

CHAPTER IV

ENVIRONMENT



ENVIRONMENT

The environment plays a vital role in fostering the health, safety, and quality of life of Christiansburg residents. Natural resources, clean water, streams, and open spaces contribute to the Town's character and support recreation, economic vitality, and community resilience. Effective environmental stewardship helps protect these natural resources and reduce flood risks, minimize erosion, safeguard critical infrastructure, improve water quality, and create a healthier, more resilient community.

The Town of Christiansburg is located within the Great Valley Subprovince of the Ridge and Valley Physiographic Province of the Appalachian Mountains. The area's bedrock is primarily carbonates (limestone and dolostone), with lesser amounts of siltstone, shale, and sandstone. Carbonate bedrock is typically uneven and produces karst landscapes characterized by sinkholes, caves, and rock outcroppings. These geologic conditions influence the Town's topography, drainage patterns, groundwater movement, soil characteristics, and development potential. The uneven bedrock can present challenges for site development, particularly during excavation and foundation construction, requiring careful evaluation. To help address potential soil-related issues, the Town requires the submission of shrink-swell soil testing results as part of the development review process for all new construction of principal structures to help ensure soil suitability.

Christiansburg's terrain is characterized by broad areas of gently rolling land, with slopes generally less than 15 percent, providing favorable conditions for development. Steeper slopes occur primarily along stream corridors and near portions of the Town's northern, southern, and eastern boundaries, where development may require additional engineering, erosion control, and stormwater management measures.

The Town contains a variety of natural features that influence both development opportunities and environmental protection. Incorporating environmental considerations into the land development process helps ensure that development occurs in a manner that protects natural resources while supporting a vibrant community. Features such as wetlands, floodplains, steep slopes, and karst terrain provide important ecological functions while also presenting development constraints that require careful planning and site design.

Christiansburg's streams, waterways, and watersheds are valuable natural resources. The Town is drained primarily by Slate Branch and Crab Creek, which are within the New River Basin. Town Branch and Walnut Creek are two main tributaries of Crab Creek. Other portions of the Town are drained by Wilson Creek, Den Creek, Spring Branch, Falling Branch, Smith Creek, and Elliott Creek, which are within the Roanoke River Basin. Protecting these waterways through the protection and restoration of riparian buffers helps improve water quality, reduce erosion, provide wildlife habitat, and enhance the long-term health of local watersheds. The Town encourages watershed conservation through public education, partnerships, and grant opportunities that support stream restoration, riparian buffer enhancement, and other watershed improvement initiatives.

Open spaces provide important environmental, recreational, and aesthetic benefits for Christiansburg. They provide natural areas within the community by protecting natural landscapes, supporting ecological functions, and filtering pollutants from stormwater runoff before they reach streams and waterways. Open spaces also enrich neighborhoods by providing opportunities for recreation and improving community well-being.

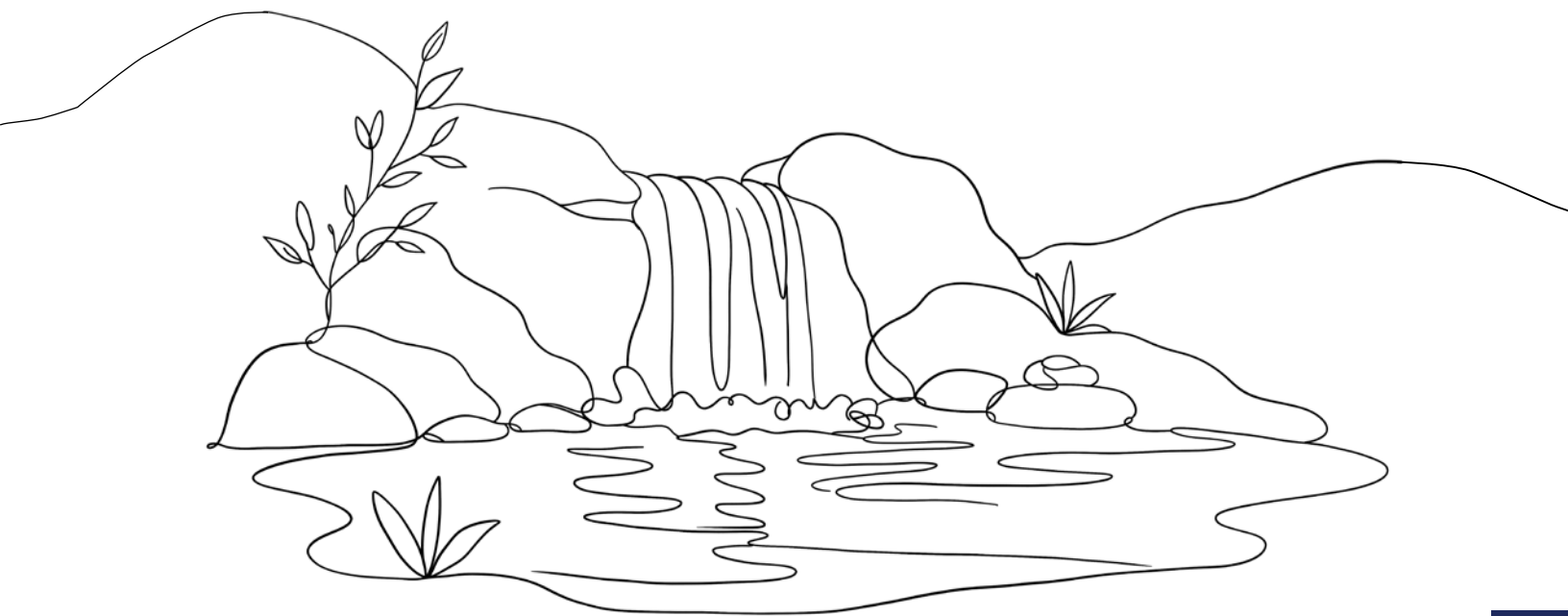


Environmental quality extends beyond the protection of natural resources. Trees, landscaping, and well-designed public spaces contribute to the Town's character and enhance the visual appearance of neighborhoods, commercial areas, and public spaces. Trees also contribute significantly to the Town's environmental health by providing shade, improving air quality, reducing stormwater runoff, supporting the urban tree canopy, and enhancing neighborhood aesthetics. Protecting air quality, minimizing excessive noise and light pollution, and protecting the Town's natural setting all contribute to the health, well-being, and quality of life of Christiansburg residents.

Promoting sustainable practices helps reduce environmental impacts and improve the long-term resilience of the community. Green infrastructure, such as rain gardens, bioswales, permeable pavement, and other natural stormwater management practices, can reduce runoff, improve water quality, and enhance the Town's natural environment. Renewable energy technologies, including appropriately sited solar energy systems and expanded electric vehicle charging infrastructure, support the Town's sustainability initiatives. Sustainable building design practices can further improve energy efficiency, conserve natural resources, and reduce long-term environmental impacts.

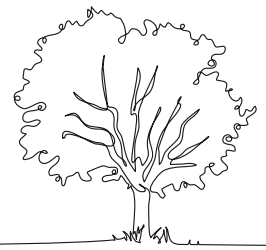
The use of native trees, shrubs, and other vegetation helps preserve local ecosystems by supporting wildlife habitat, improving biodiversity, and reducing the need for irrigation and chemical treatments. Conversely, invasive plant species can displace native vegetation, degrade natural habitats, and diminish ecological health. Through its Sustainability Committee, the Town promotes environmental awareness and encourages sustainable practices such as native landscaping, invasive species management, renewable energy, and electric vehicle charging infrastructure. These efforts are supported through public education, land development requirements, park management, community partnerships, and other initiatives that advance environmental stewardship.

Protecting environmental resources is a shared responsibility among residents, businesses, developers, local government, regional organizations, educational institutions, and state and federal agencies. Public education, collaboration, sound development practices, and environmental stewardship all play important roles in protecting Christiansburg's natural resources and environmental quality.



ENVIRONMENT

Goals, Objectives, & Policies:



Goal E.1: *Promote a healthy, resilient, and visually appealing environment by protecting natural resources, improving water and air quality, expanding green infrastructure and open space, and guiding development to minimize pollution, erosion, and stormwater impacts.*

Environment

Objective E.1.1:

Advance environmental sustainability and resilience through protection of natural assets, green infrastructure and renewable energy.

Policy E.1.1.1:

Limit clear-cutting and unnecessary tree removal during development by encouraging the retention of existing trees and wooded lots.

Policy E.1.1.2:

Protect trees along public streets and trails and exploring the integration of tree preservation and planting requirements into the landscaping standards.

Policy E.1.1.3:

Protect and enhance community's tree canopy through education, conservation efforts and appropriate regulations.

Policy E.1.1.4:

Promote the use of native plant species and implement strategies to eradicate invasive vegetation.

Policy E.1.1.5:

Increase solar energy use in municipal facilities and support residential adoption through incentives and simplified permitting processes.

Policy E.1.1.6:

Expand access to electric vehicle charging stations in key locations and position the town as supportive of electric vehicles.

Policy E.1.1.7:

Encourage developments to pursue LEED or other green certifications by exploring incentives and showcasing exemplary projects.

Policy E.1.1.8:

Encourage environmentally sound construction practices, including retrofitting existing buildings.

Policy E.1.1.9:

Require identification and mapping of critical environmental features such as floodplains, karst features and wetlands in development plans.

Policy E.1.1.10:

Utilize existing sinkhole data and public input to identify karst features across the Town.

Policy E.1.1.11:

For parcels with known karst topography, encourage the use of Best Management Practices (BMPs) during development to minimize environmental and structural risks.

Policy E.1.1.12:

Discourage intensive development on parcels predominantly characterized by karst terrain, while allowing site-specific flexibility to support responsible land use.

Policy E.1.1.13:

Encourage site designs that avoid altering natural topography in ways that create or intensify steep slopes.

Policy E.1.1.14:

Allow development on steep slopes only when engineered solutions can ensure long-term stability and prevent erosion and reduce negative environmental impacts.

Policy E.1.1.15:

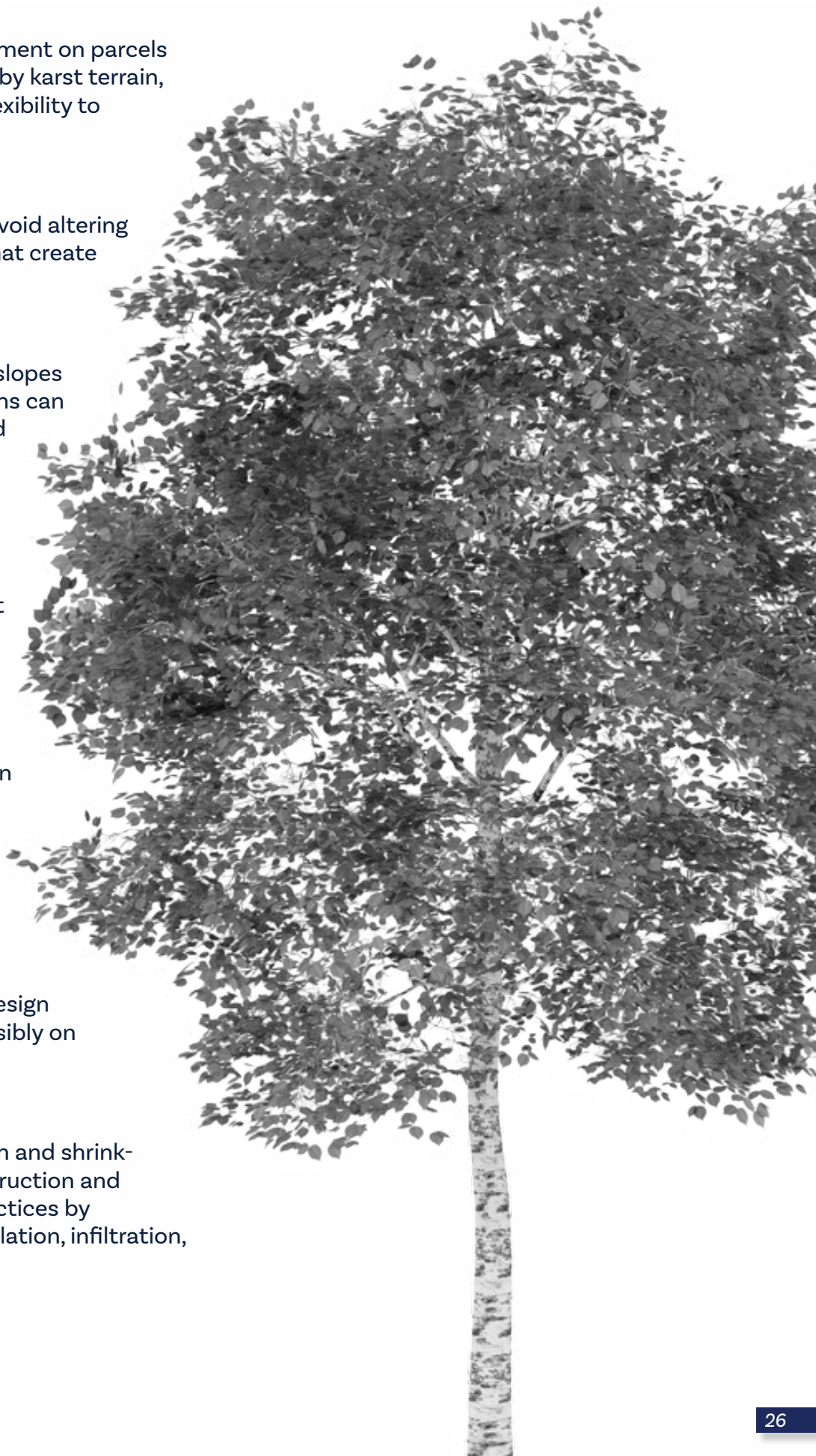
Ensure effective management of drainage, erosion, and sedimentation during and after construction on steep slopes through site inspections and long-term post construction stabilization requirements.

Policy E.1.1.16:

Facilitate collaborations with local, regional, state, and academic programs to provide property owners with resources on effective design strategies for building responsibly on steep sites.

Policy E.1.1.17:

Require soil type identification and shrink-swell testing for all new construction and ensure safe development practices by enforcing standards for percolation, infiltration, and runoff.



Policy E.1.1.18:

Support implementation of Best Management Practices (BMPs) to reduce stormwater runoff and improve water quality by pursuing funding for outreach programs, assisting property owners' implementation, and encouraging the use of rain barrels, rain gardens, permeable pavement, green roofs, impervious surface removal, and urban tree canopy expansion.

Policy E.1.1.19:

Strengthen enforcement to prevent illicit discharges in the stormwater system.

Policy E.1.1.20:

Meet individual Waste Load Allocations (WLAs) for each watershed in accordance with applicable Total Maximum Daily Loads (TMDLs) and integrate these allocations into TMDL Action Plans as required under the Town's MS4 permit to guide water quality improvements.

Policy E.1.1.21:

Reduce stormwater runoff and prevent flooding by requiring infrastructure upgrades improvements at existing sites undergoing redevelopment, rezoning, or major improvements.

Policy E.1.1.22:

Promote the use of green infrastructure Best Management Practices (BMPs) throughout the land development process. Encourage on-site water infiltration systems that utilize natural vegetation and soil filtration to manage runoff, enhance groundwater recharge and improve water quality.

Policy E.1.1.23:

Promote stream restoration projects and the use of native plantings on critical slopes to reduce erosion, enhance infiltration, and protect water quality across watersheds.

Policy E.1.1.24:

Promote the use of reclaimed water and greywater reuse systems in new developments, where feasible, for irrigation and other non-potable purposes in order to conserve potable water resources.

Policy E.1.1.25:

Continue to restrict improper development in the floodplain through the enforcement of the Floodplain Ordinance.

Policy E.1.1.26:

Protect wetlands by ensuring new developments comply with applicable state and federal wetlands regulations, and encourage them to avoid impacts and incorporate best management practices to preserve wetland functions.

Policy E.1.1.27:

Identify environmentally sensitive areas within forested and open lands and promote public education on recognizing and protecting these environments.

Policy E.1.1.28:

Encourage residents and developers to avoid disturbance and consult with appropriate state or federal agencies when planning activities near environmentally sensitive areas such as wetlands, floodplains and endangered species habitats.



Policy E.1.1.29:

Require dedicated open space in new developments and land use changes where appropriate.

Policy E.1.1.30:

Encourage adding open space in neighborhoods that currently lack such spaces.

Policy E.1.1.31:

Promote the preservation of air quality, reduction of noise and light pollution, and control of litter to protect the environment and maintain community well-being.

Policy E.1.1.32:

Encourage the use of fixtures certified by the International Dark-Sky Association and install low-glare, energy-efficient streetlights in public projects.

Policy E.1.1.33:

Encourage collaboration with operators of high-impact transportation and commercial facilities to reduce noise through measures such as quiet zones, operational adjustments, or physical sound barriers, particularly in proximity to residential neighborhoods, schools, and other sensitive land uses.

