CHAPTER 6 - NATURAL RESOURCES AND SENSITIVE AREAS

INTRODUCTION

The impact of growth and development on the natural resources and environmental quality of the area is an issue of increasing public concern. Caroline County is blessed with an abundance of valuable natural resources which contribute to the County's pleasant quality of life. The effects of increased population and physical development can manifest themselves on the natural environment in many ways, including:

- Clearing of trees and natural vegetation;
- Loss of plant, wildlife habitats, and populations;
- Loss of farmlands;
- Loss of important wetlands and aquatic habitats;
- Contamination of groundwater for drinking supplies;
- Reduced surface water quality in streams, rivers, and the Bay;
- Disruption of natural water drainage systems;
- Increased air pollution;
- Increased amounts of solid wastes and litter; and
- Loss of scenic natural views.

Environmental deterioration does not have to be an inevitable consequence of growth and development. The construction of the new homes, businesses, industries, schools, and roads necessary to accommodate growth can occur without unduly threatening the area's environmental quality if steps are taken to ensure that new development is designed and implemented in an environmentally sensitive manner.

Throughout the Town, there are areas that are much more susceptible to environmental degradation than others due to the presence or proximity of sensitive natural features. Future development should be directed away from sensitive environmental areas and guided towards areas where environmental impacts would be less severe. Regardless of location, all future development should be subject to minimum performance standards for environmental protection and natural resource conservation.

GOALS

- Preserve and protect the important natural features of the Town including streams, wooded areas, wildlife habitats, and other sensitive natural areas.
- Improve water quality in the Choptank River.
- Protect environmentally sensitive areas.
- Establish specific development policies for reviewing all development activities within natural corridors, with respect to impact on, and protection of groundwater and green infrastructure.
- Preserve natural drainage ways.

OBJECTIVES

- Assess future development proposals in light of the site's physical suitability to accommodate development while protecting natural resources, historic features, and the quality of the Town's groundwater.
- Provide specific protection measures for the following areas: 1) Streams and stream buffers, 2) 100-year floodplain, 3) endangered species habitats, and 4) steep slopes.
- Identify wetlands and flood plains in order to provide the special protection they may need.
- Preserve and protect fragile groundwater resources within the Town.
- Assure that proper stormwater management, and sediment and erosion controls are enforced in accordance with the Stormwater Management Ordinance.
- Conserve forest and woodland resources and, wherever possible, replenish them through tree conservation measures, and replanting programs in compliance with the Maryland Forest Conservation Act.
- Insure that all new development and redevelopment minimizes pollutant loadings and runoff from the site through the implementation of sediment, stormwater, and erosion control plans.
- Protect and preserve the most valuable remaining ecological lands (Green Infrastructure) in and around the Town, and encourage restoration of lands to a green infrastructure condition.

Chesapeake Bay Critical Area

Within the Town of Denton, there are environmentally sensitive areas located adjacent to the Choptank River, a tributary of the Chesapeake Bay. The Town, along with other local jurisdictions in the State of Maryland, was required to develop a local Critical Area program in accordance with the Environment Article of the Maryland Annotated Code and the Code of Maryland Regulations.

The Critical Area Law evolved out of recognition by the State of Maryland General Assembly that the effects of human activity have resulted in deteriorating water quality and productivity of the Chesapeake Bay and its tributaries. This activity has caused increased levels of pollutants, nutrients, and toxins in the Bay system. It has resulted in the decline of low intensity land uses such as forest land and agriculture. The restoration of the Chesapeake Bay and its tributaries is dependent, in part, upon improving water quality and minimizing further adverse impacts to the natural habitats of the shoreline and adjacent lands. The primary focus of this law is to provide for more sensitive development and conservation measures for shoreline development and uses, for all land at a minimum of 1,000' of the landward boundaries of the state or private wetlands and the heads of tide (mean high tide).

The Town of Denton Chesapeake Bay Critical Area Local Program was approved in 1988 and updated in 2004. Map 6-1 shows the area included in the Town's Critical Area Program. The Denton Critical Area Program establishes criteria and standards which will accomplish the three protective goals of the Critical Area Act, namely:

- Minimize adverse impacts on water quality that result from pollutants that are discharged from structures or conveyances or that have runoff from surrounding lands;

- Conserve fish, wildlife, and plant habitat; and
- Establish land use policies governing development in the Chesapeake Bay Critical Area which accommodate growth and also address the fact that, even if pollution is controlled, the number, movement, and activities of persons in that area can create adverse environmental impacts.

Following adoption of its Critical Area Program, the Town adopted ordinances and regulations to implement the protection standards recommended.

In July 1, 2008, House Bill 1253 took effect. These legislative changes were necessary to:

- Fill gaps in operational structure and enhance State-local coordination
- Clarify and strengthen enforcement procedures
- Streamline the Critical Area Program in order to enhance consistency, predictability, and fairness
- Protect Maryland's tidal shoreline from negative impacts of growth and development
  (Source: Critical Area Commission, Chesapeake and Atlantic Coastal Bays, Critical Area Update Summary, May 20, 2008)

Some of the changes were the expansion of the buffer to 200' feet for developments meeting certain criteria being located in the Resource Conservation Area, holding contractors accountable for Critical Area violations, and a change in terminology from "impervious surface" to "lot coverage" to better control the amount of surface run-off.

Map 6-1

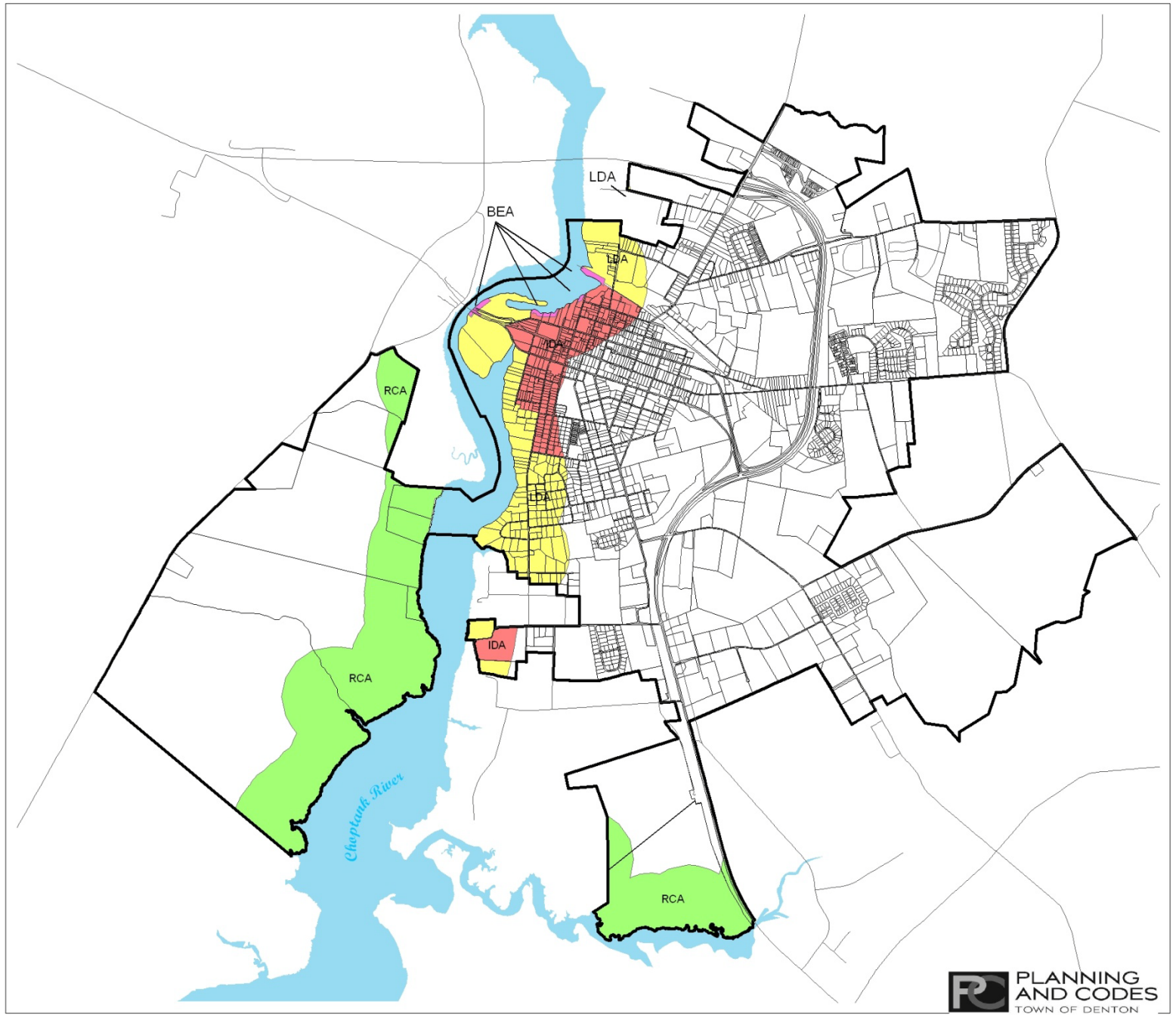
Comprehensive Plan 2010
Denton, Maryland
Critical Area

N

0 1,875 3,750 7,500

Feet

- Corporate Boundary
- BEA - Buffer Exempt Area
- LDA - Limited Development Area
- IDA - Intense Development Area
- RCA - Resource Conservation Area



Eastern Shore Regional GIS Cooperative, ESRGC
Caroline County Planning and Codes
Maryland Dept Natural Resources, DNR

Sensitive Areas

The Maryland Economic Growth, Resource Protection, and Planning Act of 1992 added provisions to Article 66 B of the Annotated Code for the State of Maryland that require the Denton Comprehensive Plan contain a Sensitive Areas Element which describes how the Town will protect the following sensitive areas:

- Streams and stream buffers;
- 100-year floodplains;
- Habitats of threatened and endangered species; and
- Steep slopes.

Many of these sensitive areas are shown on Map 4-1, "Municipal Growth Element, along with other habitats of State concern. Performance standards to protect these sensitive resource areas have been included in the Zoning Ordinance and Subdivision Regulations. These standards establish minimum protection levels for stream valleys, wetlands, forests, wildlife habitats, and sensitive soils.

Streams and Stream Buffers

Streams and their buffers are important resources. Streams support recreational fishing and serve as spawning areas for commercial fish stock. Development near stream areas subject to flooding can result in the loss of life and property. Streams and their adjacent buffers are home to countless species of animals and plants; and transport valuable nutrients, minerals, and vitamins to rivers and creeks and, in turn, the Chesapeake Bay. The floodplains, wetlands, and wooded slopes along streams are important parts of the stream ecosystem. There are three Tier II designated water bodies within Denton's boundary. All three streams are located along the Town's current boundary, proposed growth area, and proposed "greenbelt."

As development activity consumes large amounts of land, forest cover, and natural vegetation along streams are diminished. The cumulative loss of open space and natural growth reduces the ability of remaining land along streams to buffer the effects of greater stormwater runoff, sedimentation, and higher levels of nutrient pollution. Buffers serve as protection zones when located adjacent to streams and reduce sediment, nitrogen, phosphorous, and other runoff pollutants by acting as a filter, thus minimizing stream damage. The effectiveness of buffers to protect stream water quality is influenced by their width (which should take into account such factors as contiguous or nearby slopes, soil erodibility, and adjacent wetlands or floodplains), the type of vegetation within the buffer (some plants are more effective at nutrient uptake than others), and maintenance of the buffer.

Buffers also provide habitat for wetland and upland plants which form the basis of healthy biological communities. A wide variety of animals use the natural vegetation as a corridor for food and cover. A natural buffer system provides connections between remaining patches of forest in the area to support wildlife movement.

Floodplain

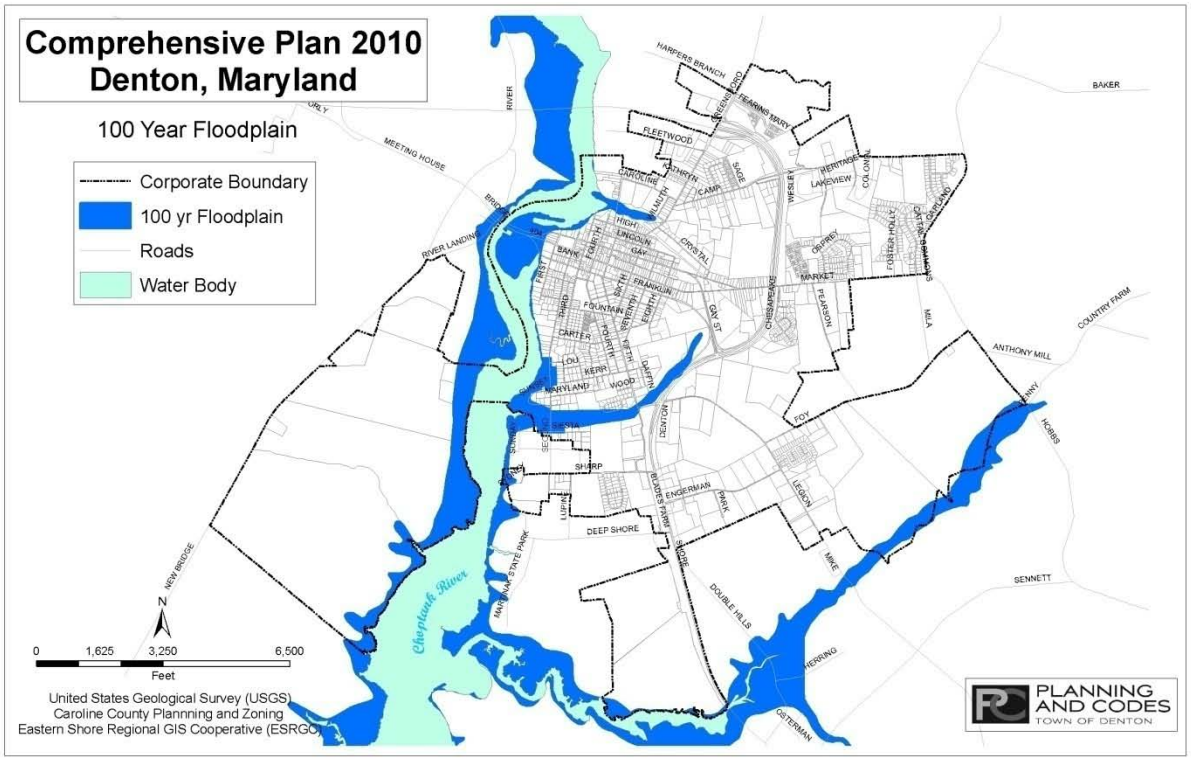
Some areas are subject to periodic flooding which poses risks to public health and safety, and potential loss of property. Flood and flood-related losses are created by inappropriately located

structures which are inadequately elevated or otherwise unprotected and vulnerable to floods, or by development which increases flood damage to other lands or development. (Map 6-2) While protection of life and property provided the initial basis for protection of floodplains, there has been a growing recognition in recent years that limiting disturbances within floodplains can serve a variety of additional functions with important public purposes and benefits.

Floodplains moderate and store floodwaters, absorb wave energies, and reduce erosion and sedimentation. Wetlands found within floodplains help maintain water quality, recharge groundwater supplies, protect fisheries, and provide habitat and natural corridors for wildlife.

The minimum requirements of the National Flood Insurance Program do not prohibit development within the 100-year floodplain. However, to adhere to the minimum federal requirements, the Town requires development and new structures in the floodplain to meet certain flood protection measures including elevating the first floor of structures a minimum of one foot above 100-year flood elevations and utilizing specified flood-proof construction techniques.

Map 6-2: Floodplain



Moreover, where alternative building sites on a parcel are available for construction outside the 100-year floodplain, then construction in the floodplain is prohibited. These requirements are established in the Town's Floodplain Management Ordinance.

Habitats of Threatened and Endangered Species

Materials and chemicals produced by plants and animals are a largely non-researched storehouse for products beneficial to people. More than half of all medicines in use today can be traced to wild organisms. Plant chemicals are the sole or major ingredient in 25 percent of all prescriptions written in the United States each year. Likewise, agriculture depends on the development of new varieties of crops, often created by cross-breeding strains with wild relatives of crop species, in efforts to develop pest, disease, or drought resistant crops. Maintenance of biological diversity today sustains future opportunities to advance health care and provide a number of other societal benefits.

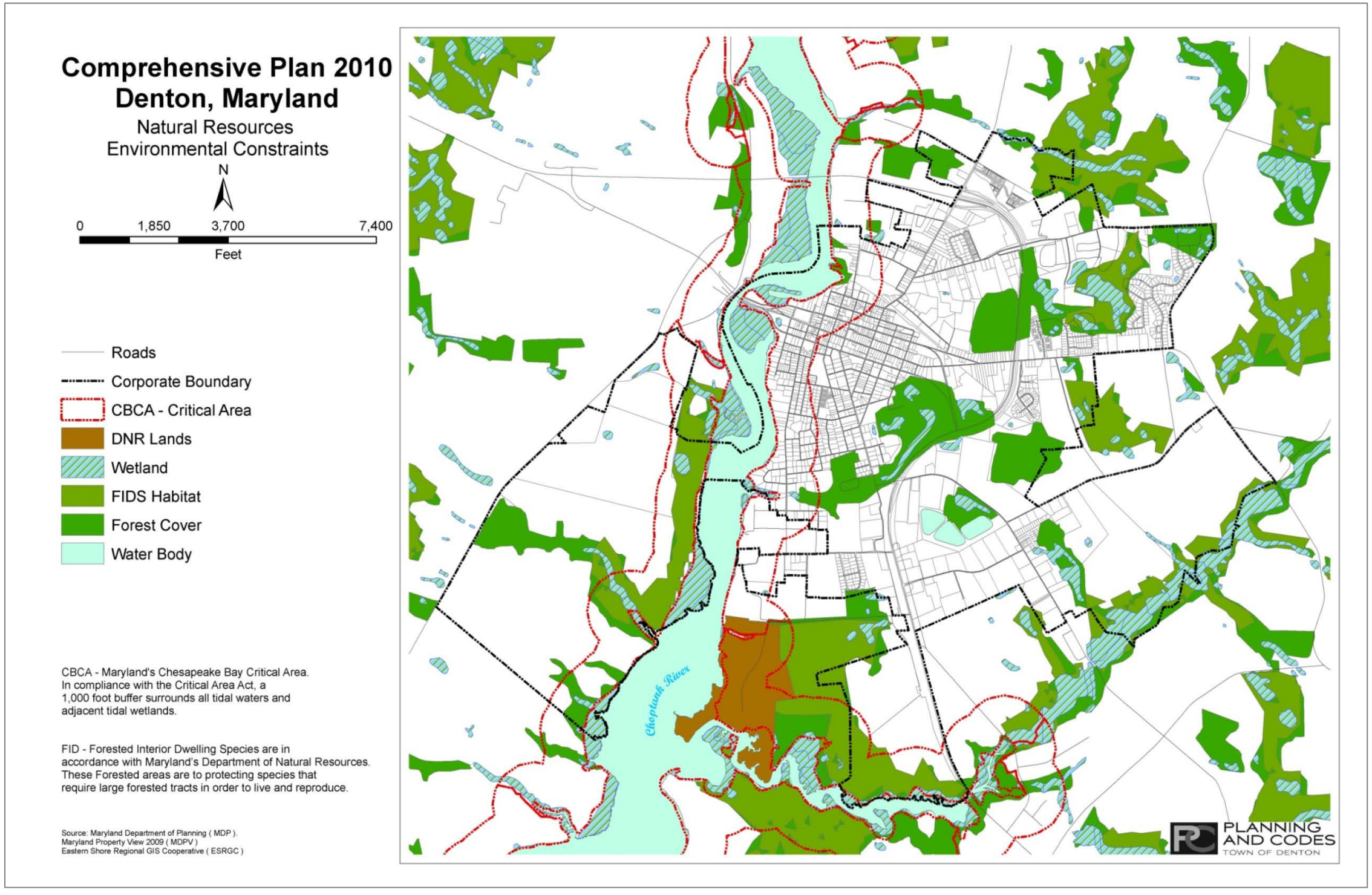
Habitat destruction and degradation is currently estimated to threaten some 400 native Maryland species with extinction. The key to protecting threatened and endangered species is protecting the habitats in which they exist. Map 6-3 shows the Town's Environmental Resource areas, such as Wetlands, Forested Areas, Forested Interior Dwelling Species (FIDS), and a large area (107 acres) just outside of Denton town limits that is DNR lands, Martinak State Park.

The Maryland Nongame and Endangered Species Conservation Act (Natural Resources Article, 10-2A-01 through 06) provides definitions of threatened and endangered species. Maryland law and regulations do not currently provide a definition of habitat. As a basis for establishing protection measures for habitats of threatened and endangered species, habitat is defined in this Plan as "areas which, due to their physical or biological features, provide important elements for the maintenance, expansion, and long-term survival of threatened and endangered species listed in COMAR 08.03.08. Such areas may include breeding, feeding, resting, migratory, or overwintering areas".

Steep Slopes

Slopes provide an environment that facilitates movement of soil and pollutants when land disturbances occur. Control of erosion potential is usually achieved through regulation of development on steep slopes because such areas represent the greatest opportunity for accelerated soil loss, and resultant sedimentation, and pollution to streams. For regulatory purposes, steep slopes should include, at a minimum, any slope with a grade of 25 percent or more covering a contiguous area of 10,000 square feet or more.

Map 6-3


Comprehensive Plan 2010
Denton, Maryland
Natural Resources
Environmental Constraints
N
0
1,850
3,700
7,400
Feet
Roads
Corporate Boundary
CBCA - Critical Area
DNR Lands
Wetland
FIDS Habitat
Forest Cover
Water Body
CBCA - Maryland's Chesapeake Bay Critical Area. In compliance with the Critical Area Act, a 1,000 foot buffer surrounds all tidal waters and adjacent tidal wetlands.
FID - Forested Interior Dwelling Species are in accordance with Maryland's Department of Natural Resources. These Forested areas are to protecting species that require large forested tracts in order to live and reproduce.
Source: Maryland Department of Planning (MDP).
Maryland Property View 2009 (MDPV)
Eastern Shore Regional GIS Cooperative (ESRGC)
Choptank River
PLANNING AND CODES
TOWN OF DENTON

Sensitive Areas Regulations

Streams and Stream Buffers

The Town of Denton has established development standards to protect sensitive environmental areas that apply to all subdivisions and development requiring site plan approval. These standards require retention or creation of natural buffers along all perennial and intermittent streams. Perennial streams require a 100 foot natural buffer and intermittent streams require a no-disturbance 50 foot buffer. The minimum perennial stream buffers must be expanded to include contiguous one-hundred-year floodplain and nontidal wetlands, hydric soils, highly erodible soils, and soils on slopes greater than 15% to a maximum distance of 300 feet.

The Federal Clean Water Act requires the State of Maryland to identify water bodies that are high in quality (Tier II water bodies). Denton has three Tier II streams within their jurisdiction, these streams also require a100 foot buffer, and must comply with Maryland's antidegradation policy. A further discussion concerning Denton's Tier II streams are found in Chapter 5, "Water Resource Element".

Buffers located within the Town's Critical Area are required to follow new regulations that became effective on March 8, 2010. The new regulations create standards for delineating the Buffer, measuring the Buffer, and mandatory expansion for contiguous sensitive areas. The minimal buffer requirement is 100 feet landward from tidal waters or tidal wetlands, within the Resource Conservation Area a buffer of at least 200 feet from tidal waters or a tidal wetland is required under certain conditions.

The buffer is expanded in the Critical Area when one or more of the following conditions exist:

- Steep slopes at a rate of four feet for every one percent of slope or to the top of the slope, whichever is greater,
- Nontidal Wetlands of Special State Concern to include the wetland and its regulated (by MDE) 100-foot buffer,
- Nontidal wetlands to the upland boundary of the nontidal wetland, and
- Highly erodible soils and hydric soils to the landward edge of the soil or 300-feet (which include the minimum 100-foot Buffer), whichever is less.

Environmentally sensitive building and site-design guidelines that follow LEED (Leadership in Energy and Environmental Design) guidelines should be incorporated into the subdivision review process to minimize the potential negative impacts of stormwater flows on adjacent aquatic resources and water quality.

Nontidal Wetlands

A twenty-five foot setback from all nontidal wetlands (except for the above mentioned conditions concerning nontidal wetlands in the Critical Area), is required for all development around the extent of the delineated nontidal wetland except as may be permitted by the U.S. Army Corp of Engineers and the State of Maryland, Department of Natural Resources, Nontidal Wetlands Division.

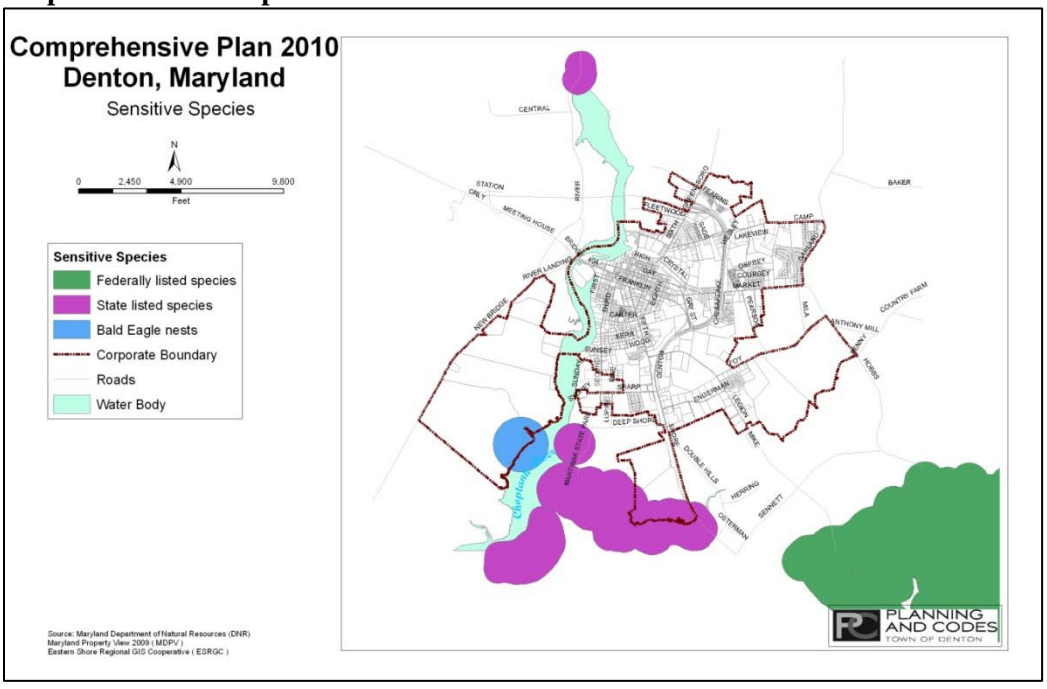
Steep Slopes

Structure or impervious surface may not be placed on any slope with a grade of 15% or more covering a contiguous area of 10,000 square feet or more. On slopes between 15% and 25%, good engineering practices shall be used to insure sediment and erosion control and slope stabilization before, during, and after disturbance activities and to minimize cut and fill. A minimum fifty foot buffer must be established between development and the crest of slopes in excess of 25%. Within the Critical Area, the buffer requirements are expanded if the steep slopes are at a rate of four feet for every one percent of slope or to the top of the slope, whichever is greater.

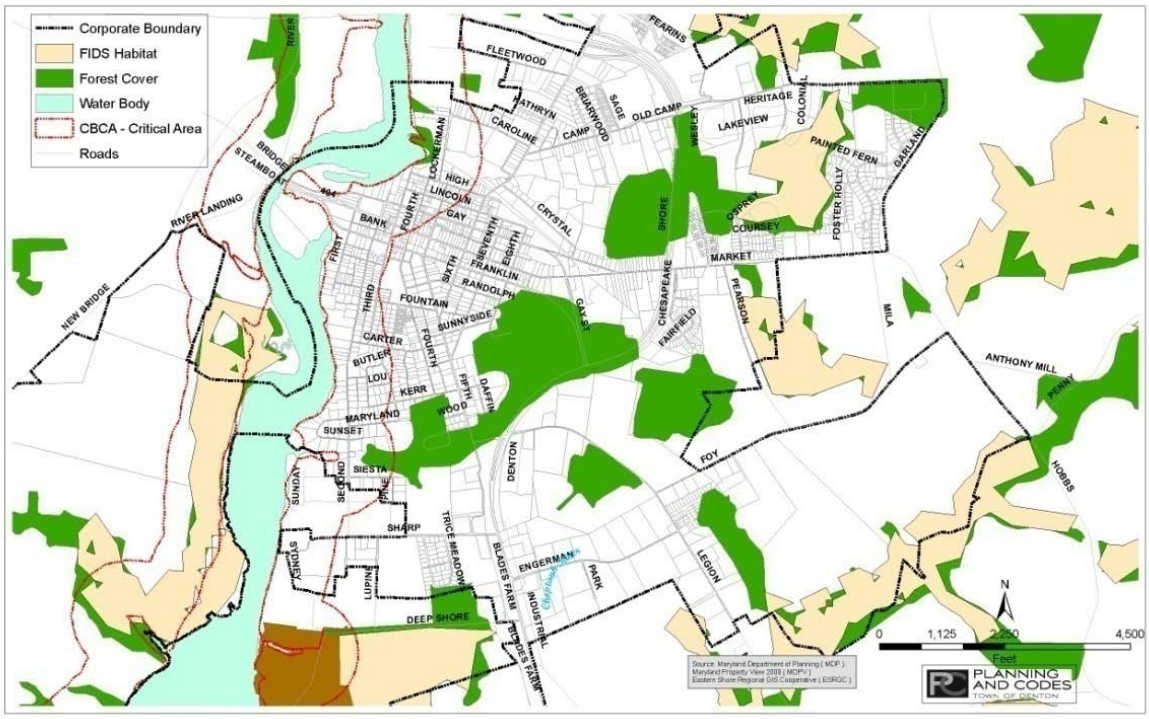
Habitats of Threatened and Endangered Species

The Town requires that development (as described by the Maryland Department of Natural Resources Natural Heritage Program) avoid habitats of rare, threatened, and endangered species. Proposed development projects must be reviewed by the Maryland Department of Natural Resources. Map 6-4 shows Sensitive Species areas in and around Denton. When a project is within a Wildlife Habitat (Project Review Area), the developer is required to contact the Maryland Department of Natural Resource's Heritage and Biodiversity Conservation Program (HBCP) and address any comments and/or recommendations made by that State agency. Populations of many Forest Interior Dwelling Bird species (FIDS) (Map 6-5) are declining in Maryland and throughout the eastern United States. The conservation of FIDS habitat is strongly encouraged by the Department of Natural Resources.

Map 6-4: Sensitive Species



Map 6-5: Inset Map of FIDS areas

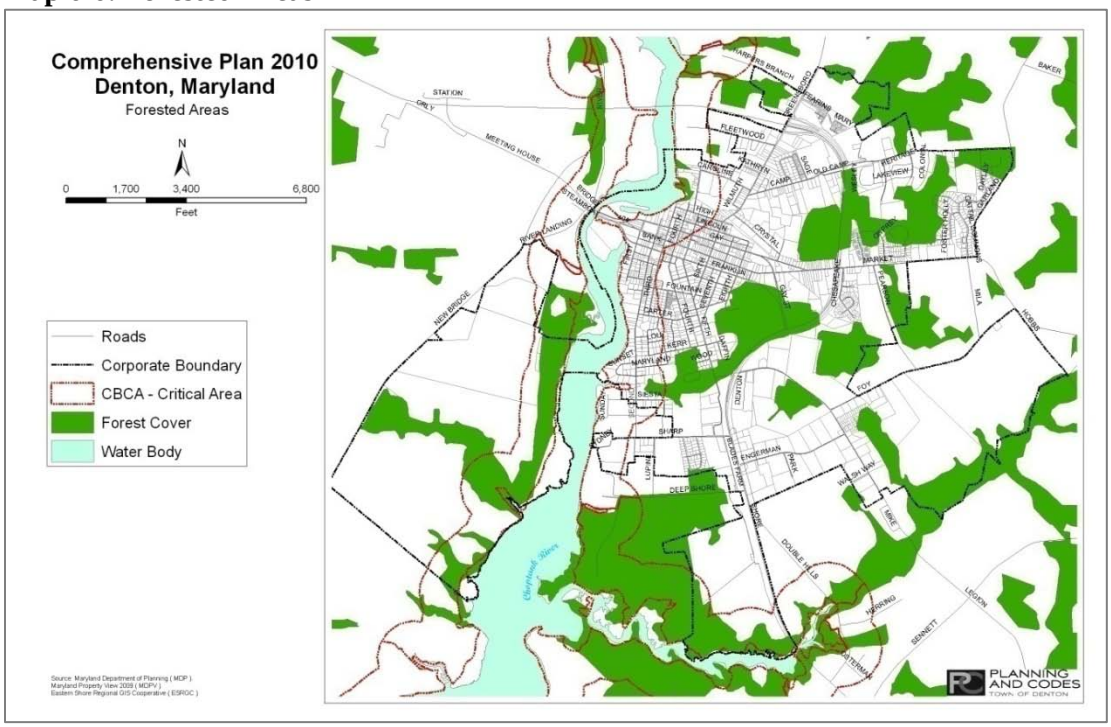


Forest Conservation

The Forest Conservation Act of 1991 (Natural Resources Article, § 5-1601, et. seq.) was enacted to protect the forests of Maryland by making forest conditions and character an integral part of the site planning process. It is regulated by the Maryland Department of Natural Resources, but implemented and administered by local governments. The Forest Conservation Act seeks to maximize the benefits of forests and slow the loss of forest land in Maryland, while allowing development to take place. Map 6-6 shows forested areas within the Town boundary.

The Denton Forest Conservation Ordinance requires that a person making application for subdivision, project plan approval, a grading permit, or a sediment control approval on units of land 40,000 square feet or greater must submit a forest stand delineation and a forest conservation plan for the lot or parcel on which the development is located if the regulated activity cannot be exempted. A qualified professional reviews forest stand delineation and forest conservation plans for the Town to insure accuracy and compliance with the Town code.

Map 6-6: Forested Areas



The Ordinance establishes forest conservation thresholds for all land use categories. The forest conservation threshold sets the percentage of the net tract area at which the reforestation requirement changes from a ratio of 1/4 acre planted for each acre removed above the threshold to a ratio of 2 acres planted for each acre removed below the threshold. After reasonable efforts to minimize the cutting or clearing of trees and other woody plants have been exhausted in the development of a subdivision; site plan or project plan; grading and sediment control activities; and implementation of the forest conservation plan; the forest conservation plan must provide for reforestation, or payment into the forest conservation fund, consistent with the following forest conservation threshold for the applicable land use category:

Table 6-1 Forest Conservation Threshold Requirements

Category of Use	Threshold Percentage
Agricultural and resource areas	50 percent
Institutional development areas	20 percent
High density residential areas	20 percent
Mixed use and planned unit development areas	15 percent
Commercial and industrial use area	15 percent

Source: Forest Conservation & Critical Area Program, Town of Denton

Each acre of forest retained on the net tract area above the applicable forest conservation threshold will be credited towards the total number of acres required to be reforested for all existing forest cover cleared on the net tract area below the applicable forest conservation threshold, the area of forest removed shall be reforested at a ratio of two acres planted for each acre removed below the threshold.

If little or no forest exists in the site, the applicant must conduct afforestation on the lot or parcel. An agriculture or resource area tract having less than 20 percent of the net tract area in forest cover must be afforested up to at least 20 percent of the net tract area. Institutional development areas, high density residential areas, mixed use and planned unit development areas, and commercial and industrial use areas with less than 15 percent of net tract area in forest cover must be afforested up to at least 15 percent of the net tract area.

The 2009 Maryland Legislative Session enacted SB666 "No Net Loss of Forestry Policy." This bill modifies several provisions of the Forest Conservation Act, and supersedes conflicting regulations within the Town's current Forest Conservation Ordinance; Hence, the stricter provisions would apply.

Some changes are:

- limit the exemptions for forest clearing associated with a single lot, a linear project, and a dwelling house to a maximum disturbance of 20,000 (instead of 40,000) square feet of forest;
- limit the exemption for construction of dwelling houses to owners and their children, eliminating authority for an owner's grandchildren;
- eliminate an exemption for areas that were previously developed and covered by paved surface;
- authorize the use of an off-site protective agreement that applies to forests that are temporarily protected as a mitigation practice for meeting afforestation or reforestation requirements;
- broaden the acceptable uses of State and local Forest Conservation Funds to include maintenance of existing forests and achieving urban tree canopy goals; and
- require that priority be given to specified trees, shrubs, plants, and areas for retention and protection, unless a variance is granted.

The bill alters the fee-in-lieu contribution rate to State and local conservation funds that is required under specified circumstances from 10 cents per square foot to 30 cents per square foot of the area of required planting until September 30, 2014. After September 30, 2014, the rate must be adjusted for inflation as determined annually by DNR via regulation.

Regional Environmental Protection

Natural systems do not follow political boundaries. Consequently, any efforts to manage for adverse impacts to the natural environment must recognize the regional context for protection efforts and involve coordinated efforts at all levels of government to have any hope for success. State, county, and town strategies for environmental protection should be based on sound watershed management principles and coordinated resource protection strategies. Two components of regional strategies for natural resource protection are based on the region's geographic components: watersheds and green infrastructure.

Watershed Management

Impervious surfaces strongly influence watershed quality. Accordingly, critical analysis of the degree and location of future development (and impervious cover) that is expected in a watershed is important to the long-term health of the land and receiving waters. Planning at the watershed and sub-watershed level presents the opportunity to comprehensively address land use and environmental protection as intricately related topics. It enables decision makers to better understand the potential impacts of land uses on such things as stream health, water quality, and wildlife diversity; and devise strategies to offset or address potential adverse results. A 1996 publication by the Environmental Protection Agency entitled, "The Why Watershed Report," makes the following point in concerning the reasons watershed planning makes sense:

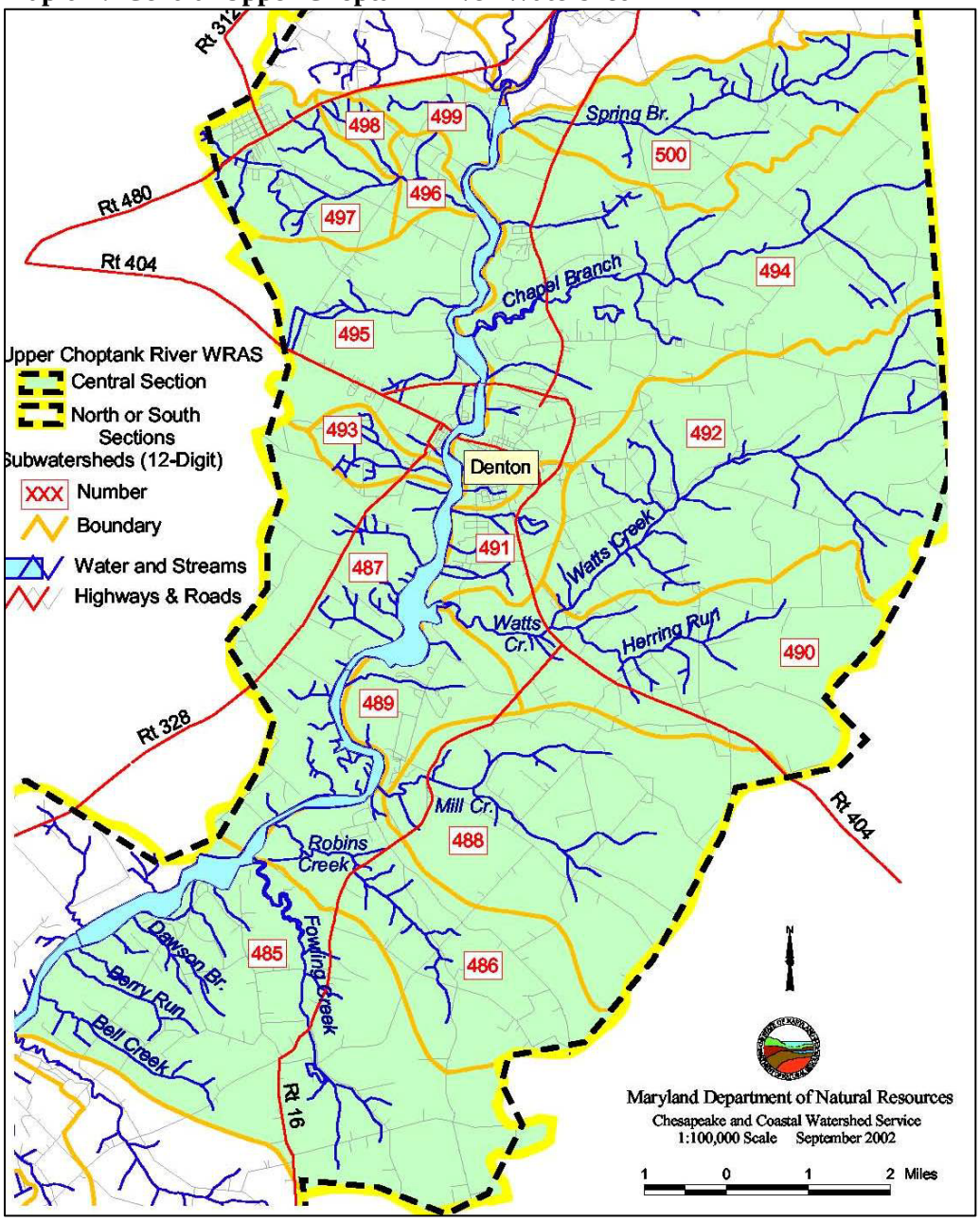
> "Because watersheds are defined by natural hydrology, they represent the most logical basis for managing water resources. The resource becomes the focal point, and managers are able to gain a more complete understanding of overall conditions in an area and the stressors which affect those conditions.
>
> Traditionally, water quality improvements have focused on specific sources of pollution, such as sewage discharges, or specific water resources, such as a river segment or wetland. While this approach may be successful in addressing specific problems, it often fails to address the more subtle and chronic problems that contribute to a watershed's decline. For example, pollution from a sewage treatment plant might be reduced significantly after a new technology is installed, and yet the local river may still suffer if other factors in the watershed, such as habitat destruction or polluted runoff, go unaddressed. Watershed management can offer a stronger foundation for uncovering the many stressors that affect a watershed. The result is management better equipped to determine what actions are needed to protect or restore the resource."

Because the incorporated area of Denton is wholly located in a sub-watershed that includes Caroline County, effective watershed planning must be a cooperative planning effort among both jurisdictions (Map 6-7). The potential benefit of undertaking sub-watershed planning with the County presents an opportunity to strengthen the comprehensive plans of both jurisdictions.

Maryland's Clean Water Action Plan, completed in 1998, identified water bodies that failed to meet water quality requirements. As part of the State's response, the Maryland Department of Natural Resources (DNR) established a program to offer funding and technical assistance to Counties willing to work to devise and implement a Watershed Restoration Action Strategy (WRAS) for the impaired water bodies. A watershed characterization has been developed for two of the four major watersheds in the County. The characterizations will be used to develop watershed plans for the County.

Currently Caroline County is developing a watershed plan for two twelve-digit watersheds within the Upper Choptank River watershed. The goal of this plan is to reduce nonpoint source pollution that enters the Choptank River. These watershed basins drain lands occupied by the municipalities of Greensboro and Denton. The Town of Denton has partnered with the County to assist with the development of the watershed plan.

Map 6-7: Central Upper Choptank River Watershed

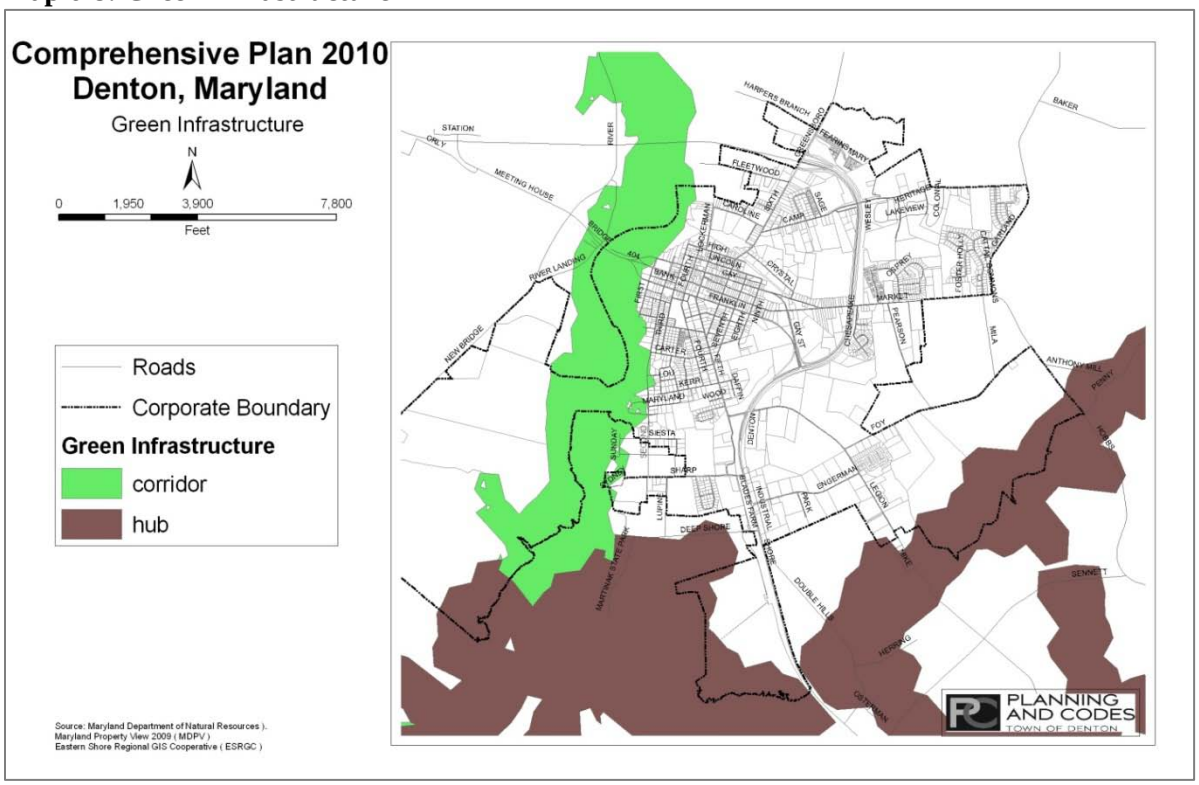


Source: Maryland Department of Natural Resource, Upper Choptank River Watershed Characterization", in partnership with Talbot County and Caroline County, 2002

Green Infrastructure

"Green Infrastructure" is defined as lands critical to long-term ecological health of a region. These lands provide the natural foundation needed to support a diverse plant and animal population and enable valuable natural processes, like filtering water and cleaning the air, to take place. Maryland's green infrastructure has been mapped using sophisticated satellite imaging technology, with the results being reviewed by scientists, local government officials, and conservation groups. The first step in the mapping process identified the heart of green infrastructure, called "Green Hubs." (Map 6-8) These are typically sweeping areas hundreds of acres in size and are vital to maintaining the County's vibrant and unique ecology. The second step is to connect hubs with "corridors" - linear remnants of natural land such as stream valleys and mountain ridges that allow animals, seeds, and pollen to move from one area to another. They also protect the health of streams and wetlands by maintaining adjacent vegetation. Preserving linkages between the remaining blocks of habitat will ensure the long-term survival and continued diversity of Maryland's plants, wildlife, and environment.

Map 6-8: Green Infrastructure



Protecting green infrastructure is vital in the effort to prevent the shrinking and fragmentation of undeveloped open space. Fortifying and restoring the green infrastructure can maximize the ecological potential of the landscape. In Green Hubs, distinctive wildlife will have access to a full range of habitat enabling animals to flourish amidst vast stretches of protected lands. Green Hubs also reduce the stress placed on forests, helping to renew woodlands, and preventing their collapse into isolated pockets of trees. Preserving linkages between the remaining large habitat

areas will help ensure the long-term survival and continued diversity of natural resources and the environment.

Caroline County and the Town should recognize the importance of natural resource protection objectives associated with conserving green infrastructure. Coordinated strategies should include development regulations that support new development design that maintains green infrastructure hubs and corridors to the maximum extent possible, and encourages opportunities to restore land to green infrastructure condition.