Environmental Stewardship

Draft Goals and Objectives

Fall 2023

This document includes the draft Goals and Objectives for the updated Environmental Stewardship chapter (previously referred to as 'Natural Resources') and provides additional context and background on this topic. The document is organized by the following sections:

- **Overview:** Brief introduction to this topic.
- **Draft Goals and Objectives:** The draft updated Goals and Objectives for this chapter. This is the section we're asking for community input on this fall.
- **Phase 2 Community Input Themes:** Major themes from community input heard on this topic during the first two rounds of Phase 2 engagement (January - July 2023).
- **Topic Report and Connections to the AC44 Framework:** Information on challenges, opportunities, recent trends, and data on this topic, as previously provided in the 'topic reports' at the beginning of Phase 2. Summary of how this topic is connected to the AC44 Framework for an Equitable and Resilient Community.

Environmental Stewardship Overview

Albemarle County's landscape, located in the Virginia Piedmont and on the eastern flank of the Blue Ridge, has a variety of habitats, species, and environmental features. Ongoing protection and restoration of the environment is essential for the health of our ecosystems and biodiversity, our water supplies, our community's resilience to the effects of climate change, and our enjoyment of the natural world.

The updated Goals and Objectives for this chapter reflect community input and carry forward key themes from the 2015 Comprehensive Plan, including clean and healthy waterways, drinking water protection, biodiversity, connected and restored habitats, and natural hazard mitigation. The updated recommendations have a stronger focus on climate change resilience and mitigation efforts and recognize additional climate risks and vulnerabilities in our community. The updated chapter will also incorporate language and recommended actions from the County's ongoing Stream Health Initiative.

Protecting and restoring our natural environment supports climate action. In the County's 2018 Greenhouse Gas Inventory, the County used a new tool from ICLEI to estimate the effect of forests and trees throughout the county on greenhouse gases - particularly carbon dioxide. The analysis revealed that, on balance, forests in Albemarle County sequester significant amounts of carbon dioxide (estimated to be 945,732 tCO2e per year on average[1]) – providing a local and global benefit. The magnitude of

[1] tCO2e is tonnes of carbon dioxide equivalent, a standard unit of counting greenhouse gas emissions

the sequestration potential of local forests, trees, and other ecosystems emphasizes the importance of protecting and sustainably managing these resources—to preserve their sequestration potential, to prevent large amounts of unnecessary emissions from forest loss, and for the many other benefits of healthy local forests. Tree coverage also improves air quality and helps cool surrounding areas, which is especially important in areas with more pervious surfaces (e.g. parking lots and rooftops) where the 'urban heat island' effect can be felt.

Access to our natural environment should be equitably distributed throughout the county, including through parks, trails, and educational opportunities. Identifying gaps in access to our parks and natural systems and where community members may be most vulnerable to the effects of climate change are important initial steps for implementing the recommendations in this chapter and related sections of the Comprehensive Plan, including Parks and Recreation.

Some streams in Albemarle County experience serious erosion and sedimentation, harming the habitat and health of aquatic organisms and in some cases putting infrastructure at risk. Since 2011, the County has used stream and wetland restoration techniques to help reduce erosion of streambanks, increase storage and infiltration of floodwaters in floodplains, and ultimately reduce the smothering of habitat by excessive silt, sand, and clay. The Future Biscuit Run Park (above) is slated for stream restoration activities.

The protection and restoration of our natural environment is also strongly tied to Land Use and Transportation, including how we lay out our communities. Compact and concentrated development takes up less space than larger lot and sprawling development, preserving more natural areas. For example, a small to medium 'multiplex' building with multiple housing units can fit on the same amount of land as one single-family detached home with a one-acre yard.

It should be noted that this chapter name has been changed from 'Natural Resources' in the 2015 Plan to 'Environmental Stewardship' in AC44. This change is intended to emphasize the importance of protecting and restoring our natural environment while recognizing its many benefits and its broader importance, rather than a series of 'resources' to be used.

Draft Goals and Objectives

These draft Goals and Objectives were developed based on input from community members, County staff and partner agencies, the Planning Commission, and the Board of Supervisors, the AC44 Framework for an Equitable and Resilient Community, best practices, and the current Comp Plan. They will inform the Action Steps that will be developed in Phase 3.

Goal 1: Albemarle County will undertake robust local climate action by implementing the County's Climate Action Plan (2020) and future updates to meet the Board of Supervisors' targets to reduce community greenhouse gas emissions by 45% from 2008 levels by 2030, achieve zero net emissions by 2050, and bring multiple benefits to the community and environment.

Objective 1.1: Increase the use of walking, cycling, transit, telecommuting, and electric vehicles in order to improve quality of life and health outcomes and to reduce transportation emissions in 2030 by at least 37% from 2008 levels.

Objective 1.2: Increase clean energy generation, electrification, and energy efficiency in order to reduce energy costs for households and businesses and to reduce stationary energy emissions by at least 83% in 2030 from 2008 levels.

Objective 1.3: Restore forests and soils to increase sequestration while reducing forest conversion and lowering agricultural emissions to enhance local environmental health and reduce net Agriculture, Forestry, and Other Land Uses (AFOLU) emissions in 2030 by at least 25% from 2008 levels.

Objective 1.4: Divert organic materials from landfills in order to enhance a local circular economy, reduce pollution, and reduce waste emissions by at least 50% in 2030 from 2008 levels.

Goal 2: Albemarle County will have communities, properties, public facilities, and natural systems that are resilient to natural hazards and the impacts of climate change, and will support residents in protecting themselves, their properties, and local ecosystems from damage that can be prevented when natural hazards occur.

Objective 2.1: Prepare and implement the Climate Adaptation and Resilience Plan to fill gaps in community services and infrastructure to ensure equitable resilience for everyone in our community and to incorporate regional hazard mitigation plans, relevant strategies from the County's Climate Action Plan (2020), and FEMA's Threat and Hazard Identification and Risk Assessment (THIRA) and Stakeholder Preparedness Review (SPR).

Objective 2.2: Through nature-based solutions, infrastructure improvements, mutual aid networks, and regulations that account for future floodplain growth and more intense storms, limit the adverse impacts of severe precipitation, flooding, and debris flows on the community compared to the predictions in the County's Climate Vulnerability and Risk Assessment (2022).

Objective 2.3: Through green infrastructure and facilities improvements, limit the adverse impacts of extreme heat on the community compared to the predictions in the County's Climate Vulnerability and Risk Assessment (2022).

Objective 2.4: Through water supply planning and equitable water restriction policies, increase community preparedness for withstanding a major drought with as few adverse impacts as possible.

Objective 2.5: Through green infrastructure, public facilities, and improved public communications, increase community preparedness for local adverse health impacts of wildfire smoke.

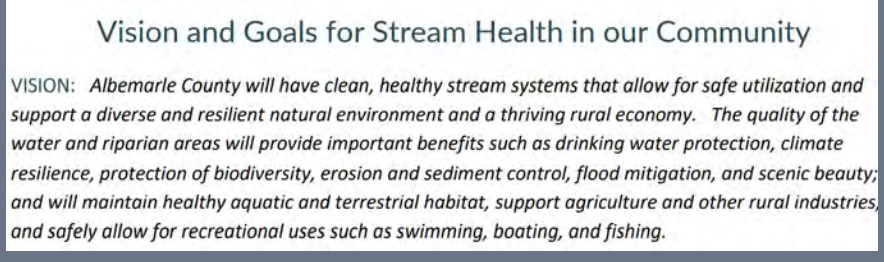
Objective 2.6: Prepare for and achieve greater community awareness about larger disease vectors to prevent illness and achieve greater ecosystem resilience to invasive pests.

Goal 3: Albemarle County will have natural waters – including rivers, streams, wetlands, and groundwater – and riparian areas that are healthy, plentiful, diverse, and resilient and are able to provide the community with many benefits.

Objective 3.1: Enhance protections and advance restoration practices for wetlands, streams, floodplains, and forested riparian buffers.

Objective 3.2: Protect natural waters, stream channels, and riparian areas from unmanaged stormwater and other sources of pollution.

Objective 3.3: Protect the quality and quantity of groundwater supplies throughout the county.



Vision Statement for the County's Stream Health Initiative. Relevant recommendations from the Stream Health Initiative are being incorporated into updated Comp Plan recommendations.

Goal 4: Albemarle County will achieve better local biological diversity, ecological integrity, and ecosystem resilience, including by implementing the Biodiversity Action Plan.

Objective 4.1: Protect and improve the network of native habitat blocks in the county, including forests, rock barrens, grasslands, and wetlands. The basis of this network is a pattern of large, well-connected forest blocks (with significant interior-forest area) that includes other types of native habitat patches.

Objective 4.2: Conserve and restore forested habitat corridors and riparian buffers in the county, and remove barriers to wildlife movement, to improve habitat connectivity and to provide resilience for ecosystems and species affected by climate change.

Objective 4.3: Protect and restore the quality and connectivity of river and stream habitats, and of wetlands, in the county. Restore more natural floodplain topography for both habitat improvement and flood-control benefits.

Objective 4.4: Use land conservation tools to direct development away from priority areas identified in the Biodiversity Action Plan and from the Mountain Protection Areas, and to require appropriate management of important habitat areas that are protected by conservation easements.

Objective 4.5: Increase native plant species and remove invasive species on County-owned properties, and support adoption of these actions on private land.

Objective 4.6: Increase the County's capacity to effectively protect biodiversity by updating the Biodiversity Action Plan to incorporate more current information; to provide a more specific map of priority habitat patches and corridors for protection; and to focus on prioritized actions for protection and restoration of landscape patterns that support and improve native biodiversity. The plan update should develop indicator measures for tracking the state of biodiversity in the County.

Goal 5: Albemarle County will move towards a sustainable system where products, materials, and resources are continuously reused, refurbished, and recycled to extend their lifespan and reduce waste.

Objective 5.1: Expand the presence of industries that allow for rethinking and redesigning materials used in manufacturing and production.

Objective 5.2: Reduce the unnecessary consumption of materials and products, particularly single-use products.

Objective 5.3: Increase the amount and types of products that are maintained and reused.

Objective 5.4: Reduce the amount of material being landfilled by diverting recyclable materials from the waste stream.

Objective 5.5: Reduce the amount of food waste and yard trimmings being landfilled by diverting from the waste stream.

The 'Waste Management Hierarchy'. The management strategies are ranked in order of most to least environmentally preferred.

Source: EPA

Objective 5.6: Continuously improve waste management through planning, coordination, engagement, and using best practices with an equitable distribution of costs and equitable access for all community members.

Phase 2 Community Input Themes

The following summary highlights the major themes from community engagement heard to date during AC44 Phase 2. These are organized by the chapter's Goals. It should be noted that Plan recommendations for tree coverage and tree stewardship will primarily be in the Land Use section of the updated Plan.

Climate Action

- Provide support and incentives for green and environmentally friendly businesses.
- Support solar and renewable energy, including utility scale solar and rooftop solar.
- Support sustainable agriculture and forestry practices, local food systems, and community gardens to help mitigate climate impacts.

Community Resilience

- When asked the question 'How would you prioritize the following ways to protect natural resources to improve our community's resilience to climate change?', the top three answers (in order of priority) were:
    - » Restore degraded streams and wetlands to improve habitat and flood resiliency.
    - » Reduce stormwater runoff and pollution into waterways through more rain gardens, green roofs, pervious pavement, bioswales, and other green infrastructure.
    - » Increase the use of land conservation tools (e.g. conservation easements) to prevent habitat fragmentation and development in natural areas and on agricultural lands.
- Disaster preparedness is essential, including preparing for power outages.
- Protect against flooding, including with improved stormwater management. There is concern about potential future flooding impacts.
- Protect against heat impacts, drought, and forest fires.
- Protect and enhance tree coverage by retaining existing trees (including through incentives), supporting tree replacement, and ensuring trees to do not conflict with utilities
- Parking lots should include tree coverage to provide shade.
- Community resilience hubs could provide spaces for community gathering and emergency preparedness and response. Top priorities for these hubs are community centers, food access, senior and youth programming, and emergency shelters.

Healthy and Resilient Waterways

- Protect and restore waterways, water quality, riparian buffers, and wetland habitats.
- Improve stormwater management practices to protect waterways.
- Use nature-based solutions, including the riparian buffer overlay district through the Stream Health Initiative.
- Ensure the county has an adequate drinking water supply, especially with increasing risks from climate change such as heat and droughts.

Biodiversity and Ecoystem Resilience

- Have stronger protections for local habitats and native species, including mountains and ridge tops, old growth forests, unique local habitats, aquatic habitats, open space, wildlife corridors, pollinators, and natural carbon sinks.
- Prioritize protection of the habitats and species identified in the county's Biodiversity Action Plan.
- Protect habitats and natural resources in the Development Areas, not just in the Rural Area.
- Encourage community members to practice environmental stewardship.
- Preserve more natural and green spaces in recreational areas, in addition to having buildings and designated recreation fields.
- Preserve dark skies, including through improved lighting requirements.
- Protect habitats and natural areas through land conservation.
- Remove invasive species and encourage/require the use of native plants.

Waste Management and Recycling

- Encourage waste reduction and improve waste management, including by providing incentives, through education initiatives, and by expanding recycling programs.

Planning Toolkits

The following community input was shared during engagement on the planning toolkits:

- Avoid environmentally sensitive areas and protect natural resources by:
    - » Requiring developers to minimize clear cut, preserve big old trees, plant native species, and replace tree canopy.
    - » Protecting steep slopes, mountain resources, and scenic views.
    - » Protecting the conservation focus areas in the Biodiversity Action Plan and wildlife corridors.
    - » Considering the existing use of land in any potential future Development Areas expansion areas. For example, land that has already been cleared for agriculture or grazing or views is less important to preserve compared with mature wooded areas.
- Protect water resources and water quality by:
    - » Avoiding development in water supply watersheds, as water quality is already an issue, and more development increases impervious surface and runoff.
    - » Protecting and enhancing stream buffers.
    - » Considering impervious surface impacts on flooding and avoiding development in the floodplain.
    - » Ensuring groundwater and existing wells and septic systems are not impacted for surrounding properties if there are future changes to land use designations in areas currently designated Rural Area, such as any potential future Development Area expansion or at rural interstate interchanges.
- Protect and restore unique and local environmental features, including:
    - » Mountain and ridge tops
    - » Old growth forests and other carbon sinks
    - » Wildlife corridors
    - » Pollinators
- Activity Centers should incorporate tree coverage for shade/cooling benefits and ‘green’ stormwater management practices.

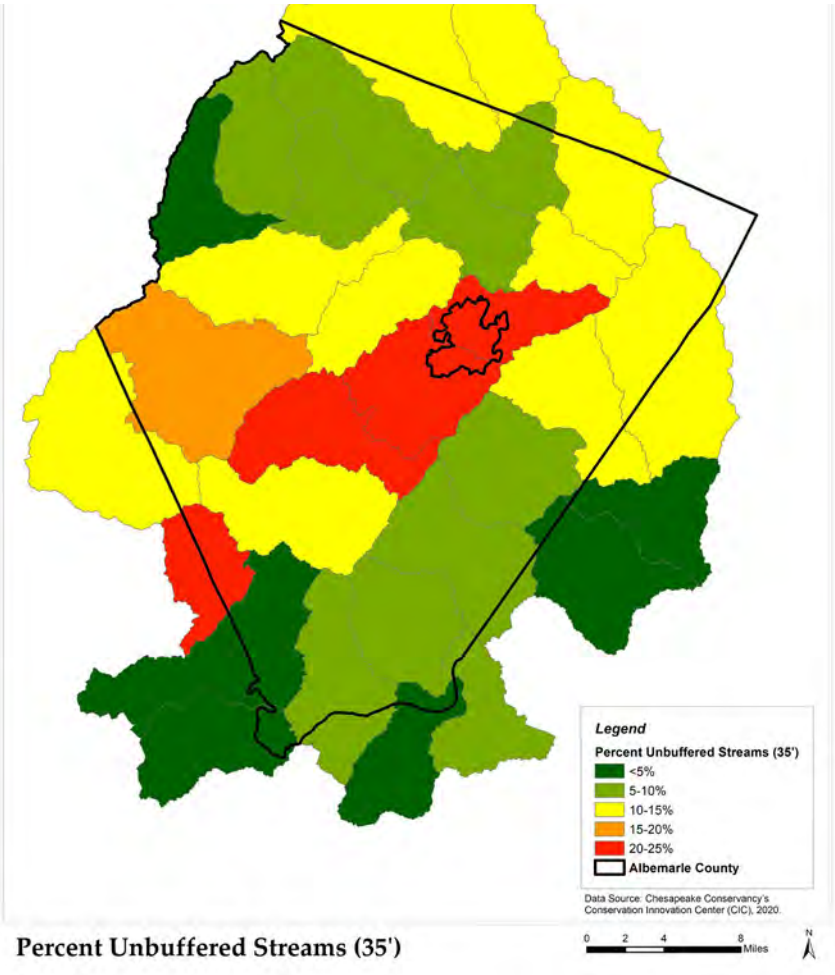
Environmental Stewardship Topic Report

The following topic report was shared at the beginning of Phase 2 to provide an overview of the major opportunities and challenges for Environmental Stewardship. These key issues and supporting data and trends were used to inform updated Comprehensive Plan Goals and Objectives, along with input from community members.

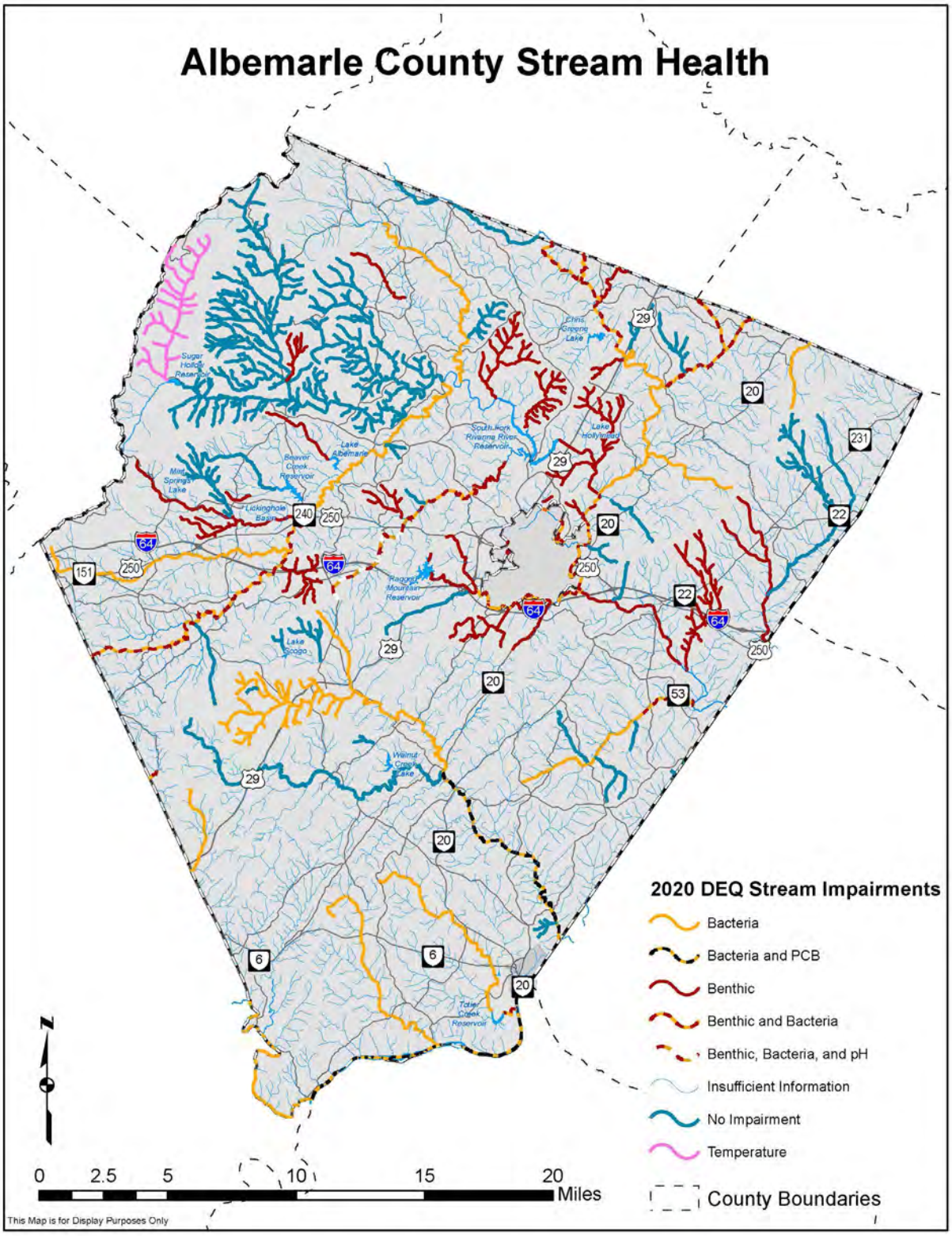
Water Resources

Clean water is critical both for human use and for healthy ecosystems. The 2015 Comprehensive Plan and the Biodiversity Action Plan (adopted in 2018) both prioritize water quality protection.

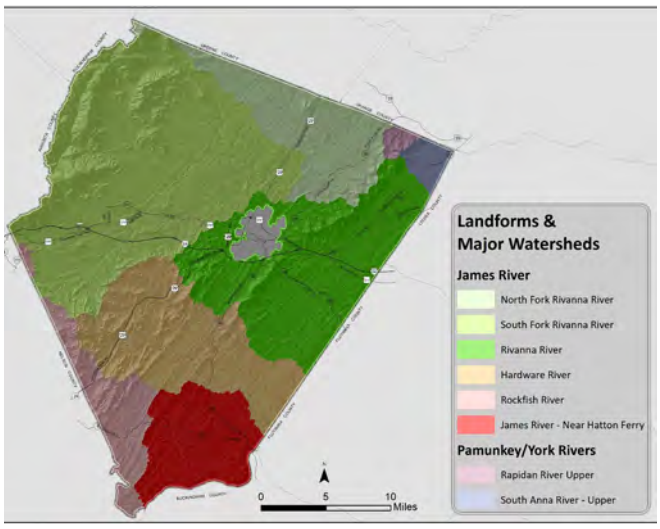
Contributing factors to water pollution include sedimentation from earth disturbance and erosion, bacteria from human and animal waste, and chemical contamination. In addition, waterways can be impacted by sedimentation and bank erosion caused by faster runoff from hard surfaces, and by increased runoff and lost filtration where vegetated buffers have been removed.



County stream buffer evaluation: warm colors = higher percentage of unbuffered streams (per 2013 aerial imagery). Source: Chesapeake Conservancy



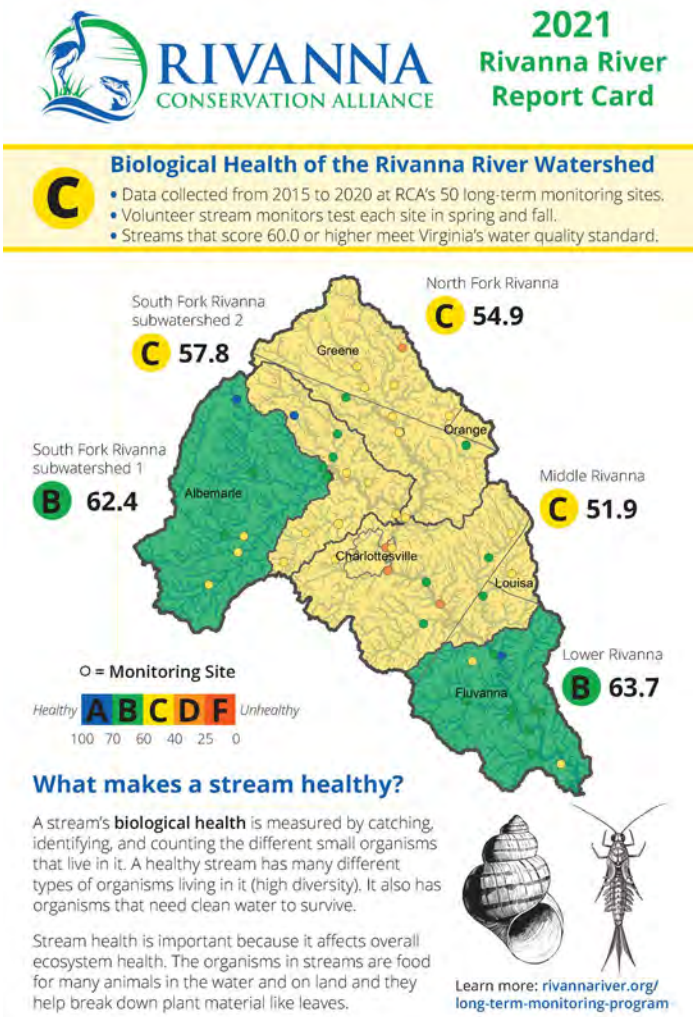
Albemarle County streams evaluation: VA Dept. of Environmental Quality (DEQ), 2020. Many streams are impaired by excessive bacteria and/or poor benthic conditions (for aquatic organisms).



Albemarle County Watersheds

Existing programs for protecting water include the Virginia Stormwater Management Program (VSMP), which addresses erosion, sedimentation, and runoff from land development; the County's Water Protection Ordinance (WPO), which addresses erosion, vegetated stream buffers, and illicit discharges and dumping; and the County's Municipal Separate Storm Sewer System (MS4) program to minimize pollutants discharging from developed areas into State waters or through storm sewer systems. Also, several organizations include water protection measures in conservation easements that protect rural land from development.

Stream health can be evaluated in many ways. One method is to survey and count the species of small organisms living on stream bottoms (benthic macro-invertebrates). Evaluations performed 2019-2021 by the Rivanna Conservation Alliance showed that 82% of stream segments sampled in the Rivanna River watershed failed to meet state standards for aquatic life. Monitoring of bacterial levels in streams can measure levels of contamination, which often rise after major storm events carry human and animal waste into streams.



At right: Rivanna Conservation Alliance, 2021 Report Card. Stream health scores measured by sampling aquatic organisms (over a 5-year period)

Biodiversity

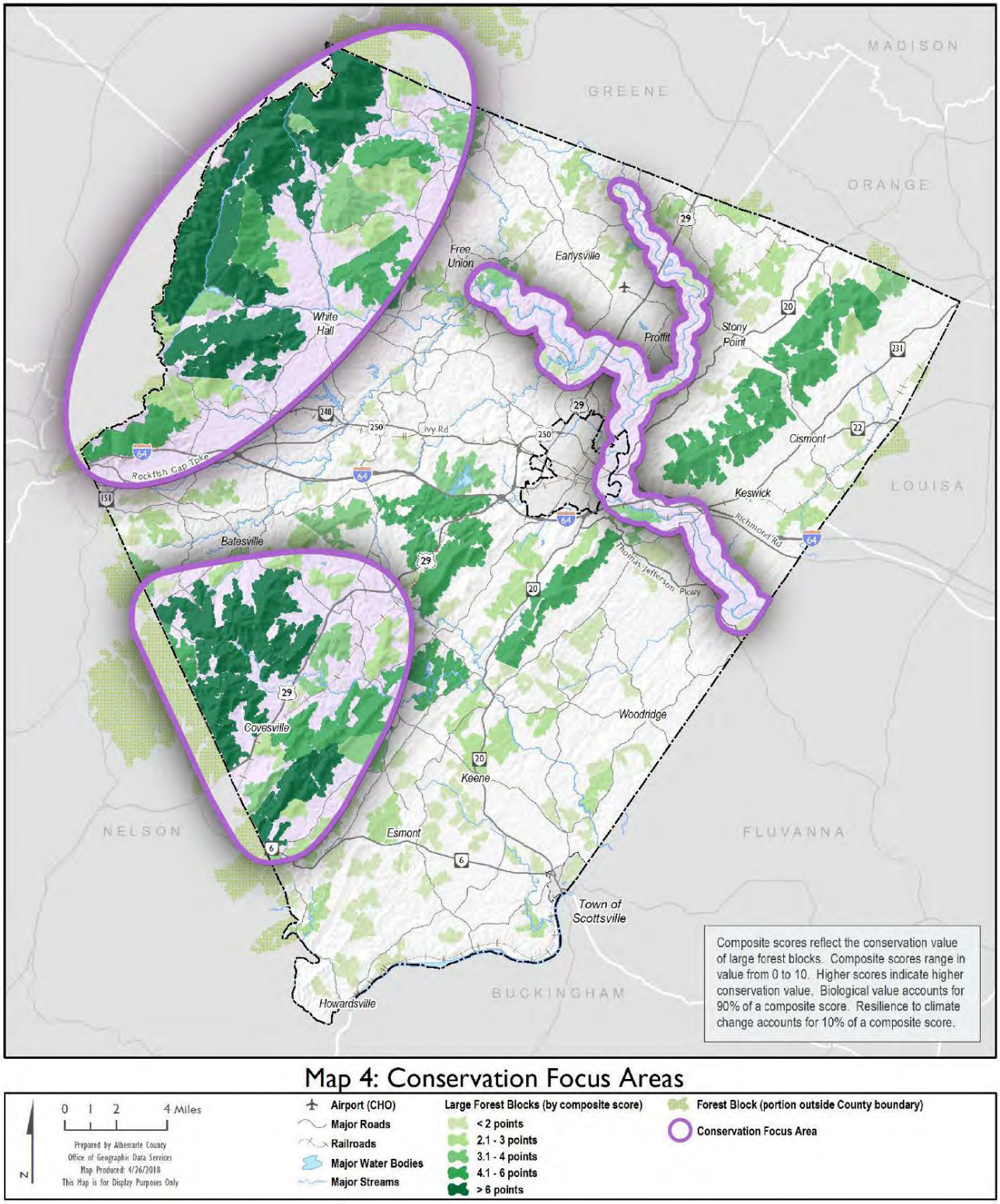
Biodiversity, a contraction of "biological diversity", has been defined as "the diversity of life in all its forms, and at all levels of organization" (Hunter 1996, 19). This includes the variety of animals, plants, fungi, and microorganisms found on our planet. Levels of organization include the genetic, population, species, and ecosystem. Living systems at all levels require diverse interacting elements.

Protection of biological diversity has been among the County's Comprehensive Plan goals since 1998. Key components of biodiversity protection include preservation of large forest habitat blocks and the habitat corridors that connect them (including stream corridors); protecting known important habitat sites; protecting water qualify for aquatic life; and controlling the spread of non-native invasive species.

While a variety of wildlife habitats are found throughout the county, the County's Biodiversity Action Plan, adopted in 2018, identifies three particularly important areas of the county for biodiversity protection. These include:

- **Northwestern Albemarle County** – This is an area with significant large forest-habitat patches, along the eastern boundary of Shenandoah National Park.
- **Southwestern Mountains** – This is an area of relatively steep terrain with large blocks of native hardwood forest and important habitat sites, located around Heards Mountain and Green Mountain.
- **The Rivanna River Corridor** – This riparian corridor connects important aquatic habitat and includes riparian (riverside) forests that provide connections between other habitat blocks. The Rivanna is also an important recreational resource where residents can encounter nature.

The native landcover for much of the county is hardwood forest, and a key conservation approach is to keep large forest blocks intact, as many species are dependent on interior forest habitats for breeding and survival. Keeping and improving habitat connections between forest blocks is also important, so that wildlife populations can thrive across the region, rather than becoming isolated and eventually eliminated in small, disconnected habitats.



Map 4: Conservation Focus Areas

Conservation focus areas in Albemarle County from the Biodiversity Action Plan. Darker shades of green indicate priority protection forest blocks. The Rivanna River corridor is also included as a primary conservation zone.

Beyond the major forest blocks, the county also supports aquatic habitats, wetlands, native grasslands, rock barrens, and a variety of other habitats. The county's wide range of elevation, slope, and terrain – from steep mountainsides over 3,000 feet in elevation to wide, flat floodplains in the Piedmont – has given it a rich variety of plant communities. Sites where past land disturbances have been minimal, such as riverside bluffs that were too steep for forestry, retain a rich diversity of plant life. These pristine areas of prime habitat also support a rich diversity of animal life.

Land Cover Type	Acres
Forest (wooded areas: 1 acre +)	305,741.3
Pasture	73,949.5
Tree (wooded areas: < 1 acre)	26,751.9
Turf Grass	26585.7
Impervious	12,159.8
Cropland	8,021.3
Open Water	3,370.2
Wetlands/Other	3,121.5
Harvested	2,671.5
Scrub/Shrub	1,517.7
Barren	736.7
Total	**464,626.9**

County land cover: 2013 County GIS data

Albemarle's landscape is important for wildlife over a much wider area as well. For example, the Blue Ridge and other ridges that pass roughly north-south through the county are critical migration corridors for bird species that pass through the area on their way to breeding habitats in the northern United States and Canada, and wintering habitats in Central and South America. The Blue Ridge in particular is a famed migration route for eagles, hawks, and falcons. Conservation of mountain forests support conservation of these wide-ranging species, as well as local, non-migratory wildlife.

Phase 1 Engagement – Recap

Community input shared during Phase 1 reflected the following challenges and opportunities for Environmental Stewardship:

- One of the most prominent themes was protection of the natural environment, especially **tree coverage protection**. Comments noted the extensive removal of trees associated with large scale construction sites, especially within Development Areas. A desire was expressed for tree replacement or new plantings following tree removal.
- The need to **improve stream buffers**, which overlaps with the need for tree protection.
- Comments indicated the desire to **mitigate the impacts of light and noise pollution**.
- The desire for **community gardens** and an interest in supporting **local food systems**.

AC44 Framework

The Framework for an Equitable and Resilient Community was developed during Phase 1 of AC44. The Framework presents a snapshot of what the county aspires to be in the year 2044, which is a community that has centered equity and resilience in its policies, plans, and actions. The Framework was developed based on input from community members, the AC44 working group, the Planning Commission and the Board of Supervisors, and by incorporating equity and climate action considerations, reviewing goals in the current Comprehensive Plan, and researching best practices. Moving forward, the Framework will be used to guide updating Plan recommendations, including Plan Goals, Objectives, and Strategies.

Relevant guidance from the **Framework for an Equitable and Resilient Community** for this chapter includes:

- The County will strive for **healthy and thriving ecosystems** with protected natural resources, such as the Rivanna River and Blue Ridge Mountains, water, wildlife, forests, and other natural resources. It will work towards protecting these resources, especially those that serve as natural carbon sinks, **increase biodiversity**, and **enhance its resilience to climate change**.
- Green and resilient designs should be incorporated into new neighborhoods, including compact, mixed-use developments with parks, trails, and energy-efficient design. Existing neighborhoods should have parks, trails, and new landscaping and **tree canopy** added to them to bring **greater access to green space and resilience to climate change** and environmental challenges.
- Natural and wild areas should be protected and there will be **wildlife habitats** with connecting **corridors** and **stream networks**.

Data Sources and References

Albemarle County Biodiversity Action Plan, Adopted 2019

James River Consortium – Riparian Buffer Benefits, 2022

Chesapeake Conservancy: James River Water Quality Improvement Program (JRWQIP) Restoration Planner: (County Stream Buffer Evaluation)

Rivanna Conservation Alliance: 2021 Rivanna River Report Card

Rivanna Conservation Alliance: Rivanna River Watershed: 2022 Stream Health Report

Virginia Department of Environmental Quality (DEQ): Stream Impairments, Albemarle County, 2020