

CHAPTER 7

HISTORIC AND NATURAL RESOURCES

GOAL

To recognize the significance of our historic, natural, and cultural resources and to be good stewards of these valuable commodities.

CHAPTER 7 HISTORIC AND NATURAL RESOURCES

Historic and natural resources contribute to the quality of life enjoyed by County residents. These resources provide amenities, lend themselves to attractive recreation facilities, draw visitors and tourists, and enhance the overall environment of the County. This Plan provides guidance for preserving and incorporating these assets in an effort to sustain the unique sense of place, history, and environmental quality that define Goochland County.

The County's Strategic Plan encourages, "Balanced development that contributes to the welfare of the community and preserves its rural character." The strategic plan's objectives and the strategies include promotion and support of the County's historic resources.

Historic and natural resources should be maintained and protected when appropriate. Evaluating impacts to these resources is critical when considering land use decisions, as their preservation and protection generally enhances development. The County's long-term economic prosperity and property values will be enriched by promoting development practices which require stewardship of the County's resources.

The natural and historic resources maps should be used in tandem with other land use planning tools.

The Historic and Cultural Resources Map identifies properties on the National Register of Historic Places, historic sites, and historic mines. The Conservation Lands Map identifies specific lands that are already protected or are in need of protection and includes areas with conservation easements, surface water bodies, wetlands, steep slopes (over 25% gradient), floodplains, and Natural Heritage Resources (unique vegetation and wildlife habitats).

HISTORIC RESOURCES

Brief History of the County

Goochland County was formed in May 1728 from "upper Henrico County" by proclamation of Sir William Gooch from Williamsburg and aptly named after him. Sir William Gooch served as Lieutenant Governor of Virginia from September 8, 1727 to June 20, 1749. A native Englishman and officer in the British Army, Gooch was proclaimed to be the most successful and efficient executive in the history of the colony.

At the time of formation, Goochland included all lands west of Tuckahoe Creek to the Blue Ridge Mountains on both sides of the James River. In 1744, Albemarle County was carved from the western part of the County, and in 1748, Powhatan County was created south of the river.

Prior to the European settlement, Goochland was occupied by the Monacan Indians who lived in brush huts. In 1700, King William of England was persuaded to give land tax free to French Huguenot refugees who

had fled religious persecution. William Byrd dedicated 20,000 acres of his land south of the James (present day Powhatan County) for the settlement known as Manakintown.

Several prominent people were either born in Goochland County or spent part of their lives in the County. Thomas Jefferson was born on April 17, 1743 at Shadwell, then within the boundaries of the County. Thomas Mann Randolph, born at Tuckahoe in 1768, and James Pleasants, born at Contention in 1769, became Governors of Virginia. The County furnished a native son for the cabinet of each of the opposing governments during the Civil War - Edward Bates in the Cabinet of Abraham Lincoln and James A. Seddon in the Confederate Cabinet of Jefferson Davis.

In addition to serving as the homestead for several prominent Americans, Goochland experienced two significant historical events during the Revolutionary and Civil Wars. In June 1781, practically the entire army of Lord Cornwallis was within the boundaries of the County as they raided Elk Hill and the Cottage at Rock Castle. General Marquis de Lafayette's forces were in Goochland at this time in an attempt to engage the army of Cornwallis. On March 1, 1864, Colonel Ulrich Dahlgren and his raiders traveled through the County during his march on the Confederate Capital of Richmond.

Goochland County was a frontier area which provided an ideal setting for development of new farmland to produce tobacco. Large land grants and plantation homes were established along the James River. The

Goochland Historical Society has detailed records available on 408 original land grants: including the acreage and location on current County maps with dates and names of settlers. A few of the mid-to-late eighteenth-century dwellings built by the wealthiest landowners exist today.

William Randolph, a wealthy landowner from eastern Henrico County, patented a large tract of land in what would become Goochland County at Tuckahoe Creek. The property, called Tuckahoe, was expanded by his son, Thomas, who was living there in 1723. The house was later expanded to become one of Virginia's best-known and most ornate plantation seats. Thomas Jefferson spent his childhood years at Tuckahoe where he received his early education in a school house that remains today.

In 1730, the first courthouse and jail were built just above Atkinson's Ferry near present-day Maidens. In 1763, the frame courthouse grew inadequate, both in form and location, and a new courthouse was built in 1763 a short distance away at a place called Beaverdam. The need for the courthouse to be near Atkinson's Ferry was eliminated 1748 when Cumberland County was carved out of Goochland.

The present Goochland courthouse was built in 1827 by Dabney Cosby, a brick mason trained by Thomas Jefferson, and Valentine Parrish, a builder from Cumberland County. Cosby had completed two buildings for the University of Virginia under Jefferson's guidance before coming to Goochland. The old stone jail was built in 1833 during the

construction of the canal, and served as the headquarters of the historical society. There was originally no clerk's office – the clerk kept records in a building on his own property. The small, brick Clerk's Office was added to the west of the courthouse in 1847. A second brick office was built nearby in 1906, and a larger brick office building was added to the east side in 1955.

National Register of Historic Places

The National Register of Historic Places is the official list of the Nation's historic places worthy of preservation. Goochland County has 23 sites listed on the National Register of Historic Places. Preservation of the sites is of the utmost importance in maintaining the historic character of the County. The County's Strategic Plan encourages the promotion of our historic sites. The **Historic and Cultural Resources Map** shows the location of these areas and other sites of historical significance in the County.



Goochland Courthouse

National Register of Historic Places

Name	DHR #	Map #
Bolling Hall	037-002	1
Ben Dover	037-0078	14
Bolling Island Plantation	037-0003	2
Brightly	037-0004	3
Byrd Presbyterian Church	037-0016	5
Dover Slave Quarter Complex (Brookview Farm)	037-5012	20
Elk Hill (Harrison's)	037-0009	4
First Union School	037-5016	22
Goochland County Courthouse Square	037-0136	17
Howard's Neck	037-0100	15
Jackson Blacksmith Shop	037-0163	18
Lockkeeper's House	037-0105	16
Mount Bernard	037-0038	10
Oak Grove	037-0076	23
Powell's Tavern (Double House)	037-0023	6
Rochambeau Farm	037-0069	12
Rock Castle; Queen Anne Cottage	037-0054	11
Second Union Colored School	037-5051	21
Springdale	037-0073	13
Tanglewood Ordinary	037-5010	19
Tinsleyville Tavern (Tinsley Tavern)	037-0032	7
Tuckahoe	037-0033	8
Woodlawn (Taylor Home)	037-0035	9

Source: Virginia Department of Historic Resources (DHR), 2014.

NATURAL RESOURCES

Goochland's abundance of forested, agricultural, and riverfront land supports diverse wildlife habitats, provides opportunities for recreation, enhances the local economy, and helps define the County's rural character. Residents take pride in the County's existing natural resources and want to preserve them for future generations. With increasing development pressure, a greater focus on environmental planning is critical to minimize and prevent impacts to water, land, and air resources.

Development is associated with altering the natural landscape. Farmland, forests, wetlands, meadows, etc., are replaced with roof tops, roads, and parking lots. These hardened surfaces are impermeable to rainfall and are collectively known as impervious cover. Impervious cover has a profound impact on the quality of aquatic resources. Research has demonstrated that as impervious cover in upstream watersheds exceeds 10%, the quality of streams, lakes, and wetlands decline due to the stormwater runoff. Minimizing these impacts of development on the County's natural resources can be addressed through a number of design techniques such as: reducing impervious cover where unnecessary, treating stormwater runoff at its origin, reducing parking space requirements, encouraging sidewalk construction on only one side of the street, incorporating grass swales into parking lots, etc.

By concentrating growth and higher density development within the villages, the County can help protect its forest and agricultural resources. Current zoning options, such as the Rural Preservation District, promote clustered development and preservation of open space. Conservation easements are another opportunity to protect land.

It is important to balance preservation of the County's natural resources and environmental quality with new development. In order to protect our natural resources, it is important to understand environmental features and how they impact the County. The following is a summary of environmental features impacting the County.

Surface Water

The James River accounts for more than 40 miles of the County's southern border. The James River is the largest watershed in Virginia encompassing 10,236 square miles and is the longest river in the nation contained in a single state - all 340 miles flowing within Virginia from the Allegheny Mountains to the Chesapeake Bay. The river flows toward the southeast and its tributaries flow toward the south and southeast.

The river is divided up into three watershed regions: the upper, middle, and lower. Goochland is located within the Middle James River region which extends west to Amherst County, north to Greene County, south to Prince Edward County, and east to Charles City County. The majority of Goochland County is drained by the James River and its tributaries. At the

County level, the Middle James River watershed can be broken into smaller sub-watersheds made up of streams and adjacent land draining into the streams. The **Rivers and Streams Map** provides individual stream locations.

Eastern portions of the County are drained by Tuckahoe, Dover, and Genito Creeks. The Tuckahoe Creek watershed is split almost in half between Goochland and Henrico County. James River/Little River (Dover and Genito Creeks) watershed includes Manakin Village and parts of Oilville. Land uses within this watershed are mostly agricultural and low-density subdivisions.

Central Goochland is drained by the Beaverdam Creek/Courthouse Creek watershed and the James River/Mohawk Creek (Powhatan Co.) watershed. Low-density residential and agricultural land uses make up the majority of this watershed with more dense uses located within the Goochland Courthouse area.

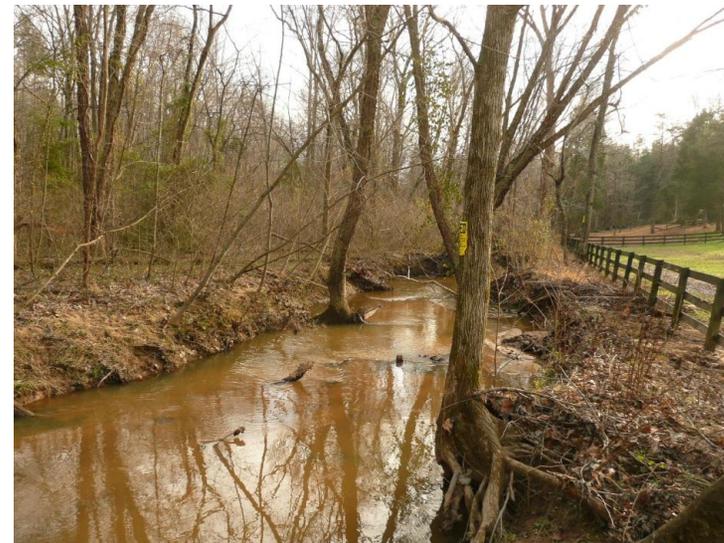
Western Goochland is drained by Byrd, Little Lickinghole, and Big Lickinghole Creeks where the land uses are predominantly agricultural, forestal, and very low density residential.

Stormwater management permits are required for land disturbance activities larger than one acre. Beginning July 1, 2015, Goochland County assumed local authority for the Stormwater Management Program (previously administered by DEQ). Detaining stormwater onsite decreases runoff into

existing channels and minimizes erosion along the channel. This is particularly important when the channel is inadequate to accommodate the runoff. Stormwater detention may also be required to address downstream flooding problems.

Impaired Streams

The Virginia Department of Environmental Quality (DEQ) monitors state waters for pollutants annually to determine if they pose a threat to human and environmental health. If pollution amounts are too high, the waters cannot support their designated uses (recreation, water supply, aquatic life) and fail to meet Virginia water quality standards. These waters are considered "impaired." Several local streams and segments of the James River exceed water quality standards and are therefore considered "impaired":



Impaired Streams

Stream	Parameter Impaired	Miles Affected
Beaverdam Creek	E. coli**	8.75
Big Lickinghole, Little Lickinghole, and White Hall Creeks	E. coli**	21.4
Big Lickinghole	Dissolved oxygen	3.34
Broad Branch	pH	2.59
	Fecal coliform**	4.92
Byrd Creek	Fecal coliform**	19.52
Courthouse Creek	E. coli**	10.32
Genito Creek	E. coli**	6.80
Little Byrd Creek	E. coli**, Benthic-macroinvertebrate	8.02
Little Creek	pH, E. coli**	0.66
Little Tuckahoe Creek	E. coli**	5.89
James River	PCB in fish tissue	201.78
	Mercury in fish tissue	4.36
Ransome Creek	Benthic-macroinvertebrate	3.36
Tarred Rat Creek	E. coli**	3.28
Tuckahoe Creek	E. coli**	7.58
Unnamed Tributary to James River	Fecal coliform**	0.41
Unnamed Tributary to Tuckahoe Creek	E. coli**	1.73
Unnamed Tributary to Tuckahoe Creek	pH	1.81

* "Miles Affected" includes total miles impaired and is not limited to Goochland County.

** Total Maximum Daily Load document has been approved or other control measures are present.

As a rule, a cleanup plan, or Total Maximum Daily Load (TMDL), must be developed to restore impaired waters. Two TMDL plans have been developed for watersheds in Goochland for bacterial (fecal coliform or E. coli) impairments.

A TMDL identifies significant sources of pollution, the pollutant contribution from each source, and necessary pollutant reductions from each source to attain and maintain water quality standards. The TMDL establishes the basis for identifying future pollution reduction levels and the actions necessary to achieve them. For example, the TMDL may attribute the bacterial contamination to fecal matter deposited from livestock, pets, human, and wildlife which is carried by stormwater into the streams and rivers. The potential for bacterial impairments is significantly increased by allowing livestock to graze within the stream or by the absence of riparian buffers to act as natural filters. The second phase of the TMDL may address the implementation of "best management practices" to reduce the bacteria contamination.

Groundwater

Geographically, most of the County depends on wells for drinking water (approximately 87% of households); therefore, the availability and quality of groundwater is an important development consideration. The diversity of the subsurface geology of the Piedmont Province results in wide variations in groundwater quality and well yields. Groundwater in the County can be found in two principal types of aquifers - surface and confined aquifers. *Surface aquifers* (not

deep enough to be protected by layers of clay) are particularly vulnerable to contamination from pollutants introduced at the surface. Bored wells tap into surface aquifers. These shallow wells are not much deeper than the water table and usually obtain water that infiltrated relatively nearby, typically less than a mile. To protect surface aquifers from contamination, the recharge area (area where groundwater flow replenishes the aquifer) around the well needs to be protected.

Most private wells in the County are drilled wells (deeper than bored wells) and draw water from the Piedmont Geologic Crystalline Bedrock Aquifer. This system is dependent on fractures for groundwater production, yield, and recharge. The size and number of fractures and faults in the bedrock which store and transmit ground water decrease with depth, so most significant water supplies are found within a few hundred feet of the surface. Drilled wells are installed more frequently because they tend to produce higher yields and don't fluctuate as greatly as bored wells. Rather than protecting the recharge area around individual wells, the entire recharge area of the aquifer should be protected.

In the past few years, regional and local drought conditions have brought water supply issues to the forefront, and resulting state legislation requires each locality or region to prepare a Water Supply Plan. The plan, completed in 2011, evaluates existing and future water supply needs for the counties of Goochland, Henrico, Powhatan, and Cumberland. The Plan indicated that there would be adequate water supply

through the time horizon of this Plan.

Floodplains

A floodplain, or flood-prone area, is land that experiences occasional or periodic flooding. The floodplain includes the *floodway*, the stream channel and adjacent land area that carries flood flows, and the *flood fringe*, areas inundated by floodwaters but which do not experience a strong current.

The 100-year floodplain is the standard recognized by the National Flood Insurance Program and the County. The 100-year floodplain delineates the level of flood water expected to be equaled or exceeded at least once in a 100-year period. These lands account for 19,896 acres (10 %) of the County.

Floodplains act as a natural reservoir for excess water during storms by providing storage capacity for excess water until downstream waterways can handle the load. Holding the excess water during flooding reduces the dangers downstream to life and property. If floodplain areas are developed or their natural vegetative cover removed, natural flood controls are altered or eliminated.

The County's zoning ordinance allows only limited uses within the floodplain. Measures to protect floodplains protect property owners from flooding events and also discourage degradation of natural riparian buffers.

Wetlands

Wetlands are an integral part of the water cycle;

filtering the water supply, preventing soil erosion, and absorbing floodwaters. They are most commonly situated within floodplains along rivers and streams, in isolated depressions surrounded by dry land, along the margins of lakes and ponds, and in other low-lying areas where the groundwater intercepts the soil surface or where precipitation sufficiently saturates the soil. Wetlands are identified by unique soils (hydric soils), by plants adapted to life in wet environments (hydrophilic vegetation), and by the presence of water (hydrology).

The ecological value of wetlands has become understood in recent years, and the loss of wetlands can adversely impact water quality and flood water storage. Wetlands serve as reservoirs from which groundwater supplies can be replenished during dry seasons and provide biologically productive ecosystems for a variety of fish and wildlife species.

According to the National Wetland Inventory, most wetland areas within the County are located along streams and the James River. The inventory is based on aerial photography and soil associations and can only be used as a planning tool. A site-specific delineation is required for any proposed development to determine the true extent of wetlands and potential impacts. This is reviewed during the POD process.

Soils

Soil characteristics affect the capacity of land to support structures, roads, foundations, and septic systems; therefore, soils types are an important consideration in evaluating the capability of land to

support development. Although the Soil Survey provides detailed descriptions of soil types and soil associations and soil maps for the County, a site-specific study must usually be conducted for a specific parcel(s) to delineate and identify soil types.

About 16% of the County's soils are classified as having no limitation for development. These soils are capable of supporting more intense development, especially when public water and sewer services are provided. The majority of the soils in the County (51%) are categorized as having Moderate limitations. Soils with Severe limitations (40%) have limitations due to slope, shrink-swell potential, low soil strength, and/or hydrology.

The majority of residential property owners (only about 800 homeowners are on public sewer) in the County utilize private septic systems. When considering the capability to support septic systems, local soils generally provide slow percolation for septic tank absorption fields which limits where systems can be located. In case the first system fails, the State Health Department requires a reserve drainfield area for all buildings served by septic systems.

Alternative septic systems are an option for those properties with soils that are not compatible with a conventional septic system. An annual maintenance agreement with a certified professional is required because of the systems' mechanical complexity and potential environmental health hazards that could arise with malfunction. There are also significant costs associated with alternative systems including

installation costs and annual maintenance.

Natural Heritage Resources

Common Name	Scientific Name	Federal Status*	State Status*
Bald Eagle	<i>Haliaeetus leucocephalus</i>	NL	LT
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	LT	
Brook Floater	<i>Alasmidonta varicosa</i>	NL	LE
Yellow Lance	<i>Elliptio lanceolata</i>	SC	NL
Atlantic Pigtoe	<i>Fusconaia masoni</i>	SC	LT
Green Floater	<i>Lasmigona subviridis</i>	NL	LT
Virginia Pigtoe	<i>Lexingtonia subplana</i>	SC	NL
James Spiny mussel	<i>Pleurobema collina</i>	LE	LE
Virginia Least Trillium	<i>Trillium pusillum var. virginianum</i>	SC	NL

*SC: Species of Concern; LT: Listed, Threatened; LE: Listed, Endangered, and NL: Not Listed.

Alternative discharging septic systems that discharge effluent above ground are considered "point source discharges" and must be permitted by DEQ in addition to the Health Department. The County restricts these alternative systems to property owners with an existing, conventional septic system that has failed and there are no alternatives to prevent condemnation. These specific systems are prohibited within the Tuckahoe Creek Watershed by State statute to protect the downstream water quality of the intake at Boshers Dam in Henrico County (four miles downstream of the Goochland County line).

Natural Heritage Resources

Department of Conservation and Recreation (DCR)

identifies and protects natural heritage resources statewide and maintains a comprehensive database of all documented conservation sites in Virginia. Conservation sites are recommended for protection because of the natural heritage resources and habitats they support but are not under an official protection designation. The County is home to 16 distinct known natural heritage resources.

Identifying natural heritage site locations enables the County to better screen development projects for potential impacts to resource areas, to identify targets for open space, and to guide restoration activities. The following table lists natural heritage resources documented in the County:

Forest Resources

Woodlands help maintain water quality by filtering and trapping sediments and absorbing pollutants from runoff and subsurface flows. Woodlands act as natural buffers along the James River and its tributaries, reducing the amount of excess nutrients from polluting County waterways. Forests provide unique ecosystems for a variety of plants and animals and provide food, shelter, cover, nesting and bedding areas for a wide variety of wildlife. Trees also support public health through the reduction of noise, air, and visual pollution and help moderate air temperature and artificial glare - preventing large expanses of impervious surfaces.

The value of the County's 2012 timber harvest was \$1.8 million dollars. This figure underestimates the total contribution forests provide to the economy because it

does not include values for hunting, recreation, or tourism or for air quality, water quality, and aesthetic benefits. Timber harvesting can be both sustainable and a good forestry practice if forestry best management practices are in place.

Trees and wooded areas provide a desirable environment for County residents to live and work. Trees and woodland areas are an essential element in promoting and preserving the rural character and appearance and promoting the lifestyles and traditions that make the County unique. Finally, woodlands areas screen unpleasant or distracting views minimizing their impacts.

The County's forests are a critically important renewable resource. Policies and regulations that maintain forest resources are essential to ensuring a high quality environment for County residents.

Mineral Resources

The majority of the mineral resources extracted in the County are crushed stone from granite quarries. In 2008 over five million tons of crushed stone were produced from granite in the eastern part of the County. There are several quarries located in the County. The Zoning Ordinance requires excavating to be confined to an area at least 1,000 feet from the nearest occupied residential dwelling at the time the use was permitted by the state. The quarry locations can be found on the **Quarries and Mines Map**.

Mineral Resources

Mine Name	Company	Resource
Anderson Creek	Martin Marietta Materials, Inc.	Granite
Boscobel Plant	Luck Stone Corp.	Granite
Rockville Plant	Luck Stone Corp.	Granite
Royal Stone Quarry	Vulcan Construction Materials	Granite
Waller Mine	Minerals & Chemicals Corp.	Iron Oxide, Gold

*Source: Virginia Department of Mines and Minerals (DMME), 2014.

Luck Stone has conditional use permit approval for a 350 acre site in Hadensville which is not yet in operation.

The western portion of the County historically had a number of gold mines. Gold was first discovered near Caledonia about 1829, and lode and placer mining were conducted intermittently at sites in western Goochland County until about 1942. Southern Piedmont Mining is permitted for gold and quartzite mining in the County but is not active. Another perspective gold mine operation has recently obtained approval for a site located at the western boundary of the County.

Abandoned mines pose a threat to public safety by increasing the potential for groundwater contamination and sinkholes. To identify these areas, the Department of Mines, Minerals, and Energy (DMME) has developed maps depicting the locations of abandoned mines found in the agency's publications, databases, and archives. Historic Mines are shown on the **Quarries and Mines Map**.

Historic and Natural Resources Existing Trends

- The recently adopted Strategic Plan identifies the need to promote and support historic resources in the County
- Twenty-three sites in the County are located on the National Register of Historic Places.
- The County in the past approved several conservation easements using local easement programs. Conservation easements allow a landowner to protect rural land from development and reduce land available for potential development in rural areas. The County no longer accepts conservation easements but they can be accepted by other agencies such as the Virginia Outdoors Foundation.
- Virginia Department of Forestry regulations regarding clear cutting of sites do not address impacts on adjacent properties or public views from rights-of-way from the clearing of the previously forested areas.

Historic and Natural Resources Existing Trends (cont'd)

- According to the soil survey conducted by the U.S. Soil Conservation Service, many soil types in the County have moderate to severe limitations for septic drainfields. Steep slopes and flooding, in combination with soil limitations, increase the potential for contamination of both private wells and streams. The County also has shrink swell soils which impact development.
- Goochland County is in the Chesapeake Bay Watershed. Activities in the County impact water quality downstream.
- Development encroaching on streams, wetlands, and riparian forests increases the potential for excess nutrient and sediment runoff. Clearing land next to these sensitive areas denudes the vegetated buffer that acts as a natural filter, slows runoff, and provides wildlife habitat.
- Water quality is an important development consideration. Development typically increases impervious surface area and reduces area for stormwater infiltration.
- Stormwater management permits are required for land disturbance activities larger than one acre.
- New stormwater regulations were implemented by the State on July 1, 2014.
- The County recently adopted a “dark sky” ordinance for lighting.

HISTORIC AND NATURAL RESOURCES IMPLEMENTATION STRATEGIES

Historic Resources

Type*	Implementation Strategies	Responsible Department	On-Going	Short Term	Mid Term
P	Support designation of appropriate sites for the State and National Registers	Planning	✓		
P	Promote public awareness of the County's history	Planning	✓		
P	Support voluntary preservation efforts	Planning & Parks & Rec	✓		
P	Support efforts to preserve the Historic Courthouse Area	Econ Dev	✓		
P	Protect important sites through the zoning and subdivision ordinances and conditional rezoning	Planning	✓		
P	Look for opportunities to include historic and cultural resources into parks or other public facilities	Planning & Parks & Rec	✓		
P	Promote historic resources through tourism promotion and marketing	Planning & Econ Dev	✓		

Natural Resources

Type*	Implementation Strategies	Responsible Department	On-Going	Short Term	Mid Term
P	Retain natural topography and existing vegetation in new developments	Planning	✓		
P	Encourage open space in new developments	Planning	✓		
P	Encourage Best Management Practices as amenities	Planning	✓		
P	Encourage environmental stewardship through volunteer programs	Planning	✓		
A	Review landscape requirements and encourage the use of native plants	Planning			✓
P	Continue to enforce the Dark Sky Lighting Ordinance	Planning	✓		

*P: Policy, A: Action

Water Quality

Type*	Implementation Strategies	Responsible Department	On-Going	Short Term	Mid Term
P	Establish riparian buffers along streams and wetlands	Planning	✓		
A	Identify stream bank and slope erosion problem areas	Planning			✓
P	Land disturbance permits are currently required for land disturbing activities within 50 feet of the James River. Consider increasing the requirement to 100 feet	Planning & Parks & Rec	✓		
P	Work to reduce bacterial levels in impaired streams and continue to develop methods to address streams with a Total Daily Maximum Load plan	Planning	✓		
A	Discourage development on steep slopes (over 15%)	Planning			✓
A	Develop strategies to address illegal, direct discharge	Planning			✓

Groundwater

Type*	Implementation Strategies	Responsible Department	On-Going	Short Term	Mid Term
P	Continue to require groundwater testing for new residential development not served by public water and sewer	Planning	✓		
A	Revise the County water supply plan at least every five years	Planning & Public Utilities			✓
A	Review ordinances to determine barriers to implementing low impact development	Planning			✓

*P: Policy, A: Action

Floodplains

Type*	Implementation Strategies	Responsible Department	On-Going	Short Term	Mid Term
P	Continue to limit uses to agricultural, passive recreational, and open space land uses within 100-year floodplain areas	Planning	✓		
A	Update County GIS as needed for floodplain and dam inundation zone mapping	Planning & GIS			✓

Land Conservation

Type*	Implementation Strategies	Responsible Department	On-Going	Short Term	Mid Term
P	Support conservation easements to be accepted by Virginia Outdoors Foundation or other similar agencies	Planning	✓		

Mineral Resources

Type*	Implementation Strategies	Responsible Department	On-Going	Short Term	Mid Term
P	Continue to allow mineral extraction through the conditional use permit process	Planning	✓		
P	Continue to maintain setback requirements for new residential uses	Planning	✓		

*P: Policy, A: Action