Comprehensive Vegetation Management Plan for M-NCPPC Parkland in Montgomery County, Maryland

April 2009

Park Planning and Stewardship Division
Natural Resources Stewardship Section
ABSTRACT

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Comprehensive Vegetation Management Plan for M-NCPPC Parkland in Montgomery County, Maryland

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Description
As the County’s largest landowner, much of the responsibility for preserving Montgomery County’s natural vegetation resource heritage as a public trust for future generations rests with the M-NCPPC Department of Parks. To support our mission to steward these lands, this document was prepared to establish a strategic, science-based approach to vegetation management on M-NCPPC Parklands.

It outlines broad goals and objectives for the protection, enhancement and long-term management of diverse vegetation or habitat types. It also includes strategies and actions used to identify and evaluate existing vegetation, and describes management prescriptions to be applied in order to achieve goals and objectives.
COMPREHENSIVE VEGETATION MANAGEMENT PLAN FOR M-NCPPC PARKLAND IN MONTGOMERY COUNTY, MARYLAND

APRIL 2009

M-NCPPC Department of Parks, Montgomery County

Park Planning and Resource Stewardship Division,
Natural Resources Stewardship Section
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Introduction and Purpose

The purpose of this document is to establish a strategic, science-based approach to vegetation management on Montgomery County Parkland. It outlines broad goals and objectives for the protection, enhancement and long-term management of diverse vegetation or habitat types. It also includes strategies and actions used to identify and evaluate existing vegetation, and describes management prescriptions to be applied in order to achieve goals and objectives. As the County’s largest landowner (over 34,500 acres in Montgomery Parks—approximately 26,000 of which are natural areas), much of the responsibility for preserving Montgomery County’s natural vegetation resource heritage as a public trust for future generations rests with M-NCP PC Montgomery Parks.

While in the past, merely acquiring natural area parkland and holding it in trust for the future might have been enough to assure preservation of our vegetation resource, this is no longer the case. In our rapidly urbanizing county, natural areas are relatively small and are under numerous stresses due to the surrounding developmental pressures. Our vegetation resources undergo constant change due to impacts including—but not limited to—deer predation, proliferation of non-native invasive plants, storm-water run-off and erosion, water and air pollution, forest and habitat fragmentation due to road and utility routing, and encroachment by adjoining property owners. Consequently, these vegetation resources require active management to retain the health and diversity they would sustain under more natural conditions.

Following in the spirit of the mission of the Montgomery County Department of Parks to “Protect and interpret our valuable natural and cultural resources; balance the demand for recreation with the need for conservation; offer a variety of enjoyable recreational activities that encourage healthy lifestyles; and provide clean, safe, and accessible places for leisure-time activities”, a Natural Resource Vegetation Management Plan has been constructed to preserve and enhance vegetation resources while balancing the need for recreational development.

Vegetation is the “Green infrastructure” of our park system. In our increasingly urbanized environment, forests and open habitat natural areas provide numerous environmental and social benefits related to maintaining and restoring natural cycles and to making Montgomery County a desirable place to live.

- Forests help reduce air pollution through carbon sequestration and interception of airborne particulates.
- Forests improve water quality by helping to retard erosion, stabilize stream banks, control floods, lower water temperature, provide groundwater recharge and reduce storm water run-off.
- Natural meadows and forests in their varying seral stages provide habitat and offer a haven for diverse species of plants and animals.
- Forests conserve energy; they provide shade (relief from the heat island effect), and offer protection from winds.
- Natural open habitats and forests provide aesthetic enjoyment and recreational opportunities for citizens.

Changes made to the land today tend to be much more permanent than those made in the past. Converted to pasture, logged or burned, the forest always grew back. The same cannot be expected from the conversions made to other land uses now. Land covered over by impervious surface in the
form of acres of parking lots, shopping centers, roads, highways, concentrated housing developments, are less likely to melt back into a natural succession community as time advances.

As the undeveloped land continues to shrink, the critical importance of our Montgomery Parks acreage for preserving our natural heritage will become even more obvious. Again, as our population numbers climb and our county forest cover decreases (in 1973--45% forested, in 2008--29% forested), the 26,000 acres of natural vegetation in M-NCPPC Park properties are often the preserver, the protector, and the net exporter of biological diversity for the county.

**Vision, Goals, Objectives**

**VISION**

Natural Areas within Montgomery County Parks are maintained in a manner that maximizes biodiversity of native species and their habitats.

**GOALS**

- Protect and enhance existing forest on parkland to maximize biodiversity of plant and animal species.
- Manage existing open habitats to maximize biodiversity of plant and animal species.
- Prioritize the Conservation/Preservation of all Best Natural Areas, Biodiversity Areas, and Environmentally Sensitive Areas (M-NCPPC, 2005).

**OBJECTIVES**

- Maintain and regularly update a comprehensive broad spectrum inventory of Montgomery Parks Natural Resources using GIS.
- Protect existing large blocks of forest—particularly acreages of forest interior—from fragmentation.
- Protect existing high quality forest.
- Identify, monitor, and protect rare, threatened, endangered, and uncommon plant species and uncommon vegetation habitats/communities on Park property.
- Identify, protect, manage, and enhance natural park habitats including—but not limited to—early successional to climax forest, meadows, hedgerows, edges, vernal pools, wetlands, ponds, rock outcrops, streams.
- Prepare management plans/guidelines for Best Natural Areas, Biodiversity Areas, and Environmentally Sensitive Areas.
- Identify, monitor and work to control non-native invasive species (NNI’s) populations.
- Monitor and manage deer populations at a level to protect Park vegetation regeneration and biodiversity.
- Educate Park staff and County citizenry as to the importance for future generations of identifying special vegetated habitats, prioritizing them for preservation and conservation.
- Educate Park staff and County citizenry as to the importance of maintaining a sound natural vegetation structure countywide—of “Saving what you have” in the natural world, rather than
thinking you can always replace it/ restore it/ mitigate for it—because evidence is beginning to show that you can’t.

**Regulatory and Policy Framework**

M-NCPDC is charged with the acquisition, development, operation and maintenance of the public park system. Laws, regulations and policies established by the county, state, and federal governments provide a framework for this work. The most important of these documents include: The Maryland Economic Growth, Resource Protection, and Planning Act of 1992, The General Plan for the Maryland-Washington Regional District in Montgomery and Prince Georges Counties (General Plan) (1964, and updates 1970, 1993); the Park, Recreation, and Open Space Master Plan (PROS) (1988, and updates 1993, 1998); and The Land Preservation, Parks and Recreation Plan (LPPRP) which replaced the PROS plan starting in 2005. *(Appendix B)* Each of these documents contains goals, strategies and objectives that are relevant and provide guidance to the management of vegetation on parkland. These include:

General Plan Refinement of the Goals and Objectives for Montgomery County (1993)

- Conserve and protect natural resources to provide a healthy and beautiful environment for present and future generations.
  - Manage the impacts of human activity on our natural resources in a balanced manner to sustain human, plant, and animal life.
  - Increase and conserve the county’s forests and trees.
  - Plant and retain trees and other vegetation near streams to conserve waterways.
- Preserve and enhance a diversity of plant and animal species in self-sustaining concentrations,
  - Minimize forest fragmentation to protect habitat continuity.
- Preserve natural areas and features that are ecologically unusual, environmentally sensitive, or possess outstanding natural beauty,
  - Protect natural resources through identification, public acquisition, conservation easements, public education, citizen involvement, and private conservation efforts.
  - Identify and designate forest preservation and tree planting areas.

Park, Recreation, and Open Space Master Plan (PROS) (2005)

- Consider tree conservation early in the park planning process.
- Identify and designate forest preservation and tree planting areas.
- Encourage a proactive urban forestry program.
- Provide public information regarding the importance of natural areas and environmental studies that are prepared, and techniques proposed to minimize environmental impacts during construction.
- Preserve conservation areas and rare, threatened and endangered species within the park system, including biodiversity areas.
- Plant and retain trees and other vegetation near streams.
• The objectives of the planning, design, construction, and management of the park system shall be based on:

• Meeting the needs of recreation and preservation in a manner that is harmonious with the natural beauty and parkland physiography, reflecting concern for the environment.

• A planned and scientific approach to resource management, cognizant of the ecological interdependencies of people, the biota, water and soil.

Additional guidance and requirements for this management plan come from the State Forest Conservation Law (Natural Resource Article Title 5, Subtitle 16), the accompanying State Forest Conservation Regulations (Title 08, Subtitle 19), the Montgomery County Forest Conservation Law (Montgomery County Code, Chapter 22A) and its accompanying County Forest Conservation Regulations (Montgomery county Planning Board Regulation Number 1.97. (Appendix C)
Management Issues and Recommendations for Forest Sustainability and Open Natural Habitat Sustainability

Background

Vegetation is the resource that defines natural areas and provides the food and habitat upon which wildlife species depend. Plants help protect water quality by maintaining cool stream temperatures, controlling water runoff and soil erosion. Plant communities also provide a calming, “park” atmosphere for nature-related recreational activities and education. An understanding of the plant communities on parkland is essential to the successful management of all Park natural resources.

Well over a thousand plant species can be found growing in the wild in Montgomery County. In order to make sense of this “riot” of plant growth one needs a basic understanding of why each plant grows where it does and what changes occur over time to these communities of plants.

In general, plant distributions are controlled by physical features of the environment including underlying bedrock, soil type, soil pH, soil moisture, slope, aspect (direction of slope), climate, elevation, previous land use, and age of the vegetation. As a result, plant species do not grow randomly across the landscape but are grouped into more or less distinct communities or associations based on these site conditions. If left undisturbed, most of the County would develop into deciduous forest. The dominant trees of these forests are generally predictable based on the site conditions and are used to classify and name natural vegetation community types. The “Vegetation Map of Maryland” (Brush, et. al., 1976) shows the major vegetation associations or forest types for the State and is useful in classifying forests in Montgomery County. According to this classification system, four upland deciduous forest assemblages occur in Montgomery County: tulip poplar association, chestnut oak association, shingle oak association, and chestnut oak post oak-blackjack oak association. There are also two floodplain deciduous forest assemblages: sycamore-green ash-box elder-silver maple association, and river birch-sycamore association. (Appendix D)

All forests in the County have been cut several times over the past two centuries, therefore each of these forest associations exist in various aged stands ranging from acres that have recently been cut down and are now an open field, to young saplings, to mature second-growth forest.

Montgomery County contains very few naturally occurring, open canopy habitats such as marshes, bogs, and grasslands, however, a variety of non-forested habitats exist on parkland and are extremely important to the biodiversity of the county. Most of these open habitats are the result of past land disturbance—often farming—and are slowly re-growing back into forest through a process called “secondary succession”. This orderly and predictable process begins with bare ground and proceeds through several stages consisting of annual herbaceous plants, perennial herbaceous growth, shrubs and young shade intolerant trees, shade intolerant forest and eventually the climax stage of shade tolerant forest. Each of these intermediate stages supports a unique assemblage of plant and animal species. A management program to identify and maintain examples of each of these “seral” stages across the spectrum of soil types and hydrology is therefore essential to preserving our county’s biodiversity.

Steps to Follow in Implementing a Vegetation Management Plan

Whether the Park acreage to be managed is of forested or of open vegetated habitat, steps to the implementation of best management practices for naturally vegetated Parkland will remain the same:
• Inventory and Evaluate existing conditions.

• Protect and Enhance Natural Vegetation Resource through review process:
  - Review all proposed improvements on parkland including trails, park facilities, utility ROWs, roads, etc.
  - Work through the Park acquisition process to identify and acquire the best remaining and/or unique natural areas.
  - Review all private development to identify and acquire additional priority parkland.

• Evaluate Management options.
  Management Options include:
  - Protect/maintain existing habitat—meadow, scrub/shrub, forest, etc.
  - Restore existing habitat—NNI management, deer management, reforestation, regeneration, meadow restoration, wetland restoration.
  - Set Back Succession—cut/mow, farm, cut hay.
  - Advance succession—afforestation, reforestation, protect regeneration.
  - Create special habitats—wetland/vernal pool creation, conifer management.
  - Protect RTE’s and uncommon species and the natural communities that support them.

• Prioritize Options.
  - In close coordination with other Park staff, develop and implement site-specific management plans.

**Forest Management**

Montgomery Parks does not practice traditional forest management (i.e. tree thinning, harvesting, prescribed burning, etc). Most forested areas in the park system are second growth stands of various ages and protection of the stands in order to allow them to mature is generally the goal.

Management efforts focus on the review of development plans and habitat monitoring in order to protect our best quality forest stands from negative impacts associated with development adjacent to or within parks (i.e. park facilities, WSSC sewer lines, utility lines, etc.), non-native invasive plants (NNIs) and animals (e.g. Gypsy Moths), and conflicts with native species such as deer, beaver or geese. Efforts are also made to enhance forests of lesser quality and establish and improve forested stream buffers through protection and reforestation.

The most important and potentially damaging impacts to Montgomery Park’s forests include:

• Forest Fragmentation, especially of forest interior habitat.

• Loss of forest understory or lack of regeneration due to high numbers of white-tailed deer.

• Proliferation of NNIs.

• Loss of forest canopy due to gypsy moths.

• Encroachment by adjacent property owners.
Non-forest (Meadow, Shrub and Edge Habitat) Management

Maintaining diverse habitats is key to maintaining diverse plant and animal species. In addition to a variety of forest types and ages, the Department needs to maintain open habitat areas in various stages of succession in order to manage and maintain species diversity. Since little active forest management like clear cutting, thinning, etc. is conducted on Montgomery Parkland it is very unlikely that any new large open habitats will be created. Left on their own, the park’s existing open habitats will grow out of their current vegetative cover and eventually evolve into forest, reducing overall floral and faunal diversity. Maintaining these important diverse habitats requires active, well planned, long-term management. The edges between habitat types (ecotones) are especially rich areas that contain species from both adjacent habitats plus species that specialize in edge and may not be found in either habitat alone.

The following are important non-forest habitats in Montgomery County:

<table>
<thead>
<tr>
<th>HABITAT TYPE</th>
<th>DOMINATE VEGETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass dominated meadow or grassland</td>
<td>Warm-season, native grasses, some broad-leaved herbaceous plants (e.g. Broomsedge, Indian Grass, little bluestem, common milkweed, goldenrod, aster).</td>
</tr>
<tr>
<td>Forb dominated meadow</td>
<td>Native wildflowers (e.g. goldenrod [some species, especially tall goldenrod can be near monoculture], aster, common milkweed, dogbane, grasses).</td>
</tr>
<tr>
<td>Wet meadow - Emergent wetland</td>
<td>Native herbaceous wetland plants (e.g. sedges, grasses, arrowhead, cattails).</td>
</tr>
<tr>
<td>Scrub-shrub (Dry)</td>
<td>Shrubs and young shade intolerant trees (e.g. Blackberry/raspberry, persimmon, blackhaw viburnum, sapling trees).</td>
</tr>
<tr>
<td>Shrub swamp (wet)</td>
<td>Alder, black willow, silky dogwood, swamp rose, with herbaceous understory.</td>
</tr>
<tr>
<td>Shade intolerant saplings (1 – 4.9 inches DBH) (often conifers)</td>
<td>Often dominated by conifers – (e.g. Eastern red cedar, Virginia pine, also tulip poplar, persimmon, black cherry, red maple).</td>
</tr>
<tr>
<td>Savanna</td>
<td>Meadow with irregularly spaced patches of shrubs and trees which result from soil moisture regimes or disturbances such as grazing.</td>
</tr>
<tr>
<td>Edge or Ecotone</td>
<td>Varies depending on adjacent habitats.</td>
</tr>
</tbody>
</table>

Note that each of these habitat types represents a continuum that may grades into others.

Adapted from DeGraaf 2006

Meadows dominated by grasses and wildflowers offer important habitat for a variety of species of plants and animals including native wildflowers, bluebirds, meadowlarks, bobwhite, kestrels, box turtles, a variety of small mammals and butterflies. Meadow habitat was once fairly common in much of Montgomery County as a result of farming methods used through most of the past 200 years. With the recent changes to farming practices that leave few fallow fields, and as the few remaining old farm fields mature into forest, or are developed, this rich and diverse habitat is disappearing. Many of our parks
that once provided large areas of meadows have now grown up in shrubs and young forests and in many cases have become dominated by NNIs.

Grasslands are disappearing faster than any other habitat in the Eastern U.S. As a result grassland-dwelling birds are suffering the most precipitous population declines of any habitat–specific group of species (Maryland Partners in Flight, 1997). Population decreases as great as 90% have been recorded for species such as Northern bobwhite, Grasshopper Sparrow, and Eastern Meadowlark. Most grassland birds require expansive areas of habitat to maintain successful breeding populations. Areas of 100 acres or more are required to accommodate the most area sensitive species. However grasslands 25 acres or larger, (especially if there are several closer together than ½ mile apart) will benefit many species.

Smaller areas of grasslands and other open habitats provide breeding and feeding habitat for a host of species including: butterflies, dragonflies, eastern bluebirds, wild turkeys, woodcock, a variety of small mammals, box turtles, hawks, owls, and other predators.

Shrub habitats, like grasslands, have declined for many of the same reasons. Unless they are maintained by mowing or by some other means they grow up into young woodlands. Shrub areas provide unique habitat features that support specialized species many of which are also declining at a rapid rate. Species include Blue-winged warblers, yellow-breasted chats, willow flycatchers, yellow warblers, yellowthroats, red foxes, and rabbits. Shubby edges between fields and forests can be the most species rich habitat in the county.

Criteria for Determining Appropriate Management Practices in Open Habitat Parkland

Montgomery Parks manages approximately 34,500 acres of parkland. The system includes about 26,000 acres of undeveloped natural areas. These areas have been mapped on GIS and are included under the Natural Resources Program Element of the Department program budget. Of these, natural areas--about 3,100 acres (12%)--are in some type of open habitat. About 390 acres within this open habitat (1% of the total) fall in environmentally sensitive areas. See table below.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>ACRES</th>
<th>% OF TOTAL PARKLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Park System total</td>
<td>34,500</td>
<td>100%</td>
</tr>
<tr>
<td>Natural Areas – total acres</td>
<td>26,000</td>
<td>74%</td>
</tr>
<tr>
<td>Natural Areas – non-forested</td>
<td>3,100</td>
<td>12%</td>
</tr>
<tr>
<td>Natural Areas – non forested &amp; environmentally sensitive</td>
<td>390</td>
<td>1% (13% of Non-forested natural areas)</td>
</tr>
</tbody>
</table>

- There are no studies to document the preferred or ideal ratio of open habitat to forest in the Eastern US. We are therefore left with our best professional judgment in determining a starting point and utilizing an adaptive management approach to fine-tune this ratio. An initial goal of preserving a minimum of 10% of our parkland in some type of open habitat seems a reasonable and modest goal. As more knowledge is gained in what habitats we have, management methods and costs, and the results of management in terms of species diversity, staff will be in a better position to adjust this percentage. If it is determined that less than 10% open habitat is sufficient to meet our diversity goals then it is a simple matter to identify and reforest the excess acres.
Balancing between forested and non-forested habitats

It should be noted that maintaining diverse open habitats and reforestation represent mutually exclusive goals that are essentially competing for the same land. The Montgomery County Forest Conservation Act requires reforestation to replace forest removed during development. As the county is built out, pressure to fill open habitats with reforestation is increasing. There is growing concern among ecologists and conservationists that developers and even county leaders are beginning to view all open habitats as simply places to plant trees rather than a mix of essential and diverse habitats that support a wide assemblage of plant and animal species.

• In order to attain both our open natural habitat and reforestation goals, it will be necessary to compromise and develop criteria to help guide the decision making process. It must also be understood that any set of criteria or decision tree is only a tool and will always require a healthy dose of best professional judgment.

The following process will be used to help determine the best management practice to implement in open habitat areas. It represents an attempt at reaching a balance between the competing interests described above:

• Map all open habitats in the park system on GIS and identify current habitat type.
• Overlay with soil type and hydrology layers and label accordingly.
• Establish list of potential open habitat types; Determine goals for the percentage of park natural areas to be maintained in open habitats.
• Evaluate percentage of parkland currently within each habitat type the distribution of open habitats and habitat types across county parkland.
• Evaluate the best use of open habitats on site-by-site basis.

The following information/criteria, along with best professional judgment, will be used to determine best management prescriptions:

• Existing habitat type, size and location.

The following conditions push decision towards natural regeneration or reforestation:

• In environmentally sensitive area – especially if in SPA
• Small open areas surrounded by forest
• Area inaccessible (we own a lot of land we cannot get to with equipment)

The following conditions push decision towards maintaining conifer habitat:

• Other conifers nearby dying out.
• No other conifers nearby (w/in 2 miles) and appropriate soil type
• Appropriate soil type
• Open habitat with south facing wood edge – conifers will provide habitat for roosting birds including owls and also provide shading to forest edge helping reduce invasion by sun-loving NNIs.
• Large open habitat (>25 acres) with room for mixed habitats.
The following conditions push decision towards maintaining open habitat:

- 5 acres or more, with other open habitats near by
- 10 acres or more with no other open habitats near by
- Larger tracts, >25 acres - maintain as open meadows with scrub-shrub around the edges and willow thickets along riparian areas.
- Tracts currently in a mix of meadow and trees (savannah) should be maintained in this especially rich habitat mix.
- Potential to improve surrounding forest habitat through reforestation.
- Existence of target or indicator species on site – maintain existing habitat. (See example Indicator Species per Habitat Type Table below):

### Indicator Species per Habitat Type Table

<table>
<thead>
<tr>
<th>HABITAT TYPE</th>
<th>INDICATOR SPECIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grassland Meadow</td>
<td>Eastern Meadowlark, Grasshopper Sparrow, American Kestrel, Northern Bobwhite, butterflies</td>
</tr>
<tr>
<td>Scrub-shrub</td>
<td>Yellow-breasted Chat, Blue-winged Warbler, Prairie Warbler</td>
</tr>
<tr>
<td>Willow Thicket</td>
<td>Yellow Warbler, Willow Flycatcher</td>
</tr>
<tr>
<td>Young conifer</td>
<td>Blue-winged Warbler, Prairie Warbler</td>
</tr>
</tbody>
</table>

- Existence of other types of open habitat types exist within 2 miles – evaluate these areas together to determine best geographical mix of habitats. For example if there is one larger area and other smaller areas, larger area might best be grassland meadow and others as scrub-shrub or conifer habitat. Potential for management to desired habitat type – e.g. access, available maintenance equipment and staff.

### Reforestation Considerations – Cost and Long-term Management

Reforestation can accelerate the growth of forest and provide a number of benefits. However there are considerable costs associated with both planting and long-term maintenance that must be considered. Currently (2009) reforestation plantings cost about $20,000 per acre. The long-term management of these areas - to ensure they are not overwhelmed by NNIs - is an additional cost that currently is not well known. General management of NNIs can cost $1,000 per acre per year. The handwork that is often required to protect small trees from NNI vines without damaging the trees can add to that cost.

Until recently, reforestation on Parkland has been restricted to small plantings done by park staff or volunteers. Most were not required for mitigation but were simply conducted to improve habitat in environmentally sensitive areas. The long-term maintenance of these sites has been manageable through existing maintenance budgets and the use of volunteers.

Several recent projects and programs, however, have greatly accelerated reforestation on parkland. Unlike previous reforestation, these projects are to fulfill required mitigation for non-park related forest impacts. Examples include: reforestation of existing parkland as mitigation for the Inter-County
Connector (ICC) and several properties that include large areas of reforestation that are being dedicated to Parks from State Highway Administration as part of ICC mitigation and by private developers through the Development Review Process. A partial list of the larger projects is provided in the table below. As a result, the Park Department will be acquiring nearly 440 acres of newly reforested land within the next 5 to 7 years. The maintenance period for these projects varies from 2 to 5 years. During this period, the party responsible for the planting must maintain them. After this period, however, the long-term maintenance of these areas will fall to the Department of Parks. It can take 10 to 30 years or more for a reforestation site to grow to the point where it will become self-sustaining depending on the species planted, the existing vegetation, competition from NNIs and depredation by deer. This will significantly increase long-term maintenance costs for reforestation sites on parkland.

<table>
<thead>
<tr>
<th>AREA ID</th>
<th>PROJECT TYPE</th>
<th>REFORESTED ACRES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICC Reforestation on existing parkland</td>
<td>ICC* Mitigation</td>
<td>100</td>
</tr>
<tr>
<td>Casey/Hoyles Mill Parkland Acquisition</td>
<td>ICC Mitigation</td>
<td>100</td>
</tr>
<tr>
<td>Peach Orchard Allnut Parkland Acquisition</td>
<td>ICC Mitigation</td>
<td>50</td>
</tr>
<tr>
<td>Preserve @ Rock Creek</td>
<td>Developer Dedication</td>
<td>35</td>
</tr>
<tr>
<td>Reserve @ Fairhill</td>
<td>Developer Dedication</td>
<td>15</td>
</tr>
<tr>
<td>Former Indian Springs CC</td>
<td>Developer Dedication</td>
<td>48</td>
</tr>
<tr>
<td>Fee-in-lieu M-NCPFC-- Env. Plan. Dpt.</td>
<td></td>
<td>60</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>438</td>
</tr>
</tbody>
</table>

*ICC – Inter-County Connector Road Project

As the county continues to develop, additional pressure to place reforestation mitigation on parkland for road construction is expected. While there are certainly benefits to reforesting some acres of parkland, long-term maintenance as well as maintaining a balance of habitat types must be fully considered. Any requests to fulfill non-park related reforestation on parkland should consider the total long-term management costs that would be incurred.

**Vegetation Management Strategies and Recommended Actions**

In order to achieve our goal of maximum forest and natural habitat sustainability on M-NCPFC Park land, the following strategies and management actions are recommended:

**STRATEGY**

Gather, analyze, and incorporate the most detailed Natural Resource data available when initiating work on a Vegetation Management Plan.

The first step in preparing a Vegetation Management Plan on any scale—from the broad Master Plan level to the very specific individual Park property level—is the inventory of environmental resources in the Park acreage under study. When initiating work on a VMP, Park Staff gathers and analyzes the most
detailed resource information available regarding the forests, open habitat areas, community types, uncommon or protected species, geology, soils, topography, water quality, wetlands.

Inventory work is prioritized based on the natural resource value of the area (i.e. located within a Best Natural Area, Biodiversity Area, Environmentally Sensitive Area (Appendix E), and by the development of park plans (e.g. Master Plans, Operation and Use Plans or guidelines, Park development plans, etc).

A variety of tools and field inspections are used to inventory park natural resources, but the initial step utilizes the Department’s GIS data layers capturing bedrock, soil, and vegetation cover information. Digital soils information provided by the National Resources Conservation Service (NRCS) provides bedrock type, hydric and erodible soil information. Knowledge of bedrock types provides information on the potential for uncommon vegetation communities and/or rare, threatened and endangered plant species. Wetlands information is available from the Digital Orthophoto Quarter Quad (DOQQ) coverage developed through the Maryland Department of Natural Resources. M-NCPPC planimetric tree cover information was merged with the state forest inventory to provide a basic classification of tree cover information by forest type. Additionally, information about Biodiversity Areas, designated Park Best Natural Areas, and environmentally sensitive buffers is available and included.

Detailed botanical inventories and Forest Stand Delineations (FSDs) are developed and updated by Park Ecologists for most park natural areas on a regular basis and are important components of the Inventory stage for any vegetation management plan. Park staff also compile information on habitat quality (level of impacts due to non-native species, deer, past land use, etc.), and other unique or significant habitat feature details.

In addition to Park staff inventories, Maryland State Heritage Botanists performed detailed field studies on select M-NCPPC Park properties in 1993, 1997, and 1999, and provided valuable insight on Rare, Threatened, Endangered (RTE’s) species and uncommon habitats in Montgomery Parks.

RECOMMENDED ACTIONS

- Continue to prioritize inventory work in park acreages based on the natural resource value of the Park property (environmentally sensitive areas, BNAs, Biodiversity areas, areas of large contiguous forest).
- Establish an inventory/monitoring schedule that will cover all natural park areas every 10 years. This would require an average of 2,600 acres to be covered each year.
- Establish an inventory/monitoring protocol.
- Incorporate existing flora and fauna databases into GIS based system.
- Continue to regularly update Resource data compiled across the Park system. Planning, development, and management decisions should only be made after analysis of the most accurate background information available.

STRATEGY

Guard against Forest Fragmentation; Protect and Enhance Forest Interior Habitat.

Forest Fragmentation is the “chopping-up” of large forested areas into smaller patches separated by non-forested land. Fragmentation is most often the result of development, especially the expansion of roads, trails, and other linear land disturbances. Intact forests play a key role in protecting watersheds,
aquifers, groundwater supplies, wetlands, and in providing wildlife food and shelter, cleaner air, open space, and recreational opportunities. Large contiguous forests do the best job of providing these benefits.

Forest interior is defined as existing forest with trees larger than 5”dbh and at least 100 acres in size, with high area to edge ratio and a forested buffer of at least 300 feet width around the entire interior. Interior forest acreage is especially important for Forest Interior Dwelling Species (FIDs) that require forest interior habitat to survive. (Appendix F)

Forest fragmentation has resulted in dramatic population reductions of certain species of wildlife, especially birds, which require large forest tracts in order to survive and reproduce. A list of forest interior dwelling birds (FIDs) in Maryland was developed by the State and is included in, “A guide to the Conservation of Forest Interior Dwelling Birds in the Chesapeake Bay Critical Area”. At least 20 of these species occur or did occur in Montgomery County within the past 20 years. Many, such as wood thrush, Kentucky warbler and worm-eating Warbler, are declining rapidly and several, such as Whip-poor-will and Cerulean Warbler may no longer breed in the County at all due to forest fragmentation. Protection of remaining forest interior habitat and forested corridors that connect these areas as well as reforestation efforts focused on connecting forest fragments to re-establish larger tracts are essential to protecting FID habitat in the county.

RECOMMENDED ACTIONS

- Encourage Park staff to participate in the process through which the Planning Department, (Environmental Planning, Transportation Planning, etc.), notify Park staff of development impacts to parkland from outside entities, (utilities, roads, developers, etc.), early in the process so that the Parks Department can be represented in the planning process as would any other landowner.
- Ensure that every Park development plan is reviewed according to the PDCO process.
- Conduct biannual trail/park inspections to prevent the development of unofficial trails that impact interior forest.
- Maintain trails that conform to park standards, remove trail obstructions and repair wet spots in trails on a regular basis to prevent trail widening or user initiated re-routes.
- Evaluate existing open habitats and identify those that should be reforested to increase forest interior habitat while still maximizing the mix of habitats within the park.

STRATEGY

Protect and Enhance Plant Populations and Habitats of Special Concern

Despite heavy widespread development, Montgomery County still retains areas of rich vegetative diversity. Montgomery County Parks has identified Biodiversity Areas, Best Natural Area Parks, and Environmentally Sensitive Areas as our most important natural areas for protecting the County’s diversity. Biodiversity Areas are surveyed and verified by the Maryland Department of Natural Resources Heritage Program Botanists as having rare, threatened, endangered, or watchlist species or examples of uncommon plant communities, and generally represent the best examples of unique plant community types found in Montgomery County. The 12 BNAs usually contain large contiguous areas of
high quality forest or marsh, often encompass a Biodiversity Area, but also represent areas of important aquatic communities and areas of exceptional beauty.

The vegetation communities in our Biodiversity areas and BNAs are recognized as being our top natural resource areas and meriting special attention in resource management and stewardship. These communities include large forested tracts that can support forest interior dwelling species, mature field systems, wildlife corridors, and communities of plants and animals that are highly complex, diverse and uncommon to the county.

We have identified and will work to preserve these named communities, however, we also need to realize that change is constant in natural areas, and will occur even more quickly in areas like Montgomery County Parks due to impacts from urbanization. As referenced previously, these communities must be preserved and protected according to the Park Board’s and State’s adopted policies. Continued pressure from development, NNIs, high deer populations, and the pressures of recreational use make the protection of these areas both a necessity and a challenge.

**RECOMMENDED ACTIONS**

- Continue to emphasize the importance of avoiding compromise of these irreplaceable resources when planning facilities such as recreation related park improvements, roads, trails and utilities.

- Continue to incorporate knowledge about uncommon vegetation communities as an important tool for land acquisition.

- Re-establish contract work with Maryland State Heritage Botanists to re-evaluate named Biodiversity Areas and inventory additional Park acreages on a regular basis.

- Use interpretive signage to encourage park users to stay on park trails to reduce disturbance to plants, wildlife and unique habitats including rock outcrops, wetlands, etc.

- Survey and monitor recognized Biodiversity and Best Natural Areas every 5 years on a rotating basis (i.e. each site should be surveyed at least once every 5 years) to evaluate the health of populations; provide deer protection.

- Establish routine annual Staff surveys of other park natural areas to identify and GIS map additional new RTEs and uncommon communities. Surveys should cover approximately 2,600 acres per year so that all natural area parkland (26,000 acres) is surveyed at least once every 10 years.

**STRATEGY**

**Prioritize Non-Native Invasive (NNI) Management in Vegetation Restoration and Management Work Park-wide**

The proliferation of NNIs is one of the greatest threats to Montgomery Park’s native vegetation resource and to biodiversity across the taxa. NNIs are species that are not native to the region and are extraordinarily adapted to out-compete other species. The end result is often a vegetation cover dominated by the NNIs to the detriment of native species. NNIs often invade open, disturbed areas where they quickly take over and dominate. Once established in disturbed sites, NNIs can move into more established habitats including forest interiors and gradually increase in dominance. Large vines like Asiatic Bittersweet are capable of growing into the forest canopy, shading out and killing mature forest trees.
NNIs have been steadily increasing their coverage over the past 15 years and represent a serious threat that must be carefully addressed if we are to preserve the natural diversity of County Parkland.

Removal of NNIs can at times eliminate virtually all available food and shelter for wildlife. A critical part of the NNI program is therefore the replanting of native, wildlife friendly plants to replace these lost resources. Because the complete eradication of NNIs often requires repeated treatment over a year or two or more, the replanting is delayed. Therefore, treatment should be done stepwise and over an extended period to allow some new food and cover to become established before moving on to the next adjacent area. Planting large size stock allows for continued NNI treatment after planting.

NNI management is a relatively new science and evolving quickly. Park staff has developed a Non-Native Invasive Management Plan (2004, 2007) (see Appendix G) and a Non Native Invasives Best Management Practices Document (NNI BMP) (See Appendix H) which are updated regularly as new infestation situations arise and as recommended treatment protocols change.

RECOMMENDED ACTIONS

- Continue NNI surveys to identify and prioritize infested areas for management using GIS mapping techniques.
- Continue tracking NNI management efforts and record details using GIS.
- Follow the NNI Management Plan’s two-prong approach. 1) Treat NNIs in areas of high infestation to improve habitat and remove major seed sources, and 2) Treat NNIs in high quality areas working from areas of low infestation outward towards higher infestation with a goal of protecting and expanding the high quality areas.
- Follow M-NCPPC’s NNI Best Management Practices.
- Institutionalize a process by which Region and Park Planning and Stewardship Division staff adopt and revise annual NNI management prioritized work schedules based on NNI surveys and results of completed management efforts.
- Schedule plantings of wildlife food and structure providing native species ASAP after NNIs are removed (this will likely be 1.5 to 2 years after initial treatment due to repeat treatments required to completely extirpate NNIs).
- To the extent possible, conduct NNI work in small areas at a time to reduce impacts to wildlife.
- Continue to coordinate with outside agencies (e.g. Montgomery County Department of Environmental Protection (DEP), Maryland State Highway Administration (SHA), Washington Suburban Sanitary Commission (WSSC), Maryland Transportation Authority (MDTA) towards the incorporation of NNI management in all county-wide habitat restoration projects.
- Conduct 4 Park Staff NNI Management Training programs annually; institutionalize a training process for current and new staff so that Staff has a better awareness of the issues and more knowledge about how to address the problem in their work program and monitor for reoccurrences.
- Continue to expand the scope and accomplishments of the WEED WARRIOR citizen volunteer program. (Appendix I)
STRATEGY

Prioritize Deer Management in Vegetation Management and Restoration Work Park-wide

The over population of white-tailed deer in our Parks has significantly altered forest structure, function, and appearance (M-NCPPC, 1995).

Deer depredation impacts forest regeneration in every vegetation stage and has seriously affected populations of rare, threatened, endangered, and uncommon plants. Selective browsing of certain plant species by deer gives a competitive advantage to other species and can result in the complete elimination of some desirable species from the mix in a regenerating forest stand.

Deer predation also impacts open habitat and wetland area species regeneration and development. Over browsing of certain deer-favored species (Examples = all Orchid and Lily family members) has meant that these plant species are now basically absent from most open habitats in the county. This is especially unfortunate when the favorite browse plants are also the host plants for our uncommon to rare insects species (Examples = turtlehead and prickly ash are devoured by deer. They are also the host plants for the Baltimore Checkerspot and the Giant Swallowtail—both state endangered butterflies).

M-NCPPC Parks has operated a Deer Management Program since 1995 to address the negative impacts to Park vegetation communities as well as the high number of deer-vehicle collisions on roads adjacent to and through Park boundaries. Since the Deer Management Program is already a fully established program (see Appendix J), time will not be spent here elaborating on the details of the program, other than to emphasize that control of the deer population is absolutely necessary for the future health, stability, existence of our vegetation resource.

RECOMMENDED ACTIONS

- Continue deer population management in accordance with the countywide deer management plan.
- Review direct reduction methods annually and modify as needed.

STRATEGY

Prioritize Areas for Reforestation

“Reforestation” refers to planting an area with trees in order to skip the earlier stages of secondary succession and establish a forest more quickly.

Though preservation and conservation of existing forested resource is a primary concept to understand and an essential goal to strive for, reforestation is desirable in the following situations:

- To **Restore** a riparian buffer in order to shade the stream, prevent erosion, etc.
- To **Enhance** existing forested acreage by filling in gaps between forests.
- To **Extend** the edge of an existing forest.
- To **Restore** an area where high deer numbers or non-native invasive populations impede the normal plant succession process.
To Restore a patch after NNI removal.  
To Mitigate following development of a Park property.

While reforestation provides environmental benefits, there can be significant long-term costs associated with large areas of reforestation. Therefore it is prudent to prioritize planting areas in order to ensure cost effectiveness.

In order to determine areas that would benefit most from reforestation, Park acreages are inventoried and evaluated using a GIS mapping and then field verified. Areas chosen for reforestation are further prioritized based on the natural resource value of the area - i.e. located within a Best Natural Area, Biodiversity Area, Environmentally Sensitive Buffer, or Special Protection Area. Other factors affecting the department’s ability to reforest areas include access to the site, availability of staff, and funding.

Recent cooperative efforts between M-NCPPC Planning and M-NCPPC Parks Departments have launched a program through which dollars collected by the Forest Conservation Act’s Fee-in-lieu program will be used to restore publically owned riparian buffers. These funds originate from county developers who, after rigorous efforts to find reforestation sites on their project site or other private properties, are unable to do so. These funds will potentially account for a very small percentage of the reforestation that is required from developers through the County’s Forest Conservation Act.

The broader use of parkland as a repository for non-Park related reforestation has been limited in years past for several reasons. The goal of reforestation efforts is to replace forested land that has been developed. Because parkland is already protected from development, the planting of trees on land already in stewardship does not really fulfill this goal. Any un-forested parkland not under some type of alternative management will eventually become forested through natural succession. Thus reforesting parkland does not result in the ultimate goal of adding trees and forested areas to the county.

The exception to this example would be for reforestation required to meet the park department’s requirements for development that occurs on parkland. Because the Dept of Parks develops parkland for recreational purposes, it is imperative that some parkland suitable for reforestation be reserved for the department’s own reforestation requirements.

RECOMMENDED ACTIONS

- Prioritize reforestation work based on the natural resource value of the area. When Park acreage is being selected for restoration work, consideration should first be given to areas located within an environmentally sensitive area, a Best Natural Area (BNA) or a Biodiversity Area.

- Focus reforestation efforts on connecting forest fragments to re-establish the larger tracts, which are essential to protecting FID habitat in the county.

Follow the specifications enumerated in Montgomery Park’s “PLANTING REQUIREMENTS FOR LAND-DISTURBING ACTIVITIES AND RELATED MITIGATION ON M-NCPPC MONTGOMERY COUNTY PARKLAND” (2008) document. (See Appendix K).

- Continue the production of appropriate native, straight species trees and shrubs for reforestation and restoration work in M-NCPPC Parks by the Pope Farm Nursery.

- Continue the coordination of efforts between Parks PPS staff, Region staff, and Horticulture staff to evaluate and prioritize possible reforestation sites, plant, and continue to maintain and monitor the reforestation plots.
GIS Map reforestation sites and maintain associated planting records

Document the successes and failures of reforestation efforts.

Continue to coordinate restoration projects with other county and state agencies so that potential reforestation work performed on Park property follows the guidelines enumerated in Parks “PLANTING REQUIREMENTS FOR LAND-DISTURBING ACTIVITIES AND RELATED MITIGATION ON MNCPPC MONTGOMERY COUNTY PARKLAND” (2008) document.

STRATEGY

Promote Natural Regeneration

“Natural Regeneration” refers to letting an area grow back into forest on its own through the process of succession.

This is the most cost effective method of establishing native vegetation which will ultimately develop into forest. Unfortunately, several problems exist. Deer browsing, beaver predation, as well as the current vegetation existing on the site—especially NNIs—can drastically reduce the abundance and the distribution of (and sometimes lead to the complete elimination of) desirable native species.

However, when Staff has identified a Park area where the deer population is somewhat under control, promoting natural regeneration and occasionally “spot planting” with appropriate species to accelerate the process is a cost effective way to help the vegetation community mature.

RECOMMENDED ACTIONS

• Within Natural Resource Stewardship areas (as identified in the Program Budget), evaluate current mowing practices within stream buffers (except for that needed to control NNIs) to determine if area should be allowed to naturally regenerate.

• Where natural regeneration fails to produce the desired species regrowth in a Park area chosen for vegetation restoration, “jump start” the restoration by spot planting desired species and protecting them from deer browse as specified in Parks “PLANTING REQUIREMENTS...” document.

• In better quality forests where active deer management efforts are ongoing and native tree saplings and young shrub species are evident, erect 8 foot tall black plastic deer protection netting around groups of regenerating trees. This fencing will protect them from deer and encourage seedling understory growth. (Appendix L)

STRATEGY

Promote Conifer Habitat Establishment

In Montgomery County conifer woodlands are restricted primarily to early successional stands of Virginia pine and red cedar. These stands are generally overgrown by deciduous trees prior to reaching maturity except in sites with thin, rocky or dry soils where Virginia pines may remain dominant for 50 years or more.

Pines and red cedars provide unique habitats. Seeds from cones (cedar berries are actually modified cones) provide food for wildlife and the evergreen foliage offers important cover for many species...
especially in winter. Dense conifer stands adjacent to fields can provide important overwintering habitat for owls, songbirds and other wildlife, and provide shade to help protect forest edges from the spread of non-native invasive plant species. Evergreen habitat is dwindling in the county as forests mature, fewer fields are being allowed to go fallow, and few fires burn long enough to kill deciduous trees. Most reforestation efforts focus primarily on deciduous species.

RECOMMENDED ACTIONS

- Identify existing open habitat on knolls or adjacent to existing conifers and encourage natural conifer regeneration and/or reforest sections with native conifers.
- Encourage natural conifer regeneration and/or plant conifers along select forest/meadow interface to provide varied wildlife habitat, winter cover, and armor forest edge against NNIs.
- Identify and map existing conifer stands and identify appropriate stands for management to prolong their viable existence.
- Develop and implement Conifer Best Management Practices (BMPs) for preserving conifer habitat in existing stands and all newly planted areas. Efforts would include thinning of dense conifer stands and girdling of deciduous trees to prevent overshadowing.

STRATEGY

Perform Non-Native Invasive Animal Species Management

While the non-native invasive species of primary concern in Montgomery Parks at this point in time are plant species, there are several non-native invasive animal species which have caused considerable damage to Parks forested acreage in the past (primarily gypsy moths), and which have the potential for future devastation (including—but not limited to—gypsy moths, emerald ash borers, Asian long-horn beetles, sudden oak death, earthworms).

Several important up-county Park properties sustained a large amount of damage during the 1988-1990 gypsy moth infestation. Many acres of high quality oak dominated forest were killed, and today, 15 to 20 years later, a return to the previous forest type is difficult due to both the level of deer predation on seedling and sapling regenerating trees/shrubs, and to the advantage that NNIs have over native species once they gain a foothold in areas left open by gypsy moth destruction.

Since 1972, the Maryland Department of Agriculture (MDA) has monitored the presence and severity of gypsy moth (Lymantria dispar) infestations using surveys of gypsy moth egg masses. Information from these surveys is used to assess the potential for damage and tree loss in each area, and is provided to landowners, managers and the general public.

Very high infestations may need to be treated with insecticide to protect trees in areas where dieback or mortality can't be tolerated. When such areas are threatened with defoliation, the Maryland Department of Agriculture, Forest Pest Management Section may propose aerial insecticide treatments conducted under the Maryland Cooperative Gypsy Moth Suppression Program. The USDA Forest Service, Maryland Department of Agriculture and local governments or landowners participate in this voluntary program.

There are additional non-native invasive insects which are currently causing destruction in other mid-Atlantic and northeastern states, including the emerald ash borer and the Asian longhorn beetle. There
are several pathogens—viruses and fungi and other organisms—which have begun to invade a number of areas and which have the potential to cause devastation in our natural habitats, including sudden oak death and laurel wilt disease. Parks staff will work with state and federal authorities to protect park properties.

Non-native earthworms have been introduced into many areas of North America. The worms are most often introduced through the release of unused fishing bait. The full impacts of non-native earthworms is still being evaluated but it appears that in some areas they can profoundly change forest soils causing alterations in the physical and chemical properties that can impact the germination of native plant species. This has become a major problem in areas of Pennsylvania and is likely having consequences in our parks that are not yet recognized. While little is known at present about controlling non-native earthworms, the more we know about where they may be and the impact they may have on soils and our native species, the better we are situated to recognize and eventually manage any problems.

**RECOMMENDED ACTIONS**

- Park Staff continue to work with the MDA in cooperative efforts.
- PPS should work closely with Horticultural Services in coordinating locations for Gypsy Moth control spraying on County Parkland.
- Where habitats and/or populations of rare lepidopteran species exist (e.g. the Baltimore Checkerspot butterfly (Euphydryas phaeton), the Giant Swallowtail butterfly (Papilio cresphontes) in Hoyle’s Mill Conservation Park, or the Buck Moth (Hemileuca maia) at Serpentine Barrens Conservation Park, the product Gypchek™ should be used to avoid impacts to nontarget butterflies and moths that result from all other Gypsy Moth pesticide applications. *(Appendix M)*
- Develop and post informational posters at all fishing and bait sale locations to educate park users and staff about the problem and advising them to dispose of all unused fishing worms completely in the water and never on land.

**STRATEGY**

*Maintain habitat in various stages of succession within Parks with a goal towards maintaining and enhancing habitat diversity.*

In order to protect biodiversity, the department must manage non-forested habitats to maximize diversity over the long-term. See Meadow, Shrub and Edge Habitat (Non-forest) Management above for more information.

**RECOMMENDED ACTIONS**

- Develop a process to identify, inventory, evaluate, and prescribe management for non-forested habitat to ensure habitat diversity based on the discussion above under Meadow, Shrub and Edge Habitat (Non-Forest) Management. These would include:
- Map and review existing habitats within Parks
• Field truth current vegetation for areas where needed and Develop finalized map of Potential Open Habitat Management sites

• Identify management prescriptions for each site - e.g. manage for meadow, scrub-shrub, wetland, conifers, reforest, etc.

• Develop Standard Operating Procedures for Open Habitat Establishment and Management.

• Explore opportunities to work with farmers to develop haying practices that better meet vegetation management goals and provide a useful product. E.g. a) strip-mowing options on Agricultural leases at most appropriate times of year; b) harvesting hay from warm-season grass fields in March.

• Explore controlled burning and light grazing as methods to manage some meadows.

LITERATURE CITED


APPENDICES

Appendix A - Glossary

Best Natural Areas - Areas of parkland which contain one or more of the following:
- Large areas of contiguous, high quality forest and/or wetland which are generally more than 100 acres, and show little evidence of past land-use disturbance.
- Rare, threatened, endangered, or watch-list species.
- The best examples of notable plant communities found in Montgomery County.
- High quality wetlands, including those of Special State Concern as noted in COMAR, Title 26.
- Aquatic communities rated as good or excellent in the Countywide Stream Protection Strategy.
- Special Trout Management Areas as noted in COMAR, Title 08.
- Areas of exceptional scenic beauty.

Biodiversity Areas - Areas of parkland which contain one or more of the following:
- Areas of contiguous, high quality forest and/or wetland which show little evidence of past land-use disturbance.
- Rare, threatened, endangered, or watch-list species.
- Exceptional examples of notable plant community types found in Montgomery County.
- Areas of exceptional scenic beauty.

Environmentally Sensitive Areas - From Article 66b, Annotated Code of Maryland
- Streams
- Wetlands and their buffers
- 100-year floodplains
- Habitats of threatened and endangered species
- Steep slopes
- Agricultural and forest lands intended for resource protection or conservation

Forest Interior - Existing forest with trees larger than 5”dbh and at least 100 acres in size, with high area to edge ratio and a forested buffer of at least 300 feet width around the entire interior. Interior forest acreage is especially important for Forest Interior Dwelling Species (FIDs) that require forest interior habitat to survive

Fragmentation - the subdivision of large natural landscapes into smaller, more isolated fragments. Fragmentation affects the viability of wildlife populations and ecosystems.

Rare, Threatened and Endangered Species (RTE’s) are defined in the Endangered Species Act (ESA) http://endangered.fws.gov/whatwedo.html as “any species which is in danger of extinction throughout all or a significant portion of its range other than species of the Class Insecta as determined by the Secretary to constitute a pest whose protection under the provisions of the Act would present an overwhelming and overriding risk to man.”

A threatened species is “any species which is likely to become an endangered species in the foreseeable future throughout all or a significant portion of it range.” The term species, as defined in the ESA
includes “subspecies of fish or wildlife or plants, and any distinct population of vertebrate fish or wildlife which interbreeds when mature.”

**Succession** - the natural replacement of one plant (or animal) community by another over time in the absence of disturbance.

**Taxa** - A taxonomic category or group, such as a phylum, order, family, genus, or species.

**Uncommon Vegetation** - Refers to a situation when a plant population is found to exist in an area where it is not usually thriving.
Appendix B  Growth and Preservation Policies


Appendix C - State Conservation Laws

State Forest Conservation Law (Natural Resource Article Title 5, Subtitle 16), the accompanying State Forest Conservation Regulations (Title 08, Subtitle 19), the Montgomery County Forest Conservation Law (Montgomery County Code, Chapter 22A) and its accompanying County Forest Conservation Regulations (Montgomery County Planning Board Regulation Number 1.97):

http://www.dnr.state.md.us/download/reforest.pdf
http://www.dnr.state.md.us/forests/programapps/fcatoc2.html
http://www.montgomerycountymd.gov/content/dep/forest/strategy.pdf
http://www.dsd.state.md.us/comar/Annot_Code_Idx/NaturalResIndex.htm
Appendix D - Vegetation Map of Montgomery County
Adapted from the Vegetation Map of Maryland by Grace Brush, et.al, 1976

The forests of Maryland have been mapped by Grace S. Brush et.al. (1976) at a scale of 1:250,000 on the basis of 15 regional associations. Six of these associations are found in Montgomery County and include: 1) river birch—sycamore, 2) sycamore—green ash—box elder—silver maple, 3) shingle oak, 4) chestnut oak—post oak—blackjack oak, 5) chestnut oak, and 6) tulip poplar. The associations differ in species composition and in abundances of species common to multiple associations. Each is identified by the presence of relatively few common discontinuous tree species referred to as characteristic species. Distribution of woody species correlates closely with geologic, topographic, and soils units mapped at a similar scale suggesting that patterns of available water are a controlling factor.

Vegetation Map of Montgomery County

![Vegetation Map of Montgomery County](image_url)
Appendix E - Montgomery Parks Best Natural Areas

1. **Black Hill Regional Park**- Several plant species that are often found in the more mountainous regions of the state have been found in this natural area (marsh marigold). Over 203 species of birds have been observed in the park, 76 of which nest in the park. Over 20 species of waterfowl overwinter on the lake and bald eagles have nested here since 2003.

2. **Blockhouse Point Conservation Park**- This natural area consists of a relatively undisturbed, highly diverse upland forest, along with one of the most spectacular views of the Potomac Valley in Mo. County. The park is also known for its rich cultural history. Many of the existing trails in the Park are part of the historic Civil War complex, which is where the park derives its name from.

3. **Cabin John Stream Valley Park**- An amazing variety and quantity of spring ephemerals are found in this natural area. RTE plants include Coville’s phacelia (endangered), ostrich fern (rare), and several other species.

4. **Hoyles Mill Conservation Park**- This Park is underlain by a diabase bedrock formation (rare in Mo. County). Bedrock outcrops are scattered throughout the park. No area in the county of comparable size is known to support more RTE plant species. These plants have adapted to the unique soil conditions of the area.

5. **Little Bennett Regional Park**- M-NCPPC’s largest natural park area. This park contains non-tidal wetlands of special state concern. Unique plant species found in the park include: butternut (rare) and purple fringeless orchid (threatened). The state rare pygmy shrew (smallest North American mammal) is also found in the park, along with other uncommon wildlife species including river otter, mink, spotted turtle, long-tailed salamander and copperhead.

6. **North Branch Stream Valley Park**- This Park has high quality wetlands that are inhabited by uncommon species, such as spotted turtles and marbled salamanders.

7. **Northwest Branch Stream Valley Park**- Some dramatic bedrock formations can be found along the fall line in this park. These formations mark the transition zone of where the piedmont meets the coastal plain.

8. **Rachel Carson Conservation Park**- Contains impressive examples of mature upland Oak-hickory forest and other habitats which support a rich diversity of plants and animals including forest interior dwelling birds, uncommon mammals and several species of orchids. The Hawlings River is one of the few locations in Mo. County where the shield darter has also been found.

9. **River Road Shale Barrens Conservation Park**- Upland areas contain a large contiguous hardwood forest on Triassic shale. Steep shale slopes and outcrops support unique flora including pricklypear cactus, fragrant sumac, dwarf hackberry and others that are specially adapted to live in very dry exposed soils. One of these species, Pursh’s ruellia, has not been found at any other locations in MD. This is the only Triassic shale barren in MD where rare species have been recorded.

10. **Serpentine Barrens Conservation Park**- Rare ecosystem that provides habitat for a number of rare plant species that have adapted to toxic soils. The park has 21 RTE plant species. Three lepidopteran species uncommon in MD are found in this area- the dusty skipper, the cobweb skipper and the woodland buckmoth.

11. **Upper Paint Branch Stream Valley Park**- Headwaters of Paint Branch have clean, cold water, which supports one of the best naturally reproducing brown trout populations in Mo. County.
12. **Watts Branch Stream Valley Park** - This natural area contains high quality mature forests, forested and scrub-shrub wetlands, and vernal pools that support a rich diversity of birds, mammals, reptiles and amphibians. Watchlist plant species that have been found in the park include green dragon, honeyvine, and spring avens.
Appendix F - List of Forest Interior Dwelling Bird Species (FIDS)

Forest Interior Dwelling Bird species that potentially breed in Montgomery County, MD. Adapted from, *A Guide to the Conservation of Forest Interior Dwelling Birds in the Chesapeake Bay Critical Area (2000)*

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Safe Date</th>
<th>Migratory</th>
<th>Class</th>
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<tbody>
<tr>
<td>Red-shouldered Hawk</td>
<td>Buteo lineatus</td>
<td>May 1 - Aug 31</td>
<td>Temperate</td>
</tr>
<tr>
<td>Broad-winged Hawk</td>
<td>Buteo platypterus</td>
<td>June 5 - Aug 10</td>
<td>Neotropical</td>
</tr>
<tr>
<td>Barred Owl</td>
<td>Strix varia</td>
<td>Jan 15 - Aug 31</td>
<td>Nonmigratory</td>
</tr>
<tr>
<td>Whip-poor-will</td>
<td>Caprimulgus vociferus</td>
<td>May 10 - July 15</td>
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<td>Hairy Woodpecker</td>
<td>Picoides villosus</td>
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<td>Nonmigratory</td>
</tr>
<tr>
<td>Pileated Woodpecker</td>
<td>Dryocopus pileatus</td>
<td>Mar 15 - Aug 31</td>
<td>Nonmigratory</td>
</tr>
<tr>
<td>Acadian Flycatcher</td>
<td>Empidonax virescens</td>
<td>May 25 - Aug 5</td>
<td>Neotropical</td>
</tr>
<tr>
<td>Brown Creeper</td>
<td>Certhia americana</td>
<td>May 15 - Aug 31</td>
<td>Temperate</td>
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<tr>
<td>Veery</td>
<td>Catharus fuscens</td>
<td>June 10 - Aug 31</td>
<td>Neotropical</td>
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<tr>
<td>Wood Thrush</td>
<td>Hyllocichla mustelina</td>
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<tr>
<td>Yellow-throated Vireo</td>
<td>Vireo flavifrons</td>
<td>May 25 - Aug 15</td>
<td>Neotropical</td>
</tr>
<tr>
<td>Red-eyed Vireo</td>
<td>Vireo olivaceus</td>
<td>June 1 -July 31</td>
<td>Neotropical</td>
</tr>
<tr>
<td>Northern Parula</td>
<td>Parula Americana</td>
<td>June 1 - Aug 15</td>
<td>Neotropical</td>
</tr>
<tr>
<td>Cerulean Warbler</td>
<td>Dendroica cerulean</td>
<td>May 25 - Aug 5</td>
<td>Neotropical</td>
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<tr>
<td>Black-and-white Warbler</td>
<td>Mniotilta varia</td>
<td>May 15 - July 25</td>
<td>Neotropical</td>
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<tr>
<td>American Redstart</td>
<td>Setophaga ruticilla</td>
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<td>Prothonotary Warbler</td>
<td>Protonotaria citrea</td>
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<td>Worm-eating Warbler</td>
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<td>May 20 - July 20</td>
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<td>Ovenbird</td>
<td>Seiurus aurocapillus</td>
<td>May 20 - Aug 5</td>
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<td>Louisiana Waterthrush</td>
<td>Seiurus motacilla</td>
<td>May 1 - July 10</td>
<td>Neotropical</td>
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<td>Kentucky Warbler</td>
<td>Oporornis formosus</td>
<td>May 25 - July 15</td>
<td>Neotropical</td>
</tr>
<tr>
<td>Hooded Warbler</td>
<td>Wilsonia citrine</td>
<td>May 25 - July 25</td>
<td>Neotropical</td>
</tr>
<tr>
<td>Scarlet Tanager</td>
<td>Piranga olivacea</td>
<td>May 25 - Aug 10</td>
<td>Neotropical</td>
</tr>
</tbody>
</table>

*a* Documentation of breeding evidence based on Stewart and Robbins (1958), Iliff et al. (1996), and Robbins and Blom (1996).

*b* Safe dates, as listed in Robbins and Blom (1996), indicate the time of year when a species can be assumed to occupy a breeding territory.

*c* Migratory classes: "neotropical" migrant - breeds in temperate North America and winters primarily in Central and South America; "temperate" migrant - breeds and winters primarily temperate North America; "nonmigratory" - year-round resident with no migratory movements.

*d* These species are highly area-sensitive and most vulnerable to forest loss, fragmentation and overall habitat degradation.

*e* State-listed as Endangered.


Appendix I – Weed Warriors
http://WeedWarrior.org

Appendix J - Planting Requirements for Land-Disturbing Activities and Related Mitigation on M-NCPPC Montgomery County Parkland" (2008)
http://www.montgomeryparks.org/PPSD/Natural_Resources_Stewardship/Veg_Management/documents/planting_reqs-on-disturbed-land_rev-april09-.pdf

Appendix K - Deer Management Plans:
http://www.mc-mncppc.org/Parks/PPSD/Natural_Resources_Stewardship/documents/deerreport_2009draft_jun08.pdf
Appendix L - Deer Protection Devices:

- For Trees: Tree sleeves. Heavy-duty plastic of an open weave mesh, 4’ tall, 6” diameter. Secure in ground with sod stakes to prevent deer and/or beaver from pushing it up. This type of device can be purchased from AM Leonard Catalog at http://www.amleo.com/index/item.cgi?cmd=view&Words=bg48

- For Tree or Shrubs: 4-foot tall, 1-3 foot in diameter (1 foot for trees, 3 feet for shrubs), wire-fence cage erected around each plant. One/two stake(s) should be used to anchor each cage in place, and 2 twist ties employed to attach the stake to the cage.

Appendix M - Nucleopolyhedrosis Virus (NPV) (Gypcheck).

NPV is a naturally occurring virus that causes disease in gypsy moth larvae. It is not available commercially but is produced in small quantities by the U.S. Forest Service. It typically is used in areas where potential non-target impacts stemming from the use of Btk or Dimilin, such as the presence of threatened or endangered butterflies or moths, would be unacceptable. Gypcheck is most effective in high populations.

Appendix N - Reforestation Inspection and Evaluation Protocols

M-NCPPC Department of Parks, Park Planning & Stewardship Division
Natural Resources Stewardship Section

Standard Operating Procedures – Reforestation Inspection/Evaluation

Purpose: To inspect reforestations in order to evaluate quality of plantings and short-term and long-term success of forest establishment.

Applicability/Scope (when to use): Inspections should be conducted at several time intervals as described in procedure including: immediately after planting; at end of years 1 and 2 and every 3 to 5 years thereafter. This SOP does not necessarily apply to reforestations that fall under the jurisdiction of M-NCPPC Planning Department until after the mandatory maintenance period is completed (however under certain circumstances, Parks staff may conduct inspections along with Environmental Planning inspectors).

Summary of Procedure: Departmental Staff or trained volunteers will utilize a standardized method to evaluate reforestation plantings at regular intervals. Standardized forms will be completed and kept on file and linked to GIS database. Any recommended management should be reported to Smart Parks through the Service Center.

Definitions

Reforestation or reforested – The creation of a biological community dominated by trees and other woody plants containing at least 100 trees per acre with at least 50 of those trees having the potential of attaining a 2 inch or greater diameter measured at 4.5 feet above the ground within 7
years. Reforestation includes landscaping of areas under an approved landscaping plan that establishes a forest that is at least 35 feet wide and covering 2,500 square feet of area.

**Non-native invasive plants** – Species introduced to local areas from other geographical regions which readily out compete and replace native species.

**Procedure**

**General**

- An initial inspection of reforestation sites will be conducted the first spring after trees have been in the ground for a minimum of one year (for fall plantings this will actually be approximately 18 months after planting).
- Subsequent inspections will occur the following spring and then at 3 to 5 year intervals thereafter.
- Inspections should occur in the spring preferably after May 15th to insure full leaf out to better evaluate tree health.
- For smaller plantings of 1/4 acre or less all trees will be inspected.
- For plantings greater than 1/4 acre, planting success will be evaluated using 100’ x 100’ randomly located plots established at a rate of 1 plot per ½ acre.
- A minimum of 25 trees should be inspected for each plot – if plot contains less than 25 trees, expand plot size to include at least 25 trees.
- The attached Data sheet will be completed for each inspection.

**Initial Inspections**

Occur immediately following plantings and should evaluate for:

- The proper number of trees
- Proper species
- Proper planting depth
- Firming or tamping the soil after planting
- Roots that are extended downward properly
- Trees that are “center-hole” planted (not slit planted)
- Proper mulching
- Deer protection as prescribed and properly installed
- Proper scalping around hole - to remove competition with grasses and prevent vole damage.

**Subsequent Inspections**

Occur at prescribed years following the initial inspections should evaluate for:

- Tree survival rate and health by stand – to evaluate success of reforestation
- Tree survival rate and health by species – to evaluate tree species for future use
- Rates of acceptable plant material shall be as follows:
  - 1st year = 90% of original number of plants acceptable.
  - 2nd year = 80% of original number of plants acceptable.
  - If acceptable plant rates fall below the specified percentage in a given year, replanting shall occur to the original specified planting number.
  - A plant showing any of the following characteristics shall be deemed unacceptable:
  - More than 25% of plant material is dead.
- Main leader had died back
- More than 25% of crown is dead or missing
- The is a wound on stem covering more than 1/3 the diameter or longer than 4 inches
- More than 50% of stems show deer browsing
- Growth of non-native invasive plants should be recorded as required on the evaluation form.
- A request for maintenance should be made through the Smart Parks Service Center when conditions dictate, as indicated on the evaluation form.

**Appropriate adaptations of this procedure:** Procedure may be appropriate for evaluating single trees or small groups of tree plants not associated with reforestation.

**Personnel Qualifications/Responsibilities:** Tree inspectors must be M-NCPPC employees knowledgeable in tree identification and with tree inspection experience, or specially trained and approved volunteers.

**Criteria, checklists, or other standards:** All Park inspections should use attached data collection sheet.

**Records Management**

Evaluation forms should be filed with the Natural Resources Stewardship office to be reviewed by the Forest Ecologist and maintained in a Reforestation Database.

When data sheet indicates the need for maintenance a Service Call should be made by Park Natural Resource to Smart Park Service Center.
MONTGOMERY COUNTY PARKS - REFORESTATION EVALUATION FORM

Location: ___________________________________________________________________________________

Number of Acres: __________________ Date Planted: __________________

Inspector: ___________________ Date of Inspection: __________________

Type survey: (check one) ___ Initial ___ Yr 1; ___ Yr 2; ___ other – ______ yrs. past planting

Number of Plots Inspected: ______________ Sheet _____ of ______

<table>
<thead>
<tr>
<th>ID or tally #</th>
<th>Species</th>
<th>Condition</th>
<th>NNI Vines? Check if yes</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
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<tr>
<td>Condition codes: 1 = dead; 2 = alive but in poor condition; 3 = alive and healthy</td>
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<tr>
<td>Total trees inspected _____; Total acceptable _____; Percentage survival _____%</td>
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<tr>
<td>Non-native Invasive (NNI) Information - Check all that apply:</td>
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<tr>
<td>□ Herbaceous Vines growing up trees*</td>
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<tr>
<td>□ Woody Vines growing up &gt; 10% of trees*</td>
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<tr>
<td>□ Invasive Vines growing between trees**</td>
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<td>□ Understory contains NNIs</td>
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*Please Print 2-Sided to Conserve Paper*