

**Recommendations for the Protection
and Enhancement of Forest
in the Potomac Subregion**

Maryland-National Capital Park and Planning Commission

September 1999

Purpose

This report uses the information from the forest analysis contained in the Technical Appendix to formulate conservation and management strategies for the forest stands within the Potomac Subregion. It also provides recommendations on forest restoration that may be incorporated into land use and planning considerations. The recommendations set forth in this report are intended to be used to help develop and guide land use and other recommendations for the Potomac Master Plan Amendment work.

This memorandum looks at the following questions:

- What is the ownership and/or development status of the land which contains a forest stand that has been ranked as high priority for preservation?
- Are the current master plan recommendations, regulatory requirements for land development activities, and the County' forest conservation program sufficient to protect each of the forest stands under consideration?
- Which stands cannot be properly protected and managed with current land use recommendations and regulatory requirements? What measures should be implemented to provide the appropriate level of protection and management?
- Which priority restoration areas should be incorporated into land use and planning recommendations of the master plan?

Forest Stands with High Priority for Preservation

Table 1 summarizes the relative ranks and staff recommendations for protection of those forest stands identified in the forest analysis report as high priority for preservation. This table does not include forest stands which are within riparian corridors of 300 feet or less (i.e., those that are in Preservation Category 4) and which are also considered high priority for preservation. The table also includes information on the ownership of properties that contain each stand of interest.

Detailed recommendations for stands with high priority for preservation are as follows:

1. Most of the largest forest stands (i.e., those in Preservation Categories 1, 2, and 3) lie partly or entirely within public parkland (M-NCPPC, Seneca State Park, or national park system along the Potomac River). Such stands are not only large and have high

potential for providing forest interior habitat, but are also associated with major stream valleys. Therefore, the highest level of protection should be afforded these stands. Park activities could significantly affect the health and character of the stands. Park activities that involve disturbance of these stands, especially those that would result in fragmentation or significant clearing (e.g, new paved trails, access roads), should be avoided. Non-park uses on parkland (e.g., construction of sewer lines) should also be carefully located and designed to avoid fragmentation and clearing within these forest stands as much as possible. The forest stands where these recommendations apply are shown in Table 1.

2. **WB-4, WB-5, WB-6, and WB-9** lie on developable properties and are recommended for acquisition because of the following characteristics: the presence of unique vegetation communities or state RTE species (WB-9) or high potential for RTE habitat (WB-4, WB-5, and WB-6), the fact that almost the entirety of the applicable properties are covered by the stand, the high potential for forest interior habitat, and the large sizes of the stands. WB-9 has been documented to be part of a regionally unique, and possibly globally rare, serpentine ecosystem. WB-4, WB-5 and WB-6 also lie on serpentine soils and, although their flora and fauna have not been inventoried, they have a high potential for supporting RTE species.
3. **WB-7** lies on developable property. Much of the stand lies on very steep slopes and much of its boundaries abut or are very close to forested M-NCPPC parkland. Development of the property would not only significantly fragment the forest stand, but could likely create severe erosion problems through deforestation and disturbance of the large and very steeply sloping areas. Such disturbance could also lead to significant sediment input into the receiving stream system of nearby Watts Branch, which is already documented to have problems with sediment deposition and stream bank instability. In addition, because much of the property is on steeply sloping ground, the provision of adequate stormwater management and sediment and erosion control measures for development on the property would be problematic. Therefore, staff recommends park acquisition of the forest stand.
4. **MB-7** lies mainly on M-NCPPC parkland and developable property (a small portion lies within developed properties). Staff's recommendation no. 1, above, would apply to the part of the stand within parkland. The part of the stand within developable land should be acquired as parkland for purposes of preserving the large size and high quality of the stand and preventing further fragmentation of the stand.
5. **LGS-10** lies within Seneca State Park, on open space parcels and residential lots of subdivided property, and on developable land. Staff's recommendation no. 1 should apply to the portion of the stand within parkland. Some of the residential lots which cover parts of the stand are recorded, but not yet constructed. Construction on these

lots will reduce the size of the southern part of the stand somewhat. However, this southern portion will still be fairly large in size and still have some potential for supporting forest-interior species. To better ensure that the southern portion of the stand will be adequately protected, staff recommends that the portions of the stand that lies within open space parcels of approved subdivisions be acquired and added to the adjacent forested parkland. In addition, the developable property could be developed and still provide protection for the part of the forest stand on the property by clustering away from the forest. That is, staff recommends that any development on the developable property should preserve the forest in its entirety; the forest should be part of land that is dedicated as parkland as part of any development of the property.

6. Part of **LGS-3** lies within private open space parcel of a residential subdivision and on developable land. The southern portion of the stand lies on proposed state park. Staff supports the acquisition of the southern portion of the stand for parkland. Staff also recommends acquisition for state park of the large portion of the stand that lies within private open space to ensure adequate protection of the forest. For the developable property, staff recommends that the non-forested part of the property could be developed as a cluster subdivision; the entirety of the forest on the property should be within the open space area of the cluster. Staff recommends that the open space area be dedicated as parkland.
7. **MB-6, DP-1, LGS-7, MB-9, WB-2, and LGS-5** lie partly in parkland and partly on developable properties. For the portion of each stand within parkland, staff's recommendation no. 1 should apply. The forest on developable property should be part of a cluster development in which the entirety of the forest lies within a conservation easement on private common open space land or within land dedicated for parkland.
8. Much of **LGS-1** lies within state parkland, and staff's recommendation no. 1 should apply. In addition, the southeastern portion of the stand lies on developable property. Since the property is fairly small and is entirely forested, staff recommends that development should be limited to the part of the property near Seneca Rd. The property is probably too small for a cluster development. But staff believes maximizing forest save, especially in and around the riparian buffer and the area adjacent to the state park, should be a major objective for any land use for the property.
9. **DP-2** lies almost entirely on property that has an approved preliminary subdivision plan, but has not yet been constructed. The subdivision requires an approved site plan before construction can begin. Although the stand is fairly large, and includes riparian area, it is not adjacent to existing parkland. Therefore, staff recommends

that the site plan for the subdivision should maximize forest save. The site plan should cluster in such a way as to maximize forest save in **and around** the stream buffers and adjacent to the C&O Canal National Park. Staff recommends that forest save should be at least the amount needed to meet the break-even point as defined by the County Forest Conservation Law.

10. **WB-1** lies mostly in parkland, and staff's recommendation no. 1 should apply. In addition, a small portion of the stand appears to lie within developable property. Any development of the property should protect the forest within stream buffers as part of the normal regulatory process.
11. **MB-3** lies mostly in parkland, and staff's recommendation no. 1 should apply. In addition, a small upland portion of the stand lies on developable property. Any development of the property should maximize forest save in the area of the property that is adjacent to parkland.
12. **LGS-2, LGS-4, MB-5, MB-8, and LGS-6** have large portions or the entirety of the stands on developable properties. These properties also include significant areas of non-forested land. Therefore, the entirety of forest on the developable properties should be protected by placing it within a conservation easement on private, open space land or within land that would be dedicated as park.
13. A significant portion of **MB-4** lies in developable land. To protect the upland portion of the forest, as well as the riparian areas, staff recommends creation of a conservation easement on private common open space land over the entirety of the forest on the developable properties as part of a cluster development. To create a cluster development to achieve this object may require assemblage of the developable properties.

Table 1. Summary of Preservation Prioritization of Forest Stands in the Potomac Subregion

Preservation Category	Stand Number	Stand Rank	Ownership of Properties Containing Forest Stand			Staff Recommendations for Protecting Forest Stand ⁽¹⁾
			Parkland	Private, Already Developed or Committed for Development	Private, Developable or Redevelopable	
1	WB-9	1			all	• Park acquisition
	MB-6	2	mostly M-NCPPC	small portions of stand edges	some	• Continue protection • Cluster to maximize forest save and get restoration area if possible.
	DP-1	3	mostly M-NCPPC	small portions of stand edges	some	• Continue protection • Cluster to save entire stand or park acquisition.
	CJ-7	3	mostly in M-NCPPC	small portions of stand edges		• Continue protection
	MB-10	4	almost all in M-NCPPC	very small portions of stand edges		• Continue protection
	LGS-9	5	mostly in state park	southern and western edges		• Continue protection
	MB-2	6	mostly in M-NCPPC	small portions of stand edges		• Continue protection

Preservation Category	Stand Number	Stand Rank	Ownership of Properties Containing Forest Stand			Staff Recommendations for Protecting Forest Stand ⁽¹⁾
			Parkland	Private, Already Developed or Committed for Development	Private, Developable or Redevelopable	
	DP-4	6	national park			<ul style="list-style-type: none"> • Continue protection
	LGS-7	7	mostly in state park	very small portions of stand edges	some	<ul style="list-style-type: none"> • Continue protection • Cluster to save entire stand or park acquisition
	LGS-10	7	large part in state park	large part in created open space	some	<ul style="list-style-type: none"> • Continue protection • Park acquisition of forested HOA and private open space land • Cluster to save entire stand or park acquisition
	MB-1	8	M-NCPPC park			<ul style="list-style-type: none"> • Continue protection
	LGS-1	9	most in state park	very small portion of eastern edge	southeastern edge	<ul style="list-style-type: none"> • Continue protection • Protect riparian buffer and maximize forest save along boundary of developable property adjacent to park (develop only near Seneca Rd.)

Preservation Category	Stand Number	Stand Rank	Ownership of Properties Containing Forest Stand			Staff Recommendations for Protecting Forest Stand ⁽¹⁾
			Parkland	Private, Already Developed or Committed for Development	Private, Developable or Redevelopable	
	LGS-11	10	mostly in state park	eastern portion of stand		<ul style="list-style-type: none"> • Continue protection
2	DP-2	1		all		<ul style="list-style-type: none"> • Protect riparian buffers • Cluster to maximize forest save as part of site plan
	MB-9	2	large portion in M-NCPPC		large portion	<ul style="list-style-type: none"> • Continue protection • Cluster to save entire stand or park acquisition
	WB-5	3			all	<ul style="list-style-type: none"> • Park acquisition
	WB-6	3			all	<ul style="list-style-type: none"> • Park acquisition
	WB-4	4			all	<ul style="list-style-type: none"> • Park acquisition
	MB-7	5	large portion in M-NCPPC	some	large portion	<ul style="list-style-type: none"> • Continue protection • Park acquisition of developable properties
	RR-1	6	mostly in M-NCPPC	small portions of stand edges		<ul style="list-style-type: none"> • Continue protection

Preservation Category	Stand Number	Stand Rank	Ownership of Properties Containing Forest Stand			Staff Recommendations for Protecting Forest Stand ⁽¹⁾
			Parkland	Private, Already Developed or Committed for Development	Private, Developable or Redevelopable	
	LGS-3	7	large portion in proposed state park	large portion	large portion	<ul style="list-style-type: none"> • Continue protection • Support acquisition of proposed state park • Cluster to save entire stand or park acquisition • Consider park acquisition of stream valley open space on developed portions of the stand
	CJ-6	7	almost all in M-NCPPC	very small portions of stand edges		<ul style="list-style-type: none"> • Continue protection
	WB-3	8	almost all in M-NCPPC	very small portions of stand edges		<ul style="list-style-type: none"> • Continue protection
	DP-3	8	mostly in national park	small portions of stand edges		<ul style="list-style-type: none"> • Continue protection

Preservation Category	Stand Number	Stand Rank	Ownership of Properties Containing Forest Stand			Staff Recommendations for Protecting Forest Stand ⁽¹⁾
			Parkland	Private, Already Developed or Committed for Development	Private, Developable or Redevelopable	
	MB-3	9	most in M-NCPPC	small portions of stand	small portion	<ul style="list-style-type: none"> • Continue protection • Maximize forest save on portion of developable property adjacent to park
	WB-1	10	most in M-NCPPC	some	small portion	<ul style="list-style-type: none"> • Continue protection • Protect riparian buffers
	LGS-8	11	most in state park	small portion of southern edges		<ul style="list-style-type: none"> • Continue protection
	LGS-2	12		large portion	large portion	<ul style="list-style-type: none"> • Protect riparian buffers • Cluster to save entire stand or park acquisition
	CJ-4	12	almost all in M-NCPPC	very small portions of stand edges		<ul style="list-style-type: none"> • Continue protection
	LGS-4	13			all	<ul style="list-style-type: none"> • Cluster

Preservation Category	Stand Number	Stand Rank	Ownership of Properties Containing Forest Stand			Staff Recommendations for Protecting Forest Stand ⁽¹⁾
			Parkland	Private, Already Developed or Committed for Development	Private, Developable or Redevelopable	
3	MB-5	1		some	large portion	• Cluster
	MB-4	2		large portion	large portion	• Assemble developable properties and cluster
	CJ-5	2	almost all in M-NCPPC	very small portions of stand edges		• Continue protection
	WB-7	3			all	• Park acquisition
	MB-8	4		large portion	large portion	• Cluster to maximize forest save
	LGS-6	5		some	large portion	• Cluster to save entire stand or park acquisition
	WB-2	5	most in M-NCPPC	some	some	• Continue protection • Cluster
	CJ-1	5	all in M-NCPPC			• Continue protection
	WB-8	6	most in M-NCPPC	small portions of stand edges		• Continue protection

Preservation Category	Stand Number	Stand Rank	Ownership of Properties Containing Forest Stand			Staff Recommendations for Protecting Forest Stand ⁽¹⁾
			Parkland	Private, Already Developed or Committed for Development	Private, Developable or Redevelopable	
	CJ-3	7	most in M-NCPPC	small portions of stand edges		• Continue protection
	CJ-2	8	almost all in M-NCPPC	very small portions of stand edges		• Continue protection
	LGS-5	9	almost all in state park		small portions of stand edges	• Continue protection • Cluster to save entire stand or park acquisition

(1) There are four major staff recommendations for protection forest stands identified for high priority preservation. These recommendations area as follows:

Continue protection - Continue protection of that part of the forest stand within parkland. Park activities and uses should avoid reduction in size or fragmentation of the stand.

Park acquisition - Acquire property containing forest stand as parkland.

Protect riparian buffers - Protect riparian buffers through application of the Planning Board's *Environmental Guidelines* and the County Forest Conservation Law when the property containing the stand is reviewed as part of a proposed land development project under the normal County regulatory review process.

Cluster - One of the following: a) Develop only the non-forested portion of developable property that contains part or all of the forest stand. Forest stand may include both riparian buffer areas, as well as upland forest. Protect entirety of the forest stand through dedication of parkland or creation of conservation easements on private land, preferably common open space, as part of the development of the land. Cluster development should be low density; sewer service which requires construction of new lines through the forest stand should not be allowed. b) Cluster development to maximize forest preservation. c) Cluster development to save as much forest as possible.

Opportunities for Forest Restoration

14. Generally, non-wooded stream buffers are the highest priority areas for reforestation. It is particularly important to afforest stream buffers in those areas identified in the CSPA as priority subwatersheds. Priority subwatersheds are those that are recommended in the CSPA to be the first group of subwatersheds in the County to receive protection and management measures to achieve the following goals: protecting the highest quality streams; maintaining existing conditions and reversing past trends of stream deterioration; and restoring degraded streams, where feasible and cost-effective. Afforesting stream buffers in these subwatersheds would complement efforts to provide measures to protect and restore the targeted streams in a timely manner.

15. Other opportunities for reforestation are intended to accomplish one or more of the following: to plant in a non-wooded area within a forest stand (i.e., to fill in an interior gap); to plant between two more or less linear portions of a forest stand to create less edge for the stand (i.e., to fill in an exterior gap); or to connect two or more forest stands. These reforestation areas were identified using GIS data at a planning-level scale. If a forest-planting project is considered for any of these areas, it is recommended that a site-specific evaluation is conducted to determine any existing land uses that may preclude or limit a reforestation project.

The forest stands which include priority areas for forest restoration are shown in Table 2. This table does not include riparian buffer areas that are recommended for reforestation.

Table 2. Forest Stands with Priority Restoration Areas

Stand Number	Recommended Forest Restoration Areas		
	Interior Gap	Exterior Gap	Area Connecting Two Forest Stands
CJ-6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CJ-4	<input checked="" type="checkbox"/>		

Stand Number	Recommended Forest Restoration Areas		
	Interior Gap	Exterior Gap	Area Connecting Two Forest Stands
Small stands on AWTP property in Rock Run watershed		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DP-3		<input checked="" type="checkbox"/>	
Stream buffer forest in headwaters of Piney Branch on Traville Property (Watts Branch watershed)		<input checked="" type="checkbox"/>	
WB-2		<input checked="" type="checkbox"/>	
WB-4			<input checked="" type="checkbox"/>
WB-5		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
WB-6			<input checked="" type="checkbox"/>
Stream buffer area downstream of WB-6	<input checked="" type="checkbox"/>		
DP-2		<input checked="" type="checkbox"/>	
Stream buffer area adjacent to C&O Canal and southeast of DP-2		<input checked="" type="checkbox"/>	
MB-9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
MB-8		<input checked="" type="checkbox"/>	

Stand Number	Recommended Forest Restoration Areas		
	Interior Gap	Exterior Gap	Area Connecting Two Forest Stands
MB-7			<input checked="" type="checkbox"/>
MB-6		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MB-5			<input checked="" type="checkbox"/>
MB-3			<input checked="" type="checkbox"/>
MB-2			<input checked="" type="checkbox"/>
DP-1		<input checked="" type="checkbox"/>	
Small riparian buffer area west of DP-1 in same subwatershed		<input checked="" type="checkbox"/>	
LGS-1		<input checked="" type="checkbox"/>	
LGS-2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
LGS-3		<input checked="" type="checkbox"/>	
LGS-5		<input checked="" type="checkbox"/>	
LGS-7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
LGS-8		<input checked="" type="checkbox"/>	
LGS-10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
LGS-11	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>

POTOMAC SUBREGION FOREST ANALYSIS

A Technical Appendix to:

Recommendations for the Protection and Enhancement
of Forests in the Potomac Subregion

Maryland-National Capital Park and Planning Commission

September 1999

Executive Summary

The Potomac subregion consists of approximately 43,520 acres of Montgomery County roughly bounded by the I-495/I-270 corridor on the east, MD Rte. 28 on the north, Lower Great Seneca Creek on the west, and the Potomac River on the south. An assessment of the forest resources for this planning area was conducted as part of the environmental resources analysis undertaken to provide supporting information for the revision of the Potomac Master Plan.

Forests were inventoried and classified into deciduous, mixed deciduous-coniferous, coniferous, and successional forest types as part of the Potomac Subregion *Environmental Resources Inventory*. This information was updated to include most recent forest clearing information and used to define forest stands. The stands were then ranked by their priority for preservation based upon an analysis of several stand and watershed characteristics. Opportunities for forest restoration were also identified and prioritized based upon their proximity to streams and existing forest stands.

Several forest stands within each of the ranking categories were identified as high priority for preservation. Fortunately, many of them are located within existing county, state and federal park land which already provides them with a relatively high level of protection. The highest ranking preservation stand, however, is a unique forest community which exists in the Watts Branch watershed on a developable property south of the Travilah Quarry. Several other areas which make up portions of the highest ranking preservation stands are also on developable properties. Some of the more important ones are on tributaries to Muddy Branch and Lower Great Seneca Creek. The highest ranking restoration areas were the unforested stream buffers within the Watts Branch watershed because cumulatively, this watershed has the greatest number of them. Other important restoration opportunities are adjacent to existing forest stands within the Lower Great Seneca Creek watershed. The success of efforts to preserve the adjacent forest stands will in part determine whether the potential restoration areas are feasible.

Purpose of Study

The purpose of this study is to identify and generally characterize the various forest stands that are found in the Potomac Subregion, rank the stands with respect to their characteristics and the characteristics of the subwatersheds in which they occur, and choose stands which should be given consideration for preservation. This study is intended to be used in two ways: to ensure that the existing high quality forest stands are given consideration as part of developing land use recommendations for the update to the master plan for the Potomac Subregion; and to help guide future analysis of forest resources elsewhere in the county as part of the County's forest conservation program.

Benefits of Forest

Forests provide a variety of ecosystem and other benefits to the health of the environment. These benefits include reducing air pollution by trapping dust and filtering pollutants, reducing soil erosion and the impacts of flooding, and reducing the level of carbon build-up in the atmosphere which off-sets the effects of global warming. Forests also collect and filter rainwater, and from it generate and store groundwater. The porous soil created by decomposing leaves, bark, and fallen trees act as a huge sponge, absorbing water and purifying it as it seeps into the ground, surfacing later in springs, drilled wells, or as baseflow in a stream. The many layers of a forest ecosystem, from the canopy to the middle layer to the understory and ground cover, provide varying light and moisture conditions. This creates a multitude of habitats for plant and animal species, which contributes to biodiversity. Some of these species are often the most valued and endangered. Conserving forests and preserving these and other benefits is an essential part of the planning process.

Adverse Impacts to Forest

Threats to forest resources include both direct loss to land development and other land disturbing activities, and loss of forest benefits within the fragments of forest which remain after these activities. Existing State and County regulations, guidelines and other programs for forest conservation prioritize protection of forest in stream valley corridors and on other environmentally sensitive land (e.g., steep slopes), but often don't adequately protect large, mostly upland forest stands outside these areas. These large forest blocks provide the best opportunities for maximizing forest benefits. Forest clearing, particularly as part of land development, results in fragmentation or complete loss of these areas.

One of the most significant impacts of this fragmentation is edge effect which may influence up to the first 100 meters of the outside of a forest stand. In general, creation of a new forest edge by clearing causes a change in the light, temperature and wind regimes to

which the trees are exposed. This change causes regression along the edge from the more mature, shade tolerate species of the interior forest to pioneer, shade intolerant, and often undesirable (i.e., alien and invasive) species. When forest is fragmented into narrow corridors and stands as often occurs as part of land development, this edge effect can result in the loss of all interior forest habitat¹. Forest interior dwelling species, particularly birds, require large tracts of unfragmented forest to sustain them. Thus, it is important to preserve forest stands of adequate size and shape to minimize the effect of edge.

Overview of Forest Resources in the Potomac Subregion

There are approximately 10,500 acres of forest in the Potomac Subregion which covers about one third of the total subregion area. The largest component of the forest is deciduous woodland which comprises 80 percent of the total forest area in the subregion. Pure coniferous woodland stands are relatively rare, and in many cases have been planted by landowners. Stands of mixed deciduous and coniferous trees occur in areas where a young forest is succeeding to a mature deciduous forest or where soil conditions favor the growth of coniferous species. Successional woodlands exist mainly on the edges of more mature forest stands where land (primarily agricultural) has been left fallow long enough for a dense cover of young, pioneer trees to develop. The majority of the forest resources are associated with stream valleys and parks. Although several forest stands are fragmented by utility and road crossings, tracts of mature forest which are large enough to support forest interior dwelling plants and animals are also present.

Dominant tree species within the forest include oaks (*Quercus spp.*), tulip poplar (*Liriodendron tulipifera*), red maple (*Acer rubrum*), and sycamore (*Platanus occidentalis*) with associated American beech (*Fagus americana*), and hickories (*Carya spp.*) in some areas. Eastern red cedar (*Juniperus virginiana*), and Virginia pine (*Pinus virginiana*) are the dominant trees in successional stands. Understory trees and shrubs vary depending upon type of forest and the location of the stands². The larger forest stands in the subregion exist in the lower Great Seneca Creek and Muddy Branch watersheds where less dense residential and agricultural land uses predominate, and in park land along the Potomac River. Another significant forest area exists in the Watts Branch watershed. Although structure and species diversity is variable between these stands, they all generally exhibit good to very good overall quality.

¹ Interior forest is the area within a forest stand that is not exposed to edge effects. For this analysis, interior forest is assumed to be the area of the forest stands which is at least 300 feet (~100 meters) away from the stand edge.

² More detailed overall description of forests within the Potomac Subregion may be found in the *Environmental Resources Inventory*, MNCPPC, January 1998.

Technical Approach of Forest Analysis Study

This forest analysis has been conducted to identify areas that are suitable for forest preservation and restoration, and to assign each of them a level of relative priority. This information will then be used by planners to develop appropriate land use, regulatory, and public outreach strategies to ensure that forests in Potomac are adequately conserved and enhanced.

Methodology

A. Compiling and Updating Forest Resources Data

Two GIS forest coverages were used to begin the forest analysis. The first was the coverage created for the Commission by EA Engineering, Science and Technology, Inc. as part of the Potomac Master Plan analysis which identifies forest areas and general types (deciduous, mixed deciduous-coniferous, coniferous, and early successional) from 1990-94 aerial photos. The second was a coverage created by MCDEP which uses the Maryland Department of Natural Resources forest cover boundaries to identify forest stands as of 1990, their proximity to streams, and the amount of potential interior forest habitat within each one based on size and shape.

The two data coverages were updated to correct forest boundaries, identify individual forest stands, and incorporate subdivision plan approvals that have or will result in forest clearing. The changes included removing forest areas which have been cleared and combining stands which were shown to be divided by stream channels, but have forest canopy which connects over the stream.

B. Defining Criteria and Prioritization for Analyzing Forest Stand Preservation Potential

Prioritizing forest preservation areas involved a two-step approach of assigning forest stands into five general ranking categories and then ranking the individual stands within the top three.

Step 1 - The updated stand coverage was used to separate the stands into general categories which aid in ranking the importance of each stand for preservation. The categories used (in descending order of their priority) are outlined below along with the rationale for their use (See Figure 1 for categorization):

- | | |
|--------------------------|---|
| Preservation Category 1: | Large forests with significant amounts of potential interior habitat (both upland and riparian forest resources and the stands have low edge to area ratios). |
| Preservation Category 2: | Riparian forest that has potential for some interior forest |

- habitat (corridor width more than 600 feet).
- Preservation Category 3: Riparian forest that is between 300-600 feet in width (no interior forest habitat).
- Preservation Category 4: Riparian forest that is less than 300 feet in width.
- Preservation Category 5: Smaller upland forest.

Rationale: Size was considered to be one of the most important forest characteristics for preservation prioritization because the larger forests are most likely to provide high levels of biodiversity and high quality habitat for species sensitive to fragmentation and edge effects. Conservation is a critical need in high quality areas because once the resource becomes fragmented, important habitat is lost and not easily replaced. Due to the high correlation between forest and stream water quality, riparian forest areas are also prioritized with size being factored into their ranking. Although smaller upland forest areas received lower ranking because of the limited amount of habitat and water quality benefits they may have, these stands may be a very important part of overall neighborhood character.

Step 2 - Within each of the first three general ranking categories, individual stands were ranked using weighted scores that numerically represent the characteristics of the stands themselves and of the subwatersheds in which the stands lie. The parameters, the possible scores for each parameter, and rationale for using the parameters in ranking forest stands are outlined below. This analysis placed emphasis on parameters which could be readily analyzed with the available data and coverages. In future analyses, these parameters will likely be expanded and refined.

It should be noted that individual riparian forest stands of less than 300 feet in width (Preservation Category 4) and small upland forest areas (Preservation Category 5) were not ranked against each other. The narrow riparian areas are all high priority for retention and will likely be protected by application of existing guidelines and regulations as part of the County's normal development and regulatory review process. As previously mentioned, small upland forests may be important from individual neighborhood standpoints but are less important for forest conservation benefits.

The parameters used in establishing preservation priorities for the forest stands are as follows:

Parameters that Define Forest Characteristics

- 1) Forest Type
 - a. Deciduous = 4
 - b. Mixed Deciduous/Coniferous = 3
 - c. Coniferous = 2

d. Early Successional = 1

Rationale: Individual stand analysis was not possible for all the forest in Potomac, but staff field visits to several stands within each forest type indicated that forest type could be used as a general indicator of other forest stand characteristics such as: age, structure, and quality. The type was therefore used as a way of ranking the value of the stands based upon these characteristics. Most deciduous forests were medium aged to mature stands in good health with well developed understory vegetation, and varying degrees of alien and invasive species encroachment depending upon fragmentation of the stand. The mixed deciduous/coniferous forests were typically young to medium aged stands in good health with dense trees that still included a large percentage of the early successional coniferous species such as red cedar and Virginia pine. These stands generally contained a less developed understory and higher degrees of alien and invasive species encroachment due to slightly less upper canopy closure. Coniferous stands were typically planted white pine or young stands of red cedar and Virginia pine which had not yet developed much of a deciduous species presence. Early successional forests contained little or no forest structure and large amounts of alien and invasive species. The weight of this category was averaged for stands with more than one of these characteristics.

2) Documented Presence of state-designated R,T&E Species or Association with High Potential R,T&E Habitat

- a. Yes = 4
- b. No = 0

Rationale: Potential or actual presence of rare, threatened and endangered species within a forest stand was considered to be a component equal in importance to forest type and quality. For this analysis and limited geographic area, indicators of high potential for R,T&E habitat include: priority wetlands, State Natural Heritage identified biodiversity areas, and areas underlain by Diabase and Ultramafic (Serpentinite Outcrop) bedrock.

3) Stand Contains Potential Restoration Areas

- a. Stand contains two or more restoration areas = 2
- b. Stand contains one restoration area = 1

Rationale: Loss of a forest stand with a potential restoration area also results in loss of the restoration area.

4) Stand Contains Steep Slopes

- a. More than 50% of the forest stand contains greater than 15% slopes and the majority of these slopes are greater than 25% = 1
- b. Less than 50% of the forest stand contains slopes greater than 15% = 0

Rationale: Forest on steep slopes protect against erosion and subsequent sediment deposition into stream systems. Presence of slopes also increases habitat diversity due to the variation in aspects and hydrologic conditions. Topographical diversity contributes to regional biodiversity.

Parameters that Define Watershed Characteristics

1) Percent of the Subwatershed³ which is Forested

- a. Less than 50% existing forest within the subwatershed = 1
- b. Greater than or equal to 50% existing forest within the subwatershed = 0

Rationale: The benefits to water quality of having forest within a watershed are well documented. Fifty percent cover is used as the break point in this analysis because it represents the majority of the subwatershed. Fifty percent cover is also a recommended level of cover recommended in a recent analysis of tree and forest cover and runoff attenuation completed by American Forests (*Chesapeake Bay Regional Ecosystem Analysis*, American Forests, 1999).

2) Percent of the Total Subwatershed Forest which is Made Up by the Forest Stand

- a. Stand is greater than or equal to 2/3 of the total subwatershed forest = 3
- b. Stand is between 1/3 and 2/3 of the total subwatershed forest = 2
- c. Stand is less than 1/3 of the total subwatershed forest = 1

Rationale: The loss of forest stands which make up the majority of the existing total forest within a given subwatershed should be avoided. That is, such a stand most likely provides the majority of current forest-associated water quality benefits for the subwatershed.

³ For this analysis, subwatersheds correspond to those defined in the Montgomery County, Countywide Stream Protection Strategy (CSPS), February 1999.

3) Potential for Loss of the Forest Stand

- a. Entire forest stand is developable = 4
- b. Portion of stand is developable or developed but not in an easement = 3
- b. Entire stand on park land = 1

Rationale: Prioritizes the forest stands, or portions of stands, in the most potential danger of being lost.

4) Subwatershed CSPA Ranking

- a. Poor = 4
- b. Fair = 3
- c. Good = 2
- d. Excellent = 1

Rationale: Presence of forest within the subwatershed contributes to the level of water quality by filtering groundwater, reducing surface runoff, alleviating flooding and modifying temperatures of the stream environment. Forest within subwatersheds which have lower water quality is especially important to preserve because it may be the last major defense against further stream degradation. The weight of this category was averaged for stands that crossed subwatershed boundaries.

C. Defining Criteria and Prioritization for Analyzing Forest Restoration Opportunities

Potential restoration areas were grouped into four general ranking categories. The categories used (in descending order of their priority) are outlined below along with the rationale for their use (See Figure 3 for categorization). Ranking of the restoration areas within each of the general categories will be done after land use recommendations have been made and forest preservation areas are identified. The type of ranking criteria which will be used to formulate a future reforestation/restoration approach are included for information.

- Restoration Category 1: Unforested riparian buffer areas up to 150' from the stream bank.
- Restoration Category 2: Interior forest gaps.
- Restoration Category 3: Exterior forest gaps.
- Restoration Category 4: Gaps of 500' or less between two forest stands.

Rationale: Riparian forests provide a number of valuable functions to a stream's overall health

and the water quality of a subwatershed/watershed. Additionally, riparian forests are important to aquatic habitats, as stream organisms use energy from organic material produced outside the stream, usually in the form of coarse particulate leaf litter. Interior forest gaps are unforested areas which are completely surrounded by existing forest. Exterior forest gaps are unforested areas adjacent to forest stands which are surrounded by existing forest except for gaps of less than 500 feet. Filling interior and exterior forest gaps increases the overall amount of forest and provides additional potential interior forest habitat for plants and animals with a minimum amount of forest planting.

The following are restoration area parameters which will be used to formulate future reforestation priorities. These parameters may be revised based upon results and recommendations of the environmental modeling being completed for the Subregion.

- 1) Stream length unforested
- 2) Location within headwaters
- 3) Amount of total forest within a subwatershed
- 4) CSPA Watershed Management Category of a subwatershed
- 5) Presence of existing old field habitat
- 6) Association with potential R,T&E habitat
- 7) Potential for creation of interior forest habitat
- 8) Development status of parcel
- 9) Ownership of already developed land containing restoration areas

Analysis and Results

A. Preservation Priorities

Tables 1 through 3 show the results of the preservation ranking analysis for each of the stands within the first three general prioritization categories. Refer to Figure 1 for stand locations. Appendix A contains the individual scores of each forest stand that form the basis for the rankings.

Preservation Category 1 - Most of the highest priority forest stands are located within the Lower Great Seneca Creek and Muddy Branch watersheds. Two are within the area which drains directly to the Potomac River, and the Watts Branch and Cabin John Creek watersheds each have one Category 1 stand. The stand which obtained the highest priority ranking in this category (WB-9) is on developable property south of the Travilah Quarry in Watts Branch. The stand is the only forest with significant amounts of both upland and interior forest in the watershed. It is also located on soils derived from serpentinite rock which support a unique plant community including several rare plants and a wide variety of oak species which is rare in the county.

The majority of the other Category 1 forest stands are located within county, state and federal park land which increases the likelihood that they will be preserved. There are, however, significant portions of some of these stands which are on developable properties (see Figure 2 for locations). The highest priority of these forest areas are part of forest stands extending from park land in the Muddy Branch and Direct Potomac watersheds (MB-6 and DP-1). The DP -1 areas contain high quality deciduous trees and are part of riparian forest that is greater than 300 feet wide and is part of a larger stand that has the potential for rare, threatened or endangered species. The MB-6 area is successional forest which is also associated with riparian area. Both of these areas could be combined with potential restoration areas⁴ to create forest interior habitat.

Other portions of high priority stands on developable property are located within the lower Great Seneca Creek watershed (LGS-7 and LGS-10). Although the stands obtained the same priority ranking, those forest areas of LGS-7 which are on developable land are particularly important because in addition to having high quality deciduous forest associated with riparian areas, they are also large enough to have interior forest habitat; these areas also contribute to the amount of forest interior in LGS-7. This is also true for portions of stand LGS-10 which are outside the existing park land and which lie within both already developed and developable land. The remaining portion of the high quality stands outside park land (LGS-11) is also adjacent to park land and contributes to the overall forest interior within LGS-11.

Table 1. Ranking for Category 1 Preservation Stands

<u>Stand Number</u>	<u>Stand Score</u>	<u>Stand Rank</u>
WB-9	17.5	1
MB-6	17.2	2
DP-1	17.0	3
CJ-7	17.0	3
MB-10	16.5	4
LGS-9	14.5	5
MB-2	14.0	6
DP-4	14.0	6
LGS-7	13.0	7
LGS-10	13.0	7
MB-1	12.0	8
LGS-1	11.0	9
LGS-11	10.0	10

⁴ Potential restoration areas are displayed on Map B.

Preservation Category 2 - Forest stands in the next highest priority level are distributed throughout all the watersheds within the subregion. Like the highest priority stands, a significant amount of the Category 2 forest areas are also within existing park land. Several important stands and portions of stands, however, are on developable property. The highest ranking stand within this category is one of these (DP-2). The stand is associated with a tributary which drains directly to the Potomac River and is on a property which is already committed for development, but has not completed the subdivision approval process. The stand contains very high quality deciduous forest which by virtue of its location adjacent to the Potomac River is potential rare, threatened and endangered species habitat. The stand is also characterized by a large amount of sensitive steep slope areas.

A portion of the next highest priority stand (MB-9) is also located on developable property. This stand contains good quality deciduous forest and a high priority restoration area which could be combined to create interior forest habitat associated with a riparian area. The next three highest ranking stands (WB-5, WB-6, and WB-4) are all within the portion of the Watts Branch watershed which is influenced by the presence of serpentinite rock. Although past installation of utilities (i.e., power transmission lines and gas pipelines) has resulted in fragmentation of the overall forest into these stands, they still support the unique plant community discussed above with only moderate amounts of edge species invasion. In addition, they are also laced with streams and very high quality wetlands. It should be noted that the development pattern that would be needed to protect these streams and wetlands if the properties develop would severely fragment the remaining forest. This additional fragmentation along with the associated impacts from grading would most likely result in total loss of this very sensitive forest community.

Other priority forest areas within this category are also on developable property. These include a portion of stand MB-7 in the Muddy Branch watershed. Although it has been fragmented by location of a house within the stand, significant areas of deciduous and mixed forest exist adjacent to existing park land. In the lower Great Seneca watershed along Hookers Branch, several areas exist which are important both because of their location along the stream and because the remaining forest within the stands is on developed land and not protected as park land (LGS-3, LGS-2, & LGS-4). They contain good quality deciduous forest with some areas of mixed forest also present.

Table 2. Ranking for Category 2 Preservation Stands

<u>Stand Number</u>	<u>Stand Score</u>	<u>Stand Rank</u>
DP-2	20.0	1
MB-9	19.0	2
WB-5	18.0	3
WB-6	18.0	3
WB-4	17.5	4
MB-7	16.5	5
RR-1	16.0	6
LGS-3	15.5	7
CJ-6	15.5	7
WB-3	15.0	8
DP-3	15.0	8
MB-3	13.5	9
WB-1	13.0	10
LGS-8	12.5	11
LGS-2	11.5	12
CJ-4	11.5	12
LGS-4	11.0	13

Preservation Category 3 - Among the stands ranked within the next category, only a few areas are not within existing park land. These include significant portions of the two highest ranking stands (MB-5 & MB-4) which both contain good quality deciduous forest. Loss of these areas would significantly reduce the benefits provided by these stands. All of stand WB-7 in the Watts Branch watershed is high priority for preservation because it contains very good quality, mature deciduous forest associated with very steep stream valley slopes. MB-8 and LGS-6 are important stream valley forest remnants. LGS-6 contains better quality, mature deciduous forest and MB-8 is successional with some associated coniferous forest. The remaining Category 3 area is a portion of stand WB-2 which is most important if it can be combined with the potential restoration area to create a larger stand with forest interior habitat.

Table 3. Ranking for Category 3 Preservation Stands

<u>Stand Number</u>	<u>Stand Score</u>	<u>Stand Rank</u>
MB-5	17.0	1
MB-4	15.0	2
CJ-5	15.0	2
WB-7	14.0	3
MB-8	12.7	4
LGS-6	11.0	5
WB-2	11.0	5
CJ-1	11.0	5
WB-8	10.0	6
CJ-3	9.7	7
CJ-2	9.5	8
LGS-5	8.7	9

Preservation Categories 4 and 5 - As discussed in the Methodology section, Category 4 and 5 forest stands were not ranked against one another. Within Category 4, all the stands are very high priority for preservation since they usually represent minimum stream buffers and are the last defense between the streams and the development that has already occurred. The buffers must be saved when properties are developed so most of these stands will be preserved. In a few instances, Category 4 stands have been delineated which contain forest area that extends beyond the minimum stream buffers but doesn't really fit into the next higher category. When these instances occur on developable property, attempts should be made to save all the stand.

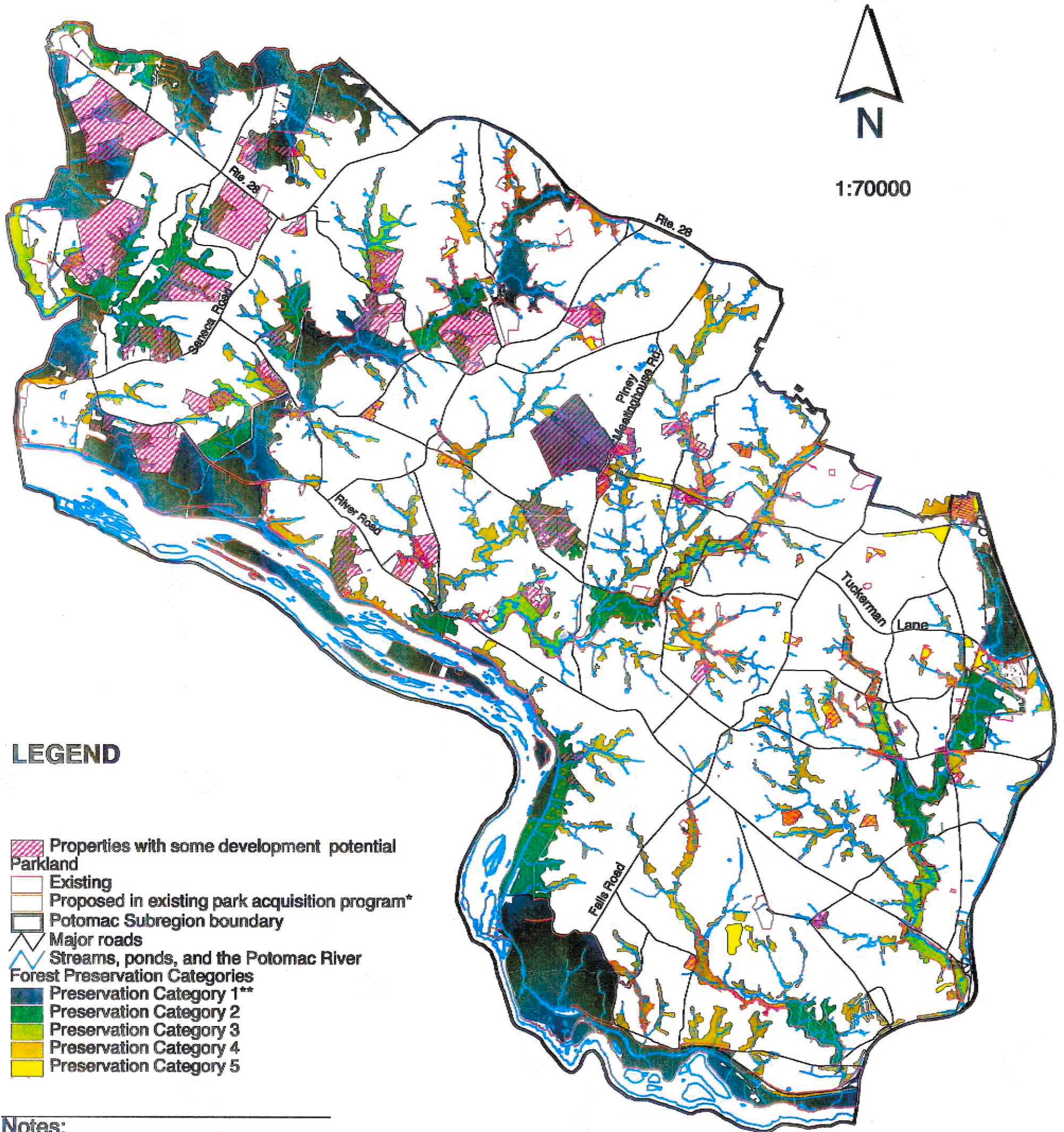
Category 5 forests on developable properties may also be high priority for preservation. Consideration should be given to the contribution these stands may make toward neighborhood character. In some instances, a stand may be the last remaining forest within an otherwise developed neighborhood and could be an opportunity to get some green space. One Category 5 forest which exists on an undeveloped property in the northwest quadrant of the intersection of MD Interstate 270 and Montrose Road, is significant because of its size and the character of some of the forest. For its location, it is unique to have a forest as large as this stand. Based on size alone it would be a priority to try and preserve the stand, however, its location next to a major interchange and the fact that the stand contains no associated environmentally sensitive areas makes this unlikely. At a minimum, the portions of the stand which contain mature, high quality deciduous forest and are associated with very steep slopes along Seven Locks Road are very high priority for preservation. Other areas of mature forest within the stand should also be given consideration as part of development.

B. Restoration Priorities

Potential restoration areas are shown on Figure 3. Based on the general ranking categories for restoration areas, most of the highest ranking restoration areas (i.e., Restoration Category 1) are within the stream buffers along all the tributaries of Watts Branch. Unfortunately, nearly all these areas and a significant amount of unforested buffers in other watersheds are on privately owned, developed residential lots. Although restoration strategies for unforested buffers on open space, park land, larger developed lots and developable properties should be the highest priority, options for the other lots also need to be considered.

Like Restoration Category 1 areas, the Category 2 and 3 restoration areas which are on open space, park land, larger developed lots and developable properties are the highest priorities. The availability of the other Category 2 and 3 areas is largely dependent upon the decisions which are made on forest preservation. Almost all the forest gaps (Category 4 Restoration Areas) are existing utility easements between stands. Although reforestation of these areas is most likely not feasible, other types of woody vegetation communities which would minimize the edge effects caused by the gaps need to be explored.

**Figure 2.
Forest on Properties with Some Development Potential**



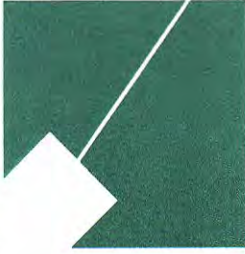
LEGEND

- Properties with some development potential
- Parkland
- Existing
- Proposed in existing park acquisition program*
- Potomac Subregion boundary
- Major roads
- Streams, ponds, and the Potomac River
- Forest Preservation Categories**
- Preservation Category 1**
- Preservation Category 2
- Preservation Category 3
- Preservation Category 4
- Preservation Category 5

Notes:

* Does not include staff recommendations for park acquisition found in this analysis

** Although not discussed in this analysis, forest on islands in the Potomac River are part of Preservation Category 1.



October 18, 1999

Memorandum

To: Callum Murray, Potomac Team Leader
Community Based Planning Division

Via: Mary Dolan, Planning Supervisor *MD*
Countywide Planning Division-Environmental

From: Cathy Conlon *CC*
Countywide Planning Division-Environmental

Subject: Addendum to the Recommendations for the Protection and Enhancement of
Forest in the Potomac Subregion

In response to comments made by the Master Plan Advisory Group during the recent meeting at which the results of the Forest Analysis were presented, I am submitting this memo as an addendum to the *Recommendations for the Protection and Enhancement of Forest in the Potomac Subregion*.

Although general recommendations for forest stands within preservation categories 4 and 5 were covered in the technical appendix, we would like to reiterate them and provide more specific recommendations.

Preservation Category 4 Forest

Category 4 forest stands (minimum riparian buffers) should all be considered high priority for preservation. This should be possible through application of stream buffers per the Planning Board's *Guidelines for Environmental Management of Development in Montgomery County*. In instances where buffers would be insufficient to protect the entirety of the stand, cluster development and/or park acquisition should be considered. One location where acquisition may be appropriate to preserve this type of forest is the surplus school site located at the intersection of Circle Drive and Spring Drive adjacent to Glen Hills Local Park.

Preservation Category 5 Forests

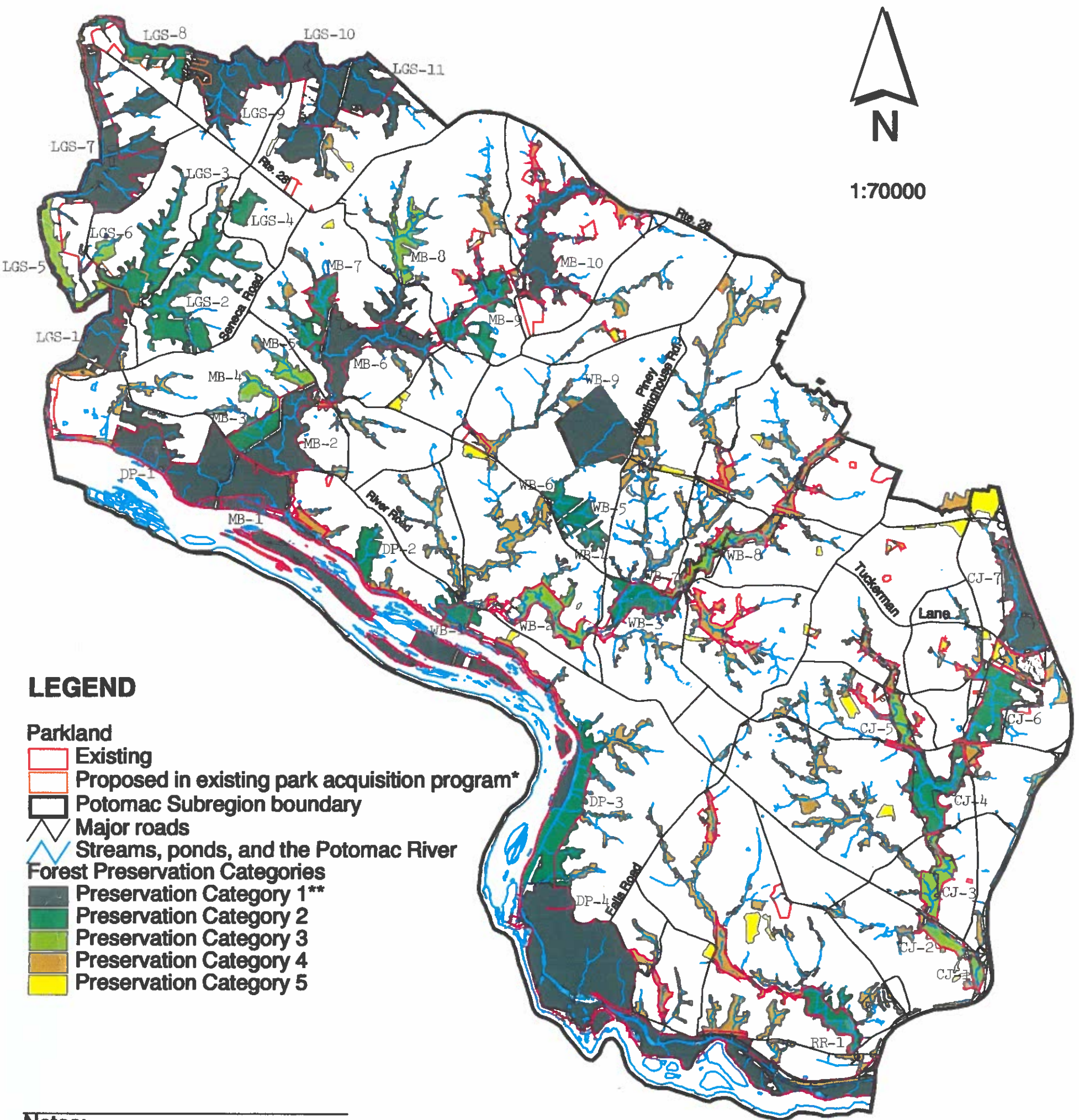
Category 5 forest stands (isolated upland forests) may be high priority for preservation because they help to establish community character. However, most are located in high density zoning areas where it is unlikely they can be saved as part of development. Acquisition should be considered the primary way of preserving these forests intact. One location which could be considered because of its availability is a surplus school site at Brickyard Lane east of Horseshoe Lane and across the street from Rock Run Stream Valley Park. Another location which is a high priority in this category is the Fortune Parc site at the intersection of Seven Locks Road and Montrose Road. At a minimum, the portions of this forest which contain mature, high quality deciduous trees associated with the very steep slopes along Seven Locks Road should be preserved. Since this property is large and will likely be developed in a mix of uses, this should be possible through adjustment of site layout.

In response to questions raised by the advisory group, I am also providing the following table. It details total forest acreage within each of the preservation categories and the amount found on developable or redevelopable properties. It also includes the amount of forest acreage from developable or redevelopable properties that is recommended for park acquisition in this report.

Summary of Existing Forest Acreage and Recommendations for Preservation Through Park Acquisition			
Forest Preservation Category	Total Acreage	Acreage on Developable or Redevelopable Properties	Acreage From Developable or Redevelopable Properties Recommended for Park Acquisition in this Report⁽¹⁾
1	4,180	515	289
2	2,275	514	305
3	847	111	6
4	2,928	195	13.5
5	259	108	8
TOTALS	10,489	1,443	621.5

⁽¹⁾ Acreage includes forests recommended for park acquisition if cluster development options are not used. It does not include forest that could be protected through the application of cluster or environmental buffers, as defined in the Planning Board's Environmental Guidelines, during the development process.

**Figure 1.
Forest Preservation Categories in the Potomac Subregion**



LEGEND

- Parkland**
- Existing
 - Proposed in existing park acquisition program*
 - Potomac Subregion boundary
 - Major roads
 - ~ Streams, ponds, and the Potomac River
- Forest Preservation Categories**
- Preservation Category 1**
 - Preservation Category 2
 - Preservation Category 3
 - Preservation Category 4
 - Preservation Category 5

Notes:

* Does not include staff recommendations for park acquisition found in this analysis

** Although not discussed in this analysis, forest on islands in the Potomac River are part of Preservation Category 1.