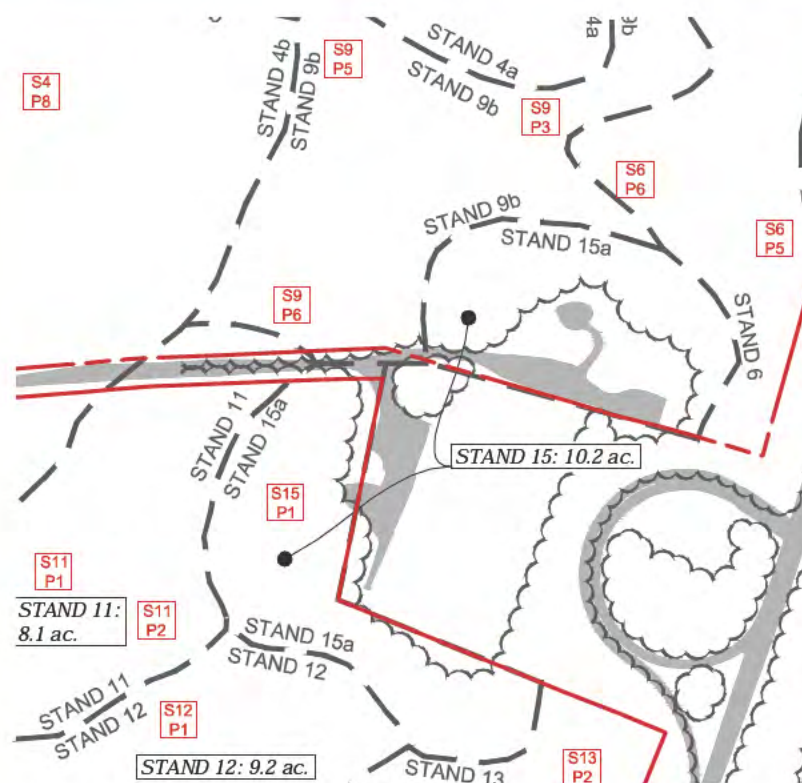
Sheet 1 of 1



Contours, trails & soil boundaries



Color infrared photograph



Forest stand boundaries



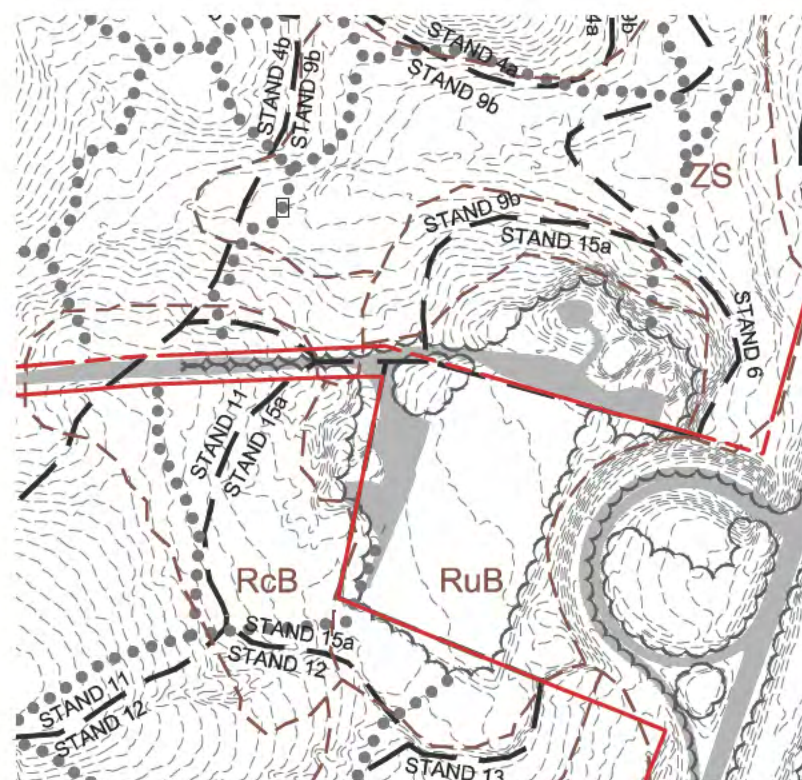
Color photograph



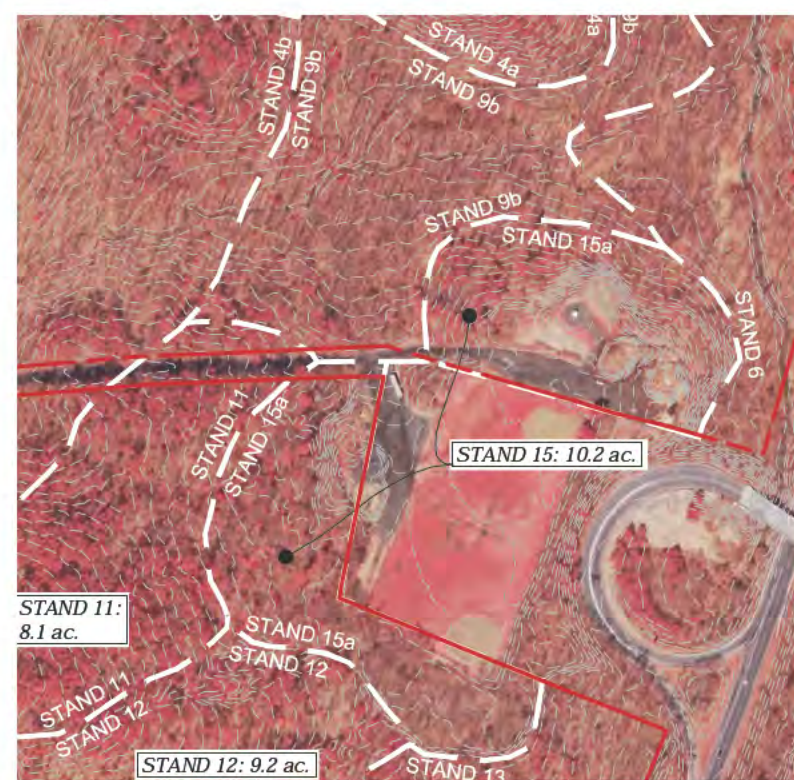
A - This stand is characterized by a highly disturbed landscape, including but not limited to invasive species and unnatural grading, shown here.



B - Old appliances, such as washing machines and refrigerators were dumped here. These items are still present today and now surrounded by invasive species.



Contours, trails & soil boundaries



Color infrared photograph



C - This composting pile is present at the top of a steep slope. Rainfall moves excess nitrogen and phosphorous from the compost pile down the slope and into the "wetlands of special state concern." This has the potential to result in nutrient overloading and other negative consequences detrimental to the health of the downstream aquatic system.



D - Stockpiles for asphalt millings and soil encroach into the forest.

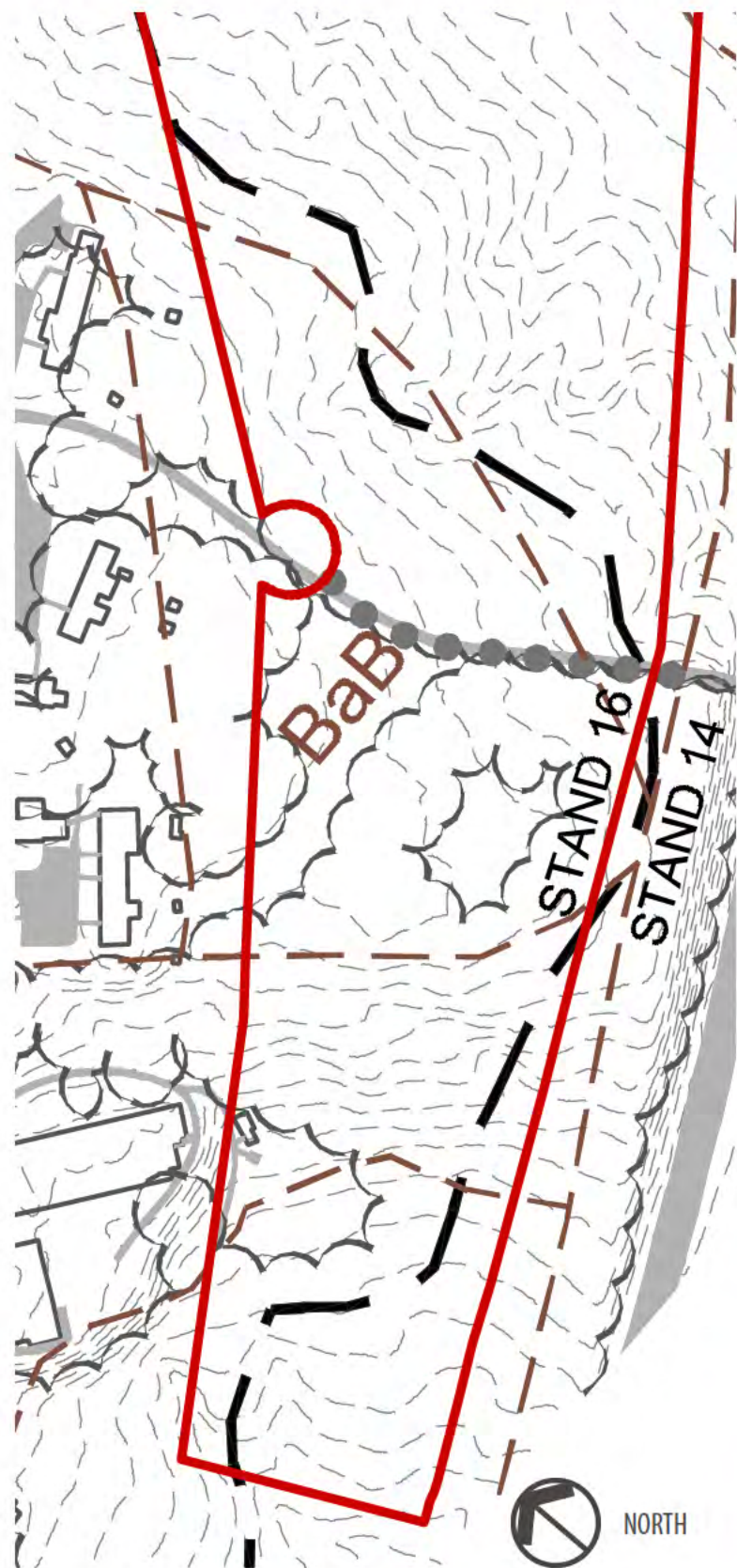
FOREST STAND 16:

- Topography:** primarily <10%
- Elevation:** 168' to 196' ± above sea level; upland forest
- Aspect:** very broad ridge with equal parts east-facing, SE-facing, and SW-facing slopes
- Hydrology:** This Stand encircles a small and shallow ridge. Few, if any, signs of erosion are present. No streams, channels, wetlands, or seeps are present.
- Historic imagery notes:** n/a
- FIDS habitat:** Not present
- Abiotic factors:** forest edge created by clearing (to allow for lawn/turf area)
- Invasives:** invasives (*Hedera helix*, *Smilax*, *Berberis thunbergii*, *Rosa multiflora*, *Lonicera japonica*) are spreading into S16 from forest edges
- Unique habitat notes:** Older (larger) trees are primarily *Quercus sp.*; younger juvenile species such as *Liquidambar styraciflua* (Sweet gum) are filling in and will ultimately replace the older Oaks in this stand.
- Adjacent uses:** S16 is bound by S14 and the BW Parkway to the east and south; and residential areas to the west and north.
- Forest Structure Value:** 41/60

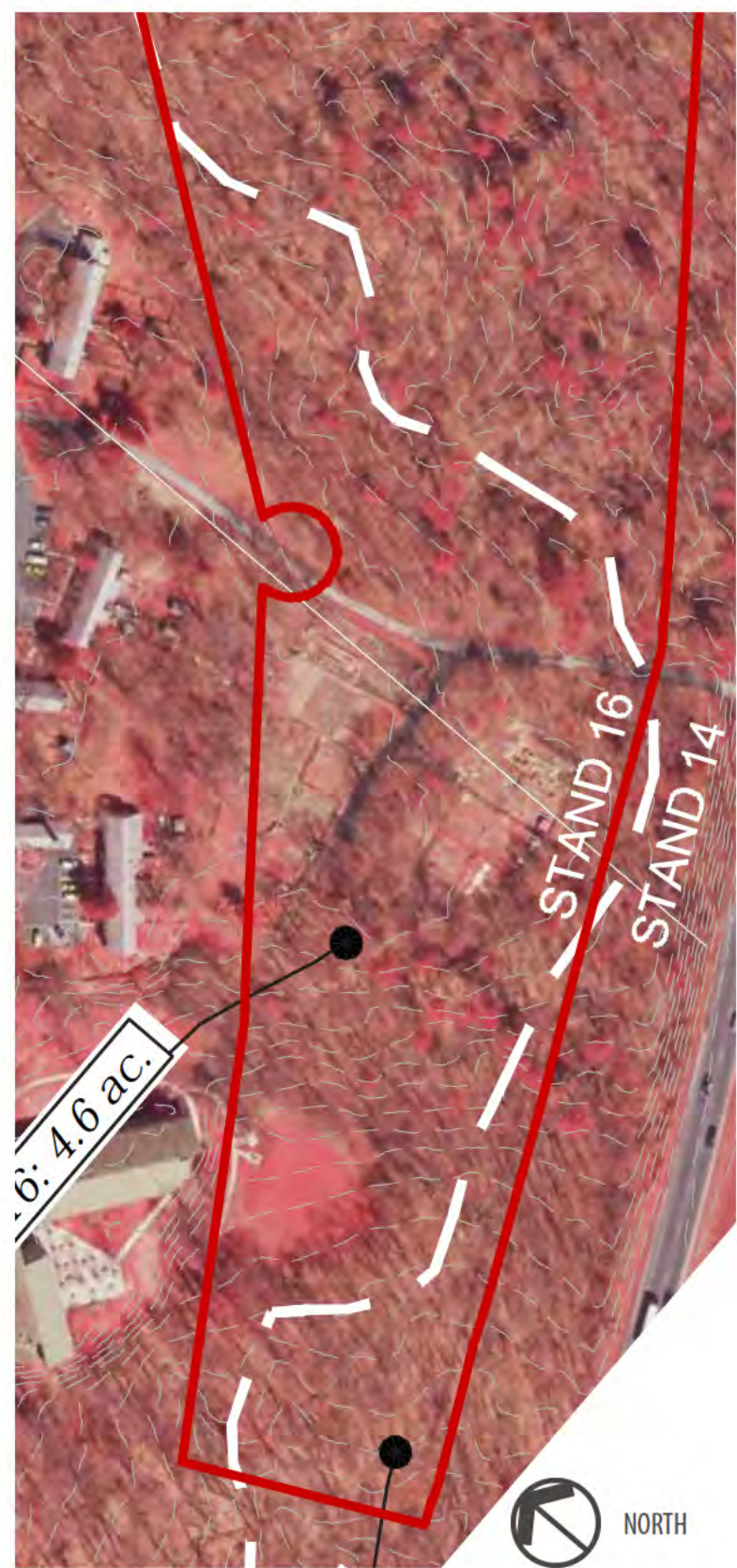


Forest Stand Summary Sheet	
Property Name:	<u>Greenbelt Forest Preserve</u>
Location:	<u>Greenbelt, MD</u>
Prepared By:	<u>CML</u>
	Date: <u>2015-11-06</u>
Stand Variable	Stand # 16
1. Dominant species/Codominant species	<i>Quercus alba</i> , <i>Quercus phellos</i> , <i>Quercus rubra</i> , <i>Quercus falcata</i> , <i>Liquidambar styraciflua</i>
2. Forest Association	White oak-Red oak association
3. Successional stage	Early-/Mid-successional upland forest
4. Basal area in s.f. per acre	97
5. Size class of dominant species	10" - 29.9" dbh
6. Percent of canopy closure	66%
7. Number of tree species	10
8. Common understory species	<i>Ilex opaca</i> , <i>Fagus grandifolia</i> , <i>Prunus serotina</i> , <i>Vaccinium angustifolium</i> , <i>Quercus alba</i> , <i>Liquidambar styraciflua</i> , <i>Vaccinium corymbosum</i> , <i>Toxicodendron radicans</i>
9. Percent of understory cover 3' to 20' tall	20%
10. Number of understory species 3' to 20' tall	8
11. Common herbaceous species	<i>Allium sp.</i>
12. Common herbaceous & woody plant cover 0' to 3' tall	8%
13. List of major invasive plant species & percent of cover	<i>Hedera helix</i> , <i>Smilax</i> , <i>Berberis thunbergii</i> , <i>Rosa multiflora</i> , <i>Celastrus orbiculatus</i> , <i>Lonicera japonica</i> , 22%
14. Number of standing dead trees 6" dbh or greater (average per plot)	1.3
15. Comments	Older trees are all <i>Quercus</i> . Young <i>Liquidambar styraciflua</i> saplings are filling in (P2)
Sheet 1 of 1	





Contours, trails & soil boundaries



Color infrared photograph



A - Invasives species encroach into wooded areas after establishing at forest edges (open turf areas).



B - A notable amount of large, well-established oaks are present and surrounded by younger pioneer tree species.



C - Some areas of this stand include an especially low density of trees.

WILDLIFE

Diverse terrestrial wildlife, including birds, mammals, reptiles and amphibians are associated with both the North and South Preserves. Fish species diversity appears limited, due to the small number and limited variety of water bodies and low quality of in-stream habitat within the Forest Preserve. The diversity of terrestrial species is influenced by several factors, including the size and structural diversity of forest in both tracts. Wildlife habitat within the project area benefits from a forest consisting of mostly deciduous native species with a well-stratified composition of mature, dominant and codominant trees, understory trees, large and small shrubs, saplings and herbaceous ground covers. The North Preserve displays greater diversity, with its larger size and contiguous forested habitat to the north. The North Preserve serves as a link between the City of Greenbelt and the forest, open fields and wetlands on the Beltsville Agricultural Research Center (BARC). On a regional level, wildlife and habitat in the study area benefits from connectivity and synergies with the extensive natural resources at BARC, Goddard Space Center and the Patuxent Wildlife Refuge. The connection of the Forest Preserve to adjacent riparian and terrestrial forest cover is part of a larger green infrastructure that wildlife use for travel, habitat, food sources and migration opportunities. The forest in the southern portions of the Study Area are significantly less well-stratified and diverse overall, but it still provides beneficial wildlife habitat for many species.

Fauna surveys within the project area were conducted in Spring of 2016. Techniques used to identify the presence of wildlife included direct visual/audible observations and indirect observations such as the presence of tracks, cavities, nests, fecal material, carcasses, etc. In addition, information was obtained from the Maryland Department of Natural Resources (DNR) on potential species likely to be identified within the project area. Other sources included the Patuxent Wildlife Refuge's List of Suspected or Known Species and various field guides.

Despite the high human population density and surrounding suburbanization, the project area appears capable of supporting a wide range of wildlife species. Common species include a variety of land birds found along the forest edge as well as within the forest interior and include hawks, owls, woodpeckers, flycatchers, warblers, sparrows, chickadees, and other songbirds. Mammals common to the area are likely to include gray (*Urocyon cinereoargenteus*) and red fox (*Vulpes fulva*), opossum (*Didelphis marsupialis*), raccoon (*Procyon lotor*), bats, white-tailed deer (*Odocoileus virginianus*), eastern cottontail (*Sylvilagus floridanus*), eastern chipmunk (*Tamias striatus*), groundhog (*Marmota monax*), eastern gray squirrel (*Sciurus carolinensis*), shrews, mice, moles and skunk (*Mephitis mephitis*). Herptofauna likely to be present include frogs (bullfrog, green, leopard, peepers) toads, skinks, salamanders, snakes (garter, rat, black) and turtles (predominately box turtle).

The forest assessment identified a diversity of native forest species within all the vegetative strata, including a variety of oak species, flowering dogwood, American holly, highbush blueberry and partridge berry. The majority of the project area provides strong plant diversity, as well as varying topography that offers wetland, mesic, and dry habitats. This allows for a myriad of desirable wildlife species to be sheltering, foraging, and migrating through the Study Area. The value of the habitat and the variety of species potentially found within the preserve is further increased by the abundance of nearby open space, forest, floodplains, wetlands, and streams.

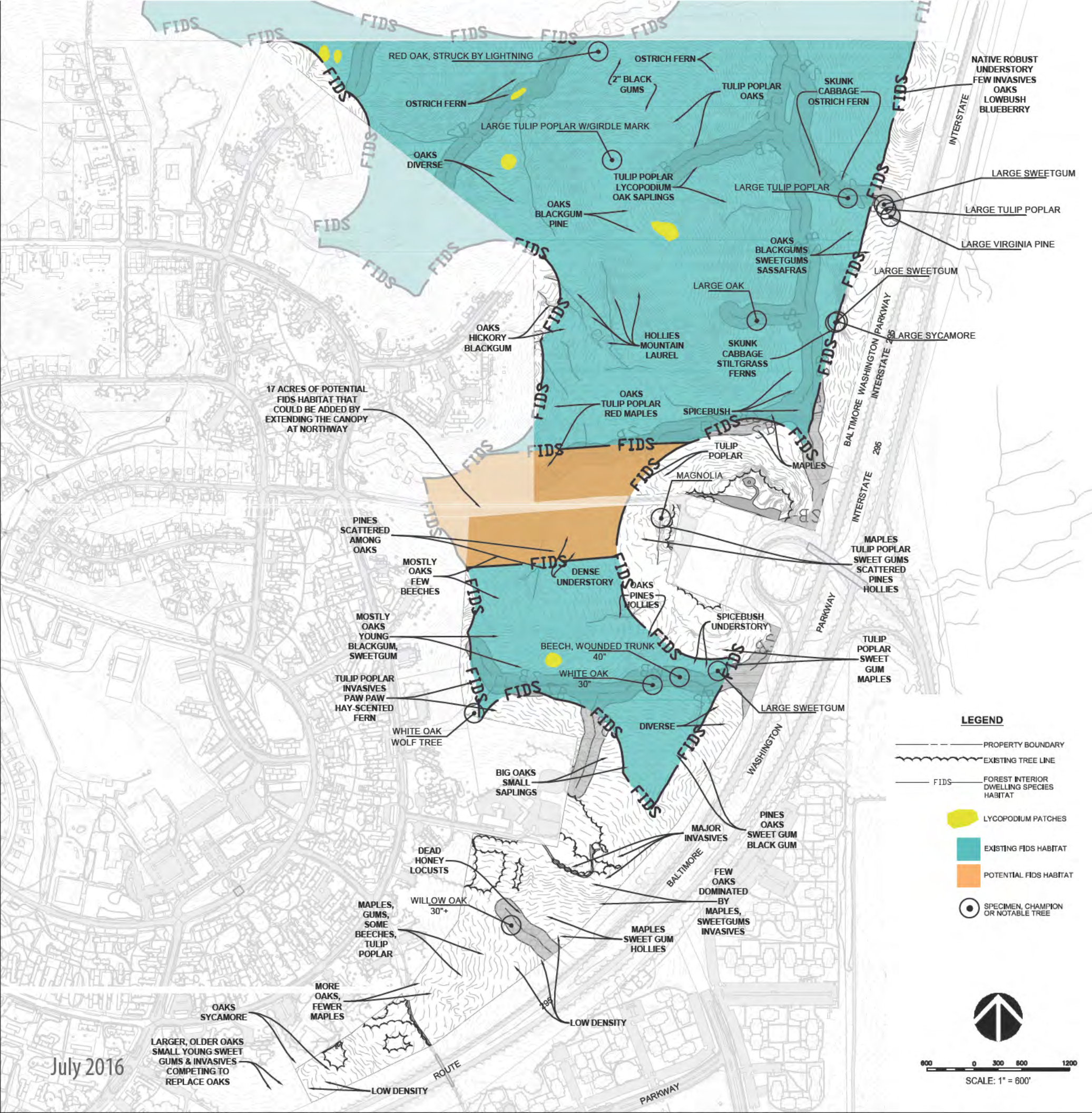
However, there is pressure from surrounding urbanization. Fragmentation of forests and isolation of many remaining forest stands has led to an increase in the amount of edge habitat in the region. As previously noted, Stands 14, 15 and 16 in the southern part of the study area have less forest richness and diversity, but still provide good wildlife habitat, particularly for edge dwelling species. A wide variety of species are attracted to forest edges and many species that are better adapted to forest edges, such as white-tailed deer, red fox and groundhog, profit from it. There you will find many generalist bird species whose life history requirements are broad and whose tolerance of human disturbance is high. Avian species may include brown headed cowbird (*Molothrus ater*), northern mockingbird (*Mimus polyglottos*), chipping sparrow (*Spizella passerina*), northern cardinal (*Cardinalis cardinalis*), common grackle (*Quiscalus quiscula*), house finch (*Carpodacus mexicanus*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), mourning dove (*Zenaida macroura*), and Carolina wren (*Thryothorus ludovicianus*).

While edge habitat and wildlife prosper, other species are declining. One group in particular, whose numbers are declining in Maryland and throughout the Eastern U.S. is forest interior dwelling bird species (FIDS). These include neotropical migratory songbirds, such as scarlet tanagers (*Piranga olivacea*), warblers, wood thrush (*Hylocichla mustelina*), and vireos (*Vireo* spp.), and red-shouldered and broad-winged hawks (*Buteo* spp.), barred owl (*Strix varia*) and various woodpeckers. These species depend upon large, contiguous forest stands in order to successfully breed and produce sustainable populations. As confirmed by Maryland DNR and by our forest assessments (see letter in Appendix D), the study area contains interior forest (defined below) that is well-stratified and of sufficient size and maturity to provide suitable (FIDS) habitat. DNR strongly encourages conservation of this habitat.

Downstream of the Forest Preserve, the wetlands of Beaverdam Creek are classified as Wetlands of Special State Concern (WSSC). Although there are no records of Rare, Threatened or Endangered Species (RTEs) in the Study Area, six of these RTEs are known to occur in Beaverdam Creek. Because of this valuable wetland, the tributary to Beaverdam Creek in the eastern part of the North Preserve is also classified as a WSSC wetland. The mainstem of this tributary is in poor condition. Runoff from almost the entire study area and upstream portions of its watershed flows through this tributary. Therefore, its condition is a significant ecological concern.

Although there are no RTEs in the Study Area, during the forest assessment we found indications of vernal pools and, based on the topography of both the North and South Preserves, vernal pools may be present within the forest communities. A vernal pool is a contained, seasonal depression with a seasonal source of water. Numerous species use vernal pools for various parts of their life cycle, but most predominantly for the breeding season. Species that use vernal pools that may be found within the study area include several species of mole salamanders (family Ambystomatidae), wood frogs (*Rana sylvatica*), spring peeper (*Pseudacris crucifer*) and American toad (*Bufo americanus*).



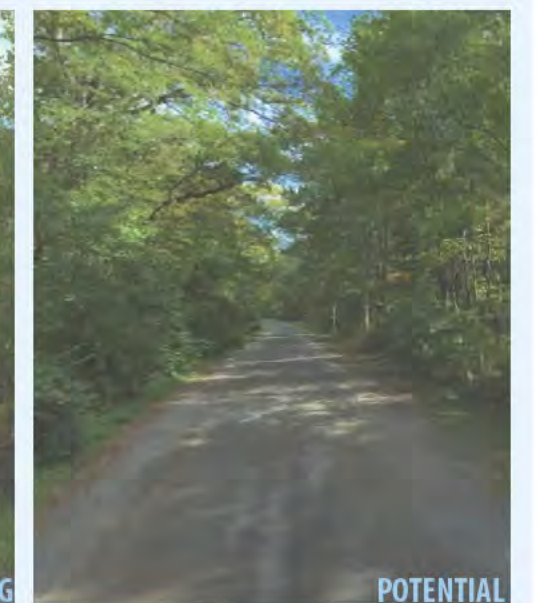
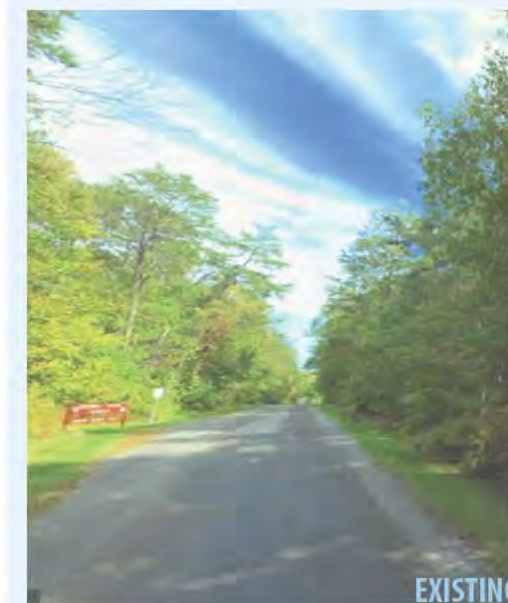


FOREST INTERIOR DWELLING SPECIES (FIDS)

FIDS habitat may be present in smaller forest tracts or absent in larger ones, and depends on a number of factors including surrounding land use, age, size, and forest type. The Critical Areas Commission for the Chesapeake and Atlantic Coastal Bays issued guidance that is commonly used to evaluate whether a forest community may be suitable habitat for FIDS. Common criteria for potential FIDS habitat include:

- Forests of at least 50 acres in size with ten acres or more of forest interior habitat that is at least 300 feet from a forest edge.
- Riparian forests of at least 50 acres in size, with an average width of at least 300 feet.
- The majority of trees within the forest tract should have a dbh of five inches or larger, or have a closed canopy.

Based on these guidelines there is approximately 169 acres of FIDS habitat in the Study Area. Anything that results in permanent breaks in the canopy of 30 to 50 feet, such as Northway, is considered an edge and causes two forested tracts to be disconnected. If the canopy along Northway were extended to reduce or eliminate this gap, this would add another 17 acres of FIDS habitat.



NORTHWAY Canopy and FIDS

Northway currently cuts the forest interior dwelling species (FIDS) habitats in two parcels and greatly reduces the potential for FIDS to grow. The existing FIDS habitat on site is approximately 169 acres. If Northway had a full canopy, this could add an additional 17 acres of FIDS.

IMPACT OF ABIOTIC FACTORS

WASTE / HAZARDOUS MATERIALS CONCERNS

There is a large waste dump just south of the athletic fields, along with several other trash piles found sporadically within the forest. Some of the trash found can be attributed to users while other piles have been left by stormwater flows carrying debris from offsite and depositing it within the incised channels and eroded stream beds. There is trash along the edges of the forest, common for forests surrounded by major traffic routes (I-295) and general urbanization. Air pollution stresses forests, and it can be quite high along roads such as I-295. Noise and lights also disturb wildlife and decrease the recreational value of the forest.

The Study Area was not listed in any of the databases searched by EDR to identify known hazardous waste sites. The Beltsville Agriculture Research Center (BARC) is listed on the National List for Cleanup Sites under the Superfund Program. It is not known whether the project area is affected by its proximity to the BARC property.

SOIL EROSION & STREAM CONDITIONS

The majority of the soils present on site are highly erodible and have been prone to erosion, as per data provided by the USDA Soils Survey (See Appendix A and Appendix B). The Study Area was heavily eroded during the period of time it was cleared and used for agriculture. This is particularly true along the lower slopes and channels. These sediments were deposited in the valleys downstream. With development of the City of Greenbelt, increased amounts of impervious areas and runoff have been captured by storm drains and routed to outfalls that discharge directly into the forest. These comparatively recent and chronic conditions have caused extensive erosion on the forest floor. Downstream this has led to incised channels and eroded streambanks, poor water quality, and lack of in-stream habitat. There are several “headcuts” within these incised channels where the incisions are likely to continue moving upstream and the incised channels will become deeper.

There are also signs of compaction of the soil along the numerous trails throughout the forest. In some locations runoff flowing down the trail is causing erosion. Poor trail design and location such as this can cause excessive and avoidable damage. The popularity of mountain bikes and ATVs has risen dramatically in recent years. Noise from cyclists were observed within the forest. These have the potential to cause considerable trail erosion and damage to adjacent forest.

EROSION & HEAD CUTTING



INCISED CHANNELS



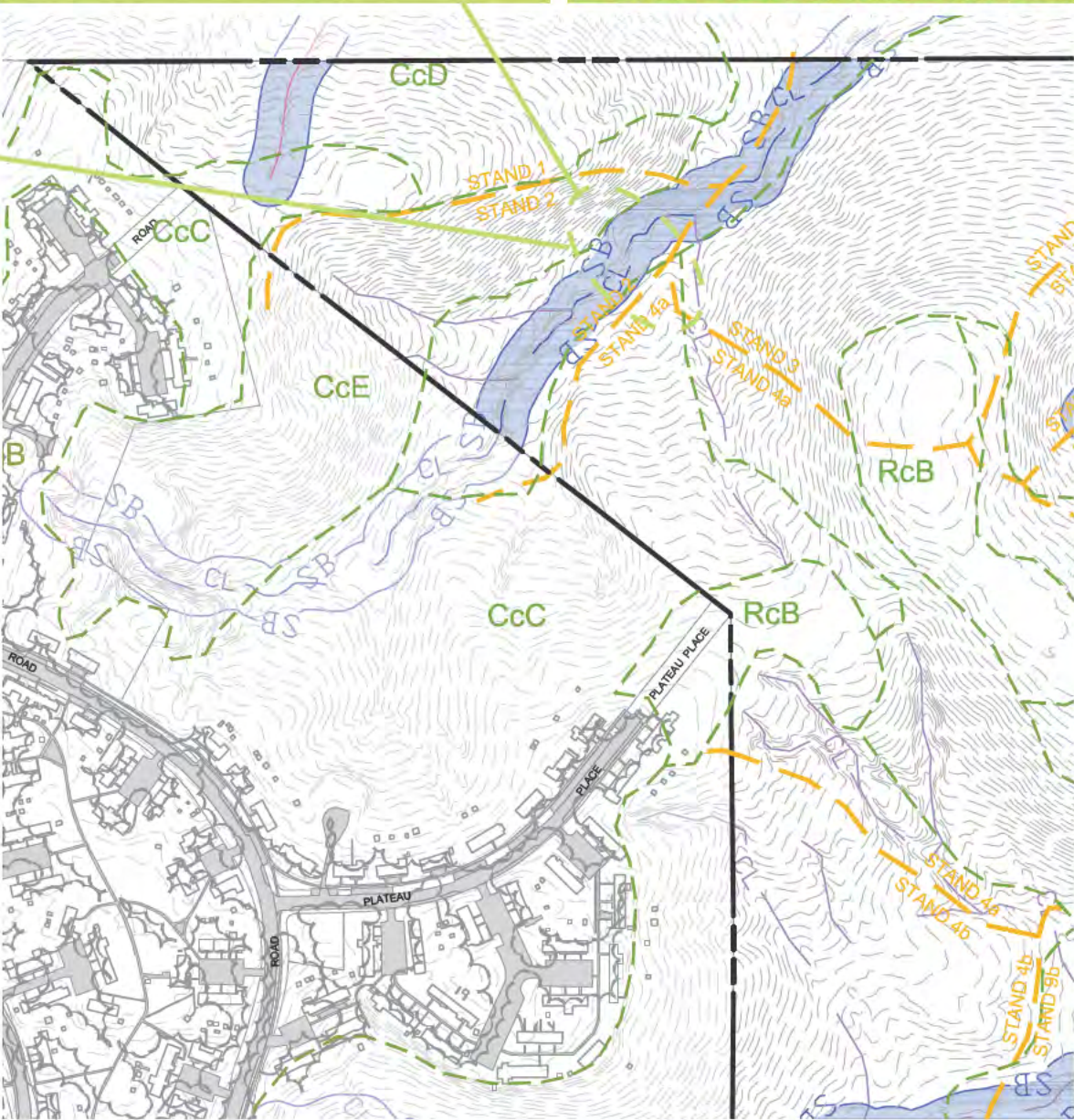
ERODED PATHS



SOILS TABLE		
MAP UNIT SYMBOL	MAP UNIT NAME	HIGHLY ERODIBLE
BaB	BELTSVILLE SILT LOAM, 2-5% SLOPES	yes
CcC	CHRISTIANA-DOWNER COMPLEX, 5-10% SLOPES	yes
CcD	CHRISTIANA-DOWNER COMPLEX, 10-15% SLOPES	yes
CcE	CHRISTIANA-DOWNER COMPLEX, 15-25% SLOPES	yes
CdD	CHRISTIANA-DOWNER-URBAN LAND COMPLEX, 5-15% SLOPES	-
EkA	ELKTON SILT LOAM, 0-2% SLOPES	yes
RcB	RUSSETT-CHRISTIANA COMPLEX, 2-5% SLOPES	no
RuB	RUSSETT-CHRISTIANA-URBAN LAND COMPLEX, 0-5% SLOPES	-
Zs	ZEKIAH AND ISSUE SOILS, FREQUENTLY FLOODED	yes



KEY MAP



TRASH & DEBRIS



INVASIVE SPECIES



MAN-MADE STRUCTURES



INVASIVE PLANT CONCENTRATIONS



DUMP SITE



IMPACT OF ADJACENT LAND USES

The forest is potentially impacted in several ways by adjacent land uses and by the users. These potential impacts, very common for forests surrounded by urbanization, include:

- Accidental or even intentional fire starts or spreads
- Household pets that are allowed access to the forest. These “subsidized predators” (cats are a notable example) can have a significant detrimental impact on wildlife
- Alterations to trees or other vegetation by users
- Fertilizer, herbicides and insecticides applied by homeowners, oils, heavy metals and other particulate contaminants from roadways, and other toxic material discarded where it is carried by runoff into the forest and streams of the Forest Preserve
- Dumping of yard clippings and solid waste
- Introduction of invasive species

In general, the forest stands throughout the project area are not typically considered candidates for fire outbreak. This is under the assumption that the area receives normal rain falls. However, there is the possibility of fire spreading under very dry growing season conditions. Sources might be lightning strikes, accidental spread of fire from surrounding property owners from dumping coals from grills, burning leaves, etc., or users of the forest building campfires that accidentally escape. In addition to allowing their pets to wander freely throughout the forest, resulting in fecal droppings, hunting of birds and other small animals within the forest, residents may release unwanted pets such as snakes or turtles in the forest. Lastly, there is the concern with the alteration of the forest vegetation or wetland and streams by users building structures, such as the stick huts observed present within the project area. Some users may remove dead trees or even live trees to construct huts or other shelters. Others may consider placing structures in the streams, such as creating dams, that may result in additional erosion and sediment laden waters.

GOALS & RECOMMENDATIONS

Goals and recommendations for the Forest Preserve, the Forest Preserve Advisory Board & Forest Preserve Articles of Chapter 12, and the Forest Preserve Management & Maintenance Guidelines can be found in Volume Two of the Forest Preserve Health Assessment report.



KEY MAP

Forest Health Assessment Report of the **Greenbelt Forest Preserve**

Prepared for: City of Greenbelt Department of Planning and Community Development
15 Crescent Road

Prepared by: A. Morton Thomas & Associates, Inc.

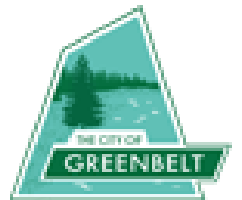
April 2016, revised July 2016

GOALS & RECOMMENDATIONS

Forest Health Assessment Volume II

for the
North Preserve & South Preserve
of the
Greenbelt Forest Preserve

Prepared for:



THE CITY OF

GREENBELT

MARYLAND

Department of Planning and Community Development

Prepared by:



A. Morton Thomas & Associates, Inc.



FOREST HEALTH ASSESSMENT VOLUME II

GOALS AND RECOMMENDATIONS

The goals for the Forest Preserve must be examined by the Greenbelt City Council, the Forest Preserve Advisory Board and the citizens of the City of Greenbelt, and decisions made that reflect the wishes of the community. In turn, the City may need to revise and refine the Greenbelt Ordinance Chapter 12 and the Forest Preserve Management and Maintenance Guidelines.

There is a wide range of opinion and strongly held beliefs about the type of use and management that would be appropriate for the preserve, ranging from a total “hands-off” policy, allowing nature to take its course, to intensive management and intervention to promote specific goals, correct damage, and provide additional amenities.

The data and findings reported in the 2015 & 2016 “Forest Health Assessment Volume I” provide baseline information about the North and South Preserves. The report is intended to be a useful tool for making informed decisions about how to **protect and conserve the forest for the use and enjoyment of present and future generations**. In this section we describe the main principles and key recommendations in furtherance of that goal.

Following this section, we provide marked up copies of Articles VII & IX of Chapter 12 – Parks and Recreation of the Greenbelt City Ordinance and of the Forest Preserve Management and Maintenance Guidelines. These include suggested text edits and commentary about management priorities and goals.

As noted above, we are aware that there is a wide range of opinions about the purpose, goals and functions of the Forest Preserve. Instead of advocating every alternative point of view, our recommendations favor an active management approach. Actions taken by humans are not viewed as inherently undesirable, *per se*. We favor management and maintenance approaches that harness natural processes. Although “artificial”, these actions may provide large benefits.

Issues and Priorities

Although parts of the forest have been referred to as pristine, the health inventory findings show this is not the case. Past uses heavily altered the native landscape and they continue to determine the characteristics of the present day site. The forest experiences significant biotic and abiotic stresses and impacts from adjacent land use. Significant problems include:

- **Stormwater Runoff:** The forest suffers from the effects of not installing adequate stormwater management facilities at the time Greenbelt was developed. The runoff carries pollutants and trash into the forest and damages the highly erodible soils. For the substantial benefits offered, the City should implement a program of stormwater retrofits in community areas that are outside of the forest. Potential retrofits and improvements at outfalls that discharge into the forest should be studied. However, these activities would be severely limited or prohibited by current regulations.

- **Stream and Water Quality:** Conditions in the North and South Preserves are poor, and they threaten the health and quality of the (WSSC) Wetlands of Special State Concern at Beaverdam Creek as well as the section of tributary in the North Preserve that is included in this classification. The City should implement measures to control erosion, prevent channels from incising further, improve stream channel morphology and improve in-stream habitat. Many strategies that might directly improve stream quality and its protective capacity would not be allowed under the current regulations.
- **Invasive Species:** An invasive species control program should be developed, with removal, stabilization, replanting, and follow-up monitoring and control. Strategies may include using goats to graze unwanted species, repeated cutting, mowing, or spot applications of herbicides. Root systems may need to be dug up and removed. After the invasives are removed from an area, the land may require stabilization and revegetation. Where light penetrates forest edges they are susceptible to invasive species. Additional plantings of edge species to soften “hard”, abrupt forest edges would reduce this. This activity may not be adequately supported by the current regulations.
- **Forest Fragmentation:** The region continues to suffer from this, which has significant impacts on forest ecosystems. The construction of I-295 caused significant fragmentation to the forest, altered the south to north running main tributary to Beaverdam Creek, and brought air pollution, noise and light to the forest interior.
- **Associated Loss of (FIDS) Forest Interior Dwelling Species Habitat:** To qualify as FIDS habitat forest must be at least 300 feet from a forest edge and 50 acres or more in size. Loss of FIDS habitat is a statewide concern. It leads to reduction in overall wildlife diversity. Protection and enhancement of FIDS habitat should be a priority. The City could take measures to extend the canopy and close the gap that exists along Northway. This may include some active planting, control of invasive species, and other management practices within the forest.
- **Highly Disturbed Areas:** Forests near the facilities at the end of Northway (Forest Stand 15) are highly disturbed. The stockpile areas lie in close proximity to streams and drainage areas that would benefit from wider buffers. The composting area should be moved. It is located near the edge of very steep slopes that are hydraulically adjacent to a main tributary to Beaverdam Creek and WSSC wetlands. Currently there is nothing to prevent nutrients and other pollutants from being carried directly into the stream. At the abandoned dump, removal of waste material, invasive and early seral species, and reforestation would increase forest and wildlife value and enhance the forest’s ability to protect the hydrology and improve water quality. These same recommendations apply to the part of Forest Stand 15 that is adjacent to I-295.
- **Highly Stressed Forest Areas:** Stands 14, 15 and 16 in the southern part of the study area are more highly disturbed than other parts of North and South Preserves. Stressors include the community gardens and I-295, and the relative smallness of the forest stands here. As previously discussed, where light penetrates forest edges they are susceptible to invasive species. Where the transition from forest to open meadow or turf is abrupt, these are referred to as “hard edges”. “Soft edges” include a greater range of sizes and a larger variety of trees and shrubs that flourish in these conditions. They provide valuable habitat and forage for wildlife. Site specific programs including selective removal of existing trees and planting a variety of trees, shrubs and herbaceous species would improve the value and resilience of these areas. Other parts of the Forest Preserve that display similar stresses should also be targeted for these programs.

- **Disease and Pests:** The City must be prepared to prevent the invasion and spread of organisms that threaten the health or diversity of the forest. An example of this is the Emerald Ash Borer. In August, 2003 it was found in a shipment of ash trees at one Prince George's County nursery. Quarantine efforts have failed. This insect could potentially to decimate the ash trees that are a significant component of the region's forests.
- **Adjacent land uses and activities:** Fertilizer, herbicides and pesticides and pollutants from impervious surfaces drain into the forest without even rudimentary stormwater best management practices in place to mitigate their impact, compromising water quality. Invasive species escape from landscaped areas and crowd out native species near forest edges, and in isolated areas where disturbance is more frequent. Pets (aka subsidized predators) with unhindered forest access put pressure on native wildlife. Dumping of lawn clippings, trash, and other foreign material adversely affects the forest. Educational and interpretive programs and other forms of public outreach can produce better results and are easier to implement than enforcement programs.
- **Trails:** These provide access to the forest and direct the movements of the majority of people visiting the forest. Some poorly located trails are eroding, and they may allow inappropriate usage and damage to the forest. ADA accessibility should be improved. This may require constructing new trails. These conditions can and should be corrected, although some activities would not be allowed under the current regulations.

Revisions to Greenbelt Ordinance Chapter 12 and the Forest Preserve Management and Maintenance Guidelines

In response to the findings of the Forest Health Inventory, the City may wish to revise its ordinance and Management and Maintenance guidelines to address inconsistent, vague or contradictory wording. The specific revisions adopted will depend upon the community's decisions about the nature of the forest conditions that are desired and what priorities should be.

The following pages provide the text of the current ordinance and Management and Maintenance Guidelines, with text edits and commentary. As stated above, we acknowledge there is a wide range of opinion and strongly held beliefs about the type of use and management that would be appropriate for the preserve.

The following comments favor an active management approach. Currently, different sections of the Management and Maintenance Guidelines appear to follow divergent and sometimes contradictory points of view. To a lesser extent, the ordinance reflects similar inconsistencies, ambiguity or vagueness that deter decision making and clear policy statements. For example, the Management and Maintenance Guidelines, Section Five – Invasive Species, is highly cautionary and reticent about taking actions to control invasive species, ultimately providing little specific guidance for managers. It discourages disturbance, noting that **"Invasive species management activity, in itself, constitutes a disturbance."**

On the other hand, Section Twelve – Forest Health describes the dynamics and complexity of forest ecosystems and recognizes disturbance as an aspect of the natural processes that shape it and influence its health. From the outset it states that "... the Management and maintenance Guidelines have addressed

how the City will manage the impact of people and activities on the Forest Preserve. **While the acts of people, direct and indirect, can have impacts both positive and negative, so can the natural growth and aging of a forest, including succession, competition, as well as weather, pests, pollution and fire. Accordingly, the management and maintenance of the Forest Preserve should include monitoring of the health of the forest community, including taking action as indicated to promote the health of the forest."**

It seems appropriate that the recommendations based upon this Forest Health Assessment are based upon this latter perspective.

Every owner of any tree overhanging any street or right-of-way within the city shall prune the branches so that such branches shall not obstruct the light from any street lamp or obstruct the view of any street intersection and so that there shall be a clear space of eight (8) feet above the surface of the street or sidewalk. Said owners shall remove all dead, diseased or dangerous trees, or broken or decayed limbs which constitute a menace to the safety of the public. The city shall have the right to prune any tree or shrub on private property, at the owner's expense, when it interferes with the proper spread of light along the street from a street light or interferes with visibility of any traffic control device or sign.
(Ord. No. 1189, 2-28-00)

Sec. 12-130. Removal of trees on city property.

No person shall remove or destroy or cause the removal or destruction of a tree on any city property or undertake construction or other action that may significantly and permanently detract from the health or growth of such tree without having first obtained written permission from the city manager or his/her designee. Such trees may be removed only by the city horticulturist or his agent, unless this condition is waived by the city manager.
(Ord. No. 1189, 2-28-00)

Sec. 12-131. Removal of stumps.

All stumps of street trees shall be removed below the surface of the ground so that the top of the stump shall not project above the surface of the ground.
(Ord. No. 1189, 2-28-00)

Sec. 12-132. Violations and penalties.

(a) Persons or firms found to be in violation of this article shall be subject to a municipal infraction as established by the city.

(b) The penalty for violation of this article shall be one thousand dollars (\$1,000.00) per violation. In a case where multiple trees are impacted by violation of this article, each tree impacted shall be considered a separate violation of this article.
(Ord. No. 1189, 2-28-00; Ord. No. 1230, 8-12-02)

Secs. 12-133--12-139. Reserved.

ARTICLE VIII.

FOREST PRESERVE ADVISORY BOARD

Recommend that this Article be placed after Article IX. Forest Preserve.

Sec. 12-140. Established.

There is hereby established an advisory board to be known as the forest preserve advisory board.
(Ord. No. 1279, 5-9-07)

Sec. 12-141. Membership.

(a) The forest preserve advisory board shall be composed of nine (9) members who shall be selected from the citizenry of the city by the city council to serve a three-year term of office, except that of those first appointed, three (3) shall be appointed to one-year terms, three (3) shall be appointed to two-year terms, and three (3) shall be appointed to three-year terms. With the consent of the majority of members voting, the board may involve additional people as nonvoting members for special projects based on their expertise.

(b) The city manager shall appoint a city staff member to serve as a nonvoting member of the board. The city council may designate one (1) of its members to serve as a council liaison to the board.

(c) Members may be removed for cause by the city council. If a member is repeatedly absent from regularly scheduled meetings, the city council may void the appointment and appoint another person to fill the position.

(Ord. No. 1279, 5-29-07)

Sec. 12-142. Officers and bylaws.

The board shall elect from its own members a chair, vice-chair and such other officers as it deems necessary. The board may adopt its own rules or bylaws, subject to approval by the city council.

(Ord. No. 1279, 5-29-07)

Sec. 12-143. Functions. **FPAB: Role, Authority, Functions, Purpose**

(a) The purpose of the forest preserve advisory board shall be to provide advisory guidance to the city council on the formulation of policy related to the management and maintenance of the forest preserve, the designation of forest preserve areas, and any other matters as directed by the city council.

(b) The duties of the forest preserve advisory board shall be as follows:

- (1) On an annual basis, report to the city council on the health and condition of the forest preserve.
- (2) As needed, monitor the health and condition of the forest preserve, as well as activities within the forest preserve, and report to the city council any circumstances indicating that intervention, consistent with the approved management and maintenance guidelines, is required.
- (3) As needed, review, interpret, and make recommendations to the city council on the management and maintenance guidelines and on the forest preserve article of this chapter.
- (4) Advise the city council on the designation of forest preserve areas.
- (5) Sponsor educational, interpretative, maintenance, or other programs, as appropriate and consistent with the forest preserve article and the management and maintenance guidelines, for the purpose of furthering the city's objectives of protecting the forest preserve areas.
- (6) Ensure coordination between the forest preserve advisory board and other city advisory boards

and committees by reporting to the city council and to the appropriate advisory groups should any matter before the board impact areas of interest and responsibility of those advisory groups, including but not limited to issues and matters related to forest health and the management and treatment of invasive plant species.

(Ord. No. 1279, 5-29-07)

1) Forest Health, and 2) responding to and treating Invasive Species are specifically recognized purposes. No specific limitations are cited.

Secs. 12-144--12-149. Reserved.

ARTICLE IX.

FOREST PRESERVE*

*Ord. No. 1279, adopted May 29, 2007 redesignated Art. VIII, §§ 12-132--12-145 as Art. IX, §§ 12-150--12-163.

Sec. 12-150. Intent. A statement about mission and vision either in the Ordinance or in the M&M guidelines would be valuable. Does stewardship of the Forest Preserve include actions that might affect or transform the forest in a positive way, or should it minimize human action as much as possible? Section 12-155 might be where this statement should be.

In order to protect, manage, and administer certain designated areas for the present and future use and enjoyment of the citizens of Greenbelt by protecting them from the impacts of a growing population, expanding growth, and growing mechanization, thus preserving these lands as an enduring natural resource. It is important to note that "natural resource" does not mean "wilderness" or "wild"

Sec. 12-151. Forest preserve defined.

* See note below

Forest preserve areas shall be considered those parcels and lots, or portions thereof, and areas owned by the City of Greenbelt, characterized as predominantly undisturbed and wooded, which are to be protected and conserved as forest ecosystems in their existing natural state for the use and enjoyment of present and future generations, by restricting uses to those consistent with the goals of protection and conservation and by setting forth procedures for management and maintenance that are consistent with the goals of protection and conservation.

(Ord. No. 1243, 10-27-03; Ord. No. 1279, 5-29-07)

Sec. 12-152. Designated forest preserve areas. Comment: The FPAB is authorized to make recommendations about MANAGEMENT and MAINTENANCE and report any circumstances indicating INTERVENTION consistent with the approved management and maintenance guidelines. "Protecting" the forest is not defined in any specific way. There is no express presumption in favor of a "hands off" policy.

(a) The North Preserve shall be defined as that area held in ownership by the City of Greenbelt and located north of Northway, west of the Baltimore-Washington Parkway, south of the corporate city limits, and east of Ridge Road, comprised of legal parcels described as Map 27, Grid A2, Parcel 10, consisting of 102.5869 acres; Map 27, Grid B2, Parcel 17, consisting of 13.90 acres; Map 27, Grid A1, Parcel 19, consisting of 24.3363 acres; Map 27, Grid B3, Parcel 20, consisting of 4.079 acres; and Map 27, Grid A3, Parcel 12, consisting of 10.6427 acres; excluding those areas designated for location of the observatory and appurtenance improvements, and a yard waste collection location and described as follows: Beginning at the southwest property corner and extending east for a distance of 1,025 feet, then extending north at a 90-degree angle for a distance of 275 feet, then extending east at a 90-degree angle for a distance of 450 feet, then extending south at a 90-degree angle for a distance of approximately 275 feet to its intersection with the southern property line.

(b) The South Preserve shall be defined as that area held in ownership by the City of Greenbelt and
* These lands are wooded, but they are not undisturbed. They have a past history of significant disturbance. Existing conditions (adjacent uses, runoff, pollution, etc.) exert both negative and positive influences. "Undisturbed" is a misnomer. Knowing that the forest suffers from adverse conditions, a passive or no-action approach is tantamount to shirking the City's responsibility to PROTECT AND CONSERVE the forest resources.

located south of Northway, west of the Baltimore-Washington Parkway, and east of Ridge Road, comprised of legal parcels described as Map 27, Grid A3, Parcel 6, consisting of 20.4667 acres; Map 27, Grid A3, Parcel 7, consisting of 17.1919 acres; Map 27, Grid A3, Parcel 8, consisting of 11.8707 acres; Map 27, Grid A4, Parcel 9, consisting of 11.8707 acres; Map 27, Grid A4, Parcel 11, consisting of 9.34 acres; and Map 27, Grid A4, Parcel 21, consisting of 10.1552 acres.

(c) The Boxwood Preserve shall be defined as that area held in ownership by the City of Greenbelt and located north of Crescent Road, west of Lastner Lane, south of Ivy Lane, and east of Ridge Road, comprised of the legal parcel described as Map 26, Grid D3, Parcel 56, consisting of 8.81 acres; excluding those areas improved for active use and recreation, and described as follows:

- (1) The basketball court area located in the northwest corner of the Boxwood Preserve, consisting of .69 acres, and extending from the property corner at the point of intersection of Ridge Road and Ivy Lane, east along the Ivy Lane property line for a distance of 200 feet; and then extending south at a 90-degree angle for a distance of 150 feet; and then extending west at a 90-degree angle to the property line along Ridge Road for a distance of 200 feet; and then extending north along the Ridge Road property line for a distance of 150 feet to the point of origin.
- (2) The playground and picnic area, located in the northeast to north central quadrant of the Boxwood Preserve, consisting of 2.2 acres, more or less, and extending from the property corner at the point of intersection of Ivy Lane and Lastner Lane, and extending south along the Lastner Lane property line for a distance of 430 feet; and then extending northwest at a 70-degree angle for a distance of 350 feet; and then extending north for a distance of 110 feet; and then extending northeast to the point of origin.

(d) The Belle Point Preserve shall be defined as that area held in ownership by the City of Greenbelt and located south of the Greenbelt Lake; adjacent to Map 26, Parcel 81; northwest of Vanity Fair Drive; and east of I-495, comprised of the legal parcel described as Map 26, Parcel 59, consisting of 10.0 acres; except that an area located adjacent to the Belle Point subdivision, adequate in size and dimension to accommodate playground, picnic or similar neighborhood recreation amenities, as designated by the city council, shall be considered excluded from the area included in the forest preserve and shall not be regulated by the provisions of this chapter.

(e) The Sunrise Preserve shall be defined as that area held in ownership by the City of Greenbelt and located northwest of the Capital Beltway, Route I-495, north of Parcel B held in ownership by the City of Greenbelt, south of the Maryland Trade Center Parcel B, and southwest of the terminus of Hanover Drive, comprised of the legal parcel described as Tax Map 34, Grid E2, Parcel A and consisting of 9.9591 acres, more or less.

(Ord. No. 1243, 10-27-03; Ord. No. 1279, 5-29-07; Ord. No. 1282, 6-18-07; Ord. No. 1283, 6-18-07; Ord. No. 1284, 6-18-07; Ord. No. 1285, 6-18-07)

Sec. 12-153. Designation of or addition to forest preserve areas.

(a) Any designation of or addition to a forest preserve area shall be accomplished by ordinance adopted by the city council.

(b) Prior to the introduction of any ordinance to designate or add to a forest preserve area, the city council shall cause to be prepared a report that includes but is not limited to: a description of the area proposed as a forest preserve, including its unique characteristics and its existing uses and users; and a map indicating the location and boundaries of the proposed forest preserve area.
(Ord. No. 1243, 10-27-03; Ord. No. 1279, 5-29-07)

Sec. 12-154. Removal of forest preserve designation.

(a) Removal of any lands, in whole or in part, from the forest preserve designation as set forth in section 12-152 shall be by ordinance of the city council, following a public hearing which shall be held not less than two (2) weeks preceding first reading of the ordinance.

(b) Approval of any ordinance to remove lands from the forest preserve designation shall be by supermajority vote of the city council.

(c) No ordinance passed by the city council to delete or reduce a forest preserve area may become effective until approved by the voters of the City of Greenbelt, by way of a question placed on the ballot of the next regularly scheduled general city election, in accordance with the city Charter.
(Ord. No. 1243, 10-27-03; Ord. No. 1279, 5-29-07)

Sec. 12-155. Management and maintenance guidelines.

(a) Forest preserve areas as defined in this article shall be managed to provide for and protect the natural character of these lands and to allow for the use of these lands in a manner that does not alter or degrade the essential natural character of these lands.

(b) The city council shall adopt management and maintenance guidelines, which shall set forth policy on permissible, required, and prohibited management and maintenance activities. Such guidelines shall be subject to the limitation that any maintenance proposed is the minimum necessary to preserve and protect the natural resource.* See note below
(Ord. No. 1243, 10-27-03; Ord. No. 1279, 5-29-07)

Sec. 12-156. Prohibited activities.

Recommended insertion: "Except as otherwise provided in this article or as provided in the management and maintenance guidelines, the following are prohibited:"

(a) Except as otherwise provided in this article and subject to any existing rights, no commercial enterprise or permanent road, except for fire roads or temporary road required in emergencies involving the health and safety of persons and/or the area and its environs, shall be permitted within an area designated under this article as a forest preserve area. Prohibited activities shall also include the use of motorized vehicles, except for maintenance and public safety vehicles operated in conformance with the management and maintenance guidelines; landing aircraft; or other forms of mechanical transport except for that authorized subject to the Americans with Disabilities Act.

(b) The grading of any area shall be prohibited, except as provided in the adopted management and maintenance guidelines. Grading shall be considered the alteration of natural and existing grade by any means other than natural forces.

*This language could hamper the City's ability to take actions it deems appropriate. Allowing only activities to PRESERVE AND PROTECT THE NATURAL RESOURCE" does not allow for any activity that might protect the health, safety, and general welfare of the public (e.g. a hazardous condition; off-site or downstream adverse conditions attributable to conditions in the Forest Preserve). Furthermore, this restriction seems to preclude any activity, such as trail construction and maintenance, whose primary goal might not be preservation and protection of the forest resources.

This phrase provides adequate flexibility for the City to adopt management and maintenance guidelines that it considers necessary or beneficial. When absent, the provision may be too restrictive.

(c) Except as provided in the management and maintenance guidelines, the construction of bridges, shelters, culverts, levees, dams, dikes, or other manmade structures shall be prohibited, unless required by a state or federal agency whose authority supersedes that of the city, subject to approval by the city council.

(d) The construction, either permanent or temporary, of any structure, or the installation of any public facilities or utilities shall be prohibited. * See below

(e) No action shall be taken to alter or modify the natural course of any water course or body, even if such body is only seasonal or intermittent in nature, unless required by a state or federal agency whose authority supersedes that of the city, subject to approval by the city council. "Water course" can be broadly interpreted to include any ephemeral drainage pattern.

(f) Hunting, trapping, fishing, driving, harassing or otherwise capturing or harming wildlife shall be prohibited. Like Section 12-156(d), before it, there is also no provision for activities that follow approved M&M guidelines.

(g) All forms of biking shall be prohibited.

(h) The introduction of any exotic or invasive species is prohibited.

(i) No trail maintenance shall be permitted except as provided in the management and maintenance guidelines.

(j) The creation of trails or the widening, grading, or change of surface materials of any existing trail shall be prohibited except as provided in the management and maintenance guidelines or as set forth in an adopted trails plan. We recommend that a master plan of trails be adopted.

(k) Dumping or depositing of soil, trash, yard waste, garbage, or other offensive material shall be prohibited.

(l) The addition, extension of, or modification to any utility, except as otherwise provided in this article, shall be prohibited. What if there is a pest or disease outbreak (e.g. Emerald Ash Borer)? What about hazardous trees, aka "widowmakers". forest

(m) Clearing and pruning of vegetation shall not be permitted, unless for the benefit of the land and or consistent with the management and maintenance guidelines.

(n) Camping, grilling, cooking, or creation of any fire, regardless of purpose, mechanism of combustion, type of fuel, or type of containment, is prohibited. Be cautious about the unintended consequences of any unqualified prohibited activity. Barring grading, alterations of water courses can prevent activities that address stormwater problems or stream degradation. Even prohibiting hunting or trapping animals could hamper otherwise beneficial or necessary activity. What if rats or coyotes become a problem? What if a beaver blocks a culvert? What if the City wants to introduce beaver or other desirable wildlife? It is hard to know everything; even harder to predict the future.

Sec. 12-157. Resource protection.

(a) Natural resources within a forest preserve area are considered protected and may not be harmed, damaged, killed, relocated or removed, except as related to exotic and/or non-native species that may be recommended for removal or as otherwise provided in the management and maintenance guidelines.

Other resources include reptiles, insects, soils, molds/fungi, the organic duff layer that develops within a forest, etc. Resources of the forest preserve area shall include all trees, indigenous plants and flora, all forms and species of wildlife, including fish, amphibians, and birds.

* In this case there is no qualification to allow for activities consistent with management and maintenance guidelines, or for any other structure whatsoever. How do you define a structure? Is it a shelter? a bench? an interpretive panel? a sign? a blind for observing wildlife? a waterbar to deter erosion? "Any structure" is a highly restrictive term, with potentially unforeseen consequences. Can the fence surrounding the preserve be repaired? Are temporary tree shelters to protect newly planted trees from herbivores not allowed?

(c) Violation of this section shall be considered a misdemeanor.
(Ord. No. 1243, 10-27-03; Ord. No. 1279, 5-29-07)

"non-destructive" is difficult to define and subject to debate. Almost any activity can alter, consume or degrade a resource.

Sec. 12-158. Permitted activities.

(a) Any activities intended to and conducted so as to result in the non-destructive experience of the forest preserve and its essential natural qualities are considered consistent with the intent of this article and are permitted activities.

(b) Maintenance activities as set forth in the approved management and maintenance guidelines are permitted.
(Ord. No. 1243, 10-27-03; Ord. No. 1279, 5-29-07)

Sec. 12-159. Management and maintenance activities.

(a) The upgrading or expansion of any electrical transmission line, distribution line, telephone line, natural gas line, or other aboveground or underground line is permitted, if the person or entity responsible for the line had the right, subject to any required approvals, to upgrade or expand the line in the forest preserve area prior to the designation of the area as a forest preserve.

(b) Normal maintenance of utility lines and related easement areas is permitted, such that the activities are consistent with the right-of-way and/or easement, and such that the utility line, easement, or right-of-way existed prior to the date that the forest preserve was so designated.

(c) Any activity related to the management and maintenance of existing public drainage within a forest preserve area is permitted, provided that such maintenance does not increase the impervious area of coverage and does not widen, extend, or modify the drainage channel such that it would increase volume, velocity, or rates of discharge of natural or stormwater flows.

(d) Maintenance improvements to existing roads and parking areas within forest preserve areas, or within twenty-five (25) feet of the edge of the existing road or parking areas, are permitted so long as such maintenance improvements do not alter the existing surface material, do not expand or extend the area of the improvement, and do nothing to increase impervious surfaces.
(Ord. No. 1243, 10-27-03; Ord. No. 1279, 5-29-07)

12-159(c) and (d) are fraught with potential problems. Methods to manage stormwater runoff are complex problems. Would an activity that decreases stormwater flows be okay? If placing additional impervious in one location allows removal of more impervious in another, is that acceptable or prohibited?

Sec. 12-160. Special events.

The city will not sponsor or permit special events to be conducted in forest preserve areas if those events might be inconsistent with the intent of this article. Special events that are principally commercial in nature or activities involving animal, foot or watercraft races, physical endurance of a person or animal, organized survival exercises, war games, or similar exercises shall be considered inconsistent with the intent of this article.
(Ord. No. 1243, 10-27-03; Ord. No. 1279, 5-29-07)

Sec. 12-161. Preexisting improvements.

Improvements existing within designated forest preserve areas as of the day of designation shall be considered preexisting improvements and may be continued and maintained, but may not be expanded in size, area, or character of the improvement or related use. **There are no exceptions allowed for actions that are "in accordance with management and maintenance guidelines." Recommend including this provision.**
(Ord. No. 1243, 10-27-03; Ord. No. 1279, 5-29-07)

Sec. 12-162. Enforcement and violations.

Violations of this article shall be considered a municipal infraction and may be punishable with a fine of one thousand dollars (\$1,000.00) for each violation, except as provided in section 12-157 of this article.
(Ord. No. 1243, 10-27-03; Ord. No. 1279, 5-29-07)

Sec. 12-163. Changes to article.

(a) Prior to the consideration of any ordinance to amend this article, except for revisions to forest preserve boundaries as set forth in sections 12-152 through 12-154, the city council shall make a mandatory referral of the ordinance for review and comment to the forest preserve advisory board, in addition to any other city council advisory boards or committees, or other groups as determined by the city council.

(b) Prior to the consideration of any ordinance to amend this article, the city council shall schedule and hold a public hearing.

(c) Any ordinance that provides for an addition to, amendment of, or deletion from this article, except for revisions to forest preserve boundaries as set forth in sections 12-152 through 12-154, may be placed on the ballot as a referendum question as provided in the city charter.

(d) Any ballot question shall be placed on the ballot of the next regularly scheduled city election, in accord with the city charter.
(Ord. No. 1243, 10-27-03; Ord. No. 1279, 5-29-07)

* Note: This quotation does not appear anywhere in the ordinance. The word "undeveloped" does not appear anywhere in the ordinance. As a beginning it weakens the work of the FPAB, because it appears to mislead and insert values and priorities that are not part of the original law.

CITY OF GREENBELT, MARYLAND

FOREST PRESERVE MANAGEMENT AND MAINTENANCE GUIDELINES

Executive Summary

Note: See comments at end of this section.

In October 2003, the Greenbelt City Council passed legislation which created the Forest Preserve, which is intended to designate and manage limited forested areas as

* "protected, undeveloped, and undisturbed area for the benefit of current and future generations of Greenbelters ..."

The forest is not undisturbed

The area known popularly as Parcels 1 and 2, also referred to as the Great North Woods, was included in the initial Forest Preserve designation. The enabling legislation requires that a Management and Maintenance plan or guidelines be adopted. The purpose of these guidelines is to define the fashion by which the Forest Preserve areas will be used by the public, as well as the measures which may and should be undertaken by the City to ensure that the Forest Preserves are managed consistent with the intent of the designation.

As noted above, the intent of the legal designation is unclear.

M&M guidelines are about more than just public use. They include guidance for managing the health of the forest ecosystem.

An eleven (11) member Forest Preserve Task Force was appointed by the City Council to draft the management and maintenance standards. Equally important, the task force was to recommend any additions to the Forest Preserve system.

The Management and Maintenance Guidelines which follow are the product of a year long effort of the task force to find a balance between the public's use of and access to the Forest Preserve, with the City policy to protect the preserve areas from the detrimental impacts associated with future development. To be successful in this effort, it was necessary that the task force members work in a collaborative environment that embraced the perspectives of each task force member. The result is the document that follows. It is one that evaluates each area of the Forest Preserve, and defines restrictions and guidelines based on existing patterns of use and activity.

Based on field studies, the task force determined that the Forest Preserve can be divided into five areas based on differences in use patterns, historic changes, and the condition of the Forest Preserve area. These areas can be characterized by a range of descriptions, such as the very pristine North Preserve, with little human disturbance (Area A), and locations where the thoughtless and damaging activities in the Forest Preserve have dramatically altered its natural condition. Guidelines take into account these differences between areas.

Forest is not pristine

This wording gives a general negative connotation to all public use of the Forest Preserve. It also gives an unqualified negative connotation to future development. As noted above, development is not used in the ordinance and is not defined here. The message is public use = detrimental impact. There is no reference to any type of management activity to improve and enhance the health of the forest, or to share its benefits with "current and future generations of Greenbelters".

The Management and Maintenance Guidelines are divided into sections based on specific issues. The content sections are as follows: Introduction, Trails, Signage, Maintenance, Invasive Species, Catastrophic Events, Vegetation, Clean-up and Removal of Debris, Enforcement, Activities and Special Events, Contingencies and Forest Health. It is anticipated that these guidelines can be applied to any new Forest Preserve areas which may be designated in the future, with special issues addressed as they have been within this document.

Section Twelve - "Forest Health" strikes a more balanced tone and demonstrates a recognition that the Forest Preserve is a dynamic ecosystem. (font enlarged for emphasis):

For the most part, the Management and Maintenance Guidelines have addressed how the City will manage the impact of people and activities on the Forest Preserve. While the acts of people, direct and indirect, can have impacts both positive and negative, so can the natural growth and aging of a forest, including succession, competition, as well as weather, pests, pollution and fire. Accordingly, the management and maintenance of the Forest Preserve should include monitoring of the health of the forest community, including taking action as indicated to promote the health of the forest.

CITY OF GREENBELT, MARYLAND
FOREST PRESERVE
MANAGEMENT AND MAINTENANCE GUIDELINES

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CITY OF GREENBELT, MARYLAND

FOREST PRESERVE MANAGEMENT AND MAINTENANCE GUIDELINES

Policy Statement

The following Statement of Policy is a summary of the philosophy, intent and direction of the Management and Maintenance Guidelines for the Greenbelt Forest Preserve.

Statement of Policy

Recognizing that the supply of ~~undeveloped, undisturbed~~ ^{forested} land in Greenbelt has been depleted over the past several decades, and also acknowledging that without strong public intervention, the preservation of these valuable open spaces could not be guaranteed, the City Council adopted a Forest Preserve program. This program is intended to designate and manage forest resources as a **protected, undeveloped, and undisturbed area for the benefit of current and future generations of Greenbelters.** See comments at Executive Summary

The land areas designated as Forest Preserve are City owned park areas consisting of nearly 200 acres. The initial areas designated as Forest Preserve have been described as the North and South Preserves. The character of the North and South Preserves varies greatly. Accordingly, **each area should be governed by Management and Maintenance Guidelines specific to the area.** Certain guidelines will be consistent for all preserve areas. However, the application of the same guidelines to each area would ignore the unique qualities of each, as well as the patterns of use, current conditions, and public needs associated with each area. Repetitive

These Management and Maintenance Guidelines have been developed to recognize the overarching objectives of the Forest Preserve program, as well as the uniqueness of the Forest Preserve as a whole, and when viewed as discrete areas. There are **guidelines that will be applicable to all preserve areas, as well as guidelines that are specific to a certain area.** As new preserve areas are designated, guidelines which are specific to that area should be drafted, and incorporated within these guidelines, consistent with the approach reflected in this document. This will allow for the appropriate level of control consistent with the objectives of the Forest Preserve program, while allowing for the flexibility to address the unique and specific issues impacting individual preserve(s) areas.

SECTION ONE

INTRODUCTION

History

When the Federal Government divested itself of its ownership of Greenbelt in 1953, placing both the developed and undeveloped lands of Greenbelt in private ownership, it allowed for private entities to develop the greens of Greenbelt for suburban residential and commercial construction. Since the early 1960's, the City government has been engaged in a continuous battle to stave off new construction of a character and density which would be inconsistent with the history of Greenbelt. Much of what was built in the decades following private acquisition of the previously federally owned lands of Greenbelt does not reflect the planning details that characterize the historic community.

Perhaps the greatest loss resulting from the privatization of land ownership of Greenbelt was the incremental loss of the greenbelt. At various times since the early 1960's, proposals for development of what has popularly been called Parcels 1 and 2, were circulated and included plans for apartments and houses. At one point, parcel 2 had been acquired by Prince George's County as the site of a new high school.

Recognizing that ownership provides the only guaranteed way to protect what remained of the original greenbelt, the City set about to acquire all undeveloped parcels located in the north end of the historic city. The largest and most significant acquisition was completed after the City initiated condemnation action to acquire Parcels 1 and 2. The City was able to pursue this purchase through the passage by voters of a bond referendum, allocating \$2 million for the purchase of the remaining greenbelt. This acquisition became a reality when the Department of the Interior contributed to the cost of purchase, and the City also assumed ownership of the excess high school property.

Since the time of that land purchase, ^{find better wording} the City Council has sought a mechanism to protect the greenbelt from conversion ^{in use} which would compromise and/or damage the essential natural characteristics of the property. After considering public land trusts, private land trusts, easements, and county zoning overlays as possible mechanisms to protect these lands, it was determined that the party most capable of acting as a steward to protect the natural qualities of the north end greenbelt, would be the citizens of Greenbelt themselves. This led to the establishment of the Forest Preserve program, creation of management and maintenance guidelines, and the designation of a task force to develop and recommend policies for activities and behavior.

To counteract, rather than prevent, adverse conditions is a more realistic description of existing circumstances.

Philosophy of Guidance

The terms "stewardship" and "conservation" are more in keeping with the idea of Management and Maintenance Guidelines.

These Management and Maintenance Guidelines set forth a comprehensive program to guide the public stewardship of the City's Forest Preserve. Therefore, the primary goal of these guidelines is the preservation of the Forest Preserve wooded areas and the wildlife habitats within its boundaries. The first concern for citizens is the stewardship of the Forest Preserve – to protect and conserve the land in its existing natural state. The natural growth and maturation of the forest will be allowed and provisions made to prevent adverse conditions from inhibiting its growth or the viability of the natural ecosystem, including all trees, indigenous plants and flora, and all forms and species of wildlife, including fish, amphibians and birds. Other resources include reptiles, insects, soils, molds/fungi, the organic duff layer that develops within a forest, etc.

Secondary objectives for the Forest Preserve are public education about the preserves and their natural value, provision for passive recreation for citizens and protection of the aesthetic quality of the forest by minimizing the impact of modern civilization within the preserve. Public education, recreation, aesthetics should be embraced to the maximum extent practicable, consistent with wise stewardship and conservation of the forest ecosystems.

Enabling Legislation

Some human actions can enhance these values.

The Forest Preserve program and procedures of its administration are set forth in Greenbelt City Council Ordinance 1243, adopted on October 27, 2003, and codified in Chapter 12 of the City Code.

Role of the Forest Preserve Task Force

The Forest Preserve Task Force is a body of eleven members, appointed by the City Council, to formulate Management and Maintenance guidelines for the Forest Preserve program and park lands managed through the program. The Task Force is also charged with evaluating potential sites for future designation as Forest Preserve areas.

Assessment of Forest Preserve

On October 27, 2003 the Greenbelt City Council, by Ordinance 1243, designated two Forest Preserves, known as the North Preserve and the South Preserve.

The North Preserve consists of 144.9 acres, and is described as Parcels 10, 17, 19 and 20. The North Preserve is largely an undisturbed wooded area. While it is used by hikers on a regular basis, it is not used to the extent that other City parks, such as the Buddy Attick Park and Schrom Hills Park, are used. incorrect

The North Preserve is probably best described as a primitive area. The path system, though extensive, is informal. Path surfaces are not improved and range in width from several feet to a barely navigable course, impeded by vegetation, fallen trees and limbs, and streams. In some locations attempts have been made by trail users to stabilize and clear trails. At some stream crossings, rudimentary bridges have been laid out.

Currently, there are no standards for the creation or maintenance of trails or stream crossings. The “improvements” that have been made are the result of individual efforts. In no way should these improvements be considered formal, permanent, or approved. To protect the preserve area, as well as the public, from possible ill impacts from well intentioned acts of maintenance and improvement, the Management and Maintenance Guidelines should clearly prohibit such private improvements. Those improvements that are currently in place should be left in place, unless they are unsafe and present a danger to the public.

Section 12-162 of the Ordinance already addresses the existing improvements. Recommend preparing a Trails Master Plan and standards for trail construction and maintenance. The M&M guidelines should provide acceptable approaches for correcting problems and enhancing trails as might be required to serve the general public. New accessibility standards for persons with disabilities is an example of this.

SECTION TWO

TRAILS

Introduction

The North and South Preserves consist of five distinct areas, each with different natural conditions and usage patterns. This variety, particularly as evidenced in the usage patterns, necessitates the preparation of different management and maintenance standards, tailored for each area.

The different existing use patterns and natural conditions provide the option to designate a trail system that meets the needs of the public, while protecting the essential elements of the Forest Preserves that the City Council and citizens of the community have been fighting to protect for nearly 20 years.

Agree. In the drafting of guidelines for Forest Preserve maintenance, several points should be kept in mind. Forest management is a process. Forests are continually changing. The change may be indicative of a healthy forest system or a distressed forest system. Regardless, change is a fundamental characteristic of every forest. Guidelines may attempt to address all contingencies, but not all will be addressed. Guidelines should focus on the goals of the management strategy.

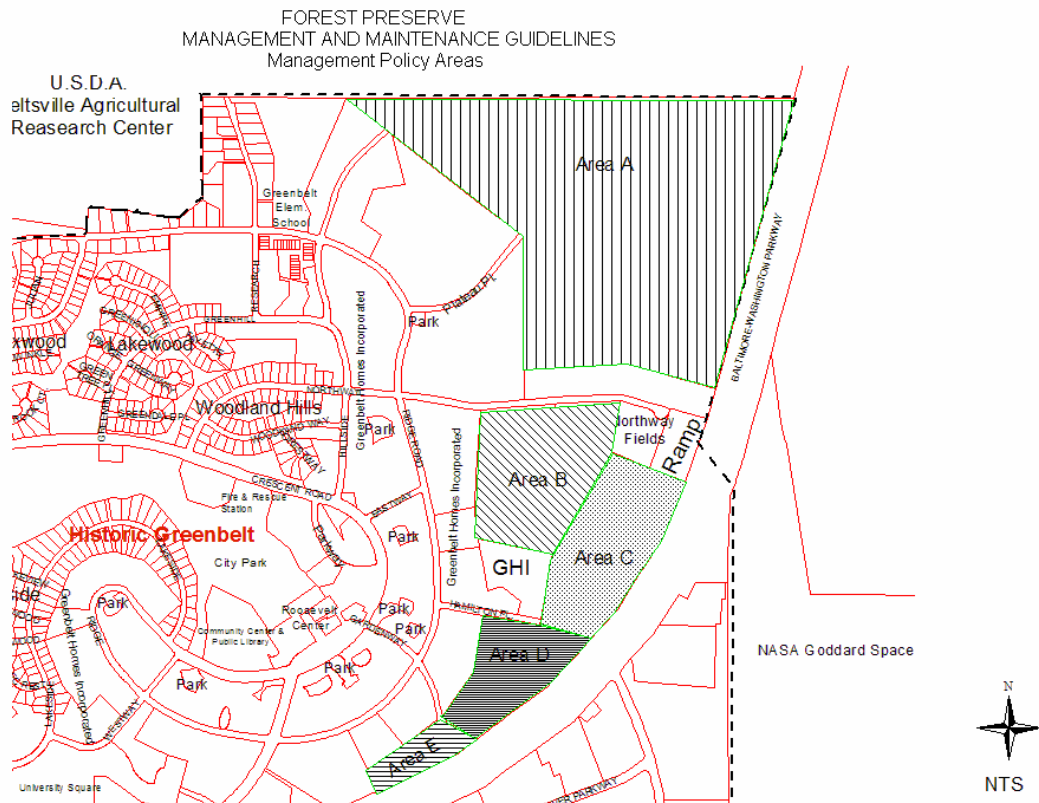
In considering impacts to a forest system, certain uses and forces are readily acknowledged to cause “damage”. Other uses, assumed to be benign and compatible with a stable and protected environment, also create change in the environment. The simple act of hiking alters the forest environment. Hiking causes compaction of the floor of the forest. Understory is walked on, pushed aside, and damaged. Over time, paths created by repeated walking become denuded, and subject to erosive processes. It is important to recognize that any process in the forest environment, be it introduced through natural forces or by the presence of humans, will change the forest. The relevant issues in planning for the long term health of the forest area is how these forces will be controlled, and to what extent change associated with these forces be accepted and tolerated.

This is no longer true. The State of Maryland is trying to meet the guidelines of the new 2013 standards.

A final consideration relates to accessibility. The Americans with Disabilities Act does not dictate standards for recreation trails. Therefore, the issue is whether or not to provide barrier free trails within certain preserve areas. It is important that elements of a trail system match the expectations of the user. If a trail is designated as being barrier free, then all elements of the trail should be consistent with that standard. A trail user negotiating a paved, level path would expect to find a bridge over a stream, and not a

11/25/13 - See 2014 Accessibility Standards for Outdoor Developed Areas: The Forest Preserve meets none of the conditions for exceptions. Minimum clear width is 36 inches, 60 inches for passing or a T shaped intersection with the base and arms extending 48 inches beyond the intersection.

fallen log. When a trail element along a trail is not consistent with the trail's overall design, a user could be forced to turn back in frustration.



North Preserve – Parcels 10, 17, 19, 20 - (Area A)

The North Preserve, located north of Northway, west of the Baltimore-Washington Parkway, south of the Beltsville Agricultural Research Center, and east of GHI units on Ridge Road, consists of 144.9 acres. This area, known in the community as the Great North Woods, is perhaps the most pristine, undisturbed, and critically valued area of the City's park land. **The forest is in later successional stages than other areas.**

The topography varies from gently sloping, to grades that exceed 15%. There are a series of informal paths that have been intentionally, and unintentionally, blazed over many decades of hiking. Trails maintenance has been done informally, so the trails range in quality and condition.

This suggests that some active management would improve the health and quality of the forest.

Even though the trails do not receive extensive use, there are spots of erosion, muddiness, slope failure, littering, vandalism, purposeful landscape damage, trail blazing, and other conditions reflecting concentrated use.

As opposed to planned trail systems, there is no loop trail, or consciously planned trail that creates a specific route. Users of the trail systems usually know where the trails go, and are not discouraged from using the trails because the trails do not have prescribed routes or entry and exit points. It is a primitive, informal trail system, and most individuals who visit the North Preserve are in favor of maintaining the culture of use which has allowed this forested area to retain its natural character for the decades that individuals have hiked this area. Is this true? How has this been determined? Could reluctance to change lead to unintended consequences?

South Preserve – South of Northway Fields – Parcels 6, 7, 8 – Area B

This area, which is relatively flat in topography, exhibits the quality of the wooded areas in the North Preserve. Perhaps due to the topography, it is this area that has been used for informal experiential/educational events and activities (e.g. Pumpkin Walk) that have been conducted on an annual basis for many years.

This area has also received informal maintenance in the past. Trails tend to be wider, flatter, and have been surfaced with straw. The introduction of straw as a surface material introduces a non-native material to the environment, which is capable of supporting the growth of undesirable vegetation in the preserve. This situation demonstrates the danger of allowing informal maintenance in the preserve areas. Well intended “improvements” may actually lead to unintended and undesired outcomes. Accordingly, under any maintenance or management plan, “informal” management or maintenance should not be permitted. Disagree. Straw is the chaff from wheat, and unlike hay, contains few seeds. The benefit of protecting the soil from excessive foot traffic or user's choice trails around muddy areas should continue.

The favorable topography of this South Preserve area provides an option to consider the management of the trail system in a fashion that provides greater opportunity for citizens to use this area of the preserve.

This area has drainage channels that are incising. It would be beneficial to halt or reverse this.

South Preserve – South of Northway Fields – Parcel 8, 9 – Area C

This area, consisting of approximately 18 acres, is very difficult to access, is heavily vegetated, and has a varied topography. This area does not lend itself to a planned trails system, given the limitations on the designation of loop, or joined trails. In addition, waste and dumped materials from the abandoned landfill can be found, partially buried, in areas near where hiking trails have been established. Were this area to be managed to encourage greater use, some measures would need to be taken to remove or mitigate the hazards created by the vestiges from the landfill operations. Due to the growth of vegetation around these landfill hazards and the lack of access to the buried junk, it would be very difficult to remove these junk cars, household

appliances, construction debris, and similar waste. Public access near these areas should be discouraged, if not restricted.

It is this area where “informal” trail maintenance has been undertaken by well meaning trail users. The most notable example of this maintenance is the use of an old diving board as a foot bridge. Should footbridges be designated as an approved trail element, unsafe measures which currently exist should be removed and replaced consistent with the guidelines and governing codes. Agree.

This is an instance where the Ordinance does not provide the necessary flexibility. Although 12-156(c) allows bridges in accordance with M&M guidelines, 12-156(d) absolutely prohibits footbridges.

South Preserve – Gardenway to Community Gardens at Hamilton Place – Part of Parcel 21 – Area D

This is a very flat portion of the preserve, and exhibits wear and abuse associated with heavy use (compared with the other areas of the preserve). This portion of the preserve is bounded by the Baltimore-Washington Parkway, and is impacted by the noise associated with the roadway. This noise intrusion detracts from the natural experience of the preserve and makes its character substantially different from the character of other areas, particularly the North Preserve.

There is evidence of illegal and undesirable activity within this area of the preserve, such as consumption of alcoholic beverages, drug use, gun use and overnight use. There is litter strewn throughout this area of the preserve. The fence dividing the City park land from the Baltimore-Washington Parkway right-of-way has been cut and taken down in locations to provide ready access to this area. Those fence breaches should be repaired. Ordinance may not allow this.

In spite of the negatives associated with the proximity of this area of the preserve to the Baltimore-Washington Parkway and the current use activities, this area could be utilized to provide hiking trails, which are convenient to large areas of the North End neighborhoods, without changing the essential character of the park area. Due to the topography, as well as the limited number of stream and similar crossings, this, of all preserve areas, would be most suitable for planning and management as an open access hiking area. Further, the encouragement of desired activity in this area could help reverse the evident pattern of misuse and undesirable use of the area. Accordingly, formalization of the path system which has developed over time is recommended.

Another benefit of the management of a designated park/hiking area is that such a park can reduce the demand on the primitive areas of the preserve where public use is not actively encouraged.

South Preserve – Gardenway to McDonald Field – Part of Parcel 21 – Area E

This area of the preserve is relatively flat and is also heavily vegetated. It is not well used for hiking, so consequently, there are few informal trails. The minimal access also leaves this area less impacted by littering, and other signs of neglectful activity that is evident in the preserve area north of Gardenway.

There does not seem to be significant public use in this area of the preserve. Further, when there is public discussion about protecting the North and South Preserve, there is little reference made to this specific area.

Lacking an obvious demand for use based on public comment or evidence of existing use patterns, this area should be managed based on the continuation of the existing condition. **This is a part of the Forest Preserve that actually has a lot of non-forest use and is not wooded in some locations.**

Development of Management and Maintenance Guidelines

As the foregoing discussion illustrates, a variety of use patterns, natural features, topography, opportunities, constraints and problems, are evident throughout the North and South Preserves.

Utilizing existing use patterns as the foundation to define the policies by which the preserves will be managed and maintained provides an immediate validation for the policy, as the public, through its years of use, has established the character of the forested area.

The following describes general guidelines for the management and maintenance of trails within the Forest Preserve. These guidelines present broad parameters which may apply, in whole, in part or perhaps not at all, to the management of trails in specific and unique areas.

General Guidelines for Preserve Trails

I. Purpose and User Expectation

Preserve trails are, in general, unimproved, informally designated paths within the preserve lands. The trails are not formally maintained, so users are likely to encounter a variety of conditions along any given trail, such as fallen trees, stream crossings, low and narrow clearances, and rough trail surfaces. When designated trails are authorized, the purpose would be to provide the public with a minimally intrusive and destructive mode to experience a large, forested area, and to participate in activities consistent with that type of experience.

II. Trail planning

Existing trails are not officially planned, and have evolved over time through public use. Trail planning would occur in situations where, due to sensitive areas or hazardous conditions, public access should be restricted, and alternate trails must be designated or promoted.

III. Trail layout

Since the existing trail system is unplanned, the trails themselves reflect actual use. It is probable that most existing trails reflect the general guidelines which might correspond with a planned trail system. Nonetheless, the layout of a trail is not required to be specified unless a trail is itself planned.

IV. Stream crossings

Stream crossings present the most significant public safety and environmental safety issue associated with trail management and maintenance. Certain general guidelines which are intended to protect the stream from damage to the bank, alterations in the channel, changes in water velocity, and unsafe conditions, are recommended.

Management of stream crossings is also a challenge when users erect informal bridges, which could be unsafe. Therefore, under any circumstance, bridging of a stream in the Forest Preserve should only be undertaken by the City, in accordance with the following general guidelines:

- Fords (natural crossings) can be used to traverse slow moving streams less than 24 inches deep. Stream crossings should be located where banks are stable and gently sloping and the stream bed naturally consists of gravel or sand.
- Unapproved construction or installation of bridges is not permitted.
- On hiking trails, a log bridge can be used for stream crossings less than 10 feet wide unless the trail is designated as a barrier free trail.
- When placing a bridge, it is advisable to select a location where the grade on either side of the stream is roughly equal, to allow for a relatively flat crossing.
- Bridges greater than two feet above the streambeds should have a hand rail consistent with appropriate local codes. **A handrail is not required where height is less than 30 inches.**

- On light use trails, bridges should be 2-4 feet in width. On heavy use trails, the ideal width for a bridge would be 5-6 feet. These standards are intended to be used only as general guides, and not as mandated standards.

Note that all of these actions are forms of "grading". Grading can be done successfully in ways that are acceptable for forest health and should be allowed. However, 12-155(e) prohibits any action to alter or modify the natural course of any water ...

V. Surface drainage

Surface drainage may cause ponding and erosion, which could detract from the user experience of the Forest Preserve and/or cause damage to the environment. Certain maintenance activities may be required for the long term health and safety of and within the Forest Preserve. The following should be considered strategies for dealing with specific problems and not as mandatory maintenance activities:

- For trails on steep slopes where erosion is occurring, flowing water should be diverted off the trail. This can be accomplished by out sloping the trail surface at 2-3 percent grade toward the downhill side of the trail.
- Grade dips or water bars may also be used to divert surface water flow from a trail. Water bars may be constructed of logs or stones, and should be placed at a 30 degree angle from the trail's edge.
- Excessive cross slope to reduce erosion can cause a trail to become difficult to negotiate, so care must be exercised to achieve the desired water diversion without the creation of excessive cross slope.

VI. Subsurface drainage

Trails where groundwater surfaces and collects can cause problems if it causes hikers to divert around the trail, thus widening the area of impact. Where subsurface drainage makes passage difficult, countermeasures to mitigate the ponding or wet conditions should be considered, consistent with the following guidelines:

- Raise the tread way 3 to 6 inches above the surrounding terrain which will allow water to drain away.
- Trail surfaces can be elevated with the use of natural materials, such as stones, gravel, or alternatively boardwalks.
- Boardwalks are preferable in areas where the soils are erodible and/or tree roots are exposed.
- Short runs of log bridges may also be used.

More examples of structures that are prohibited by 112-155(d).

VII. Trail signage **Agree. Again, some could argue that these are structures.**

Trail signage may be used to indicate the name of the preserve, post rules of use, and to provide information about the preserve.

In general, signage can be a useful tool by identifying the name, ownership, purpose and restrictions governing use of public lands, such as the Forest Preserves. Signage intended to attract the public to a location should be positioned at entrances to the preserve and other strategic locations. Signs may also be used to orient users to trail heads, etc.

For those areas where extensive public use is not encouraged, and regulations governing use may be more restrictive, signage should be considered. However, this signage would be smaller, and the content would focus on the preservation element of the management activities and use restrictions.

VIII. Trail markings/blazes

One feature sometimes found along hiking trails are trail blazes or markings. These markings orient users to a route, allowing them to navigate through a park area. This is a matter not only of use management, but also of safety. Blazed trails help keep users on already created trails, but they also help keep users from getting lost. Therefore, a management guideline providing for blazing of a primary trail, where one exists, is recommended consistent with the following:

- Trail users should be able to sight from one trail marker to the next, in any season of the year.
- While painted blazes or markings on trees is one way to mark a trail, use of non-permanent markers, such as flags or marking tapes, is the preferred method of blazing trails. Use of such durable yet movable markings will allow a blazed trail to be modified in route, marked temporarily, or deemphasized, as circumstances may necessitate.
- Unauthorized placement or marking of blazes is prohibited.

IX. Trail clearing

Trail clearing is only permitted in areas where a barrier free trail is being planned. In those situations, shrubs and small trees should be cut flush with the ground. Under any circumstance, trail clearing should be minimized.

There are instances when removal of a fallen tree along any trail may be preferable. It discourages non-sanctioned "user's choice" trails. Reconnaissance for hazardous trees should be conducted and measures taken to eliminate the hazard.

X. Trail surfacing

Trail surface will be governed by the type of trail, user expectations, and the condition of the soils, surface and subsurface drainage. Trails other than primitive trails, should be free of stones, stumps and protruding roots. The more heavily traveled the trail, the greater the need for a stable surface treatment.

XI. Maintenance

Maintenance can be considered a function of observation and monitoring, as well as actual scheduled maintenance. Any designated trail within a preserve area should be inspected on an annual basis, to identify any maintenance or use issue.

XII. Accessibility

Incorrect. See earlier comments.

There are no ADA standards for recreational trails. The existing conditions, use patterns and character of the preserves, particularly in the South Preserve, provide opportunities to designate and provide a trail system that is barrier free. This is not to suggest that paved trails should be provided at any particular location. Rather, it is to suggest that the more actively a trail is planned and managed, the wider the range of trail users for whom access may be desired.

Specific Guidelines for Preserve Areas **Sections V., VI., IX., X. and XI are repetitive**

Due to the unique character of the areas of the North and South Preserves, it is prudent to define trail guidelines that are specific to each area. The following are those guidelines:

North Preserve – Area A

I. Purpose and User Expectation

use a different word here

The North Preserve is the largest, most pristine, and critically valued of the City's parklands. Due to the expanse of wooded area, the extreme variations in topography, and the isolation of the preserve area in relation to other public areas, use levels should not be expected or encouraged to increase. Trails management should reinforce this objective.

II. Trail planning **Some trails in the North Preserve are not well located. Better alternate routes may exist.**

The use patterns of the North Preserve have been well established and validated through City Council policy. Public sentiment supports the goal that public access in the North Preserve should not be changed, except as necessary to protect the area from disruptive use or alteration of the essential characteristics of the forest area. Therefore, the formalization of trails is not recommended.

- No new trails are proposed. Trails occur as a result of informal use by the general public.
- All trails shall accommodate only hiking or similar foot based activity.
- Trails resulting from inappropriate or prohibited use are not permitted.

III. Trail layout

- Trail users should contain hiking to existing trails to minimize disturbance to flora, fauna and undisturbed ground spaces.
- Hiking on courses on a steep slope should be avoided in order to minimize potential for erosion. Switchback hiking patterns are recommended.

IV. Stream crossings **How do you accomplish some of the objectives / take actions laid out below if trails occur as a result of informal use by the general public? The FPAB should give some thought to how some necessary, planned human intervention, can be done in a manner consistent with the ordinance, vision, and M&M guidelines.**

- Stream crossings should be kept to a minimum.
- Hikers should cross streams at the narrowest point, where banks are gently sloped and the stream bottom consists of gravel or sand.
- The construction or creation of bridges is prohibited unless required to protect a stream bank or channel from damage.

V. Surface drainage

- Alteration of existing surface drainage patterns should be considered only when runoff creates conditions considered to be unsafe to the public or damaging to the surrounding natural conditions.
- Should surface drainage patterns require modification, such modification will only employ natural materials.
- Culverts, storm drain inlets, swales, rip rap channels, or other measures that require excavation and/or the introduction of non-natural materials, are not permitted.
- Surface drainage adjustments, if required, should focus on redirection of the surface flow.
- In lieu of the use of surface drainage treatments, access to an impacted area may be restricted for a time period necessary to allow the undesirable condition to naturally repair/restore.

Below is an instance when "minimize to the maximum extent practicable" says much the same, without having a debate about what is meant by "destructive".

- Under any circumstances, the countermeasures employed shall be the least destructive option(s) available, and shall be limited only to that area which must be impacted to improve the unsafe or degraded condition.

VI. Subsurface drainage *Is this section talking about the storm drain system?*

- Subsurface drainage is prevalent throughout the City of Greenbelt. No special treatments shall be considered to address general subsurface drainage.
- In the event subsurface drainage impacts adjacent, private properties, no countermeasures shall be implemented until a study of the severity of the problem and all possible treatments, has been conducted.
- Treatment of subsurface drainage problems impacting adjacent private properties through the alteration of surface or subsurface conditions on the preserve shall be considered only if no other options are available. More expensive options that protect the natural condition of the preserve are preferred to options which will impact the preserve.
- In the event that subsurface drainage is impacting a trail, or other area being utilized by the general public, measures may be taken to reduce and eliminate muddy and/or erosive conditions. Such measures may include placement of stepping stones over the muddy areas or redirection of the path.

VII. Trail signage

- Trail signage should be posted at the major points of public entry to the park, such as the main entrance to the Northway Field complex, near Ridge Road. These signs will indicate that the area is a forest preserve, state general rules of use, and give a phone number to call to report problems.

VIII. Trail markings/blazes

- Trail markings and/or blazes are not permitted, given the primitive nature of the North Preserve.

IX. Trail clearing

- Trail clearing is prohibited, unless in relation to a maintenance or management activity directed by Council.

On the previous page and below, these activities cannot be performed without action by the Council or the City Manager. This can be burdensome and untimely. Suggest the FPAB assign the decision making role to an individual or department of government; periodically report to the Council or City Manager.

X. Trail surfacing

- No foreign materials, including wood chips, straw, ~~and~~^{or} gravel are allowed to be used for trail surfacing.

XI. Maintenance

- The North Preserve shall be inspected on foot on an annual basis by City personnel as assigned by the City Manager, to evaluate the condition of the preserve.
- Permitted maintenance activities during the inspection include removal of trash and refuse as well as removal of improvements installed by others and considered inconsistent with the Management and Maintenance Guidelines.
- Any conditions believed to be dangerous to the public or potentially injurious to the natural environment shall be reported to the City Manager, who will determine the appropriate response according to these guidelines. ~~As noted previously, actions like removing sections of trees blocking trails or hazardous trees are desirable. They should not require reports to and action by the Council or City Manager.~~

XII. Accessibility

- There are no barrier free trails in the North Preserve.

~~This may no longer be acceptable, per new ABA guidelines. Consider routes near stream / wetlands or on plateau areas, where "construction" or grading would be minimal.~~

South Preserve – South of Northway Fields – Area B

I. Purpose and User Expectation

It is this area of the South Preserve where informal educational and experiential activities, such as the Pumpkin Walk, have been conducted for many years. As a result, a trail system has developed to accommodate use by groups of individuals who might otherwise not visit woodlands. Informal trail maintenance has been conducted, including the use of straw to stabilize the trail surface. There has been public interest to allow for the continuation of these special activities.

The evolution of the informal trails in this area of the forest preserve provides an opportunity to temporarily designate a trail to support popular experiential/educational activities.

II. Trail planning

As this area of the preserve is popular because of the special activities which have been held here over the years, it is prudent to define how and under what circumstances the temporary designation and marking of trails related to these special events, is to be undertaken.

- The proposed temporarily designated trail shall utilize the general alignment of the trails which have been used for past organized activities.
- Trails shall be planned and maintained to avoid the removal of trees and vegetation.
- Trails resulting from inappropriate or prohibited use are not permitted.

III. Trail layout

- Trail users should contain hiking to existing trails in order to minimize disturbance to flora, fauna and undisturbed ground spaces.
- Temporary designated trails should be limited to areas of relatively flat topography where a system of marginally maintained trails has already developed.
- Access to the designated trail shall be via the Northway ball fields parking area and/or Northway. Consider allowing access from adjacent neighborhoods, developing more of a network of trails.

IV. Stream crossings

- Stream crossings should be kept to a minimum.
- Hikers should cross streams at the narrowest point where banks are gently sloped and the stream bottom naturally consists of gravel or sand.
- Stream crossings along a designated trail are not required. Extension of the designated trail to necessitate a stream crossing is not permitted.
This may not be the case after a Trails Master Plan is completed.

V. Surface drainage

V. and VI. are identical to those for North Preserve

- Alteration of existing surface drainage patterns should be considered only when runoff creates conditions considered to be unsafe to the public or damaging to the surrounding natural conditions.
- Should surface drainage patterns require modification, such modification will only utilize natural materials.
- Culverts, storm drain inlets, swales, rip rap channels, or other measures that require excavation and/or the introduction of non-natural materials, are not permitted.
- Surface drainage adjustments, if required, should focus on redirection of the surface flow.

In V. and VI. the only unique bullet is this one. Perhaps the sections could be consolidated or incorporated in the General Guidelines.

- In lieu of the use of surface drainage treatments, access to an impacted area may be restricted for a time period necessary to allow the undesirable condition to naturally repair/restore.
- Under any circumstances, the countermeasures employed shall be the least destructive options available, and shall be limited only to that area which must be impacted to improve the unsafe or degraded condition.
- In lieu of natural materials, a boardwalk may be constructed, so long as the boardwalk allows the natural drainage flow to continue. The boardwalk may be considered only along segments of the designated trail.

Prohibited by 12-156(d)

VI. Subsurface drainage

- Subsurface drainage is prevalent throughout Greenbelt. No special treatments shall be considered to address subsurface drainage.
- In the event subsurface drainage impacts adjacent, private properties, no countermeasures shall be implemented until a study of all the possible treatments, and the severity of the problem, has been conducted.
- Treatment of subsurface drainage problems impacting adjacent private properties through the alteration of surface or subsurface conditions on the preserve shall be considered only if no other options are available. More expensive options that protect the natural condition of the preserve are preferred to options which will impact the preserve.
- In the event that subsurface drainage is impacting a trail or other area being utilized by the general public, measures may be taken to reduce and eliminate muddy and/or erosive conditions. Such measures may include placement of stepping stones over the muddy areas, redirection of the path, or use of a boardwalk over the muddy/eroded portion of the trail.

VII. Trail signage

- Trail signage should be posted at the main entrance to the Northway Fields complex, near Ridge Road.

VIII. Trail markings/blazes

- Temporary trail markings and/or blazes shall be utilized to mark the designated trail.
- Blazes shall be indicated through the use of flags or marking tape, if at all possible. Different loops or legs of the trail may be indicated through the use of different colors.
- Signs, marking, or other identification of a permanent nature should not be affixed to a tree or other vegetation, rock, or natural element.
- Unauthorized placement or marking of blazes is prohibited.

These conditions may be contradictory or impractical. For example, even the guidance for the North Preserve recognizes the possibility that grading, such as water bars, may be required.

IX. Trail clearing

- Trail clearing is prohibited, except to create a designated trail if authorized by Council.
- Trail clearing shall only occur when significant impassible hazards are present along the designated trail. In these instances, small trees or shrubs should be cut flush to the ground and shall be the minimum necessary to create and maintain the trail.
- Excavation or grading in the creation of managed trails is not permitted.
- The designated trail shall not be widened. **If accessible trail must be 3 feet clear.**

X. Trail surfacing

- No foreign materials, including wood chips, straw and gravel, are permitted to be used for trail surfacing. **See previous note about straw. It is cheap and effective for temporary stabilization.**

XI. Maintenance

- Area B of the South Preserve shall be inspected on an annual basis on foot by City personnel as assigned by the City Manager to evaluate the condition of the preserve.
- Permitted maintenance activities during the inspection include removal of trash and refuse and removal of improvements installed by others and considered inconsistent with the Management and Maintenance Guidelines.
- Any conditions believed to be dangerous to the public or potentially injurious to the natural environment shall be reported to the City Manager, who will determine the appropriate response within these guidelines.

XII. Accessibility

- The designated trail is intended to be usable by the general public, specifically those who are not familiar with the more extensive, informal trails of the North Preserve. However, the designated trail is not considered a barrier free trail.

South Preserve – South of Northway Fields – Area C

I. Purpose and User Expectation

The isolation of the preserve area south of Northway Fields, as well as its heavily vegetated character, extensive stream channels, steep slopes, and remnants of the landfill operation, does not lend this area for a designated trail system.

The presence of landfill materials, such as car parts, household appliances, and tires, may present a hazard to the public. It would be difficult to remove such remnants without clearing, excavating and grading. Such extreme activities should not be undertaken unless a clear and obvious danger to the public's health and safety is found to be related to the landfill artifacts.

Recommend removing the landfill in the future.

While not recommended at this time, if access to the landfill materials poses a threat, consideration should be given to the installation of a barrier, such as a split rail fence, but may not include a chain link fence.

II. Trail planning

The informal trail system reflects low usage. Further, this area is difficult to access, and appears to be used with even less frequency than are the informal trails of the North Preserve.

- No new trails are proposed. Trails occur as a result of informal use by the general public.
- All trails shall accommodate only hiking or similar foot based activity.
- Any trails resulting from inappropriate or prohibited use are not permitted.

III. Trail layout

- Trail users should contain hiking to existing trails to minimize disturbance to flora, fauna and undisturbed ground spaces.
- Hiking on courses on a steep slope should be avoided in order to minimize potential for erosion. Switchback hiking patterns are recommended.

IV. Stream crossings

- Stream crossings should be kept to a minimum.
- Hikers should cross streams at the narrowest point, where banks are gently sloped and the stream bottom consists of gravel or sand.

- The construction or creation of bridges is prohibited, unless required to protect a stream bank or channel from damage.
- The existing “diving board” bridge is an example of informal trail maintenance, and is inconsistent with the policy to prohibit the construction of bridges. It is recommended that the diving board, and similar existing structures, be allowed to remain. However, should such structures be damaged, deteriorate, or otherwise degrade to the point that the public’s safety is clearly endangered then such structure shall be removed and will not be replaced.

V. Surface drainage

V. and VI. are identical to those for North Preserve

- Alteration of existing surface drainage patterns should be considered only when runoff creates conditions considered to be unsafe to the public or damaging to the surrounding natural conditions.
- Should surface drainage patterns require modification, such modification will only utilize natural materials.
- Culverts, storm drain inlets, swales, rip rap channels, or other measures that require excavation and/or the introduction of non-natural materials, are not permitted.
- Surface drainage adjustments, if required, should focus on redirection of the surface flow.
- In lieu of the use of surface drainage treatments, access to an impacted area may be restricted for a time period necessary to allow the undesirable condition to naturally repair/restore.
- Under any circumstances, the countermeasures employed shall be the least destructive options available, and shall be limited only to that area which must be affected to improve the unsafe or degraded condition.

VI. Subsurface drainage

- Subsurface drainage is prevalent throughout Greenbelt. No special treatments shall be considered to address subsurface drainage.
- In the event subsurface drainage impacts adjacent, private properties, no countermeasures shall be implemented until a study of all possible treatments, and the severity of the problem, has been conducted.
- Treatment of subsurface drainage problems impacting adjacent private properties through the alteration of surface or subsurface conditions in the preserve shall be considered only if no other options are available. More expensive options that protect the natural condition of the preserve are preferred to options which will impact the preserve.
- In the event that subsurface drainage is impacting a trail or other area being utilized by the general public, measures may be taken to reduce and eliminate muddy and/or erosive conditions. Such measures may include

placement of stepping stones over the muddy areas, or redirection of the path.

VII. Trail signage

- Trail signage is not recommended for this area of the South Preserve.

VIII. Trail markings/blazes

- Trail markings and/or blazes are not permitted, given the primitive nature of this area of the preserve.

IX. Trail clearing

- Trail clearing is prohibited unless in direct relation to a maintenance or management activity directed by Council.
- Trails shall not be widened. See previous comments about requiring Council or City Manager action.

X. Trail surfacing

- No foreign materials, including wood chips, straw and gravel, are permitted to be used for trail surfacing.

XI. Maintenance

- Area C of the South Preserve shall be inspected on an annual basis on foot by City personnel as assigned by the City Manager, to evaluate the condition of the preserve.
- Permitted maintenance activities during the inspection include removal of trash and refuse and removal of improvements installed by others and considered inconsistent with the Management and Maintenance Guidelines.
- Any conditions believed to be dangerous to the public or potentially injurious to the natural environment shall be reported to the City Manager, who will determine the appropriate response within these guidelines.

XII. Accessibility

- There are no barrier free trails existing or planned for Area C of the South Preserve.

South Preserve – Gardenway to Community Gardens at Hamilton Place – Area D

I. Purpose and User Expectation

This area is relatively flat and exhibits the heaviest use of any Forest Preserve area. Use patterns indicate that both desirable and undesirable activities occur in this area. In addition, this area suffers noise intrusion from the Baltimore-Washington Parkway, which detracts from the natural character of the woodland.

Of all preserve areas, this is the most readily accessible, which explains the use patterns. Given the accessibility, amount of usage, quality of that usage, and flat topography, this area is most suitable for planning and designation of trails offering access to the widest range of users.

II. Trail planning

- An inventory of existing trails, sensitive areas, areas of misuse and/or environmental decline, connections, stream crossings, and similar features, should be conducted. This will provide a basis for a comprehensive trail plan.
- Based on the results of this inventory, the following can be determined:
 - o Existing trails and suitability for use as a designated trail segment.
 - o Areas of sensitivity, where trails and public intrusion should be avoided.
 - o Areas of decline, where past activities have compromised the character, health and/or condition of the Forest Preserve, and require treatment to restore the area.
 - o Unique opportunities to make a portion of the Forest Preserve available to a larger segment of the public without threatening or compromising the character and quality of the preserve.
- Following this evaluation, consider planning for a system of easy to use, barrier free, interpretive trails which would provide an opportunity for citizens to enjoy the experiences of a naturally forested area, without compromising the larger, primitive areas of the North and South Preserve.
- Trails resulting from inappropriate or prohibited use are not permitted.

III. Trail layout

- Trail users should contain hiking to existing trail to minimize disturbance to flora, fauna and undisturbed ground spaces.
- Hiking on courses on a steep slope should be avoided in order to minimize potential for erosion. Switchback hiking patterns are recommended.

IV. Stream crossings

- Stream crossings should be kept to a minimum.
- Hikers should cross streams at the narrowest point, where banks are gently sloped and the stream bottom consists of gravel or sand.
- The construction or creation of bridges shall be considered in the context of trails planning. Should a barrier free trail be planned, any stream crossings shall match the experience associated with the planned trail system.

V. Surface drainage

- Alteration of existing surface drainage patterns shall be considered only when runoff creates conditions considered to be unsafe to the public or damaging to the surrounding natural conditions.
- Should surface drainage patterns require modification, such modification will only utilize natural materials.
- Culverts, storm drain inlets, swales, rip rap channels, or other measures that require excavation and/or the introduction of non-natural materials, are not permitted.
- Surface drainage adjustments, if required, should focus on redirection of the surface flow.
- In lieu of the use of surface drainage treatments, access to an impacted area may be restricted for a time period necessary to allow the undesirable condition to naturally repair/restore.
- Under any circumstances, the countermeasures employed shall be the least destructive options available, and shall be limited only to that area which must be impacted to improve the unsafe or degraded condition.

VI. Subsurface drainage

- Subsurface drainage is prevalent throughout Greenbelt. No special treatments shall be considered to address subsurface drainage.
- In the event subsurface drainage impacts adjacent, private properties, no countermeasures shall be implemented until a study of all possible treatments, and the severity of the problem, has been conducted.
- Treatment of subsurface drainage problems impacting adjacent private properties through the alteration of surface or subsurface conditions on the preserve shall be considered only if no other options are available. More expensive options that protect the natural condition of the preserve are preferred to options which will impact the preserve.
- In the event that subsurface drainage is impacting a trail or other area being utilized by the general public, measures may be taken to reduce and

eliminate muddy and/or erosive conditions. Such measures may include placement of stepping stones over the muddy areas, or redirection of the path.

VII. Trail signage

- Trail signage should be posted at the major points of public entry to this area of the preserve. These signs will indicate that the area is a Forest Preserve, state general rules of use, and give a phone number to call to report problems.

VIII. Trail markings/blazes

- Trail markings and/or blazes shall be utilized to mark only the designated trail(s).
- Blazes shall be indicated through the use of flags or marking tapes, if at all possible. Different loops or legs of the trail may be indicated through the use of different colors.
- Signs, markings, or other identification of a permanent nature should not be affixed to a tree, vegetation, rock, or other natural element.
- Blazes should be placed to be visible from all trail approaches.
- Each blaze location should have visibility to the next blaze in sequence.

IX. Trail clearing

- Trail clearing is prohibited except to create a designated trail, if authorized by Council.

X. Trail surfacing

- No foreign materials, including wood chips, straw and gravel, are permitted to be used for trail surfacing, unless a barrier free trail is planned.

XI. Maintenance

- Area D of the South Preserve shall be inspected on an annual basis, on foot by City personnel as assigned by the City Manager, to evaluate the condition of the preserve.
- Permitted maintenance activities during the inspection include removal of trash and refuse and removal of improvements installed by others and considered inconsistent with the Management and Maintenance Guidelines.

- Any conditions believed to be dangerous to the public or potentially injurious to the natural environment shall be reported to the City Manager, who will determine the appropriate response within these guidelines.

XII. Accessibility

- The decision regarding the possibility of designating any trails, including barrier free trails, should be based on the findings of the trail planning assessment.

South Preserve – Gardenway to McDonald Field – Area E

I. Purpose and User Expectation

This area of the South Preserve is not extensively used. The area is relatively flat and is heavily vegetated. It is recommended that this preserve area be managed based on a continuation of the existing use pattern.

II. Trail planning

- No new trails are proposed. Trails occur as a result of informal use by the general public.
- All trails shall accommodate only hiking or similar foot based activity.
- Trails resulting from inappropriate or prohibited use are not permitted.

III. Trail layout

- Trail users should contain hiking to existing trails to minimize disturbance to flora, fauna and undisturbed ground spaces.
- Hiking on courses on a steep slope should be avoided in order to minimize potential for erosion. Switchback hiking patterns are recommended.

IV. Stream crossings

- Stream crossings should be kept to a minimum.
- Hikers should cross streams at the narrowest point, where banks are gently sloped and the stream bottom consists of gravel or sand.
- The construction or creation of bridges is prohibited, unless required to protect a stream bank or channel from damage.

V. Surface drainage

- Alteration of existing surface drainage patterns should be considered only when existing runoff creates conditions considered to be unsafe to the public or damaging to the surrounding natural conditions.
- Should surface drainage patterns require modification, such modification will only utilize natural materials.
- Culverts, storm drain inlets, swales, rip rap channels, or other measures that require excavation and/or the introduction of non-natural materials, are not permitted.
- Surface drainage adjustments, if required, should focus on redirection of the surface flow.
- In lieu of the use of surface drainage treatments, access to an impacted area may be restricted for a time period necessary to allow the undesirable condition to naturally repair/restore.
- Under any circumstances, the countermeasures employed shall be the least destructive option(s) available and shall be limited only to that area which must be affected to improve the unsafe or degraded condition.

VI. Subsurface drainage

- Subsurface drainage is prevalent throughout Greenbelt. No special treatments shall be considered to address subsurface drainage.
- In the event subsurface drainage impacts adjacent, private properties, no countermeasures shall be implemented until a study of all possible treatments, and the severity of the problem, has been conducted.
- Treatment of subsurface drainage problems impacting adjacent private properties through the alteration of surface or subsurface conditions in the preserve shall be considered only if no other options are available. More expensive options that protect the natural condition of the preserve are preferred to options which will impact the preserve.
- In the event that subsurface drainage is impacting a trail or other area being utilized by the general public, measures may be taken to reduce and eliminate muddy and/or erosive conditions. Such measures may include placement of stepping stones over the muddy areas, or redirection of the path.

VII. Trail signage

- Trail signage is not recommended for this area of the South Preserve.

VIII. Trail markings/blazes

- Trail markings and/or blazes are not permitted.

IX. Trail clearing

- Trail clearing is prohibited unless in direct relation to a maintenance or management activity directed by Council.

X. Trail surfacing

- No foreign materials, including wood chips, straw and gravel, are permitted to be used for trail surfacing.

XI. Maintenance

- Area E of the South Preserve shall be inspected on an annual basis on foot by City personnel as assigned by the City Manager, to evaluate the condition of the preserve.
- Permitted maintenance activities during the inspection include removal of trash and refuse and removal of improvements installed by others and considered inconsistent with the Management and Maintenance Guidelines.
- Any conditions believed to be dangerous to the public or potentially injurious to the natural environment shall be reported to the City Manager, who will determine the appropriate response within these guidelines.

XII. Accessibility

- There are no barrier free trails in Area E of the South Preserve.

SECTION THREE

SIGNAGE

Signage is generally used for two purposes – to identify a building or location to the public and to convey information. The size, location and text content of a sign will be determined by the purpose of the sign.

Signs are often viewed as a necessary evil. Signs, if used, should be designed and placed based on an understanding of the purpose and need for the sign. It is therefore important to identify the intended purpose of any sign before determining that one is required, and if required where it will be placed and how large it needs to be.

The need for signs at the Forest Preserve may be subject to debate and disagreement. Some may believe that a sign will attract users and advertise the preserve area for greater use than it might otherwise experience. These fears must be balanced against the benefit of a strategically worded, designed and maintained sign.

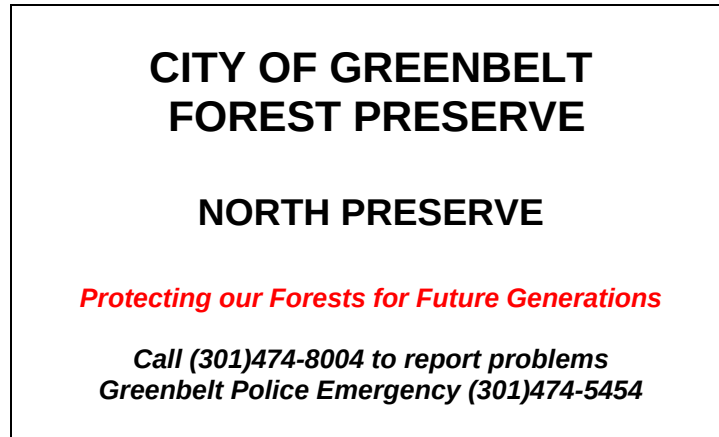
It is recommended that modest signs consistent with the standard redwood signs used at other City facilities and public areas be placed on Northway at Ridge Road near the entrance to the Northway complex. The other location recommended as appropriate for signage would be entrances to Area D of the South Preserve, should designated trails be planned and approved for this area.

The purpose of the sign would be to communicate information regarding the Forest Preserve. First, the sign would identify the park as a “Forest Preserve” and thus specially designated and managed by the City. Second, the sign would convey a simple statement indicating that the area is intended to be used for passive recreation experiences, and is ultimately an area to be protected and preserved. Finally, the sign would contain a phone number indicating where information about the park area and the Forest Preserve program may be obtained. It would also provide direction regarding the filing of complaints and/or reporting of inappropriate or illegal activity.

Consistent with other City parks and facilities, it is proposed that the sign be constructed of red wood, with the name of the park and the City seal routed and mounted on the sign. A line of smaller text could be placed below the Forest Preserve name, indicating that the area is a Forest Preserve and advising visitors of the limitations on activities and uses. A third area of text, which could be a small sign hung below the primary sign, would give the phone number to call for information and emergencies.

The purpose of these signs is to communicate basic information about the park area and the Forest Preserve program. The size and the scale of the sign should be consistent with other standard City facility signs located throughout Greenbelt.

A sample sign and text is as follows:



SECTION FOUR

MAINTENANCE

Webster's Dictionary defines *maintenance* as "*To keep in a desirable condition*". The use of this term often reflects the perspective of the individual reader. For example, from a public works perspective, maintenance can be interpreted to include those routine activities associated with the operation of a public park, including trash collection, turf control, surface preparation and repair, landscape installation, and pest management.

Within the context of the Forest Preserve, *maintenance* is addressed in four sections of this document. In the section addressing trails, the discussion applies to maintenance of the trails and reflects a perspective that active maintenance for the purpose of addressing the impact of people on the preserve should be sparingly undertaken. This section of the document elaborates further on this approach.

"Minimize to the maximum extent practicable"

The active mitigation of human impacts on the preserve, which is suggested be approached in a very conservative and measured fashion, is different from the maintenance of the preserve from the perspective of the health of the natural resources. In sections addressing Invasive Species (Section 5) and the Forest Health (Section 12), a far different approach is advocated. In Sections 5 and 12, it is recommended that the appropriate maintenance approach to the Forest Preserve as a natural resource is proactive and include a continuous evaluation of the forest health.

It is therefore important, when considering maintenance, to ensure that the objective of the contemplated act be understood and the resulting action evaluated in the context of the health of the natural resource.

The following defines a suggested approach for the maintenance of the Forest Preserve from the perspective of the impact of use of the public on the protected forest areas. The reader is directed to separate discussions on Invasive Species and Forest Health for additional information on the general topic of maintenance.



Due to the size and vastness of the North and South Preserves, it would be difficult to maintain these forested areas to the same standard as large City parks (Buddy Attick, Schrom Hills Park). Equally important, "maintenance" can be viewed as an intrusive activity and one which would change the essential character of the Disagree with this philosophy. Maintenance (see Webster) does not mean every blade of grass and every leaf is tended. The issue is one of defining the "desirable condition".

What is the proper maintenance for things such as fences, erosion, pests, trash, hazardous trees, etc. "Regular" is vague. It could be weekly, monthly, seasonally, yearly, etc.

preserves. Therefore, regular maintenance of any of the Forest Preserve areas is not recommended.

Within the trails section of this document, it is recommended that each Forest Preserve area be inspected on foot on an annual basis. The purpose of this inspection is two-fold. First, it provides an opportunity for a formal assessment of the condition of the Forest Preserve. Second, City personnel conducting the inspection/assessment can pick up trash and debris discovered during the inspection. It is not the intention of this recommendation to advocate for inspection or clean-up requiring the use of heavy equipment. To place this recommendation in context, the character of the inspection and clean-up should relate to the character of public access and use as defined in this document. No routine or annual maintenance, clean-up or inspection should impact or alter the essential characteristics of the Forest Preserve. The use of fertilizers or soil aeration should be specifically prohibited.

However, the "front door" of the Forest Preserve(s) should be more regularly inspected and maintained. By "front door," this document makes reference to the edges of the Forest Preserve abutting a City street and/or a formal entrance to the Forest Preserve. The purpose of more frequent inspections and clean-up of these edges is to ensure that there is never a visual impression communicated that the Forest Preserve is not a protected area. The accumulation of trash and debris along a roadside abutting the Forest Preserve (such as Northway and Gardenway) or at an entrance (Plateau Place and Laurel Hill Road terminus) could convey an impression of disinterest, lack of public stewardship, and lack of monitoring. Consistent with the "broken window" theory, properties that are not maintained tend to experience more decline associated with disuse and abuse. It is important that even if the Forest Preserve areas are not scheduled for regular internal maintenance, that the external view of these preserves areas be vigorously protected.

Even lacking routine maintenance, the City should quickly respond to citizen complaints of dumping, damage, severe erosion, flooding, poaching of vegetation or wildlife, or any other evidence of misuse or abuse.

COMMENT: This section is handicapped by the ambiguous terminology cited elsewhere. Furthermore, the FPAB needs to clarify the input and guidance it is providing. We suggest focusing on forest health. As stated above, "In Sections 5 and 12, it is recommended that the appropriate maintenance approach to the Forest Preserve as a natural resource is proactive and include a continuous evaluation of the forest health." Active maintenance should not be considered an intrusive activity as long as it is founded upon objectives that promote forest health. Instead of grappling with terms like "essential natural character", "undeveloped", "pristine", "minimum necessary", "least disturbance", etc. the FPAB should define those "desirable conditions" or qualities that are most valuable. Maintenance guidelines that harness natural processes are typically more successful. The values of environmental stewardship, protection and conservation provide a better approach than avoidance of any human activity.

This section should be rewritten. Currently it is didactic and cautionary, and sometimes silent on matters that should be addressed. More positive guidance should be provided. The FPAB cannot let itself be sidelined by fear. For example, emphasizing that "Invasive species management activity, in itself, constitutes a disturbance" can immobilize the FPAB. It is important to understand and respect ecosystem dynamics. It is equally important to develop approaches that take advantage of this understanding, and finding possible synergies with other forest management goals can empower successful programs to control invasive species.

SECTION FIVE

INVASIVE SPECIES

Policy Statement

With the development of a Management and Maintenance plan for the City of Greenbelt Forest Preserve, the issue of invasive plant species impacting the preserve must be addressed. It is therefore necessary to define the term "invasive species" as it pertains to the Greenbelt Forest Preserve. In this case an invasive species will be defined as: *"Any plant species that out competes and limits the distribution of more desirable plant species and provides reduced ecological benefits in terms of biodiversity."* Lists of invasive species are available, and those that are pertinent to the Forest Preserve could be listed.

It is necessary to develop a set of criteria that particular plant species must meet to be included on a list of invasive species that may merit management efforts within the Forest Preserve. Plant biology, history of invasiveness in other areas, and distribution within and around the Forest Preserve should be factors in development of these criteria.

A specific set of guidelines must be followed in order for systematic and unbiased evaluation of the impacts (both negative and positive) of particular invasive species on the Forest Preserve. It is also necessary to determine the need for and the likelihood of successful management of those species and to set priorities based on site characteristics and location, current and projected site use, targeted species, and feasibility of control efforts.

If management of a particular species of invasive plant in a given area is determined to be necessary and viable, a plan specific to that species and to that site should be developed and a multi-year commitment made for the plan to be carried out.

Guidelines

- Management goals must be defined prior to any action being taken. To what end and for what benefits are we managing?
- Management decisions must be made by committees designated by City Council (e.g. a Forest Preserve Advisory Committee and the Advisory Committee on Trees) and qualified individuals (e.g. forest health professionals) with City Council consent.
- In setting criteria for identifying invasive species to be managed, it should be remembered that only a small percentage of plants display the aggressive

ability to colonize areas and out compete other plants that characterizes them as invasive. Just because a plant is not native does not mean that it is invasive or undesirable. On the other hand, a number of native species of plants (Virginia Creeper and Poison Ivy, for example) display many of the same characteristics that we find troublesome with non-native invasive species.

- Plants known to be problematic in other areas of the region are very likely to become invasive in the Greenbelt Forest Preserve.
- In general, areas with the fewest invasive species should have priority for management over those areas with the most. Also, areas with developing populations of invasive species not known to be widespread should be given priority for management over areas invaded by more common invasive plant species.
- All management plans developed should be site and plant species specific.
- Areas with ecologically significant and uncommon or rare plant species or plant communities should be given highest priority for protection from disturbance or impact by invasive species. For example, in the North Preserve, the area known as Blueberry Hill and Canyon Creek should be noted as areas with unique plant populations and a high priority for preservation of existing ecosystems. Preservation is easier than remediation.
- Large tracts of habitat with limited incursions by invasive species should have priority for management over smaller parcels with heavy infestations.
- Generally, older forest stands should receive higher priority for invasive species management than younger stands. Exceptions to this guideline should be made where reforestation or other revegetation efforts are undertaken. Competition from invasive species is a common cause of failure of new plantings.
- Small tracts of woodland between and bordering residential property should only be targeted for invasive species management if significant neighborhood volunteer effort is involved. For long term management of invasive species at these sites to be successful, there must be an understanding of the problem and a sustained commitment for management by the residents of the affected neighborhood.
- The level of disturbance to an area must be considered. Sites highly disturbed by human activity such as construction, mowing, clearing, filling, and even trail use, or by natural phenomena such as flooding, fire or wind are much more likely to be invaded by many species of invasive plants. Highly disturbed sites should be recognized as such and plans specific to such sites should be implemented if determined to be necessary. For example, if a highly disturbed site is inhabited by invasive species, management of the invasive species at that site for the sake of returning it to a "native state" may not be realistic, with the resulting decision that no effort be made to manage the invasive species at that site. If, on the other hand, the disturbed site is adjacent to an area that has little or no established invasive species, the

disturbed site may be prioritized for invasive species management in order to prevent its spread into undisturbed area(s).

- Invasive species management activity, in itself, constitutes a disturbance. Care must be taken to minimize disturbance when implementing an invasive species management plan. For example, in areas where English Ivy is encroaching from residential areas into the wooded area surrounding them, it may be a viable option to simply cut the ivy at the bases of the trees in order to minimize the spread to outlying areas by transport of the seed that is produced by mature, arborescent ivy plants.
- Once management efforts are implemented in a given area there must be a commitment to continued management at that site for an indefinite period of time, often many years in length. That area should have very high priority for continued management efforts, even at the expense of postponing the implementation of new management efforts in other areas.
- Nature abhors a vacuum. Removal of invasive plant species without a plan for filling the void left by its removal will likely result in reinvasion by the same or an even more aggressive and difficult to manage invasive species.
- At times, attempts at management of invasive plants without the necessary knowledge of plant biology and habitat, the proper use of management tools, and without sufficient commitment to or funding for control measures, can worsen existing environmental problems, leading to invasive species composition shifts, erosion, and habitat loss. There are likely to be situations where doing nothing is a viable management option.
- Disturbance of soils and native vegetation by any activity other than minimal impact recreation such as hiking should be highly discouraged. Disturbance is the driving force behind invasion by undesirable plant species. In performing maintenance of trails or restoration of stream beds, extreme care must be taken to minimize site disturbance and to avoid introduction of invasive species.
- Invasive species management is a science. Decisions should be made with that in mind rather than being driven by emotional reactions to alien plant species.

SECTION SIX

CATASTROPHIC EVENTS

As actively and comprehensively as the City may try to protect the Forest Preserve from damage due to natural or human forces, there is no way to protect these areas from all such catastrophic events. Therefore, it is prudent to determine how the City will respond if or when such an event occurs, resulting in significant damage to a Forest Preserve area.

Catastrophic events may be the result of several different forces of nature, such as tornadoes, hurricanes, floods, forest fires, wind storms, ice storms, and severe thunderstorms. The events are usually of short duration, unpredictable, unpreventable and uncontrollable. Sometimes pests and diseases can lead to catastrophic disturbances.

There can be other catastrophic events that are equally unpredictable, but result from the actions of persons, rather than natural events. The greatest danger would be from forest fires, resulting from a deliberate or accidental act by a person or person(s). Other possible severe damage could be caused by chemical spills, vandalism, or accidents involving a vehicle (including air plane).

Important points to consider in determining how to respond to a catastrophic event would be the nature of the damage, the extent of the damage, the ability of the natural community to regenerate itself following the event, possible damage/impact to adjacent properties associated with the damage, ease of clean-up, and cost/benefit of clean-up/restoration versus leaving the Forest Preserve area as is.

After any catastrophic event, the first course of action should be to survey the damage. The survey will provide an overview of the damaged areas and tree condition. Different types of storms will result in different types of damage. For example, ice storms often result in broken stems, limbs and branches. Lightning usually affects single trees. High winds usually result in bent trees, uprooted trees and root damage. Severe storms can cause a variety of damage.

Windthrow is a natural event that leads to successional changes in the forest.

Once the survey is complete, a course of action to address damage should be developed. Any high hazard areas should be cleared of any trees or branches that directly threaten people, buildings, power lines, active park areas or private property. Hazard areas should be limited to those areas of the Forest Preserve along the periphery thereby presenting a possibility for impact or damage to persons and properties outside the Forest Preserve.

Should also look at hazards near trails and other areas where people may gather.

Any access roads, formal trails, or park areas should be cleared of any fallen trees or branches. This should be done immediately following a catastrophic event.

Agree. Make the trails section consistent with this.

Other considerations to be addressed in the post event survey would be clearance and maintenance of identified vistas, erosion prevention and control, disruption of blazes or trail markings, damming of water ways, or other significant and environment damaging impacts to the Forest Preserve.

There are other issues associated with storm damage, such as wind thrown trees, tree damage and wounding, potential for insect attack, disease, pests, and fire hazard. Were a management and maintenance policy recommended to actively address these issues, within the context of the routine Forest Preserve maintenance, than a strategy to respond to storm induced damage would be needed. However, since these guidelines are not now recommending that forest health be actively managed, then forest health in the aftermath of a damaging storm is not recommended beyond the measures previously identified.

The manner in which the City responds to catastrophic events which impact a Forest Preserve should be consistent with the level of maintenance promulgated elsewhere in these guidelines. In other words, the level of clean-up and restoration associated with a disaster should not exceed the actions to be taken under normal and routine circumstances.

Unclear. Defining "desirable conditions" might lead to a better explanation.

The opening statement is taken out of context. The full text is Section 12-156(m)
"Clearing and pruning of vegetation shall not be permitted, unless for the benefit of the land and consistent with the management and maintenance guidelines." Changes to this section should be made accordingly.

SECTION SEVEN

VEGETATION

The Forest Preserve legislation states that it is prohibited to clear or prune vegetation or to harm, remove, or damage any natural resource. It is expected that the basic activity of hiking could result in secondary damage to vegetation. Limitation of walking to existing trails will reduce the possibility for accidental damage or injury to vegetation.

Other than accidental damage, vegetation may be intentionally damaged or removed by individuals attempting to blaze new trails, widen existing trails, remove "offensive vegetation", or harvest interesting vegetation for removal and replanting. Each of these acts is a violation of the Forest Preserve ordinance. The removal, pruning, or cutting of vegetation should only be undertaken by knowledgeable foresters or horticulturalists and if then, only under a plan or program developed and adopted through these guidelines.

It is important to communicate to the public that protection of the Forest Preserve includes the enforcement of strict prohibitions on the removal, in whole or in part, of any vegetation from within the preserve area. The inclusion of such warning language on a park information sign should be considered.

SECTION EIGHT

CLEAN-UP AND REMOVAL OF DEBRIS

Lacking routine maintenance, it will largely fall upon those who visit the Forest Preserve areas to perform custodial duties for the preserve, such as removal of trash and garbage. There will be occasions that an organized clean-up effort in the preserve areas may be necessary.

Stream clean-up activities are popular and routinely scheduled by environmental groups, concerned citizens, civic associations, and government agencies. The benefit of such clean-up events is the ability to remove a significant volume of trash etc., efficiency in collection and removal of waste and debris, and the opportunity for public education and awareness associated with the activity.

Clean-up programs should be scheduled at a semi-regular basis, but there should be a clear need for the clean-up to justify the disruption (physical and experientially) within the preserve. In the event of a single major or damaging action or event, efforts should be made to remove or mitigate the intrusion as soon as possible.

Organizations or individuals interested in sponsoring a clean-up effort should coordinate through the City to ensure that appropriate support is provided (i.e. pick up of trash, bags supplied, etc.) and also to make sure that there are no conflicts.

SECTION NINE

ENFORCEMENT

City parks and activities within city owned parks are regulated through a variety of general and specific regulations set forth in the City Code. These regulations cover a range of issues, such as hours during which the park area is open to the public, permitted activities, prohibited activities, and expected behavior of users of the parks. There are also regulations setting forth conditions under which special use permits may be required.

While parks are generally open from dawn to dusk (or 11 p.m. for parks managed for active recreation programming), there is no effort to physically restrict public access during off-hours. In fact, the enforcement of the various restrictions is largely informal, with specific enforcement action requested only when activities interfere with the public's peace and/or peaceful enjoyment of the park area.

Since the Forest Preserve has been designated as an area of passive activity intended for protection of the forests with permitted activities consistent with this goal, there are more restrictions for use than in any other park in the City. The City Code enumerates restricted/prohibited activities, and dictates that violations of the activity restrictions will be considered civil infractions, punishable through the issuance of a Municipal Infraction civil citation with a fine of \$1000.

A class of more serious violations has also been defined, which could generally be called poaching of natural features. Violations of these regulations would be considered a misdemeanor and therefore would be a criminal sanction.

While strict adherence to the use restrictions is desirable to protect the Forest Preserve, as well as the experience of those who visit the preserves, aggressive patrol and enforcement would detract from the character of the Forest Preserve. Therefore, it is important that the enforcement philosophy for the Forest Preserves be consistent with the use and experience philosophy reflected in the enabling legislation and these guidelines.

Accordingly, the following guidelines are intended to reflect a general enforcement approach, which should encourage compliance through respect for the Forest Preserve, understanding of the Forest Preserve program, and education about the forest community.

- Protection of the Forest Preserves, and the experience of those who visit the Forest Preserves, from any incompatible, illegal, or unauthorized use or activity, should be the primary objective of any regulatory or enforcement efforts.
- The assistance of the public in the identification and reporting of violations of rules of use of the Forest Preserve shall be actively solicited. Contact phone numbers for reporting of problems or violations of use at the Forest Preserve should be posted on any signs for the Forest Preserve.
- Information regarding use of the Forest Preserve, and reporting of problems and/or violations should be posted on the City of Greenbelt web page.
- City personnel as designated by the City Manager should patrol Forest Preserve areas as part of their normal work routine. Such designated personnel should focus on education and training if and when violations or violators of Forest Preserve regulations are observed.
- Code enforcement personnel with the Department of Planning and Community Development should be responsible for the enforcement of the civil violations of the Forest Preserve law.
- Individuals who are observed or reported to be violating rules and regulations for the Forest Preserve will be advised, in writing (if possible) of the observed behavior and the associated violations. This written communication will stress the purpose of the Forest Preserve restrictions, and will encourage voluntary compliance. Mention of possible formal sanctions, in the form of civil citations and monetary fines, may be mentioned but should not detract from an overall cordial tone in the communication. These actions will be conducted through the Department of Planning and Community Development.
- Records should be kept indicating known dates of violations of rules and regulations governing activity at the Forest Preserves. Individuals known to have violated these regulations will also be recorded. This information may be used in an effort to identify trends in inappropriate activity, repeat offenders, or any other information relevant to the protection of the Forest Preserve.
- Second offenders of rules and regulations governing the Forest Preserves should be issued a civil citation, as set forth in the City Code.
- Suspected criminal violations, as specified in the City Code, should be promptly reported to the Greenbelt Police Department. A full and thorough criminal investigation should be initiated to identify any individual(s) who have committed criminal acts, and prosecution should be sought.

- In the event criminal activities are noted as part of a pattern of acts and abuses, the Greenbelt Police Department shall implement investigation, including monitoring of the Forest Preserve, in the interest of apprehending any individuals who are repeatedly committing such criminal acts. In the event that surveillance is required, such surveillance shall be conducted in a fashion to minimize disruption to the Forest Preserve lands and users of the preserves.

SECTION TEN

ACTIVITIES AND SPECIAL EVENTS

The enabling legislation for the Forest Preserve program sets forth specific and general criteria to describe both organized and informal activities which are permitted or prohibited.

Other than several specific examples of prohibited activities (events which are inconsistent with the intent of the program; races; survival exercises; war games; and activities which are “principally commercial” in nature), the limitations on uses comes from the general description of “*uses which do not alter or degrade (the) essential natural characteristics (of the Forest Preserve).*”

Cannot find this quote in the ordinance.

To some degree, activities may or may not be permitted depending upon the number of participants and the magnitude of the use. For example, an individual who jogs through the preserve on a daily basis would not be considered to be participating in a prohibited activity. However, a running club consisting of dozens of runners that schedules training runs on preserve trails, may be considered inappropriate. The distinction may not necessarily be in the activity itself, but in the impact associated with the activity.

Certain activities are clearly inconsistent and prohibited, and have been so identified in the ordinance. As previously noted, such prohibited activities would include racing, war games, survival exercises, activities of a principally commercial nature, hunting, trapping, fishing, biking, clearing, pruning, or other actions which harm or remove resources. This listing should be expanded to include uses referenced in other sections of the code, such as construction of improvements, uses implied but not specified (construction of viewing platforms, tree stands or tree houses), camping, cooking, and burning of fires. Are there not instances where something like this might be desirable?

Enforcement of use and activity violations may be done when the list of prohibitions is clearly stated. However, a subjective determination that a use is prohibited (such as the running club example) may be difficult to enforce, beyond the offending party being advised to discontinue the activity. Therefore, if there are specific uses or activities, which by the nature of the activity is inherently inconsistent with the objectives of the Forest Preserve program, such activities should be added to the list of prohibitions set forth in the ordinance. Lacking this specificity, the limitations on use cannot be enforced.

An example of this is the annual “Pumpkin Walk”, which has generally been limited to Area B of the South Preserve, has been discussed in the context of the Forest

Preserve ordinance. It has been the intent of the City Council to allow this activity to continue, and the terminology “principally commercial” was included to differentiate the Pumpkin Walk from other activities which may be proposed by groups or individuals. However, even though the Pumpkin Walk would be considered a permitted activity, there are actions taken by organizers which are considered unacceptable, such as the application of straw to stabilize the walking trail. City staff should work with the organizers of the Pumpkin Walk to address this issue. **Disagree, as noted previously.**

Regardless of the specific use and user(s) of the Forest Preserve, it is most important that all understand and respect the principal objective in the control of activities and special events, that uses should not alter or degrade the “essential natural character” of the Forest Preserve. The seemingly benign act of walking or hiking through the preserve alters the natural character of the Forest Preserve.* This type of impact we acknowledge as acceptable in order to make the Forest Preserve accessible to the public so that Greenbelters can experience the beauty and serenity of a woodland environment. Any activities or special events must balance the opportunity to experience this natural area with the impact which would result. Only when the benefit from the experience is of greater value to the community than the expected impact to the Forest Preserve should the activity or event be permitted. A process to review, authorize and monitor such events should be developed and administered through the Office of the City Manager.

*** Agreed. This argument can be made. Therein lies the basis of many of our comments. When arguments like this are carried to their logical conclusion, maybe hiking MUST be prohibited. For that matter, many human activities should cease, because they directly or indirectly affect the Forest Preserve. Instead, the emphasis should be one of developing guidelines and practices to mitigate damages, and to counteract adverse impacts instead of trying to prevent them entirely. The Forest Preserve is a community resource. Activities that benefit the forest and wildlife and enhance the user experience should be encouraged, no matter whether they are "human" or "natural" in origin.**

SECTION ELEVEN

CONTINGENCIES

The Management and Maintenance Guidelines assume that use patterns in existence are largely in conformance with the guidelines. However, there are several uses, within the Forest Preserve, that are not consistent with the purpose of the Forest Preserve program or the content of this document. In the future, other parcels may be added to the Forest Preserve which contain uses inconsistent with the law and guidelines.

In general, historic and desirable uses, inconsistent with the letter of the Forest Preserve law and these guidelines, which are important to the community, should be protected and allowed to continue operation. By acknowledging the importance of these uses, it is also recognized that activities associated with the inconsistent use may conflict, at times, with law and policy. It is not practical to define every possible conflict, as the nature of the conflicts will vary based on the specific use. The guiding principle in setting guidelines to allow existing uses and protect the Forest Preserve is balance. The physical limits of the existing uses should remain unchanged. Expansion into Forest Preserve lands should not be permitted. By the same token, encroachment of the Forest Preserve into the inconsistent use area should also be avoided. At times, temporary infringement of one area into the other may be necessary. When such occasions arise, any disturbance must be unavoidable and minimized.

Is it possible that some relocations could be considered; ones that benefit the forest as well as the community?

The following identifies several known incompatible uses, which have been in existence for many years, and some of which are part of the original city plan. Special considerations related to each are identified.

- o Community gardens - The community gardens are shown on the original city plan, and are reflected in the name of the major access – Gardenway. The community gardens remain an integral part of the social structure and cooperative spirit of the city.

Community gardens are assigned through a City garden club and the use of the garden plots is managed through this group. The community gardens are divided into individual garden plots, which may be delineated with the use of gates and fencing. The character of the garden plots is decidedly eclectic. Some are neatly tended, orderly, and well maintained. Others appear chaotic in comparison, but may be just as productive for the use. There are shed-like structures within some of the garden areas, rain barrels, flags, sitting areas, and other related furnishings. There is a certain charm to the community gardens because they reflect the free spirit of the community.

The FPAB should consider beneficial ways to manage the forest edges. "Hard edges", with abrupt transitions from tree cover to lawn or other open space are different from and often inferior to "soft edges". Soft edges offer better wildlife habitat and forage opportunities, and they can diminish the amount of light entering the understory, which is one cause of invasive species.

Community gardens are located on the south side and east end of Hamilton Place. South of Hamilton Place is a garden area measuring approximately 200 feet parallel to Hamilton Place and 275 feet in depth from Hamilton Place. This garden area measures slightly more than 1.05 acres in area. The garden area located east of the terminus of Hamilton Place extends 200 feet along the east-west axis, and extends 250 feet north, with an area of approximately one acre. The Hamilton Place community gardens are within Areas C and D of the South Preserve.

There are two gardens located southwest of Gardenway, within Area E of the South Preserve. A smaller garden is situated 40 feet southwest of the terminus of the Gardenway right-of-way and measures 100 feet square. A second, larger garden is found 210 feet south-southwest from the terminus of Gardenway. This garden measures 90 feet in depth and 230 feet in length and measures approximately 5 acres in area. These descriptions are not intended to specify exact measurements of the existing community gardens, but rather the general locations and dimensions of each garden area.

These guidelines are not intended to govern the gardening activities within the community gardens, but rather explain the historic and planned relationship between community gardening and the Forest Preserves. While some may find the community gardens unattractive and unkempt, the gardens are part of the fabric of Greenbelt and deserve to be protected, both in area and in operation.

In order to maintain the physical area set aside for gardens, necessary pruning, removal of trees, and selective clearing by City employees will be permitted. However, such pruning or removal of vegetation will only be permitted to the extent necessary to maintain the limits of the gardens and to remove any canopy that obstructs the clearstory of the garden area.

- o Hamilton Cemetery – The Hamilton Cemetery is located at the end of Hamilton Place. It consists of seven graves of the Hamilton family. There is an interpretive panel at the trail head leading to the grave site. It is not a heavily visited site.

The importance of the Hamilton Cemetery in the consideration of Management and Maintenance Guidelines is to acknowledge that the cemetery exists, allow basic maintenance to protect the grave sites and interpretive panels, and respect the dignity of this final resting place. The grave site is identified and discussed in city tourism and history materials, but a concerted effort has not been made to direct visitors to the site. These guidelines recommend that it is not necessary to "promote" the cemetery as a public visiting place. However, maintenance associated with the current use pattern is necessary and justified. Therefore, the recommended Management and Maintenance Guidelines for the cemetery would be to maintain the existing interpretive panels and grave area. Any required

maintenance should be the minimum necessary to maintain signage and grave sites in good repair. There should be no effort to encourage greater visitation to this historic site.

- o Northway Fields - Northway Fields is an active recreation complex located at the terminus of Northway, adjacent to the Baltimore-Washington Parkway. The complex is built over an abandoned landfill. The two softball fields in this park area are in poor condition and require surface rehabilitation if they are to be programmed for competitive use.

Also located at the Northway Fields are two parking areas, surfaced with crusher run gravel. There is a pile of asphalt millings used by the Public Works Department in City work. There is also a yard waste recycling/composting center, which has expanded in recent years. Northway Fields is also the location of the proposed observatory building.

The Northway Fields complex is in poor physical condition. This is exacerbated due to the illegal dumping of all varieties of waste and debris at the park. The City is diligently attempting to identify and fine individuals or companies that conduct this illegal activity.

In addition to the poor physical condition of the ball fields, there are problems with the aesthetics of the park, the relationship of uses to one another, inadequate spectator area, difficulty of maintenance, and lack of seating/gathering/spectator areas. The City has retained the services of a design firm to develop a master plan for the park.

It is not the intent of the Forest Preserve program, or these Management and Maintenance Guidelines, to cause the discontinuation of the use of the Northway Fields for active recreation use. However, the impacts associated with use of the fields should be limited to the existing limits of the fields and not be permitted to infringe or encroach upon the surrounding Forest Preserve. To the extent the area of existing use and activity infringes upon parcels designated as Forest Preserve, those existing Northway Fields and related activities should be considered consistent with these guidelines, as described herein.

See prior comments. Refer to 11/25/2013 ABA accessibility guidelines; Outdoor Developed Areas

- o Handicap access – As the prior discussion and evaluation indicates the North and South Preserves are characterized by a wide variety of topographic, vegetated and use patterns. The heavily forested and steep slopes make the planning of barrier free trails impossible without altering the contours and vegetation of the preserve area.

The natural characteristics of Areas “B” and “D” of the South Preserve may allow for some barrier free trails.

This discussion about handicap access is very well written and balanced in its approach to the subject matter. Other parts of the M&M guidelines could benefit from the same approach.

The debate over the need, advisability, and potential negative impacts of barrier free trails has been a quiet but persistent concern. Some feel that a barrier free trail would compromise the experience of the preserve, due both to the possible introduction of a hard surface in the preserve and by providing a trail surface which could be attractive to prohibited users (i.e. bicyclists). The result could be a fundamental alteration to the Forest Preserve.

These are all very credible and compelling arguments to keep the trails in the Forest Preserves as they are. Barrier free trails would not be a natural surface. Such trails would have to be maintained and repaired from time to time. Barrier free trails may well experience greater use than trails in portions of the Forest Preserve where only primitive trails are available. Finally, barrier free trails seem to be inconsistent with the principles and philosophy which have guided the creation of the Forest Preserve program, and the preparation of the Management and Maintenance Guidelines. Viewed from this perspective, planning for a barrier free trail system, regardless of the length of travel, or its location within the Forest Preserve could be viewed as inappropriate.

Notwithstanding the points made above, in the past 15 years this country has made tremendous progress in the removal of physical barriers for the use of buildings, parks, and even wilderness areas, for the entire population. Barriers can be either physical barriers or the absence of an accommodation which would provide access. Under either scenario, the rights of all the public to participate in, have access to, and enjoy the same quality events and experiences as those of able body, mind, senses, and spirit, have been acknowledged and are considered a basic civil right.

In developing guidelines to address the issue of barrier free access, the practices of the National Park Service were consulted. The Park Service has managed to operate this country's vast national park system in a manner that provides for those with limitations.

The Directive of the National Park Service recognizes the obligation of a public entity to provide barrier free access for all the public:

"The National Park Service has legal obligations to make available equal opportunities for people with disabilities in all programs and activities. This requirement includes the opportunity to participate in wilderness experiences."

Within the same directive, the agency recognizes that the ability to provide access can be limited:

"Undeveloped areas, such as those outside the immediate influence of buildings and roads, will not normally be modified, nor will special facilities be provided for the sole purpose of providing access to all segments of the population."

Accessibility to facilities in threshold areas will be determined on the basis of the nature of the topography, the significance of the attraction, the amount of physical modifications being made to the environment and the modifications necessary to ensure programmatic accessibility."

The agency directive provides further guidance in the following: "Section 17.550 of the Secretary of the Interior's regulations regarding the enforcement of non-discrimination on the basis of disability in Department of the Interior programs (43 CFR Part 17, Subpart E) states that agencies are not required to take any actions or provide access that would result in a fundamental alteration in the nature of a program or activity."

These guidelines of the National Park Service provide wide latitude for an agency to determine if and how barrier free access will be provided in a park area. The agency indicates that access should be provided, but the manner in which such access is provided may be influenced by impacts such alterations would have on the natural environment. The decision whether or not to provide barrier free access to a park area is thus very subjective in nature.

The challenge of addressing barrier free access can be dealt with either proactively or in reaction to a demand or challenge to the City's accommodations.

Extending the policy of the National Park Service to the Management and Maintenance Guidelines for the Forest Preserve would seem to give very clear guidance with respect to the heavily vegetated North Preserve as well as Areas C and E of the South Preserve. Extension of barrier free trails in these areas of the Forest Preserve would be difficult, given the topography of the lands, and would result in a "fundamental alteration" in the protected area.

The same cannot be said of Areas B and D of the South Preserve. These areas already have extensive trail systems and the topography is relatively flat.

Upon a review of the guidelines of the National Park Service, the City is given latitude in determining how trails will be provided. Consideration may be given to the physical character of the forested area, such as topography. Further, accommodations that would fundamentally alter the program, activity, and resource are not mandated. However, there should be provided the opportunity for disabled citizens to participate in and enjoy the Forest Preserve. The guidance of the National Park Service would allow the City to explore barrier free accommodations in areas of the Forest Preserve where it is reasonable to do so, without damaging or compromising the essential qualities of the natural setting.

The most suitable area of the Forest Preserve to consider for barrier free trail accommodations would be Area D of the South Preserve. This area is relatively

flat in grade, there is an extensive system of existing earthen trails already in existence, it is accessible via Gardenway, and it is probably the most heavily used area of the Forest Preserve. The balance to be struck is in determining how extensive a barrier free trail system needs to be provided and how that trail system will fit in with a trail system maintained to a lesser standard.

Within the Trails section of these guidelines, it is suggested that the existing trails within Area D be mapped and evaluated, so that a designated trail system can be established. A barrier free trail could be included as part of this comprehensive trail plan for Area D.

In the future, as the Forest Preserve is expanded, the same considerations should be made in determining if a specific area is suitable for the creation of barrier free trails.

In general, accessibility in Forest Preserve areas should neither be preemptively prohibited nor automatically assumed to be appropriate. The Forest Preserve experience should be available to all citizens, regardless of physical condition. The challenge will be to determine in which areas of the Forest Preserve accommodations for those with physical handicaps may be implemented without damaging or degrading the preserve to the extent that it loses its intrinsic value.

The following contingency statements address existing, incompatible uses, in areas proposed to be designated as forest preserve. Should the related parcels ultimately be designated as forest preserve, these contingencies would apply.

Remove the compost area, limit stockpiling and consolidate operations to the maximum extent practicable. Yard Waste Compost Facility – In order to encourage composting of yard waste by city residents, the city created a yard waste compost yard at the terminus of Northway, adjacent to the Northway Fields, within Parcel 12. Parcel 12 is adjacent to the North Preserve, and is also the location of the proposed observatory.

The compost yard has been very successful, and has helped remove yard waste from the household waste stream, which ultimately ends up in a landfill. Trees, branches, and woody waste are ground into mulch. This mulch is available to city residents for use at no charge.

While the yard waste compost area is a very environmentally responsible operation, which is not necessarily incompatible with the forest preserve, the concern with its continued operation is that the limits of the yard will gradually encroach into the adjacent wooded areas of the preserve. (In fact this is already apparently happening and it is hoped that this will be remedied as soon as possible.) The stockpiling of waste materials, even if only yard waste, will have a detrimental impact on any trees whose root system is covered with these materials.

If the yard waste compost area can be relocated to another more central and less sensitive area, it should be. However, recognizing that there may be no locations appropriate for this activity, and also acknowledging the value of composting of yard waste, if an alternate location is not available, the compost yard should be allowed to continue at the present location.

It is advisable for the long-term health and protection of the North Preserve that the limits of the compost yard be maintained, and that the potential that the area allotted for the compost might creep beyond the current limits be avoided. It is therefore recommended that the current limits of the yard waste compost area be designated through the use of hurricane fence or other appropriate durable divider and that this divider be maintained in good repair as a constant reminder that the compost yard, while beneficial, must be managed within a designated area.

- o Observatory - For many years, an area at the Northway Fields complex, located on Parcel 12, has been used by amateur astronomers for regular star parties. The location has been considered a good local site for astronomy, because it offers access to some of the darkest skies in Greenbelt. The hill created with the stockpiling of stormwater dredge spoils has created a promontory, which also makes Parcel 12 an excellent location for star gazing.

Several years ago, the city was given an observatory structure from Montgomery County Community College. After evaluating several locations for the observatory, it was determined that the site at the Northway Fields was the best permanent location for the structure. Over the past two years, planning and design for the installation of the observatory on the hill on Parcel 12, at the Northway fields, has been underway. Permits have been issued for installation of the observatory.

When the boundaries of the North Preserve were being considered, Parcel 12 was excluded as planning and design of the observatory was not complete. Now that the planning is complete and the permit has been issued, Parcel 12 can be added to the North Preserve, so long as provisions are made to allow the installation, operation and use of the observatory within the forest preserve.

Consequently, the Greenbelt Observatory, and related viewing platforms, paths, and related appurtenances, should be considered as acceptable improvements within the Forest Preserve. The observatory should be permitted to be utilized and maintained according to the approved plans for the facility. Star gazing is an activity which is compatible with the objectives of the Forest Preserve program, and the observatory is a reasonably complementary use in the Forest Preserve, given the location of the structure, the scale of the structure, and the fact that installation of the structure will not require the disturbance to any existing

forested area. So long as the observatory and its ancillary improvements (decks, mounting piers, path), are restricted to the portion of Parcel 12 which is cleared, the continuation of the use should be considered consistent with the Forest Preserve designation.

- o Belle Point Preserve - The Belle Point Preserve extends from the Belle Point subdivision to Buddy Attick Park. The property is partially wooded. However, there is a wide cleared area extending the length of the property, which corresponds to the WSSC right-of-way. This right-of-way provides the WSSC unrestricted access to clear, grade and excavate for the purpose of maintaining the associated water main. The WSSC's rights to access and maintain its water main is addressed in the Forest Preserve article.

While there is no current plan to construct a trail connection between the Belle Point subdivision and the lake park trail system, the opportunity for such a connection exists. Neighborhood residents have also expressed a desire in having a playground installed on the Parcel 15 property. Therefore, the option to install a trail connection to the Belle Point subdivision, within the area of the WSSC right-of-way, should be accommodated within these guidelines, subject to its containment within the existing cleared area of the WSSC right-of-way. In addition, the opportunity to allow for the installation of a playground on portions of the Belle Point Preserve that are currently cleared should also be protected.

- o Boxwood Preserve - The Boxwood Preserve is a partially wooded, partially cleared parcel which could be described as serving open space, recreation, park and open play needs. Those areas which are cleared are maintained as open lawn, playground, sitting area and a basketball court. The description of the Boxwood Preserve excludes the open areas herein described, so technically, the provisions of the Forest Preserve do not apply to the cleared and improved areas of the Boxwood Preserve. These open and play areas provide one of only a few public play areas in the Boxwood area. These are important recreation areas, and should be protected. Even though it is not technically necessary to address the non-forest preserve characteristics of the Boxwood Preserve, to ensure that the protection of the open, play areas of the Boxwood Preserve are protected as diligently as would be the wooded areas through the forest preserve program, this contingency is being included in the guidelines. Neither the Forest Preserve, nor the open, play areas, should encroach into the limits of the other.

SECTION TWELVE

FOREST HEALTH

For the most part, the Management and Maintenance Guidelines have addressed how the City will manage the impact of people and activities on the Forest Preserve. While the acts of people, direct and indirect, can have impacts both positive and negative, so can the natural growth and aging of a forest, including succession, competition, as well as weather, pests, pollution and fire. Accordingly, the management and maintenance of the Forest Preserve should include monitoring of the health of the forest community, including taking action as indicated to promote the health of the forest.

These guidelines have already touched on some issues that are relevant in determining the health of the forest community, such as invasive species, runoff and erosion, and catastrophic events. Many other indicators of the health of a forested area require the expertise of a forester to identify, evaluate, and recommend treatment.

Well said. Like many other parts of this well written section of the guidelines, consider including this in the Executive Summary, Policy Statement, or Introduction of the M&M guidelines.

The goal of all forest management activities on the Forest Preserve is to maintain forest health. Economic benefits or resources derived from management activities are not considered relevant to the goal of maintaining forest health and therefore should not be considered in designing a management strategy.

(although wood could be used to build structures or create brush piles for wildlife habitat.)

Inventory of existing resources is the first step in prescribing a management strategy. It is imperative to know the current state of the forest in order to make conscientious decisions. There are many things to consider prior to conducting an inventory, such as:

- The purpose of the inventory must be defined.
- The specific data required must be identified.
- The methods to collect and analyze the data must be determined.

Following the inventory of existing conditions, goals must be set to achieve the desired state of the forest. For forest health, goals are usually long term over many years.

Diversity of plant and animal species is of primary importance to the health of a forest and therefore a principal component of a management strategy. However, there are many types of diversity that play a role in forest health. Plant “age-class” diversity ensures that not all of a particular species reaches maturity at the same time. Plant height class diversity allows plants with different mature sizes to coexist and provide

increased benefits for wildlife and general forest health. Forest ecosystem diversity allows for a collage of different forest types, both small and large, within a given forest area. All of these types of diversity should be promoted in any designed management strategy for the Forest Preserve.

(Such as erosion, invasive species)

Strategies for managing the Forest Preserve should focus on reparation of existing damage and prevention of future damage. Existing damage, whether from an insect or disease infestation, stream bank erosion, or one of many other influences, can create a condition that worsens through time. Eliminating an existing damaging condition early can serve as a preventative strategy as well. There are other damaging influences that can impact forest health that can be prevented with prior planning. An example is placing barriers along stream beds to slow down flow, preventing stream bank erosion, and promoting aquatic life habitat.

Agree. Unfortunately, 12-157(e) prohibits this, with no exception for M&M guidelines

Structures to repair or prevent damage to forest health should be made of materials that are natural to a forest environment such as stone or logs. Additionally, the design of such structures should be naturalistic in order to blend in with the natural environment. One of the issues identified in the Forest Preserve is debris in the stream beds. Much of this debris is from man-made materials and some of it is from materials used to “fix” a problem. Many of the forest health issues that require a structure, or modification of a structure, to prevent or repair damage, can be solved using natural materials.

It was stated earlier, and is extremely relevant to the discussion of forest health, that forests are constantly undergoing change. Change will occur with or without human intervention and can be a positive or negative influence on forest health. What is of issue is how aggressively the City may or may not choose to respond to the evolution and change of the Forest Preserves.

and whether the M&M guidelines can embrace some of these processes of change to benefit the forest.

Some of the natural processes all forests experience include aging of trees, competition of trees for food, light, water and space, and weather damage from droughts, floods, winds and ice build-up. Over the past several years, damage to forested areas associated with certain pests has been proactively addressed with treatments directed at killing destructive pests. Even with these treatments, trees throughout the City have been damaged due to pests such as the gypsy moth and bacterial leaf scorch. The decision to treat pests is a management act. In the future, additional steps may be necessary to protect our forest resources, whether they are in the Forest Preserve or elsewhere.

Another critical concern in fragmented and isolated urban forest systems is the shrinking habitat area, and the demand and load animals that live in these forests may place on the forest and its vegetation. In this area, white tail deer have increased in number. The increase in the deer population means that more deer are grazing and feeding off the foliage and vegetation found in forests as well as yards that adjoin the forest areas. Lacking natural predators, the populations have grown unchecked. Some

jurisdictions have relied on managed hunts as a way to control the deer population. This document in no way endorses or suggests that hunting of deer is either necessary or recommended. However, there is no data to indicate if there is an issue with deer population and what impacts may be due to the deer population.

Healthy forests undergo constant transformation. Trees will age and die. Dead trees may fall, opening the tree canopy for the succession of new trees. Some trees will die in place and become habitat for animals and birds.

There is no single measurement which can summarize the health of a forest. A wide set of indicators together can reflect the current health of the forest. When monitoring for different indicators of forest health is repeated over time, trends and changes in the health of the forest can be identified. From these assessments, programs and actions may be recommended to address declines in the overall health of a forest area. However, in order to make informed decisions regarding the physical health of the Forest Preserves, it is important to have a baseline assessment of current conditions. **Agree. We hope that the 2015-2016 health assessment will further this goal. There are still many actions that can be taken without need for a baseline.**

Some indicators of forest health include the acreage of the forested land, the rate of growth of trees and other plants, the number of trees that die from natural causes each year, the condition and diversity of plant species below the forest canopy, the species of animals supported by the ecosystem, foliage transparency of tree crowns, tree crown dieback, tree crown density, and the size and health of individual animals.

High quality habitats are required for healthy populations of wildlife and healthy forest communities. The long term vitality of the Forest Preserves can only be projected if the current health of these wooded areas is understood. Obtaining such an evaluation from an appropriately trained forest biologist/ecologist or horticulturalist would give the City an invaluable tool to further define and refine maintenance activities necessary to protect the Forest Preserves for current and future generations of Greenbelters.

APPENDIX A

PARCELS RECOMMENDED TO BE DESIGNATED AS FOREST PRESERVE

1. **Parcel 12** – Parcel 12 is immediately adjacent to the North Preserve and is situated on the north side of Northway at the Northway Fields complex. Parcel 12 is the proposed location of the Observatory building, and is also the site of the city's yard waste compost facility. Parcel 12 was initially excluded from the designation of the North and South Preserves, because planning was still underway for the Observatory. While the Observatory is not yet in place, it is recommended that both the Observatory and the Yard Waste Compost Facility be addressed as contingency within these guidelines. Addressing these inconsistent uses with a contingency statement allows the designation of Parcel 12 as part of the forest preserve to proceed.
2. **Parcel 7/Boxwood Preserve** – This parcel comprises a city block bounded by Crescent Road, Lastner Lane, Ivy Lane and Ridge Road, at the entrance to the Boxwood subdivision. Portions of the parcel are used for open space, playground and picnic area, and a basketball court. The majority of the property is wooded. Parcel 7 was acquired with Program Open Space funds. It has been the consensus of task force members that the existing open play and active recreation areas should remain. The description of the portion of Parcel 7 to be designated as forest preserve excludes those areas currently used for open play and active recreation. The wooded areas would be protected with the recommended forest preserve designation.
3. **Parcel 15/Belle Point Preserve** – At the time that the Belle Point development was approved, ten (10) acres of the property were dedicated to the city to add to the Buddy Attick Park. This parcel is partially encumbered due to the existence of a right-of-way to the WSSC related to an existing water main. From time to time, the WSSC has disturbed the area as a result of water main maintenance. There has been discussion since the dedication of this parcel that a path may be constructed linking Belle Point to the Buddy Attick Lake Park path, and homeowners in Belle Point have also expressed an interest in having a playground installed adjacent to the development. While neither of these improvements has occurred, the opportunity for either or both to be constructed in the future should be protected. Accordingly, there is a contingency to allow for a

future trail and playground included as part of the ordinance which would designate this parcel as part of the Greenbelt forest preserve.

4. **Sunrise Preserve** – The city acquired this parcel with the intent of protecting it as open space. The recommendation of the task force to include this parcel in the Greenbelt forest preserve is consistent with the purpose of the acquisition of the property.

APPENDIX B

PARCELS CONSIDERED BUT NOT RECOMMENDED TO BE DESIGNATED AS FOREST PRESERVE

1. **Schrom Hills Park** – The heavily wooded northern portion of Schrom Hills Park may be a future candidate for designation as part of the forest preserve, but this portion of the park has been discussed for the possible extension of a primitive trail system which would connect the neighborhoods of Greenbelt East with Schrom Hills Park. This area of the park is also heavily regulated due to the presence of streams, stream buffers, wetland and wetland buffers. The topography of the northern half of the park does not lend itself to active recreation use. While there may be justification to include this area of the park as forest preserve, at the same time there are sufficient encumbrances on the property which would make the property unusable for everything but passive recreation enjoyment. There is no pressing reason to include this area in the forest preserve, particularly when questions about a primitive trail system have not been addressed.
2. **Greenbriar Park** – This park is located at the northeast quadrant of the intersection of Hanover Parkway and Mandan Road. It is predominantly wooded, but there is a playground, picnic area, and fitness course in the park. This park receives a great deal of foot traffic as a short cut to Eleanor Roosevelt High School. It is heavily impacted by this use, and there are many informal trails, littering, and evidence of possible inappropriate activity. As with the Schrom Hills Park, there is no pressing or urgent demand on the use of this park for any use other than those previously described, which would indicate that the aggressive protection associated with the forest preserve designation is not necessary. Further, the task force believes that the forest preserve designation should not be used for every forested city property, but rather for those with some strategic value. Opportunity must be retained for the city to respond to future recreation and park needs, and this requires that some city properties not be designated as forest preserve. Given the location of this property, the character of the public's use, and the existing park amenities located within the park, this parcel should be excluded, at least for the time being, from the forest preserve program.
3. **Lakewood Stream Valley** - This is a meandering park which extends from Crescent Road, between the Lakewood and Woodland Hills

subdivisions, up to Greenhill Road. There is a concrete stream channel, a paved walking path, a playground, basketball court and backstop for non-league quality baseball/softball/kickball. The park terminates at the Greenhill underpass and outfall. The stream channel at this location is in a significantly degraded condition, and is subject to an environmental restoration project. As the list of uses indicates, there are many different uses and users in this park. These uses are all inconsistent with the forest preserve program. It is true that this is primarily a wooded park area, but it in no way satisfies the criteria for the forest preserve program, and so it is not suggested to be designated as such.

4. **Buddy Attick Park** – This park is arguably the jewel of the city's park system. It is a very popular destination, and is accessible to many different neighborhoods in the historic city. The path is used for walking, jogging and bike riding. There are open areas, picnic areas, spots for large gatherings, and areas for passive enjoyment. There is a separate policy document for the Buddy Attick Park which was developed after many years of effort. The Buddy Attick Park Master Plan has served as the basis for managing this park over the past 15 years. This plan should continue to serve as the controlling management plan for the lake park. The forest preserve designation would compromise many of the recommendations of the master plan, and is therefore not recommended.
5. **Indian Springs Park** – Located to the rear of the Golden Triangle office park adjacent to the Beltway, this park is significant because of the archeological features associated with the Walker family grave sites. There is a small picnic area. It is neither a destination park, nor is it subject to use demands which would require the aggressive controls associated with the forest preserve. Accordingly, it is not included in the list of suggested additions to the forest preserve program.

The forest preserve designation imposes a significant set of protections and controls over valuable, unique, threatened and/or significant forested city owned parcels. As it is intended to be an essentially permanent protection, care must be exercised to ensure that the value of any designated forest preserve is as a protected forested area. Other forested park areas can be retained as forested areas without the forest preserve designation, through the adoption of public policies which retain forested park lands. We must exercise caution that, in an effort to protect woodlands, opportunities to respond to the public's need for active and open park areas are not compromised because every city park has been designated a forest preserve.

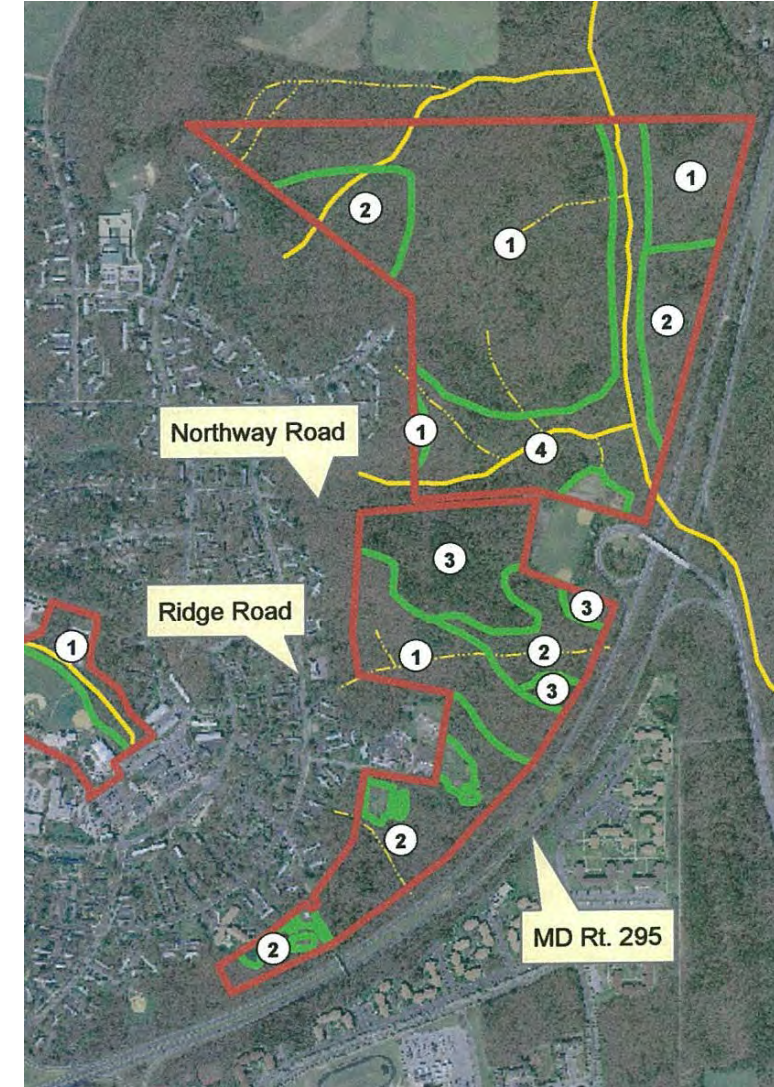
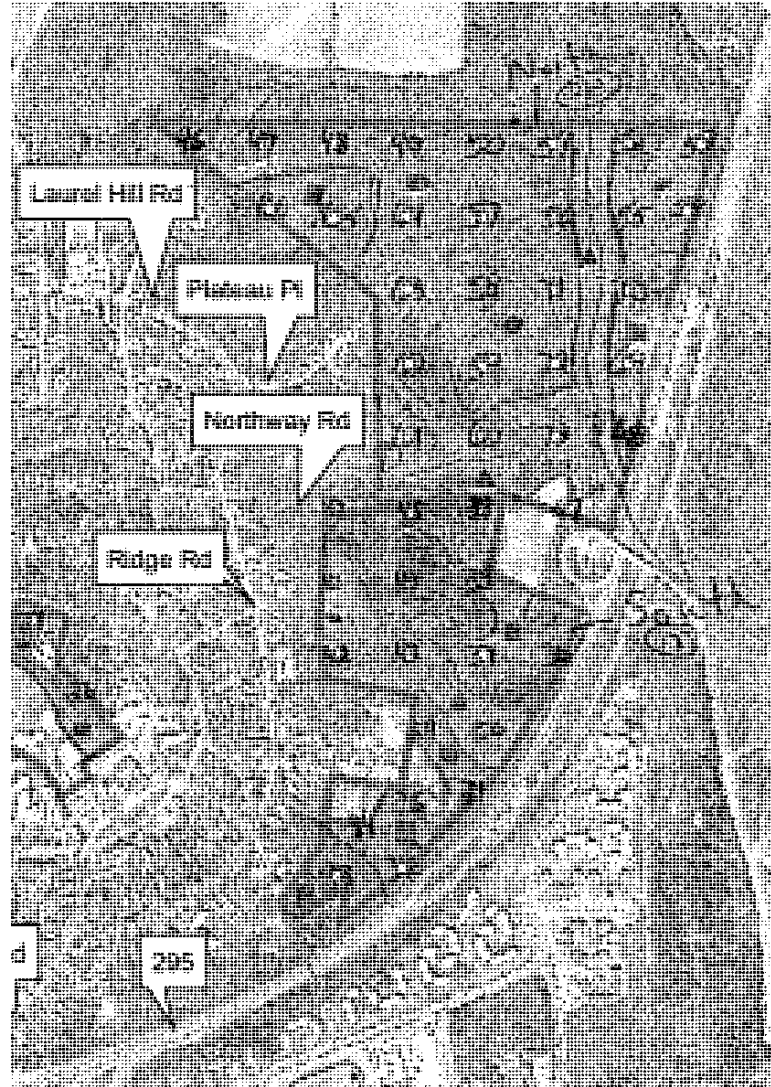
FOREST HEALTH ASSESSMENT

- Baseline Data to Understand Existing Forest Conditions
- Guide Decision Making
- Future Conditions can be Compared and Provide Feedback to Forest Managers



DNR FOREST STEWARDSHIP PLAN

- Sample Points
- Four Forest Stands
- Recommend:
 - Enhance Natural Heritage and Recreational Opportunities
 - Invasive Species
 - Trail System
 - Hazardous Trees
 - Riparian Buffers
 - Habitat Improvement



EXISTING CONDITIONS



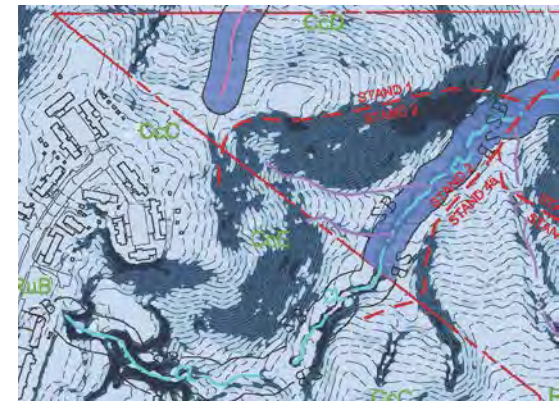
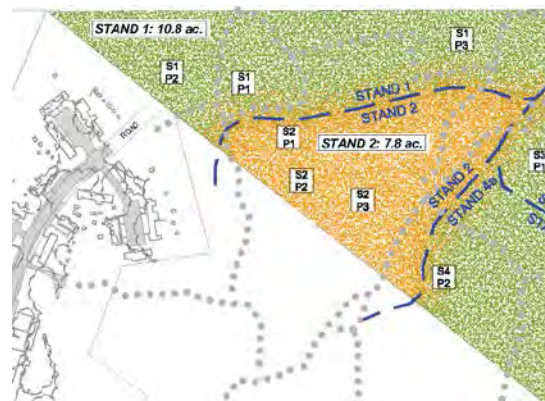
EXISTING CONDITIONS



EXISTING CONDITIONS



FOREST ASSOCIATIONS: STANDS 1, 2, & 4



FOREST ASSOCIATIONS

1980 Vegetative Map of Maryland

- **State Mapping Available**

Tulip Poplar Association

Chestnut Oak-Post Oak-Blackjack Oak Association

River Birch-Sycamore Association

U.S. National Vegetation Classification

- **GIS Based**

CEGL007220 Successional Tuliptree Forest (Rich Type)

CEGL008475 Piedmont Dry-Mesic Acidic Oak-Hickory Forest

CEGL004118 Upper Southeast Small Stream Sweetgum – Tuliptree Forest

The Natural Communities of Maryland

2016 Natural Community Classification Framework

- **GIS Based**

CEGL007220 Successional Tuliptree Forest (Rich Type)

CEGL008475 Piedmont Dry-Mesic Acidic Oak-Hickory Forest

CEGL004118 Piedmont Small Stream Floodplain Forest

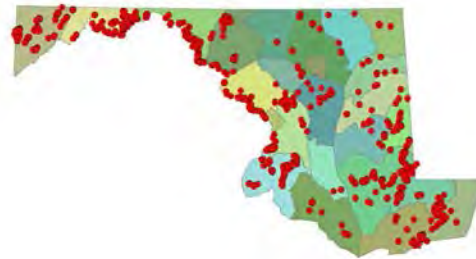


Figure 1. Vegetation sample plot locations

- “Natural community classification is an iterative process so this document should be considered a fluid one with refinements likely to occur over time.”

- **Used State-wide since 1991 Forest Conservation Law**
- **Data collection based on Prince George's County Methods**

A-1, FSD 5
Page 1
August, 2010

A-1, FSD 7



- 4 -
DENSE
70 - 100%

DATA COLLECTION METHODOLOGY

Approximately 37.5' radius around sample plot center point

DBH (diameter at breast height) measures tree trunk at 4.5' off ground

Measured using a Cruiser's crutch or wedge prism

Species prevalence: Dominant, co-dominant, or other

Trees that are no longer living, but still standing, provide habitat value.

Native "non-woody" species

Woody and "non-woody" species

0-100% values taken at centerpoint and north, east, south, west quadrants

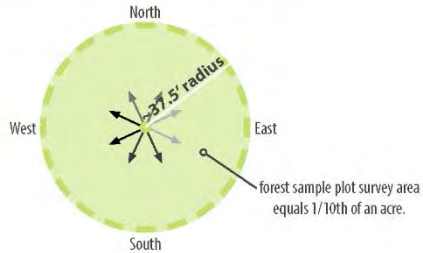
Assesses relative age and location of forest

average of values to left

Forest Sample Plot Field Data Sheet																
Property: <u>Greenbelt Forest Preserve</u>										Prepared By: <u>CML/MMW</u>						
Stand#: <u>S#</u>		Plot#: <u>P#</u>		Plot Size: <u>1/10 AC</u>		Date: <u>2015- -</u>										
Basal Area in sf/acre		Size Class of Trees within sample plot														
Tree Species	# of Trees 2-5.9" dbh	# of Trees 6-9.9" dbh	# of Trees 10-17.9" dbh	# of Trees 18-29.9" dbh	# of Trees >30" dbh	Total										
Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	
																0
																0
																0
																0
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	0	0	0	0	0	0										
Number & Size of Standing Dead Trees 6" dbh or greater	0	0	0	0	0	0										
7/100 AC Samples:																
List of Common Understory Species 3'-20':	% of Canopy Closure										Total	Plot Successional Stage: Early-, Mid-, or Late-Successional upland/lowland forest				
	C	N	E	S	W											
List of Herbaceous Species:	% Invasive Cover										Total					
	C	N	E	S	W											
List of Invasive Species:	% Understory Cover 3'-20'										Total					
	C	N	E	S	W											
Comments:	% Herbaceous/Woody Cover 0'-3'										Total					
	C	N	E	S	W											
Total number of tree species >6":																
Sheet 1 of x																



PHOTO INDEX:
We took four photographs for each forest sample plot. The location of these photographs is the center point of each sample plot, and each photograph faces one of the four cardinal directions (west, north, east, south). These pictures correspond to the sample plot on the adjacent preceding page. Each set of photographs follows the same order clockwise- from top left: looking west, looking north, looking east, looking south.



DATA COLLECTION METHODOLOGY

Forest Stand Summary Sheet	
Property Name:	<u>Greenbelt Forest Preserve</u>
Location:	<u>Greenbelt, MD</u>
Prepared By:	<u>CML</u>
Date:	<u>2015</u>
Stand Variable	Stand # <u> </u>
1. Dominant species/Codominant species	
2. Forest Association	<u>Tulip poplar association, White oak-Red oak association, Red maple-Sweet gum association, OR Highly disturbed/invasive association</u>
3. Successional stage	<u>Early-successional, Mid-successional, OR Late-successional</u>
4. Basal area in s.f. per acre	<u> </u>
5. Size class of dominant species	<u>2-5.9", 6-9.9", 10-17.9", 18-29.9", OR >30" dbh</u>
6. Percent of canopy closure	<u>0-100%</u>
7. Number of tree species	<u> </u>
8. Common understory species	
9. Percent of understory cover 3' to 20' tall	<u>0-100%</u>
10. Number of understory species 3' to 20' tall	<u> </u>
11. Common herbaceous species	
12. Percent of herbaceous & woody plant cover 0' to 3' tall	<u>0-100%</u>
13. List of major invasive plant species & percent of cover	
14. Number of standing dead trees 6" dbh or greater (average per plot)	<u> </u>
15. Comments	
Sheet 1 of 1	

The Greenbelt Forest Preserve, North Tract and South Tract, contains 16 forest stands

"Forest association" is a term used to describe the overall and distinct characteristics of a forest stand

Part A: Composition and Structure	Plot P1 Stand 1	Part B: Condition	
1. Percent canopy closure		1. Invasive species coverage (%)	
10-100%	3	Herbaceous	
40-60%	2	<1	3
10-30%	1	1-5	2
0-9%	0	>5	1
2. Number of shrubs under 20' tall		Understory	
15 or more	3	<1	3
10-14	2	1-5	2
5-9	1	>5	1
0-4	0	Canopy	
3. # of tree species 5" DBH and greater		<1	3
6 or more	3	1-5	2
4-5	2	>5	1
2-3	1	2. Percent of damage from insect & disease or storm damage	
0-1	0	0-10	3
4. Size class of dominant trees		11-20	2
Greater than 20"	3	21-30	1
6-19"	2	31+	0
3-5"	1	3. Percent of downed dead woody material present	
Less than 3"	0	51-100%	3
5. Percent herbaceous and shrub cover under 3'		15-50%	2
75-100%	3	5-14%	1
25-74%	2	0-4%	0
5-24%	1	4. Average number of standing dead trees/60ft ² acre plot	
0-4%	0	0-1	3
6. Stocking level (BA)		2	2
>120	3	3-5	1
50-120	2	5 or more	0
<50	1	5. Other features	
7. Other features		2	2
2		1	1
1			

The Summary table is a rating system used by the state of Maryland to assign numerical value to a forest stand. The Forest Sample Plot Field Data Sheets provide data for Parts A and B, shown on the subsequent pages.

Priority 1 is defined as a forest stand that contains any of the following: green infrastructure network, critical habitat areas, contiguous wooded areas, specimen, champion and historic trees, forest legacy trees that are within an environmental setting of a historic site, wetlands, streams, steep slopes, erodible soils, or habitat for birds that are forest interior dwelling species (FIDS).

Priority 2 is any forest stand adjacent to Priority 1 forest, contains Marlboro and/or Christiana soils complex, or is adjacent to roadways.

All other areas are designated as **Priority 3**.

Each stand is categorized as High, Medium, or Low priority based on the total number of points awarded.

Priority for preservation:

- High: Located in Priority 1 areas regardless of structure or condition, or scoring more than 15 in either structure or condition or total stand analysis of 45 or greater
- Medium: Located in a Priority 2 area, or scoring 12–15 in structure and condition or total stand analysis of 30 or greater
- Low: Located in a Priority 3 area, or scoring less than 12 in structure or condition or total stand analysis less than 30

Priority for Restoration:

- High: Located in a Priority 1 area
- Medium: Located in a Priority 2 area
- Low: Located in a Priority 3 area

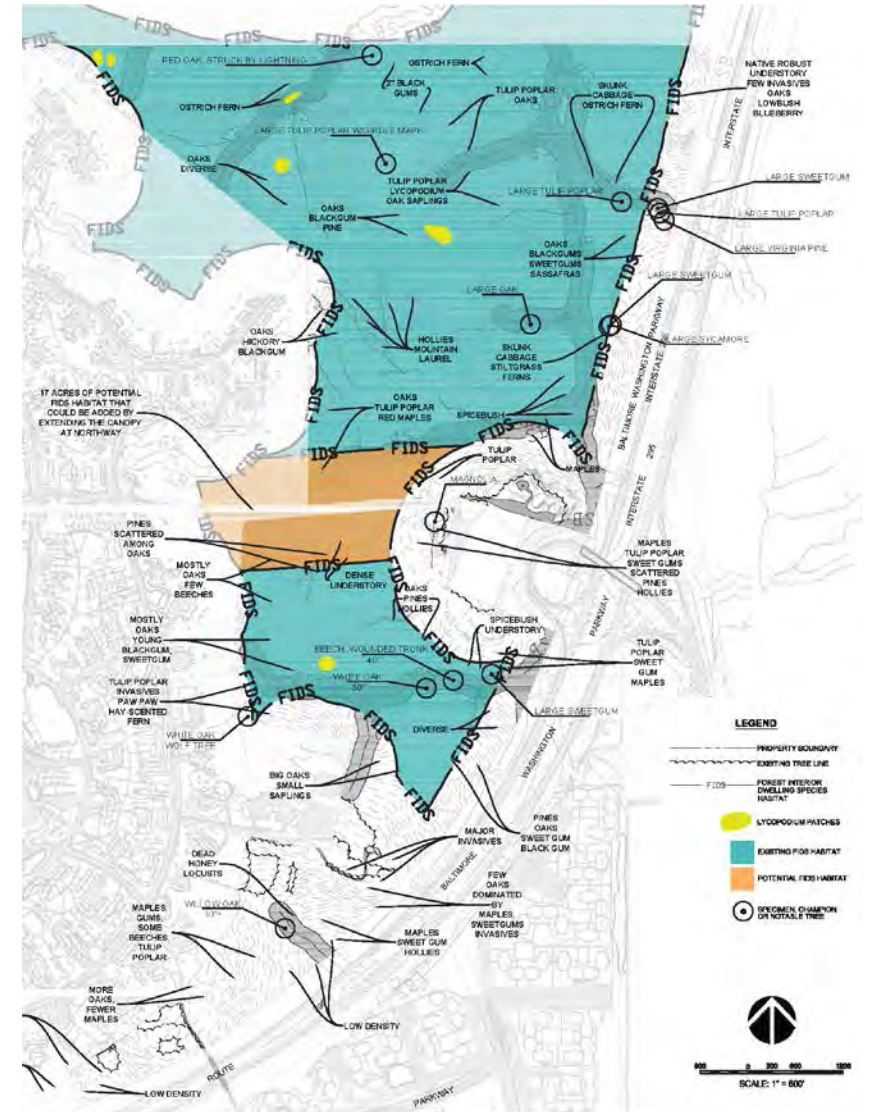
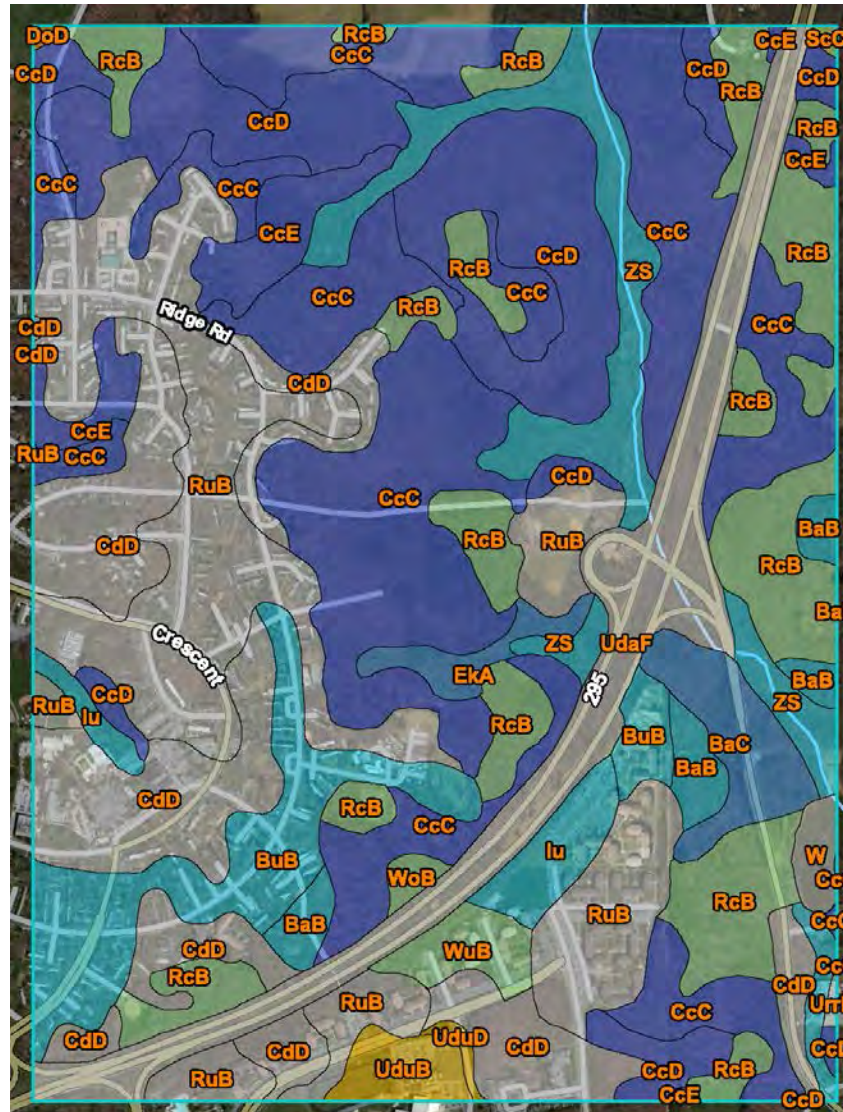
Part C: Location			
Priority 1	20	Stand	Location Rating
Priority 2	15	1	
Priority 3	10	2	

Part D: Stand Function						
Stand	Water Quality Protection	Visual Screening	Wildlife Habitat	Energy Conservation	Personal Woodlot	Other Function
1						
2						

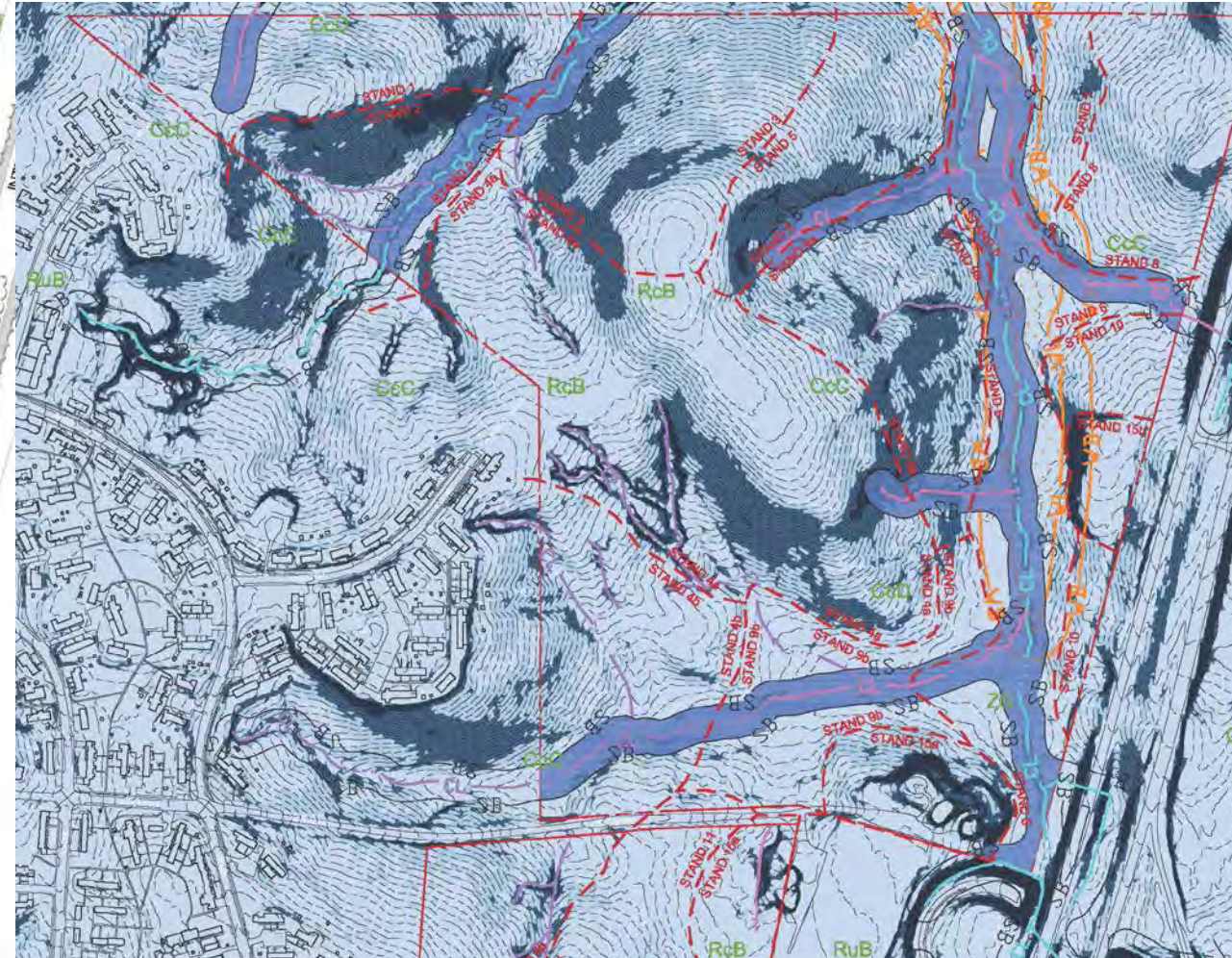
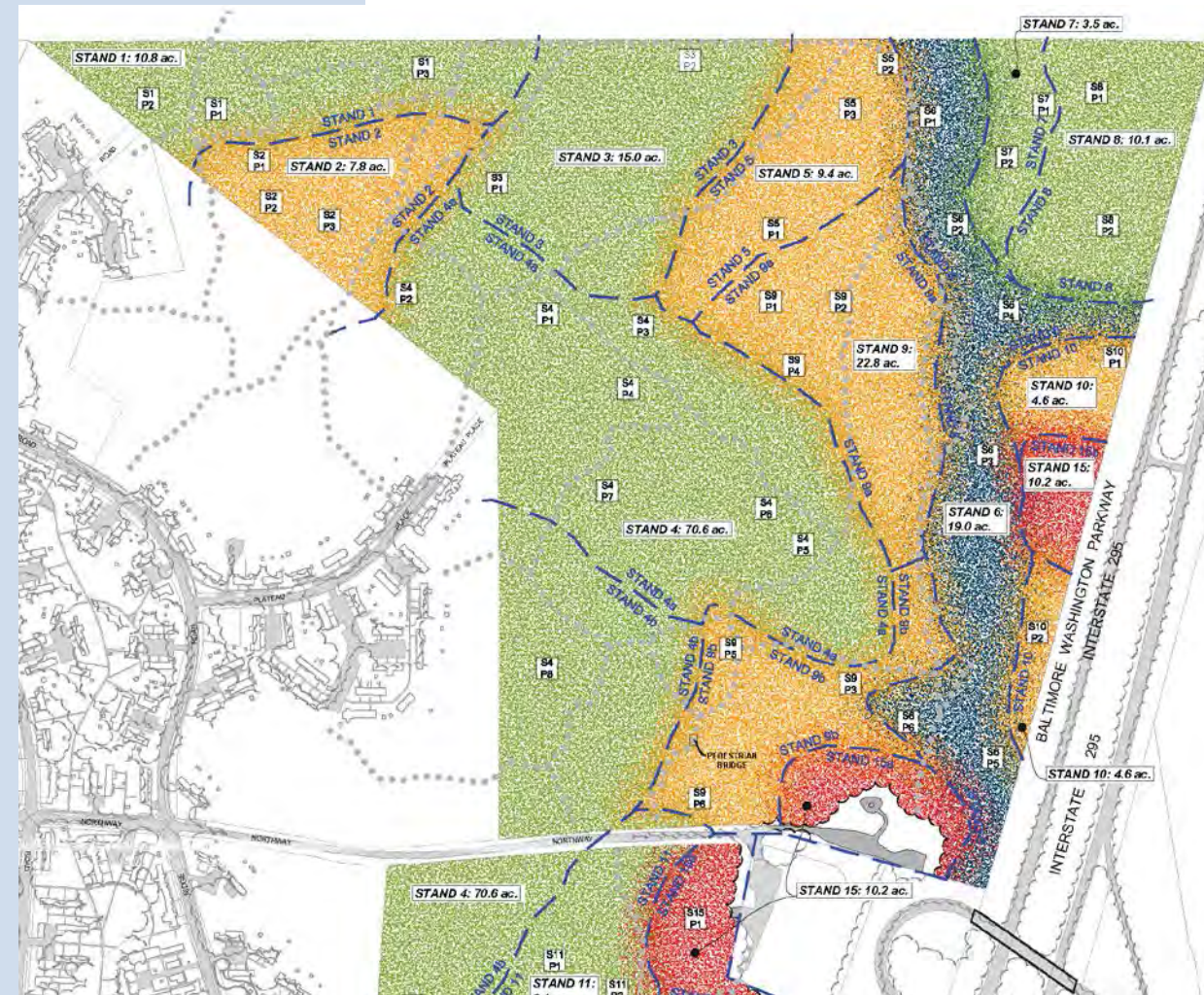
Summary Table - Forest Analysis and Priorities						
Stand	Part A Structure (Out of 20)	Part B Condition (Out of 20)	Part C Location (Out of 20)	Total (Out of 60)	Priority for Preservation (H, M or L)	Priority for Restoration (H, M or L)
1						
2						

DATA COLLECTION METHODOLOGY

- Waste
- Fire
- Hazardous Material
- Adjacent Land Use
- Soils & Soil Erosion
- Streams and Water Quality



NORTH PRESERVE FOREST STANDS



STAND 1 & STAND 3



STAND 4A & STAND 4B



STAND 2 & STAND 5



STAND 9A & STAND 9B



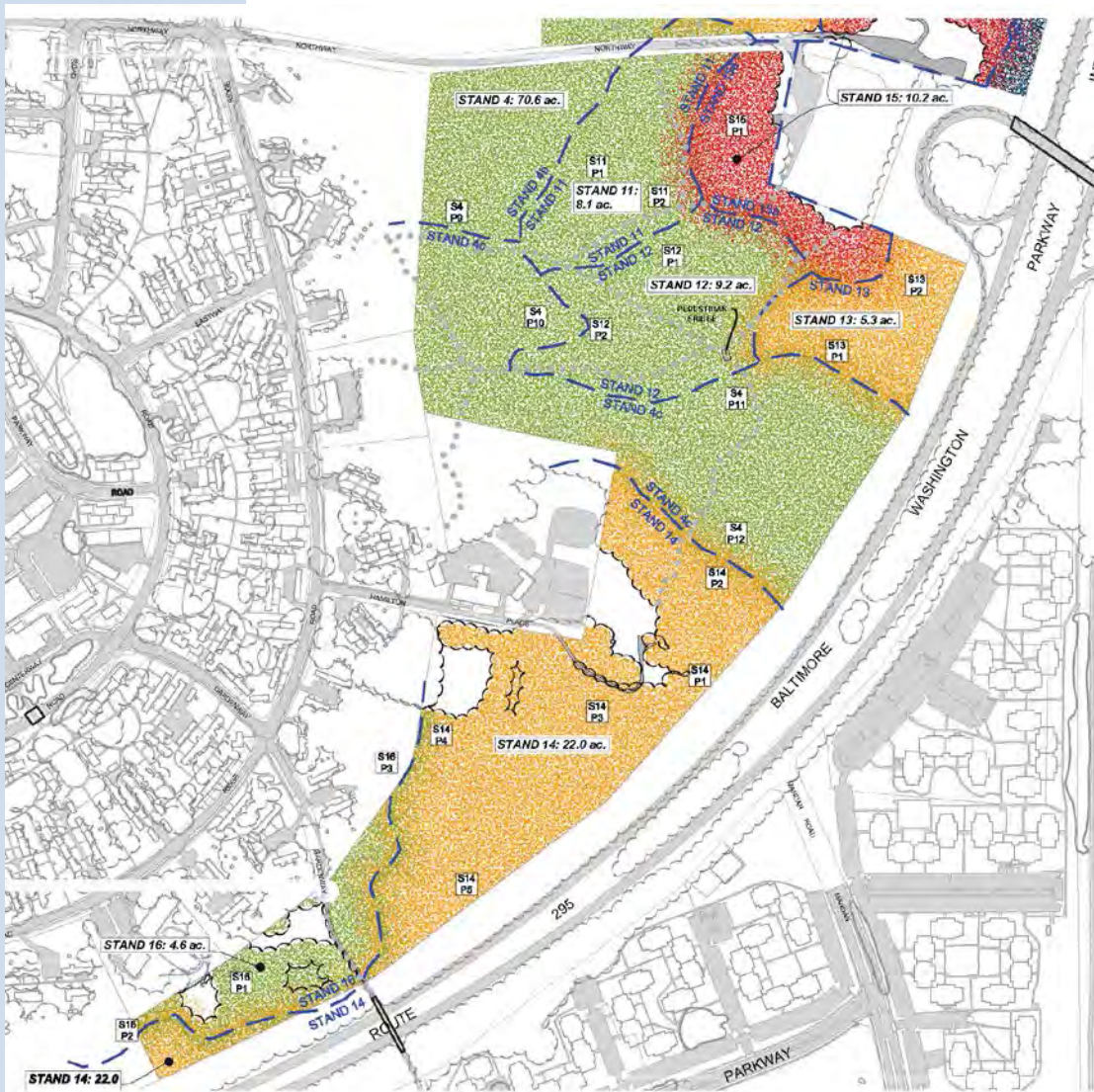
STAND 7 & STAND 8



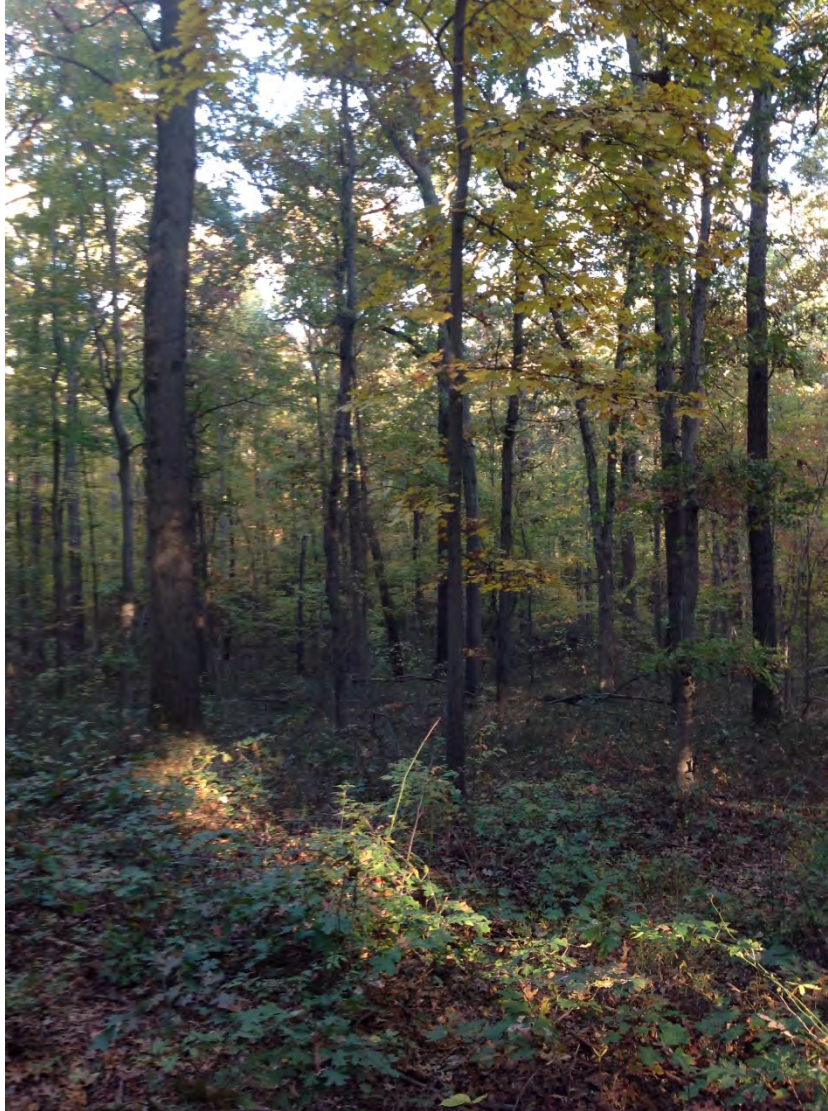
STAND 10 & STAND 15B



SOUTH PRESERVE FOREST STANDS



STAND 4B & STAND 4C



STAND 11 & STAND 12



STAND 13 & STAND 14



STAND 16 & STAND 15

