9. Sensitive Areas: Environmental Resource Protection

Introduction

Uniquely positioned at the point where the Susquehanna River becomes the Chesapeake Bay, Havre de Grace has many qualities within its environment that make it stand out. Distinctive landforms include the Atlantic Coastal Plain along its eastern portion, the Piedmont plateau of its western side, and the steep riverine wall of the Susquehanna River Valley to the north, making a range of rich cultural and environmental landscapes and sensitive areas. These characteristics have shaped the history of the region and still affect the City today. This chapter identifies areas to be protected, planned, and in some cases preserved in accordance with the State of Maryland. It sets forth goals, objectives, and policies to address sensitive areas from the adverse effects of development while continually planning for future growth and opportunity that capitalizes on natural environmental features that are assets to the community.

Much of the City's environmental regulations, such as stream buffers, floodplain, wetlands, and forest conservation requirements, are mandated by the State of Maryland. For development projects, environmental impacts to these items are addressed at the subdivision and site plan review stages for individual properties. In addition to these regulations, the City's location adjacent to the Chesapeake Bay requires a heightened level of environmental oversight. The City adopted the Chesapeake Bay Critical Area (CBCA) Program in 1988, and periodically reviews its program under the auspices of the CBCA Commission staff. The program is tailored to the historical development patterns of Havre de Grace, and it serves to regulate land uses and development practices immediately adjacent to the tidal waterways of the Susquehanna River and Chesapeake Bay.

State agencies that oversee environmental regulations are the Maryland Department of the Environment (MDE) and the Department of Natural Resources (DNR). These agencies assist with local ordinance review and interpretation and, in some cases, carry out enforcement actions for environmental infractions. MDE enforces 100-year floodplain compliance and is responsible for issues related to stormwater management, shoreline, and tidal and non-tidal wetlands. Offices within DNR address streams and their buffers, forest conservation, habitats of threatened and endangered species, steep slope protection, and individual jurisdictions' Chesapeake Bay Critical Area programs. Recommendations for this chapter are geared toward strengthening the City's local ordinances to address sensitive areas and environmental resources and to clarify the role of State agencies in the City's development review process.

Sensitive Areas in Need of Protection

AREAS OF PROTECTION:

This section outlines environmental considerations that currently exist within the community and are required to be included as part of the Sensitive Areas Element under the Land Use Article and Sensitive Areas Element guidance documents[1]. These sensitive area features make Havre de Grace a wonderful coastal community and are of primary consideration when development is occurring. These areas of protections create a unique sense of place within the City for people to live, work, and explore.

- Streams and their buffers
- 100-year floodplain and floodways
- Habitat areas
- Steep slopes
- Tidal and nontidal wetlands
- Forest conservation

[1] Managing Maryland's Growth: Models and Guidelines: Preparing a Sensitive Areas Element for the Comprehensive Plan and Sensitive Areas, Volume II

- Landscape conservation
- Chesapeake Bay Critical Area
- Eroding shorelines

In addition to these environmental areas, the City voluntarily participates in the National Flood Insurance Program (NFIP), Community Rating System (CRS) and coastal resiliency efforts to resist, adapt to, respond to, and recover from natural hazards and environmental threats while protecting vulnerable resources and sensitive areas.

Streams and Their Buffers

Streams are parts of a watercourse, either naturally or artificially created, that contain intermittent or perennial base flow of groundwater origin. Several streams traverse the landscape within the Lower Susquehanna River Watershed consisting of 6,846 acres with 1,917 acres within the City and Swan Creek Watershed consisting of 15,175 acres containing 1,851 acres within the City. By conserving streams and their buffers, floodplains, wetlands, steep slopes and wooded areas, the City is able to enhance the quality of water, the diversity of habitat, and streamside and instream vegetation for aquatic insects, worms, clams, snails, crayfish, fish, salamanders, frogs, turtles, snakes, birds, and mammals.

Stream buffers, as defined by the State, are areas that extend a minimum of 25 feet from the top of each stream bank along both sides of a stream. This 25' buffer is required for wetlands and waterways by MDE. Buffers are a crucial "best management technique" that reduces sediment, nitrogen, phosphorus, and other runoff pollutants by acting as a filter, thus minimizing damage to streams. The effectiveness of buffers depends on their width, (which should take into account such factors as contiguous or nearby steep slopes, soil erodibility, and wetlands), the type of vegetation within the buffer (some plants are more effective at nutrient uptake than others), and maintenance of the buffer (natural, unmowed vegetation is preferable).

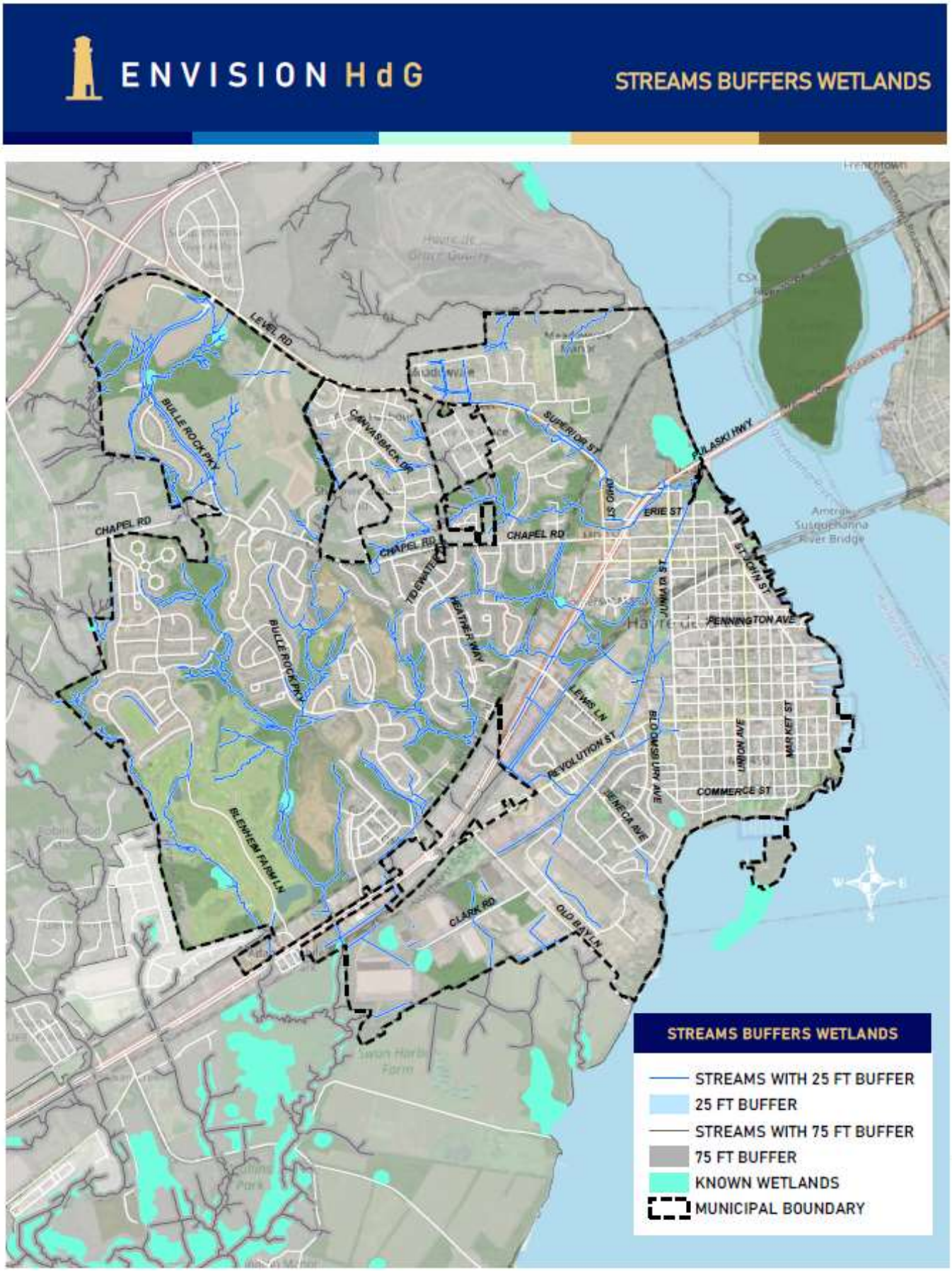
100-Year Floodplains and Floodways

Floodplains are areas adjacent to streams, rivers, lakes and the Chesapeake Bay that become covered by water during a storm event. The City is vulnerable to tidal waters and storm surge, rivers or streams, storm water (urban) drainage problems and local drainage problems. The floodplain ordinance was first adopted in 1991 in order to provide a comprehensive approach to floodplain management and to mitigate loss and damages. Flood insurance is required for properties in the Special Flood Hazard Areas (SFHA) and the flood zones are identified on Flood Insurance Rate Maps (FIRMS) published by the Federal Emergency Management Agency (FEMA).

The ordinance addresses Federal and State programs provided by FEMA so the City can qualify for National Floodplain Insurance Program (NFIP) benefits and resources when a national disaster is declared. Also, the City voluntarily participates in the Community Rating System (CRS) so all citizens can benefit from reduced flood insurance rates. The City is vulnerable to both riparian and coastal flooding which provides unique challenges for the community and construction regulations for developers.

Defining the 100-year floodplain involves engineering studies, field observations, and other available information. In this respect, the definition, as it translates to a map, leaves little room for interpretation in comparison to other sensitive areas. Local protection regulations under the Growth Act may exceed, but may not, diminish State standards. Because of the distinction between tidal and non-tidal floodplains under State Law, the definition should reflect that distinction and closely mirror the following:

- **Riverine Flooding**: Riverine flooding occurs along creeks, streams and rivers from rain or snowmelt. Due to the relatively small drainage areas of the creeks and rivers, flooding usually occurs quickly during or just after a heavy storm.
- **Urban Drainage Problems:** Storm water flooding usually occurs where the storm drains are not large enough to contain all the water from a rainstorm, snowmelt, and hurricane.


ENVISION HdG
STREAMS BUFFERS WETLANDS
LEVEL RD
BULLE ROCK PKY
CANVASBACK DR
SUPERIOR ST
PULASKI HWY
CHAPEL RD
ERIE ST
TIDEWATER
HEATHER WAY
PENNINGTON AVE
LEWIS LN
REVOLUTION ST
BLOOMSBURY AVE
COMMERCE ST
SENECA AVE
BLENHEIM FARM LN
CLARK RD
OLD BAY LN
STREAMS BUFFERS WETLANDS
STREAMS WITH 25 FT BUFFER
25 FT BUFFER
STREAMS WITH 75 FT BUFFER
75 FT BUFFER
KNOWN WETLANDS
MUNICIPAL BOUNDARY

- **Local Drainage Problems:** Poor yard drainage occurs throughout the City. This is due in part to perched water tables, compacted soils, construction in low lying areas and poor grading. Proper grading allows rainwater to drain away from buildings.
- **Tidal 100-Year Floodplain:** The land along or adjacent to tidal waters that is susceptible to inundation by the 100-year flood generated by coastal or tidal flooding due to high tides, hurricanes, tropical storms, or steady off-shore winds.
- **Nontidal 100-Year Floodplain:** The land area along or adjacent to nontidal streams and bodies of water that is susceptible to inundation by the 100-year flood as a result of rainfall and runoff from upland areas. Nontidal streams convey flow downstream under the force of gravity and are not influenced by tidal (lunar) forces.
- **Tidal Wetlands:** are classified as lands that are continuously or intermittently inundated by the rise and fall of the tide.
- **Nontidal Wetlands:** The U.S. Army Corps of Engineers (Federal Register 1982) and the U.S. Environmental Protection Agency (Federal Register 1980) jointly define nontidal wetlands as: those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Floodplains are the products of natural floods which moderate and store floodwaters, absorb wave energies, and reduce erosion and sedimentation. Wetlands found within floodplains help maintain water quality, recharge groundwater, protect fisheries, and provide habitat and natural corridors for wildlife. Stream buffers found within floodplains also help to maintain water quality.

Safeguarding the many natural functions performed by floodplains benefits adjoining and downstream communities by minimizing the risks and costs associated with the loss of life and property; by contributing to the maintenance of water quality and quantity which may directly affect drinking water supplies and recreation opportunities; and, in many cases, by helping to restore the health of the Chesapeake Bay--a goal which will benefit the entire public.

Habitat Areas

Havre de Grace has unique habitat areas due to its geologic, terrain, and waterway conditions. It is a convergence of coastal plain and extreme fall-line grades at the edge of the Piedmont plateau and includes numerous streams, the Susquehanna River, and the Chesapeake Bay. Specific habitats in this Upper Bay region include in-water resources, like submerged aquatic vegetation (SAVs) and the benthic environment which support a wide range of plants, animals, and bacteria in the bottom of its waterways. Waterfowl, colonial nesting bird sites (like the great blue heron), and anadromous fish spawning areas are major considerations. The Upper Chesapeake Bay is historically famous for migratory waterfowl as part of the Atlantic Flyway and major fisheries for blueback herring and American shad due to its freshwater estuarine condition.

Virginia Institute of Marine Science SAV map of the Upper Bay at Havre de Grace, June 2023

Habitats of threatened and endangered species are not directly mapped in order to keep them protected. However a great source of information for Maryland's environmental resources can be found in MERLIN, an


ENVISION HdG
FLOODPLAIN
LEVEL RD
BULLE ROCK PKY
CHAPEL RD
CAMMASRACK DR
SUPERIOR ST
OHIO ST
ERIE ST
CHAPEL RD
HEATHER WAY
TIDEWATER DR
PULASKI HWY
JAMES ST
STORY ST
PENNINGTON AVE
LEWIS LN
REVOLUTION ST
BLOOMSBURY AVE
UNION AVE
MARKET ST
COMMERCE ST
SENECA AVE
BLENHEIM FARM LN
CLARK RD
OLD BAY LN
Swan Harbor Farm
FLOODPLAIN
100 - YEAR FLOODPLAIN
500 - YEAR FLOODPLAIN
STREAM
MUNICIPAL BOUNDARY

interactive mapping tool which shows a great range environmental information. It offers general mapping for Sensitive Species Project Review areas, Biodiversity Conservation Network areas, forest, and wetland layers that can be overlain to understand unique habitats. In addition to MERLIN, another great resource is the Virginia Institute of Marine Science, or VIMS, for up-to-date mapping of in-water habitat of SAVs.

Steep Slopes

In general, steep slopes are defined as areas over 25% and above that cause development difficulties. Private streets and walkways also become un-walkable on slopes over 20%. In terms of public utilities, slopes beyond 20% become unmanageable for the efficient and environmentally acceptable construction of storm drainage systems and sanitary sewer laterals. A slope of 30% is normally the cutoff beyond which cut and fill can be benched without accelerated engineering treatment. Furthermore, it should be noted that the great majority of soils found in Maryland are highly erodible at 30% or greater and are unacceptable, for the most part, for usable yards, active recreation open spaces, or accessory use.

The City's elevation ranges from the rolling hills and valleys of the Piedmont to the flat terrain near the Chesapeake Bay of the Atlantic Coastal Plains. Variation in elevation ranges from sea level to 420 feet above sea level. Much of the developed area of Havre de Grace is located in the Coastal Plain Physiographic Province. For walkability and bike-ability to be increased, ADA regulations and Universal Accessibility is concerned, slopes with less than 8% are preferred. The City is encouraging biking and walking as an alternative method of transportation that contributes to the accessibility and small town charm. By increasing biking and walking paths and trails on existing slopes the City increases connectivity of disparate and fragmented areas to its urban core and beyond.

Tidal and Nontidal Wetlands

In this region, wetlands consist of 3 types: estuarine, riverine, and palustrine. Maryland State requires a 25-foot buffer around nontidal wetlands and a 100-foot buffer surrounding wetlands of Special State Concern. Wetlands in addition to floodplains improve water quality through infiltration and percolation, provide diverse wildlife habitat, slow storm flows and dissipate flood water energy allowing more of it to percolate into the ground, and maintain surface water flow. Wetlands act as transition zones between open water or aquatic environments and uplands. They are both inland freshwater areas not subject to tidal influence and adjacent to tidal waters that are subject the tidal influence and inundation. Several wetlands exist and provide valuable high-quality habitat for native flora and fauna.

- **Estuarine Wetlands:** Form along the tidal reaches of rivers and streams, and along the margins of estuarine bays and straits. Estuaries are home to unique plant and animal communities that have adapted to brackish water—a mixture of fresh water draining from the land and salty seawater.
- **Riverine Wetlands: F**ound in floodplains and riparian zones associated with stream channels. Riverine systems can be broken down based on watershed position (and thus hydrologic regime) into tidal, lower perennial, upper perennial, and nonperennial subclasses.
- **Palustrine Wetlands:** Can occur in both floodplain and non-floodplain landscapes and can be ephemeral, seasonally or permanently inundated. These wetlands include bogs, fens, marshes and forested wetland swamps, and are dominated by persistent plants, mosses, shrubs, lichens and trees.

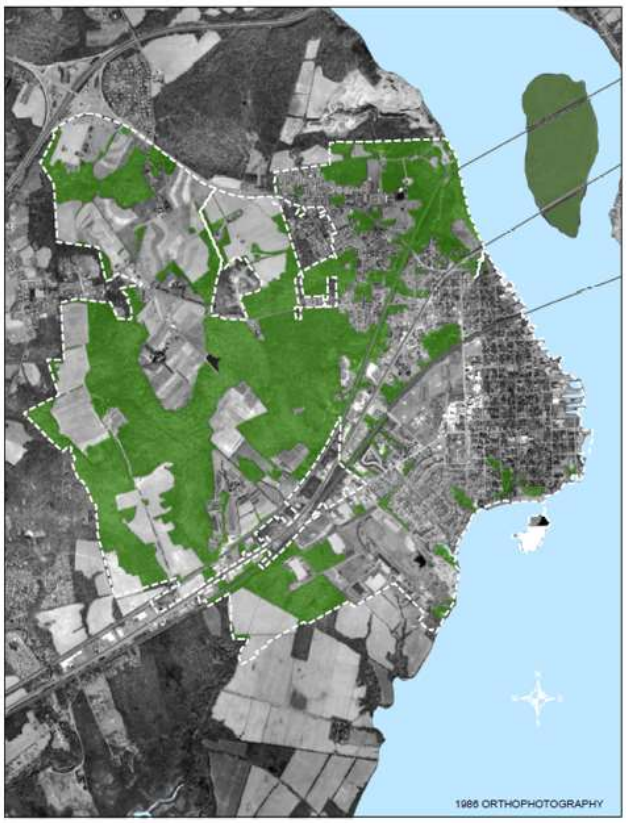
The National Wetlands Inventory has identified 12 areas of wetlands within City limits. Wetlands are regulated by the Environmental Protection Agency (EPA) and which writes the guidelines for determining whether a particular activity will affect wetlands can be permitted and oversee a regulator process reviewed by the United States Army Corps of Engineers (USACE) and Maryland Department of Environment (MDE) during the permit review process. Additional wetland determination occurs at the site and subdivision review level. Wetlands, if applicable, can be protected and preserved using the Forest Conservation ordinance through the DNR if they meet certain criteria, further strengthening the City's ability to protect and preserve existing wetland habitat.


ENVISION HdG
STEEP SLOPES
LEVEL RD
BULLE ROCK PKY
CANVASBACK DR
SUPERIOR ST
OHIO ST
ERIE ST
RCA
CHAPEL RD
HEATHER WAY
TIDEWATER DR
JUANITA ST
ST JOHN ST
PENNINGTON AVE
FULASKI HWY
LEWIS LN
REVOLUTION ST
BLOOMSBURY AVE
UNION AVE
MARKET ST
COMMERCE ST
SENECA AVE
BLENHEIM FARM LN
CLARK RD
OLD BAY LN
Amtrak Susquehanna River Bridge
STEEP SLOPES
> 15% SLOPE
> 20% SLOPE
> 25% SLOPE
> 30% SLOPE
> 35% SLOPE
> 40% SLOPE
> 45% SLOPE
>50% SLOPE
CHESAPEAKE BAY CRITICAL AREA
RESOURCE CONSERVATION AREA (RCA)
STREAM
MUNICIPAL BOUNDARY

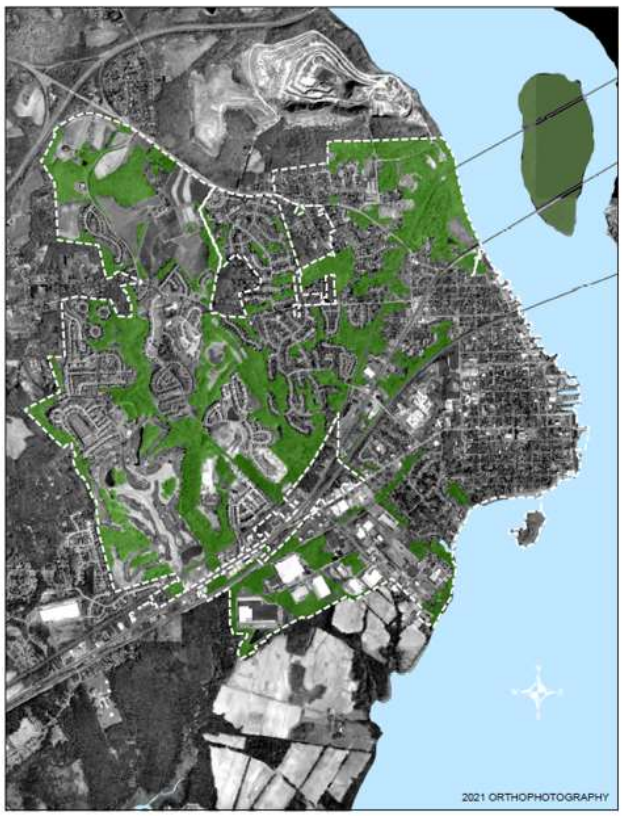
Forest Conservation

Forest cover has been declining in Maryland for several decades due to land development. The Forest Conservation Act is intended to slow the loss of forest and is currently being strengthened by the State of Maryland to ensure there is "no net loss" of forest cover. The City's Forest Conservation ordinance was first adopted in 1992 and regulates forest retention, removal, afforestation, and reforestation requirements during the development process. The ordinance is implemented in collaboration and guidance of the Maryland DNR. Unfortunately, the City has lost a substantial amount of forest cover due to development, as shown in the following aerial photos comparing 1986 forest cover with 2021 forest cover. The 1986 aerial photo occurred prior to the development of Bayview Estates, the Bulle Rock Planned Adult Community, Scenic Manor, and Grace Manor, as seen below.

Forest Cover, 1986



Forest Cover, 2021



At the site and subdivision plan review, a Forest Stand Delineation (FSD) and Forest Conservation Plan (FCP) are required for a development plan where land disturbance is 40,000 square feet or greater. A forest is a biological community dominated by trees and other woody plants covering a land area of 10,000 square feet or greater. Maintaining and increasing forest cover provides significant benefits including habitat enhancement, stormwater infiltration, shoreline stabilization, nutrient absorption, and temperature mediation.

All existing ecologically viable forest areas contribute to the character of a landscape. Forest areas that are important for the conservation of a group of bird species called Forest Interior Dwelling Species (FIDS) because they require habitat in the interior of forests for optimal reproduction and survival. These lands are critically important to preserve because many species and important ecosystems are dependent on large forested blocks. The benefits to the community are exponential. Maintaining large tracts of undisturbed woodlands or other natural vegetation within developments are a priority. Such stands help control stormwater run-off, minimize erosion and sedimentation of streams, provide wildlife habitats, and provide shade to help moderate local temperatures in addition to acting as hubs and corridors. Also, they form visual buffers and are scenic in their own right. The City's Forest Conservation and Landscape ordinances must be strictly enforced to preserve the tree canopy and to meet state standards, which are currently being strengthened.

Tree City USA is a voluntary program the City has participated in since 2002 which has community benefits that directly impact the people, neighborhoods, and City as a whole. Current efforts consist of improving forest cover and tree canopy downtown which helps improve water quality and reduce energy costs while promoting healthy green spaces. This is done through grants and program efforts, a community tree ordinance, forest conservation ordinance, landscaping ordinance, and site plan review process. These initiatives contribute to the mission to promote a greener, healthier, and a more livable environment for residents.

Landscape Conservation

The Sensitive Areas, Volume II of the State's guidance document includes landscape conservation as a required area for protections. This includes wildlife corridors, FIDS bird habitat, riparian zone corridors, scenic vistas, and geologic features. For the purpose of this section as related scenic vistas, cultural landscapes are also described since they are significant cultural landscapes worth recognizing and preserving.

Wildlife corridors consisting of stream valleys and forested areas should be identified and retained during the development process. These are not only environmentally regulated spaces but can be tied with recreational use by adjoining communities. Forest corridors specifically lend to FIDS bird habitat which require interior forests that are more than 100 meters from a forest edge.

Although the City currently lacks regulation and protective measures for landscape conservation and scenic vistas, several exist within the City and should be identified for preservation. For instance, views from MD 155 to the Chesapeake Bay are stunning. The vistas offered here are a gradual descent from the I-95/MD 155 interchange into the historic area from an elevation of 420 feet then steep grades along the fall line to the coastal plain. Private preservation of 50 acres along MD 155 through a Maryland Environmental Trust easement protects the viewshed from the historic structure of Sion Hill National Historic Landmark to the Bay. Retaining that viewshed is important for the gateway experience to Havre de Grace from MD 155.

An unfortunate cultural landscape loss is the allee associated with the Mt. Pleasant II Georgian mansion located in Bulle Rock that was part of the original homestead. Though the historic structures and surrounding grounds are under Maryland Historical Trust (MHT) easement, the allee was separated by the development's road system and is under construction. Although the original structure still stands, the significance of the context could have been preserved and as a result, a historic landscape will be forgotten. These are the kind of historic landscape features that are well worth preserving as part of site plan and subdivision review. As the City continues to grow, it should be careful not to lose the rich cultural historic landscapes that make it appealing.

Distinctive cultural landscapes under public ownership along the waterfront include the Concord Point Lighthouse and Keeper's House and the Lock House Museum and grounds, all of which are protected under Maryland Historical Trust easements. The context of these important public spaces is intended to be preserved so that both views from and to the historic structures are protected. Additional public buildings of historic significance are the Moore Family Homestead (3 contributing structures) and the Cultural Center at the Opera House and adjoining #2 Fire House. Careful consideration must be made when seeking improvements on these cultural landscapes.

Chesapeake Bay Critical Area

In 1984, the Chesapeake Bay Critical Area (CBCA) Protection Act passed and was adopted by the City in 1988, designating the Critical Area as all land within 1,000 feet of the mean high-water line of tidal waters (Chesapeake Bay) or the landward edge of tidal wetlands, and all waters of and lands under the Chesapeake Bay and its tributaries (Susquehanna River) with the intent to preserve the water quality of the bay as well as wildlife habitat along the shoreline. Within the 1,000-foot Critical Area is also a 100-foot Buffer where disturbance is additionally limited. The Buffer is subject to stricter requirements than the rest of the CBCA by striving to improve the function of the Buffer as part of all development activities. Located to the North along the shoreline are Intensely Developed Areas (IDA) and Resource Conservation Areas (RCA) Designations shown in the adjoining map.

> **RCA**: Resource Conservation Areas make up approximately 80% of the Critical Area in Maryland and are characterized by natural environments or areas where resource-utilization activities are taking place.

Resource utilization activities include agriculture, forestry, fisheries activities, and aquaculture, which are considered "protective" land uses. RCAs are required to be developed at a residential density of less than 1 dwelling unit per 20 acres or be dominated by agricultural uses, wetlands, forests, barren land, surface water, or open space.

IDA: Intensely Developed Areas are defined as areas of twenty of more adjacent acres where residential, commercial, institutional or industrial land uses predominate. IDAs are areas of concentrated development where little natural habitat occurs. In IDAs, the main focus of the Critical Area Program is on improving water quality and protecting habitat areas.

10 Percent Rule: Water quality must be improved with a 10% nutrient reduction - pollutant loads generated from a developed site to a level at least 10% below the loads generated at the same site prior to development. This requirement is commonly referred to as the "10% Rule".

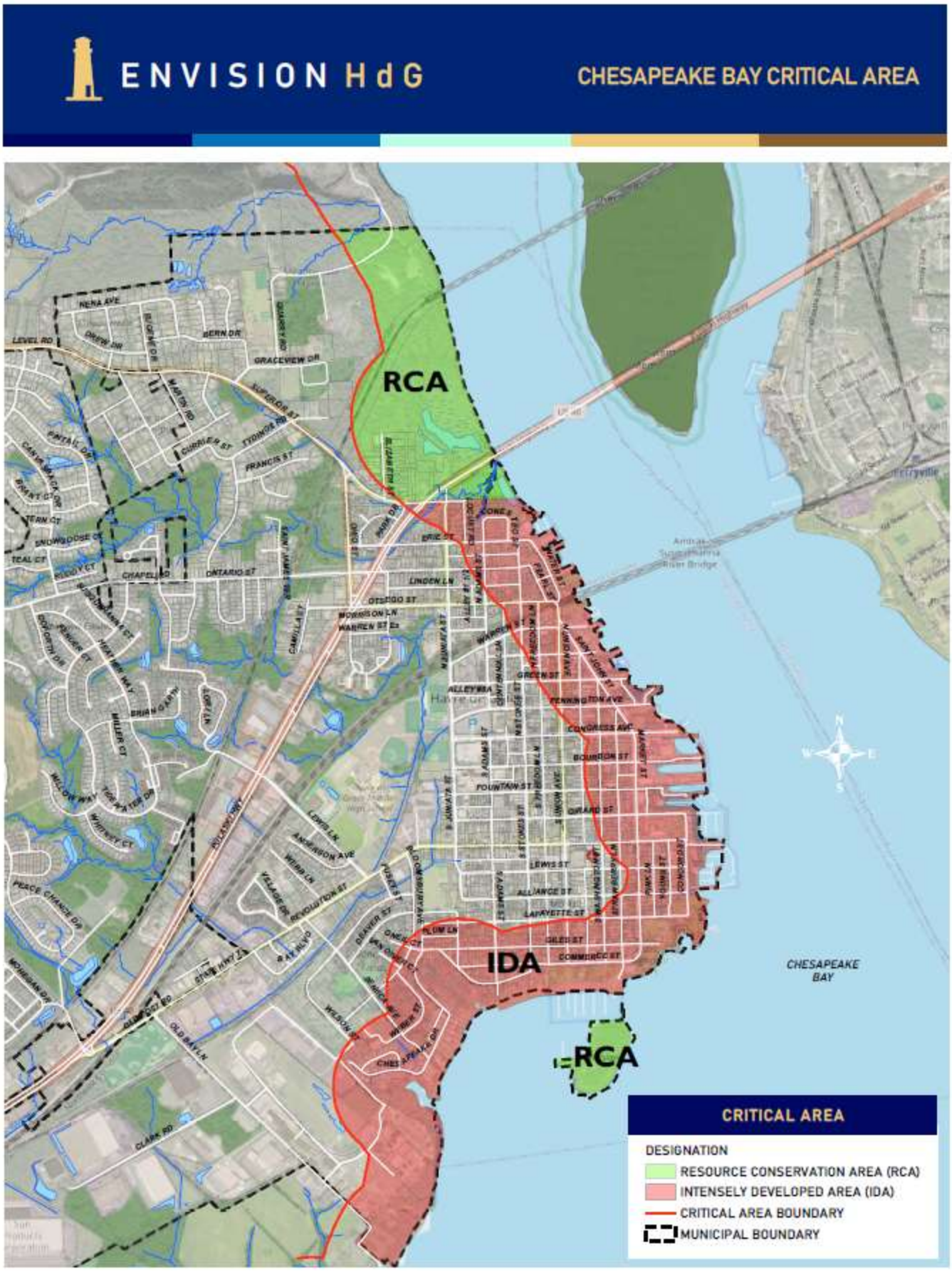
HPA: Habitat Protection Areas are sensitive areas that help protect water quality and provide wildlife habitat.

The line of demarcation between RCA and IDA within the City follows the northern edge Superior Street inland 1,000 feet from the shoreline of the Susquehanna River. Lot coverage and/or mitigation of impervious surface improvements are required depending on Critical Area designation. IDA (red) is least restrictive designation and RCA (green) is most restrictive. The protection, restoration and enhancement of the shoreline is a priority for the City to continue to provide safe, accessible and quality experiences for the community and visitors while increasing the quality of life for people, plants, and animals.

The Critical Area regulations require that designated habitat protection areas be identified, conserved, and promote the use of clustering of development to reduce the amount of impervious surfaces and increase the area of natural vegetation. Within the RCA, the retention and increase of forested areas is extremely important to the health of the Chesapeake Bay. In RCA area, Critical Area regulations require that all development projects include the replacement of cleared forest cover in ratios ranging from 1:1 to 3:1, depending on the percentage of forest acreage cleared. Constellation and public lands to the north of Superior Street as well as Tydings Island are designated RCA within City-limits.

Some aspects of the CBCA are native plants, pollution reduction, storm water mitigations, coastal resiliency and shoreline accessibility. The term used for a rooted aquatic plant that grows completely under water is submerged aquatic vegetation (SAV). These plants occur in both freshwater and saltwater but in estuaries, where fresh and saltwater mix together, they can be an especially important habitat for fish, crabs, and other aquatic organisms.

This is evident with their extensive riparian buffer and living shoreline projects in addition to their critical area rigorous site plan review process and collaboration with other environmental agencies in relation to development. Collectively, these aspects will continue to guide the restoration of the living shoreline and coastal resiliency efforts that make Havre de Grace a unique place to live and play. So far there are approximately 2,780 linear feet of living shoreline projects completed with more to come in the future. As the City continues to grow and look forward, the accessibility and connection to the water will be enhanced for current and future residents and visitors.


ENVISION HdG
CHESAPEAKE BAY CRITICAL AREA
RCA
IDA
RCA
CHESAPEAKE BAY
CRITICAL AREA
DESIGNATION
RESOURCE CONSERVATION AREA (RCA)
INTENSELY DEVELOPED AREA (IDA)
CRITICAL AREA BOUNDARY
MUNICIPAL BOUNDARY

Eroding Shorelines

The City has approximately 3 miles of shoreline located along the Chesapeake Bay and Susquehanna River which are currently under various phases of land use and development conditions. As described in the prior section, the shoreline is subject to the Chesapeake Bay Critical Area Law and criteria of 1,000 foot and 100 foot requirements, which regulates development as well as shore erosion control (such as the construction of stone revetments) and other shoreline disturbance activities.

Extensive efforts to protect, conserve, and enhance the shoreline through a 'living shoreline' program is underway through the City's Department of Public Works. Currently, approximately 2,780 linear feet – over half a mile – of shoreline have been completed via the living shoreline method and provide significant benefits to stormwater run-off and water quality. These projects are combining regenerative stormwater conveyances with living shorelines to treat stormwater runoff from older portions of the City that did not have water quality stormwater management features. The supplemental planting of native vegetation, bank stabilization, and erosion control enhances the water quality and wildlife habitat on both public and private properties along the Bay ensuring continued economic and ecological enjoyment for years to come. Please see the Water Resources Element chapter for more information on these projects.

Dark Sky

Havre de Grace sits in a relatively clear sky sweet spot between the urban areas of Wilmington / Philadelphia to the north and Baltimore / DC to the south. This location results in less polluted air quality with blue skies during the day and star lit skies at night. The City's dark skies in particular are further buffered by the surrounding Susquehanna River / Chesapeake Bay on one side and preserved rural land on the other. However, the ever increasing presence of artificial lighting dilutes the treasured wonder of the night sky both in Havre de Grace and worldwide. Excessive artificial light at night has also increasingly been linked to adverse impacts on wildlife and human health. While recent moves to LED lighting has produced the environmental benefit of reduced energy consumption, it has also produced greater glare which exacerbates artificial light's negative night sky impacts.

Over recent years, Havre de Grace has added anti-glare regulations to Zoning Code, Subdivision, and Site Plan regulations. However, unshielded, and now LED, lights continue to proliferate. An example of this is the unshielded BGE acorn-type street light recently installed in The Residences at Bulle Rock. Those lights direct more light to the sky and neighboring properties than to the streets that they are supposed to illuminate. The impact of those lights has been made worse by the switch over to glare producing LED lights. Increased lighting glare not only impacts neighboring properties but results in an unnatural glow that extends into the night sky, potentially affecting diurnal rhythms of humans and wildlife. This is a new area of environmental protection that needs to be considered and addressed as it is an unnecessary encroachment into a community's quality of life and enjoyment of the night sky. The City Code should incorporate anti-glare lighting regulations into a comprehensive set of lighting regulations that mandate shielded lights and limit glare producing light sources.

GRANT FUNDING OPPORTUNITIES:

Due to the location of the City at the mouth of the Susquehanna River and the Chesapeake Bay, the City qualifies for many funding opportunities. The City has been strategically and aggressively pursuing funding and has been successful in obtaining several grants from various sources to use in combination with funding from the City Capital program to fund the engineered plans and the permitting. In addition, the City has been successful in acquiring grant funding after design is completed and permits have been obtained. The following are grants that the City has gotten to construct shoreline projects:

- Harford County Government
- Department of Natural Resources (DNR): Chesapeake and Coastal Service
- Chesapeake Bay Trust Funds (CB Trust)

- DNR - Coastal Trust Funds (CT Funds)
- Natural Resources Conservation Service (NRCS)
- Maryland Department of Environment (MDE)
- Maryland Department of Transportation State Highway Association (MDOT SHA) Recreational Trails Program

Additional Funding Opportunities Available:

- National Fish and Wildlife Foundation (NFWF)
- Federal Emergency Management Agency (FEMA)
- Environmental Protection Agency (EPA)

Currently, the City is working on grant proposals for the Lilly Run stream that traverses through several neighborhoods and is often a choke point for flooding. Harford County Government has expressed interest in funding some of the flood management projects in exchange for a share of impervious area treatment credits.

The City has established a Chesapeake Bay Critical Area Taxing District that generates annual funding for projects within the CBCA and can be used in combination with grants to use on specific projects and also for the living shoreline projects. The City also utilizes the Critical Area funds for the maintenance of these projects. The City is fortunate to have built partnerships with many grantors on these beautiful projects to ensure the continued success and enjoyment for many generations to come.

BEYOND 2023:

Havre de Grace is an expanding community whose unique position at the mouth of the Susquehanna River and the Chesapeake Bay makes it an appealing place to live, work and explore. With several tributaries traversing the City (Lilly Run, Fountain Run, Gasheys Creek, and Swan Creek) that carry stormwater into the Susquehanna River, there is an abundance of opportunity for recreation and community engagement with nature while mitigating urban flooding. As a benefit, the City is dedicated to providing the community with the resources to continue to age in place while extending cost saving benefits to citizens on flood insurance. This is done through voluntary partnerships with NFIP, CRS, and FMAP. Their programs provide discounts and real tangible cost savings to vulnerable residents who are impacted through coastal flooding, stormwater inundation, and natural hazards as a direct and indirect result of land use, development, and significant storms. Looking beyond 2023, the City is undergoing several public infrastructure improvement projects that benefit the community, replace dilapidated infrastructure, expand recreational opportunities and enhance the quality of life, while protecting, preserving and capitalizing on existing environmental assets for future generations to enjoy.

ACTION ITEMS:

The following action items are meant to identify key features and opportunities for improving the surrounding environment's balance between economic development, environmental resources, and sensitive areas.

- Recognize open spaces and natural resources as key City infrastructure and develop a comprehensive natural resource map to preserve sensitive environmental features and guide development, to include watercourses, wetlands, forested areas, historic landscapes, critical habitat, steep slopes, and scenic vistas;
- Improve stormwater management and runoff water quality in the older portions of Havre de Grace through innovative techniques, such as small bioretention facilities, storm drains and grass filter strips;
- Consider adjacent land uses in relation to important environmental resources when preserving, developing, and traversing landscapes;
- Require all development to investigate areas that may contain sensitive areas such as wetlands, forest, and vulnerable habitat prior to building. Protective measures should be submitted along with the project design

unless it can be shown that these activities or disturbances will not have or cause adverse impact on the environment;
- Provide mechanisms for recognizing and maintaining Forest Conservation properties;
- Create criteria and programs to further recognize and preserve important historic landscapes and scenic vistas;
- Identifying opportunities for civic facilities and infrastructure to be retrofitted and integrated with a higher environmental standard to reduce their carbon footprint and impact, especially when located within CBCA and other sensitive areas;
- Identify opportunities to increase the City's CRS rating to provide cost saving benefits to the community and create, expand and enhance the Emergency Response program for natural disasters through public outreach and community engagement. (text, phone, email, social media);
- Map any wetlands of "Special State Concern";
- Enforce existing Forest Conservation and Landscape ordinances and provide additional mechanisms for recognizing significant forested properties;
- Integrate review and approval of Forest Conservation and Landscape Plans within the Site Plan and Subdivision applications reviewed and approved by the Planning Commission;
- Create criteria to further recognize and preserve important historic landscapes and scenic vistas;
- Enforce existing dark sky/anti-glare provisions of the City Code and implement a comprehensive dark sky ordinance to prevent and/or correct light pollution.

References:

For more information see the *Sensitive Areas - Volume I and Sensitive Areas - Volume II* sections from the Models and Guidelines.

- https://gisapps.dnr.state.md.us/coastalatlas2019/MERLIN/index.html (MERLIN)
- https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/ (Wetlands Mapper)
- https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77 (Critical Habitat)
- https://dnr.maryland.gov/wildlife/Pages/plants_wildlife/digitaldata.aspx (Digital Data Products)
- https://data.imap.maryland.gov/maps/93218f38c5014853bb308dacdaf23a9c/explore (CRAB)
- https://hcggis.harfordcountymd.gov/planning/harfordgis/ (Harford GIS)

MERLIN

Maryland's Environmental Resource & Land Information Network link:

https://maryland.maps.arcgis.com/apps/webappviewer/index.html?id=434b195197364344a661da85c9bab3c9