



# **09 Environmental Resources and Sensitive Areas**

## INTRODUCTION

The City of Aberdeen recognizes the importance of protecting its natural resources by establishing and strengthening regulations and preparing for the future as development and climate change becomes an increasing threat. This chapter has been prepared consistent with the State of Maryland’s Twelve Planning Visions, particularly as they relate to environmental protection, resource conservation, quality of life, and sustainability. The City has pursued the Sustainable Maryland designation and has created a “Green Team” to increase community awareness of our natural resources and the importance of protecting the environment.

This Chapter provides information and guidance on protecting the following environmental resources and sensitive areas: streams, wetlands and their buffers, floodplains, habitats of threatened or endangered species, steep slopes, agricultural or forested lands, and critical areas. These sensitive areas can be vulnerable to adverse impacts from development activities, residential uses, and certain types of agricultural practices.

## GOALS

The City has developed several goals and recommendations that are discussed in more detail below:

- 1. Ensure protection of the City’s natural environment and its most important environmentally sensitive features.**
  - Continue to monitor state, federal, and county regulation changes with respect to natural resources protection and update the Code of the City of Aberdeen, as necessary.
  - Preserve stream valleys, floodplains, and nontidal wetlands and their buffers.
  - Adopt updated critical area map and the critical area program requirements for Aberdeen.
  
- 2. Encourage enhancement and expansion of natural and forest lands.**
  - Use codes and plan reviews to ensure native, non-invasive vegetation is preserved and/or planted along waterways, and within parks, open spaces, and public rights-of-way to the extent practicable.
  - Establish and implement an invasive species removal program and focus on planting native species within natural areas and forest lands.
  - Continue membership in the ‘Tree City USA’ program and expand practices resourced in this program.
  - Conduct a comprehensive inventory of the existing forested lands and set goals for preserving existing forest and increasing forest on public lands.
  - Conduct a street tree inventory and assess the health and maintenance of the street trees. Complete all necessary street tree maintenance.
  - Conduct a tree cover analysis to determine the extent of the City’s tree resources and green infrastructure.

### 3. Emphasize and enhance sustainable environmental practices within the City.

- Develop a volunteer-based sustainability/green team to assist with environmental protection and enhancement goals throughout Aberdeen.
- Support the ongoing efforts for the Aberdeen’s Sustainable Maryland Certification.
- Support energy efficiency and renewable energy upgrades in new and existing public facilities.
- Adopt local mitigation, floodplain management, and outreach activities that exceed the minimum National Flood Insurance Program (NFIP) and allow for the application for Community Rating System (CRS) participation through the Federal Emergency Management Agency (FEMA).

## LEGISLATION & POLICIES

The State’s *Land Use Article*, which incorporates the provisions of the *1992 Economic Growth, Resource Protection, and Planning Act*, requires local governments to include a “Sensitive Areas” element in their Comprehensive Plans. This element must include goals, objectives, principles, policies, and standards designed to protect the following sensitive areas from the adverse impacts of development:

- Streams or wetlands and their buffers
- Floodplains
- Habitats of threatened or endangered species
- Steep Slopes
- Agriculture or forest lands intended for resource protection or conservation
- Other areas in need of special protection

*Maryland Land Use Article* also requires municipal comprehensive plans to include a Mineral Resources Element. The element must incorporate land use policies and recommendations for regulation necessary:

- To balance mineral resource extraction with other land uses.
- To the extent feasible, to prevent the preemption of mineral resources extraction by other uses.

In addition to the required sensitive areas, this chapter discusses other environmental resources within the City. Some related topics can also be found in **Chapter 3—Community Facilities** and **Chapter 10—Water Resources**.

The City has a comprehensive program in place to protect sensitive resources, including adherence to State and federal regulations and protections within City ordinances and the Development Code. The City will monitor State, federal, and county regulation changes with respect to natural resources protection and update ordinances, as necessary.

## Pertinent State & Federal Regulations

In addition to the 1992 Act highlighted in the previous section, a number of other federal and State regulations guide environmental protection efforts:

- *Clean Water Act, Section 404*: The U.S. Army Corps of Engineers (USACE) regulates the discharge of dredged or fill material into wetlands. The USACE district office determines whether various activities such as placement of fill material, levee and dike construction, mechanized land clearing, land leveling, transportation infrastructure construction, and dam construction require a permit.
- *Endangered Species Act*: The primary purpose of this Act is to protect wildlife, fish, and plants that are listed as threatened or endangered species by prohibiting their import or export and by preparing plans for their recovery.
- *Maryland Forest Conservation Act*: The main purpose of this Act is to minimize the loss of Maryland’s forest resources during land development by making the identification and protection of forests and other sensitive areas an integral part of the site planning process. Depending on the type or size of proposed development, Forest Stand Delineations and Forest Conservation Plans may be required.
- *Maryland Tidal Wetlands Act*: The Maryland Department of the Environment (MDE) manages tidal wetlands and provides resource protection for activities such as filling open water and vegetated wetlands, construction of piers, bulkheads, revetments, dredging, and marsh establishment.
- *Maryland Nontidal Wetlands Protection Act*: MDE’s Nontidal Wetlands and Waterways Division ensures there is no overall net loss of non-tidal wetland acreage and reviews the following construction activities: grading or filling, excavating or dredging, changing the existing drainage pattern, disturbance of water levels or water table, or destroying or removing vegetation. Permits are required for activities that alter a non-tidal wetland or wetland buffer.
- *Chesapeake Bay Restoration Act*: This Act and subsequent policies, programs, and regulations address Bay restoration. This Act established the Chesapeake Bay Restoration Fund administered by MDE for upgrading the 66 largest wastewater treatment plants to Enhanced Nutrient Reduction (ENR) standards. This Act established the Septic Upgrade Program to remove nitrogen and the fee paid by onsite sewage disposal system (OSDS) or septic users to fund the upgrade of septic systems through the Septic Upgrade Program.
- *Robert T. Stafford Disaster Relief & Emergency Assistance Act*: In 2000, the Stafford Act enacted the Disaster Mitigation Act and, by FEMA’s Interim Final Rule published in 2002, established in the Maryland Code that each Maryland jurisdiction adopt and maintain a Hazard Mitigation Plan (HMP). The HMP ensures eligibility for funding and technical assistance from State and federal hazard mitigation programs. It addresses natural hazards determined to be of high and moderate risk as defined by the updated results of the local hazard, risk, and vulnerability summary. Natural hazards continue to be evaluated during five-year update cycles and include sea level rise and coastal resiliency planning priorities.
- *Maryland Model Floodplain Management Ordinance (FPMO)*: MDE prepared the Maryland Model FPMO (January 2018) in response to the requirement that local jurisdictions adopt regulations that are fully compliant with the requirements of the National Floodplain Insurance Program

(NFIP). For most communities, the requirement to update regulations is triggered by revisions to the Flood Insurance Rate Maps (FIRMs) and associated Flood Insurance Study (FIS).

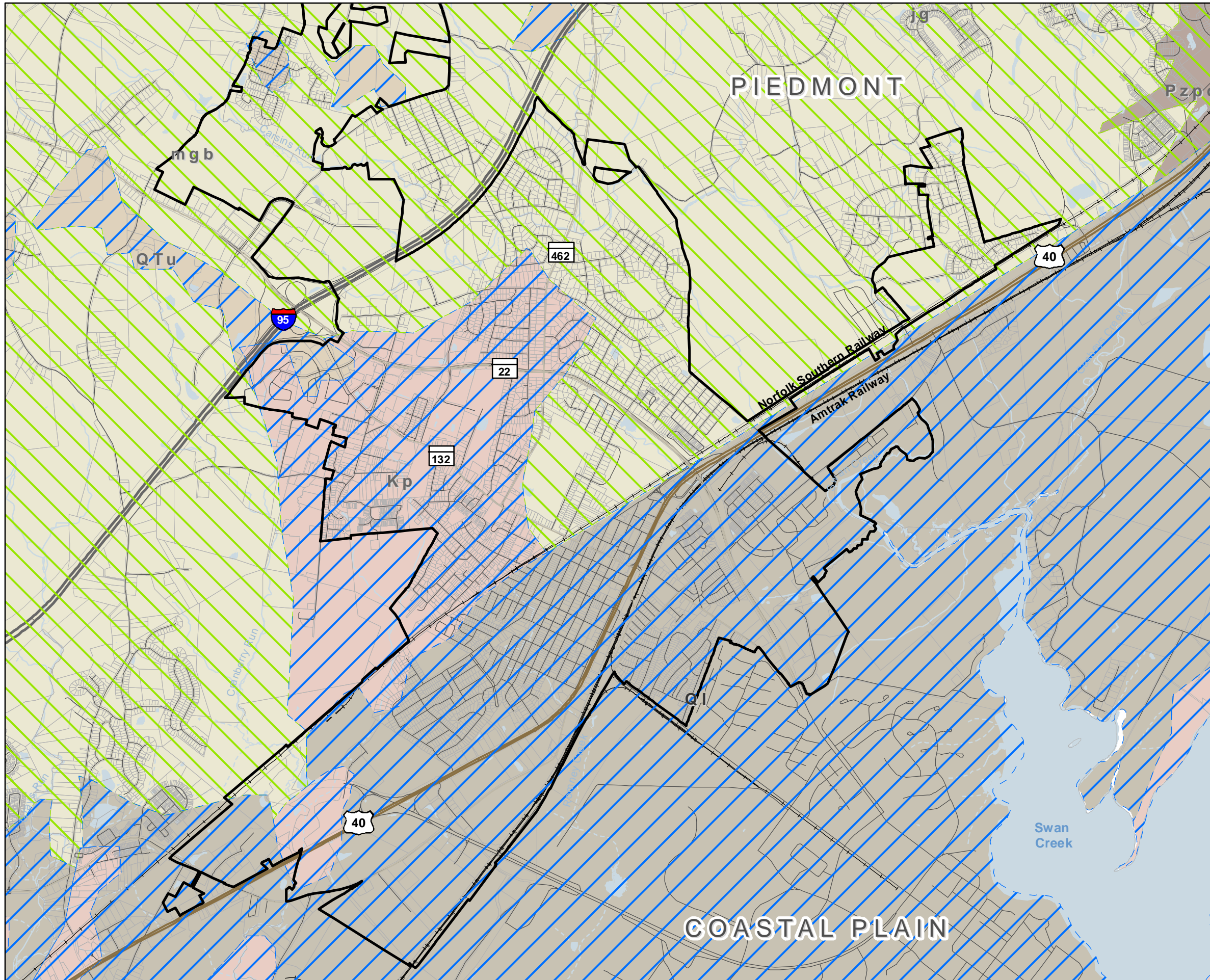
## Significant Updates Since the 2011 Comprehensive Plan

Since the adoption of the 2011 Comprehensive Plan, Aberdeen has adopted multiple environmental ordinances and resolutions. These include:

- Resolution 13-R-12, MEA Support of Energy Policies & Plans: This resolution served to adopt goals for the City to establish an electricity consumption baseline for calendar year 2011 and develop a plan with the goal to reduce per square foot electricity consumption of City-owned buildings by 15% within five years of adoption; establish a petroleum consumption baseline for all local government vehicles and put in place a comprehensive program to reduce the baseline by 20% within five years of the baseline year.
- Resolution 14-R-12, Supporting Participation in Sustainable Maryland: This resolution authorized the City to start the SMC Municipal Certification process.
- Ordinance 16-O-02, Trees & Vegetation: This ordinance added language to the City Code requiring land owners to maintain clearances and sight distances, to take action regarding dead or diseased trees, and other general items relating to trees and other vegetation in the City.
- Ordinance 16-O-03, Floodplain Management Ordinance: This ordinance repealed and replaced in its entirety language in the City Code related to Floodplain Management.
- Ordinance 16-O-17, Forest Conservation: This ordinance amended language in the City Code related to Forest Conservation.
- Additional ordinances for stormwater management, wellhead protection, grading, sediment and erosion control can be found in **Chapter 10—Water Resources**.



















## PHYSIOGRAPHY, TOPOGRAPHY, SOILS & STEEP SLOPES

Interpreting the physiography, or the physical geography, of a location is important for understanding the natural physical and climactic characteristics of a specific area and is helpful for determining natural land cover and constraining human land use. The City, as well as the rest of Harford County, is located in both the Atlantic Coastal Plain and the Piedmont Plateau physiographic provinces (**See Map 9-1, Geology**). The Atlantic Coastal Plain consists of geologic formations comprising deep-lying crystalline rocks covered with layers of gravels, sands, and clays. The layers that make up the Coastal Plain dip gently toward the Atlantic Ocean from northwest to southeast. The Piedmont Plateau consists of geologic formations comprising hard, crystalline igneous and metamorphic rocks. The layers that make up the Piedmont Plateau extend from the inner edge of the Coastal Plain westward to Catoctin Mountain, to the eastern-most boundary of the Blue Ridge Province.



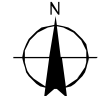
**MAP 9-1**

**Geology**

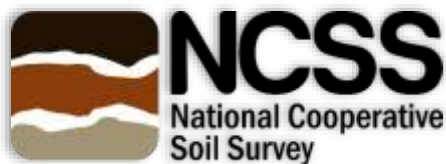
-  City of Aberdeen
-  Parcels
-  Railroad
- Major Roads**
-  Interstates
-  US Highways
-  State Routes
-  Local Routes
- Water Bodies**
-  Water Bodies
-  Stream or River (Perennial)
-  Stream or River (Intermittent)
- Geologic Province**
-  Coastal Plain
-  Piedmont
- Geologic Formation**
-  Lowland Deposits
-  Metagabbro & Amphibolite (mgb)
-  Port Deposit Gneiss (Pzpd)
-  Potomac Group/ Undifferentiated Mesozoic & Crystalline Rocks (Kp)
-  Upland Deposits - Western Shore (QTu)
-  Volcanic Complex of Cecil County (jg)



Source: MD iMAP  
 Wallace Montgomery created this map for planning purposes from a variety of sources. It is neither a survey nor a legal document. Information provided by other agencies should be verified with them where appropriate.

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Aberdeen’s surface elevation ranges from its lowest point at two feet above sea level in the southeast near Mullins Park, to 318 feet above sea level in the northwest near MD 22 and Aldino Stepney Road. In general, the elevation gradually increases across the City from southeast to northwest, with lower elevations concentrated south of US 40. These lower elevations are primarily associated with the Atlantic Coastal Plain physiographic province, where landforms typically consist of flat plains. North of US 40, elevation increases in the Piedmont Plateau physiographic province, with the highest elevations generally north of I-95.



The most current soil survey data is a product of the National Cooperative Soil Survey (NCSS), a joint effort of the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), other federal and State agencies, and local partnerships. The soil survey data identify specific soil

types and their limitations. Soil types are important in determining whether they are able to support development. Examples of constraining factors can include steep slopes, wetness, depth to bedrock, frost action, shrink/swell, and flooding. Soil types are also important in determining whether septic systems can be used. **Chapter 10—Water Resources** includes a discussion of the handful of properties within City limits that still utilize septic systems.

**Table 9-1, Aberdeen Soils**, groups soil descriptions by their drainage class, which refers to the frequency and duration of wet periods under conditions similar to those that were present when the soil formed (**See Map 9-2, Soils & Steep Slopes**). Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized: excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained.

Five classes of natural soil drainage are recognized for the City. General definitions for each represented drainage class and the percent of soils in the City associated with each drainage class, as defined by the USDA, are below:

- Somewhat excessively drained (8% of soils in Aberdeen): Water is removed from the soil rapidly. Internal free water occurrence commonly is very rare or very deep. The soils are commonly coarse-textured and have high saturated hydraulic conductivity or are very shallow.
- Well drained (36% of soils in Aberdeen): Water is removed from the soil readily but not rapidly. Internal free water occurrence commonly is deep or very deep; annual duration is not specified. Water is available to plants throughout most of the growing season in humid regions.
- Moderately well drained 22% of soils in Aberdeen): Water is removed from the soil somewhat slowly during some periods of the year. Internal free water occurrence commonly is moderately deep and transitory through permanent.
- Poorly drained 16% of soils in Aberdeen): Water is removed so slowly that the soil is wet at shallow depths periodically during the growing season or remains wet for long periods. Most terrestrial

plants that are not adapted to particularly wet conditions cannot be grown unless the soil is artificially drained. The occurrence of internal free water is shallow or very shallow and common or persistent. The soil, however, is not continuously wet directly below plow-depth.

- Very poorly drained (8% of soils in Aberdeen): Water is removed from the soil so slowly that free water remains at or very near the ground surface during much of the growing season. The occurrence of internal free water is very shallow and persistent or permanent. Unless the soil is artificially drained, most terrestrial plants that are not adapted to particularly wet conditions cannot be grown.

The remainder of the land (10%) is not classified by drainage class as it is water or urban land.

**Table 9-1. Aberdeen Soils**

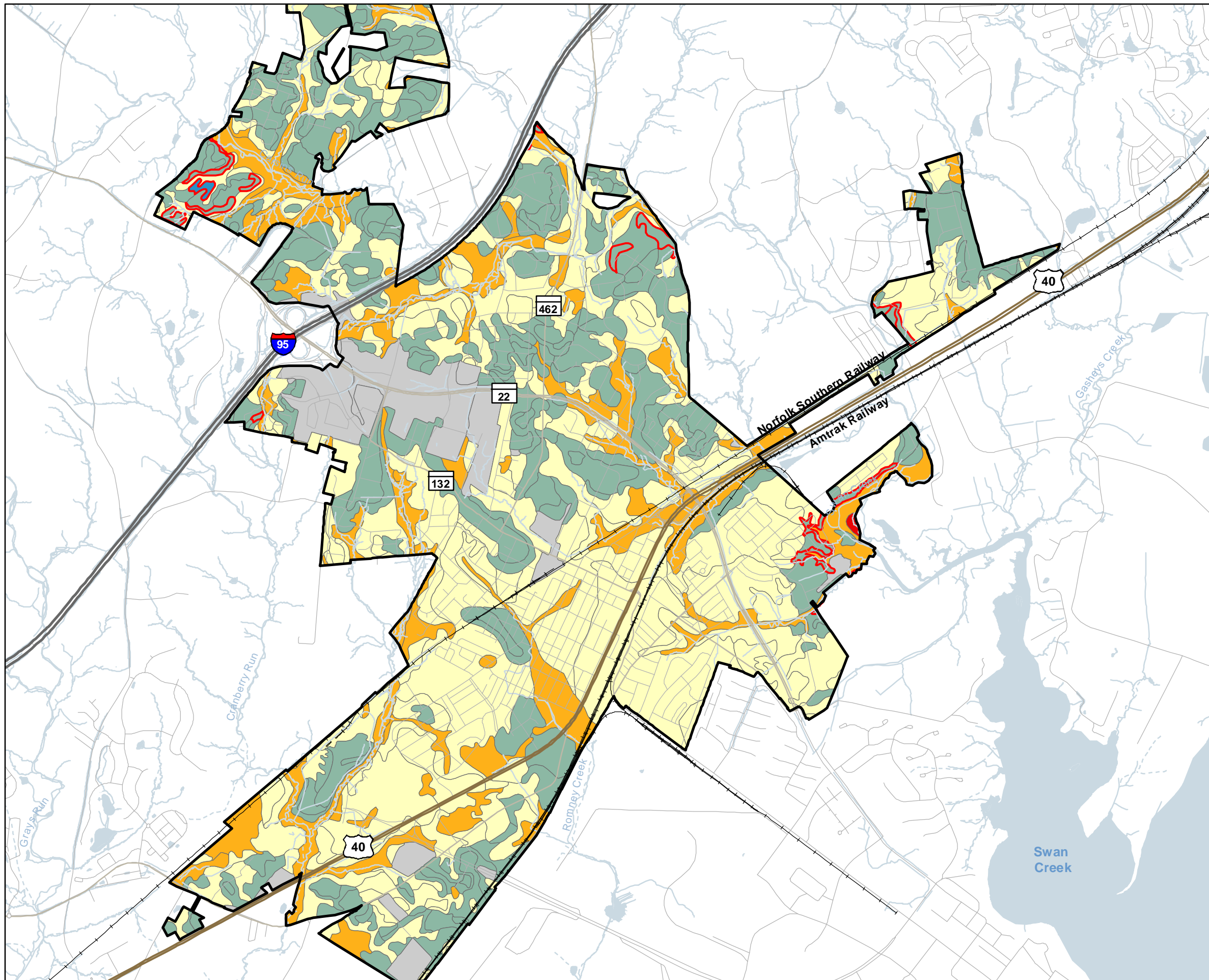
Hydrologic Soil Group	Drainage Class	Soil Types
A	Somewhat excessively drained	Brandywine gravelly loam, 15 to 25 percent slopes, severely eroded
A, B, C	Well drained	Chester silt loam, Chillum silt loam moderately eroded, Chillum-Neshaminy silt loams moderately eroded, Comus silt loam, Elsinboro loam, Elsinboro loam moderately eroded, Glenelg loam, Glenelg loam severely eroded, Joppa gravelly sand loam, Legore silt loam moderately eroded, Legore very stony silt loam, Legor silty clay loam severely eroded, Manor loam, Manor channery loam, Mattapeake silt loam, Montalto silt loam, Montanto silt loam moderately eroded, Neshaminy silt loam moderately eroded, Neshaminy and Montalto very stony silt loams, Sassafras sandy loam, Sassafras loam, Sassafras loam moderately eroded, Sassafras and Joppa soils, Hambrook sandy loam, Nassawango silt loam, Udorthents
C, D, C/D	Moderately well drained	Aldino silt loam, Aldino very stony silt loam, Beltsville silt loam, Codorus silt loam, Delanco silt loam, Glenville silt loam, Kelly silt loam, Mattapex silt loam northern coastal plain, Russet fine sandy loam, Woodstown loam northern coastal plain, Woodstown sandy loam northern coastal plain
B/D, C/D, D	Poorly drained	Elkton silt loam, Fallsington loams northern coastal plain, Hatboro silt loam, Hatboro-Codors complex frequently flooded, Kinkora silt loam, Leonardtown silt loam, Othello silt loams northern coastal plain, Watchung silt loam, Watchung very stony silt loam
D	Very poorly drained	Swamp

Source: National Cooperative Soil Survey for the City of Aberdeen



# MAP 9-2

## Soils & Steep Slopes



- City of Aberdeen
- Railroad
- Major Roads
  - Interstates
  - US Highways
  - State Routes
  - Local Routes
- Water Features
  - Water Bodies
  - Stream or River (Perennial)
  - Stream or River (Intermittent)
- Steep Slopes
  - Soils with Greater than 15% Slopes
- Drainage Class
  - Somewhat excessively drained
  - Well drained
  - Moderately well drained
  - Poorly drained
  - Very poorly drained
  - Other



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Source: MD iMAP, The US Department of Agriculture



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Topography and areas with steep slopes have specific implications for site development—they impact the location of roads, buildings, and utilities and also affect the overall visual character of a site. Slopes provide an environment for movement of soil and pollutants when land disturbance occurs. While soils have varying degrees of erodibility, all are subject to movement, which is exacerbated as the slope of the land increases. Preservation of steep slopes adjacent to watercourses is especially important because of the potential harm to water quality and aquatic habitat. The identification and protection of steep slopes help to protect the immediate and downstream communities from these hazards. **Map 9-2, Soils & Steep Slopes**, shows the location of steep slopes throughout the City. The Code of the City of Aberdeen, *Chapter 297—Grading and Erosion & Sediment Control* requires the identification of highly erodible soils and slopes of 15% or steeper as part of the concept phase of project review. These identified areas are to remain undisturbed or enhanced protection strategies must be approved for these areas during construction. Vegetative stabilization of these (and other) areas must occur before developers are permitted to remove temporary sediment control elements.

## STREAMS & STREAM BUFFERS

Streams and their buffers are valuable to people and vital to natural resources. They are used for irrigation, provide important spawning grounds for finfish and shellfish, and help support other kinds of wildlife. Streams also support commercial and recreational fishing and attract outdoor enthusiasts such as hunters, boaters, and birdwatchers. Streams are vulnerable to adverse impacts from development activities, residential uses, and certain types of agricultural practices, making their protection and regulation a vital aspect of city planning.

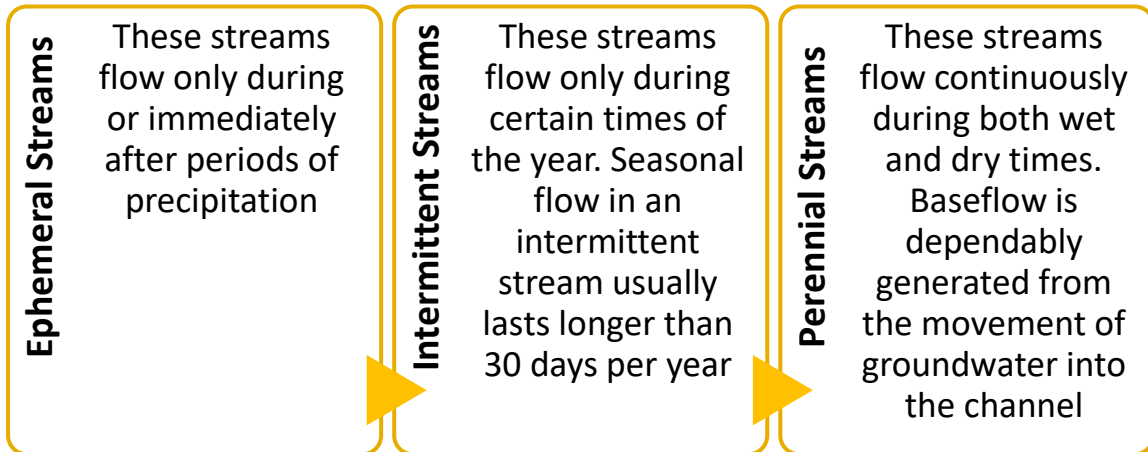
Streams include any natural or engineered watercourse that conveys stormwater runoff and maintains a base flow for at least nine months of the year. Aberdeen and its future planning areas contain a network of tributaries, streams, and creeks that feed into the Chesapeake Bay. The



streams and creeks located within Aberdeen and the future planning areas are Swan Creek, Carsins Run, Gashey's Creek, Cranberry Run, and Gray's Run (**See Map 9-3, Environmental Features**).

Streams are categorized by the USACE based on the balance and timing of stormflow and base flow components. Stormflow refers to streamflow that is influenced by precipitation events, such as rain and snow/snowmelt, while base flow refers to the streamflow that is sustained between those precipitation events.

These include:



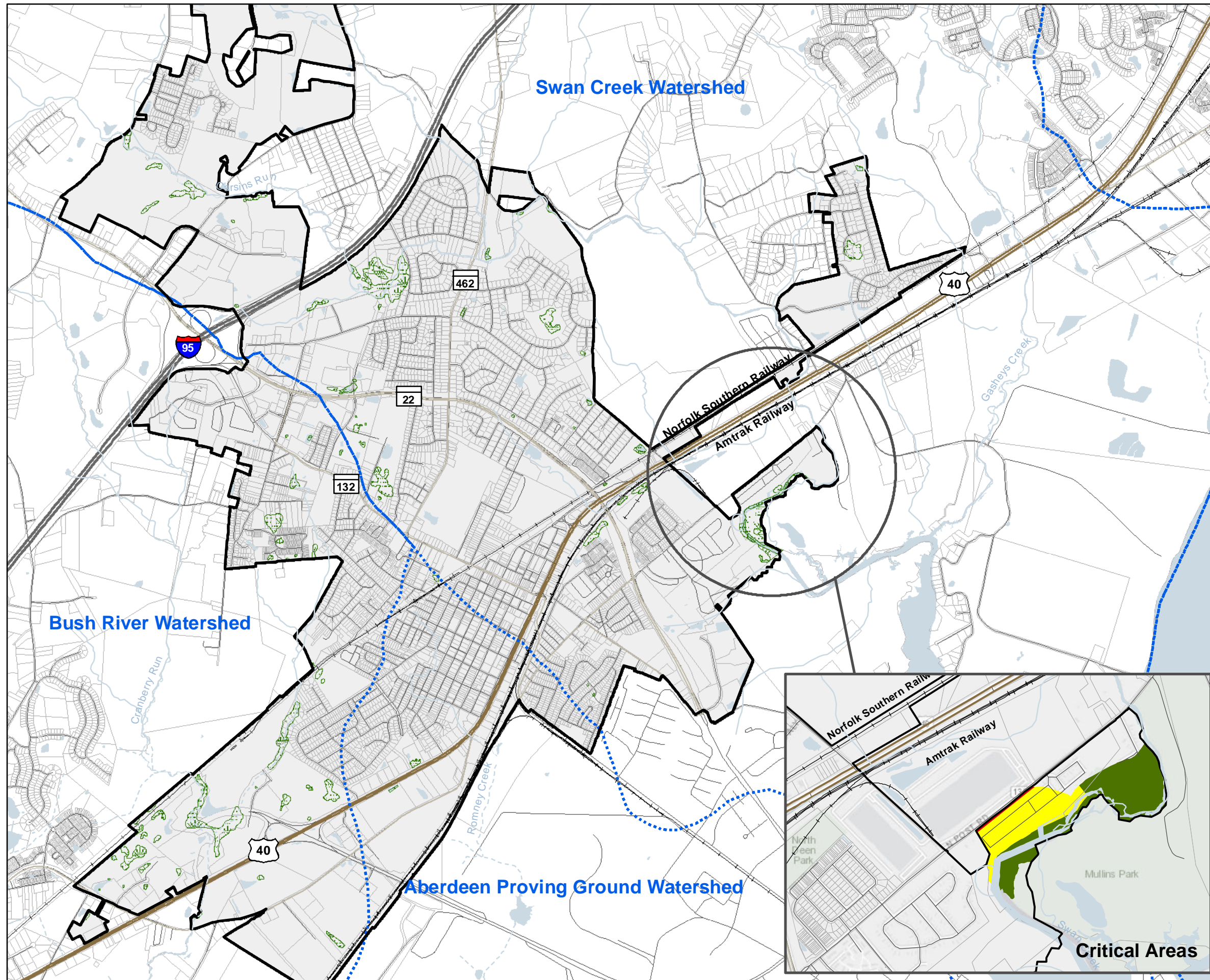
Stream buffers are areas along the lengths of stream banks established to protect streams from human disturbances. They are defined by the State as an existing, naturally vegetated area, or an area established in vegetation and managed to protect aquatic, wetlands, shoreline, and terrestrial environments from man-made disturbances (COMAR 27.02.05). Buffers are a best management technique that reduces sediment, nitrogen, phosphorus, and other runoff pollutants by acting as a filter, thus minimizing damage to streams. Buffers also provide and improve habitat for birds and other animals, and they can serve as areas for hiking, hunting, and nature observation. Healthy buffers hold soils in place, can provide a refuge for threatened animals and plants, filter stormwater runoff pollutants, hide predators from their prey, and keep streams shaded and cool. The effectiveness of buffers depends on their width and other factors such as steep slopes, soil erodibility, and wetlands.



# MAP 9-3

## Environmental Features

- City of Aberdeen
- Parcels
- Railroad
- Major Roads
  - Interstates
  - US Highways
  - State Routes
  - Local Routes
- Water Features
  - Watersheds
  - Water Bodies
  - Stream or River (Perennial)
  - Stream or River (Intermittent)
- Wetlands
  - Wetlands of Special State Concern
  - DNR Wetlands
- Critical Areas
  - Intensely Developed Area
  - Limited Development Area
  - Resource Conservation Area



Source: MD iMAP, MD Department of the Environment  
Wallace Montgomery created this map for planning purposes from a variety of sources. It is neither a survey nor a legal document. Information provided by other agencies should be verified with them where appropriate.

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Stream buffers ideally include:

- Floodplains, where most streamside wetlands are formed and where energy dissipation, natural filtration, food storage, and water storage occur.
- Stream banks and steep slopes, which should remain intact to prevent erosion from clogging the stream bed and provide habitat for plants and animals.
- Streamside forests and other vegetation, which provide habitat, stabilize banks, provide shading, reduce pollutants, and produce leaf litter supporting a host of microscopic shredders, filter feeders, and decomposers that form the base of a healthy stream food chain.

The City defines stream buffers as all lands lying within 50 feet of a perennial or intermittent stream, measured from the top of each normal bank. The stream buffer is expanded to 100 feet for the edge of a watercourse within a floodplain. The City has additional buffer yard requirements which can be found in the Code of the City of Aberdeen, *Chapter 235 Development Code*.

Ground water is a major source for the City and the County's existing and future water supply. The land area that overlays the aquifers which contribute water to the public water supply well is known as the City's Wellhead Protection Districts. Both the aquifer systems providing the community water supply and the wellhead protection district are integrally connected with many surface waters and streams, making protection of both ground water and surface waters critical for protecting public health, safety, and welfare. The designation of the Wellhead Protection Districts and careful regulation of activities within these districts ensures a future supply of safe and healthy drinking water. For more information on Wellhead Protection Districts, see **Chapter 10—Water Resources**.

## WETLANDS

Wetlands are defined by wetland hydrology, hydric soils, and hydrophytic vegetation. They are particularly important to reduce or mitigate flooding impacts, maintain and improve water quality, and provide habitat for various plant and animal species. **Map 9-3, Environmental Features** shows that approximately 95.5 acres, or approximately 2.2% of the City is covered in mapped wetlands. The City's wetlands are two main types: palustrine and riverine. The most abundant type is palustrine, or freshwater wetlands, which may be tidal or nontidal. Palustrine wetlands represent 96.3% of the City's total wetlands, equivalent to 92.0 acres. Riverine wetlands, or those wetlands that depend on the flow of water conveyed by natural or artificial waterways, represent 3.7% of the City's total wetlands, equivalent to 3.5 acres.

While the United States Geological Survey (USGS) and the Maryland Department of Natural Resources (DNR) both provide generalized mapping of wetland areas, the specific location and extent of wetlands require a site-by-site analysis. Final delineation of wetland locations is typically required as part of the development review process. Where detailed wetland delineations have not yet been completed, hydric soil mapping can provide one indicator of possible wetland locations that should be examined further. Hydric soil mapping is available from the U.S. Natural Resource Conservation Service (NRCS). Soil mapping for the City is shown on **Map 9-2, Soils & Steep Slopes**.

The USACE regulates tidal and nontidal wetlands under Section 404 provisions of the *Federal Clean Water Act*. The State regulates nontidal wetlands under the *Maryland Nontidal Wetlands Protection Act* and tidal wetlands under the *Maryland Tidal Wetlands Act*.

If an activity impacts a wetland, a joint permit application to the MDE and the USACE will need to be submitted and, in some cases, mitigation will be required. Activities that require permits include excavating, filling, changing drainage patterns, disturbing the water level or water table, grading, and removal of vegetation in a nontidal wetland or within a 25-foot buffer.



## FLOODPLAINS & FLOOD HAZARDS

The floodplain or special flood hazard area is a graphic representation of the base flood on FEMA’s Flood Insurance Rate Maps (FIRMs). The base flood is the flood expected to have a 1% chance of being equaled or exceeded in any given year. In a 30-year period (the standard length of a conventional mortgage), there is a 26% chance that a structure in the floodplain will be flooded by a 1% chance flood, previously known as the 100-year flood event.

Undisturbed floodplains serve a variety of functions having important public purposes and benefits. They moderate storm 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 the floodplain benefits adjoining and downstream communities by minimizing the risks (and costs) associated with the loss of life and property, contributing to the maintenance of water quality and quantity that may directly affect drinking water supplies and recreation opportunities, and in many cases helping to restore the health of the Chesapeake Bay.

The Aberdeen FPMO was originally adopted in 1992 and, as a result of FEMA updates to the FIRMs, Floodway Maps, and NFIP requirements, was most recently amended in 2016. The City regulates floodplain management and construction activity within designated floodplains. These provisions establish standards for new construction or substantial improvements to existing structures in accordance with FEMA guidelines, to prevent as much as possible, damage to buildings and structures from flooding. For additional information on the current Floodplain Management Ordinance, refer to the *Code of the City of Aberdeen, Chapter 275—Floodplain Management*.

There are 377.0 acres of FEMA mapped 1% chance annual flood zone (special flood hazard areas) in the City, which equates to approximately 8.5% of the City’s total land area. The designation of “1% chance annual flood zone” is also known as the 100-year floodplain. This means the land within this designated boundary is predicted to flood during a 100-year storm, which has a 1% chance of occurring in any given year. Any development within these defined areas will have to comply with the City’s FPMO. Additionally, there are 1.2 acres of FEMA mapped 0.2% chance annual flood zone (500-year flood hazard area) in the City, which equates to approximately 0.03% of the City’s total land area. The designation of “0.2% chance annual flood zone” is also known as the 500-year floodplain. This means the land within this designated boundary is predicted to flood during a 500-year storm, which has a 0.2% chance of occurring in any given year. In Aberdeen’s future planning areas, there are 866.4 acres of FEMA mapped 1% chance annual flood zone and 4.5 acres of FEMA mapped 0.2% chance annual flood zone.

It is important to note that FIRMs provide an analysis of flood scenarios based on past events and data. They indicate areas of high, moderate, and low risk. Future conditions are not considered. FEMA FIRMs do not account for:

- Shoreline erosion, wetland loss, subsidence, or relative sea rise
- Upland development or topographic changes
- Degradation or settlement of levees and floodwalls
- Changes in storm frequency and severity
- Effects of multiple storm events

While some of these factors do not impact the City directly, or have as great an impact as others, it is important to be aware that approximately 25% of flood damages nationally occur to structures that are outside of FEMA mapped flood hazard areas and that few, if any, standards exist nationwide for development in the areas immediately adjacent to the floodplain or outside of mapped floodplain areas.

To help the City review proposed developments, developers should provide detailed base flood elevation information to the City where none exists. The City can provide this information to FEMA and request revisions to floodplain maps with more accurate data.

FEMA most recently issued updates to Aberdeen’s FIRMs on April 19, 2016. The map panels for Aberdeen are 24025C0187E, 24025C0191E, 24025C0192E, 24025C0194E, 240250193E, 24025C0189E, 24035C0277E, and 24025C0281E. Floodplains are shown on **Map 9-4, Flood Hazard Areas**; however, copies of the official FIRMs may be viewed at City Hall.

### Community Rating System (CRS)

Aberdeen is not currently participating in the FEMA Community Rating System (CRS). The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed NFIP requirements. As an incentive, flood insurance premium rates are discounted to reflect reduced risk. Additional benefits of the CRS include:

- Increased opportunities for citizens and property owners to learn about risk, evaluate their individual vulnerabilities, and take action to protect themselves as well as their homes and businesses;
- Adoption of floodplain management activities that enhance public safety, reduce damage to property and public infrastructure, and avoid economic disruption and loss;
- Opportunities for communities to evaluate the effectiveness of their flood programs against a nationally recognized benchmark;
- Availability of free technical assistance for community officials in designing and implementing some activities; and
- Incentives for communities to maintain and improve their flood programs over time.

The three goals of the CRS include:

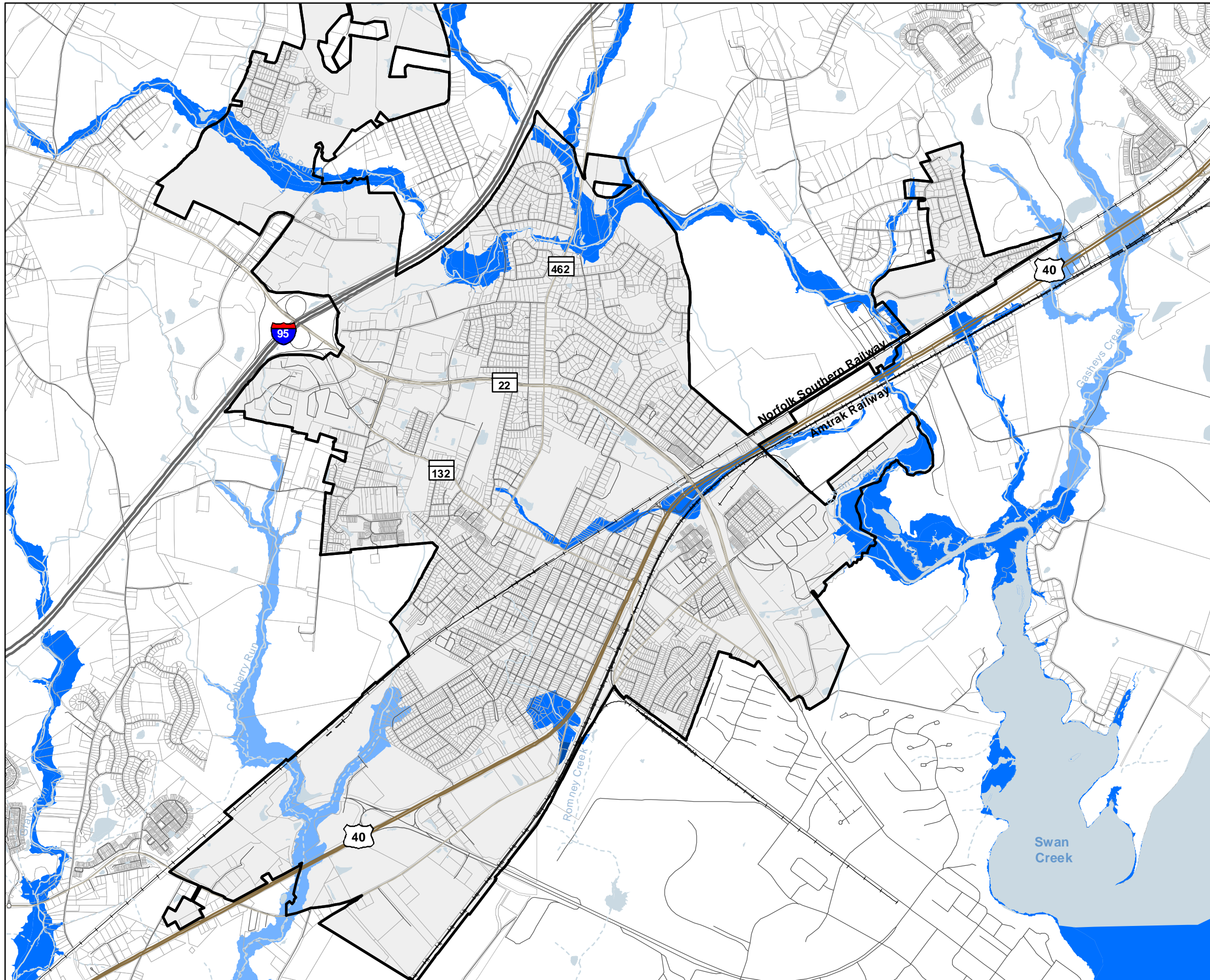
1. Reducing and avoiding flood damage to insurable property
2. Strengthening and supporting the insurance aspects of the NFIP
3. Fostering comprehensive floodplain management.

These goals can be reached by implementing higher regulatory standards, establishing a robust public outreach initiative, preserving open space to reduce flooding risk and increase resiliency, and creating an emergency preparedness plan.



# MAP 9-4

## Flood Hazard Areas



City of Aberdeen

Parcels

Railroad

Major Roads

Interstates

US Highways

State Routes

Local Routes

Water Features

Water Bodies

Stream or River (Perennial)

Stream or River (Intermittent)

Flood Hazard Areas

1% Chance/100-Year

A

AE

AO

0.2% Chance/500-Year

X



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Source: MD IMAP, FEMA



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## HABITATS OF RARE, THREATENED, & ENDANGERED SPECIES

The federal *Endangered Species Act of 1973* requires a list of endangered and threatened species and the protection of those species and their ecosystems. The primary State law that allows and governs the listing of endangered species is the *Nongame and Endangered Species Conservation Act* (Md. Natural Resources Code Ann. §10-2A). This Act is supported by regulations that contain the official State Rare, Threatened, and Endangered Species list. The Wildlife and Heritage Service Natural Heritage Program tracks the status of over 1,100 native plants and animals that are among the rarest in Maryland and most in need of conservation efforts. The current Rare, Threatened, and Endangered Species List for Harford County (2021) includes a total of 28 animals and 128 plants.



Protecting animal and plant species and their habitats is important for many reasons. These animal and plant species contribute to the City's environmental quality, making it an attractive place to live. Additionally, the abundance of animal and plant species support outdoor recreational activities such as hunting, boating, wildlife viewing, and hiking.

Habitats of these rare, threatened, and endangered species are defined as areas that, due to physical or biological features, provide important elements for the maintenance, expansion, and long-term survival of threatened and endangered species. This area may include breeding, feeding, resting, migratory, or overwintering areas. Physical or biological features include (but are not limited to): structure and composition of the vegetation; faunal community; soils, water chemistry, and quality; and geologic, hydrologic, and microclimatic factors.

To assist in identifying the potential habitats for these species areas, DNR designates Sensitive Species Project Review Areas (SSPRAs). SSPRAs represent the general location of documented rare, threatened, and endangered species, and other areas of concern including Critical Areas, Natural Heritage Areas, Listed Species Sites, and Nontidal Wetlands of Special State Concern.

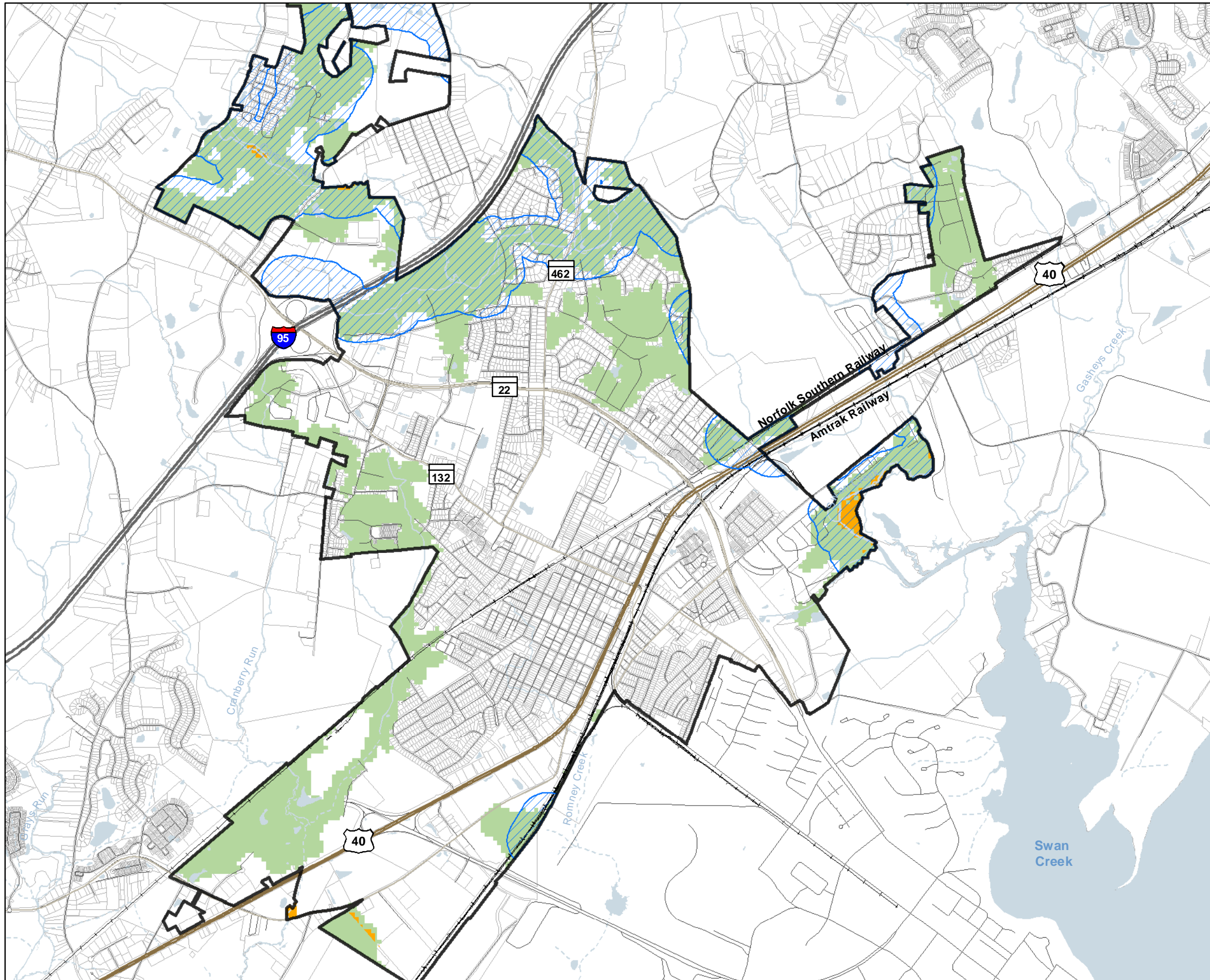
Forest Interior Dwelling Species (FIDS) are those species that require large blocks of forests to survive and maintain sustainable populations. This diverse group of birds includes tanagers, warblers, and vireo, as well as short-distance migratory birds such as woodpeckers, hawks, and owls. Many factors have contributed to the decline of FIDS; however, the loss and fragmentation of forests on the breeding grounds is a major contributor for this decline. In general, FIDS are not well adapted to compete with species that evolved along forest edges and openings. The fragmentation of large forest tracts largely through land development threatens the habitat needed for long-term survival of these species and exposes them to predators or competing species.

When forests are under extreme stress, individual species and their habitats become threatened, thereby endangering the health of the forest. The plants, animals, and forests are essential to maintaining biological diversity in this region. The distance between blocks of forests influences the abundance of many FIDS. Some species can survive in smaller forests if they are connected to other areas via corridors.

**Map 9-5, Ecological Areas** includes significant wildlife assessment areas in the City including SSPRAs, Targeted Ecological Areas, and FIDS habitats. These areas may need special management or protection because of their importance to conservation of the threatened or endangered species. The City should continue to pursue all efforts to protect habitats of threatened and endangered species by adopting regulations protecting these species from habitat loss. Further protection of woodlands or forested lands will have a positive impact on targeted ecological areas and wildlife habitats, will contribute to ecological balance, and offer sustained recreational opportunities for residents. Development in these areas should be discouraged and if development does occur, techniques to reduce impacts on targeted ecological areas and wildlife habitats should be utilized. Control of non-native invasive species within ecological areas will further protect wildlife and habitats from degradation. The City plans to establish and implement an invasive species removal program and focus on planting of native species within open lands, ecological areas, natural areas, and forest lands.



# MAP 9-5 Ecological Areas



- City of Aberdeen
- Parcels
- Railroad
- Major Roads
  - Interstates
  - US Highways
  - State Routes
  - Local Routes
- Water Features
  - Water Bodies
  - Stream or River (Perennial)
  - Stream or River (Intermittent)
- Ecological Areas
  - Sensitive Species Review Areas
  - Targeted Ecological Areas
  - Forest Interior Dwelling Species



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Source: MD iMAP, MD Department of Natural Resources

Wallace Montgomery created this map for planning purposes from a variety of sources. It is neither a survey nor a legal document. Information provided by other agencies should be verified with them where appropriate.

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## CHESAPEAKE BAY CRITICAL AREA

The Chesapeake Bay Critical Area (CBCA) is the land that lies within 1,000 feet of the Chesapeake Bay and its tributaries as measured from the mean high-water line, or the average high-water heights, of tidal waters. The intent of the Critical Area is to preserve the water quality of the bay as well as the wildlife habitat along the shoreline. Land within the Critical Area is categorized by its predominant use and the intensity of its development. This system allows local governments to focus new development toward existing developed areas and permits some infill of similar density. It also allows them to designate natural resources areas for habitat protection, forestry, agriculture, and other resource utilization activities. The current Critical Area map for Harford County (including Aberdeen) is in a “Summary Draft Map” state.

Land within the Critical Area is designated as one of the following:

### RCA - Resource Conservation Area

- Areas characterized by natural environments or areas where resource-utilization activities are taking place
- Resource-utilization activities include agriculture, forestry, fishing activities, and aquaculture, which are considered "protective" land uses

### LDA - Limited Development Area

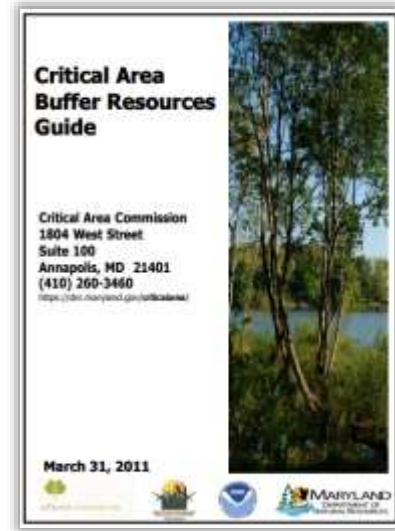
- Areas characterized by low-or-moderate intensity development, but also contains areas of natural plant and animal habitats
- Generally, the quality of runoff has not been substantially altered or impaired

### IDA - Intensely Developed Area

- Areas of twenty or more adjacent acres where residential, commercial, institutional, or industrial land uses are predominant and where realivly little natural habitat occurs

Within the CBCA is a 100-foot Critical Area Buffer, which exists immediately landward from mean high water of tidal waters, the edge of a bank of a tributary stream, or the edge of a tidal wetland. The buffer is expanded beyond 100 feet in areas where there are neighboring sensitive resources such as steep slopes or soils with development constraints. Ideally, this buffer is composed of trees, shrubs, and other plants that catch sediments and other pollutants coming from buildings, lawns, and paved areas. State regulations and all local Critical Area ordinances require the establishment and maintenance of a minimum 100-foot buffer adjacent to all tidal waters, tidal wetlands, and tributary streams. In general, new development activities that result in disturbance to land or natural vegetation or that involve the construction of a structure or result in new lot coverage are not permitted in the buffer.

The CBCA Program functions through the cooperative efforts of local and state governments. In 2009, *Resolution 09-R-01* stated the intent of the City to adopt a Critical Area Program to ensure all development and redevelopment activities that occur within the municipal boundaries comply with the development standards of an adopted local program. The City currently follows Harford County’s Critical Area program through County Zoning Ordinance §267-63, which outlines the unique responsibilities that property owners have in the Critical Area. Property improvements such as driveways, walkways, accessory structures, and even certain kinds of yard work must comply with Critical Area regulations. Bill No. 22-013 was introduced in May of 2022 to repeal and reenact, with amendments, Section 268-10, Chesapeake Bay Critical Area Overlay District. The Bill updates the name to the CBCA Program and states that applications for subdivision of land which lies within the CBCA Program shall be forwarded by the Department of Planning and Zoning to the CBCA Commission, a step not previously defined in Harford County Code. Bill No. 22-012 was adopted in June 2022 to repeal and reenact, with amendments, Subsection A(1), CBCA Management Program, of Section 169-1, Adoption; legal status, of Chapter 169, Master Plan of the Harford County Code, as amended; to adopt the CBCA Program, including the Zoning Code regulations, critical area maps and critical area manual, as part of the Official Harford County Master Plan.



The City has within its corporate limits 40.8 acres located in a Critical Area. Lands within the Critical Area are shown in **Map 9-3, Environmental Features**.

## CONSERVATION LANDS

### Agricultural & Forest Lands

Agriculture is defined as all methods of production and management of livestock, crops, vegetation, and soil. It also includes the activities of feeding, housing, and maintaining of animals such as cattle, dairy cows, sheep, goats, hogs, horses, and poultry.

A forest is defined as a biological community dominated by trees and other woody plants covering a land area of 10,000 square feet or greater. A forest includes areas that have at least 100 live trees per acre, with at least 50% of those trees having a two-inch or greater diameter at 4.5 feet above the ground. A forest also includes areas that have been cut but not cleared. A forest does not include orchards.

In the late 1970s, Harford County began its preservation efforts through programs offered by the Maryland Environmental Trust (MET), which conserves land in working cultural landscapes such as farmland, forest, and significant natural resources through conservation easements and the Maryland Historic Trust (MHT), which is dedicated to the preservation and interpretation of the legacy of the state of Maryland. In 1982, the County began its first agricultural preservation program with the Maryland

Agricultural Land Preservation Foundation (MALPF), which supports the County purchase of conservation easements on farmland which also preserves working cultural landscapes, rural historic districts, and the historic contexts of individual properties and farms.

Increased forest land and tree plantings can provide many benefits, including enhanced water and air quality, reduction of urban heat island effects and wildlife habitat restoration. The City will conduct a comprehensive inventory of the existing forestland and then set goals for preserving existing forest and increasing forest on public lands.

In addition, the County continues to protect agricultural lands utilizing the Rural Legacy Program and recently developed a Priority Preservation Area Plan. Following the Priority Preservation Area Plan, the County is working towards an 80% preservation rate for the undeveloped lands in that area. The City recognizes the County's efforts and will continue to work closely to support them on preserving those properties that are designated as a Priority Preservation Area.

The State's *Forest Conservation Act* became effective July 1, 1991 and applies to all tracts of land proposed for development that are 40,000 square feet or more in size. Permit requirements under this Act took effect in Aberdeen on February 1, 1993 (*Ordinance No. 405-92*). Mitigation is required as part of the Aberdeen Forest Conservation Ordinance, which was subsequently amended by *Ordinance Nos. 12-O-14 and 16-O-17*. For further information refer to the Code of the City of Aberdeen, *Chapter 280, Forest Conservation*.

Also see the section on Rural Buffer Areas in **Chapter 5—Municipal Growth**.

## Tree City USA

The Tree City USA program, sponsored by the Arbor Day Foundation in cooperation with the U.S. Forest Service and the National Association of State Foresters, provides direction, technical assistance, public attention, and national recognition for urban and community forestry programs in thousands of towns and cities. A Tree Plan is prepared every year by the City's Green Team as part of the annual Tree City USA application. The City has been involved in this program since 2018. Aberdeen achieved Tree City USA recognition by meeting the program's four requirements:



1. Establishing a Tree Board or Department
2. Adopting a Tree Care Ordinance
3. Funding an annual community forestry budget of at least \$2 per capita
4. Holding an Arbor Day observance and proclamation

The City's annual budget for park maintenance which includes tree replacement, tree maintenance and care is \$10,000. The City's Forest Conservation Ordinance satisfies the requirements for the Tree Care Ordinance.

## MINERAL RESOURCES

Maryland consists of six total physiographic provinces. A physiographic province is an area where the geology and climate have created landforms that are distinctly different from other land areas and potentially provide natural mineral resources. The geology of these areas is normally classified into different types of sediments and mineral resources.

The City passes through the Piedmont and Coastal Plain (Atlantic) provinces. The Piedmont Province consists of geologic formations comprising hard, crystalline igneous and metamorphic rocks. These formations contain a variety of potential mineral resources including gravel deposits, crushed stone, building stone, and small amounts of non-metallic minerals. The Coastal Plain consists of geologic formations comprising deep-lying crystalline rocks covered with layers of gravels, sands, and clays. The layers that make up the Coastal Plain dip gently toward the Atlantic Ocean from northwest to southeast.

Natural gravel deposits within the City occur along Bel Air Avenue, west of Paradise Road, extending to Carsins Run. Refer to **MAP 9-1, Geology** for the Provinces and geology within the City.

### Current Operations

In the City, the area around MD 22 and I-95 was previously a great source for gravel and sand excavation since it resides along the border of the Piedmont and Coastal Plain Provinces. The main mine that maintained that operation was the Churchville Quarry. Extraction at these sand and gravel reclamation sites has since been abandoned and many of the former gravel pits have seen the successful construction of commercial and residential uses. For more information on current non-coal surface mining sites and permits in Harford County, please refer to the Maryland Department of the Environment's (MDE) website. The City does not anticipate future permitting of mineral extraction activities within its current boundary or future Planning Areas that may be annexed.



## CLIMATE CHANGE

The City of Aberdeen is susceptible to the impacts of climate change. Temperatures in the northeast United States have increased by almost two degrees Fahrenheit since 1895. Projections anticipate additional increase in temperatures, which means frequency, intensity, and duration of heatwaves are expected to increase in the future. These increased temperatures also cause melting of glaciers and ice sheets, which in turn adds more water volume to the ocean. This melting, compounded with thermal expansion of sea water due to warmer temperatures, leads to rising sea levels, which then leads to an increase in nuisance flooding and more intense storms surge flooding. Warmer temperatures also allow for higher rates of evaporation as well as higher capacity for that warmer air to hold water vapor. When rain-triggering conditions are favorable, the additional water vapor in the air is released in the form of heavier precipitation. The effects of these climate change issues have potential for major impacts to the City, and mitigation of the effects is an integral part of what will shape Aberdeen in the coming years.

The *2015 Maryland Commission on Climate Change (MCCC) Act* required the MCCC and its participating agencies to develop an action plan and firm timetable for mitigation of and adaptation to the likely consequences and impacts of climate change in Maryland. In February 2021, MDE released *the 2030 Greenhouse Gas Reduction Act (GGRA) Plan*, which is a comprehensive plan that sets a clear and unifying path for the State to dramatically reduce greenhouse gas emissions that contribute to climate change.

### Heavy Precipitation Events

Climate change is expected to result in more frequent heavy precipitation events. This can lead to flooding, especially in areas with inadequately sized drainage infrastructure. This flooding can result in safety hazards, inaccessible roadways, travel delays, and damage to buildings or other infrastructure. Aberdeen's infrastructure and its ability to handle such events plays a contributing role in how effectively the area can be evacuated and how it can prevent damage from these events. Planning for these events also contributes to how successful the City and emergency services can respond to these events. Aberdeen should continue to assess the vulnerability of older commercial and residential structures in preparation for the higher frequency of heavy rainfall events. In addition, the City will continue to monitor the impact of events to the City infrastructure and capacity to handle heavy precipitation events. Many current flooding problems associated with heavy precipitation are due to restricted or blocked drainage at storm drains. Continued maintenance efforts to eliminate blockage to existing storm drains is needed to help minimize flooding during heavy precipitation events.

### Temperature Rise

Another key issue surrounding climate change is a steady rise in temperature. Rising temperatures will result in a longer growing season, heat waves, and more days where it does not cool off at night. This has many implications for infrastructure and human health. Air conditioning systems in buildings may not be sized appropriately for increasing temperatures and shorter, milder winters can mean residents are dealing with more ticks and mosquitoes. Of particular concern are vulnerable populations (e.g., elderly, low-income, non-English speakers) who may not have access to air conditioning in the summer. Although temperature is not something that can be controlled, there are ways for the City to prepare for a possible

increase. Tree planting and shade contribute greatly to heat dispersion. Making sure buildings are up to code for cooling systems will also mitigate the effects of long-term temperature changes. Educating people on how to deal with heat waves and erratic weather also helps prepare the population for such events and can be a successful way to prevent the dangers of high temperatures.

## Sea Level Rise

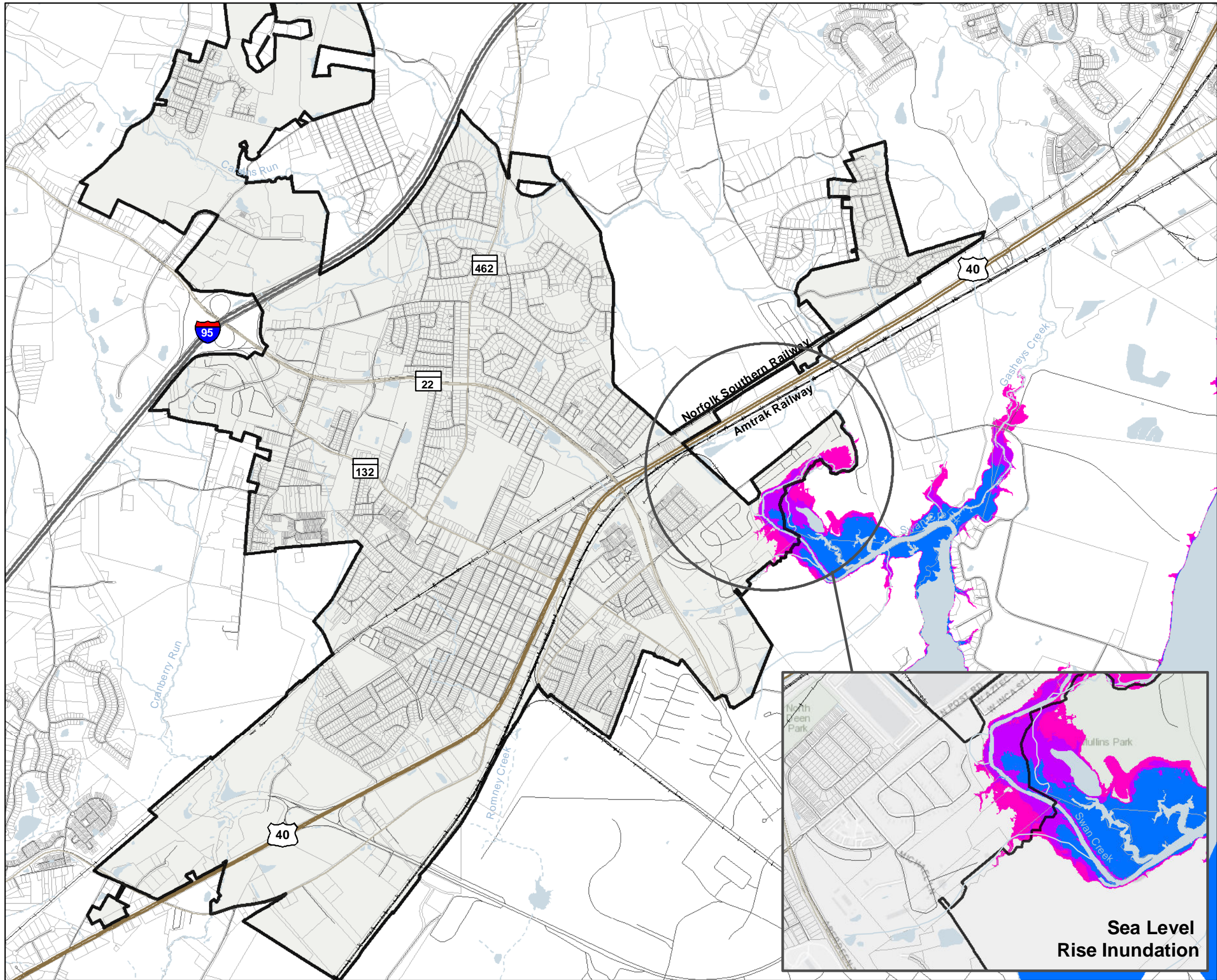
The rising and spreading of water over normally dry land is referred to as inundation. Scientists use models to develop maps showing the possible impacts of inundation based on various Sea Level Rise (SLR) scenarios for state’s waterways and the land that surrounds them (watersheds). These maps reflect the filling of these watersheds at constant elevations, also referred to as bathtub modeling. In other words, the maps show the water levels rising in the watersheds similar to the filling of a bathtub.

Portions of the City are adjacent to tidal waterways, and these areas are particularly vulnerable to the effects of SLR, loss of low-lying land and structures, saltwater intrusion into surface water and groundwater, and increased flooding from storm events. Changes in sea level have the potential to impact existing infrastructure and natural resources in the short-term and also the durability of future development with long-term design life. The impacts of 2-, 5-, and 10-foot SLR are shown in **Map 9-6, Sea Level Rise Inundation**. While the area within the City impacted by SLR is small, it is still important to take into account the potential associated impacts, which include flooding and loss of wetlands, saltwater intrusion, and expansion of flood-prone areas. Long-range planning and accounting for changes in sea level that may be expected in the City will help lead to informed decisions for public and private investments by minimizing risk potential for damage to both existing and future resources.

## Air Quality

Air quality is projected to decline under a business-as-usual scenario, especially in the eastern U.S., which increases the risk of cardiovascular and respiratory issues. The American Lung Association reviews overall air quality elements and reports an assessment on a regional basis. As of 2020, Harford County received an “F” rating for ozone, and an “A” rating for 24-hour Particle Pollution. These ratings are based on the annual weighted average number of high ozone or high particle days, respectively. It should be noted that the ozone rating, while a “failing” grade, has been steadily improving since the mid 1990s, with the current annual weighted average just above the passing rating of 3.2 with a 6.7.

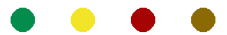
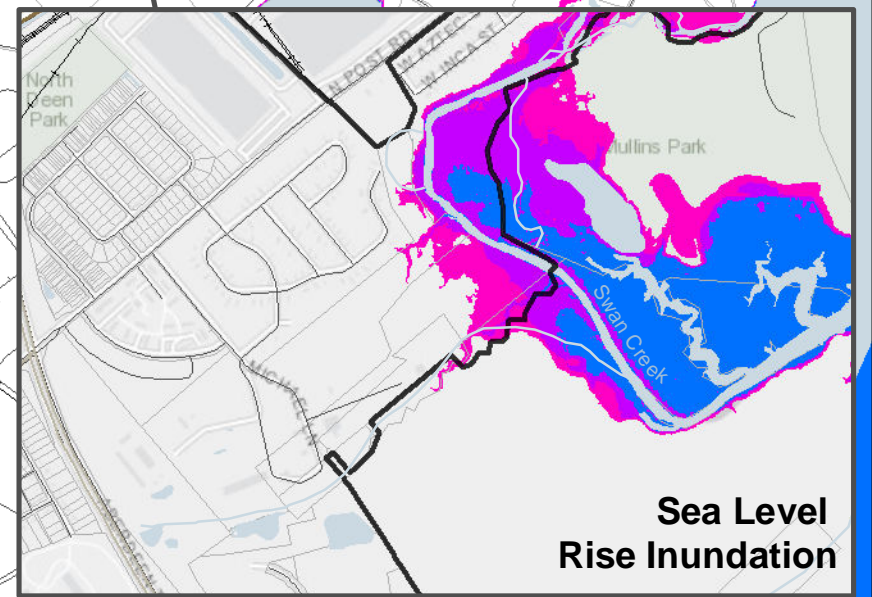
The City is dedicated to preserving natural resources for its residents. Although land use regulations do not typically account for the regulation of air quality, by contributing less carbon using multimodal pathways, promoting more sustainable modes of transportation, and integrating open space, the City hopes to incrementally decrease its emissions in an effort to improve air quality.



**MAP 9-6**

**Sea Level Rise Inundation**

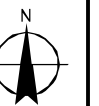
- City of Aberdeen
- Parcels
- Railroad
- Major Roads
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  - Local Routes
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  - Water Bodies
  - Stream or River (Perennial)
  - Stream or River (Intermittent)
- Sea Level Rise Inundation
  - 2 Feet Inundation
  - 5 Feet Inundation
  - 10 Feet Inundation



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Source: MD iMAP  
Wallace Montgomery created this map for planning purposes from a variety of sources. It is neither a survey nor a legal document. Information provided by other agencies should be verified with them where appropriate.

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There are a few examples of how the City is working towards a reduction in climate change contributions through land use regulations and zoning. The City currently has a handful of zoning categories that fall under the mixed-use umbrella, including the Transit-Oriented Development Zones and the Integrated Business District, and intends to incorporate additional mixed-use lands within specific growth-oriented future planning areas. These mixed land use designations indicate mixture of uses within one district to reduce the amount of vehicular travel residents need to perform in order to complete their daily routines. This can effectively reduce contributions to climate change while improving the overall quality of life for local residents as they no longer need to spend as much time driving. More information on Mixed Land Use can be found in **Chapter 4 – Land Use**, and more information on Aberdeen’s future planning areas can be found in **Chapter 5 – Municipal Growth**. Additionally, The City currently promotes other modes of transportation and the Transit Oriented Development area by providing zoning and business incentives for new development and redevelopment. More information on the Transit Oriented Development Master Plan can be found in **Chapter 7—Transportation**.

Reducing greenhouse gas emissions can be accomplished, in part, through nature-based solutions such as preserving and increasing the number of trees and acreage of forest land. Trees and forest land can offset emissions through carbon sequestration that occurs with photosynthesis. The City intends to complete a forest inventory and set goals for increase forest plantings. See Agricultural & Forest Lands section above for more details.

### SUSTAINABLE GROWTH

The City instituted a new initiative in 2022 to become more environmentally sustainable to protect its resources for future generations. This included adopting the Sustainable Community Action Plan and designating a Sustainable Community Area boundary. The plan includes a menu of environmental, economic, transportation, housing, quality of life, and land use strategies. This effort is overseen by the Department of Planning and Community Development.

Accomplishments resulting from the Sustainable Community Action Plan include improvement and expansion of multimodal transportation and transit opportunities, modification of the Aberdeen Development Code to include the form-based code for the Transit Oriented Development area, and extension and expansion of the Greater Aberdeen-Havre De Grace Enterprise Zone designation.

### SUSTAINABLE MARYLAND

Sustainable Maryland is a certification program for municipalities in the State that want to go green, save money, and take steps to sustain their quality of life over the long term. Sustainable Maryland is a collaborative effort between the Environmental Finance Center (EFC) at the University of Maryland and the Maryland Municipal League (MML). The City embarked on a path to pursue local initiatives and actions by adopting *Resolution No. 14-R-12*. After implementing several green initiatives, and established a Green Team, the City received the Sustainable Maryland designation in 2022.