Madison County Asset Mapping Project

A Report to the Madison County Planning Commission

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Prepared by Karen Firehock and Alisa Hefner

with assistance from

Graduate Students at University of Virginia’s School of Architecture
Acknowledgements

Graduate students in fall 2007 UVA School of Architecture class who contributed to this report:

Jeff Barrett
John Bolecek
Wood Hudson
Michael Leow
Shawn Means
Allison Mouch
Dustin McCracken
Cody Schank
Nora Shepard
James Watson

Professor:
Karen Firehock

GIS Technology and Map Manager:
Alisa Hefner

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To comment on this report or to request a printed copy, please contact karenfirehock@virginia.edu. This report is not copyrighted and may be reproduced in whole or in part. This report was submitted to the Madison County Planning Commission and county elected and appointed officials and staff. Data and digital maps have been provided to the county administrator for use in the county’s geographic information system to generate new maps and to update data as needed.
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Introduction and Project Background

Madison County Virginia is a rich landscape of high quality agricultural lands, forests, mountains and valleys, many scenic vistas and small towns and villages. The county was formed in 1792 from Culpepper County, but it was first settled by colonists as early as 1725. With 327 square miles of land and elevations that range from 4000 feet to 298 feet, the county boasts some truly remarkable rural landscapes. Madison County’s Comprehensive Plan notes that “In our county we value our scenic natural setting, abundant open space and farms, historic resources, a warm and friendly atmosphere, good jobs and a balanced economy, a quality educational system, and a modest amount of growth.”

Those same qualities that make Madison County a wonderful place to live and work, also put demands on the land from those who want to take advantage of its abundant qualities. In order to best utilize those qualities or “assets,” Madison County can benefit from geographic mapping tools that can be utilized to identify high quality assets and to determine potential benefits and impacts of new development. The county also can become more strategic in its decision making by ensuring that patterns of development occur at rates and locations that are most suited to conserving the county’s rural character and desired land uses.

In fall 2007, students from the University of Virginia (UVA) began a review of Madison’s forest, water, agricultural and historic assets as part of an applied planning course taught by Karen Firehock and Alisa Hefner. Since Madison County had not utilized digital mapping tools much in the past, the instructors and graduate students invested a great deal of effort to bring together various sources of data and maps to provide better quality information. At the close of the fall semester, more work was required to improve the maps and to meet the needs and interests of the County Planning Commission. Professor Firehock was able to obtain additional funding from a private foundation to continue the work and extend the project to include more mapping by a geographic information specialist, a geographer and an additional planner into fall 2008. All of the work for the project has been provided to Madison County at no cost.

This document is the final project report and represents input received from the County Planning Commission, county landowners and farmers, the general public who visited the project booth at the county fair and various meetings with county staff. The technical team also consulted numerous data sources that are described on pages 8 and 9 of this report, along with the maps for each major asset category. Each of the maps is described and sources for more information are listed for each asset category. This report is not intended to replace the county’s existing comprehensive plan which was last updated in 2006. Rather, it provides supplemental information that may be used in plan updates. The main contribution of the project is the digital data layers that have been collated, organized and supplied to the county to use in future mapping projects.
Community input was solicited through interviews, meetings and a booth at the county fair. Stakeholder interviews were conducted with several Madison County farmers and business owners. Several workshops were held with the planning commission to understand the commissioners’ concerns and needs and county staff were also interviewed to gain their insights on information needs. The project team also drove every primary and secondary road and created a photo journal of land uses, intersections, towns and unique features. Historical maps were consulted along with many databases from the county and state and federal agencies to bring in data from multiple sources in order to create a comprehensive data set of county land assets.

During the stakeholder interviews, a concern voiced by several in the agricultural community was the loss of farm land to non-farm uses such as, second homes or the conversion of productive farms to fallow lands appreciated primarily for views. Most long term landowners agreed that maintaining the county’s strong agrarian heritage requires that farmland is not lost to non-farm uses. Others expressed concern that the purchase and conversion of farmland to non-farm uses and Madison’s location surrounded by several rapidly growing counties was driving up the cost of land, thus making it more difficult for young farmers to enter the market or to hold on to farmland. Others also noted that since farmers are aging and young people do not always want to take over the family farm, there are a lack of farmers who can continue to farm.

Many residents expressed interest in preserving land based recreation. Several hunters expressed concern that development pressure has increased in recent years and begun to close off more land to hunting as people post their land as off limits. Those who enjoy fox hunting also noted that they depend on large intact areas for their rides and rely on gaining access permission from multiple adjacent farms to make long distance riding and fox hunting viable.

While acknowledging that it could be unsafe at times with blind curves, several residents also noted their enjoyment of bike riding opportunities through the winding and scenic landscape. Several residents also expressed an interest in having more recreational and walking facilities closer to their
homes. Since most outdoor recreation is located to the west in the National Park\(^1\) and Wildlife Management areas, some residents expressed the need to have county recreational sites distributed across the county.

Many residents commented on the importance of history and culture. Several residents noted that Madison has many archeological and architectural treasures that are undocumented. Residents commented on several unmarked slave cemeteries that may be at risk because they have not been assessed, as well as Native American artifacts that are sometimes found in the county. Many (if not most) residents also expressed their appreciation for Madison’s scenery, natural beauty and rural character. Residents said that living close to nature was something to be treasured in Madison County. A resident expressed delight at discovering the flying squirrels that live on his property.

**Asset Mapping**

Land areas in Madison County are often suitable for multiple purposes. Much of Madison, for example, has good quality Class II agricultural soils that are well-suited for both agriculture and forestry. Similarly, areas located near existing grey infrastructure, such as roads and power lines can be well-suited for residential or commercial development. Understanding the characteristics of Madison County’s land assets can help the community identify which assets are best-suited to different purposes. Just as an individual would not write a check without first knowing their bank account balance, a local government need not plan for economic development and other priorities without first identifying the land areas that are best-suited for particular purposes.

By inventoriring its land assets, Madison County can plan for economic development alongside social and environmental priorities in a way that provides the community with the greatest possible return now and in the future. Madison’s land assets are the natural, cultural and historic landscapes that make it such a special place to live and work. Managing and enhancing these assets can help ensure that Madison retains its remarkable character over time. These assets may also help the county in the future to increase revenue growth from heritage tourism. Heritage tourists are interested in history, local food and crafts and they spend, on average, two and a half times more per visit than other tourists. Several asset maps were created for this report.

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\(^1\) There is no longer any vehicular access to Shenandoah National Park from within Madison County.
Asset map themes include:

- **Forests and Prime Agricultural Soils:** Forested land is located throughout Madison County, including prominent forested ridgelines in the northwest and large wooded areas in the southeast. There are 531 farms in Madison County engaged in production of crops such as corn, and livestock such as calves and hogs, as well as tree farms (as of 2002).

- **Water Resources:** The county’s three major watersheds are the Rappahannock, the Robinson and the Upper Hughes which are drained by more than 300 miles of rivers and streams. Most of the county’s drinking water is from individual wells.

- **Historic and Scenic Resources:** Madison County includes 17 sites listed on the state or national historic register, two historic districts, and 36 churches that are more than 50 years old. Route 231 is a state scenic road and Route 15 has been included in the Hallowed Ground route that crosses several counties.

This report contains the following base maps of existing resources:

- Existing occupied structures and zoning
- Forests and prime agricultural soils
- Water resources and watersheds and streams
- Historic and scenic resources

This report also contains “opportunity maps” that show potential ideas for the county to consider in the future as it seeks to build local land-based tourism (also known as “geotourism”) or to protect key resources, such as high quality fishing streams. These maps represent just a few of the maps that can be printed from the digital data supplied to the county. County staff and appointed and elected officials are encouraged to utilize these maps in their daily decision-making. The data used to create the maps in this report can be utilized to create new maps by combining different layers of information as well as a zooming in to produce more detailed maps of small areas, such as for looking at a specific parcel proposed to be developed or rezoned. The data and technical guide for how to use it, known as the “metadata,” have been provided to the county’s Zoning Administrator for use, maintenance and updating as needed.
This map (above) depicts occupied county buildings (as opposed to barns) and it is created using 911 addresses (emergency response addresses). This shows the current pattern of development in Madison County. It also shows the county’s zoning classifications and public lands. Most development occurs along the existing road networks.
How to Use the Information

This report is intended as an introduction to the mapping project. Only four asset maps are provided within this printed report, but many more can be generated by county staff using the data packaged and provided with the project report. To make use of the information, the most productive approach is for the county to create custom maps or targeted analyses using their Geographic Information System (GIS). A GIS uses computers and software to provide tools for managing, visualizing, and analyzing geographic information. A variety of information can be tied to a specific location and when displayed on a map, it allows viewing of patterns that may not otherwise be apparent.

GIS works with a variety of data from different sources. Part of this project included integrating and organizing data from many sources into one data collection for Madison County to use for planning and land-based decision-making. This data collection can be used to create county-wide maps or, on a case-by-case basis for specific areas or projects. For example, if a project comes before the planning commission for a small subdivision, commissioners could request a map for the project area that shows adjacent land uses, proximity of key resources such as historic sites or streams, and examine nearby patterns of development. The table below lists some of the key data available to the county and supplied to the county staff as part of this project, from which maps can be created. These different data act as layers that can be utilized and depicted based on the specific project or need.

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data related to the built environment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>Available county data and VA Department of Transportation</td>
<td>Primary and secondary roads, bridges, driveways, and intersections</td>
</tr>
<tr>
<td>Parcels</td>
<td>Available county data</td>
<td>Parcel boundary and associated tax assessment information for each parcel</td>
</tr>
<tr>
<td>Buildings and Structures</td>
<td>Available county data</td>
<td>Building and structure polygons and 911 address location points</td>
</tr>
<tr>
<td>Zoning</td>
<td>Available county data</td>
<td>Madison County zoning</td>
</tr>
<tr>
<td>Land cover</td>
<td>VA Department of Forestry</td>
<td>2006 grid (raster image) showing land uses in Virginia</td>
</tr>
<tr>
<td>Population</td>
<td>U.S. Census Bureau</td>
<td>Census data by census block</td>
</tr>
<tr>
<td>Places</td>
<td>US Geological Survey</td>
<td>Populated and non-populated locations (towns, mountain peaks, schools, etc.)</td>
</tr>
<tr>
<td><strong>Data related to the non-built environment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>Available county data, National Hydrography Dataset, National Wetlands Inventory</td>
<td>Rivers, streams, open water (ponds, reservoirs), wetlands, and watershed basins</td>
</tr>
<tr>
<td>Floodplain</td>
<td>FEMA</td>
<td>FEMA designated floodplains</td>
</tr>
<tr>
<td>Soils</td>
<td>U.S. Dept. of Agriculture, Natural Resources Conservation Service</td>
<td>Soil productivity derived from the Soil Survey Geographic (SSURGO) database</td>
</tr>
<tr>
<td>Dataset</td>
<td>Source</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Forest Cover</td>
<td>Virginia Department of Forestry</td>
<td>2006 grid (raster image) showing forested, non-forested and water areas in Virginia</td>
</tr>
<tr>
<td>Elevation</td>
<td>USGS National Elevation Dataset</td>
<td>Topography, elevation, slope, landform can be derived from NED</td>
</tr>
<tr>
<td>Impaired Streams</td>
<td>VA Department of Environmental Quality</td>
<td>2006 303(d) impaired rivers and streams</td>
</tr>
<tr>
<td>Species</td>
<td>VA Department of Conservation and Recreation Division of Natural Heritage and Department of Game and Inland Fisheries</td>
<td>Rare, threatened, and endangered species information is available</td>
</tr>
</tbody>
</table>

**Data related to cultural resources**

| Historic resources            | VA Department of Historic Resources                                    | Sites on the National Register of Historic Places and/or Virginia Landmarks Register, potentially eligible architectural and archeological features, historic districts, and identified civil war sites |
| Recreation and Conservation Lands | VA Department of Conservation and Recreation                          | Federal, state, and local recreation and conservation lands (including national and state parks, wildlife management areas, and local parks) |
| VA Scenic Byways              | VA Department of Conservation and Recreation                           | Designated scenic byways                                                                                                                  |

**Models**

| Virginia Conservation Lands Needs Assessment | VA Department of Conservation and Recreation | The VCLNA uses GIS to model and map land conservation priorities and actions in Virginia. Models include: cultural resources, ecological resources, forest economics, agricultural, watershed integrity |
Intact Forests and Agricultural Soils

This map (page 11) depicts the forests and prime agricultural soils of Madison County. The map was generated to meet the Madison County Comprehensive Plan’s goal under Agriculture and Forestry of Goal One “Maintain agriculture and forestry as leading industries in the county in terms of gross revenue and employment” and “Maintain agriculture and forestry as the primary land use in the County” (page 54-55, Madison County Comprehensive Plan, 2006). This map also seeks to address the goal under Natural Resource Protection of “Protect and enhance the natural ecosystems and working lands that support the County’s quality of life and economic base” (page 56, Madison County Comprehensive Plan, 2006). Under objective one “Protect the natural resource base” under the natural resources goal above, a number of features are listed that the county would like to have identified within the Comprehensive Plan. Most of these maps can now be generated using the existing GIS layers that the county now has as a result of this project.

Of Madison County’s total acreage of 205,902 acres, more than half of the land is in forest cover at 128,283 thousand acres or 62.3%. Madison County’s 2006 Comprehensive Plan also notes that while forest acreage has been increasing over time, the percentage of land in private timberland acreage decreased from 1992 to 2002 by 24%. It is important to note that although forest cover is increasing, this does not necessarily indicate that forests are of high quality. In other words, what may appear to the untrained eye as a healthy forest may, in actuality, be rife with invasive species, too much understory growth, invasive insect pests, poor soils or other problems. Having a forest management plan in place is one way to help ensure that the forest is being managed in a way that increases forest stand health and quality over time.

The Forest Assets and Prime Agricultural Soils map depicts all forests of 10 acres or more in green shading. The large green area in the northwestern area of the county shown with a line pattern differentiates the land area under government management including Shenandoah National Park and the state wildlife management areas. As the park is managed entirely by the National Park Service, no further analysis was conducted for that portion of the county. The orange color on the map depicts Class II and III agricultural soils.

Once all forests and farm soils were mapped, a further review was conducted to determine which forests had the greatest potential to support the county’s goal of “forestry as a leading industry.” To support forestry goals, forested areas of 20 acres or greater were selected. The reason for selecting a minimum acreage of 20 acres of contiguous forested land is to ensure that land area is large enough to be viable for forestry (silviculture). As a general rule of thumb, lots that are fewer than 20 acres are generally too small to manage for a viable on-going forestry operation. This concept is based on the project team’s consultation with professional foresters. This is especially true if a house is already located on the lot, since people generally do not cut down all the vegetation between themselves and their neighbors. In other words, those enjoying the privacy of a wooded lot are not likely to do a major cut where they are living, if the lot is relatively small.

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2 This figure is based on Virginia Department of Forestry (DOF) 2006 Land Cover Data and represents an increase of more than 2000 acres since the 2002 DOF survey. There are no data yet available for 2007 as of the printing of this report.
To locate the forested parcels greater than 20 acres and under single-ownership, the county's parcel data were used. It is not uncommon for a land owner's property holdings to be made up of several parcels but managed as one tract. Under single ownership, management by the landowner for timber or for other values is more feasible than under multiple different ownerships, when management objectives may be different amongst landowners. The pictures above show the concept of large lots that can be managed for timber versus lots that have already been subdivided and are no longer viable as timber lands or to manage for wildlife.

The next step was to consider which lots-under single ownership-met the minimum acreage threshold of 20 acres or greater and that were also adjacent (contiguous) to other large forested parcels. As noted earlier, parcels less than 20 acres were excluded because they are not likely to be viable for timber management over the long term. These criteria resulted in the green shaded areas on the map.

Finally, in the eastern areas of the county where slopes are less steep, forested land of at least 500 acres were highlighted on the map. The purpose in selecting these “500 acre woods” was simply to show areas where some of the largest non-fragmented tracts of forested land remain in the county’s lower elevation land.3 This is both an opportunity, because these woods are more easily accessed for forestry, as well as a challenge, since their lower elevation and proximity to major roads

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3 While large 500 acre areas were selected for this analysis, new maps can easily be generated for other sizes such as 100 acres, or 250 acre woods.
may put them in the potential path of development and thus make them more difficult to manage for timber or for wildlife values.

The county’s forests that are located on steeply sloped areas tend not to be suitable for harvest. This is due, in part, to the cost and difficulty or removing trees on steep slopes as well as the potential for harm from erosion. These forested ridge tops also provide myriad benefits when left forested such as, water recharge of the many headwater streams located in the ridge areas, as well as habitat for wildlife. In general, forested lands of 100 acres or greater are a good minimum size to support many of Virginia’s native plant and animal species. Those who enjoy hunting and fishing in the county’s wildlife management areas in the south and western portions of the county also understand that animals do not follow legal boundaries and the proximity of privately held forest land is also important to conserving the ecological health and habitats of these areas.

As of 2002, the Agricultural Census listed 102,874 acres in farm uses (not including forests or conservation lands). Farms in Madison County are both a vital part of the county’s economy and its rural identity. Twenty eight percent of Madison’s farmland is in harvested crops which includes 10% of Madison’s agricultural lands that are under cultivated crop production (corn, corn silage and soybeans) and small grains (wheat, barley, alfalfa and hay). The remaining 72% of agricultural lands are comprised of non-harvested crop area that includes land in pasture (open and woodland grazing areas), cover crops, apples, peaches, grapes and specialty crops. Some of the largest farms, based on agricultural income, are located in the southwest, the southeast and middle portions of Madison County. While average farm size county wide is 194 acres (down from 206 acres in 1997), there are also some very large farms along the foothills of the Blue Ridge. However, the steep topography in western Madison County limits agricultural crop cultivation to the valleys, while forests tend to dominate the steeper slopes. In addition to forests, steeper sloped areas are also used for grazing, grapes and orchards, along with some hay production.

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4 The 2008 Agricultural Census will have updated numbers in the near future, but these figures were not available as of October 2008.
In seeking to determine which specific parcels are in farm uses, the county’s use value assessment data were reviewed to determine which tracts were being used for agricultural purposes. Under the current (2007) county system of use value assessment, almost all (more than 90 percent) of parcels were getting use value as farmland and therefore this was not a useful approach for determining farm uses. A landowner may get use value assessment based on income from agricultural products, but this does not mean that all of their land is under cultivation.

Determining farm use and type by specific location is more difficult that might be assumed. Data in the agricultural census are reported by the Natural Resources Conservation Service as county-wide data. Data from satellite imagery can be used to show open land versus forested, but this does not necessarily mean it is cropped or grazed. Data on who is conducting large scale agriculture is potentially available from the Farm Services Agency, but due to agency concerns of privacy and a perceived potential for bioterrorism if farm locations are released, this data were not made available to the project team. Of course, individual farmers may access the soil maps from the Natural Resources Conservation Service and the Soil and Water Conservation District to determine specific soils information for their own farmlands. However, at this time, all that can be mapped at a county wide scale spatially are the class II and III soils that are listed as viable for agricultural purposes represented by the bright orange color on the map. Since Madison County has only a very small pocket of Class I soils (the best for most crops), this class is not highlighted.

Finally, is worth noting that many farms in the county also contain forested land. Farmers who are seeking to maximize the economic return on their lands may also want to consider developing forest management plans to ensure that they will be able to manage their forests in a way that sustains economic vitality for the long term. If there is a drought year and a loss in crops and revenue, a farmer may wish to harvest some trees for added income.

If farmers have a forest management plan in place, they will be prepared to make the best possible decisions for harvest. For example, a farmer may decide to do a selective cut and take out the largest, straightest (better for mills) and most healthy trees. However, this approach may result in “high grading” in which the best trees are removed and less high quality stock remains in the forest to reseed the forest with the good quality trees in the future. In other words, some of the best trees should be left untouched to reseed the forests with the superior trees over time. Similarly, if a farmer chooses to also plant some acreage as forest for a long term investment, they may also want to make sure that they have chosen the right trees for the site’s conditions so that their investment will yield the desired returns.
In the past year, Madison County required all landowners who claim use value assessment for forestry to have a forest management plan and to file that plan with the county. The reason for this is to ensure that anyone who is claiming a lower tax assessment for agricultural purposes is legitimately engaged in farming, whether that is trees or crops. Consulting foresters are available for developing plans and the Virginia Department of Forestry (DOF) is available on a limited basis for this assistance as well. However, the DOF does not presently have enough staff to meet the demands for the county.

There is some funding available for assistance in obtaining private forest management plans. One source of funding to help landowners develop and implement their forestry management plan is through the Virginia Department of Forestry from the Forestland Enhancement Program. Non-industrial private landowners can qualify for these grants, which help pay for the creation of management plans and certain other stewardship activities. This is a particularly good strategy because it encourages forest owners to follow the Forestry Management Plans (FMP) that are drafted as a part of the grant, “landowners must be willing to maintain cost-shared practices for a minimum of 10 years. During this 10-year period, if the landowner or a future landowner destroys the practice, the landowner must refund the cost-share assistance plus a 10% penalty charge.” A second source of funding is to offer local sales tax breaks to those landowners whose marketable timber is harvested from tracts with an implemented Forest Management Plan on record.

There are many interesting programs available to help promote agriculture. As noted earlier, the increasing costs of farmland may make farming prohibitive to new farmers who lack land and want to enter the market. The Virginia Farm Link program (see resources below) seeks to match young farmers with older farmers who may not have an heir interested in taking over the farm. The opportunities map on page 31 depicts additional ideas for promoting farm income from agritourism.

**Forest and Agricultural Resources Contact Information:**


**Madison County Forester:** Jack Kauffman, Forester, Virginia Department of Forestry, 308 Thrift Road
Madison, Virginia 22727 Phone: 540.948.5341, FAX: 540.948.5905


**Natural Resources Conservation Service (NRCS) Soils Data:** [http://soildatamart.nrcs.usda.gov/](http://soildatamart.nrcs.usda.gov/)

**NRCS Agricultural Census for Virginia Counties (2002):**
[http://www.nass.usda.gov/census/census02/volume1/va/index2.htm](http://www.nass.usda.gov/census/census02/volume1/va/index2.htm)

**Virginia Farm Link Program:** [http://www.savefarms.com/farmlink_about.htm](http://www.savefarms.com/farmlink_about.htm)
Water Resources

Three hundred miles of rivers and streams are located in Madison County and the major watersheds include the Rappahannock (35.40% of the county), the Robinson (54.62% of the county) and the Upper Hughes (9.98 % of the county). The Shenandoah National Park contains the headwaters of the county’s main rivers and as they originate within the park, the headwaters are afforded some measure of protection and management. Government managed land is indicated by a series of lines shading the park boundary to the northwest as well as the state wildlife management areas. The water resources map shows the locations of rivers and streams and the county’s major watershed boundaries and acreages are noted in the table below.

<table>
<thead>
<tr>
<th>Watershed Areas:</th>
<th>Hughes</th>
<th>acres</th>
<th>Robinson:</th>
<th>acres</th>
<th>Rapidan:</th>
<th>acres</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20549</td>
<td>mile^2</td>
<td>112,463.60</td>
<td>acres</td>
<td>72,889.26</td>
<td>acres</td>
</tr>
<tr>
<td></td>
<td>32.11</td>
<td>mile^2</td>
<td>175.72</td>
<td>mile^2</td>
<td>113.89</td>
<td>mile^2</td>
</tr>
</tbody>
</table>

The water resources map on page 21 also shows the boundaries of the major floodplains according to the Federal Emergency Management Agency (FEMA). These are 100 year floodplains which means that in any one given year there is a 1% chance that a flood covering those areas will occur. Floods are natural events and they deposit fine soils that enrich the soil fertility of floodplain land. Since the 100-year floodplain refers to probability, it is also statistically possible, though not likely, that there could be more than one 100-year floods in any given year. Also, floodplains change over time so the exact locations of floodplains should not be considered static. Examples of changes that may alter the floodplain area include clearing of land upstream that causes water to enter the stream at greater volumes and velocities than in previous years, changes to the stream channel though active construction such as for road projects, or filling in of upstream channels or their associated wetlands that reduce channel capacity and upstream storage, leading to increased flooding downstream.

The flood that stands out in the minds of most Madisonians is the great flood of June 1995 which was characterized as a 500 year flood (or a flood that has only a .05 percent chance of occurring in any given year). During June 27, 1995, a severe storm affected an area of about 50 square miles in Madison County with extreme landslides occurring in the Graves Mill and the Criglersville area. Over 16 hours, up to 30 inches of rain fell with some smaller areas experiencing up to 25 inches of rain over just five hours. This resulted in soil slides and slumps and rock slides over massive areas of hillsides with debris flows that took out entire forests. As these materials came to rest in stream valleys, flash floods resulted in destruction of houses, roads, utilities, livestock, and crops (source: Morgan, B.A., Wieczorek, G.F., Campbell, R.H., and Gori, P., USGS Open File Report 97-438, L. 1997).
Debris flow hazard areas were mapped by the U.S. Department of Interior and the U.S. Geological Survey and this map is available at the Madison County Zoning Office. Madison County does restrict some development on steep slopes through its conservation zoning but it is unclear at this time as to whether all of the areas under conservation zoning overlap with potential landslide hazard areas. In order to protect the loss of life and property in the future, Madison County has restricted development in floodplain areas to structures that are flood proofed. In general, however, it is advisable to restrict all buildings for human habitation from location in flood plain areas to prevent loss of life and damage to residential structures.

Madison County’s rivers boast some of the finest trout fishing in Virginia, and the Virginia Department of Game and Inland Fisheries cites the Rapidan as Virginia’s best known trout stream. It was the first state stream to receive special regulation to protect the river within the Shenandoah National Park and the Rapidan Wildlife Management Area. The stream contains a viable native brook trout population with adults ranging from 10 to 11 inches. Access to the Rapidan is available over Route 662 from Graves Mill and over Route 649 from Criglersville. Fishing within the Rose River is available outside of the park at Graves Mountain Lodge or by special arrangement at the Rose River Farm. The Conway and Robinson Rivers are also popular with anglers. Of course, there are many other favorite fishing spots known to local anglers along the county’s rivers.

Protecting the fisheries also requires protecting the riparian habitat along them. Fish, such as trout, need cool, clear water that is rich in oxygen. To keep water cool, tree canopy is especially important and tree roots and overhangs provide shelter for fish. Leaf litter provides food for insects that fish eat and stable stream banks prevent the water from becoming muddy and clogging fish gills. Forested areas alongside streams can help to filter agricultural chemicals and nutrients, such as nitrogen and phosphorus, which can rob streams of oxygen when resultant algae blooms decompose all at once. There are several programs that help to cover costs of restoring riparian buffers (see resources at the end of this section).

Most of the drinking water in Madison County is supplied through individual wells. The White Oak reservoir is a dammed section of White Oak Creek that primarily serves the town of Madison. The Rapidan Service Authority (RSA) was formed between three localities in 1969. The RSA has a water intake, storage, filtration, and distribution facility on the Madison-Greene line at the Rapidan River. This facility serves Stanardsville, Ruckersville and Madison County from Route 621 to the Greene County line. The White Oak Lake water treatment system serves the Town of Madison and contiguous areas.
Madison County has approximately 36 public wells as of 2005, six of which are within the National Park. Public wells in the county primarily serve public or institutional uses (such as schools, churches, or restaurants) and residential uses (such as apartment buildings, nursing homes, or subdivisions). Public wells are defined as those serving 15 or more users and are required to be protected from contamination under the Virginia wellhead protection program. These public wells must establish a Source Water Protection Area (SWPA) which is defined as the area contributing to recharge of a well or surface water source. Virginia operates a technical assistance program for well head protection and portions of southeastern Madison County have been identified as priority areas (http://www.vdh.state.va.us/DrinkingWater/source/wellhead.htm).

Community wells are already required to implement well head protection measures and the requirements for these wells are covered under the wellhead protection act. However, most water in rural areas comes from individual wells and these wells are not usually monitored. Many rural counties lack the funds to conduct such planning efforts and often do not have enough (or any) planning staff. Rural localities also may lack good maps to help them determine where future growth should go, thus making it difficult to anticipate future water supply needs. Like many rural counties, Madison does not have environmental planners on staff but may eventually determine a need for such a position as the county continues to grow and increasing demands for environmental compliance are placed on the county by federal and state law.

In November 2005, Virginia adopted the Local and Regional Water Supply Planning Regulation (Chapter 780 - Local and Regional Water Supply Planning) that establishes a planning process and criteria that all local governments must use in the development of local or regional plans. The requirement for water supply planning is a positive step forward for Virginia. Unlike urban and suburban areas, rural localities often have not engaged in water supply planning. However, periods of drought over the past several years have demonstrated the need for water supply planning to many rural localities. Plans are reviewed by the Virginia Department of Environmental Quality (DEQ) and a determination is then made by the State Water Control Board as to whether the plans comply with the regulation. The plans will be reviewed every five years to assess their adequacy and significant changes will require the

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5 Public Water Supply (PWS): Public Water Supplies are water systems that provide water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serves an average of at least 25 people for at least 60 days a year (Source: Virginia Department of Health).

6 Source Water Protection Area: For most wells in central and western Virginia, VDH utilized a fixed radius method of 1000-ft and 1-mile to define the Source Water Protection Areas for each well. The 1000-ft zone is a priority zone for managing potential sources of contamination. The 1-mile zone represents an estimate of the total recharge zone for the well. For surface water sources, the source water protection area generally includes a buffer zone adjacent to the water source and the 5-mile upstream watershed of the water source. (Source: Virginia Department of Health).
submission of an amended plan and review by the Board. Rural localities, including Madison County, must submit their plans by 2010.

Water supplies can be placed at risk not only due to increasing supply demands but also from changes to land cover that affect groundwater recharge. At current rates, Virginia is projected to lose one million acres of forest in the next 25 years. As we lose forests, we also lose our ability to have healthy and plentiful water. According to the Trust for Public Land, studies have documented that the larger the forest cover in a watershed, the lower the cost to treat drinking water (2007). Preserving and expanding the county’s natural assets is thus central to sound economic and heath policy. While much of Madison’s watershed acreage is forested, oftentimes streams that flow through agricultural areas are not forested.

<table>
<thead>
<tr>
<th>Total Watershed Areas with Forested Land Cover:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hughes:</td>
<td>16,311.80 acres</td>
</tr>
<tr>
<td>Robinson:</td>
<td>68,872.71 acres</td>
</tr>
<tr>
<td>Rapidan:</td>
<td>43062.97 acres</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Percent Watershed Area with Forested Land Cover:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hughes:</td>
<td>79.38% of watershed</td>
</tr>
<tr>
<td>Robinson:</td>
<td>59.08% of watershed</td>
</tr>
<tr>
<td>Rapidan:</td>
<td>61.24% of watershed</td>
</tr>
</tbody>
</table>

Madison County is currently working to develop its base resource information for its water plan. Within the GIS data that has been supplied to the county as part of this project, much of the required information is now available or can be added to existing base maps. The regulation within Section 9 VAC 25-780-90 requires the following existing resource information be provided for each locality as part of their water supply plans:

9 VAC 25-780-90. Existing resource information.

A. A program shall include a description of existing geologic, hydrologic, and meteorological conditions within the planning area, and in proximity to the point of withdrawal if it is outside the planning area.

B. A program shall include a description of existing environmental conditions that pertain to, or may affect, in-stream flow, in-stream uses, and sources that provide the current supply. This description of conditions may be provided in a distinct section of the plan document or as a part of the existing water sources information required pursuant to 9 VAC 25-780-70. This information may be derived from existing, readily available information and additional detailed studies shall not be required. The description of conditions shall include the following items, as they are applicable:

1. State or federal listed threatened or endangered species or habitats of concern;
2. Anadromous, trout and other significant fisheries;
3. River segments that have recreational significance including state scenic river status;
4. Sites of historic or archaeological significance;
5. Unusual geologic formations or special soil types;
6. Wetlands;
7. Riparian buffers and conservation easements;
8. Land use and land coverage including items such as percentage of impervious cover within a watershed and areas where new development may impact water quality of the source;
9. The presence of impaired streams and the type of impairment;
10. The location of point source discharges; and
11. Potential threats to the existing water quantity and quality, other than those from above.
Madison County also has a role in the health of the drinking water of its neighbor counties. As noted, in addition to the White Oak Run, there are two other public water intakes on the Rapidan that service the Town of Orange and Greene County. The Town of Orange’s intake on the Rapidan is located along the southern boundary of Madison County and the Rapidan Service Authority servicing Greene County is located along the Rapidan that forms Madison’s western boundary.

The DEQ is responsible for monitoring and reporting on the water quality of streams in Virginia. The state’s 305(b) report provides the status of streams across the commonwealth as required under the Clean Water Act. The state also may increase water quality standards. Standards must be as strict as federal requirements, but they may be made more stringent at the state level. The DEQ monitors and evaluates streams within each major watershed in Virginia to ensure that each meets its assigned standard, such as for drinking water use, contact recreation, or supporting aquatic life.

Streams that fail to meet the assigned standards are placed on the State’s 303(d) Impaired Waters list. Impaired streams are mapped in this report on page 23. In 2008 the state released names of additional impaired waters. In Madison County, most of the impairments are for fecal coliform, generally measured as escheria coli (or e-coli as an abbreviation). It is important to note that a stream may be impaired and not named on the list. Streams that are impaired may go undetected because the DEQ is not able to monitor every stream reach. Over the past several years the DEQ has expanded its monitoring program and, predictably, this has added to the list of known impairments in the Commonwealth.

There are currently eight streams in Madison County on the impaired list: Beautiful Run, Finks Run, Leathers Run, White Oak Run, an unnamed tributary of the Rapidan River, Little Dark Run, and various sections of the Rapidan and Robinson Rivers. In 2008, Virginia proposed several additional segments to add to the impaired waters list for the county:

- Hughes River segment (between Route 707 and Route 231)
- Additional segment of Little Dark Run (Headwaters to unnamed tributary)
- Deep Run segment (between Muddy Run and confluence with Robinson)
- Great Run segment (headwaters to Robinson)
- Crooked Run segment (confluence with Little Crooked Run to confluence with Robinson)

Once streams are placed on the State’s 303(d) Impaired Waters list, they require preparation of a TMDL (Total Maximum Daily Load), which is an analysis of the maximum amount of pollution a stream can receive and still meet the assigned standard (including a margin of safety), as well as a plan for allocating that load to various sources to ensure the maximum is not exceeded. A TMDL plan is also required for all streams listed as impaired. Madison County’s impaired streams are indicated in red on the Water Resources Opportunities Map.
Although the state develops the TMDL and bears the cost of doing so, there are additional costs associated with development of implementation plans and monitoring to ensure the effectiveness of those plans. Madison should consider seeking grant funds to assist with the development of an implementation plan for each TMDL once the pollution loading numbers have been developed and approved by the state. There is some limited grant money available to offset planning costs. The advantage in seeking funds to develop a TMDL plan locally is that the locality can initiate the plan’s strategy development and craft plans that work best to meet local needs and capacities as well as to ensure that the county remains in compliance with the law.

An approved TMDL plan is in place for Little Dark Run, but the cleanup implementation plan has not yet been developed. Draft TMDLs are underway for the upper Rappahannock basins which will encompass some, but not all, of Madison’s impaired waterways. The DEQ has developed a total maximum daily load calculation for bacterial contamination in the Upper Rappahannock TMDL for portions of Marsh Run and the Rapidan River. The other impaired streams are scheduled for development of TMDL plans by 2018. For more information or to learn of the schedule for future TMDLs, contact the Virginia DEQ in Woodbridge, Virginia at (703) 583-3804.

Most of the impairments in Madison county are from fecal sources. The sources for fecal contamination can be determined though testing to learn whether the sources are deer, geese or human (from failing septic or sewer), dogs (common in public parks) or livestock. A common solution for preventing bacterial contamination sourced to livestock is to fence cattle from streams and provide cattle with alternative water supplies from wells. In addition, riparian areas can be reforested to help filter runoff once cattle are moved away from stream banks.

According to staff with the Virginia Cooperative Extension Program, farmers who have fenced out cattle from creeks have found that it increased the health of their cattle by providing them with cleaner, more reliable water supplies, better weight and increased animal safety by keeping cattle away from steep ravines. However, it should be noted that Madison County is currently utilizing 100% of its funding through the Federal Conservation Reserve Enhancement Program (CREP), a voluntary land conservation program that provides a 50% cost share fund to restore stream buffers by fencing cattle from streams and providing alternative water. Land restricted to protected stream buffer uses can be offset by an annual rental payment. Present demand for this program far exceeds the availability of funds in Madison County. For additional programs see http://culpeper.vaswcd.org/.

As future development goals and land use plans are assessed, Madison should consider suggesting an upgrade of the assigned standards in some streams that may serve as surface sources of drinking water.
for growth areas. As noted above, Madison may also elect to develop its own TMDL plan for an impaired stream in order to address stream quality and restoration before the 2018 goal date. As noted, Madison should consider applying for grants available to fund the development of implementation plans and volunteer monitoring for approved TMDLs. Some localities have partnered with their planning district offices to seek grant funds for this work.

**Water Resources Contact Information:**
A list of state contacts for funding opportunities to help Madison become more involved in TMDL processes and the restoration is available at: [www.epa.gov/owow/npss/319hfunds.html](http://www.epa.gov/owow/npss/319hfunds.html)

Additional funding resources, general information and technical assistance can be found on the following websites:

**Virginia Department of Environmental Quality (DEQ) TMDL site:** [www.deq.virginia.gov/tmdl](http://www.deq.virginia.gov/tmdl)

**DEQ impaired waters list:** [www.deq.virginia.gov/wqa](http://www.deq.virginia.gov/wqa)

**Environmental Protection Agency TMDL resources:**
- [www.epa.gov/owow/tmdl/](http://www.epa.gov/owow/tmdl/)
- [www.epa.gov/owow/watershed/initiative/](http://www.epa.gov/owow/watershed/initiative/)
- [www.epa.gov/owow/funding.html](http://www.epa.gov/owow/funding.html)

**Center for Watershed Protection:** [www.cwp.org](http://www.cwp.org)

**National Association of Counties presentation on TMDLs:**
- [http://www.naco.org/Template.cfm?Section=New_Technical_Assistance&template=/ContentManagement/Conte ntDisplay.cfm&ContentID=21026](http://www.naco.org/Template.cfm?Section=New_Technical_Assistance&template=/ContentManagement/ContentDisplay.cfm&ContentID=21026)
- [http://dcr.state.va.us/soil_&_water/documents/wshedguideb2b.pdf](http://dcr.state.va.us/soil_&_water/documents/wshedguideb2b.pdf)

**CREP Program:** [crep@dcr.virginia.gov](mailto:crep@dcr.virginia.gov)

**DCR:** [http://dcr.state.va.us/soil_&_water/documents/wshedguideb2b.pdf](http://dcr.state.va.us/soil_&_water/documents/wshedguideb2b.pdf)

**Department of Conservation and Recreation, Soil and Water Conservation Programs:**
203 Governor Street, Suite 206, Richmond, VA 23219-2094, (804) 786-2064


**Understanding the Science Behind Riparian Forest Buffers -- Effects on Water Quality:**
Historic and Scenic Resources

Madison County has a wealth of historic assets and residents value the county’s scenic vistas and rural landscape. The county’s historic buildings, century farms, rolling hills, ridges and valleys and farms all contribute to the rural character that most residents treasure. These land-based resources are what make up the unique culture of the country and make it “feel like home.” In this section, a number of resources are discussed as well as opportunities to expand the tourist revenue that may be possible from development of tour maps as well as associated tourism facilities such as bed and breakfasts and restaurants to serve more visitors.

Madison has two designated civil war battlefields. Within the county there are two historic districts, the independent town of Madison in the center of the county and James City (adjacent to the Civil War battlefield site). James City is now known as Leon, Virginia. The Civil War Cavalry Battle of James City was fought from October 8th to 11th, 1863. Only remnants of this small town remain to mark the day-long fighting between cavalry under Confederate Gen. J.E.B. Stuart and Union Gen. Judson Kilpatrick on Oct. 10, 1863.

There are 15 historic buildings on the James City property that include an inn, general store, feed store, blacksmith shop, house and three barns. A postmaster was on site as of 1810 and in 1840 the site’s name was changed to Leon. Unfortunately, the site as viewed from the road is somewhat dilapidated and in need of painting and restoration. While there is a small amount of public parking at the Civil War site marker, the James City District itself sits on private property and is not presently viable as a tourist destination.

The James City site could be restored and, if the owners were willing, it could be rehabilitated as a tourist attraction. Recently a dilapidated old store in Brandy Station just to the north on Route 29 was restored to provide battlefield information to tourists. In fact, they discovered that the Brandy Station site had once been a civil war hospital. Those who appreciate history and culture are known as heritage tourists. They enjoy experiencing local history, culture, crafts and local foods. They-spend, on average, two to two and half times more per visitor than other tourists, making it well worth the efforts to attract them to unique local sites.
To the west on Route 231 is Rochelle, site of the Battle of Jack's Shop, where J.E.B. Stuart was almost captured by Union cavalry under Kilpatrick and John Buford on Sept. 22, 1863. This countryside is little changed since the Civil War and is still dotted with antebellum homes along the old Blue Ridge Turnpike (Route 231). There is a roadside marker in Rochelle is just northeast of the intersection with parking from which to view the former battlefield. The battle of Jack’s Shop resulted in heavy casualties on both sides and many local homes were converted into hospitals to care for the wounded.

Planning commissioners commented that General Ewell’s ride to Cedar Mountain on Caves Ford Road in southeastern Madison should also be considered for research and mapping in the future. Other sites of interest that should be emphasized include the original Civilian Conservation Corps (CCC) camp as well as a World War II training camp. The old toll road known as the Blue Ridge Turnpike that goes through Syria is no longer open into the park, but it remains significant to many Madison residents. Several residents commented that perhaps this road could be considered for scenic byway designation.

There are 17 sites in Madison County listed on the national or state register of historic places. Of these 17 features, 6 are in the Shenandoah National Park (sites in place before the Park’s designation in 1935) and 11 in the County (note that some are within the town of Madison). There are also 218 archeological resource sites in Madison County with most of those inside the current boundary of the national park and 66 within the county. Of these 218 archeological features, 12 are also listed as architectural features. There are 17 registered “century farms” in the county, at least 100 years old.

Anyone familiar with Madison County will immediately recognize that the above list is far from complete. Madison County boasts 51 churches and 36 of those buildings are more than 50 years old. These churches may be eligible for state or national register status but not yet have not yet been submitted or designated. In fact, in addition to the county’s 17 registered sites, there are an additional 69 potential sites, 46 of those in Madison County. Although these 69 sites have been submitted to the state for consideration, they have not yet been designated. Those non-designated features in the state’s database were submitted via a Preliminary Information Form (a preliminary evaluation) and they may not yet have been evaluated for the Historic Register (requires more paperwork).

While anyone can submit a Preliminary Information Form, it does not mean it is a significant resource or that it will make it on the register. To be listed, the site needs to have other features that make it distinct beyond simply being old. For example, if the site is architectural, it may be a particularly excellent example of an architecture that typifies the period or it may have an association with an important event, such as serving as a Civil War hospital or association with a famous person such as
James Madison. Designation on the National Register is important to those who wish to seek tax credits for their work. Tax credits are provided to property owners who follow accepted historic preservation guidelines to ensure the historic features are not destroyed during renovation.

The state of Virginia has identified Madison County as one of its priorities for survey work. As noted, while the county appears to have many historic resources, only a handful have been formally surveyed.

Madison County, along with its neighbors Green and Culpeper Counties, is ranked as “poor” for its survey information. If the county were interested in conducting a formal county-wide survey, the Virginia Department of Historic Resources runs a Survey and Planning Cost Share Program that shares fifty percent of the costs and administers the survey. There are also benefits beyond individual tax credits. As the county grows and develops it is important to consider the character of the county and how Madisonians want to perceive their county in the future. Old homes are often expensive to repair and promotion of funding sources to help homeowners maintain their buildings could be a county priority.

Another tool of potential interest to the County is the Virginia Rehabilitation Tax Credit Program for revitalization that can provide benefits to those who want to restore buildings (http://www.dhr.virginia.gov/pdf_files/CompPlan2001.PDF). Rehabilitation can also help to generate jobs. The Virginia Department of Historic Resources has found that over a 15 year period statewide, the rehabilitation of historic properties created over 12,000 jobs, which increased household incomes by $275 million.
Madison County’s unique mix of historic, cultural, and agricultural sites can be preserved to maintain the county’s rural character as well as provide economic development through heritage or “geotourism.” Madison County has 7.3 million people living within 100 miles of the County, 23% of US population living within 300 miles (Madison Area Heritage Study, 2003). Heritage tourism is travel directed toward interactive experiences and activities concerning locally or regionally significant historic, cultural and natural resources or landscapes that provide educational, aesthetic, and economic benefits. Resources are those sites that are significant to the heritage of a particular locality and may include its unique culture, character, development, lifestyles, architecture, natural features and landscapes, indigenous and emerging communities, and its historic events, places, people, and folklore. Geotourism is another relatively new term that refers to tourist activities tied to the unique geography of a place. For example, Madison’s scenic vistas and abundant outdoor recreation opportunities such as hunting and fishing comprise its “geotourism” assets.

Heritage Tourism, that is tied to local crafts, food and experiences such as music is the third largest sector of spending and employment in Virginia. In 2000, estimated traveler spending in Central Virginia was $2,294,419,000, 17.5% of the state's total traveler spending. Visitors paid $10 million in local taxes, and $2.5 million in lodging and food tax. By a large margin, first-time visitors to Virginia come to see the historic buildings, museums, battlefields, and cultural landscapes. Among repeat visitors, Virginia's historic sites still rank as the top attractions. Heritage tourists seek experiences that broaden and deepen understanding of diverse historical backgrounds. For example, 37% of golf vacationers also visited historic buildings during their stay in Virginia. On average, heritage visitors stay twice as many nights and spend two-and-a half times more money than do other tourists.

As Madison grows and develops it will be important to recognize its unique historic and scenic assets so that they can be protected. Just as particular sites are important so are the settings and the landscape in which they sit. Civil war battlefields that sit next to developed areas such as malls, or historic plantations that are abutted by unsightly highway exits, begin to lose their historic context. This represents a loss not only for the county’s character, which is highly valued by residents, but also impacts tourism opportunities.

The size of parcels along road ways can also impact views. While some roads still have large tracts of land adjacent to them, such as around Route 230 towards Wolftown or Route 15, other areas such as Route 230 east are becoming fragmented. The county’s zoning regulation limits distance between driveways in order to prevent too many driveways on major roads, but other planning tools could also be used to protect larger tracts of land. This matters both for preserving the historic integrity of sites as well as for attracting heritage tourists. In the book Better Models for Development in Virginia, authors McMahon, Hollberg and Mastran lay out principles for how development can be in harmony with goals of conserving rural character and working landscapes.
An emphasis on the county’s historic and scenic landscape does not suggest that Madison County should become simply a window to the past. Madison County is a working landscape of farms, forests, businesses, lumber yards, furniture makers, schools and retail outlets. Yet to conserve the county’s rural character and scenic vistas of farms and forests, the county may need to do more to ensure that views are not marred by land uses that could be located elsewhere in the county or that could be made to work with the views through implementing some level of design control. Madison County has two scenic roads, Route 231 as well as Route 15 part of the Journey Through Hallowed Ground. Placing restrictions on landowners who live on these roads is not generally popular and this is due, in no small part, to remaining anger over the original removal of the mountain people from Shenandoah Park land. However, design standards do not prevent development, they simply ensure that the scale and look of properties are in keeping with the rest of the corridor or how the county wishes to look in the future. For example, the towns of Staunton, Charlottesville and Smithfield all have entrance corridor standards as does Albemarle County. Madison County may wish to implement entrance corridor standards as allowed under § 15.2-2306 that pertains to preservation of historical sites and architectural areas. The county has limited access to Route 29 to both protect public safety and to ensure that the road can remain as a throughway. While this measure helps, it does not necessarily protect county character and views.

§ 15.2-2306. Preservation of historical sites and architectural areas: A. 1. Any locality may adopt an ordinance setting forth the historic landmarks within the locality as established by the Virginia Board of Historic Resources, and any other buildings or structures within the locality having an important historic, architectural, archaeological or cultural interest, any historic areas within the locality as defined by § 15.2-2201, and areas of unique architectural value located within designated conservation, rehabilitation or redevelopment districts, amending the existing zoning ordinance and delineating one or more historic districts, adjacent to such landmarks, buildings and structures, or encompassing such areas, or encompassing parcels of land contiguous to arterial streets or highways (as designated pursuant to Title 33.1, including § 33.1-41.1 of that title) found by the governing body to be significant routes of tourist access to the locality or to designated historic landmarks, buildings, structures or districts therein or in a contiguous locality. An amendment of the zoning ordinance and the establishment of a district or districts shall be in accordance with the provisions of Article 7 (§ 15.2-2280 et seq.) of this chapter. The governing body may provide for a review board to administer the ordinance and may provide compensation to the board. The ordinance may include a provision that no building or structure, including signs, shall be erected, reconstructed, altered or restored within any such district unless approved by the review board or, on appeal, by the governing body of the locality as being architecturally compatible with the historic landmarks, buildings or structures therein.

Related to view protection, Madison County is currently developing a guidance document for location of cell towers. Cell tower location can be guided to ensure that towers are not unnecessarily disruptive. Guidance on tower design such as disguising cell towers as flag poles or clock towers, requirements for co-location on existing towers wherever possible, and identification of existing scenic views that are priorities for protection are just a few examples of cell tower policy elements. Several counties, such as Albemarle, have already adopted tower siting and design policies making it easier for cellular companies to understand and meet the standards while also facilitating fair review of applications by planning commissions and boards of supervisors. As Madison develops this policy, it is recommended that the county identify those stretches of road and views that it deems most important to conserve along with design and location guidelines.
The Historic Resources Opportunities Map (page 31) depicts existing clusters of historic resources in blue that may be important to consider protecting as Madison grows. These points labeled in blue show locations that should be assessed and may prove to be important resources to protect. It may also be worth considering resources that are not on the map but which the county also thinks could be historic, such as old stores in crossroad towns. During the days when people’s lives were clustered around these smaller towns such as Etlan or Rochelle, local stores were important places for staples, trade and even gossip. These places remain significant to many who live there today. Wolftown Store is appreciated by locals and visitors alike.

The Ag-Tourism Opportunities Map (page 33) refers to possible agritourism routes. The idea of agritourism is to promote tourism to for those who enjoy local agricultural products. This is one way to help farmers earn extra income from their farms while also bringing local tourists to the area. Local food is more popular now than ever before. The Virginia Tourism Department has embarked on a “live passionately” campaign, to highlight the local food, experiences and geography of Virginia. While Madison has Civil War battlefields and festivals such as Taste of the Mountains, it is important to have as many experiences as possible for heritage tourists so that they can stay longer and spend more throughout the year. The opportunities map depicts some possible stops and routes that could make up a heritage tourism trail. This map could easily be expanded to add lodging, such as bed and breakfasts or camping and restaurants.

**Historic and Heritage Resources Contact Information:**

- **Thomas Jefferson Planning District Committee, Example of a Toolkit for Heritage Tourism:** [http://www.tjpdc.org/workforce/tjV_heritageTourism.asp](http://www.tjpdc.org/workforce/tjV_heritageTourism.asp)
- **USDA Rural Development Grants:** [www.usda.gov](http://www.usda.gov)
- **Cultural Heritage Tourism Website:** [http://www.culturalheritagetourism.org/stories.htm](http://www.culturalheritagetourism.org/stories.htm)
- **Journey through Hallowed Ground:** [www.hallowedground.org](http://www.hallowedground.org)
- **Virginia Piedmont Tourism Resources:** [http://www.theyvirginiapiedmont.org/](http://www.theyvirginiapiedmont.org/)
- **Virginia Wine Trails:** [http://www.virgniawine.org/regions/central-virginia/](http://www.virgniawine.org/regions/central-virginia/)
Next Steps

As a county that is surrounded by rapidly growing localities of Green, Culpepper and Orange, residents are increasingly concerned as to what the future holds for Madison County. The lack of public water and sewer expansion at present, provide some assurances that the county will not be able to grow too quickly. However, as land in surrounding localities is “built out” meaning there is no longer an abundance of cheap and available land, some developers may be willing to go ahead and pay the high costs to expand water and sewer treatment in order to service their developments. The “four in ten rule” is a regulation enacted by the county to slow the pace of development. The rule allows only four land right divisions every ten years. However, the rule may not be effective over the long term. Those who are patient may be willing to slowly accumulate and divide land over long time horizons, essentially creating a series of mini-estates from what were once productive farms. In addition, some interviewees expressed concern that the “four in ten” rule may not hold up if challenged in court due to Virginia’s Dillon Rule status that expressly limits the powers of localities to those already granted by the legislature. Since phased development is not clearly defined as a local power, this rule may one day be challenged. In the future Madison may need to look at other tools such as density based zoning in order to protect large agricultural and forested tracts.

Madison County is a treasure and one of the most beautiful places in Virginia. A key to ensuring that Madison can continue to grow and develop in patterns that suit local desires, the county can consider which areas it wants to highlight as important for agriculture, tourism, water quality and groundwater recharge or forestry. As these resources are further refined and mapped, Madison can continue to improve its Comprehensive Plan by adding specific locations and detailed objectives for its growth and development. The first step has been created for the county. The digital maps assembled and provided to Madison along with the “metadata” reports that describe how to use and update them, provide a powerful tool box for looking at county trends over time, understanding impacts from land development decisions and proposing where and how to grow in the future.

This report summarizes only a few of the ideas that can be derived from the digital maps. Now that the data layers are in place on county computers, staff and local officials can request printed maps of key features, zoom in to specific areas of interest and even model changes to the land over time. There is no one right answer for how Madison should grow. The key is to ensure that all decisions are made with the best information possible so that outcomes from development decisions represent what the county intended and how it wants to grow in the future. It is our hope, as the project team, that these new tools will help Madison to reach its goals now and for the future so that it retains all of the remarkable features that make it such a special place to live, work and visit.