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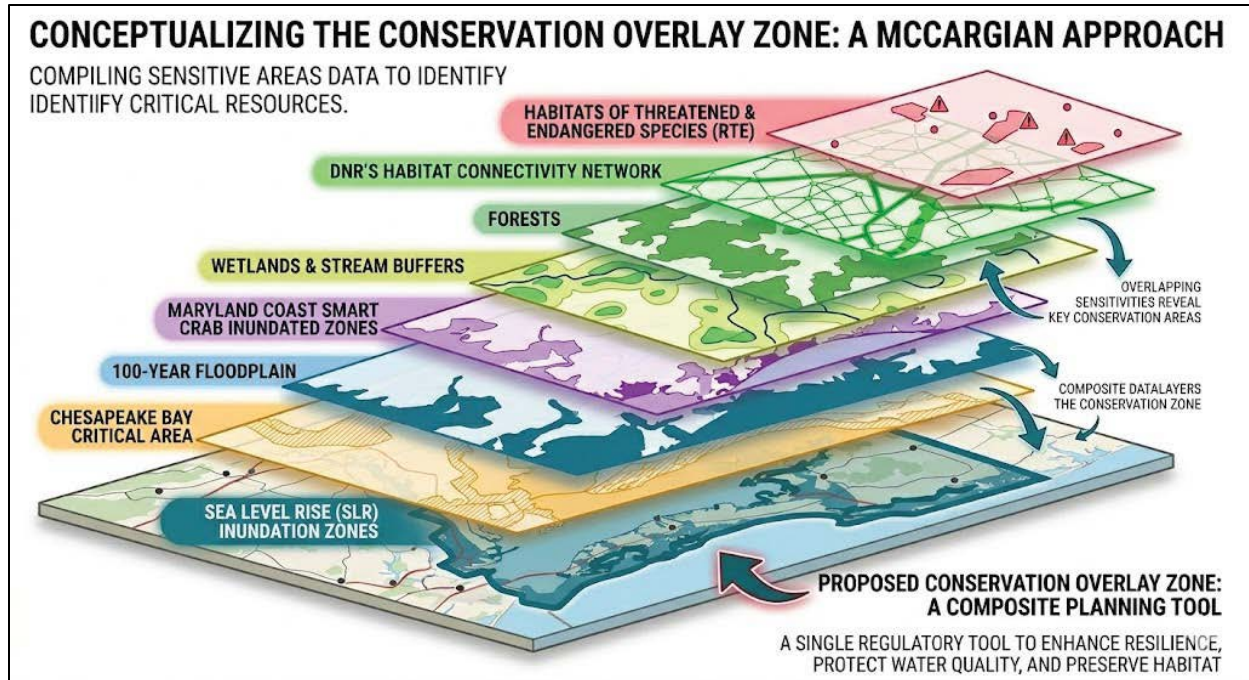
CHAPTER V - SENSITIVE AREAS ELEMENT

Introduction

The Sensitive Areas Element is a required component of the Town of Greensboro's Comprehensive Plan, as mandated by Maryland Land Use Article §3-104. This element establishes principles, policies, and standards to protect sensitive areas from the adverse effects of development, ensuring the long-term sustainability of natural resources while supporting the Town's growth visions. Sensitive areas include streams and their buffers, 100-year floodplains, habitats of threatened and endangered species, and steep slopes. In accordance with guidance from the Maryland Department of Planning (MDP), this element also addresses additional locally identified areas such as wetlands, forests intended for resource protection or conservation, groundwater resources, and Maryland Department of Natural Resources (DNR) designated Green Infrastructure (now referred to as the Habitat Connectivity Network), key wildlife habitats, and Tier II streams, particularly within the Chesapeake Bay Critical Area.

This element integrates updated state guidance from the Maryland Department of Natural Resources (DNR) on habitats for rare, threatened, and endangered (RTE) species, the Habitat Connectivity Network, and key wildlife habitats; and from the Maryland Department of the Environment (MDE) on stormwater management, floodplain protections, and stream tier designations. It incorporates climate change considerations such as increased flooding and sea-level rise, which exacerbate vulnerabilities in low-lying areas along the Choptank River. It also incorporates environmental justice (EJ) principles, as outlined in the dedicated section below, to ensure equitable protection of sensitive areas in overburdened and underserved communities, aligning with MDE's EnviroScreen tool and state EJ mandates.

To enhance protections and address the complexity of these interconnected resources, this element recommends establishing a Conservation Overlay Zone within Greensboro's Zoning Ordinance. Greensboro's location along the tidal Choptank River exposes it to escalating threats from climate change, including sea level rise (SLR), which is projected to be 1-3 feet by 2050-2100, intensified storms, and nuisance/riverine flooding, which amplify risks to sensitive ecosystems such as tidal wetlands and RTE habitats. Existing regulations (e.g., the Critical Area Program and the Forest Conservation Act) provide foundational protections but are fragmented, potentially allowing cumulative degradation from development. The overlay zone offers a proactive, integrated approach to safeguard these resources, promote resilience (e.g., by facilitating tidal wetland migration and natural surge attenuation), and ensure equitable application—minimal impacts on existing built-out properties while imposing progressive requirements on new or intensified uses. This approach aligns with state visions for environmental stewardship, Chesapeake Bay TMDL goals, and MDP guidance, streamlining permitting while supporting sustainable growth and preventing habitat loss or water quality declines.



Identification of Sensitive Areas

Greensboro's sensitive areas are shaped by its location along the Choptank River in the Chesapeake Bay watershed, with flat topography, occasional steep slopes, extensive wetlands, floodplains, and forested areas. The following describes each sensitive area with local context:

Streams and Buffers

The Choptank River and its tributaries, such as Forge Branch, are vital for drinking water, recreation, fisheries, and wildlife habitat. Stream buffers filter pollutants, reduce erosion, and mitigate flooding. In Greensboro, buffers are required within the 1,000-foot Critical Area (expanded to 100 feet for non-tidal streams outside), but development pressures could degrade water quality if not protected. In the vicinity of Greensboro, Forge Branch is designated as Tier II (high-quality waters subject to anti-degradation policies under MDE's regulations, meaning no degradation is allowed beyond existing uses) or upstream of Tier II segments, requiring enhanced protections to maintain water quality standards (see Map *).

The Conservation Overlay directly incorporates catchment/stream buffers and Tier II designations as core protected features. It enforces no disturbances in core riparian buffers for major projects, requires Low Impact Development LID stormwater to minimize pollutant runoff, mandates site-specific buffer plans (expandable as needed), and prioritizes enhancements/restoration on public lands to maintain water quality in the Choptank River and tributaries.

100-Year Floodplains

Approximately 15-20% of the Town, 103 properties with an assessed value of nearly \$18 million, lies in FEMA-designated 100-year floodplains, primarily along the Choptank River, posing risks to life, property, and infrastructure (see Map *). Climate projections indicate increased flood frequency due to sea-level rise (up to 4 feet by 2100) and intense storms.

Floodplains form a foundational layer in the Conservation Overlay, with added SLR/storm surge simulations (e.g., Coast Smart CRAB inundation zones for +3 ft scenarios) to identify expanded high-risk areas. It would impose stricter setback/no-build rules in high-inundation zones, require elevation/freeboard adjustments, exclude floodplains from net buildable area calculations, and support acquisition and open-space conversion for flood mitigation.

Habitats of Threatened and Endangered Species (RTE)

DNR identifies potential RTE habitats in wetlands, forests, and riparian zones, including species like the bald eagle, least tern, and various amphibians/fish in the Choptank. The Maryland State Wildlife Action Plan highlights threats from habitat loss and invasive species. Key wildlife habitats in the Greensboro area, as per DNR classifications for the Coastal Plain physiographic province, include Coastal Plain River, Coastal Plain Stream, Coastal Plain Floodplain, Coastal Plain Seepage Swamp, Mesic Mixed Hardwood Forest, Basic Mesic Forest, and Coastal Plain Oak-Pine Forest. Important features include mature forests, migratory fish spawning areas, and habitats for species such as the shield darter (watchlist), triangle floater (state-threatened), sparkling jewelwing (state-rare), and plants such as creeping burhead (state-endangered).

The Sensitive Species Project Review Areas (SSPRA) is a GIS data layer (vector polygon coverage) maintained by the Maryland Department of Natural Resources (DNR), Wildlife and Heritage Service (see Map *). It provides a statewide overview of areas containing habitats for rare, threatened, and endangered species, as well as rare natural community types. The layer consists of buffered polygons that generally encompass (but do not precisely delineate) documented sensitive locations, serving as a screening tool to flag potential impacts during project reviews. The data layer contains/incorporates buffered/generalized areas around documented rare, threatened, and endangered species locations. It also encompasses various regulated and sensitive habitat types, including:

- Natural Heritage Areas.
- Listed Species Sites.
- Other or Locally Significant Habitat Areas.
- Colonial Waterbird Sites.
- Non-tidal Wetlands of Special State Concern.
- Geographic Areas of Particular Concern.
- Critical Area Habitat Protection Areas.

The primary purpose of this data set is to trigger consultation with DNR's Heritage and Biodiversity Conservation Program for proposed development, land-use changes, or other projects that may affect these resources. Created to streamline compliance with laws such as the

1992 Economic Growth, Resource Protection and Planning Act, it serves as a "one-stop" preliminary indicator rather than exact boundaries for specific species or features. Detailed site-specific reviews follow if a project intersects these areas.

Steep Slopes

Slopes exceeding 15% (and critically 25%) are limited but occur near riverbanks, increasing erosion and sedimentation risks. Protection is essential to maintain soil stability and water quality. In Greensboro, steep slopes primarily occur along the banks of the Choptank River within the Critical Area Buffer. Steep slopes, especially along the banks of the Choptank River in the Critical Area, are incorporated into riparian buffers. The Conservation Overlay builds on the Critical Area standards, requiring enhanced controls in SLR-vulnerable zones to reduce sedimentation risks.

DNR's Habitat Connectivity Network (Green Infrastructure)

This network, updated from the 2005 Green Infrastructure Assessment, identifies ecologically significant hubs (large, intact natural areas) and corridors (connections between hubs) to promote biodiversity and resilience (see Map *). In Greensboro and Caroline County, it includes riparian corridors along the Choptank River, forested hubs, and linkages to larger regional networks, supporting habitat connectivity for species movement and adaptation to climate change. These areas overlap with other sensitive features, such as floodplains and wetlands.

This network (hubs and corridors along the Choptank and forested linkages) is a primary merged layer in the Conservation Overlay. It would guide conservation priorities, enforce forest retention thresholds, limit fragmentation in connectivity areas, require connectivity assessments for major projects, and promote restoration (e.g., reforestation) to enhance biodiversity resilience and species adaptation.

Other Areas (Wetlands, Forests, Agricultural Lands, Groundwater)

Other sensitive areas in and around Greensboro that require appropriate management to maintain their contributions to the region's overall environmental health include non-tidal wetlands, forests, and agricultural land (see Map *). Wetlands (with migration corridors per SLR projections) and forest cover (tied to Forest Conservation Program retention) are explicitly included in the Conservation Overlay which would require designs permitting tidal wetland migration (e.g., setbacks, no barriers/living shorelines), strict no-clearing for forests in new major developments, expanded Critical Area-like protections town-wide, and LID/retrofits to protect recharge/contamination risks.

Climate Change

Why Climate Change Matters to Greensboro

Greensboro, a small historic town on Maryland's Eastern Shore in Caroline County, faces growing risks from climate change that directly affect its residents, economy, environment, and

quality of life. As a river-oriented community along the Choptank River, the Town is particularly vulnerable to the region's accelerating changes.

Key reasons climate change is important include:

- **Rising Sea Levels and Increased Flooding:** Maryland's Eastern Shore experiences faster-than-average sea-level rise driven by land subsidence and global warming, with projections of 1–1.5 feet by 2050 and 4–6 feet by 2100. Sea level rise (SLR) exacerbates riverine and tidal flooding along the Choptank River and its tributaries, including Forge Branch, threatening low-lying areas, infrastructure, homes, and agricultural lands. Current tools, such as the Maryland Coast Smart CRAB data, already show projected inundation zones that overlap with Greensboro's rural edges and open spaces.
- **More Intense Storms, Precipitation Changes, and Extreme Weather:** Heavier downpours, wetter winters/springs, drier summers, and stronger storm surges increase risks of flash flooding, erosion, and damage to roads, bridges, and stormwater systems. Warmer temperatures lead to more frequent heat waves, stressing public health (especially vulnerable groups such as seniors and outdoor workers) and straining energy supplies.
- **Impacts on Local Economy and Livelihoods:** Caroline County's agricultural base—corn, soybeans, and livestock feed—is threatened by saltwater intrusion into soils (already affecting lower Eastern Shore farms), shifting growing seasons, and extreme weather, all of which reduce yields. The Choptank River supports fisheries, recreation, and water quality in the Chesapeake Bay watershed; degraded conditions from pollution runoff or habitat loss affect these vital resources.
- **Environmental and Community Resilience:** Climate change worsens challenges such as nutrient loading, habitat fragmentation, and "ghost forests" observed regionally, while threatening drinking water sources and recreational opportunities. Without proactive measures, these changes could increase repair costs, reduce property values, and disproportionately impact families, seniors, and underserved residents.

Greensboro's Comprehensive Plan addresses these by focusing on infill growth in safer central areas. By planning for resilience—protecting the Choptank, preserving open space, and building adaptively—the Town can safeguard its small-town Eastern Shore character and support sustainable growth.

Potential Effects

Maryland Coast Smart - Climate Ready Action Boundary (CRAB) Inundated Zones and Riverine Flood Depth Grid GIS data layers, part of Maryland's Coast Smart program, provide critical tools for assessing future flood risks due to climate change. They support resilient planning by identifying areas vulnerable to increased inundation, informing decisions on infrastructure, land use, development siting, and environmental protection—particularly relevant in river-oriented communities like Greensboro along the Choptank River.

CRAB Inundated Zones (see Map *): This polygon-based map service delineates geographic areas across Maryland impacted by projected inundation under the Climate Ready Action Boundary (CRAB) scenario. Created by the Maryland Environmental Service (MES) in partnership with the Maryland Department of the Environment (MDE), Maryland Department of Natural Resources (DNR), and MDOT SHA, this layer guides state projects (especially those >\$500,000) to apply elevated flood standards for climate resilience.

CRAB Riverine - Flood Depth Grid (see Map *): This raster image service depicts projected flood depths for riverine (inland rivers and streams) areas statewide, focusing on non-coastal flooding from rivers such as the Choptank. It represents the CRAB-adjusted inundation in riverine floodplains, showing the depth of water above ground elevation under future climate conditions. Maintained by MDE with support from MES, DNR, and MDOT SHA, it complements the coastal-focused inundated zones by addressing inland risks from heavier precipitation, runoff, and elevated base flows. The grid supports transportation vulnerability assessments (e.g., roadways, bridges) and helps integrate riverine flooding into comprehensive plans.

Together, these layers advance Maryland's climate adaptation goals by extending beyond current FEMA flood maps to anticipate conditions through 2050+. In Greensboro and Caroline County, they highlight risks along the Choptank River and its tributaries, informing policies on buffers, elevation requirements, stormwater management, and the avoidance of high-risk development. They align with state mandates for protecting sensitive areas, water resources, and equity in resilience planning, helping preserve natural resources, reduce flood damage, and ensure sustainable growth.

The Conservation Overlay directly incorporates CRAB riverine and inundation zones as core protected features. It enforces avoidance or elevation of structures in high-depth projected areas for major projects, requires Low Impact Development (LID) stormwater practices to reduce runoff and enhance infiltration, mandates site-specific flood risk assessments and resilient design (e.g., living shorelines, elevated foundations), and prioritizes conservation easements, buffers, or restoration on public/private lands to maintain floodplain function and ecological integrity. This aligns with state mandates for climate resilience (Climate Solutions Now Act), sensitive areas protection (§ 3-104), water resources management, and integration with existing Critical Area (1,000 ft tidal) and floodplain regulations to preserve the Choptank ecosystem, reduce long-term risks, and support sustainable growth focused on infill areas.

Environmental Justice

Environmental justice (EJ) ensures the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, in the development, implementation, and enforcement of environmental laws, regulations, and policies. In Greensboro, EJ considerations are integral to protecting sensitive areas, as they address how cumulative environmental burdens disproportionately affect vulnerable populations, exacerbating health disparities and limiting access to natural resources. The Maryland Department of the Environment's (MDE) EnviroScreen tool evaluates EJ risks at the census tract level, combining pollution burdens (exposures and environmental effects), sensitive populations, and socioeconomic factors to

assign an EJ Score and classify areas as overburdened (three or more environmental health indicators above the 75th percentile statewide) or underserved (e.g., $\geq 25\%$ low-income residents, $\geq 50\%$ nonwhite residents, or $\geq 15\%$ limited English proficiency).

Census Tract 24011955100, encompassing Greensboro and surrounding areas in Caroline County, has an EJ Score of 42 and is classified as both overburdened and underserved. The overburdened status stems from high proximity to environmental hazards, including brownfields (88.8th percentile), power plants (98.4th percentile), concentrated animal feeding operations (CAFOs, 98.4th percentile), and mining (99.1st percentile). While no CAFOs or major power plants are within Greensboro's corporate limits, nearby operations in unincorporated Caroline County (e.g., poultry CAFOs on Kibler Road and Linhard Lane, and the 145 MW Cherrywood Solar project north of Town) contribute to cumulative impacts through air emissions, potential runoff, odors, and infrastructure proximity. The underserved status is driven by socioeconomic factors, including low-income residents (78.7th percentile, representing 33.9% of the population) and sensitive populations such as those with asthma (45.7th percentile) or myocardial infarction risks (51.7th percentile). Other elevated indicators include respiratory hazards (a 2.9 percentile value, though not top-tier) and cancer risk (a 0.2 percentile value), highlighting vulnerabilities in this rural, agricultural community.

These EJ concerns intersect with sensitive areas, as pollution from nearby sources can degrade streams, wetlands, floodplains, and habitats—amplifying risks in low-lying riparian zones along the Choptank River. For instance, CAFO runoff threatens Tier II streams and groundwater, while power infrastructure (e.g., solar substations) may fragment habitat connectivity networks. Climate change exacerbates these issues, with sea-level rise and flooding disproportionately affecting low-income residents in flood-prone areas. Protecting sensitive areas through the proposed Conservation Overlay Zone can advance EJ by mitigating pollution (e.g., through buffers that filter contaminants), enhancing community resilience (e.g., green spaces for health benefits), and ensuring equitable access to clean water, recreation, and natural surge protection.

To address EJ, the Town will prioritize community engagement in planning, target resources to underserved areas, and integrate MDEnviroScreen data into site reviews. This approach aligns with state mandates under the Climate Solutions Now Act and Maryland's EJ framework, promoting sustainable growth that reduces disparities without burdening existing residents. Strategies include interjurisdictional coordination with Caroline County on transboundary hazards, incentives for pollution retrofits, and equitable distribution of conservation benefits (e.g., parks in high-EJ zones). By linking sensitive areas protection to EJ, Greensboro can foster a healthier, more inclusive environment while supporting its small-town character.

Principles, Policies, Standards, Strategies, and Actions

The following table summarizes key principles, policies, standards, strategies, and actions, drawing from MDP's "Preparing a Sensitive Areas Element" guidance, DNR's RTE and Habitat Connectivity Network recommendations, and MDE's stream tier protections. These are further supported by management strategies for the recommended Conservation Overlay Zone (see Map *), which apply differentiated protections: minimal impacts on existing built-out properties (e.g., voluntary stormwater retrofits); low-impact development (LID) stormwater techniques to the

maximum extent practicable for redevelopment and small-site infill; strict forest retention (no-net-loss), LID requirements, and wetland migration accommodations for new subdivisions, master-planned developments, and major site approvals; and buffer enhancements on publicly owned riparian lands. Site plan and subdivision applications must depict the full spatial extent of merged overlay features (e.g., wetlands with migration corridors, SLR/storm surge zones, floodplains, Tier II buffers) across the property and relevant adjacent areas, including environmental assessments to evaluate site suitability and impacts on sensitive resources.

Table *: Principles, Policies, Standards, Strategies, and Actions

Sensitive Area	Principles	Policies and Standards	Strategies and Actions
Streams and Buffers	Buffers are natural filters essential for water quality and habitat.	Require 100-foot vegetated buffers (expandable to 200 feet in Critical Area); prohibit impervious surfaces within buffers per MDE stormwater guidelines. For Tier II streams, enforce anti-degradation policies to prevent increases in pollutant levels. In the Conservation Overlay Zone, require LID stormwater for redevelopment/infill and no disturbances in core buffers for major projects.	- Amend the Zoning Ordinance to mandate site-specific buffer plans that incorporate Tier designations and overlay strategies. - Partner with DNR for stream restoration (e.g., planting native vegetation); enhance public riparian buffers.
100-Year Floodplains	Floodplains provide natural flood mitigation; development increases risks.	No new structures in floodplains unless elevated 1 foot or more above base flood elevation; net buildable area excludes floodplains for density calculations. Incorporate SLR/storm surge overlays with stricter setbacks in high-risk A/AE zones.	- Update Floodplain Ordinance to incorporate climate projections (e.g., higher freeboard) and overlay management. - Acquire flood-prone lands for open space using Program Open Space funds. - Integrate floodplain mapping with SLR simulations into growth area planning and site evaluations.
Habitats of RTE Species and Key Wildlife Habitats	Habitats require site-specific protection to prevent species loss; key habitats support biodiversity.	Require environmental assessments for developments near RTE sites or key habitats; cluster development away from habitats per DNR guidance. In the overlay zone, mandate no-net-loss for sensitive species areas, with complex site-suitability evaluations that consider cumulative impacts.	- Consult DNR's Natural Heritage Program during site plan reviews, incorporating SSPRA data. - Promote conservation easements with Eastern Shore Land Conservancy, targeting

Table *: Principles, Policies, Standards, Strategies, and Actions			
Sensitive Area	Principles	Policies and Standards	Strategies and Actions
			key habitats like Coastal Plain Seepage Swamps; facilitate habitat connectivity in overlay designs.
Steep Slopes	Slopes prevent erosion and sedimentation when undisturbed.	Limit disturbance on slopes >25%; require erosion control plans for 15–25% slopes. Integrate with overlay buffers in riparian areas.	- Incorporate slope protections into Subdivision Regulations and overlay strategies.
Habitat Connectivity Network (Green Infrastructure)	Hubs and corridors ensure ecological connectivity and resilience.	Prioritize protection of DNR-identified hubs and corridors; limit fragmentation in connectivity areas. In the overlay, enforce forest retention thresholds and connectivity assessments for major projects.	- Integrate network maps into land use planning to guide conservation and overlay boundaries. - Restore corridors through reforestation and wetland projects. - Collaborate with Caroline County on regional connectivity initiatives, including climate adaptation.
Other Areas (Wetlands, Forests, Agricultural Lands, Groundwater)	These areas support biodiversity, water recharge, and agriculture.	Institute a no net loss forest cover policy; protect wetlands via state/federal permits; and agricultural easements in rural buffer. In the overlay, require designs permitting tidal wetland migration (e.g., setbacks, no barriers) and forest no-clearing for new developments.	- Implement groundwater monitoring with MDE; target retrofits for water quality. - Use LID and migration assessments in site plans.

