NATURAL RESOURCE CONSERVATION

Overview

In the late 1990s, the Maryland Department of Natural Resources (DNR) began an effort to address landscape fragmentation and to identify the most ecologically important lands in the state. In the effort, termed "Maryland's Green Infrastructure Assessment", DNR mapped key parcels of land throughout the state to target for preservation from development. In 2011, DNR revised and updated the ecological ranking of GI hubs and corridors to establish priorities for conservation and guide open space acquisition efforts and funding. The ranking was based on a variety of criteria that the department weighted based on importance.

In addition to GI, DNR has similarly identified and mapped water-based natural assets, referred to as Blue Infrastructure. Both GI and Blue Infrastructure are discussed below.

Agricultural lands are also critically important to the character and economy of Wicomico County (County). Wicomico is the most agriculturally productive county in the entire State of Maryland. Many of the parcels identified as GI are, in fact, agricultural. The previous chapter was devoted to a discussion of preserving agricultural land, including agricultural easements. Other elements of preserved land (Map 6.1) in the county include:

- Land or permanent easements owned by preservation organizations, such as the Maryland Environmental Trust, the Nature Conservancy, and the Maryland Department of Natural Resources;
- Natural areas;
- Regulated or restricted areas, such as Chesapeake Bay Critical Areas;
- County and municipal parks; and,
- Transmission lines and utility corridors

Green Infrastructure

Many elements of the GI system in the County have a specific significance in other areas of the *2027* Land Pres Rec and Park Plan *(2027 LPPRP or 2027 Plan)*. This Chapter reviews the GI system in the County and contains the following information:
Definition ¾ What is GI?

1. Purpose: Why is GI valuable? What are the benefits of protecting GI?
2. Priorities: What are the threats to GI? How important is each threat?
3. Location: Where is GI located in Wicomico County? Which parcels are in the greatest danger of development and/or have the highest priority for conservation?
4. Best Practices ¾ What are the best practices for conserving GI?

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Definition – What is Green Infrastructure

DNR defines GI as "an interconnected network of natural lands and other open spaces that conserves natural ecosystem values and functions, sustains clean air and water, and provides a wide array of benefits to people and wildlife." Several principles discussed in the Conservation Leadership Network's *Green Infrastructure Handbook* represent the guiding factors used by the County and the State of Maryland to develop GI planning, including preservation from development, linkage, solid underlying science and planning, benefits for everyone in the community, high priority/critical public investment, and diverse stakeholders.

Purpose – Why is GI valuable? What are the benefits of protecting GI?

GI systems are composed of hubs and corridors. Hubs are large expanses of natural land vital to the unique ecology of a region, such as forests, wetlands, riparian corridors, existing parks and conservation, and other natural lands that provide many services to the ecosystem. Hubs provide Ecological Goods and Services (EGS), which include:

- Clean the air
- Filter and cool water
- Filter and trap sediment runoff
- Store / cycle nutrients
- Conserve / generate soils
- Pollinate crops / other plants
- Regulate climate
- Sequester carbon
- Protect against storm / flood damage
- Protect / recharge aquifers
- Provide native animal and plant habitat

Corridors are the connections that turn a pattern of hubs into a system. Corridors may include greenways, trails, streams, riparian corridors, aquatic areas, parks, abandoned rail easements, and conservation lands. Corridors help to:

- Link native plants, animals, and wildlife areas;
- Protect greenways, trails, or historic sites; and,
- Provide recreational opportunities.

Corridors, in the form of greenways, can also define areas appropriate for future growth and areas that are ecologically sensitive and should be preserved. Within the County, DNR has identified 23 hubs (Map 6.2, Table 6.1). Of the 23 hubs, five (5) hubs¾414, 452, 461, 523, and 525 have a composite ecological score below 10 indicating high ecological sensitivity. GI is the primary physical mechanism for enhancing EGS. GI offers landscapes to promote human health through biking, walking, birding, hunting, and fishing. Combining GI with other preserved land (Map 6.3) illustrates the large amount of land in the County with some type of protection from development pressure.

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Priorities – What are the threats to GI? How important is each threat?

Perhaps the greatest threat to GI is excessive development that fragments natural, sensitive areas. GI is founded on the principle of serving hubs of sufficient size and connecting corridors to act as effective transit ways and habitat for sensitive species. Physical separation/degradation of sensitive areas permanently compromises the effectiveness of the entire ecosystem.

Table 6.1

Green Infrastructure Hub Characteristics

Hub ID	Notes	Composite Ecological Score	Hub Rank	Total Area of Hub (acres)	Natural Heritage Areas (acres)	Wetlands of Special State Concern (acres)	Upland Interior Forest (acres)	Wetland Interior Forest (acres)	Different Wetland Types (NWI)	Streams in Interior Forest (meters)	Sensitive Species Project Review Areas (acres)
414	1	3	593	12,992	3,387	3,628	6,343	2,475	50	33,861	747
419	2	36	577	3,529	244	181	1,810	341	7	4,627	0
452		7	575	40,169	0	702	16,587	3,101	101	8,942	1,570
461	3	1	594	147,47	5,560	8,999	99,539	18,716	139	263,903	23,036
465	2	20	453	511	0	12	155	5	11	2,677	471
472		84	508	5,174	0	13	3,229	75	29	5,814	360
477		73	160	672	0	0	349	6	9	964	0
479		10	483	928	0	56	417	24	9	5,699	651
484		85	101	398	0	0	229	6	4	119	0
486		74	11	505	0	0	190	0	14	110	0
487		29	523	3,787	0	16	2,307	315	24	7,622	0
491		91	113	695	0	0	444	12	16	3,113	0
495		57	338	1,227	0	0	873	64	17	0	0
496		77	164	411	0	0	238	5	4	2,823	0
507		95	196	423	0	0	167	2	5	1,435	0
512		96	29	930	0	0	413	11	10	0	0
517		58	323	2,775	0	0	1,717	206	20	441	0
519	4	56	371	2,159	0	0	1,324	298	21	537	0
521		11	355	743	0	0	401	2	5	671	140
522		89	198	957	0	0	313	11	22	0	0
523	5	3	466	1,036	0	0	577	27	12	118	0
525	5	5	340	380	0	0	222	16	4	0	0
533	4	24	543	30,778	0	0	9,330	1,541	91	6,389	404

[Source: Maryland Department of Natural Resources (2013)]

NOTES:

1. Lies in Wicomico and Sussex counties;
2. Lies in Wicomico, Dorchester, and Sussex counties;

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3. Lies in Wicomico, Somerset, Worcester, and Sussex counties;
4. Lies in Wicomico and Somerset counties; and
5. Lies in Wicomico and Worcester counties.

Low-density sprawl development is particularly concerning because it does damage to the largest amount of sensitive lands for the benefit of the fewest number of people. Other serious challenges to establishing and protecting a viable GI network include:

- Brownfields that remain unmitigated;
- Lack of available funding;
- Fragmentation of valuable hubs with isolation of wildlife and plants leading to loss of endangered species and/or probable extinction in the area;
- Development that encroaches on or are near sensitive areas and that can result in a loss of wildlife, disturbance of breeding and raising young, loss of food supplies, and introduction of domestic animals that prey on wildlife;
- Weak stewardship over parcels within the GI framework; and
- Lack of public education and outreach emphasizes the benefits of conserving forested areas within the County.

In addition to sprawl development, invasive plant species and animal species are a growing threat to the natural environment. The number of invasive species entering the County and the extent of their impact is increasing annually. This is a growing problem and increasing risk to the survivability of native species and habitat integrity. Once invasive species become established and spread, natural ecosystems are compromised and reclamation costs increase. In contrast, early detection and eradication techniques are designed to decrease the extent of the impact and reduce removal cost.

To reduce or eliminate the negative effects on our local ecosystems, monitoring and identification of invasive species is important. Both early detection and eradication are key to preventing and/or reducing widespread damage from invasive species. Additionally, under-managed or unmanaged wildlife populations (e.g. deer) can be a threat to native plant species. To prevent the adverse effects from invasive plant species, the County should continue funding weed removal efforts, as well as identify potential funding to prepare an Invasive Species Management Plan for Wicomico.

Location – Where is GI located in Wicomico County? Which parcels are in the greatest danger of development and/or have the highest priority for conservation?

The County utilized DNR's statewide GI assessment in delineating the GI network for the County (Map 6.2). In the most recent update of the County's GI network (Version 6.0), DNR omitted some

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parcels that were identified in the previous version (5.1). The DNR omissions are represented in the County GI Network as "Auxiliary GI".

Best practices – What are the best practices for conserving GI?

The County has identified three primary strategies for conserving GI hubs and corridors. The strategies are designed to:

- Protect and conserve the most sensitive areas through conservation easements and fee simple purchases whenever possible;
- Manage risk and reduce vulnerability by providing guidelines for integrating human activities and land uses; and
- Restore and enhance the GI network where gaps exist and degradation has occurred.

Each of the three strategies is further discussed below.

Strategy 1: Protect and conserve the most sensitive areas through conservation easements and fee simple purchases whenever possible.

The County's principal strategy for implementing the vulnerable / threatened GI portions of the *20*27 LPPRP is to protect the most sensitive areas in the system through targeted conservation easements, fee simple purchases, restoration, environmentally sensitive design, and best management practices BMPs). In addition to County agencies, the County will enlist the participation of departments, state agencies and organizations, including, but not limited to the following:

Public Programs for Donated or Purchased Easements:

- Rural Legacy Program;
- Maryland Agricultural Land Preservation Foundation (MALPF);
- Farm & Ranch Land Protection Program (FRPP);
- Coastal and Estuarine Land Conservation Program (CELCP);
- Program Open Space (POS); and
- U.S. Navy's Readiness and Environmental Protection Integration Program.

Public Programs for Restoration and BMPs:

- Conservation Reserve Enhancement Program (CREP);
- Wetland Reserve Program (WRP);
- Environmental Quality Incentives Program (EQIP); and
- Agricultural Management Assistance Program (AMA).

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Private and Public Organizations:

- Ducks Unlimited;
- The Nature Conservancy (TNC);
- Lower Shore Land Trust (LSLT);
- The Conservation Fund;
- Maryland Department of Natural Resources (DNR); and
- Maryland Environmental Trust (MET).

Strategy 2: Manage Risk & Vulnerability.

The principal strategy for the County itself will be to conserve and enhance GI, when possible, through conservation easements and fee simple purchases of lands that the County can manage. However, the strategy may conserve only a fraction of the ecologically important lands in the County. Therefore, the second strategy is to manage the risk of adverse effects in GI areas and to reduce vulnerability where possible.

Examples of possible county tasks to help maintain the GI include:

- Acknowledging GI and the principles that act as a guide for landowners, farmers, developers, and anyone making property decisions that might affect GI.
- Ensuring that local governments and committees are aware that GI principles and design concepts may provide guidance regarding proposed activities over which the County may act to approve, deny, direct, advise, or otherwise have influence.

The Advisory Committee will work with the County Executive, County Council, Wicomico County Planning and Zoning Commission, Wicomico County Department of Recreation, Parks and Tourism, Wicomico County Department of Planning, Zoning and Community Development, and the agricultural, forestry and conservation communities to advise decision makers on strategies and best practices to preserve the natural resources located in the County.

Strategy 3: Restore & Enhance Green Infrastructure.

In addition to protecting GI, efforts should be considered to maintain, restore, and enhance the GI network. However, maintenance, restoration, and enhancement are a tertiary strategy, given the context of limited public funding. Nevertheless, the strategy remains important to maintain awareness of restoration and maintenance, even in places where the GI is protected or carefully integrated with other land uses.

Green Infrastructure and the effects of Sea-Level Rise

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GI serves as the first line of defense against flooding. Inundation caused by a rise in sea level also causes groundwater levels to increase. Marshes and riverine beaches especially need to have inland areas protected for times when inundation causes up-slope migration. Over the past decade, Wicomico County has experienced heavy flooding and rains from weather events. GI has been adversely affected by excessive rainfall and hurricanes, resulting in sediment erosion, damaged forests, and destroyed habitats. The damage from excessive rain events associated with tidal surges is an example of potential future consequences as sea level continues to rise.

Conserving natural areas and adjacent buffers will help protect against flooding and associated impacts of sea level rise. Protection from further fragmentation is vital because the current level of degradation makes sensitive areas even more vulnerable. Development and deterioration of GI may adversely affect ecological goods and services that protect against sea-level rise. Without GI to protect against flooding, lands in the community remain at risk.

Preservation of GI can be accomplished by a myriad of planning practices and techniques, including, but not limited to directing development away from sensitive areas; as well as developing guidelines to encourage compatibility thereby reducing the impervious footprint. Encouraging infill development in areas with existing services and managing development near shorelines to minimize catastrophic losses can help prepare for changing flood conditions. Allowing compatible uses will support the landscape of GI and reduce fragmentation. Furthermore, combining conservation tools and recreation opportunities, where possible, may build public support for recreation projects. In addition to planning and partnerships, encouraging non-governmental organizations to increase capacity for providing public outreach and education about environmental stewardship and the relationship to sea-level rise is important.

Grant funding opportunities to fund a study about the implications of sea-level rise in the should be explored. The results of the study will assist in ongoing and future planning activities and prioritized acquisition of sensitive areas needed to protect the health, safety, and welfare of the County's citizens. Without valid direction detailing the possible effects of sea-level rise, it will be challenging for the County to effectively implement safeguards designed to advance the County's efforts toward environmental stewardship.

Green Infrastructure Integration with Compatible Land Cover Types and Uses

Activities and approaches to preserving GI can vary depending on the type, location, and condition of the specific land. The following section discusses various types of sensitive land and the importance of Green Infrastructure to each.

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Farmland

According to the 2022 Agricultural Census, the County was the most agriculturally productive county in the State of Maryland in overall commodity of agricultural goods. Farming is likely to be more compatible with GI than development. Therefore, retaining farming activities within conservation easements is an opportunity to reduce risk to GI, as are other measures to retain farmland and farming within the County.

Forest Land

Most of Wicomico County's GI is forest land. For generations, woodlands and forest products have been providing landowners with income and generating jobs and economic benefits for the County. Working forests provide sustainable economic contributions, as well as water and air quality protection, a diversity of plant and animal habitats, open space, scenic beauty, and an array of recreational opportunities for our citizens.

Today, forest harvesting and silvicultural operations in Maryland are restricted by regulations on Critical Areas, non-tidal wetlands, endangered species, and erosion/sediment control. The County Forestry Board provides local professional oversight. With sound, professionally prepared forest stewardship plans, timber harvesting is a compatible use on most of the GI. In part, forest harvesting exists today because landowners had a financial incentive to manage the land and retain ownership.

Recreation

Recreational land uses present an opportunity to integrate community activities with open space and habitat. Recreation can be either active or passive in nature. The following discussion presents the acquisition and design/management considerations for various types of recreation.

Active Recreation

Active recreation includes sports, playgrounds activities, swimming, skateboarding, motorized vehicle use (e.g. 4-wheelers, motorboats, jet skis), other vehicle use (e.g. bicycles, canoes, kayaks), and equestrian activities, among others. Trails and corridors also encourage walking and other forms of active recreation.

Acquisition -

When feasible, consideration should be given to locate potentially incompatible active recreation sites outside of vulnerable or highly sensitive areas of the GI network.

Design and Management -

Infrastructure may include impervious or compacted road and trails, restrooms, lighting, etc. Such high-impact design features should be in, and direct users to, less vulnerable

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areas within the site. In addition, educational efforts should be included to enhance awareness and stewardship of the more sensitive areas within the site. Design should also focus on maximizing conservation (e.g., limiting paving to pervious materials and reducing or effectively shielding lighting that interferes with wildlife).

Extractive Recreation

Activities such as hunting, fishing, and trapping are examples of extractive recreation. The County should evaluate the need to create guidelines to manage the use of motorized and non-motorized vehicles on publicly owned environmentally sensitive areas, including, but not limited to wetlands of special state concern, targeted ecological areas, and other highly sensitive GI areas.

Acquisition -

Extractive recreation sites will frequently be associated with GI hubs and/or corridors due to the presence of target wildlife and other resources. Public support for site acquisition may be less of a problem than for active sites, because surrounding properties may have similar uses.

Design and Management -

In areas used for natural resource extraction, the impact of public access (roadways, launch sites, docks, etc.) is an important issue because these access points are in direct contact with sensitive areas such as wetland margins or stream banks. Extractive recreation sites should be designed to mitigate or avoid such impacts. When feasible, infrastructure should be limited to unpaved roadways and low-impact boat launches, with lighting designs that minimize impacts on wildlife.

Resource management such as thinning timber or establishing waterfowl blind areas has consequences for G.I. as well. Where suitable, such sites may be appropriate for acquisition through easement programs or fee-simple purchase by federal, state, or local government agencies to limit extractive uses and activities in highly sensitive GI areas.

Passive Recreation

Examples of passive recreation include nature hikes, heritage tourism, nature or outdoor-based education, wildlife observation, photography, painting, and wild lands experience. Passive activities may incorporate non-motorized vehicle use.

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Acquisition -

The acquisition of passive recreation sites should target areas with high value for education and low-impact activities, such as birding, photography, and painting. Public support is often easier to obtain for passive recreation sites than for higher-impact sites.

Design and Management -

Managing passive recreation sites should emphasize education and low impact uses, such as birding. For example, Pemberton Park is primarily a passive recreation site that has considerable public access and use, especially for educational purposes. Infrastructure, including trails, observation platforms, boardwalks, restoration of historical buildings, and similar items should be designed and located to minimize impacts on sensitive features of the area. Design should balance providing access to wildlife and natural features with the negative impacts that such access causes.

Sensitive Areas and Wildlife Conservation

Natural lands that perform useful community functions should be protected from all but minimal, very low-impact activity. These sensitive ecosystems include wetlands (especially Delmarva bays), floodplains, mature forests, sensitive areas, and areas of Special State Concern. Additionally, sensitive features in areas not broadly identified as sensitive should also be afforded protection from intense recreation. Examples include rare orchids, carnivorous plants, and other endangered/threatened species.

Acquisition -

Sensitive areas/wildlife conservation sites should be targeted for acquisition. If possible, partnering with appropriate organizations, such as The Nature Conservancy, should maximize County resources. Public support for site acquisition is often strong because of the often-increased values of surrounding properties.

Design and Management -

Sensitive sites are selected and put in public trust to conserve natural attributes. Some may be designed with limited public infrastructure, such as trails. Other sites may be too sensitive to any infrastructure. Management of sensitive areas will incorporate some degree of access but should not be open for continual use.

High Value Natural Areas

Maryland's Green Infrastructure program (Version 6.0) identifies the majority of the County's GI lands. However, several important areas included in previous versions of the state's GI included

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in previous versions of the state's GI maps had been omitted from Version 6. Therefore, the Natural Resources Conservation Advisory Committee prepared an assessment and mapping of at-risk / vulnerable and sensitive land to be acquired for conservation and recreational purposes. The methodology developed for delineating High Value Natural Areas is based in science and consists of a three-tier ranking system that will guide the County in land acquisition.

The High Value Natural Areas have been delineated and are considered priority areas for conservation and recreation investments. The designated areas encompass GI hubs and corridors, targeted ecological areas, and sensitive habitats, and threatened areas to close perceived holes in the GI network.

Prior to compiling the information noted above, relevant GIS data (environmental, soils, and development pattern) was collected and analyzed to identify and establish priorities for future acquisition. Furthermore, the county considered the effects and integration of compatible and incompatible recreational activities and human-dominated features on the High Value Natural Areas. (Map 6.4)

The methodology used to evaluate and rank the High Value Natural Areas included the following items:

- Threat to development and future demand based on population and housing unit projections;
- Land use / land cover;
- Soil suitability to support onsite individual sewage disposal systems;
- Forest interior dwelling species and sensitive species project review areas;
- Wetlands of Special State Concern;
- Water Quality (Tier II waterbodies) and natural drainage systems;
- Current conservation and protection efforts in nearby or adjacent areas; and,
- Green Infrastructure Composite Ecological Index.

Identifying and securing funding for the future acquisition of vulnerable High Value Natural Areas is paramount to the sustainability of the land preservation effort. The ability to leverage funding from federal, state, and local programs, as well as the continued coordination with environmental and conservation groups, is imperative to successfully enhance conservation and recreational opportunities in the County. In addition, the Natural Resources Conservation Advisory Committee will have an integral role in the continued update of the High Value Natural Areas, as well as tracking progress and recommending land use management techniques to achieve the desired outcomes.

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