CITY OF GREENBELT, MARYLAND

FOREST PRESERVE

STEWARDSHIP GUIDELINES

2019

Executive Summary

The Greenbelt Forest Preserve is 254.8 acres of forested land that are protected and conserved in their existing natural state, for the use and enjoyment of present and future generations. The Forest Preserve serves a vital function by providing a link between residents of the city and nature. The Forest Preserve is part of Greenbelt's cultural identity, its ambiance and sense of place. It adds to Greenbelt's air and water quality and ultimately, by reducing storm water runoff, improves the quality of the Chesapeake Bay. By providing a form of passive recreation, it contributes to the health and wellness of Greenbelt residents. The Guidelines aim to expand on Greenbelt's historic legacy by suggesting ways to protect the Forest Preserve and its wildlife in a natural state to the maximum extent practicable.

On October 27, 2003, the City of Greenbelt passed legislation to designate these lands as a "Forest Preserve" (Ordinance No. 1243). Subsequently, a task force of citizens was formed to write the *Management and Maintenance Guidelines,* which were adopted by the City in 2007. This current document revises the *Management and Maintenance Guidelines*, expanding and clarifying the care needed for the Forest Preserve. In updating the guidelines, the Forest Preserve Advisory Board adopted a new title *Stewardship Guidelines* to reflect a more active approach for protecting and conserving this dynamic ecosystem.

When the federal government established the town of Greenbelt in the 1930s the city planners intended the land around the town to be a "belt of green." Greenbelt was designed as a "Garden City," a residential area surrounded by forests, community gardens, recreational facilities, farms, and other green space. This green space would provide health benefits to residents as well as protection from encroachment by nearby development that was out-of-character with the town's design. As the decades passed, parts of the "belt of green" were sold, developed, and repurchased, resulting in the loss of much of the original forest.

These *Stewardship Guidelines* are detailed and multifaceted, to cover a wide range of events, activities and uses of the forest that could have impacts on the health of the ecosystem. Residents of Greenbelt are encouraged to enjoy the Forest Preserve and explore it passively. People are encouraged to walk on designated trails. These guidelines exist so that the impact of human activity on the ecosystem is kept to a minimum. Many activities, such as lighting fires, hunting, camping, building structures and disposing of litter, are not permitted. The city code describes these in detail. Both natural events and anthropogenic activities can impact the quality of the air, land and water, as well as the health of the plants, animals and microscopic organisms. These

guidelines cover ecosystem health, trails, invasive species, disturbance, wetlands, non-conforming uses, litter cleanup, special events, and enforcement. All of these topics have been carefully reviewed and revised to create this update to the original 2007 guidelines.

- **Ecosystem Health**: The chapter on ecosystem health discusses how to determine if a forest ecosystem is healthy and functioning, and describes strategies for improving the health of the Preserve.
- **Trails**: The section on trails discusses the existing primitive informal trails and proposes a Master Trails Plan. This plan would create a designated trail system in the Preserve and describe the type and intensity of trail maintenance that should occur in order to maintain ecological health in each area. These guidelines stipulate that in all instances the City will maintain the trails to the minimal extent possible.
- **Invasive Species**: The chapter establishes a process to evaluate the impacts of invasive species in the preserve and a strategy to reduce their impacts on the forest ecosystem in a manner that will minimize disturbance caused by invasive species management. The principles of Integrated Pest Management shall be used in all planning for invasive species management.
- **Disturbance**: The disturbance section describes natural and anthropogenic disturbances in the Preserve, and establishes a method for the Board to assess and address various types of disturbance.
- **Wetlands**: This chapter describes wetlands and provides details about the location and condition of streams and wetlands in various Preserve tracts. It also describes threats to wetland and stream health and methods for assessing their health along with possible stewardship remediation.
- **Specially Managed Areas**: The parcels that make up the Preserve include non-forested areas that have been set aside for other uses. The specially managed areas section addresses these areas, as well as impacts to the Preserve from activities and uses on adjacent land.
- **Cleanup, Enforcement and Special Events**: This final chapter discusses litter and debris cleanup, the permitting process and the management of special events, prohibited activities within the Preserve and their enforcement.
- **Glossary**
- **Appendix A**: A copy of Greenbelt City Code pertaining to the Preserve, Article IX, Sec. 12-150 to 12-163 is included as Appendix A
- **Appendix B**: Legal protections of the parcels of the Greenbelt Forest Preserve

Typically, the hallmark sign of ecosystem health is the presence of a wide diversity of organisms, living in a harmonious community. These guidelines seek to

improve—or at a minimum, to maintain—the ecosystem health and biodiversity in the Preserve, while also allowing compatible recreation.

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Chapter One

HISTORY AND OVERVIEW

1.1. History

In the 1930s, the federal government established the town of Greenbelt as a New Deal era experiment in suburban planning. City planners envisioned that residential areas would be surrounded in perpetuity by what they called a "belt of green" that was to contain forests, community gardens, recreational facilities, farms, and other green space. Planners believed that green space immediately adjacent to residential areas would provide health benefits to residents. Planners also expected the belt to protect the town from encroachment by nearby development that was out-of-character with the town's design. New Deal planners cited as one of their inspirations the "Garden City" design of Ebenezer Howard, which called for a 5,000-acre belt of green around a 1,000-acre developed area. The cooperative housing of the New Deal era and the rest of what is now called "Old Greenbelt" occupies approximately 1,000 acres, but only a small portion of the surrounding 5,000 acres is still green space.[1]

The tracts of the present-day Forest Preserve are among the portions of the town's original "belt of green" that still exist. Elsewhere in town, the southern portion of the belt of green was safeguarded, when approximately 1,000 acres were transferred to the National Park Service in 1950 to create Greenbelt Park. New Deal planners intended the thousands of acres of green space in the Beltsville Agricultural Research Center (BARC) to permanently protect Greenbelt from encroachment from the north. To the west of the original cooperative housing, a partial "belt of green" exists today as Buddy Attick Park and the Belle Point Tract and Boxwood Tract of the Forest Preserve.

The surviving portion of the belt of green that lies immediately to the east of Greenbelt's original cooperative housing is made up of the two largest tracts of the present-day Forest Preserve plus a smaller area of woodlands owned by Greenbelt Homes Inc. (GHI). The precursor to GHI purchased all of this land from the federal government in December, 1952.[2] GHI soon sold much of this land to developers. Nothing was built on the land that would eventually become the North Woods and Hamilton Woods Tracts of the Forest Preserve because the county repeatedly denied the developers' petitions to have the land rezoned for high-density development in the 1960s and 1980s. Over the

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[1] Ebenezer Howard, 1902: *Garden Cities of Tomorrow*, Swan Sonnenschein, 167 pp, available online at https://books.google.com/books?id=jVJUAAAAMAAJ ; Resettlement Administration, September 1936: *Greenbelt Towns*, USDA, 32 pp, available online at https://archive.org/ details/greenbelttowns1936unit ; Cedric Larsen, 1938 August: Greenbelt, Maryland: A Federally Planned Community, *National Municipal Review*, pp. 413-420, available online at http://onlinelibrary.wiley.com/doi/ 10.1002/ncr.4110270806.epdf.

[2] Maryland Land Records, Liber 1568, Folio 199-233, 31 Dec 1952; Plats.net, Map C2482-185, Dec 1952.

years, Greenbelt residents and the city government became increasingly interested in preserving this green space, culminating in the 1990 purchase of what was then known as Parcel 1.

Following the purchase of Parcel 1, the City sought to protect the forest ecosystem in this corner of town. After considering public land trusts, private land trusts, easements, and county zoning overlays, the City determined that the best mechanism for protecting the forest would be to establish a Forest Preserve program. In 2003, the City Council modified the City Code to establish the Forest Preserve as city-owned land distinct in purpose from the town's parks, picnic grounds, and sport fields. In 2003, the City Council also formed a citizen task force to write management guidelines. In 2007, the council created the Forest Preserve Advisory Board. As is the case with the Greenbelt Forest Preserve, the term "forest preserve" generally refers to an area where the primary goal is to allow a healthy ecosystem to persist rather than altering the ecosystem to accommodate recreation or resource extraction.

In 2015, the City Council hired A. Morton Thomas and Associates to assess the health of the North Woods and Hamilton Woods Tracts of the Forest Preserve. In light of this study, the Forest Preserve Advisory Board proposed a number of revisions to the management and maintenance guidelines in 2019, including that the guidelines be renamed "Stewardship Guidelines." The motivation for using the word "stewardship" is that the forest is a living system to be watched over and protected, not a machine to be maintained. The intent of these guidelines is that Greenbelt residents will participate in the stewardship of the forest, while the City Council and the Forest Preserve Advisory Board play well-defined stewardship roles as well.

1.2. Stewardship Philosophy

The primary goal of this document is to guide the preservation of the Forest Preserve areas and the wildlife habitats within their boundaries. The first concern for citizens is the stewardship of the Forest Preserve—to protect and conserve the land in a natural state. Change occurs through natural processes in every forest and, in most forests, through human activity that occurs either inside or outside of the forest boundary. Such changes may indicate a healthy ecosystem or distressed one. The Forest Preserve Advisory Board will assist the City in determining what observed changes are acceptable and what changes should be addressed to preserve the healthy functioning of the forest ecosystem.

Secondary goals of this document are to guide and allow for public education, passive recreation, and activities that improve the aesthetics within the preserve. These secondary goals should be embraced to the maximum extent practicable, consistent with wise stewardship and conservation of the forest ecosystem. In terms of education,

the Forest Preserve Advisory Board may host a table at one of the town's various public-information days or submit letters or articles to the Greenbelt News Review about seasonal features of the forest or threats to the forest. Passive recreation refers to walking or jogging through the forest or to studying the flora and fauna to the extent that such activities do not harm the ecosystem. The Forest Preserve Advisory Board and other organizations may host free, public hikes with an ecological or education theme, subject to the permitting provisions stated in these Guidelines. Aesthetics refers to the desire that the forest appear to be a wild place free from structures, refuse, or other man-made marks. In connection with the desire for an aesthetic experience within the Preserve, the Forest Preserve Advisory Board may invite the public to participate in trash clean-up events.

1.3. Enabling Legislation

The Forest Preserve and its administration is defined in the Greenbelt City Code, Section 12, Articles 8 and 9. The original legislation that defined the Forest Preserve is City Council Ordinance 1243, which was adopted on October 27, 2003.

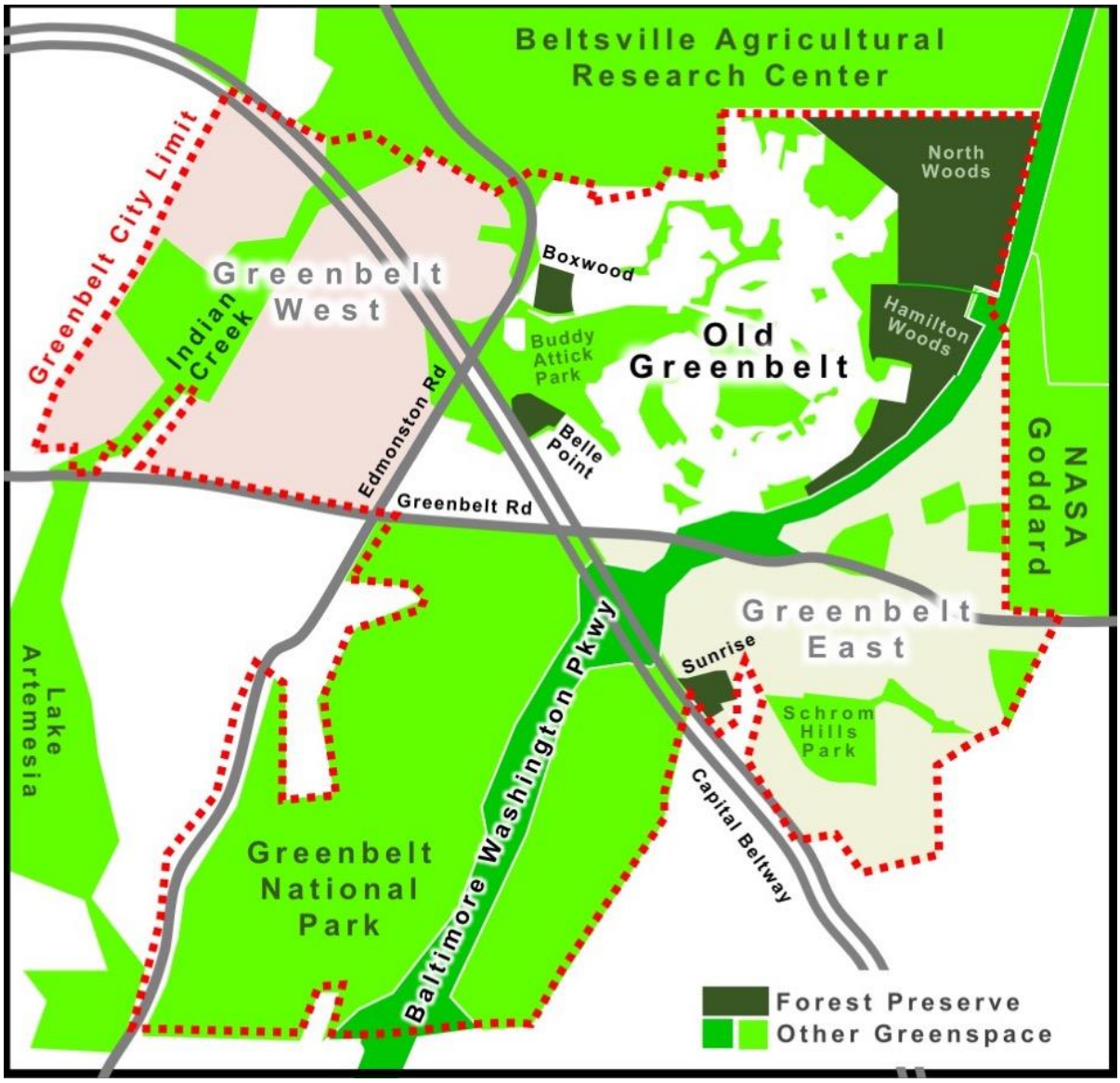
1.4. Description of the Forest Preserve

The Forest Preserve consists of five tracts shown on the following map. When the Forest Preserve was created in 2003, it originally contained only two tracts: the North Woods and the Hamilton Woods. In 2007, the Forest Preserve Task Force recommended that the City add four more tracts to the Forest Preserve, three of which were added: Boxwood, Belle Point, and Sunrise. The different ecological characteristics and surroundings of each tract influence the stewardship activities that are appropriate there.

1.4.1. North Woods Tract

Physical Description: The North Woods Tract consists of 145 acres. It is the largest tract in the Greenbelt Forest Preserve and contains more than half of the total acreage managed under the Forest Preserve program. The North Woods Tract lies immediately north of Northway Road, west of the Baltimore-Washington Parkway, south of the Beltsville Agricultural Research Center (BARC), and east of the woodlands owned by Greenbelt Homes, Inc. (GHI). The North Woods Tract lies north of the Northway athletic fields at the end of Northway Road. When the Forest Preserve was created, the city was in the process of constructing an astronomical observatory just north of Northway Road and the city had, for years, collected yard waste and generated mulch just north of Northway Road. While neither of these activities are consistent with

the intended purpose of the Forest Preserve, they were permitted as pre-existing uses of the land just within the southern boundary of the North Woods Tract of the Forest Preserve (See Map 2).



Map 1: A map of Greenbelt that shows the five tracts of the Forest Preserve in dark green, other public and private green space in light green (parks, athletic fields, forested acreage, etc.), and the town's boundaries with a red-dotted line.

Ecological Characteristics: Among all of the tracts in the Forest Preserve, the North Woods Tract contains the greatest diversity of species and habitats and is considered the most ecologically valuable. At its center is Blueberry Hill, which rises 100 feet above the Goddard Branch wetlands and Canyon Creek (See Map 2). The types of

habitats within the North Woods Tract include floodplain, cove forest, seep, vernal pools, upland oak-hickory forest, and heath forest. The North Woods Tract also contains a considerable area that is suitable for species that dwell preferentially in forest interiors, a feature of the North Woods that is enhanced because it is adjacent to extensive forest within the Beltsville Agricultural Research Center (BARC) of the U.S. Department of Agriculture.

Map 2: North Woods and Hamilton Woods Tracts, showing their boundaries and non-conforming areas within them. Forest cover, streams, buildings, and pavement from pgatlas.com.

History: A number of tulip poplars, oaks, and red maples have grown to considerable girth in the North Woods Tract, suggesting that some of these trees may have been growing already before Greenbelt was founded in 1937. Maryland Land Records trace the North Woods Tract to three parcels of land known as Green Spring (on present-day Blueberry Hill), Poplar Thicket (north and west of Blueberry Hill), and Parcel Enlarged (along the east bank of Goddard Branch). The North Woods Tract and Hamilton Woods Tract are a remnant of the eastern portion of the "belt of green" that originally surrounded Old Greenbelt in 1937.

Stewardship: The North Woods Tract shall be managed in such a way as to promote its ecosystem health to the maximum possible extent. Improvements should only be permitted when they are necessary to maintain ecosystem health.

1.4.2. Hamilton Woods Tract

Physical Description: The Hamilton Woods Tract consists of 81 acres, making it the second largest tract in the Forest Preserve. The Hamilton Woods Tract has also been called the "South Woods" because it lies immediately south of the North Woods Tract. The Hamilton Woods Tract includes land that is bounded by the Baltimore-Washington Parkway and by GHI woodlands. The narrowness of the southern portion of the Hamilton Woods Tract results in noise pollution from the Baltimore Washington Parkway impacting visitor experience.

Ecological Characteristics: The Hamilton Woods Tract contains stream and upland-forest habitats. The tract is almost entirely forested. One exception is the clearing along the western edge of Northway Athletic Fields where the Public Works Department maintains a road-tailings pile, fill-dirt pile, and large-timber pile adjacent to and possibly within the Hamilton Woods Tract. Public works also keeps a buffer zone free of trees around the community gardens that are located within the Hamilton Woods Tract. The three garden areas are located beyond the end of Hamilton Place, opposite the GHI office building, and near Gardenway Road. Along the northern boundary of the Hamilton Woods Tract and just south of Northway Athletic Fields, a known hazard is the scrap metal and other large, non-biodegradable trash items that have been scattered over several acres. This hazard has existed for a number of decades.

History: The Hamilton family owned this land from the mid-1700s to the mid-1800s. Since the late 1930s, community gardens have existed at approximately their present-day locations within the Hamilton Woods Tract. Community gardens in roughly this area were part of the original New Deal era design for Greenbelt. Since the creation of the Forest Preserve, the northern portion of the Hamilton Woods Tract has often been used for the annual pumpkin walk. Greenbelt's volunteer-run pumpkin walk was originally envisioned as a way to introduce residents to Greenbelt's forests in 1988 during the campaign to have the city purchase Parcel 1 at the heart of the North Woods Tract. While the North Woods and northern portion of the Hamilton Woods have for decades contained an informal network of trails, the southern portion of the Hamilton Woods Tract currently lacks clear trails. FPAB takes the lack of informal trails as evidence that hikers visit this area less often than other areas of the Forest Preserve.

Stewardship:

1. FPAB may recommend removing the exposed landfill refuse in the northern portion of the Hamilton Woods if a way could be found to do so without causing unacceptable disturbance to the forest ecosystem.

2. FPAB is monitoring the Public Works road-tailings and other piles of material within the eastern edge of the Hamilton Woods Tract next to Northway Athletic Fields.

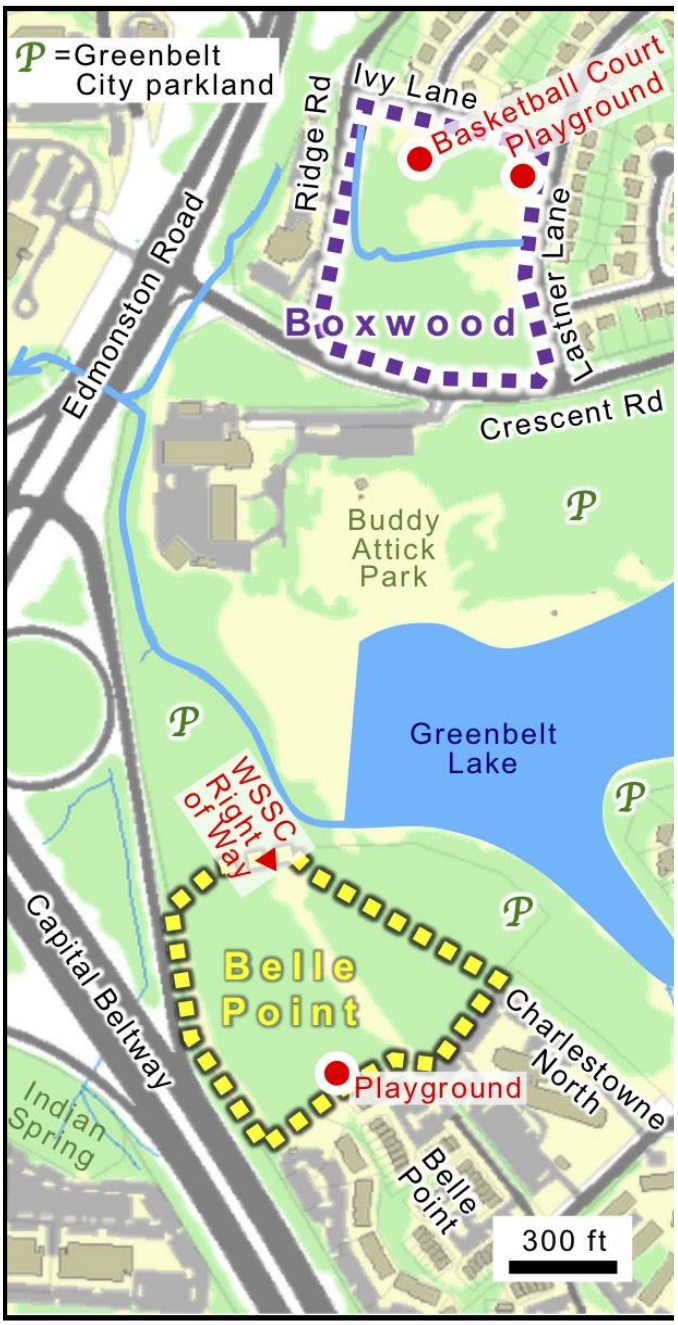
FPAB will recommend remedial action if such use were expanded or was deemed likely to cause harm to the adjacent, forested portion of the Hamilton Woods Tract.

1.4.3. Boxwood Tract

Physical Description: The Boxwood Tract consists of 8.8 acres located north of Greenbelt Lake and across the street from the main entrance to Buddy Attick Park. The Boxwood Tract is bounded by Crescent Road, Lastner Lane, Ivy Lane, and Ridge Road. The tract contains approximately two acres of mowed lawn, a playground, and a small basketball court, all of which pre-date the creation of the Forest Preserve program and are excluded by City Code from Forest Preserve regulations. These features are shown on Map 3.

Ecological Characteristics: The Boxwood Tract is mostly wooded but includes approximately two acres of fields that are regularly mowed by Greenbelt Public Works. A stream flows through the middle of the Boxwood Tract, from east to west.

History: The Boxwood Tract is named after the Boxwood subdivision of Greenbelt that was built during the 1960s. The City of Greenbelt acquired this tract in March, 1970.[3] Along with the parkland around Greenbelt Lake, the Boxwood and Belle Point Tracts are



Map 3: Boxwood and Belle Point Tracts, showing their boundaries and non-conforming areas within them. Forest cover, streams, buildings, and pavement from pgatlas.com.

[3] Maryland Land Records, Liber 3813, Folio 470

remnants of the western portion of the "belt of green" that originally surrounded the residential areas of Old Greenbelt. The Boxwood Tract was added to the Forest Preserve following the recommendation of the Forest Preserve Task Force in 2007.

Stewardship: The aesthetic value of the stream could be improved by removal of debris.

1.4.4. Belle Point Tract

Physical Description: The Belle Point Tract consists of 10 acres. It is immediately south of the parkland that surrounds Greenbelt Lake and lies north of the 495 Capital Beltway (Map 3). Within the tract, there is a small playground for the adjacent Belle Point Subdivision. The Washington Suburban and Sanitary Commission (WSSC) maintains a non-forested strip that passes through the Belle Point Tract to provide WSSC access to the underlying water main.

Ecological Characteristics: The tract is forested other than the clearing associated with the WSSC right of way.

History: During the construction of Greenbelt (1935-1937), federal relief workers cleared a path from Greenbelt Lake through the Belle Point Tract heading southwest to Indian Springs. The path was a popular one during the early years of Greenbelt, as residents walked from the residential areas of Old Greenbelt to Indian Springs, where many arrowheads were found. The construction of the Capital Beltway in the 1960s isolated Indian Springs from the Belle Point Tract and the rest of the forested area around Greenbelt Lake. The Belle Point Tract is named after the adjacent Belle Point subdivision and was acquired by the City of Greenbelt in November of 1987.[4] The Belle Point Tract was added to the Forest Preserve following the recommendation of the Forest Preserve Task Force in 2007.

Stewardship: Currently, there are no long-term stewardship concerns specific to the Belle Point Tract.

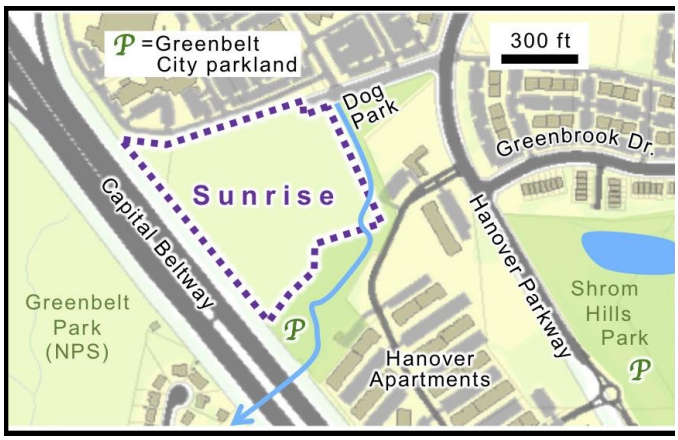
1.4.5. Sunrise Tract

Physical Description: The Sunrise Tract consists of 10 acres. It is located immediately to the east of the Capital Beltway, north of Hanover Apartments, west of Hanover Parkway, and immediately west of the Greenbelt Dog Park (See Map 4).

Ecological Characteristics: The Sunrise Tract is entirely forested. A stream flows just outside the Sunrise Tract's eastern and southern boundary and within a strip of land that is owned by the City of Greenbelt. This stream flows west into Still Creek in Greenbelt Park, a tributary to the Anacostia River.

[4] Maryland Land Records, Liber 6833, Folio 779

History: In 1991, the City worked to prevent the Sunrise Development Corporation from constructing high-rise buildings on this tract. As a result of negotiations related to the construction of a nearby post office, the City purchased the Sunrise Tract using Program Open Space Funds in October, 2004.[5] The Sunrise Tract was added to the Forest Preserve following the recommendation of the Forest Preserve Task Force in 2007.



Map 4: Sunrise Tract, basemap from PGatlas.com.

Stewardship: Several large dumpsters surround the northwest access point for the Sunrise Tract, which leads to littering and the dumping of large items in the Forest Preserve. A wooden fence to replace the broken plastic one might enhance the aesthetics of the property and a regulatory sign might mitigate dumping. The stream along the eastern and southern boundary of the Sunrise Tract that contributes to Still Creek collects trash and needs protection.

[5] Greenbelt *News Review*, 14 Feb 1991; 12 June, 2003; 14 June 2007; Maryland Land Records, Liber 20449, Folio 716.

Chapter Two

ECOSYSTEM HEALTH

The goal of all management activities in the forest Preserve is to maintain and enhance ecosystem health. To accomplish this, it is necessary to assess the current ecosystem health of the Preserve, to determine threats and opportunities for enhancing its health and to select appropriate strategies.

2.1. What is Ecosystem Health?

“Ecosystem health” is a metaphor that uses our ideas of human health to describe the state of an ecosystem. Just as human health is complex, so too many factors make up ecosystem health. In general, a healthy ecosystem is one that is able to maintain its natural diversity, including the diversity of native species and habitats and the diversity of natural processes, such as succession, predation, competition and community dynamics. The closer an ecosystem is to having its natural suite of species and processes the healthier it is. This idea can also be applied to specific habitats in the ecosystem such as forest, stream, and wetland health.

Focusing on threats to the ecosystem is one method for assessing health. The wide variety of threats to the Preserve include air pollution, water pollution, excessive runoff from impervious surfaces, litter, and non-native invasive species, including pests and pathogens that kill trees.

A second way to assess ecosystem health is to consider what is missing but which should be present in an ecosystem. For example, some large native predators would naturally be present in the Forest Preserve, but were eliminated many years ago. Similarly whole processes can be absent from an ecosystem. Fires naturally drive a cycle of disturbance and recovery in forest ecosystems and many forest trees have evolved to survive fires. However, due to the threat to life and property, fires have been suppressed, so this process no longer occurs naturally in the Forest Preserve.

It is important to keep in mind that not all changes are a threat to ecosystem health. Forests naturally undergo the processes of succession, where light loving trees that grow early in the life of a forest are replaced by more shade tolerant species. Virginia pine is an example of a common early successional tree species in the Forest Preserve that will naturally become rarer as time goes on. Similarly, as forests change, the species of animals that live there may naturally become more common or more rare.

2.2. Determining the Health of an Ecosystem

As there is no strict definition of ecosystem health, there is no simple method for measuring it. Instead there are a variety of ways to get insight into the state of the ecosystem. One common method is to conduct an inventory to determine the status of some aspect of the ecosystem. This could be an assessment of some threat to the Forest Preserve, such as determining where trash should be cleared or where new trails are being formed.

Inventories are often conducted to determine what species of plants and animals are found in an area. This sort of inventory is often carried out by a trained specialist or experienced amateur naturalist who is familiar with the species they are likely to find. The results of this type of inventory can identify areas where rare species that need extra protection are found and indicate the quality of the habitats in the Preserve. A newer type of inventory makes use of citizen science to study an area. Volunteers can download apps to their phones, such as eBird or iNaturalist, which will allow them to record when and where they have seen various species. This type of inventory is less structured than a formal study, but by harnessing the help of many volunteers it can provide information that would otherwise be unavailable.

A second type of study used to assess ecosystem health is a monitoring study. A monitoring study measures some aspect of ecosystem health – such as water quality or numbers and sizes of trees, in order to detect changes over time. By revealing trends in ecosystem health, monitoring can help managers set priorities and discover problems, before they become unmanageable. Because monitoring studies may extend over several years, they can require more financial commitment, planning and work than other types of studies.

Finally, from time to time it may be necessary to conduct an in depth study on a particular problem in the Forest Preserve. This can be particularly helpful if a problem has been identified but it is unclear what the preferred means of addressing it should be, such as determining how storm water runoff from the mulch pile effects the nearby stream.

2.3. Managing for Ecosystem Health

Preserving and enhancing ecosystem health should be a guiding principal for management of the Forest Preserve. While other parts of these stewardship guidelines will specify actions to be taken, some general strategies and guidelines to achieve this are discussed below.

One of the simplest strategies is to identify and address conditions that are a threat to ecosystem health. In the context of the Forest Preserve these conditions could include areas being used as trash dumps, erosion along streams and trails, invasive species and a proliferation of trails in a sensitive habitat. Direct action can mitigate these threats and preserve the health of the Preserve.

A second strategy involves restoring species or processes which have been lost from the Forest Preserve. The lands of the Forest Preserve are too small to accommodate large predators, but it is possible that some native plants that could survive in the Preserve have been lost prior to the establishment of the Preserve when much of the area was farmed. In principal, if such a species was identified, it could be restored to the Preserve and enhance ecosystem health. Similarly, fires are a natural part of forest ecosystems, but are largely absent from the Preserve.

A third strategy does not look to current problems, but rather tries to build resilience to future threats. Increasing urbanization, a changing climate and ongoing air pollution will likely impact the Preserve. Some actions may help maintain ecosystem health, despite these ongoing problems. These could include maintaining connections to adjacent forests to provide a better larger habitat for forest dwelling species or ensuring that streams continue to have canopy cover to prevent overheating during the summer months.

Regardless of the management strategy used, it is useful to consider the scale at which a problem should be solved. If there is litter in the Preserve or erosion along a trail, these issues can be addressed within the Preserve. Erosion due to runoff from neighboring properties would need to be addressed at a wider scale and management to mitigate the runoff may take place entirely outside of the Preserve. Effective management will likely require efforts at a variety of scales, and it will be helpful to enlist the help of neighboring property owners and other organizations to address these and related issues.

Finally, it is important to remember that management activities themselves carry the risk of causing harm to ecosystem health. For example, using broad application of an herbicide may control an infestation of an invasive plant, but it also has the potential to kill non-target species. Before any management activity takes place, there should be a careful consideration of both the risks and the benefits to ensure that the action truly promotes ecosystem health. In general, actions that address problems, when they are small, and actions that prevent problems from occurring are likely to have fewer harmful consequences. Once problems become larger, more drastic actions will need to be taken, which in turn have more potential for degrading some aspect of ecosystem health.

Chapter Three

TRAILS

3.1. Master Trails Plan

The largest tracts of the Forest Preserve have long attracted visitors, which resulted in an extensive network of trails in the North Woods and Hamilton Woods Tracts. The original Forest Preserve Management and Maintenance Guidelines of 2007 acknowledged these trails, but did not designate official or sanctioned trails. Those guidelines describe “a primitive, informal trail system,” with the goal of minimizing the impact on the environment. But over time, adverse impacts have occurred. Members of the public have made new trails, rerouted old trails around obstacles and have undertaken impromptu trail maintenance with mixed results for the environment. This section details a new approach to trail management to promote good stewardship and public safety and to encourage appropriate use of the Preserve.

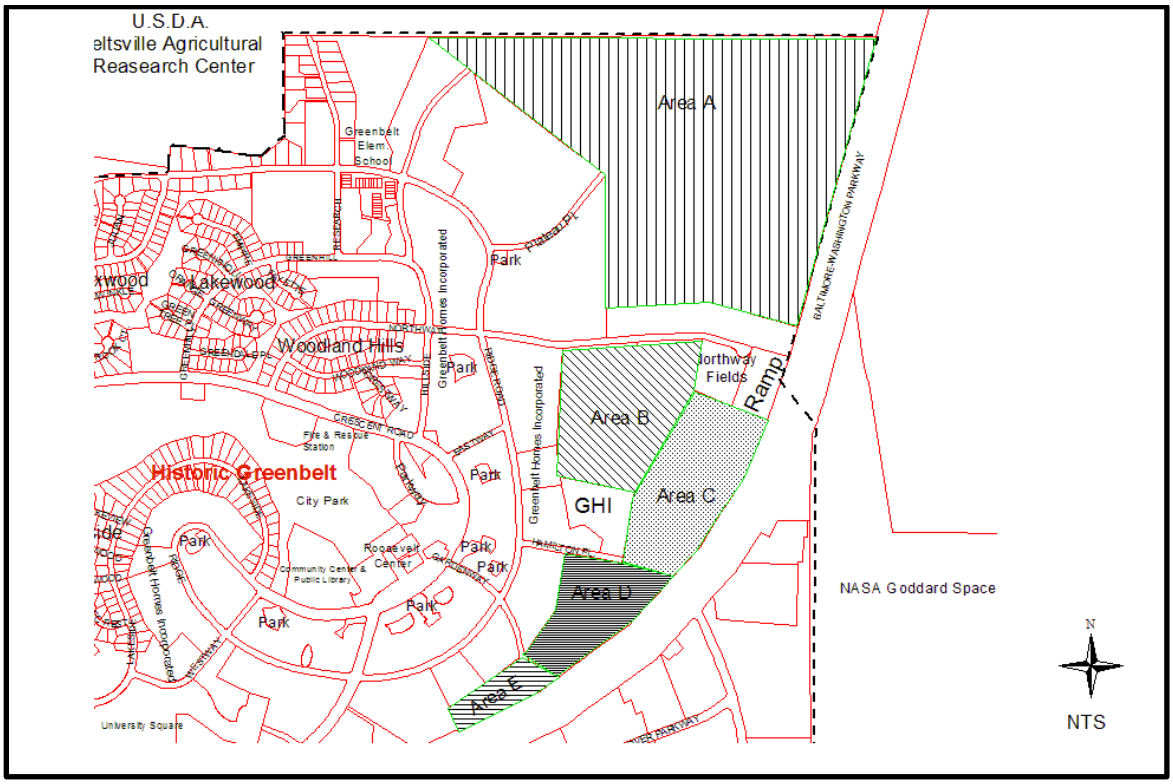
Trails will be officially designated and maintained to protect the health of the Preserve, provide a variety of experiences to hikers and allow the city to discourage unofficial trails or maintenance activities. FPAB and City staff will create a Master Trails Plan that will designate and map the official trails in each parcel and describe the type and intensity of trail maintenance that should occur to preserve ecological health in each area. In all instances, the City will maintain the trails to the minimal extent possible. Trail maintenance activities that are approved in the Master Trails Plan may be carried out by trained city staff, trained volunteers working independently, or groups of volunteers under direct expert supervision.

Designating a trail to be an official trail does not mean it will be marked by physical blazes. The Master Trails Plan will include an inventory of existing trails, sensitive areas, areas of misuse or environmental decline and stream crossings. It will denote those areas where public access may be restricted or existing trails closed. For instance, we would designate a trail on the west-side of Goddard Creek and leave the east-side without a designated trail in order to protect the wetlands. The Master Trails Plan will also indicate which trails are easy to use and barrier-free.

When issues arise, FPAB will consider and address the need for trail maintenance at specific locations. Such issues might include a newly fallen tree blocking a trail in an ecologically sensitive area, eroding trails or newly created trails. Maintenance activities on designated trails will minimize disturbance to the Preserve to the maximum extent practicable, while at the same time allowing the public to experience a large, forested area and participate in activities consistent with that type of experience.

3.2. Trail-specific Stewardship

The Preserve includes the North Woods, Hamilton Woods, Boxwood, Belle Point and Sunrise Tracts, each with its own ecological features. For Boxwood, Belle Point and Sunrise, refer to the maps in the Introduction. The North and Hamilton Woods Tracts consist of five distinct areas known as Areas A, B, C, D, and E as indicated in the diagram below.



Map 5. Original area designations for the North Woods and Hamilton Woods Tracts in the Greenbelt Forest Preserve.

3.2.1. North Woods Tract (Area A – Parcels 10, 12, 17, 19, 20)

The trails in the North Woods Tract are to be managed in such a way as to promote ecosystem health and minimize visitors' impacts on the forest. The visitor experience in the North Woods should be that of hiking through a natural environment with few, minimally maintained trails. Trail improvements or alterations would only be permitted, when they are necessary to maintain ecosystem health or pursue stewardship goals, such as if a bridge were needed to protect a steep stream bank or if fallen trees block

the trail in sensitive habitats. There will be no permanent trail markings in the interior of the North Woods Tract. Special care needs to be taken to ensure that existing trails do not damage wetlands. See Map 5.

3.2.2. Hamilton Woods Tract (Area B, Parcels 6, 7, 8; Area C, Parcels 8 & 9)

Trail management will support informal experiential and educational events and activities, such as the Pumpkin Walk, and allow temporary, non-destructive marking of trails for these events. The Master Trails Plan will designate a network of trails that maintain the existing access from the James Wolf Athletic Fields, Northway Road and GHI woodlands. The northern portion of Area C was once the site of a landfill. The presence of landfill materials in areas near existing trails may present a hazard to the public. The City might consider installing a barrier, such as a split rail fence, around the landfill to discourage public access. We discourage the use of chain link fences anywhere within the Preserve. See Map 5.

3.2.3. Hamilton Woods Tract (Area D, Part of Parcel 21)

This area is flat and has few streams or other crossings, making it the most suitable of all Preserve tracts for planning and managing an open access hiking area. Developing interpretive trails that are easy to use and barrier-free will 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 as a whole. Trails that provide accessibility for citizens with mobility issues would need to comply with the 2013 Americans with Disabilities Act Accessibility Standards. Chapters 4 and 10 of 2013 ADA Standards stipulate surface, size and slope of accessible routes and trails. See Map 5.

3.2.4. Hamilton Woods Tract (Area E, Part of Parcel 21)

This area of the Forest Preserve from Gardenway to McDonald Field is relatively flat, non-wooded in places and heavily vegetated. The few existing, informal trails will be minimally managed in their current condition. See Map 5.

3.2.5 The Boxwood Tract (Parcel 7)

Boxwood Tract has a playground, picnic area and basketball court on the north side. There are a few social trails through the woods to the basketball court.

3.2.6. Belle Point Tract (Parcel 15)

The Belle Point Tract has a WSSC right-of-way that extends from the Belle Point subdivision to Buddy Attick Park along a wide, cleared area. Since Belle Point residents use this trail to access Buddy Attick Park, it needs to be kept clear of debris.

3.2.7. Sunrise Tract (Parcel A)

This heavily wooded area has no discernible trails. A managed trail here would provide recreational hiking to the Hanover Parkway neighborhood. A wooden fence and a regulatory sign might bring recognition to this Preserve, while also discouraging extreme littering.

Chapter Four

INVASIVE SPECIES

4.1. Managing Invasive Species

Invasive species are recognized as a difficult and ongoing threat to wildlife and natural areas in North America, and many invasive species are well established in the Forest Preserve. An invasive species is defined as a species that is not native to the ecosystem under consideration and whose introduction has caused or is likely to cause economic harm, environmental harm, or harm to human health. It can be a plant, animal fungus or other organism. Conversely, a native species is any organism that existed in forest communities in the mid-Atlantic region prior to European colonization. The term invasive species has been used in gardening to describe any overly aggressive weed, but under the above definition, a native species can never be considered invasive. This includes native species that may grow in large impenetrable stands in the forest (e.g. greenbrier), as weeds in garden areas (e.g. Virginia creeper) or impact human health (e.g. poison ivy). Several species of invasive plants are common in parts of the Preserve, while invasive animals such as the emerald ash borer and invasive pathogens are likely present and may also impact the forest ecosystem. All invasive species may not merit management efforts within the Preserve, but all should be surveyed in any forest health assessments that are performed in the Preserve.

There are two significant factors that lead some non-native species to be invasive and have severe impacts on native species and natural communities. First, non-native organisms lack the typical predators, pathogens, and/or the inter-specific competition that they encounter in their native ecosystems. This lack can allow some non-native plants to outcompete native plants and allow some non-native animals to overbrowse, defoliate or otherwise kill native plants species that have not evolved defenses against them. Second, species that become invasive often have advantageous life history traits such as high seed productivity, vegetative reproduction, or allelopathy. Many invasive plants are colonizers of disturbed areas and bare soil. These species typically thrive in full sunlight, but others, such as garlic mustard, English ivy, and Japanese stiltgrass, can invade relatively undisturbed, closed-canopy, shaded forest habitats. Despite these advantages, not all non-native plants become invasive, but those that do will negatively affect native wildlife, plant communities, and ecosystems.

Invasive plants are considered one of the greatest threats to wildlife and wildlife habitat in Maryland. In urban and suburban areas where high quality wildlife habitats are often restricted to public lands, invasive plants reduce local biodiversity by overgrowing native plant communities. There are many lists of invasive species that are of concern in the region, and several lists have been prepared for the Preserve. There are significant

populations of multiforal rose (*Rosa multiflora*), Japanese barberry (*Berberis thunbergii*), English ivy (*Hedera helix*), Japanese stiltgrass (*Microstegium viminum*), oriental bittersweet (*Celastrus orbiculatus*), and lesser celandine (*Ficaria verna*) in the Preserve.

Research is on-going on the efficacy and side effects of specific invasive-species remediation techniques. We will make use of up-to-date science with regard to invasive species in the Preserve. To the degree that there is lack of scientific consensus about a particular technique, we will factor in that uncertainty into the decision-making process.

This section establishes a specific set of guidelines that will be followed to evaluate and reduce the impacts of invasive species on the Preserve, while also minimizing the disturbance caused by invasive species management. These criteria will be used to determine the need for and the likelihood of successful management of those species and to set priorities based on site characteristics, location within the Preserve, site use, target species, and feasibility of control efforts. When management of a species or community of invasive plants in a given area is determined to be necessary, a plan specific to that site should be developed and a multi-year commitment made for the plan to be carried out. In preparing management plans, the FPAB, City Council, and city staff should adhere to the principles of adaptive Integrated Pest Management. At times, attempts to manage invasive plants without the necessary knowledge of plant biology and ecology, the proper management tools, and without sufficient long-term commitment and funding for control measures, can worsen existing environmental problems, leading to invasive species composition shifts, erosion, and further habitat loss. In these situations doing nothing is preferable to haphazard and inconsistent attempts at management.

4.2. Guidelines for managing invasive plants

1. Assess the scope and magnitude of invasive populations. The MD DNR and AMT reports contain inventories of invasive plants and recommendations of areas and plants that should be prioritized. These reports should be used as starting points for prioritizing and conducting location-specific invasive plant management inventories.

    a. FPAB members, qualified Greenbelt Public Works staff, or qualified volunteers may conduct inventories under the direction of FPAB.

    b. Inventories in sensitive habitats (bogs and seeps) shall be performed in a way that minimizes entry, disturbance and trampling in those locations.

2. Identify and prioritize target locations and species in this general order:

    (1) Areas with populations of emerging or less widespread invasive species should be given priority for management over areas invaded by more common invasive plant species. These are often referred to as “Early

detection/Rapid response" species. One example is wavyleaf basketgrass.

(2) Ecologically significant plant communities should be given high priority for protection from invasive species. For example, in the North Woods Tract, the areas known as Blueberry Hill and Canyon Creek are two areas with unique plant populations. Blueberry Hill is less disturbed than any other part of the Preserve, and contains a number of spring-fed boggy areas with rare plants. Canyon Creek contains similar boggy areas. In these cases prevention is easier than remediation.

(3) Areas with the fewest invasive species should have priority for management over those areas with the most.

(4) Large tracts of habitat with limited incursions by invasive species should have priority for management over smaller parcels with heavy infestations.

(5) Growth habit (e.g. vines growing on trees or pervasive groundcover)

(6) Generally, older forest stands should receive higher priority for invasive species management than younger stands.

(7) Small tracts and areas adjacent to residential property shall be the lowest priority.

3. Set goals

    a. The ultimate goal should be to minimize the impacts of invasive plants on the entire Preserve. Proximate goals must derive from the results of the inventory.

    b. Options and goals will vary based on:

        i. Scope, magnitude and species present in the infestation,

        ii. Proximity to existing disturbances that may impact the success of the management effort.

        iii. Resources and effort needed (ease of management)

        iv. Effectiveness of management options

        v. Growth habit

    c. Need for post-management restoration or planting

4. Assess and implement management options

    a. Management methods will follow the principles of Integrated Pest

Management, an adaptive approach that includes identification, monitoring, prevention, and a variety of control tactics. These tactics are:

i. Cultural control

    1. Prevention

    2. Education

    3. Early detection

ii. Mechanical control

    1. Pulling up, grubbing, or cutting, using hands, hand tools or power tools.

        a. Pulling is effective for garlic mustard (*Aliaria petiolata*), Japanese stiltgrass, Japanese honeysuckle (*Lonicera japonica*), small bush honeysuckles (*Lonicera* spp.), small populations of English ivy.

        b. Grubbing or digging is effective for multifloral rose, bush honeysuckle, Japanese barberry

        c. Cutting can be effective for arborized English ivy, large bush honeysuckles, oriental bittersweet and porcelainberry (*Ampelopsis brevipedunculata*).

iii. Chemical control

    1. Herbicide applications to species that do not respond to mechanical control. Many species will re-sprout if cut and not dug up, and mechanical control is not appropriate for some invasive plant species. For example, lesser celandine is a small herbaceous plant that grows in stream and river floodplains in early spring, where it out-competes native spring ephemeral wildflowers. This species is not controlled by cutting or mowing. Digging or grubbing this species can affect native plants and the native seed bank, and can spread the tiny bulblets and tubers that grow at or below the ground level.

    2. Avoid broadcast herbicide applications except where necessary. Woody invasive plants can be cut down and an herbicide applied to the stumps (cut stump application), or herbicides can be applied to notches cut into the bark at

regular intervals (hack-and-squirt).

iv. Biological control

1. Goats may eat enough leafy and wood plant material to control some species. This is a form of mechanical control, and must be regularly performed.

2. Few invasive plant species that are found in the Preserve have biological control organisms that are approved by the USDA.

    a. Mile-a-minute weed (*Persicaria perfoliata*) is an invasive annual vine that is found in the Preserve that does have a biological control. The mile-a-minute weevil (*Rhinoncomimus latipes*) is an insect whose life cycle is tied to mile-a-minute vine at all stages. This insect has been widely released in the area and can likely be found in the Preserve.

3. There are some native fungi and viruses that may eventually provide natural control of some species present in the Preserve.

    a. Rose rosette disease, which affects non-native roses (such as multiflora rose), is caused by a virus that is spread by a eriophyid mite.

    b. Populations of Japanese stiltgrass can be affected by a *Bipolaris* fungus that is present in Pennsylvania and western Maryland.

b. Implement invasive plant management. 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.

i. Plant removal can be carried out by people and groups with a wide variety of skills, including:

1. Untrained volunteers led by experts

2. Trained volunteers operating independently with approval

3. City staff or other professionals

c. Implement restoration if necessary

i. Removal of invasive plant species without a plan for filling the void left by removal may result in reinvasion by the same or more aggressive invasive plant.

ii. Planting appropriate native trees, shrubs, grasses and forbs, that are locally derived (i.e., grown from wild stock from near Greenbelt) can fill empty areas after invasive plants are removed, especially along forest edges.

5. Monitor and evaluate results, reassess management needs and options.

4.3. Other invasive species

Other invasive threats to the forest include pest animals and several types of pathogen. The most recent and destructive example of an animal pest is the emerald ash borer (*Agrilus planipennis*). This invasive Asian beetle was first discovered in Michigan in 2002 and in Maryland in 2006. It has since spread to nearly every state east of the Rocky Mouintains. The beetle's larvae live in and eat the living wood of ash trees under the bark. Once infested, a tree will typically die within two years. There was a large stand of green and pumpkin ash that supported a small colony of great blue heron nests along Beaverdam Creek in BARC just north of the Preserve, but those trees have now died and the nest colony abandoned. Other known, imminent insect pest threats to Maryland forests include the pine shoot beetle (*Tomicus piniperda*), spotted lanternfly (*Lycorma delicatula*), and the Asian longhorned beetle (*Anoplophora glabripennis*). Additionally there are invasive diseases that can impact trees in the Preserve. Thousand cankers disease is a disease complex native to the western United States that primarily affects black walnut. This disease is the result of the interactions between a fungus and the walnut twig beetle *Pityophthorus juglandis*. "Sudden oak death" is a disease caused by the pathogen *Phytophthora ramorum*. It kills oaks rapidly, but also affects woody plants that are common in the horticulture trade. Beech bark disease is a fungal disease that is introduced to American beech trees by scale insects that feed on the trees. These diseases are closely monitored by the Maryland Department of Agriculture and responses are coordinated at the federal and state level. The Preserve and other forested city property should be monitored periodically for the presence of these invasive species.

Chapter Five

DISTURBANCES

5.1. What is disturbance?

Disturbance is anything that causes a sudden disruption or pronounced change to an ecosystem. The spatial and temporal scale of a disturbance may vary due to its type or severity. For instance, a disturbance could disrupt a patch within a forest or the entire forest and the result of the disturbance could last for days or decades. Disturbances can cause damage or improve biodiversity and ecosystem resilience. Disturbances within the Forest Preserve can be natural or anthropogenic. Natural disturbances come from biotic sources (e.g., disease or locusts) and abiotic sources (e.g., wind, fire, or earthquakes). Anthropogenic disturbances are due to human activities, such as dumping, vandalism, habitat fragmentation or climate change. When responding to disturbances, forest stewards must consider the source (natural or anthropogenic), the scale (spatial and temporal) and the threat to the health of the forest ecosystem, safety of the public, and impacts on the adjacent land.

Prior to European colonization the forest ecosystems in the mid-Atlantic region were managed by Native Americans with fire, and by hunting, gathering, and selective forest thinning. This activity was followed by decades of additional disturbance including timber harvesting, grazing, and farming. In more recent decades the forest ecosystem in the Preserve has been unmanaged and free of acute and large-scale anthropogenic disturbances, resulting in the flora and fauna found there today.

The City is unable to protect the Preserve from all types and degrees of disturbance. FPAB and city staff will monitor the Forest Preserve and recommend when intervention might be advisable.

5.2. Natural disturbances

Natural disturbances occur normally in forest ecosystems. For instance, the wind may blow down older trees and open the canopy, resulting in subsequent microsite availability for understory forbs and tree seedling establishment and increased habitat for insects and birds. Wind, in this example, may enrich the species and improve tree demographics. Many of the species that live within the forest have encountered natural disturbances for generations and may have adapted to one or more of them.

For many natural disturbances, regardless of scale, it may not be necessary for the city to take action because the disturbance does not decrease the health of the forest

ecosystem or pose a threat to the public or adjacent land. The city may need to intervene, only if the disturbance severely decreases the health of the forest ecosystem or creates a safety concern. Such intervention needs to minimize negative impacts to the health of the forest ecosystem.

5.3 Anthropogenic disturbance

Anthropogenic disturbance is common in the Forest Preserve and can impact the resilience and subsequent health of the forest ecosystem. FPAB evaluates the disturbance based on the spatial scale affected, the amount of time the ecosystem is disrupted, the frequency of the disruption, the severity of the threat to the ecosystem health and the safety risk to the public or adjacent land. A simple clean-up effort might be an appropriate response to dumping, for instance. The intervention may be more involved for other events, such as storm water runoff; in this case, the City might want to implement storm water retrofits to decrease the rate and volume of storm water flowing in the Forest Preserve or plant appropriate native vegetation to stabilize the stream banks. Other efforts to promote ecosystem resilience may also help to deal with the disturbances caused by climate change.

Chapter Six

WETLANDS

6.1. Introduction

Wetlands are important to the overall quality of the Forest Preserve. Healthy wetlands provide a good habitat for plants, animals and microorganisms, and many rare species are found only in wetland environments. Wetlands also provide ecosystem services to humans such as protecting and improving water quality. Wetlands can also store water during high rainfall, thereby reducing flooding.

Wetlands are found throughout the tracts of the Forest Preserve. The most prominent wetlands are the streams that flow through the forest and a large seepage bog (Map 6). Streams can be divided into perennial, intermittent and ephemeral streams based on how consistently they flow. Perennial streams are those that typically flow throughout the year. Intermittent streams will flow during wetter months when the underlying water table is relatively high, but do not flow during dry months when their water table drops. Ephemeral streams only flow immediately after rain storms and are otherwise dry.

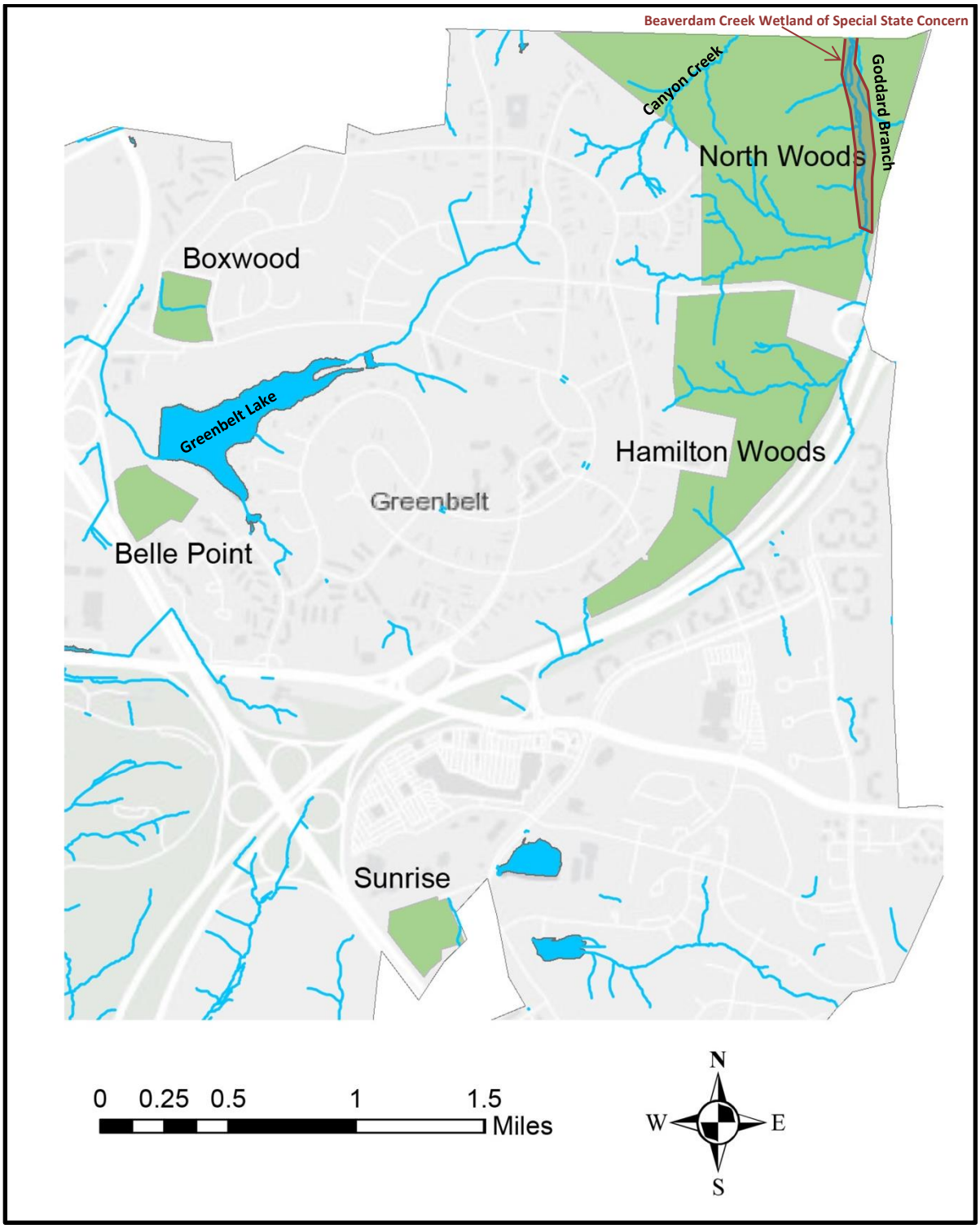
Seeps, springs, vernal pools, and acidic seepage bogs are also found in the Preserve. Seeps are springs with low flow and often appear to be wet spots in the forest, whereas springs have visible water flow. Seeps and springs are generally found on hillsides and can be home to a variety of unique organisms. Vernal pools are pools of water formed during the spring that dry out later in the year. These are important breeding habitat for amphibians because they lack fish predators that eat eggs and tadpoles. Seepage bogs are fed by groundwater, typically with a slightly acidic pH. These bogs are uncommon in Maryland and typically have communities of plants that can tolerate low nutrient soils.

6.2. Location and Condition of Wetlands

6.2.1. North Woods Tract

<u>Streams</u>

“Goddard Branch” of Beaverdam Creek: This is an incised, perennial stream that flows north from within Goddard Space Flight Center, through the North Woods Tract, and into Beaverdam Creek in Beltsville Agricultural Research Center. This stream is included in the Beaverdam Creek Wetland of Special State Concern. It receives significant amounts of stormwater runoff from the Baltimore-Washington Parkway.



Map 6. The waterways of the Forest Preserve and surrounding area in Greenbelt, MD. Data from PG Atlas, City of Greenbelt, and Open Street Maps.

“Canyon Creek”: This is a deeply incised, perennial stream that flows northeast from “60 Court” Ridge Road (between 58 and 62 Courts), through GHI Woodlands and the North Woods Tract, and into Beltsville Agricultural Research Center. It is a tributary of Goddard Branch. This stream receives significant amounts of stormwater runoff from Ridge Road and other nearby roadways and parking areas. Stormwater control measures along Ridge Road and within GHI parking areas could alleviate the impacts of stormwater on this stream.

Unnamed intermittent creek: Runs parallel to and close to Northway through GHI Woodlands and the North Woods Tract. It is a tributary of Goddard Branch and has several intermittent tributaries. The stream originates in GHI near Ridge Road and receives significant amounts of stormwater runoff from Northway, Ridge Road, and other nearby roadways and parking areas. Stormwater control measures adjacent to these paved areas could alleviate the impacts of stormwater on this stream.

Seeps and springs

Several are located on the eastern slope of Blueberry Hill and feed groundwater wetlands on the west side of Goddard Branch.

Groundwater wetlands

There is an extensive skunk cabbage bog in the floodplain of Goddard Branch. This is part of the Beaverdam Creek Wetland of Special State Concern

- Several smaller seepage bogs at the base of Blueberry Hill that are fed by the springs and seeps uphill.
- Two small seepage bogs along Canyon Creek

6.2.3 Hamilton Woods Tract

Streams

- Unnamed intermittent / ephemeral streams across areas B and C. These streams are tributaries of Goddard Branch
- Unnamed intermittent stream running SE from area D to the BW Parkway and into a pipe. This stream is a tributary of Goddard Branch

6.2.4. Boxwood

- Unnamed intermittent stream that emerges from a pipe and runs west across the

tract, enters a culvert, and then passes underneath Ridge Road to join the stream that emerges from Greenbelt Lake. These streams are tributaries of Indian Creek.

6.2.5. Belle Point

None

6.2.6. Sunrise

Streams

- Unnamed perennial stream that emerges from a pipe near the dog park, and runs along the edge of the tract, eventually crossing under the BW parkway and into Still Creek. This stream receives significant amounts of stormwater runoff and trash from the parking lots in the Greenway Center area.

Seeps and Springs

- Several along the hillside which dominates this tract.

6.3. Threats to Wetland Health

The first step in protecting the wetlands is to protect the forests themselves, but this alone is not sufficient. Wetlands face a variety of unique threats and require appropriate stewardship. Threats to wetland health can be roughly divided into three categories: 1) Biological threats arising from the presence of unwanted species, 2) Chemical threats from pollution or excess nutrients, 3) Physical threats from erosion and high water flows.

6.3.1. Biological

A diverse community of native animals, plants, fungi, algae, and microorganisms should thrive in the Forest Preserve's streams and wetlands. However, in some situations there can be threats to wetland health from organisms that live in the wetlands. Just as invasive species can be problematic in forest ecosystems, they can be problematic in wetlands. For example, *Didymosphenia geminata*, aka "Didymo" or "rock snot" is an invasive diatom that grows in ponds and on stream bottoms. It grows as a thick mat which can exclude other forms of aquatic life, particularly plants and algae. Once established it will alter stream ecosystems to make them less favorable for many

aquatic animals. A second example is *Batrachochytrium dendrobatidis*, a fungal disease, which attacks amphibians developing in vernal pools. Once established this disease can have disastrous effects on amphibian populations and can even eliminate populations in the impacted wetlands. For many aquatic invasive species there is little that can be done once they are established; thus prevention is important. Preventive measures can include public education, and ensuring that trails are routed so that they encourage people and pets to stay out of streams.

6.3.2. Chemical

Pollution of streams with harmful chemicals is a common threat to wetland health. Many chemicals enter streams in runoff water during rainstorms. These can include fertilizers and pesticides from yards, road salt, oil, gasoline, and other automotive products. Runoff can also bring trash, which can be both chemical and physical pollution. While trash can be collected from streams, reducing other sources of pollutants requires public education and working closely with homeowners who border the Preserve to reduce runoff. An additional potential source of pollution is the trash dump buried beneath area C in the South Woods. In some areas the overlying soil has been eroded away exposing refuse, including large objects such as appliances. During rainstorms water drains from this dump into nearby streams. A study is needed to determine if this runoff contains harmful pollutants.

A second type of pollution is nutrients, such as nitrogen (N) and phosphorus (P). These are required for aquatic life in small amounts but are detrimental if too much is available. Excess nutrients can lead to algal blooms. As the algae die, they sink to the bottom of the wetlands where they decompose, which reduces the oxygen available to aquatic life. There are many potential sources of excess N and P, including air pollution, detergents in waste water, and fertilizers. Furthermore, the city's mulch pile is a potential source of these nutrients, as rainwater that falls on the mulch pile will drain into Goddard Branch in the North Woods.

6.3.3. Physical

Streams located in urban areas, including those in the Forest Preserve, can have greatly altered hydrology. The watersheds of these streams often have large areas of impervious surfaces, such as roads and parking lots. During rain storms, water quickly drains off of these surfaces and into the streams. This fast moving storm water can cause the stream channels to erode. Because much of the rainwater is not absorbed by the ground, there is less groundwater available to enter the streams between rainstorms, leading to low streamflow. This cycle of floods and dry periods is called

“urban stream syndrome” and is a sign of poor stream health. Several streams in the Forest Preserve, such as Canyon Creek, show signs of erosion. These should be monitored to determine if there are signs of urban stream syndrome and if erosion is an ongoing problem. The solution to the problems caused by stormwater runoff should be to manage the storm water outside of the Preserve, before it enters the streams, so that fast, eroding flows are prevented.

A related concern is that streams in the Boxwood and Sunrise Tracts emerge from storm drains as they enter the Preserve. It is not clear what areas are drained by these streams as they are fed by the storm water drainage system. These streams are likely to be heavily influenced by rainfall, and the aboveground portions are at risk of being eroded. These streams should be monitored for flooding, drying and erosion issues.

Finally, visitors to the Forest Preserve can inadvertently cause physical damage to the streams. Many trails cross stream beds, and hikers can cause erosion at these crossing points. Seeps, springs and vernal pools can be sensitive environments that are damaged by trampling by visitors and their pets. Public education and careful management of trails can help prevent this.

6.4. Assessing Stream Health

Assessing the health of streams can be very challenging. Conditions in streams are constantly changing depending on factors such as recent rainfall, time of day and the season of the year. As a result it is hard to assess the health of a stream in a single visit.

One way scientists have dealt with this problem is to assess stream health using aquatic macroinvertebrates. Macroinvertebrates are invertebrates that are generally large enough to be seen by the naked eye. A wide variety of aquatic macroinvertebrates are found in healthy streams, but many species are sensitive to pollution. As these species are restricted to the water during all or part of their life cycle, they are subjected to the entire range of stream conditions. The presence of pollution sensitive species indicates that stream health is generally good.

Most of the streams in the Forest Preserve have not been sampled for macroinvertebrates. However, according to the Maryland Biological Stream Survey (MBSS), one site in the North Woods on Goddard Branch (referred to as Beaverdam Creek by MBSS) was sampled in 2008. At that time it was given a rating of “Poor” regarding its biotic integrity; see http://eyesonthebay.dnr.maryland.gov/mbss/v_site.cfm?site=0823-01-2008 for details.

There are a variety of tests to determine the amount of nutrients and pollutants in streams. These can be compared to standards set by the EPA or the State of Maryland

to determine if the water quality is acceptable.

Although physical damage to the streams through erosion can be easy to spot, it can be difficult to determine if it is an ongoing problem. One way to monitor erosion is to take a series of photos over time at the same location to assess if there are changes in the banks of a stream.

6.5. State Legal Protections for Wetlands

The state of Maryland has many legal protections for non-tidal wetlands. These are contained in the Code of Maryland, Title 26 – Department of the Environment, Subtitle 23 – Non Tidal Wetlands. In general, activities such as clearing vegetation, filling, excavating, flooding or draining are regulated and require a permit if done in or within 25 feet of a wetland. The Goddard Branch of Beaverdam Creek is a Wetland of Special State Concern (see Maryland code 26.23.06). This indicates that the Goddard Branch is considered by the state to have exceptional ecological and/or educational benefits. To protect this stream, the restrictions on development in the wetland extend to a 100 foot buffer. Permits to conduct restricted activities receive strict review and will not be granted, when reasonable alternatives are available. Mitigation will be required, if a permit is granted.

In general, city law extends greater protections to the wetlands in the Forest Preserve than state law. On the other hand, the protections of state laws extend to those portions of the wetlands that are outside of the Forest Preserve, including those upstream, which enhances the overall protection of these wetlands.

6.6. Suggested Stewardship Actions

The following actions are recommended for protection of wetland health.

- All wetlands in the Preserve should be mapped. Watersheds of all streams should be determined, including those that originate from drainage pipes.
- Trash should be removed from wetlands on a regular basis
- The public should be educated on the importance of wetlands, and that they and their pets should minimize time spent walking thought the wetlands.
- The Master Trails Plan should make protection of wetlands a priority. This would include ensuring that trails do not unnecessarily enter wetlands and that all stream crossings do not damage the stream.

- The streams, particularly Goddard Branch, should be monitored for macroinvertebrates to determine this aspect of stream health.
- Runoff from the mulch pile should be tested to determine if the mulch pile is leaching excess nutrients into Goddard Branch.
- The buried dump should be studied to determine, if it is impacting the nearby streams.
- Streams should be monitored to determine if they are currently undergoing erosion.
- Consider potential wetland and stream restoration activities that are compatible with Anacostia River watershed and subwatershed plans and policies.

Chapter Seven

CLEAN-UP, ENFORCEMENT AND SPECIAL EVENTS

7.1 Clean Up

The Forest Preserve Advisory Board will coordinate with City staff to schedule cleanup efforts. Visitors to the Preserve should take it upon themselves to remove any trash or garbage they may find. Organizations or individuals interested in sponsoring a clean-up effort should coordinate through the Department of Planning and Community Development in order to obtain appropriate support (i.e. scheduling trash pick-up, supplying bags, gloves, tools, etc.) and also to make sure that there are no scheduling conflicts.

7.2 Enforcement

In order to protect the forest, Greenbelt is more restrictive about what activities may take place in the Preserve than what is permitted in City parks. The City Code describes the restricted/prohibited activities which are considered civil infractions, punishable with a fine of $1000. More serious violations are considered misdemeanors, including poaching of natural features. Aggressive patrol and strict enforcement of these rules would detract, however, from the experience hikers would have in the Forest Preserve. The following guidelines reflect the City's enforcement approach.

- We encourage the public to report violations. Contact phone numbers for reporting problems or violations are posted at the entrance to each Forest Preserve tract and on the City of Greenbelt's website.
- Code enforcement personnel and other authorized individuals will inform people found violating the rules about the relevant regulations and associated penalties. The Department of Planning and Community Development will coordinate such compliance efforts.
- Anyone observing or hearing about criminal violations should promptly notify the Greenbelt Police Department non-emergency number (301 474 5454).

7.3 Activities and Special Events

Permitted activities and events are those which do not alter or degrade the essential natural characteristics of the Forest Preserve (see City Code Section 12-155). In

general, the benefit to the community of an activity or event is weighed against its potential harm to the environment. Hiking is permitted, since the experience of a woodland environment is deemed to be of value to the Greenbelt community, even though hiking itself alters the natural environment. The number of participants and the magnitude of an event may determine, whether it is permitted or not. City code specifically prohibits survival exercises, war games and activities which are “principally commercial” in nature. The Office of the City Manager ultimately decides what activities to allow. Anyone interested in sponsoring an activity or event first needs to contact the Department of Planning and Community Development.

Chapter Eight

SPECIALLY MANAGED AREAS

Several areas within the Forest Preserve host activities and uses that do not conform to the Greenbelt City Code or the Stewardship Guidelines but which have traditionally been important to the community. In light of this, their management differs from the rest of the Preserve. When a use or activity in a specially-managed area is in conflict with other parts of these guidelines, disturbance of forested areas must be minimized. Activities that may disturb the forest shall only be permitted following input of the FPAB, the related Greenbelt community (e.g., the garden club or astronomy club), city staff, the public and City Council.

The physical limits of these specially managed areas shall remain unchanged. Expansion into forested areas is not permitted and the forest should, in turn, not encroach into special use areas.

The following are the specially-managed areas within the Forest Preserve that have either existed for many years, or are part of Greenbelt's original city plan. Special considerations related to each use are identified.

8.1. Community Gardens

The community garden areas are shown on the original City plan and remain an integral part of the social structure and cooperative spirit of Greenbelt. Individual garden plots are assigned and managed by a garden club. Many Greenbelters view these gardens as unique and reflective of the community's spirit.

These guidelines do not govern the gardening activities within the community gardens but rather explain the historic and planned relationship between the gardens and the Forest Preserve. In order to maintain the physical area set aside for the gardens, necessary pruning, tree removal, and selective clearing by City of Greenbelt employees may be permitted. Such pruning or removal of vegetation will only be permitted as necessary, such as to maintain garden boundaries or limit the shading of the canopy that obstructs garden areas from the sun. Currently city staff maintains an 8 foot buffer around each garden area. This buffer maintenance is permitted under these guidelines.

Garden Locations – The following descriptions are not intended to specify exact measurements, but rather to give the general locations and dimensions of each garden area. One group of community gardens is located on the south side and east end of Hamilton Place. South of Hamilton Place, the garden area measures approximately 200 feet parallel to Hamilton Place and 275 feet in depth from Hamilton Place, with a total of slightly more than 1.05 acres. This garden is commonly referred to as Henry's Hollow.

The garden area located east of the end of Hamilton Place extends 200 feet along the east-west axis, and extends 250 feet north, with an total area of approximately one acre. This is commonly referred to as the Hamilton Gardens. These gardens are within Areas C and D of the Hamilton Woods Tract.

Two garden areas, known as the Gardenway Plots, are located southwest of Gardenway, within Area E of the Hamilton Woods Tract. A smaller garden area exists 40 feet southwest of the end of the Gardenway right-of-way, and measures 100 feet square. A second, larger garden area is located 210 feet south-southwest from the end of Gardenway. This area measures 90 feet in depth and 230 feet in length, with a total of approximately 0.5 acres. A small portion of these gardens are on GHI property.

8.2. Hamilton Cemetery

The Hamilton Cemetery, located at the end of Hamilton Place near the Greenbelt Homes Administration Building, in Area C of the Hamilton Woods Tract, contains seven graves of the Hamilton family, who occupied land now part of Greenbelt during the late 1700s and into the 1800s. Samuel Hamilton's will specified that one-quarter of an acre of land be set aside for a grave yard. After Hamilton's death, the property changed hands, and in 1939, the U.S. government purchased this property for the Greenbelt Project. An interpretive panel marks the trail head leading to the grave site.

The city provides basic maintenance to protect the grave site and the interpretive panel, and to respect the dignity of the Hamilton family's final resting place. The grave site is identified and discussed in Greenbelt City history and tourism materials, but no effort is made to direct visitors to the site.

8.3. Northway Fields

The Northway Fields, including two softball fields, is located at the end of Northway, adjacent to the Baltimore-Washington Parkway. There are two gravel-surfaced parking areas adjacent to the softball fields. These fields and parking lots are not in a Forest Preserve parcel. The south edge and fence of the softball field does impinge into the Hamilton Woods Tract. Use and maintenance of this field area and fence should not further infringe or encroach upon the surrounding Forest Preserve areas.

8.4. Yard Waste and Compost Facility

Greenbelt Department of Public Works maintains a yard waste recycling and composting center at the end of Northway, adjacent to the North Preserve. The use of a small portion of the Preserve is designated in Sec. 12-152(a) of the City Code. The composting area expanded over several years and encroached on the Forest Preserve. This led to concerns about environmental impacts. The City is currently reducing the mulch pile so that it no longer encroaches on the Preserve and intends to maintain a smaller mulch pile.

8.5. Astronomy Observatory

A small observatory, given to the City by Montgomery County Community College, is built in Parcel 12 of the North Woods. This observatory and the use of the surrounding area for astronomical observations is a designated use of the Preserve in Sec. 12-152(a) of the City Code. This observatory and related viewing platforms and paths are considered acceptable improvements within the Forest Preserve and are consistent with excepted uses in the Preserve.

10.6. Belle Point Preserve

This section of the Preserve extends from the Belle Point subdivision to Albert S. “Buddy” Attick Lake Park. A wide cleared area corresponding to a WSSC right-of-way runs through the property, providing the WSSC unrestricted access to a large water main. Pepco also has a power line right-of-way on the edge of the tract.

Additionally, in 2016 a playground was built adjacent to the north section of Belle Point, within the Preserve. This playground area was set aside, when the Preserve was first established and is excluded from the Preserve by Sec. 12-152(d) of the City Code.

10.7. Boxwood Preserve

This section of the Preserve is only partially wooded because it includes cleared areas that serve as open space and recreation areas for the Boxwood community. The cleared areas include a playground, a sitting area, and a basketball court. These areas are excluded from the Forest Preserve in Sec. 12-152 (c) (1) and (2) of the City Code. Therefore, these guidelines do not apply to the cleared and improved areas of the Boxwood Preserve because these areas provide one of a few public recreation areas within that community. A description of the area is provided here to ensure the protection of the open recreation areas. Neither the Forest Preserve nor the open areas should encroach into the limits of the other.

GLOSSARY

Adaptive Integrated Pest Management: An ecosystem-based strategy that focuses on prevention and management of invasive pests through identification, monitoring, and a variety of control tactics such as biological control, habitat manipulation, modification of cultural practices, and judicious use of chemical pesticides. Sometimes abbreviated as IPM.

Allelopathy: The chemical inhibition of one plant (or other organism) by another, due to the release into the environment of chemicals acting as germination or growth inhibitors.

AMT: A. Morton Thomas and Associates Inc.

Anthropogenic activities: Environmental impacts resulting from human activities.

Aquatic macroinvertebrates: Stream dwelling invertebrates that are large enough to be seen with the naked eye such as insect larvae.

Belt of Green: Vision of a forested area surrounding the city of Greenbelt.

Biodiversity: The variety of life in the world or in a particular habitat or ecosystem.

Community dynamics: Fluctuation in the abundance of species in a natural community.

Controlled burn: A fire which is deliberately allowed to burn in an area in order to improve the habitat for fire adapted species. The fire is “controlled” in that it is prevented from spreading outside of the target area.

Defoliate: Overbrowsing to the extent that all of the leaves or foliage are stripped from the plant.

Disturbance: In ecology, a disturbance is a sudden change in environmental conditions that causes a pronounced change in an ecosystem.

Early Detection/Rapid Response: A coordinated set of human actions to find and eradicate potential invasive species in a specific location before they spread and cause harm.

Ecologically significant plant communities: Plant communities in the Preserve that are regionally rare or uncommon due to geological or hydrological processes.

Ecosystem health: A metaphor that uses our ideas of human health to describe the state of an ecosystem.

Ephemeral stream: A stream that only flows immediately after a rainstorm and is otherwise dry.

Floodplain: The area on either side of a stream that can be covered with water during floods.

Forbs: Any herbaceous flowering plant that is not a grass.

Growth habit: In plants, the form a plant takes as it grows. Examples include trees, and shrubs; herbaceous vines and woody vines; herbaceous plants, grass-like.

Impervious surface: A surface which prevents water from being absorbed into the soil, such as asphalt or concrete.

Incised stream: A steam that has eroded a deep channel that is far below its floodplain.

Inter-specific competition: Any interaction, between different species that are both using the same resources in an ecosystem, in which one or both the species' populations are harmed.

Intermittent stream: A stream that flows only during the wettest months of the year.

Invasive species: A species of organism that is not native to the ecosystem under consideration and whose introduction has caused or is likely to cause economic harm, environmental harm, or harm to human health.

Life history: The lifecycle or pattern of survival and reproduction events typical for all members of a given species.

Management and Maintenance Guidelines: the set of guidelines created by the Forest Preserve Task Force and adopted by Greenbelt City Council in 2007. This document provided policy guidance on the care of the Greenbelt Forest Preserve. As of 2019 these are called Stewardship Guidelines.

MD DNR: Maryland Department of Natural Resources.

Native species: A species that is found in a certain ecosystem due to natural processes, such as natural distribution and evolution, and without human intervention or influence.

Non-conforming uses: a type of zoning variance where a parcel of land may be given an exception from current zoning ordinances due to improvements made before the current zoning ordinances were adopted.

Non-native species: A species living outside its natural distribution or range.

Outcompete: To displace another species in the competition for space, food, or other resources.

Overbrowse: To eat too much vegetation to the detriment of the environment.

Pathogen: A bacterium, virus, or other microorganism that can cause disease.

Perennial stream: A stream that flows throughout the year.

Predator: An animal that naturally preys on others.

Restoration: The practice of renewing and improving degraded, damaged, or destroyed ecosystems and habitats in the environment by active human intervention and action.

Seep: A type of spring with low water flow that appears as a wet spot on the ground and does not have a stream flowing away from it.

Seepage bog: A type of wetland formed by water seeping out of a slope. These have an acidic pH and support unique plant communities.

Sensitive habitats: Any area in which plant or animal life or their habitats are either rare or especially valuable and susceptible to loss. Sensitive habitat areas include, but are not limited to, riparian corridors, wetlands, marine habitats, and habitats supporting rare, endangered, and unique species.

Stormwater runoff: Stormwater runoff is precipitation such as rainfall and melted snow that flows over the ground surface and enters water bodies. It is created when precipitation falls on surfaces including roads, driveways, parking lots, rooftops and other surfaces that do not allow water to soak into the ground.

Subwatershed: A portion of a watershed. The Anacostia is a subwatershed of the Potomac River Watershed**.**

Succession: The natural change over time of the mix of species that are most common in a forest.

Target species: The species of invasive plant or animal that is being targeted for management or eradication.

Urbanization: The conversion of undeveloped natural and agricultural land into land developed for usages such as housing, commerce, and industry.

USDA: United States Department of Agriculture.

Vernal pool: A pool that forms in the spring and dries out later in the year.

Watershed: The surface drainage basin of a stream or river.

Wetlands: Areas where water is at or near the surface. This includes a wide variety of habitats such as streams, springs, bogs and marshes.

Appendix A

Greenbelt City Code, Chapter 12 Parks and Recreation, Article IX. Forest Preserve

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.

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

Sec. 12-151. Forest preserve defined.

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 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.

(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

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

Sec. 12-156. Prohibited activities.

(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.

(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.

(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.

(f) Hunting, trapping, fishing, driving, harassing or otherwise capturing or harming wildlife shall be prohibited.

(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.

(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.

(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.

(n) Camping, grilling, cooking, or creation of any fire, regardless of purpose, mechanism of combustion, type of fuel, or type of containment, is prohibited.

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

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.

(b) 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.

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

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)

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.
(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)

Appendix B

Legal Protections of the parcels of the Greenbelt Forest Preserve

The city property known as the Forest Preserve is protected by laws, covenants, and easements at the municipal, county, state, and federal levels, which limit or prohibit construction within the Forest Preserve. Some of these protections also prohibit any construction outside of the Forest Preserve that would be close enough to impact the Forest Preserve's ecosystem or the public enjoyment of the Forest Preserve.

Municipal

1. The Greenbelt Forest Preserve is city-owned property. Greenbelt City Code Chapter 12, Article 9, Section 12-154(c) defines the city-level protections on the lands of the Preserve, and the methods for adding and removing parcels. Parcels that make up the Preserve can only be removed by a public referendum.[6] See Appendix A.

County

2. Prince George's County has an interest in the Greenbelt Forest Preserve remaining protected green space. In 1990 the Maryland-National Capital Park and Planning Commission (M-NCPPC), purchased a woodland covenant on Parcel 1 within the Forest Preserve.[7]

3. The Greenbelt Forest Preserve is included in a M-NCPPC-designated Special Conservation Area in the *Prince George's County Resource Conservation Plan*, a document that functions as a county-wide master plan. This Special Conservation Area also includes Greenbelt

[6] Greenbelt City Code, Chapter 12, Article 9, Section 12-154(c). See Appendix A.

[7] The City of Greenbelt and MNCPPC entered into a woodland covenant after MNCPPC provided $1,250,478 of Program Open Space funds to assist the City with purchasing Parcel 1 (Maryland Land Records, liber 7967, folio 441–445).

National Park, the Beltsville Agricultural Research Center, and the Patuxent Wildlife Research Refuge.[8]

State

4. In 1990 the City of Greenbelt used state funds from Maryland's Program Open Space (POS) to purchase Parcel 1.[9] By Maryland state law, land purchased using POS funds means shall be perpetually-protected green space. Additionally, because POS also uses federal funds, this portion of the Forest Preserve is protected by federal statute, namely section 6(f)(3) of the Land and Water Conservation Fund Act of 1965.[10]

5. The Maryland Department of Natural Resources (DNR) has designated 6.5 acres of the 12 acres of wetlands within the Greenbelt Forest Preserve as "Wetlands of Special State Concern".[11]

6. The Maryland Department of Natural Resources (DNR) designated the North Woods Tract of the Greenbelt Forest Preserve in 2005 as part of a hub in the state's green infrastructure. The state intends this determination to guide land-conservation efforts. The hub that contains the Greenbelt Forest Preserve is a contiguous forest that includes the Beltsville Agricultural Research Center and the Patuxent Wildlife Research Refuge. Reinforcing this designation in 2011, the Maryland DNR determined that this land is a Targeted Ecological Area, i.e., an area of "high ecological value that has been identified as a conservation priority." [12]

7. The Maryland Natural Heritage Service has provided the City of Greenbelt with a letter that states that the Maryland DNR is aware of at least one state-listed species in the Greenbelt Forest Preserve.

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[8] Map 3 in section 2 of MNCPPC, 2017, *PG County Resource Conservation Plan, A Countywide Functional Master Plan*, pg. 32, available online at http://www.pgplanning.org/944/Publications .

[9] Program Open Space funds from FY1990: Maryland Land Records, liber 7967, folio 441–445.

[10] Maryland DNR, 2006, *Local Program Open Space Manual*, available online at http://dnr.maryland.gov/land/Pages/ProgramOpenSpace/Program-Open-Space-How-to-Apply.aspx .

[11] Wetland acreage measured using the Prince George's County Atlas, http://www.pgatlas.com .

[12] Hubs: DNR, 2005, Maryland GIS Data Catalog, http://data.imap.maryland.gov/datasets/maryland-green-infrastructure-green-infrastructure-hubs-and-corridors. Targeted Ecological Areas: DNR, 2011, GreenPrint Map, available online at http://geodata.md.gov/greenprint/ .

Federal

9. An active bald-eagle nest is located near the Greenbelt Forest Preserve, which means that there are federal restrictions on construction and associated tree removal within 660 feet of the nest.[13] This nest is located on Research Road at Beaverdam Creek, near the northwest portion of the Forest Preserve.[14] Other bald-eagle nests may exist in the area, and bald eagles are known to fly over various properties adjacent to the North Woods and Hamilton Woods Tracts of the Greenbelt Forest Preserve.[15] The Greenbelt Forest Preserve and surrounding forest is also an excellent habitat for the northern long-eared bat *Myotis septentrionalis* and rusty-patch bumble bee *Bombus affinis*, both federally protected species.[16]

10. In 1972, the federal government transferred ownership of a 13.9-acre forested parcel to the City of Greenbelt under the Legacy of Parks Program.[17] This federal program assisted states and local governments with acquiring parkland, forest, and wilderness located near densely populated areas because of the societal benefit of easy access to green space.[18] The 13.9-acre parcel is part of the Greenbelt Forest Preserve.

11. In 1995, the federal government purchased a scenic easement from the City of Greenbelt for Parcel 1 within the Greenbelt Forest Preserve. The City of Greenbelt sold this scenic easement in exchange for the financial assistance that the federal government provided in 1990 so that the City could purchase Parcel 1 from private developers. In addition, the federal government purchased a scenic easement in 1991 on the 13.9 acres of City-owned land in the northeast corner of the Greenbelt Forest Preserve. Both of these scenic easements prohibit construction.[19] Both scenic easements are deeds that establish a federal interest in the green space, although the City of Greenbelt retains ownership of the land itself. Due to these

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[13] In 2007, the U.S. Fish and Wildlife Service developed guidelines that include the 660-foot buffer based on the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Available at https://www.fws.gov/southdakotafieldoffice/NationalBaldEagleManagementGuidelines.pdf .

[14] Active nest: *Greenbelt News Review*, 21 May 2017, 21 Jan 2016, pg. 21; 21 April 2016, pg. 1; Jamie Jorgensen and Donn Ahearn, Greenbelt Biota, 24 Jan 2017, 04 Jan 2017, 27 Nov 2016, 17 Nov 2016, 19 April 2016, https://www.facebook.com/groups/325927877605844.

[15] Eagle in flight near Hamilton Woods Tract: *Greenbelt News Review*, 21 Dec 2017, pg. 8. Eagle near North Woods Tract: Dawn LaRae-Deya, Greenbelt Biota, 20 Dec 2016.

[16] Federal and state rare, threatened, endangered (RTE) species: http://dnr.maryland.gov/wildlife /Documents/rte_Animal_List.pdf. Rusty-patch bumble bee found in Prince George's County and Northern long-eared bat found in Montgomery County: Maryland Biodiversity Project, https://www.marylandbiodiversity.com .

[17] *Greenbelt News Review*, 25 May 1972, pg. 1; 19 Oct 1972, pg. 1; 1 Jan 1998, pages 1,12.

[18] Jim Byron, 14 June 2010, Legacy of Parks, available online at https://www.nixonfoundation .org/2010/06/legacy-of-parks/ . EPA, 1973, *Legal Compilation*, pg. 3058, available online at https://nepis.epa.gov/Exe/ZyPDF.cgi/200158MI.PDF?Dockey=200158MI.PDF.

[19] 1995 easement on Parcel 1 (Maryland Land Records, liber 8015, folio 867–874). 1991 easement on the 13.9-acre parcel (liber 10,374, folio 347–359).

easements, this land falls within the legal boundaries of the Baltimore-Washington Parkway, a unit of the National Park Service, even though the City of Greenbelt retains ownership of the land.[20]

12. The North Woods and Hamilton Woods Tracts are contributing resources to the Greenbelt National Historic Landmark listed in the National Registry of Historic Places.[21] These tracts are part of the original "belt of green" surrounding the planned community that was designed, built, and administered by the federal government during the New Deal. The plan developed during the New Deal called for the belt of green to be owned by the community in perpetuity (1) to avoid encroachment by any development that would be out of character with the residential community, (2) to provide recreation, and (3) to enable residents to enjoy a beautiful, natural setting at their doorsteps.[22]

13. Section 4(f) of the 1966 U.S. Department of Transportation Act prohibits the construction of transportation projects within protected green space or historical landmarks unless it is shown that no "feasible or prudent" alternative exists that would avoid impact to these resources and also that all possible steps will be taken to "minimize harm" if no zero-impact alternative exists.[23] This level of federal projection and review applies to the Greenbelt Forest Preserve because it is both protected green space and also part of a National Historic Landmark, as describe in detail above.

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[20] Online GIS: NPS Land Resources Division's Tract and Boundary MapServer, https://mapservices.nps.gov/arcgis/rest/services/LandResourcesDivisionTractAndBoundaryService/MapServer and http://www.arcgis.com/home/webmap/viewer.html?url=https %3A%2F%2Fmapservices.nps.gov%2Farcgis%2Frest%2Fservices%2FLandResourcesDivisionTractAndBoundaryService%2FMapServer .

[21] On 25 November 1980, the Greenbelt Historic District was added to the National Registry of Historic Places. National Historic Landmark status granted on 18 February 1997. NPS, 2017, *Spreadsheet of NHLs*, Excel spreadsheet, national-historic-landmarks-20171201.xlsx, available online at https://www.nps.gov/nr/research/ .

[22] Belt of green permanent: Resettlement Administration, 1936, *Greenbelt Towns*, pg. 9. Belt to provide recreation: Tugwell, R. G., 13 May 1936, Resettlement Administration program: Letter from the administrator of the resettlement program transmitted in response to Senate resolution No. 295, 74th Congress, 2nd session, Senate Doc. No. 213, pg. 7. Belt to prevent encroachment: Larsen, C., August 1938, Greenbelt, MD: federal planned community, *National Municipal Review*, **27**, 413–420; Fulmer, O. K., 1941, *Greenbelt*, Am. Council on Public Affairs. Garden-city concept promotes the experience of the beauty of nature, including of forests: Howard, E., 1902, *Garden Cities of Tomorrow*, Swan Sonnenschein & Co., pp. 17–18, 130, Fig. 2.

[23] Quotes from the Code of Federal Regulations (CFR) title 23 section 774, which codifies Section 4(f) of the 1966 Department of Transportation Act. CFR text available online at https://www.law.cornell.edu/cfr/text/23/part-774 .