Chapter 1

Existing Environmental Conditions

The following description of the natural resources of Damascus and vicinity are organized in three sections. The first part of the chapter provides an overview of biota and biotic conditions found within the study area, including forest resources, wetlands, parkland and agriculture, habitats of rare, threatened and endangered species, wildlife, fish, sensitive areas, and green infrastructure. The second part of the chapter examines the abiotic characteristics, including geology, groundwater, floodplains, air quality, noise, and the availability of sewer and water service. The final section covers the tributary watershed of the study area.

Biotic Characteristics

Forest Resources

The forests of the Damascus Study Area (see Figure 3) provide various environmental functions, including providing habitat for a range of plants and animals, enhancing air quality by filtering particulates and absorbing nitrogen oxides, and contributing to the hydrologic cycle through evapotranspiration. Along streams and waterways, forests play a vital role in maintaining water quality by filtering and reducing surface runoff, reducing stream bank degradation, helping to alleviate flooding, and moderating stream temperature fluctuations. The quality of life in anthropogenic communities is also improved by forests and trees through decreasing the need for cooling and heating, providing recreation, aesthetic enhancement, and perhaps most importantly providing a visible and psychological link with Nature.

Forest Description

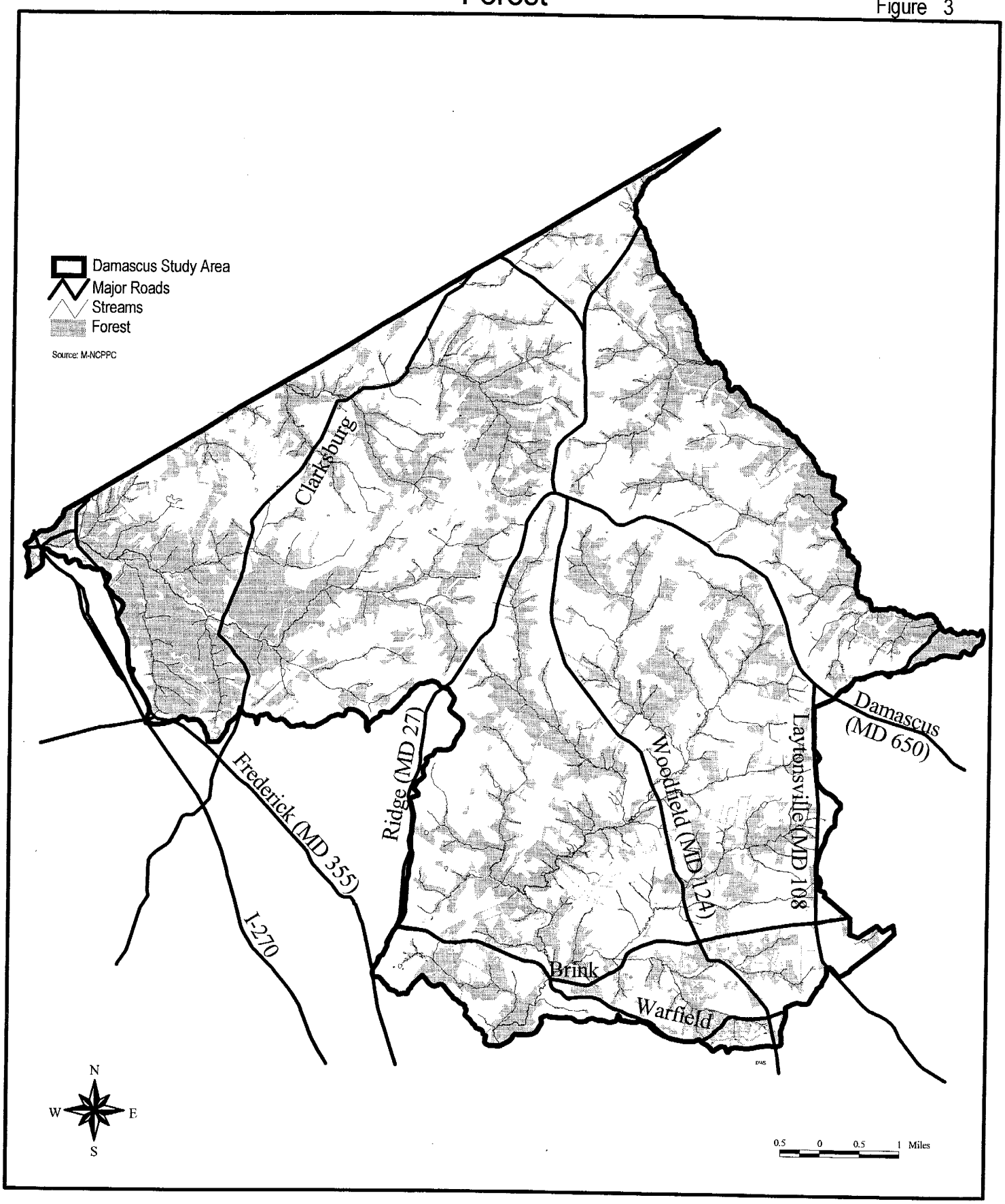
Using Geographic Information System (GIS) and aerial photographic technology, it has been determined that deciduous forest is the predominant forest type of the Damascus Study Area. Coniferous stands can be found within many of the larger deciduous forest areas in Little Bennett Regional Park, the Bennett Creek headwaters, along the Patuxent River, and along Great Seneca Creek. Mixed and successional stands are also found throughout the study area; successional stands especially along forest and field edges.

Deciduous forests of Eastern North America are comprised of various forest stands which differ in age, species, and quality throughout their extent. Dominant tree species in deciduous forests vary with topography. Mature upland stands are dominated by *Quercus alba* (white oak), *Q. rubra* (northern red oak), *Q. prinus* (chestnut oak), *Q. coccinea* (scarlet oak), *Carya tomentosa* (mockernut hickory), and *C. glabra* (pignut hickory). *Liriodendron tulipifiera* (tulip poplar) is an important secondary component of upland areas. Slopes and lowland areas dominated by *L. tulipifiera* in association with *Acer rubrum* (red maple) and *Platanus occidentalis* (American sycamore). *Prunus serotina* (black cherry) is an important associated species along with *Fraxinus pennsylvanica* (green ash), *Juglans nigra* (black walnut), *Nyssa sylvatica* (black gum), *Ulmus americana* (American elm), and *Fagus grandifolia* (American beech). Typical woody understory found in the deciduous forests of Montgomery County includes *Lindera benzoin* (spicebush), *Cornus florida* (flowering dogwood), *Kalmia latifolia* (mountain laurel), *Carpinus caroliniana* (musclewood), *Vaccinium spp.* (blueberries), and *Viburnum spp.* (viburnums) with occurrences of more unusual species such as *Ostrya virginiana* (ironwood) and *Hammamelis virginiana* (witchhazel).

The mixed deciduous/coniferous forests contain many of the same species of trees as the deciduous forest in association with *Pinus virginiana* (Virginia or scrub pine) and *Pinus strobus* (white pine). (In scattered areas along the mainstem of the

Forest

Figure 3



Patuxent River, *Tsuga* canadensis (eastern hemlock) is also found.) In the younger mixed forest stands *Juniperus virginiana* (eastern red cedar) replace the pines as the dominant associated coniferous tree.

Typical successional forest areas are dominated by *L. tulipifiera*, *A. rubrum*, and *P. serotina* in association with *J. virginiana*. Successional forest areas and old fields offer great opportunities for expansion of existing forest resources in the watershed.

Currently, many non-anthropogenic threats to forest health also exist. Non-native, invasive vegetation is a serious problem in many deciduous forest stands. The amount of damage from non-native invasive species competition varies from stand to stand, depending on the species involved and their growing characteristics (i.e. vine, groundcover, annual, perennial). In some stands non-native invasives are the most predominant species. They have a negative impact on natural succession and should be considered a major inhibitor to overall forest health and development. Individual non-native species include Ailanthus altissima (Tree-of-Heaven), *Alliaria petiolata* (garlic mustard), *Ampelopsis brevipedunculata* (porcelain berry), *Celastrus orbiculatus* (Asiatic bittersweet), *Hedera helix* (English ivy), *Lonicera japonica* (Japanese honeysuckle), *Microstegium vimineum* (Vietnamese stilt grass), *Polygonum perfoliatum* (Devil's tearthumb), and *Rosa multiflora* (multiflora rose) just to name a few.

Study area forests, like elsewhere in the county, have suffered from excessive and unnatural deer browse due to the large deer population. As a result, large areas of forest contain little to no typical understory trees, shrubs and/or herbaceous vegetation. This loss of younger vegetation, if left unchecked, will lead to a shift in succession, with serious consequences for flora and fauna of the Damascus area.

Important Forest Areas

In Montgomery County urbanization and agriculture have caused a significant loss of historic forests. Today the county is approximately 25 percent forested (opposed to the pre European settlement level of 95 percent) (Register of Champion Trees, 2003). Accordingly, conservation of all remaining forest resources is vital. High quality forest stands warrant preservation. Forest stand quality is a reflection of such characteristics as acreage of the stand, tree species and age, stand structure, percent of non-native invasive vegetation within the stand, and overall health. High quality forest stands are large enough to provide a variety of habitats, including forest interior.[1] They may contain tree species which are rare or the trees may be significant because of their maturity and size. High quality stands have more diverse forest structure including varying layers of tree canopy with associated understory trees, shrubs and herbaceous plants. Forest stands which are in good health and have a small percentage of non-native or invasive vegetation are also high quality.

Time and staff constraints prevented completion of the detailed field analysis needed to identify specific important forest stands in the study area for this report. However, a generalized analysis using the overall forest cover was accomplished. For this analysis, forest stand size and proximity to streams were used to identify significant forests. Stands, or portions thereof, that are greater than or equal to 100 acres or which create a corridor at least 300 feet wide along streams were included. These criteria were used because they generally identify stands that contain or provide connections between forest interior dwelling bird species habitat. As described later in this report, forest interior habitat is important to protect.

Table 1 summarizes the location and significance of forest within the study area. It also summarizes acreage by watershed of interior forest. About 40 percent of the study area's forests are found on parkland and therefore have at least a minimum level of protection.

Wetlands

According to the definition listed in both federal and state wetland statutes, a wetland is an area that is inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands in the study area, as documented by the Maryland Department of Natural Resources Digital Ortho Quarter Quad (DOQQ) are shown in Figure 4.

Study Area Forest by Location and Significance

Table 1

Watershed	Watershed Area	Total Forest Area		Forest in Parkland		Significant Forest[2]				Forest Interior Habitat[1,3]	
	Acres	Acres	% of watershed area	Acres	% of total forest acreage	Acres	% of total forest acreage	Acres in parkland	% of significant forest in parkland	Acres	% of watershed area
Bennett Creek	7,081	2,196	31	13	<1	1,696	78	9	<1	344	5
Hawlings River[4]	303	39	13	1	3	19	48	<1	1	0	0
Little Bennett Creek	8,165	3,804	47	2,761	73	3,354	88	2,619	78	1,315	16
Middle Great Seneca Creek[4]	1,349	448	32	315	70	378	84	301	80	72	5
Upper Great Seneca Creek	16,791	4,824	29	1,416	29	3,715	77	1,326	36	633	4
Upper Patuxent River	6,807	2,344	34	741	32	2,090	89	1,029	49	430	6
TOTAL	40,496	13,655	34	5,480	40	11,252	83	5284	47	1,794	4

(1) Interior forest is defined as any forest that is found at least 300 feet from the outer periphery of the stand.

(2) Significant Forest Area is defined as forest which may contain habitat suitable for interior dwelling birds or which provides migration corridors; consists of forest areas that are at least 100 acres in size and/or riparian corridors which, at a minimum, are 300 feet in width. Often will include interior forest.

(3) Reflected in significant forest as well.

(4) Only a small portion of these watersheds is located within the Damascus Study Area

Wetlands have soils which are saturated or flooded for a significant portion of the growing season each year. The wet soil conditions smother the root systems of typical upland plants, making it difficult for them to grow and reproduce. In wetlands therefore, the plant community changes to one dominated by plants having physiological adaptations which enable them to grow and thrive in the wet conditions. Often, plants which have become adapted to wetland areas occur nowhere else. For this reason, wetlands harbor comparatively higher numbers of rare, threatened, and endangered species than upland habitats.

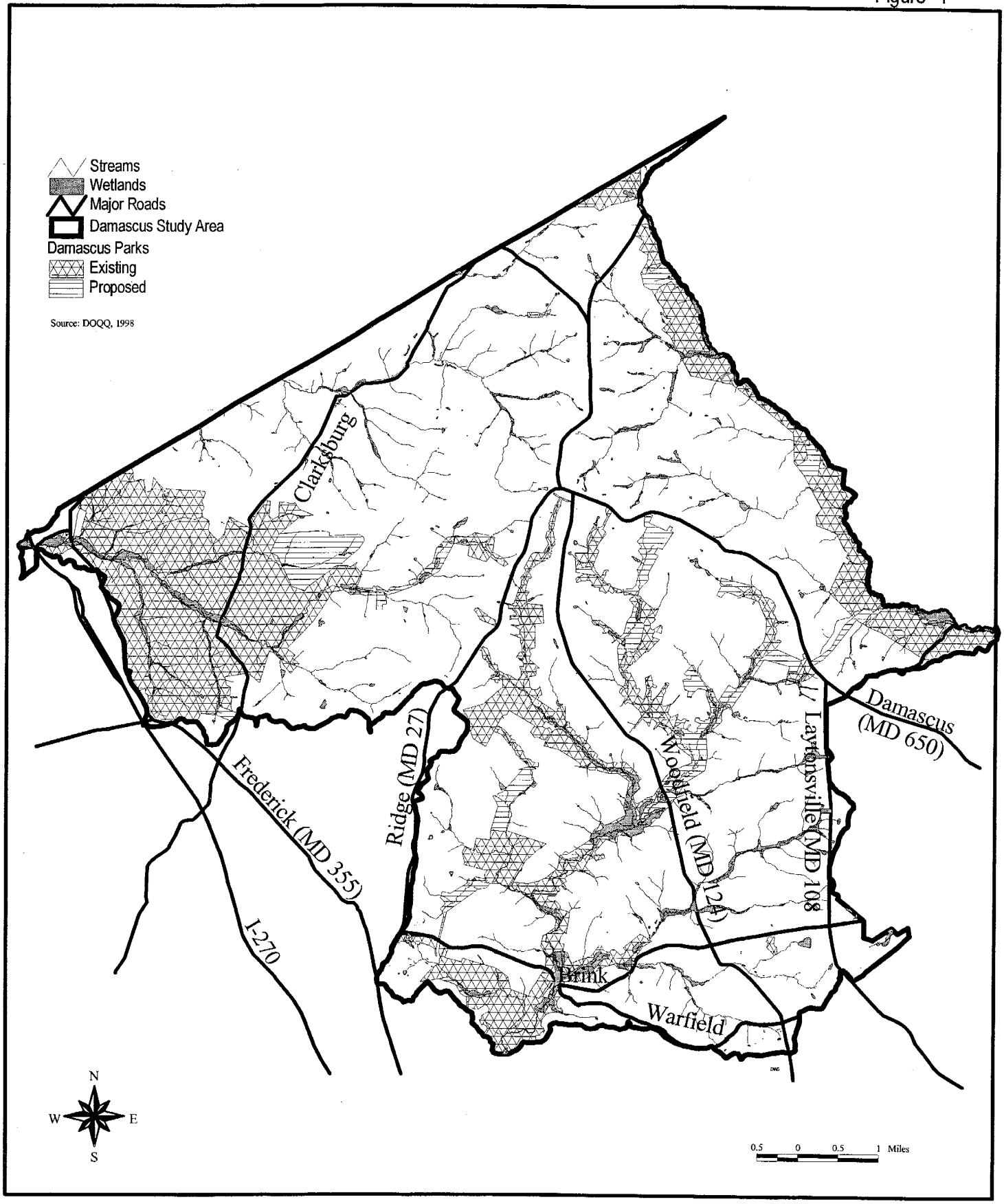
Many species of animals use wetlands for some portion of their life cycle, and some kinds of animals, such as amphibian species, are completely dependent on damp soils and standing pools of water for their survival. Other animal species, especially insects, may depend on host plants which occur only in wetlands. Because many plants and animals in wetlands are specialized to survive in saturated or flooded soil conditions, wetlands have unique biological communities which contribute significantly to the biological diversity of the county.

Wetlands frequently occur where the water table intersects low areas in the landscape. This also means that wetlands often are found in close proximity to stream systems. The location of these wetlands, coupled with some unique physical, chemical, and biological processes, allows wetlands to provide important water quality and flood control functions. The combination of water quality, flood flow attenuation, and habitat functions make wetlands valuable components of the landscape. Unfortunately, many wetlands which were historically present have been lost to agriculture and development. In recognition of this, various regulations and guidelines have been passed at the federal, state, and local government levels in an effort to protect and restore wetlands.

Among the water quality goals for Montgomery County are to "protect, maintain, and restore high quality chemical, physical, and biological conditions in the waters of the state in the county; reverse the past trends of stream deterioration through improved water management practices; maintain physical, chemical, biological, and stream habitat conditions in county streams that support aquatic life along with appropriate recreational, water supply, and other water uses; (and) restore county streams, damaged by inadequate water management practices of the past, by reestablishing the flow regime, chemistry, physical conditions, and biological diversity of natural stream systems as closely as possible (Montgomery County Code, Chapter 19, Article IV)." Protection and restoration of wetlands and wetland functions is vital to the achievement of these goals.

Wetlands

Figure 4



The DOQQ wetland inventory prepared for the Maryland Department of Natural Resources (Md. DNR) and completed in 1998 formed the basis for the representation of wetland resources in the Damascus Study Area[3]. The inventory represents interpretation of 1993-94 aerial photography. Staff has found the DOQQ inventory to be considerably more accurate than either the federal National Wetlands Inventory (NWI) or the maps of hydric soils in Montgomery County in depicting the likely locations of wetlands, although the DOQQ inventory does include errors of both addition and omission. In general, staff observed that the DOQQ's tended to overestimate the total area of wetlands; however, most areas depicted as wetlands contained at least pockets of wetlands embedded within floodplain plant communities. In a few cases, wetlands are more extensive than represented by the DOQQ. However, as previously noted, for the Damascus Study Area, no field work was conducted to supplement this state-mapped information.

Based on the DOQQ information, wetlands account for approximately three percent of the total acreage of the Damascus study area (see Table 2, below). According to the most widely accepted standard for wetlands classification in the United States, most of the Damascus Study Area wetlands (approximately 58 percent) are palustrine forested (PFO) wetlands, meaning that they occur in low areas adjacent to streams with trees the dominant vegetation. Palustrine emergent (PEM) wetlands, which typically lie near streams and are dominated by emergent vegetation, account for 18 percent of the study area's wetlands. (Emergent vegetation consists of herbaceous plants which may have their root systems temporarily or permanently flooded, but which cannot survive if the entire plant is covered with water for any significant length of time.) Approximately 11 percent of the wetlands in the study area are palustrine scrub-shrub (PSS), wetlands which occur near streams and are dominated by shrubs and small trees.

Ponds and farmed wetlands account for the remaining wetland acreage (about six percent each) in the study area. In Montgomery County, ponds are man-made, and most in the study area are associated with current or past agricultural uses. Some ponds may have been constructed for the purposes of controlling stormwater runoff from land development projects. Farmed wetlands are natural wetlands where the soil surface has been mechanically or physically altered for the production of crops; if the farming operation is halted, wetland plant communities will become reestablished. Such areas are good potential candidates for wetland restoration projects.

All the wetlands in the study area lie within a Use I-P or III-P watershed. By definition (Code of Maryland Regulations 26.23.01.01), wetlands adjacent to any Use III stream are considered to be wetlands having "significant plant or wildlife value".

Study Area Wetlands(1) on Public Lands(2)

Table 3 gives some sense of the extent to which type of long-term protection is provided to wetlands in the Damascus Study Area. Generally, the highest level of protection for natural resources occurs if conservation areas within parkland are created over and around these resources. Using GIS data, staff identified wetlands that currently lie within state or M-NCPPC parkland (see Figure 4). Although this preliminary evaluation does not distinguish the different types of parkland (e.g., conservation parks, local parks, regional parks, etc.), the results give an indication where wetlands are relatively well-protected from significant direct disturbance. It should be noted that wetlands, as well as other natural features, may be protected by other means, such as conservation easements on private land. The location and extent of such protective easements were not available to be included in this evaluation.

[3] **NOTE:** This section contains a limited study of the wetland resources for the Damascus Study Area. Severe limitations on staff resources have precluded a comprehensive, field-based assessment of the wetland resources in the study area. Topography along many of the streams in the study area indicates a high possibility of greater wetland acreage than is represented in the DOQQ. Limited field visits by staff appear to verify this.

Study Area Wetlands[1] by Type

Table 2

Wetland Type[2]	Watershed (Acres)						Total (Acres)
	Bennett Creek	Hawlings River	Little Bennett Creek	Middle Great Seneca Creek	Upper Great Seneca Creek	Upper Patuxent River	
Forested (PFO)	46	7	197	18	312	132	712
Emergent (PEM)	6	3	20	16	158	17	220
Scrub Shrub (PSS)	21	0	57	0	41	18	137
Ponds (PU and PAB)	<1	1	25	2	24	21	73
Farmed (Pf)	2	0	5	5	55	3	70
Riverine (R)	0	0	7	< 1	0	0	7
Total Wetlands	75	11	311	41	590	191	1219
Total Watershed in Study Area	7,081	303	8,165	1,349	16,791	6,807	40,496
Percent of Watershed Covered by Wetlands [3]	1%	4 %	4 %	3 %	4 %	3 %	3 %

(1) GIS coverage of wetlands (DOQQ), Earth Data 1998.

(2) Categories are adapted from Cowardin, et. al., 1979, Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service.

(3) Acreages and percentages are rounded to the nearest one acre and one percent, respectively.

Study Area Wetlands[1] Located on Parkland[2]

Table 3

Wetland Type	Acres of Wetlands																	
	Bennett Creek			Hawlings River			Little Bennett Creek			Middle Seneca Creek			Upper Great Seneca Creek			Upper Patuxent River		
	Total	In Park-land	% in Park-land	Total	In Park-land	% in Park-land	Total	In Park-land	% in Park-land	Total	In Park-land	% in Park-land	Total	In Park-land	% in Park-land	Total	In Park-land	% in Park-land
Forested (PFO)	46	1	2%	7	< 1	<14%	197	172	87%	18	14	78%	312	154	49%	132	59	45%
Emergent (PEM)	6	0	0	3	0	0%	20	14	70%	16	15	94%	158	75	47%	17	2	12%
Scrub-Shrub (PSS)	21	0	0%	0	0	—	57	52	91%	0	0	—	41	19	46%	18	3	17%
Ponds (PU and PAB)	<1	0	0%	1	0	0%	25	2	8%	2	0	0%	24	2	8%	21	1	5%
Farmed (Pf)	2	0	0%	0	0	—	5	0	0%	5	3	60%	55	33	60%	3	0.	0%
Riverine (R)	0	0	—	0	0	—	7	6	86%	< 1	< 1	100%	0	0	—	0	0	—
TOTAL	75	1	1%	11	< 1	< 9%	311	247	79%	41	32	78%	590	590	48%	191	65	34%

(1) GIS coverage of wetlands (DOQQ), Earth Data, 1998.

(2) Public lands include parkland owned by M-NCPPC and the state of Maryland.

Past field inventories of wetlands in this study area are limited to those found in M-NCPPC parkland. The Maryland Department of Natural Resources Natural Heritage Program conducted inventories of rare, threatened, and endangered plant populations and significant habitats in specific parklands in 1993, 1997, and 1999. These inventories identified significant wetland communities in three parks within the study area:

- A part of Magruder Branch stream valley in Damascus Recreational Park supports an extensive network of high-quality *Symplocarpus foetidus* (skunk cabbage) wetlands that are interconnected by small, braided streams and seeps. The stream valley is forested with *Acer rubrum* (red maple), *Liriodendrum tulipifera* (tulip poplar), *Fraxinus pennsylvanica* (green ash), and *Platanus occidentalis* (American sycamore). *Lindera benzoin* (spicebush) is the dominant understory shrub, often occurring with *Viburnum dentatum* (arrowwood). *S. foetidus* dominates the herbaceous layer in large areas that often cover several acres. Other wetland herbaceous plants include *Chrysoplenium americanum* (golden saxifrage), *Lilium superbum* (Turk's-cap lily), *Veratrum viride* (false hellebore), *Arisaema trifolia* (jack-in-the-pulpit), and various ferns, sedges, and grasses. DNR believes these wetlands to be exemplary examples of forested wetlands.

- Another segment of Magruder Branch in Damascus Regional Park supports a complex of forest and emergent wetlands which support some RTE plant populations. *Sanguisorba canadensis* (Canada burnet) is a state-threatened species, and is known to occur in only one other site in the county. *Stachys cordata* (Nuttall's hedge-nettle) is a state-highly rare species that is found in the open-canopy wetlands, and is found in no other place in the county, and in only one other site in the state.

  Along the stream valley of an unnamed tributary of Great Seneca Creek in Goshen Recreational Park, DNR has identified exemplary examples of seeps. These seep areas are part of a forested wetland complex found on the floodplain of the stream valley. Pockets of standing water are interconnected by a system of small, braided streams and seeps. Trees include *A. rubrum*, *L. tulipifera*, *F. pennsylvanica*, and *P. occidentalis*. *L. benzoin* and *V. dentatum* are the common understory shrubs. Other than *S. foetidus*, herbaceous plants include *C. americanum*, *L. superbum*, *V. viride*, and *A. trifolia*.

- Within Little Bennett Regional Park, DNR identified several high quality *S. foetidus* seeps scattered along Sopers Branch. One area of this network of seeps forms a large wetland habitat covering 10 to 20 acres. Wetlands within the floodplain and stream valley of the mainstem of Little Bennett Creek are designated by the state as Nontidal Wetlands of Special State Concern. Such wetlands support natural communities that are considered to be the best examples of Maryland's nontidal wetland habitats. Many of these special wetlands contain the last remaining populations of native plants and animals that are now rare and threatened with extinction in the state. The Nontidal Wetlands of Special State Concern in the Little Bennett stream valley supports a diverse community of plants and animals, including such state-listed species as the *Euphydryas phaeton* (the Baltimore checkerspot), a watchlist butterfly, *Sorex longirostris* (the southeastern shrew), a watchlist mammal, and S. hoyii winnemana (pygamy shrew) another mammal which is designated but not listed. Numerous species of salamanders, frogs, shrews, and birds (including many forest interior-dwelling bird species) have also been found within this stream valley.

  It should be noted that due to the increasing *Odocoileus virginianus* (whitetail deer) population, there is a possibility that many of these herbaceous plants may no longer be found in these parks or at the very least in as great of numbers.

Vernal Pools

Vernal pools are a type of cyclical wet/dry habitat that may not fall into the traditional definition of a wetland but which are nevertheless extremely valuable because they provide critical habitats for a variety of wildlife, especially various species of amphibians. Amphibians have been documented to be declining in populations world-wide and this declining trend is causing significant concerns in the scientific community. According to Maryland regulations, a vernal pool is a nontidal wetland in a confined depression that has surface water for at least two consecutive months during the growing season, and (a) is free of adult fish populations, (b) provides habitat for amphibians, and (c) lacks abundant herbaceous vegetation. It is possible to find vernal pools anywhere, not only in riparian areas but also in upland habitats. In some cases they can be quite isolated (i.e. disconnected from surface water hydrologic connections). When a pool fills with water and how long the water persists strongly influences what kinds of animal communities live in these pools.

An inventory is being conducted by the Montgomery County Department of Environmental Protection, in partnership with the USGS Patuxent Wildlife Research Center and M-NCPPC, to identify vernal pools in the county. The inventory is expected to take several years to complete and covers both public and private lands. A part of the Damascus Study Area including Little Bennett and Bennett Creek are included in the current (third) year of this inventory. Upper Great Seneca Creek was included in the first year of the inventory.

In the Great Seneca Creek watershed portion of the study area, preliminary results from the vernal pool inventory work indicate that there are vernal pool habitats along stream valleys within Great Seneca Stream Valley Park (downstream of Hawkins Creamery Road, downstream of Clematis Drive, downstream of Woodfield Road), Magruder Branch Stream Valley Park (downstream of Sweepstakes Road), Goshen Branch Park (downstream of Huntmaster Road), and North Germantown Greenway (upstream of Blunt Road).

Parkland and Agriculture

Approximately 19 percent of the study area is within public parkland, and 34 percent is in agriculture (see Figure 5 and Table 4). Montgomery County is a national leader in the preservation of agricultural lands, having already set aside over 53,000 acres. Agricultural land is found rather evenly throughout the Damascus Study Area, except for the town center. This fact is reflected in higher water quality being found in these areas due, in part, to the lower levels of imperviousness associated with agricultural land use. Parkland includes 878 acres, or 11 percent, of the agricultural land found in the study area. Parks contain many of the known sensitive areas of the study area. Whenever practical, this inventory distinguishes between resources in parkland and resources outside parkland.

Habitats of Rare, Threatened, and Endangered Species and Areas Likely to Contain Unusual Biological Communities

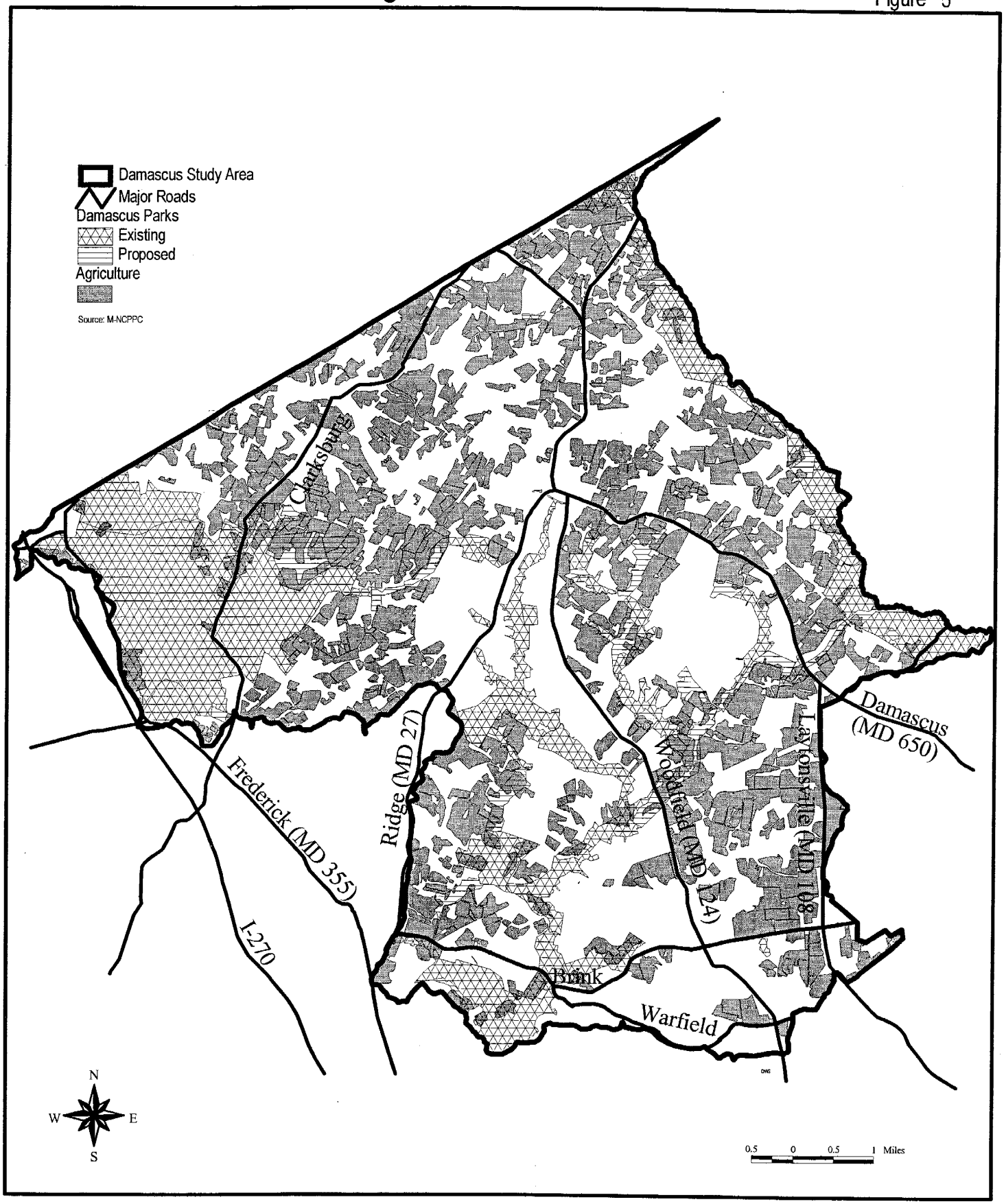
Wetlands, large contiguous forest blocks, and certain stream valleys are probable habitats for rare, threatened, and endangered species (RT&E). Many stream valleys in Montgomery County have been protected over time by their steep topography, excessive wetness, or floodplains. Where possible, they have been acquired as parkland. Besides providing important habitat for plants and animals, stream valleys historically have served as important migration corridors for many species.

The probability of finding RT&E species or unusual biological communities increases in areas underlain by certain bedrock types such as ultramafic and diabase rock formations and in areas of serpentine soils. There are six pockets of ultramafic rock in the study area (Patuxent River, Upper Great Seneca Creek, and Hawlings River watersheds). There is a seam of diabase rock that runs through the Middle and Upper Great Seneca Creek watersheds, disappears, and then reappears in a localized pocket along the Patuxent River. There are no serpentine soils found in the study area.

Most of the known locations of rare, threatened, or endangered species of plants and animals occur in Montgomery County's park system. Surveys for RT&E species and unusual biological communities have been conducted on parkland by the Maryland Department of Natural Resources Heritage and Biodiversity Conservation Program as well as by M-NCPPC staff. As

Agriculture and Parks

Figure 5



a result of these surveys, several areas within the park system have been designated as Biodiversity Areas. Biodiversity Areas included in the Damascus Study Area are shown in Figure 6. A list of rare, threatened and endangered plants identified in these areas is shown in Table 5. The significant habitats and communities identified in the surveys of the areas included: a large seepage slope, open canopy uplands, skunk cabbage seeps, floodplains, and dry upland forest (Heritage Report, 45-69)

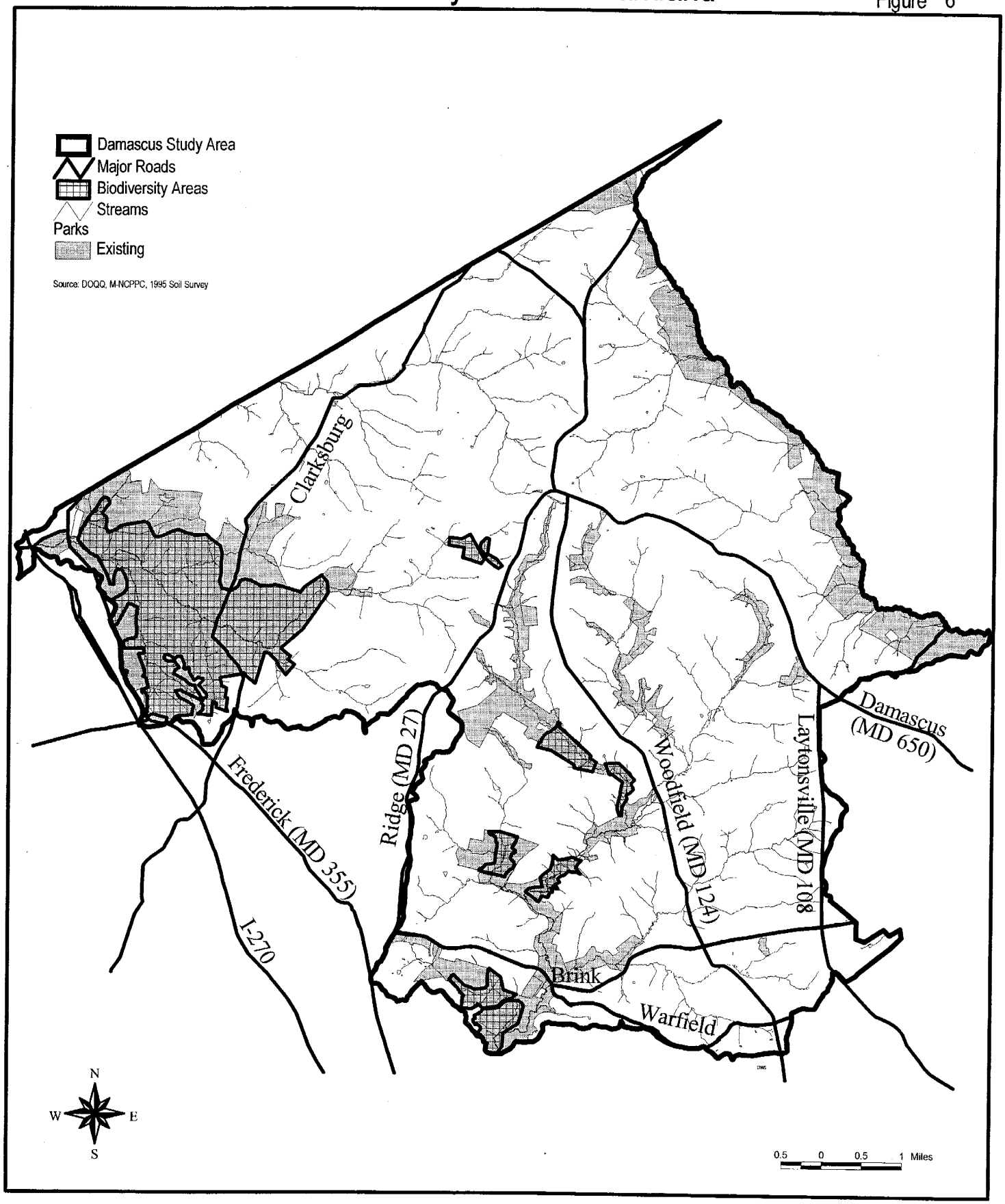
Study Area Existing Parkland[1,2] and Agricultural Distribution **Table 4**

Watershed	Total Acres[3]	Acres in Parkland	% of Watershed[4] in Parkland	Acres in Agriculture	% of Watershed[2] in Agriculture
Bennett Creek	7,081	65	>1	3,133	44
Hawlings River	303	1	>1	92	30
Little Bennett Creek	8,165	3,731	46	2,400	29
Middle Great Seneca Creek	1,349	563	42	208	15
Upper Great Seneca Creek	16,791	2,070	12	5,156	31
Upper Patuxent River	6,807	1,364	20	2,616	38
TOTALS	40,496	7,794	19	13,605	34

(1) GIS coverage of existing parkland, M-NCPPC 2002. For parkland ownership, see Appendix, Table A-1.
(2) Includes only existing parkland based upon the most recent version of the park-acquisition map.
(3) Acreage and percentages rounded to nearest whole number. Includes only the portions of the Little Bennett Creek, Upper Patuxent River, Hawlings River, and Middle Great Seneca Creek which fall within the study area boundary.

Biodiversity Areas in Parkland

Figure 6



Study Area Rare, Threatened, and Endangered Plants **Table 5**

Species in the Biodiversity Areas of Little Bennett Regional Park		
Plant Species	**Common name**	**Official Status**
Aristolochia serpentaria	Virginia snakeroot	watchlist (1)
Asclepias verticillata	Whorled milkweed	watchlist
Aster infirmus	Cornel-leaf aster	watchlist
Castanea pumila	Chinquapin	watchlist
Eupatorium altissimum	Tall boneset	watchlist
Gentiana andrewsii	Fringe-tip closed gentian	threatened(2)
Geum vernum	Spring avens	watchlist
Juglans cinerea	Butternut	state rare(3)
Monarda clinopodia	Basil balm	watchlist
Platanthera peramoena	Purple fringless orchid	threatened
Polemonium reptans	Greek valerian	watchlist
Rudbeckia triloba	Thin-leaved coneflower	watchlist
Senecio anonymus	Small's ragwort	watchlist
Species in the Biodiversity Areas of Lower Magruder Branch Park		
Plant Species	**Common name**	**Official Status**
Geum laciniatum	rough avens	watchlist
Geum vernum	spring avens	watchlist
Sanguisorba canadensis	Canada burnet	threatened
Stachys cordata	Nuttall's-hedge-nettle	highly state rare(4)
Species in the Biodiversity Areas of Oak Ridge Conservation Park		
Plant Species	***Common name***	***Official Status***
Aristolochia serpentaria	Virginia snakeroot	watchlist
Castanea pumila	Chinquapin	watchlist
Castanea dentata	American chestnut	state rare

(1) ***Watchlist***: Rare to uncommon with the number of occurrences typically in the range of 21 to 100 in Maryland. It may have fewer occurrences but with a large number of individuals in some populations, and it may be susceptible to large-scale disturbances. Not actively tracked by the Wildlife and Heritage Division (WHD). Source: Rare, Threatened, and Endangered Plants of Maryland. Maryland Wildlife and Heritage Division, Maryland Department of Natural Resources, April 30, 2001.

(2) ***Threatened*** species are those flora or fauna which appears likely, within the foreseeable future, to become endangered in all or a significant portion of their range, as pursuant to the federal Endangered Species Act.

(3) ***State Rare*** species are imperiled in Maryland because of rarity (typically six to 20 estimated occurrences or few remaining individuals or acres in the State) or because of some factor(s) making it especially vulnerable to extirpation. Actively tracked by the WHD. Source: Rare, Threatened, and Endangered Plants of Maryland. Maryland Wildlife and Heritage Division, Maryland Department of Natural Resources, April 30, 2001.

(4) ***Highly State Rare*** is a species critically imperiled in Maryland because of extreme rarity (typically five or fewer estimated occurrences or very few remaining individuals or acres in the State) or because of some factor(s) making it especially vulnerable to extirpation. Actively tracked by the WHD. Source: Rare, Threatened, and Endangered Plants of Maryland. Maryland Wildlife and Heritage Division, Maryland Department of Natural Resources, April 30, 2001.

Wildlife

There have been few comprehensive wildlife inventories conducted in the study area. Only the Maryland Breeding Bird Atlas (1983-1987) covers the entire study area. Other inventories have been conducted on parkland and include: breeding bird and amphibian surveys in portions of Magruder Branch, and the Great Seneca Creek Stream Valley Parks. A more comprehensive wildlife inventory including birds, mammals, reptiles and amphibians has been conducted for Little Bennett Regional Park. A list of wildlife species that occur in Little Bennett Regional Park is included in the Appendix (see Table A-3) and is representative of the area.

A number of wildlife habitats and species occur in the study area that are noteworthy because they are

declining regionally or they can have a direct or indirect impact on humans and human development issues.

Forest Interior and Riparian Forest Habitat

Forest interior dwelling (FID) species, particularly birds, require large tracts of unfragmented woodland to supply their life requisites. Forested areas at least 100 acres in size or riparian (streamside) forests that are at least 300 feet wide provide appropriate forest interior dwelling species habitat and migration corridors. As forested land throughout the east and central United States has been fragmented by development, FID species have declined dramatically. Approximately 2,795 acres of forest interior habitat have been identified in the study area. The Maryland Breeding Bird Atlas (1983-1987) indicates that many of these areas were supporting FID species. Preservation and protection of forest interior and riparian forest habitats needs to be a high priority.

Grassland and Edge Habitat

Land use in parts of the study area currently support large areas of grassland (> 20 acres) and edge habitat. Pastureland, hayfields, sod farms, large estates and golf courses provide grassland habitat for several specialized species of birds that are declining regionally. Species include eastern bluebirds, eastern meadowlarks, grasshopper sparrows, kestrels (a small falcon), and other grassland or open country specialists. In addition to providing habitat, these pastoral areas add a distinctive rural character to the landscape and are often of considerable importance to local residents. Unlike forest habitats, large grasslands are often not maintained on parkland. Edges where fields meet other habitats, particularly forest, provide important habitat for other uncommon species including Baltimore orioles and red-tailed and red-shouldered hawks. Second growth areas consisting of shrubs and small trees often occur along edges and provide habitat for shrub specialists. This habitat too is becoming uncommon in the study area. Large areas of grassland and smaller areas of shrub habitat should be identified, protected, and managed in order to maintain these natural communities.

Other Wildlife Species of Note

No species officially listed as state or federally rare, threatened or endangered have been identified in the study area. However, several species that are state watchlisted or considered uncommon to rare in Montgomery County are present. These include: *S. longirostris* (the southeastern shrew), S. hoyii winnemana (pygamy shrew) which is designated (but not listed) state rare; Tyto alba (barn owl) and *E. phaeton* (the Baltimore checkerspot), which are watchlisted; and *Lutra canadensis* (river otter), *Clemmys guttata* (spotted turtle), *Clemmys insculpta* (wood turtle), *Agkistrodon contortrix* (copperhead snake), and *Eurycea longicauda* (long-tailed salamander) which are uncommon to rare in Montgomery County. All these species have been documented in Little Bennett Regional Park and likely occur elsewhere. Appropriate habitat should be inventoried for these species and where possible protection provided through park acquisition or conservation easements.

Wildlife Species that Adversely Impact Humans

O. virginianus (white-tailed deer), *Castor canadensis* (beaver), and *Branta canadensis* (Canada geese) have expanded their range and population dramatically within the study area over the past decade. These three species have the potential to have, what society typically perceives as negative, direct or indirect impacts to humans and human development issues.

Increasing *O. virginianus* populations have resulted in increased deer impacts in areas throughout Montgomery County including: wholesale consumption of forest understory, deer-auto collisions, occurrences of lyme disease, and damage to farm crops and home landscapes. The county developed and began implementing a comprehensive deer management program in 1995 that includes data collection, public education, and implementation of management options including population management. Given the juxtaposition of parkland, farmland, housing communities and large estates, deer populations in the area will most likely continue to increase for some time. Property development and particularly road construction proposed for the area must take deer populations into consideration when planning new construction or upgrading existing infrastructure. This is especially important where roads cross undeveloped stream valleys or parks. Bridges, fencing and, possibly, wildlife reflector systems could greatly reduce potential deer impacts.

C. canadensis (beaver) is now present in virtually all stream valleys of the study area. Activities include the cutting of trees and the damming and flooding of small streams both of which can impact human development. No studies of *C. canadensis* populations or habitat usage

have been undertaken in the study area but casual observations and the monitoring of citizen complaints indicate that sites are often colonized for a short period of time, usually several months to a year before they are abandoned. Most impacts to private property are limited to properties built close to or within floodplains or adjacent to storm water management ponds. Efforts are underway to develop a management plan similar to the county's deer plan that will focus on education and the use of various management options to address impacts on a site-by-site basis. Current environmental guidelines should minimize problems with private landowners. Roads, sewer lines, and trails that are constructed within floodplains should be designed with the consideration that flooding from *C. canadensis* would periodically impact them. SWM facilities are a particular problem. Many of these facilities are designed in a manner that allows them to be clogged very easily by *C. canadensis* and their function compromised literally overnight.

Large numbers of *B. canadensis* (Canada geese) have taken up residence in the county over the past decade. These resident flocks do not migrate but spend the entire year in the area. *B. canadensis* are attracted to areas of open grass with ponds or lakes. Golf courses, parks and large estates can attract large numbers due to their resemblance of its natural habitat. This can result in problems with interference in activities (golf, picnicking, swimming etc) and feces buildup on lawn areas and/or in ponds. Development plans should be designed without open water stormwater management ponds or other open water features so as to minimize these potential problems.

Fish

Numerous fish surveys have been conducted in the watersheds within the Damascus Study Area since the 1970's. The Montgomery County Department of Environmental Protection (DEP), in cooperation with M-NCPPC, assesses streams on a 5-year rotating basis and inventories fish, amphibian, reptile, and benthic macroinvertebrate populations. A list of fish species found in Bennett Creek, Little Bennett Creek, the Upper Great Seneca Creek, and the Upper Patuxent River, as reported in the *Countywide Stream Protection Strategy* (DEP, 1998), is presented in the Appendix (Hawlings River is not listed because of its relatively small presence in the study area) (see Table A-2).

Bennett Creek is designated Use I-P (Water Contact Recreation/Community Water Supply) by the Maryland Department of the Environment (MDE). Preliminary monitoring indicates that Bennett Creek supports a fairly diverse fish population, with 17 species of fish collected, including pollution-intolerant *Hypentelium nigricans* (northern hogsuckers) and *Cottus bairdi* (mottled sculpin), *Clinostomus funduloides* (rosyside dace), and two species of darters - *Etheostoma flabellare* (fantail), and *E. olmstedi* (tessellated).

Little Bennett Creek is designated Use III-P (Natural Trout Waters/Community Water Supply). It has been stocked with *Salmo trutta* (brown trout) on a number of occasions and trout have been noted to successfully spawn at irregular intervals. In addition to trout, Little Bennett Creek supports healthy populations of *H. nigricans*, *C. bairdi*, *C funduloides*, and three species of darters – *E flabellare*, *E. olmstedi*, and *E. blennioide.* (greenside).

The portion of the Patuxent River within the Damascus Master Plan is designated Use III-P. This part of the Patuxent River supports a naturally reproducing population of *S. trutta*, plus stocked *Oncorhynchus mykiss* (rainbow trout). In addition to trout, 17 fish species have been collected from this portion of the watershed, including pollution-intolerant *H. nigricans* and *Percina peltata* (shield darters). It is noteworthy that all six stations monitored by the Montgomery County Department of Environmental Protection in this section of the Patuxent River are designated as reference sites, indicating that they are among the highest water quality sites that have been found in the county.

The portion of Great Seneca Creek within the master plan area carries two use designations: Wildcat Branch is designated as Use III-P with the rest of the watershed Use I-P. Wildcat Branch has supported a small naturally reproducing population of *S. trutta*, though none have been collected in the past few years. *O. mykiss*, which are stocked in the downstream portion of the creek, outside the planning area, are sometimes found within the planning area. In addition to trout, this watershed supports an unusually diverse fish community, with 30 species having been collected in the watershed, including *H. nigricans*, *C. bairdi*, *C funduloides*, *E flabellare*, *E. olmstedi*, and *E. blennioide.*

Sensitive Areas

Sensitive areas are defined by the 1992 State Planning Act as streams and their buffers; the 100-year floodplain; steep slopes; and habitats of rare, threatened, and endangered species. For the purposes of this report, wetlands and wetland buffers are also considered sensitive areas and are included in the relevant maps and tables. Habitats of rare, threatened and endangered species are not mapped as part of sensitive areas because they are not comprehensively documented.

Sensitive areas are distributed across the watersheds of the Damascus study area, and are generally contained within the stream valleys (see Figure 7). Sensitive areas cover roughly 9,579 acres extending over approximately 24 percent of the study area (see Table 6). About 33 percent of all sensitive areas within the study area are contained within parkland. The majority of sensitive areas outside parkland are within stream buffers.

Chapter 2 provides a detailed definition of sensitive areas and associated policies under Sensitive Area Protection and Biodiversity. The Appendix provides a description of the components that make up the sensitive area coverage

Study Area Sensitive Areas [1] by Watershed **Table 6**

Watersheds		Sensitive Area			
Name	Acres	Acres	% of Watershed	Acres in Parkland	% of Sensitive Acres
Bennett Creek	7,081	1,562	22	13	<1
Hawlings River	303	35	12	<1	<1
Little Bennett Creek	8,165	2,140	24	1,270	59
Middle Great Seneca Creek	1,349	290	21	203	70
Upper Great Seneca Creek	16,791	3,735	22	1,084	29
Upper Patuxent River	6,816	1,602	24	535	33
Total	40,496	9,364	23	3,105	32

(1) Geographic sum (overlay) of the following sensitive areas: wetlands and wetland buffers, floodplain, minimum buffers of streams identified in the M-NCPPC GIS planimetric data, and steep slopes. Stream buffers, wetlands, floodplain, stream buffer, and steep/ soils overlap significantly (e.g., wetlands may be partially within floodplain areas). See the Appendix for a more detailed definition of sensitive areas.

Sensitive Areas

Figure 7