

Scenic Conservation Plan,  
Brandywine Valley National Scenic Byway

# Viewshed Analysis Report



Delaware Greenways  
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SCENIC CONSERVATION PLAN, BRANDYWINE VALLEY NATIONAL SCENIC BYWAY

## VIEWSHED ANALYSIS REPORT

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SCENIC CONSERVATION PLAN, BRANDYWINE VALLEY NATIONAL SCENIC BYWAY

## VIEWSHED ANALYSIS REPORT

## 1. INTRODUCTION

In September of 2005 the Brandywine Valley National Scenic Byway (BVNSB) became the first designated National Byway in the State of Delaware. The 12.25 mile Brandywine Valley National Scenic Byway (BVNSB) corridor contains some of the most beautiful and historically significant roads and scenery in Delaware.

The Byway is comprised of the Kennett Pike (Route 52) and Montchanin Road (Route 100) corridors, extending from Rodney Square in downtown Wilmington, Delaware, north to the Delaware-Pennsylvania border. The corridor is composed of three major sections, which are: (1) The City of Wilmington (lower Route 52 from Rodney Square to Rising Sun Lane) (2) Kennett Pike (upper Route 52 from Rising Sun Lane to the Pennsylvania border) (3) Montchanin Road (Route 100 from Kennett Pike to the Pennsylvania border) Together, these three sections form a loop that begins and ends in downtown Wilmington. For the purposes of this Scenic Conservation Plan, only suburban transition and rural sections of the Kennett Pike and Montchanin Road are addressed. The urban section of the Byway within the City of Wilmington faces significantly different issues and challenges to scenic conservation and will be addressed in a future study.

Concurrent with this project, Delaware Greenways is completing the process required to extend the Brandywine Valley Scenic Byway designation to include Thompson Bridge Road, Ramsey Road, Creek Road and Smith Bridge Road. Community discussions on this extension have generated comments that all viewsheds along each roadway within the rural area of the Brandywine Valley should also be a part of this effort. To address this viewpoint, this Conservation Plan will treat all of the pertinent rural roadways as if they were Byways.



View of Biderman Golf Course

A central characteristic of the Brandywine Valley's story is a tradition of landscape conservation. The rolling landscape of the Brandywine Valley, made famous by the Brandywine School of artists and the Wyeths, has been preserved largely due to the efforts of prominent families such as the DuPont's and the Bancroft's. Public parks and private recreational facilities such as

Greenville Country Club, Biderman Golf Course, DuPont Country Club, Vicmead

Hunt Club and Brandywine Creek State Park are each on property once owned by DuPont family members.

Woodlawn Trustees Inc., an organization started by William Bancroft, still owns and maintains approximately 2,000 acres of land in Brandywine Hundred and in nearby Pennsylvania. Today, while much of that land is managed as a wildlife preserve and open space and is open to the public

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for hiking, walking, and horseback riding, it is not protected from development. Many of the original farms in these holdings continue in their traditional use, and thus the rural character of the Brandywine Valley study area remains largely intact. Open fields are leased to local farmers who are encouraged to practice soil conservation and crop rotation.

Along the northern part of the Byway corridor commercial development has been largely limited to villages such as Centreville, with much smaller outposts in Montchanin and elsewhere. While the area has historically been known as ‘Chateau Country’ due to the number of mansions and estates, this area also contains numerous enclaves of upscale suburban homes on two acre lots scattered throughout the Valley.



Ramsey Farm

The Brandywine Valley National Scenic Byway was nominated for the intrinsic historic qualities found in the character of the roadways, the adjacent landscapes, and the cultural institutions in the Valley. The historic values are supplemented by natural, cultural, archaeological, and recreational values, which collectively create a number of unique and outstanding views and sequences of views. This report will examine the multiple characteristics that contribute to scenic quality, evaluate the qualities as they exist today, present information about the community’s visual preferences,

and finally highlight views that are both highly valuable and remain susceptible to development. Subsequent steps of the scenic conservation plan process will address the findings in this report by investigating strategies for preservation.

Ultimately, the Scenic Conservation Plan will provide recommendations for how to preserve the scenic beauty of the Valley as a whole, including design guidelines for the manmade, natural and transportation environments that will guide developers, landowners, and government agencies in their responsibilities.

## 2. PURPOSE AND METHODS

### 2.1 VIEWSHED ANALYSIS—KEY COMPONENT OF THE SCENIC CONSERVATION PLAN

The Scenic Conservation study and planning process was initiated due to concern for the value of Delaware’s Brandywine Valley and the potential for its development. Ultimately, the product of this work will be a Scenic Conservation Plan, which will identify a recommended path forward to

protect and preserve the beauty and accessibility of the Valley and its landscapes, while providing for sustainable growth and development.

The BVNSB Scenic Conservation Plan has three main aims, which are:

1. to maintain the character and experience of the Valley;
2. to protect property values; and
3. to provide safe, convenient access to the Valley and Byway corridor amenities and resources for residents, businesses and visitors.

These aims are derived from the goals identified in the BVNSB Corridor Management Plan.

## 2.2 PREVIOUS EFFORTS AND SUPPORTING RESOURCES

A number of reports exist that have documented scenic views and characteristics in the Brandywine Valley study area and provide additional information, which have been used to help guide this viewshed analysis. Those documents are listed below, with highlights from each report of the most relevant information to this viewshed analysis:

### *Corridor Management Plan, Brandywine Valley Scenic Byway<sup>1</sup>*

- Prepared by Delaware Greenways, with contributions of a team of professionals led by John Milner and Associates of West Chester, PA. Sponsored by the Delaware Department of Transportation and the Wilmington Area Planning Commission.
- Includes list of historical sites (Appendix C)
- Highlights scenic views and explains that views along the Byway generally fall in the foreground to mid-ground range, limited to distances of less than ½ mile.
- Acknowledges key views from the 1987 Scenic River and Highway Study, and revisits their importance and continued existence.

### *Brandywine Valley Scenic River and Highway Study<sup>2</sup>*

- Prepared by the staff of the New Castle Department of Planning, the predecessor to the Department of Land Use.
- Identifies and describes visually significant areas according to landscape categories, landforms, and scenic vista points.
- A chapter (pp. 36-55) is dedicated to scenic resources of the Brandywine Valley; many of the issues identified in this study remain relevant today.

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<sup>1</sup> John Milner and Associates, *Corridor Management Plan, Brandywine Valley Scenic Byway*, Inc., Prepared for Delaware Greenways, Inc. and sponsored by the Delaware Department of Transportation and the Wilmington Area Planning Council, 2005

<sup>2</sup> New Castle County Department of Planning, *Brandywine Valley Scenic River and Highway Study*, 1987.

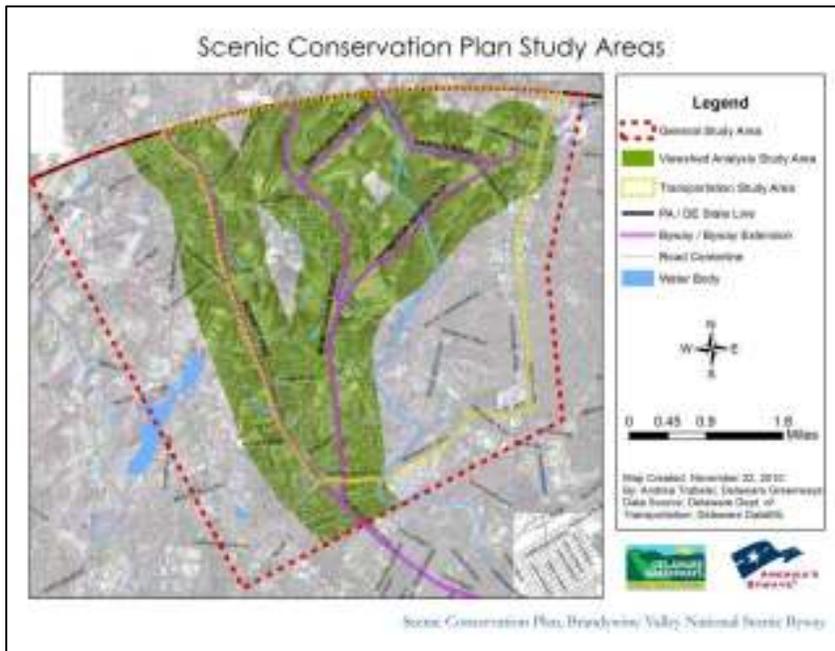
*Scenic Stewardship: A Plan to Preserve and Enhance the Landscape of the Brandywine Valley Scenic Byway*<sup>3</sup>

- Prepared for Delaware Greenways by Regional Landscape Enhancement, with technical support by Lardner Klein & Associates. Funded by a grant from the Delaware Department of Transportation.
- Documents landscape character and provides landscape design guidelines and priorities.

*Overview of Byway Historical Development*<sup>4</sup>

- Prepared for Delaware Greenways by the staff of the Historical Society of Delaware. Funded by a grant from the Delaware Department of Transportation.
- Documents historic properties, identifies primary historic characteristics, and explains their significance.
- Documents historic properties and characteristics that have been lost or moved.

## 2.3 STUDY AREA



The BVNSB Scenic Conservation Plan is being developed with an emphasis on the importance of integrating land use and transportation in a sustainable manner. The Plan process focuses on the land use, scenic resources, and roadways that make up the BVNSB corridor and its surroundings. To maintain focus on the key issues that fall into each of the three areas of interest, a separate study area has been delineated for each. The three study areas are shown in Map 2.3.A.

**Map 2.3.A Scenic Conservation Plan Study Areas**

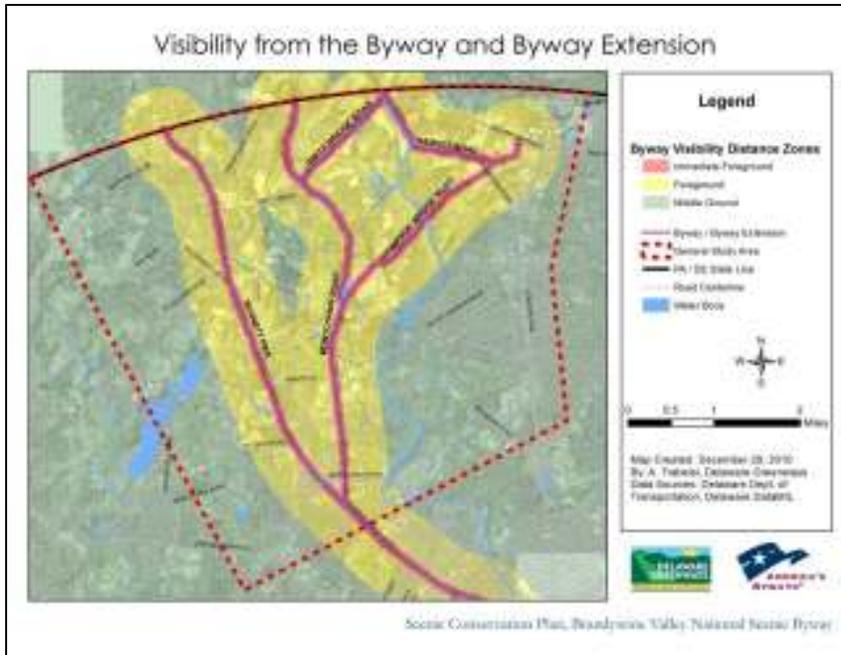
<sup>3</sup> Regional Landscape Enhancement, *Scenic Stewardship: A Plan to Preserve and Enhance the Landscape of the Brandywine Valley Scenic Byway*, Prepared for Delaware Greenways, Inc. in collaboration with the Delaware Department of Transportation, 2008.

<sup>4</sup> Historical Society of Delaware, *Overview of Byway Historical Development*, 2004.

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The purpose of defining three study areas is not to keep the issues separate, but rather to aide in organization and maintain a reasonable and focused scope of study. The primary components of the study, which include the viewshed analysis, land use planning, and transportation planning require consideration of different factors of influence; the geographic distribution and the complexity of those factors vary. Consequently, the areas of study for each of the three components are different.

The Viewshed Analysis Study Area focuses on the landscape, sights, and views within approximately 0.5 miles of the BVNSB and byway extension roads; 0.5 miles is the approximate



distance within which the eye can detect patterns and detail and is called the foreground and is shown in yellow in the figure. The immediate foreground is the first 300 feet (shown in magenta on the figure) from the roadway and the middle ground is the area up to 4 miles from the roadway (shown in light green in the figure)<sup>5</sup>. Figure 2.3.B, depicts the distance zones along the Byway and Byway extension. All study areas are bound to the south by the City of Wilmington boundary.

**Figure 2.3.B Viewshed Analysis Study Area**

A field review of zones noted above shows that between Route 52 and Thompson Bridge Road (Route 92), there is only a small amount of area that is not visible from the roadways. However, this area is visible from the trail system and the minor roads of the Valley. Accordingly, the findings of this analysis will apply to those areas that are not highlighted, but are bound by the yellow foreground areas.

## 2.4 METHODOLOGY

The analysis for this plan builds on existing documentation, plans, and reports on the Study Area's scenery, by identifying the most highly valued viewsheds in the study area that are also most susceptible to loss through development. The viewshed analysis also identifies undesirable characteristics and views of the Byway corridor, making the forthcoming plan not only a way to preserve and protect desirable views, but also to improve and enhance those views which currently detract from the scenic and historic character of the Byway.

<sup>5</sup> USDA Forest Service. "Landscape Aesthetics, A Handbook for Scenery Management." *Agriculture Handbook*, Number 701. December 1995.

The viewshed analysis consists of two primary components:

- a) a technical, GIS<sup>6</sup>-based analysis; and
- b) a qualitative, field-based analysis

The technical analysis is based on a defined set of landscape characteristics and criteria. It was conducted to both objectively identify the most valuable scenic landscapes/sites in the study area, as well as to make a preliminary determination of the susceptibility of the landscape to development. Following the technical analysis, the qualitative component is carried out to verify the results of the technical analysis, and to gather more details relating to community preferences and viewshed conditions. Each of the viewshed analysis components are explained in detail below.

### Technical Analysis

The first step in the technical analysis was to delineate and prioritize valuable views based on landscape characteristics. Landscape architecture, environmental management, and planning literature provide guidelines for landscape characteristic preferences among the general population. Visually pleasing landscape attributes cited in the literature include the presence of water features, certain vegetation types, and varied topography.<sup>7</sup> These and other standards offer guidelines to identify which landscapes are most likely to be considered visually pleasing to residents and visitors. A scenic conservation study conducted in the Old Saratoga Region of New York was used as starting point for the technical analysis criteria.<sup>8</sup> The Saratoga Region and the Brandywine Valley region share outstanding historic features and also have other similar landscape characteristics, which make the Saratoga study a good model for the BVNSB analysis. Table 2.4.A outlines the Saratoga Study's criteria, which were adapted for the BVNSB viewshed analysis.

**Table 2.4.A: Scenic Resources Ranking Criteria from Saratoga, NY study**

<b>Landform</b>	
Distinctive (3)	Predominantly undulating hills
Noteworthy (2)	Gentle slopes
Common (1)	Predominantly flat terrain
<b>Vegetation</b>	
Distinctive (3)	Predominantly open fields with mixed forest in the background
Noteworthy (2)	Large tracts of forest/vegetation in mid-ground
Common (1)	Scrub brush and non-distinct vegetation
<b>Water</b>	
Distinctive (3)	River/Creek/Lake predominant within foreground view
Noteworthy (2)	River/Creek/Lake in view or small pond in view
Common (1)	No water
<b>Land Use</b>	
Distinctive (3)	Agricultural land
Noteworthy (2)	Parkland, open space, and natural areas
Common (1)	Modern residential development and streetscapes
<b>Cultural/Historic Character</b>	
Distinctive (3)	Cultural/historic features dominate the view
Noteworthy (2)	Few cultural/historic features

<sup>6</sup> GIS is an abbreviation for Geographic Information Systems. GIS links data to a geographic location and allows complex analysis of the geographically based data set.

<sup>7</sup> Zube, E.H., Pitt, D.G., and T.W. Anderson (1974) *Perception and Measurement of Scenic Resources in the Southern Connecticut River Valley*. Amherst: Institute for Man and His Environment, University of Massachusetts.

<sup>8</sup> La Cour, Sarah. *Battles of Saratoga Viewshed Inventory and Analysis*. Accessed November 18, 2010 at: [http://www.clemson.edu/caah/cedp/cudp/pubs/alliance/13\\_lacour.pdf](http://www.clemson.edu/caah/cedp/cudp/pubs/alliance/13_lacour.pdf)

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Common (1)	Cultural/historic features are undetectable due to abundance of non-cultural/historic features in view
<b>Views</b>	
Distinctive (3)	Long/wide
Noteworthy (2)	Medium and/or narrow
Common (1)	Short
<b>Composition</b>	
Distinctive (3)	Significant unity and contrast
Noteworthy (2)	Some unity, contrast, and variety
Common (1)	Lack of unity, contrast, and variety

Of the above categories of landscape characteristics, those most relevant to the Brandywine Valley study area mirror those characteristics that have helped distinguish the area as a National Scenic Byway corridor, which are: land form; predominant vegetative cover; aquatic resources; and historic features.

Within each category in Table 2.4.A, ranking criteria were adapted from the Saratoga study using the literature described above. The ranking criteria were then applied using a computerized geographic information system (GIS) and geographic based data from local sources including New Castle County (NCC), the Delaware Department of Natural Resources and Environmental Conservation (DNREC), and the Delaware Department of Transportation (DelDOT). The ranking criteria were applied to each category individually, and the individual valuation results were then aggregated to derive the composite scenic value priorities shown in Figure 2.4.A. In all, some 400

acres were classified as outstanding, 1,500 acres as distinctive and 800 acres as noteworthy. Review of the map indicates that the viewsheds with composite scenic value were generally located to the west of Route 52, along the Brandywine Creek and within the Byway and Byway Extension Corridors. For a detailed description of the maps highlighting the individual characteristics that were aggregated to form the composite analysis, see Appendix A.

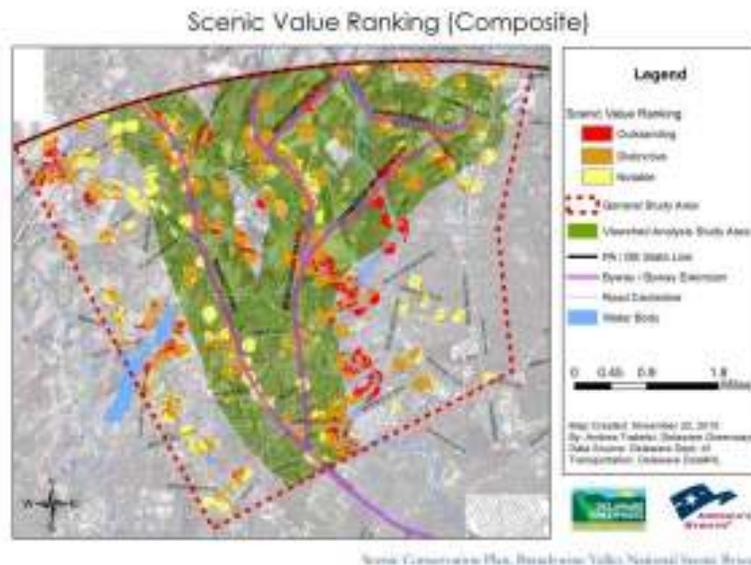


Figure 2.4.A Scenic Value Ranking (Composite)

**Qualitative Analysis**

Technical, quantitative analyses of scenic quality are helpful for initial and general identification of valuable scenery, but they are only as good as the data sources and assumptions of the analysis allow. Furthermore, relying on a computer to judge the quality of views ignores the effect of the less

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tangible and more subtle influencing factors, such as human psychology and emotion. The qualitative, field-based analysis is designed to verify the findings of the technical analysis, identify and document the viewsheds in greater detail, and develop greater understanding of what viewsheds and visual characteristics people prefer and why.

The approach taken in the qualitative analysis emphasizes the results of an on- the-ground viewshed exercise. This exercise took the form of a field day in which approximately 15 volunteers were engaged to verify and document viewsheds identified as significant in the technical analysis phase. Figure 2.4.B shows zones which were delineated around areas with the most significant views. The field day volunteers analyzed and documented view zones K, L, and M, which were chosen because they are of a high level of visibility from the Byway and Byway Extension and because much of the lands within those zones are not protected from development. Figure 2.4.C shows the viewshed zones superimposed on the areas that are not protected from development.

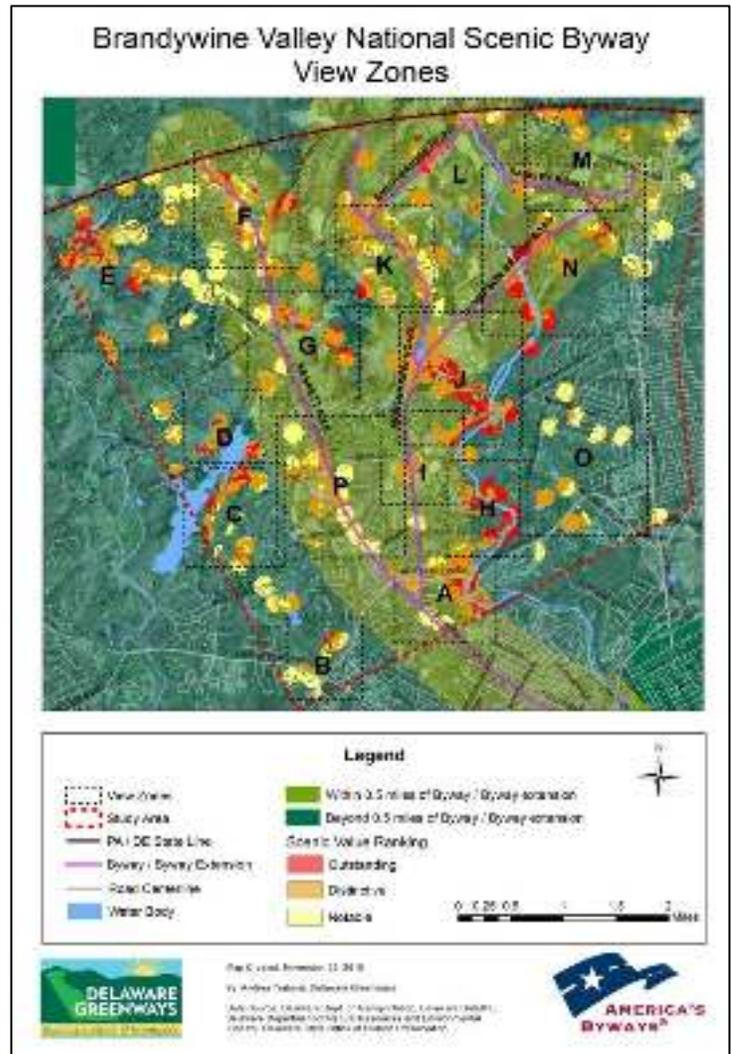


Figure 2.4.B Brandywine Valley National Scenic Byway View Zones

The field day analysis was conducted on Saturday, December 4, 2010 between 9:00 AM and 12:30 PM.

There was no snow on the ground and deciduous plants were without leaves. Volunteers met at the Delaware Greenways offices for a review of the goals of the analysis and instructions for the field analysis; each volunteer filled out a preliminary form relating to the individual's background, familiarity with the study area and region, and relevant special knowledge. (Over half of the volunteers pass through the study at least monthly.) Prior to leaving for the field analysis, groups of four to five were assembled and roles—including photographer, recorder, and guide—were assigned to group members. Groups then drove in one vehicle to their assigned study area(s) and were asked to identify and photograph particularly scenic views, any unpleasant views, and any

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characteristics of the scenery that were particularly pleasant or unpleasant. Each group was given a set of maps to record views being photographed and a form to fill out as a group relating to the scenery. The full questionnaires and forms that guided the work of the volunteers are found in Appendix B. The forms were designed to gain the perspectives and opinions of the volunteers regarding:

- Most valuable views to the community or subgroups within the community
- Undesirable characteristics
- How areas can be visually enhanced
- How views are (or are not) accessed
- At what rate of speed views are seen
- Who typically sees the views
- How accessibility of views can be enhanced
- What characteristics of the landscape should be promoted in certain development contexts

The groups were told that the analysis process could be adapted by each group as desired to insure each volunteer's input was accounted for. Accordingly, each group adopted a slightly different strategy for the analysis, but ultimately answered the questions posed and effectively photographed the study area.

In finishing out the field day analysis, group members returned to the Delaware Greenways offices to turn in forms, maps, and photographs, fill out a post-field visit form, and have a brief closing discussion about the field visit. The results from the viewshed analysis field day are summarized in the *Findings* sections, below, and are presented as turned in by each group in Appendix B.

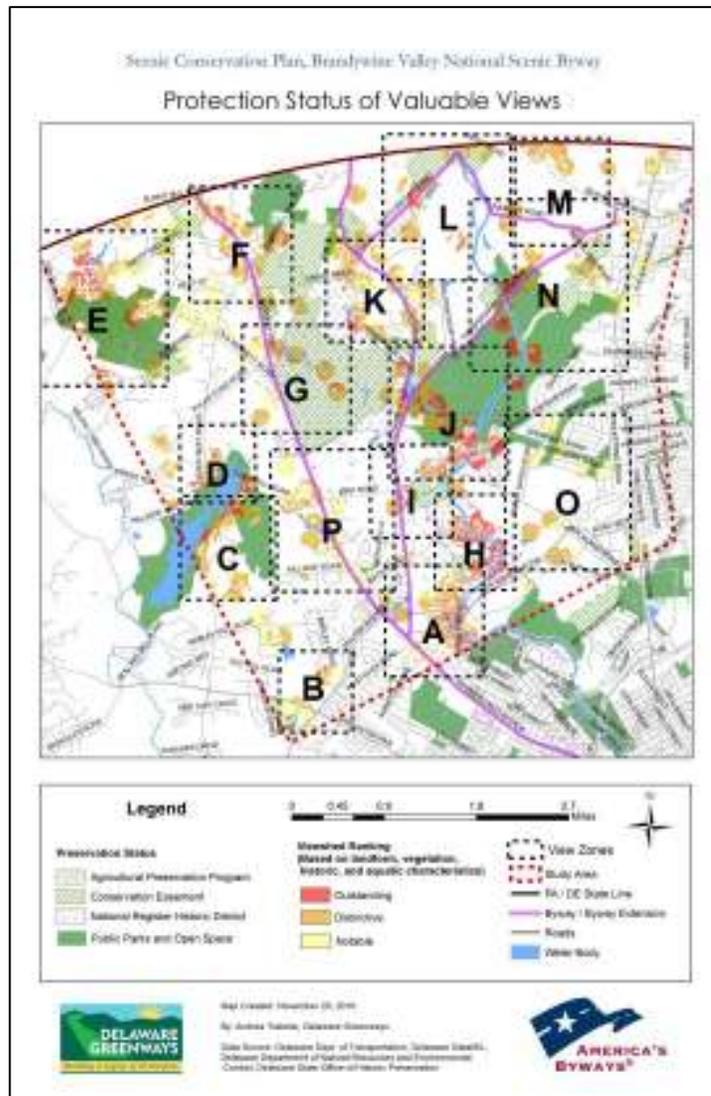


Figure 2.4.C Protection Status of Valuable Views

### 3. TECHNICAL IDENTIFICATION OF VIEWSHEDS

#### 3.1 EXISTING CONDITIONS FOR KEY VISUAL ELEMENTS

##### Topography

The landform of the BVNSB study area is predominantly rolling hills. The steepest slopes are primarily located along the Brandywine Creek and elevation changes are generally more dramatic at the northern portion of the study area, as shown in Figure 3.1.A. In general, Route 52 (Kennett Pike) and Route 202 (Concord Pike) follow areas of higher elevation with the Brandywine Creek following areas of lowest elevation.

Landform in the BVNSB study area impacts the scenery and sightlines, which present implications for scenic conservation. Figure 3.1.B shows the landscapes visible from the Byway based on the land contours. Other elements like stands of trees, buildings could also block the view from the Byway. Some of these other elements can be seen the other maps used in the analysis.

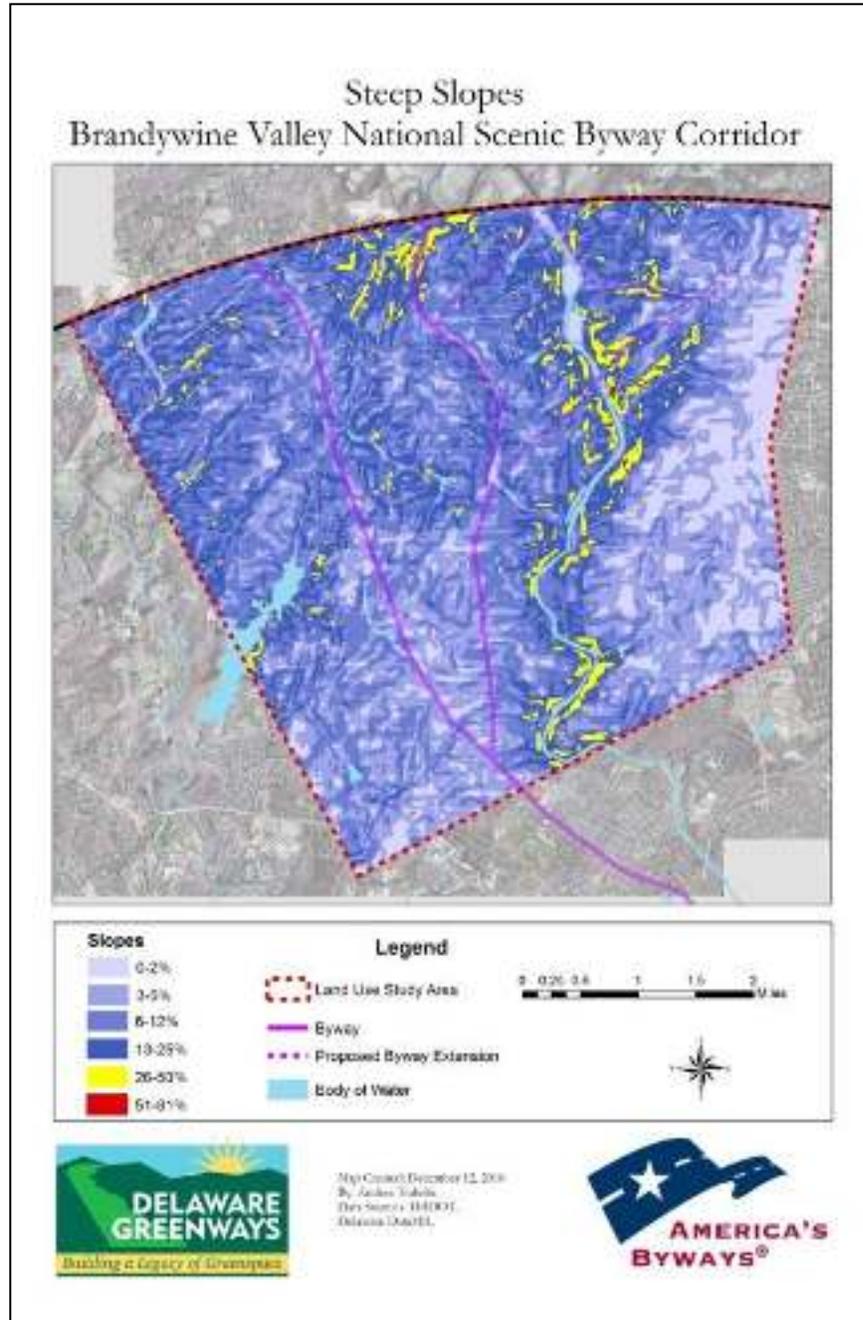


Figure 3.1.A Steep Slopes

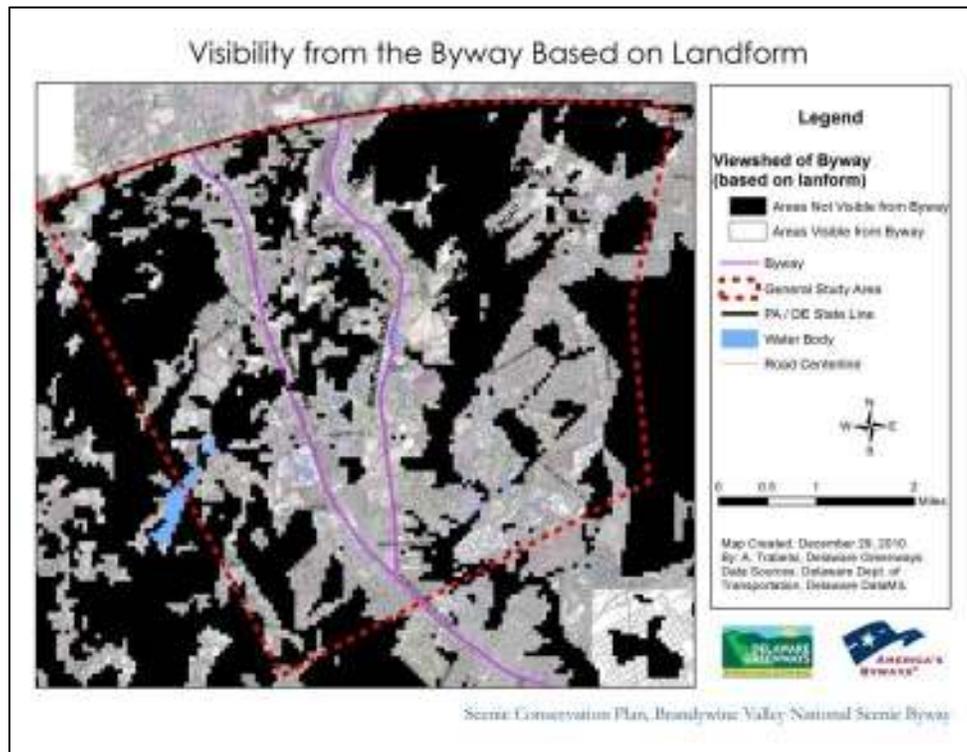


Figure 3.1.B Visibility of the Byway Based on Landform

### Natural Environment—vegetation and natural areas

Much of the study area is comprised of natural vegetation, including mixed forest cover, managed landscapes (e.g. golf courses, parks, etc.), low growth grasses and shrubs, and crops/pastureland. Figure 3.1.C shows the distribution of the natural land cover in the study area<sup>9</sup>). Within the study area, 3,950 acres are forested, 1,350 acres are designated for recreational uses and 2,500 acres are pastures or farmed.

A number of state designated natural areas also exist within the study area. DNREC publishes and maintains an inventory of State Resource Areas under the State Resource Area program. The program identifies the most important natural open space lands which are valuable for their natural, cultural, and geological significance, and then aims to permanently preserve them through various preservation techniques and mechanisms.

DNREC also identifies Natural Areas under their Delaware Natural Areas program. The areas are designated for their statewide significance of the natural qualities they exhibit. Many of the areas are protected to various degrees through public programs or private voluntary efforts. Not all areas, however, are officially designated or protected. Natural Areas within the study area are

<sup>9</sup> Delaware DataMIL, 2007 data.

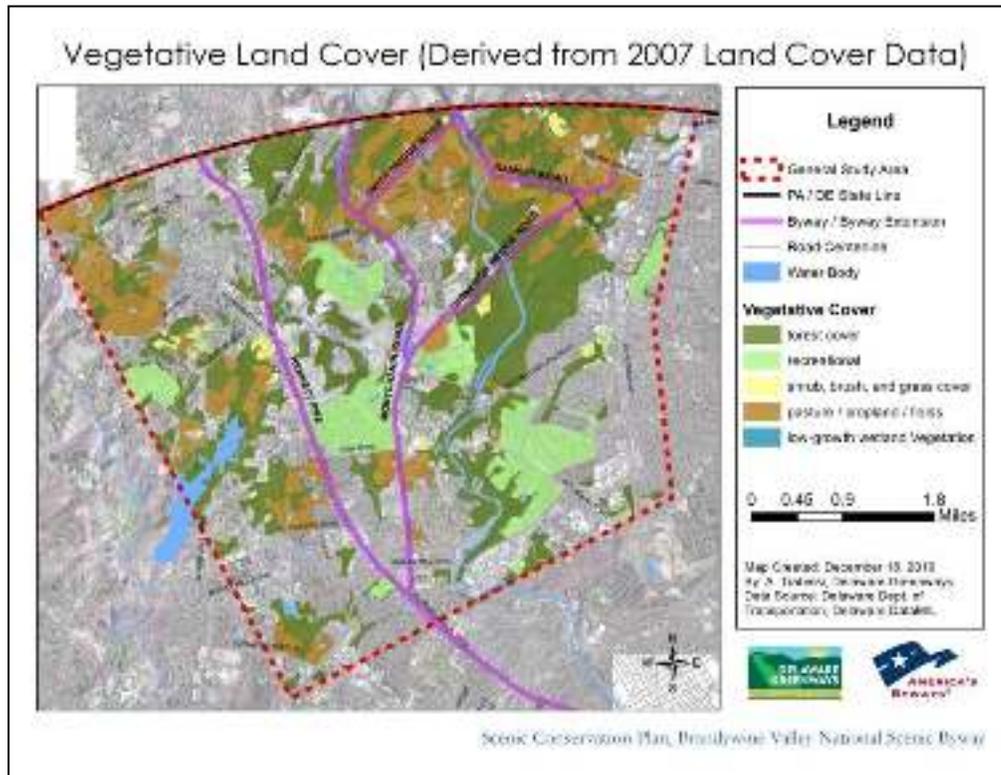


Figure 3.1.C Vegetative Land Cover

identified in the map below, and more information regarding them can be found in the Corridor Management Plan<sup>10</sup>.

Figure 3.1.D shows the State Resource Areas and Natural Areas. Within the study area, there are approximately 3,500 acres of significant natural areas as designated by DNREC. Approximately 300 acres additional land adjoining those areas is State Designated Resource Areas.

### Water Resources

The Brandywine Creek is a defining feature of the study area. It runs roughly north to south, bisecting the study area (see Figure 3.1.E). The creek is the driving force of the landscape that surrounds it. Throughout history the creek has shaped the landforms as well as the land uses in the Valley and is the ultimate source of the scenic and historic values that merit preservation today. The 100 year floodplain of the Brandywine Creek, shown in Figure 3.1.E, spreads beyond the creek's banks into the flatlands adjacent to the creek. Very little development has occurred in the 100 year floodplain, though some older properties developed prior to the County's Unified Development Code floodplain regulations were established are located within floodplain boundaries. Smaller tributaries of the Brandywine Creek and other water bodies are present throughout the study area and are also sources of scenic and natural value. Within the study area there are approximately 550 acres of land covered by water and/or the 100 year floodplain.

<sup>10</sup> Op. Cit, *Corridor Management Plan*, Chapter 5, Page 5-27.

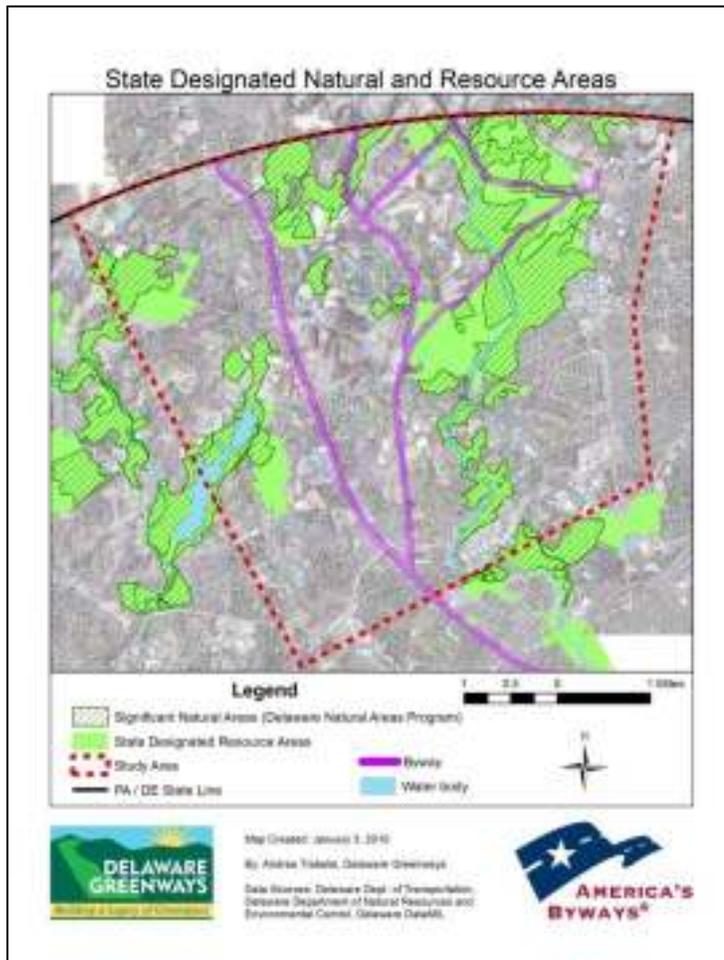


Figure 3.1.D State Designated Natural and Resource Areas

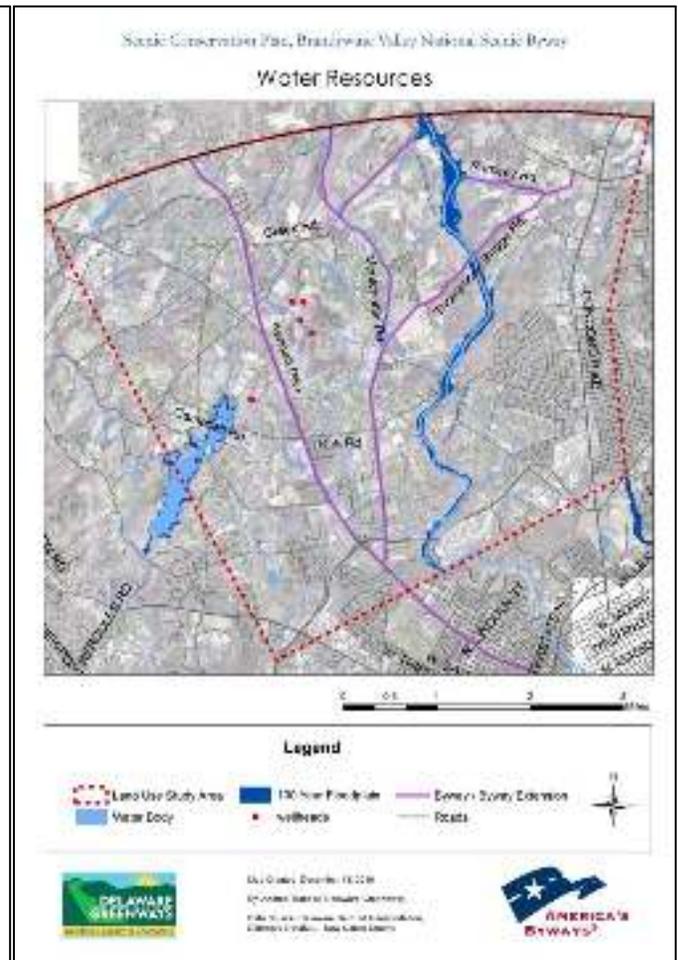


Figure 3.1.E Water Resources

### Historic/Cultural Features

An abundance of historic, cultural, and archaeological features are located within the study area. Figure 3.1.F identifies National Register Historic sites and districts, by name, as well as the location of additional buildings, structures, sites, and objects on Delaware’s cultural resource survey (an inventory of those items constructed/erected prior to 1945).

Within the study area, there are 24 sites on the national Historic Register and 369 state inventoried cultural resource survey sites.

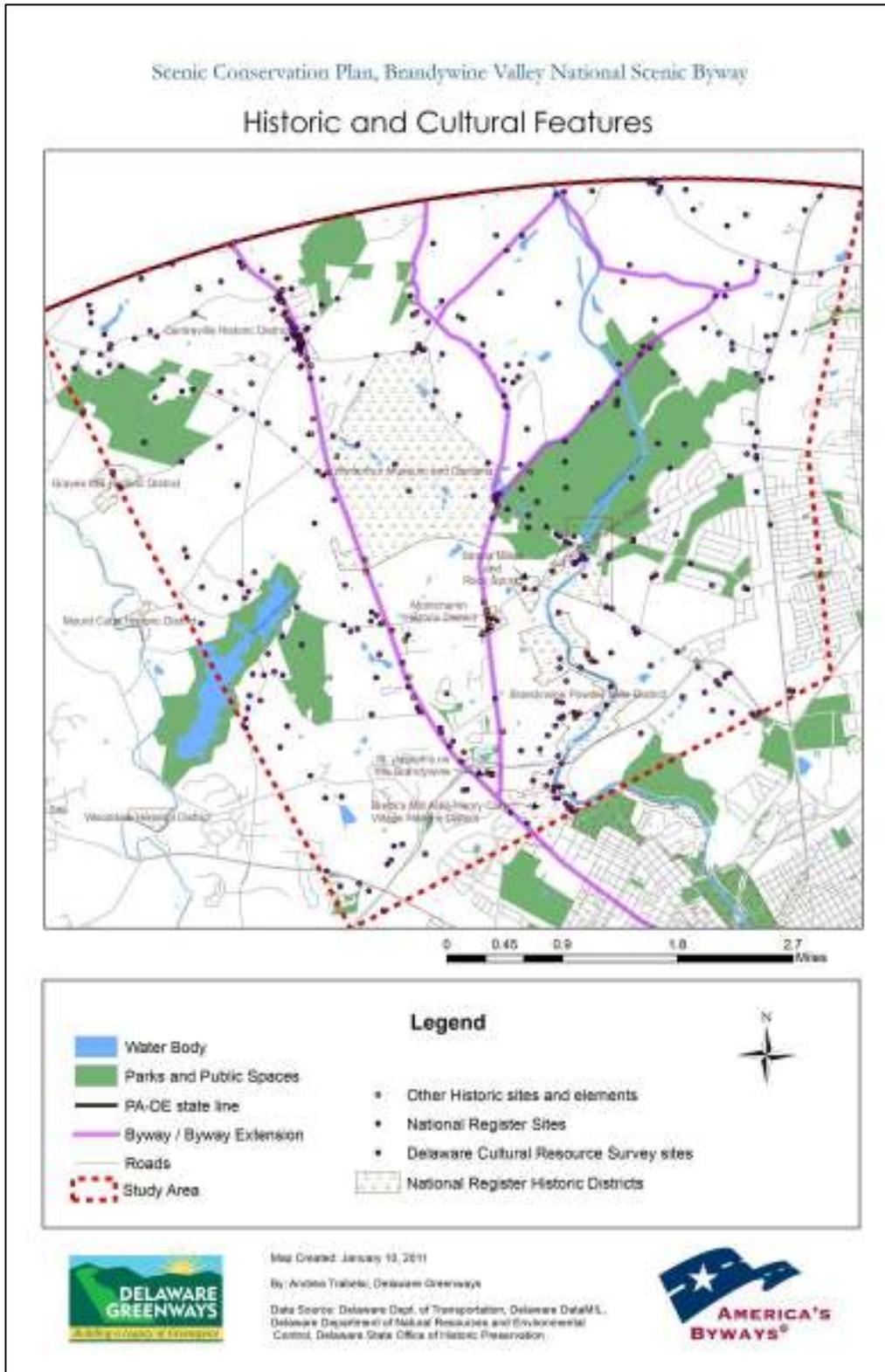
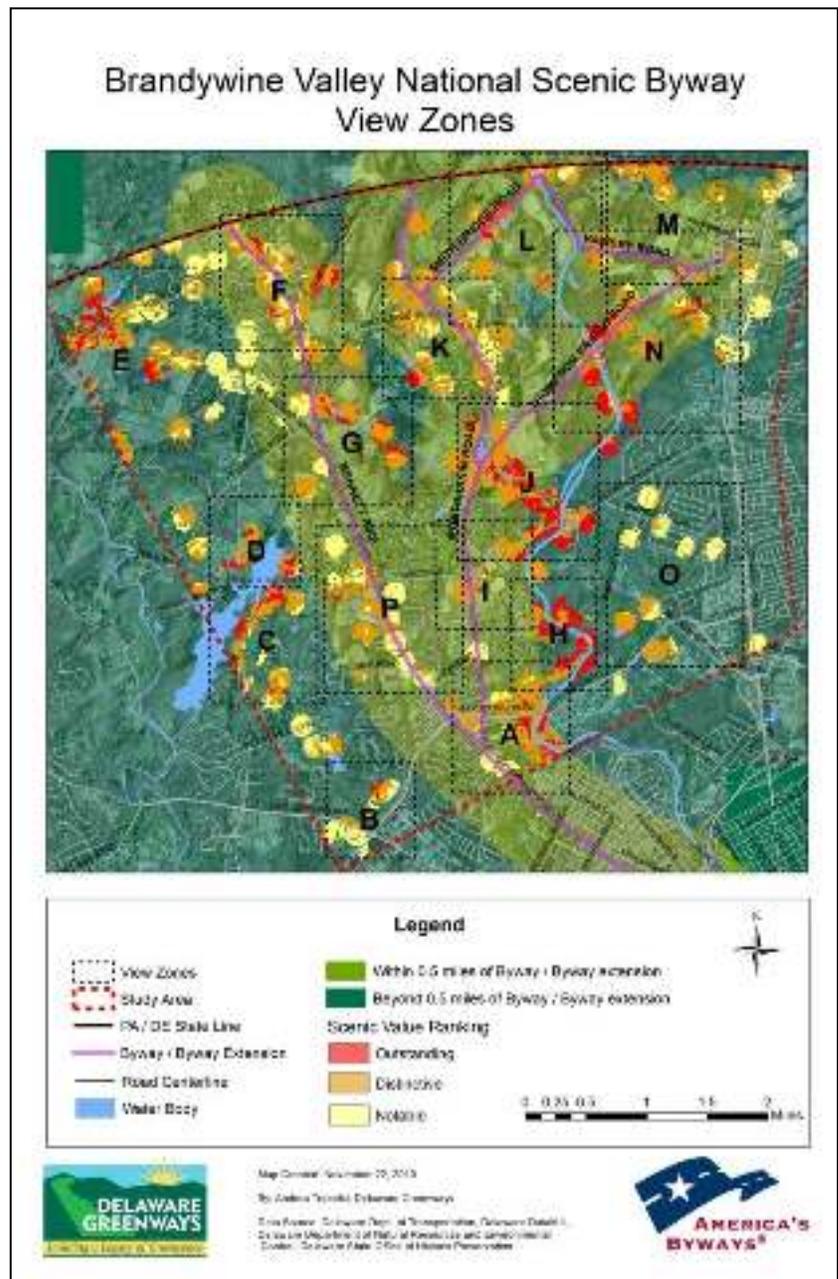


Figure 3.1.F Historic and Cultural Features

### 3.2 VALUABLE SCENERY, VANTAGE POINTS, AND VIEW ZONES

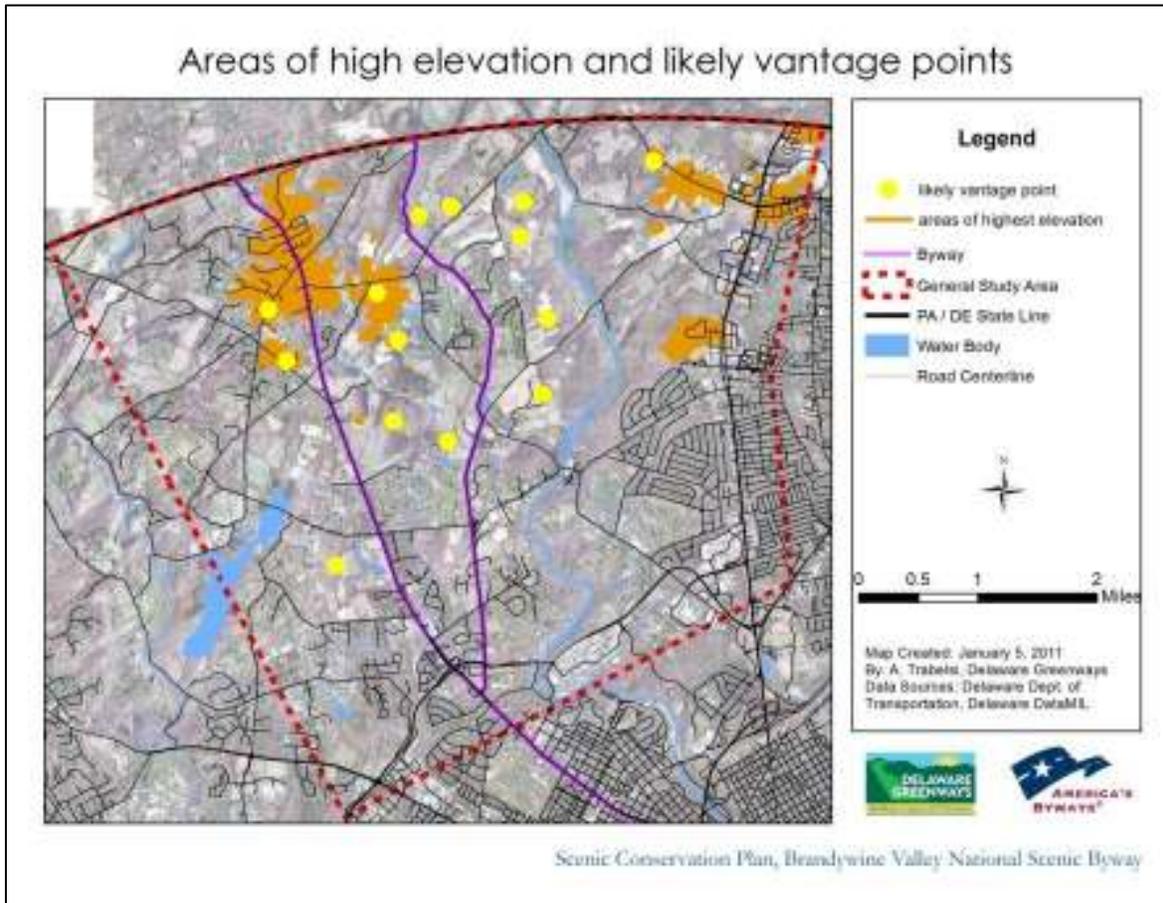
Areas of high scenic value are scattered throughout the study area and can be seen in Figure 3.2.A. The areas of high scenic value are highlighted in red, orange, and yellow, and were identified and ranked using a quantitative, computer based analysis based on landscape characteristics as part of the technical analysis. Areas in red received highest scenic value scores in the technical analysis, followed by orange and yellow. In general, these areas were identified for their noteworthy scenic value because of proximity to historic sites, water bodies, natural land cover, and varied landform.

Not only is it important to identify prime scenery, but it is also necessary to identify vantage points from which the scenery is most visible. These vantage points are likely to be areas of high elevation with low or no vegetation or clearings in vegetation. Figure 3.2.B identifies likely vantage points in the study area based on GIS analysis of elevation.



**Figure 3.2.A Brandywine Valley National Scenic Byway View Zones**

Those areas that appeared higher than the surrounding land and which also appear clear of vegetative or structural obstructions are identified by a yellow dot. Areas highlighted in orange are the highest in elevation in the study area, defined as more than 400 feet above sea level.



**Figure 3.2.B Areas of High Elevation and Likely Vantage Points**

The technical analysis rankings map (Figure 3.2.A) reveals the following with regard to creating the Scenic Conservation Plan for the BVNSB Corridor:

- Valuable scenery exists throughout the study area.
- Scenery of highest value in the study area is located primarily along the Brandywine Creek
- Clusters of highly valuable scenery exist in the following places within the viewshed study area:
  - Montchanin (View Zone I)
  - Winterthur (View Zone G)
  - Centreville (View Zone F)
  - Adams Dam Road (View Zones J and K)
  - Smith Bridge Road (View Zone L)
  - Brandywine Creek State Park (View Zone N)
  - Beaver Dam Road and Beaver Valley Road (View Zone M)
- A number of highly ranked scenic views exist within the general land use study area, but outside of the Byway viewshed study area; these views will not be assessed beyond the

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technical analysis in the Scenic Conservation Plan, however, they are important to consider for maintaining the overall scenic quality of the larger area. The protection of these viewsheds should be promoted as if they too were in the study area<sup>11</sup>.

### 3.3 ACCESS

In addition to the number of particularly valuable views identified in the study area, a second and equally important characteristic is the ability to access, as appropriate, these beautiful areas. Access by car, bicycle, on foot, and even by kayak and canoe are popular ways that these views are accessed and enjoyed. Volunteers participating in the qualitative viewshed analysis field day overwhelmingly identified proximity to urban Wilmington and accessibility as two highly valuable aspects of the BVNSB corridor. Many volunteers also acknowledged accessing the study area numerous times per year on foot or by bicycle.

Figure 3.3.A shows trails, walkways, and bikeways in the study area.

While volunteers felt the BVNSB landscapes and scenery were accessible, they also felt that access to BVNSB corridor and its views could be improved. Suggestions to improve access included:

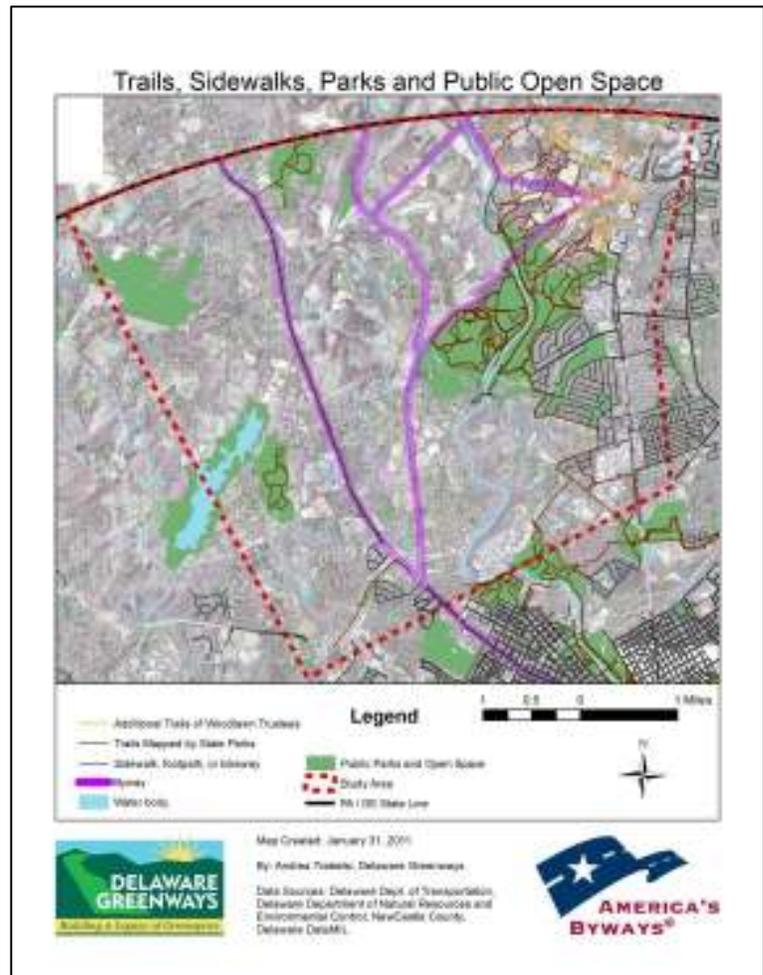


Figure 3.3.A Trails, Sidewalks, Parks and Public Open Space

<sup>11</sup> A number of these viewsheds are located in the Red Clay Valley Scenic Byway area. This Byway is a unique interconnected and interdependent network of 28 roads in New Castle County linked to the Red Clay Creek and its watershed. It is a complex network that conforms to the contours of the land mimicking the stream system. Red Clay Valley displays spectacular natural areas first described by the Delaware Nature Society in the mid-1970s as Red Clay Ravine, Red Clay Creek, Burrows Run, Coverdale Woods, and Red Clay Reservation. These natural areas sustain an abundance of plants and animals and contain some of the richest old growth forest in the Red Clay Creek watershed.

- Improving non-motorized access by improving safety and increasing trail access.
- Adding automobile accessible scenic overlooks (a safety feature as much as an amenity)

### 3.4 PROTECTED VS. UNPROTECTED

Many acres of land in the BVNSB corridor are enrolled in some form of preservation. Figure 3.4.A shows the protection status of the lands in the study area. Table 3.4.A lists areas of high scenic value in the study area and identifies the status of the preservation and the tools used if preservation is in effect.

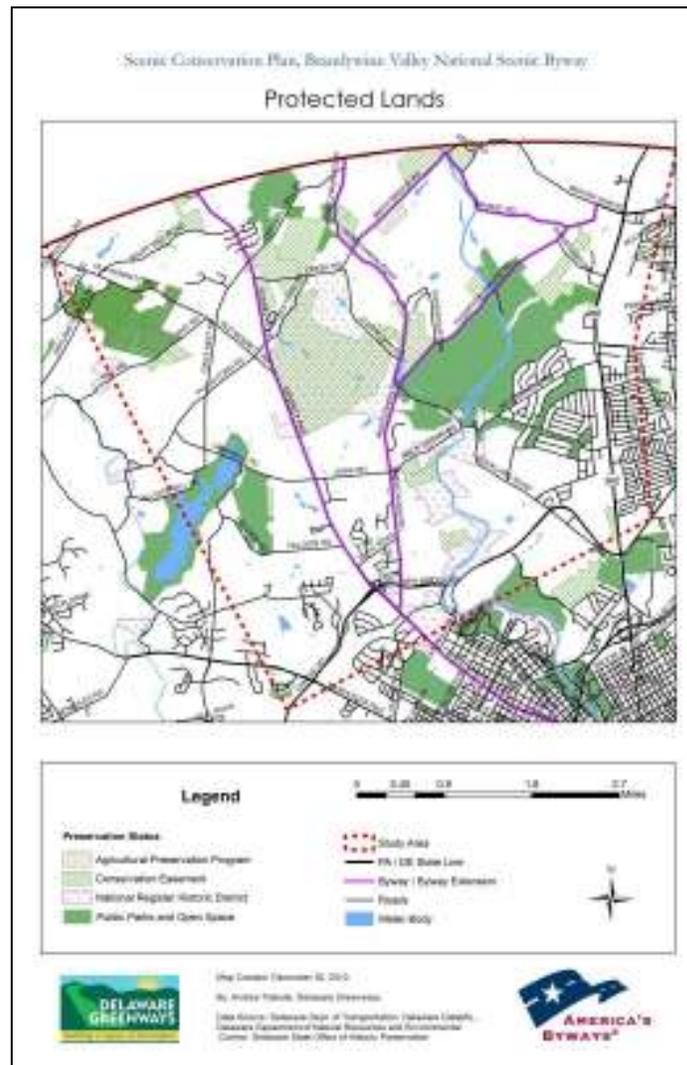


Figure 3.4.A Protection Status of Valuable Views

**Table 3.4.A Protection Status of Significant Views**

Location	Protection Status	Source
Lunger Mansion	Unprotected	Corridor Management Plan
Oberod Estate	Partially under conservation easement	Corridor Management Plan
Lower Brandywine Church and Cemetery	Unprotected	Corridor Management Plan
Historic Nichol's farm and barn (NW corner of intersection at Pyles Ford Rd. and Route 52)	Unprotected	Corridor Management Plan
Twin Lakes property	Unprotected	
Winterthur Museum and Gardens	Conservation easement	Corridor Management Plan, Viewshed Analysis
Wilmington Country Club	Unprotected	Corridor Management Plan
Great Broadloaf Hill (intersection of Montchanin Rd., Adams Dam Rd., and Thompson Bridge Rd.)	Unprotected	Corridor Management Plan
Canby Park	National Register Historic District designation; public open space designation	Corridor Management Plan
Brandywine Creek State Park	Public open space designation	Corridor Management Plan
Intersection of Montchanin Rd. and Smiths Bridge Rd.	North quadrant protected	Corridor Management Plan, Viewshed Analysis
Twaddell Mill Rd. and Montchanin Rd. intersection	Unprotected	Corridor Management Plan
Jamie Wyeth Estate	Unprotected	Viewshed Analysis
Granogue Estate	Small portion under agricultural preservation easement	Viewshed Analysis
Smith Bridge and surrounding landscape	majority under conservation easement	Viewshed Analysis
Waterfall and creek (Beaver Dam Rd. between Ridge Rd. and Beaver Valley Rd.)	Small portion protected under conservation easement	Viewshed Analysis
Old mill house (Beaver Valley Rd. at Beaver Dam Rd.)	Unprotected	Viewshed Analysis
Woodlawn Trustees property (bounded by Beaver Dam Rd., Beaver Valley Rd., Creek Rd., and Ramsey Rd.)	Unprotected	Viewshed Analysis
Brandywine Creek (along Creek Rd.)	Unprotected	Viewshed Analysis

Each of the preservation tools affords different levels of protection. The level of protection afforded and the major characteristics and requirements of the various types of preservation tools in use in the BVNSB study area and on the properties noted in the table is summarized below.

#### Permanent Protection:

##### ***Publicly-owned Parks and Open Space***

Thousands of acres of land in the study area have been acquired through fee simple purchase or donation for park and open space protection. Funding for these lands have been secured through various state and federal sources, and these lands are owned and managed by the State, County, or local governing bodies. Development on these properties

must comport with the terms under which funding was secured and further the mission of the managing agency, and is subject to all federal, state and local permitting and approval processes.

### ***Conservation Easement***

A conservation easement is a restriction placed on a piece of property to protect its associated resources. The easement is either voluntarily donated or sold by the landowner and constitutes a legally binding agreement that limits certain types of uses or prevents development from taking place on the land in perpetuity while the land remains in private hands. Conservation easements protect land for future generations while allowing owners to retain many private property rights and to live on and use their land, at the same time potentially providing them with tax benefits.

In a conservation easement, a landowner voluntarily agrees to sell or donate certain rights associated with his or her property – often the right to subdivide or develop – and a private organization or public agency agrees to hold the right to enforce the landowner's promise not to exercise those rights. In essence, the rights are forfeited and no longer exist.

An easement selectively targets only those rights necessary to protect specific conservation values, such as water quality or migration routes, and is individually tailored to meet a landowner's needs. Because the land remains in private ownership, with the remainder of the rights intact, an easement property continues to provide economic benefits for the area in the form of jobs, economic activity and property taxes.

A conservation easement is legally binding, whether the property is sold or passed on to heirs. Because use is permanently restricted, land subject to a conservation easement may be worth less on the open market than comparable unrestricted and developable parcels. Sometimes conservation easements will enable the landowner to qualify for tax benefits in compliance with Internal Revenue Service rules. In this study area, easements are held by organizations that include the Delaware Nature Society, the Brandywine Conservancy, Delaware Department of Natural Resources and Environmental Control, and the North American Land Trust.

### ***Agricultural Preservation Easement***

Agricultural Preservation programs exist at both the State level and in New Castle County. At the state level, the Delaware Agricultural Lands Preservation Foundation preserves farms - the cornerstone of rural Delaware. The Foundation, which is staffed and supported by the Delaware Department of Agriculture, preserves historic structures, wildlife habitats, important environmental features, wetlands, and forests, as well as setting aside, permanently, the critical farmland for future generations of Delawareans.

The Foundation's Agricultural Easement program is a permanent conservation program in which the Farmland Preservation Foundation purchases development rights from landowners and imposes a permanent agricultural conservation easement on the land. Land

must first be in an Agricultural Preservation District before the owner can apply to sell the development rights.

New Castle County has, in past years, also acquired easements for the purpose of agricultural land preservation. This activity has not occurred in recent years due to budgetary cuts.

#### Limited Protection:

##### ***Agricultural Conservation District***

The Delaware Agriculture Lands Preservation Foundation also features an Agricultural Preservation District program, which was established under the Delaware Agricultural Lands Preservation Act. The District program works (as described by the Delaware Department of Agriculture) as follows:

*A district is a voluntary agreement to use land only for agricultural purposes for at least a ten year period. Land must yield a minimum farm income, satisfy a scoring system standard, and undergo a review and approval process. Almost any size farm anywhere in the state can qualify. There is no payment to the landowner for creating the district. However, there are several benefits to landowners in an agricultural district. The unimproved land in the district is exempt from real estate transfer, county, and school taxes. There are significant protections against nuisance suits for land in the district. Landowners are permitted limited residential uses. Permitted agricultural uses include but are not limited to: crop production, herd animal and poultry operations, horse operations, forest production, non-commercial hunting, trapping and fishing, and agricultural eco-tourism operations, as well as farm markets and roadside stands.*

##### ***Hometown Overlay***

The Hometown Overlay designation is a protection mechanism overseen by New Castle County which allows local communities to develop guidelines for development and design for the designated local area. The Hometown Overlay District is intended to perpetuate and enhance the character of early settlement areas, hamlets, villages, and pre-World War II subdivisions. Many of these communities have unique characteristics that do not conform to modern zoning standards, but still possess qualities making them viable and attractive places to live and work. The purpose of the overlay district is to ensure that infill, redevelopment, and changes to the zoning pattern are compatible with the existing community. Each district will require its own community redevelopment plan that may address such issues as land use, dimensional characteristics, protected resources, and amenities, and other features, as appropriate. Future development will conform to the established character of the community as defined in the plan instead of adhering strictly to modern zoning standards. Communities in the unincorporated areas of the county identified in Chapter 10 of the 1997 New Castle County Comprehensive Development Plan Update as well as Claymont; and, incorporated areas regulated by the UDC are currently eligible for the overlay district.

***Density Bonuses***

Many jurisdictions preserve open space by allowing developers a greater number of development entitlements for a given tract of land. These 'density bonuses' encourage developers to design plans that preserve open space by clustering a more dense development away from the most important areas of open space. In New Castle County, the Unified Development Code (UDC) provides density bonuses for development plans that preserve significant amounts of open space.

Minimal Protection:***National Register of Historic Preservation***

The National Register of Historic Preservation is administered by the National Park Service with the purpose of protecting historically significant sites nominated by the State Historic Preservation Office. Under the federal regulations, there are no restrictions on what a property owner may do with the property. In Delaware, there are no laws protecting historic property from development, per se, however, under the state's Preliminary Land Use Service (PLUS) program the State Historic Preservation Office reviews development proposals that may impact historic properties and makes recommendations regarding ways to avoid or minimize negative effects that development will have on the historic property. The study area contains numerous National Register Historic Sites and Districts (see Figure 3.1.G). Historic districts delineate larger areas, within which properties are subject to the same rules and procedures as properties given the individual historic site designations.

### 3.5 COMMUNITY PREFERENCES

**Valuable views**

The outcome from the viewshed analysis field day verified the findings from the technical analysis: valuable views are scattered throughout the study area. Further, field day analysis volunteers brought to light the fact that most, if not all of the scenery is of high value and worth preserving, and it is the views and landscapes *in aggregate* that make the BVNSB and its surroundings such a unique experience.

Volunteers familiar with some of the iconic scenes of the Brandywine Valley, such as the Winterthur Estate, felt that the views they saw during the field day analyses were of the same high quality as those that are protected and maintained at Winterthur. [Note: the viewshed field day analysis addressed views in view zones K, L, and M, located in the northeast portion of the study area.]

VIEWSHED ANALYSIS REPORT

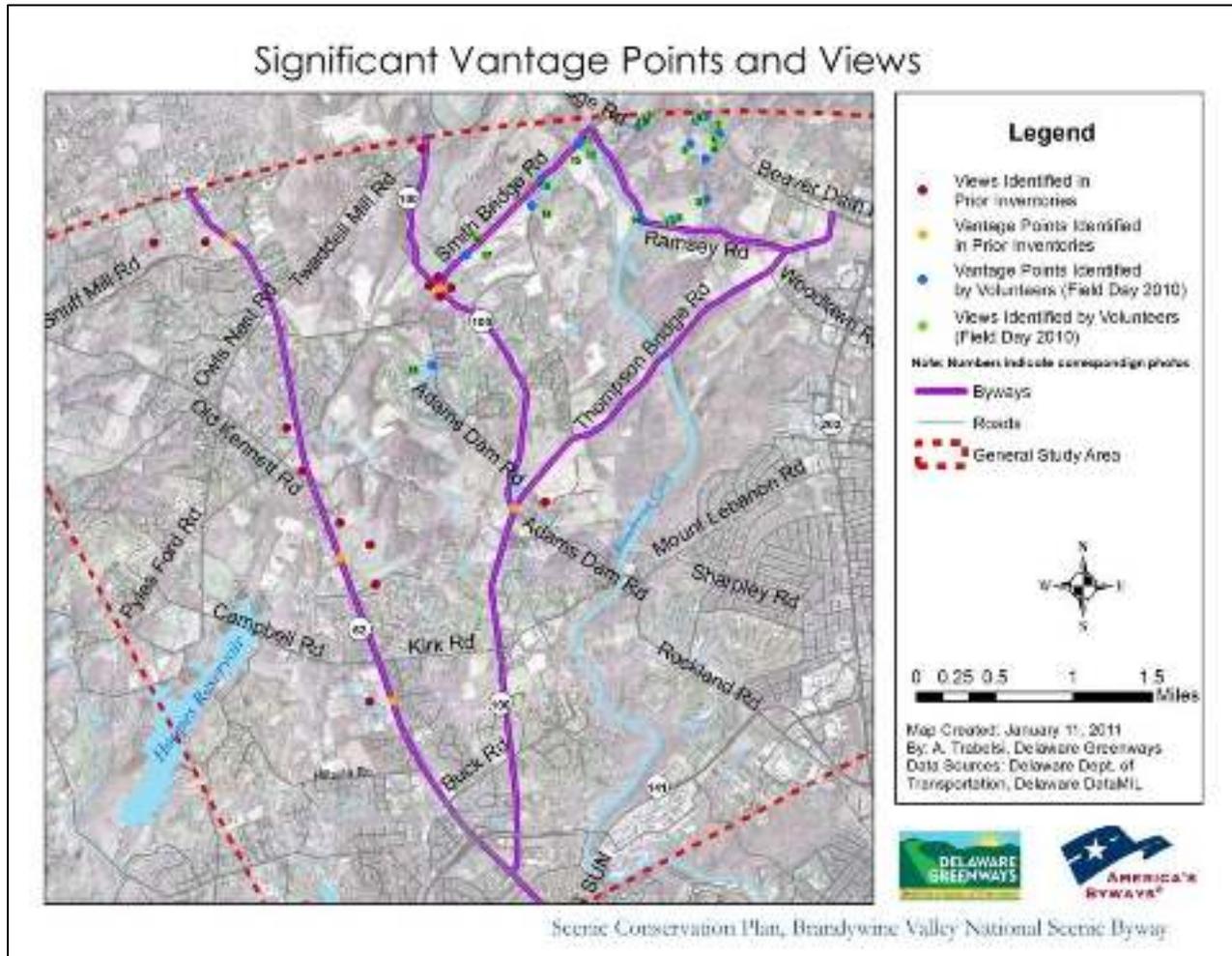


Figure 3.5.A Significant Vantage Points and Views

Views and viewpoints identified through all resources consulted as well as during the field day are shown in Figure 3.5.A. Each view identified during the field day is numbered and corresponding photographs subsequently presented in Figure 3.5.B. The numbers in the figure correspond with the photographs that follow.

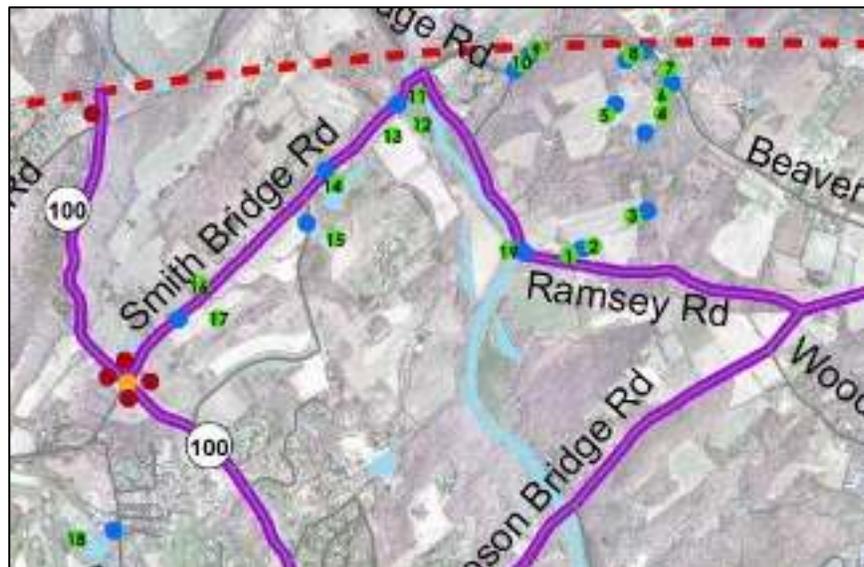


Figure 3.5.B Key to Viewshed Photographs

**View 1**



Vista from Woodlawn Trustees property looking west toward Granogue over the Brandywine Creek



View of Ramsey Farm (foreground) and Granogue tower (background) as seen from the Woodlawn Trustees property



View from Woodlawn Trustees property looking west/southwest toward Ramsey Farm

This view is especially beautiful when leaves are off the trees, as layers of landscape (hills, valleys, different textures from different vegetative cover) can be seen.

## **View 2**



View looking east at boarded up farm house on Woodlawn Trustees property

**View 3**



Vista of Brandywine Valley emerging from woods on crest of hill on Woodlawn Trustees property (looking west)

**View 4**



View of horse farm barn along Beaver Dam Road

## **View 5**



View southwest from trail near the old mill house on the Woodlawn Trustees property

## **View 6**



View from Beaver Valley Road looking southwest at farm

**View 7**



View looking down Beaver Valley Road from top of hill

**View 8**



View of old mill house at intersection of Beaver Valley Road and Beaver Dam Road (looking west)



View of intersection of Beaver Valley Road and Beaver Dam Road looking northeast (old mill house just below the grassy hill in the foreground)

### View 9



View of the water fall on north side of Beaver Dam Road

**View 10**



View of creek on south side of Beaver Dam Road



View of grassy roadside along creek (Beaver Dam Road on the right side of frame)

**View 11**



View of Smith Bridge from east side of Brandywine Creek

**View 12**



View of floodplain along west side of Brandywine Creek

**View 13**



View toward Granogue property looking southwest along Smith Bridge Road

**View 14**



View toward Granogue from railroad track, looking southeast

VIEWSHED ANALYSIS REPORT



View of Granogue property from railroad, looking southeast

**View 15**



View of Granogue looking east from the driveway to the mansion

**View 16**



Vista of the Brandywine Valley from the tower at edge of Granogue property

**View 17**



Granogue tower with vista of Brandywine Valley in the background looking east



View of Granogue from tower looking east

## **View 18**



View of Biderman Golf Course from Adams Dam Road looking west

VIEWSHED ANALYSIS REPORT



**View of Biderman Golf Course looking east from Adams Dam Road**



**View of Biderman Golf Course**

## **View 19**



**View of Brandywine Creek from Creek Road and Ramsey Road intersection**

The most notable findings from the viewshed field day analysis are:

- The quality of the Byway's physical and visual experience comes from the contiguous nature of quaint, historic, undeveloped landscapes; the Brandywine Valley is one of few areas in this region with so many scenic, historic, and natural areas in close proximity to one another and in such high concentration
- Many of the scenic views have limited accessibility; access was either precluded because it could only be viewed from private property, or because it could only be seen safely from a moving automobile.
- Trails along the Brandywine Creek and near Ramsey Farm in the northeast portion of the study area are heavily used by walkers, bicyclists, joggers, and horseback riders.
- Analysis of Zones K, L, and M revealed that views of the Granogue estate in the northeastern portion of the study area (View Zone L) are the most valued; all teams identified Granogue as the highest value viewshed.
- Analysis of Zones K, L, and M revealed that volunteers prefer long views/vistas.
- Many viewsheds that can be seen in winter months when the leaves are off the trees are not likely able to be seen in summer months, which implies that while long views and vistas are

highly valuable aesthetics in the leaf-off months, aesthetic details and immediate roadside/trailside views will be of most scenic value in the summer (leaf-on) months.

The viewshed analysis field day did not cover all of the areas identified with valuable, threatened views. The following View Zones that fall within the viewshed analysis study area have yet to be verified in the field: A, F, G, H, I, J, N, P (see Figure 3.2.A).

The individual landscape characteristics used for ranking viewsheds in the technical analysis (landform, vegetation, water resources, and historic/cultural features) accurately predicted the general areas in which views are particularly scenic, according to volunteer feedback from the viewshed field day. However, it was clear from feedback that the wider setting, sequence of views, and viewshed expanse are factors influencing scenic quality, but is not accounted for in the technical analysis. Consequently, any technical analysis findings that do not also factor in field verification may be able to identify the general vicinity in which views are particularly beautiful, but will lack specificity, especially with regard to context. If possible, all View Zones should be field verified.

Additional information regarding the views that were not assessed during the viewshed field day can be gleaned from previous studies. The following is a list of views and characteristics identified in other past planning documents cited at the beginning of this document. The CMP provides a good description of the many viewsheds not field verified on viewshed analysis field day<sup>12</sup>.

#### **Along Kennett Pike**

- Twin Lakes property
- Canby Park (in Centreville)
- Lower Brandywine Church
- Snuff Mill Road
- Wilmington Country Club and Winterthur

#### **Along Montchanin Road**

- Brandywine Creek State Park/Winterthur at Adams Dam Road
- At Smith's Bridge Road
- At Twaddell Mill Road

#### **Desirable visual elements**

Viewshed analysis volunteers identified and documented some examples of elements of the landscape and built environment that are pleasing and may provide examples for design guidelines to be incorporated in to management and implementation components of the Scenic Conservation Plan.

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<sup>12</sup> Op. Cit., Corridor Management Plan, Pages 5-21 through 5-23.

## VIEWSHED ANALYSIS REPORT

The following list represents volunteers' responses to the question "what is the single most memorable/valuable/significant viewshed/visual element of the Byway":

- Open land and twisting, winding roads (See photo from Group 2)
- View on peak across from Ramsey Farm looking over valley to Granogue
- Nature and wildlife
- View of Granogue
- The walk to the spot overlooking Winterthur and Biderman Golf Courses
- Creek road and Brandywine Creek State Park

The general responses volunteers gave regarding what they value about the Byway views and visual elements was elaborated upon when volunteers went into the study area to document details of their preferences. The following is a list of those elements:

- The boulders demarking the parking lot east of the intersection of Beaver Valley and Beaver Dam Roads are a nice aesthetic; the natural material blends well with the context. Boulders like those shown in the picture above are used throughout the study area to denote boundaries, border parking lots and denote special areas.

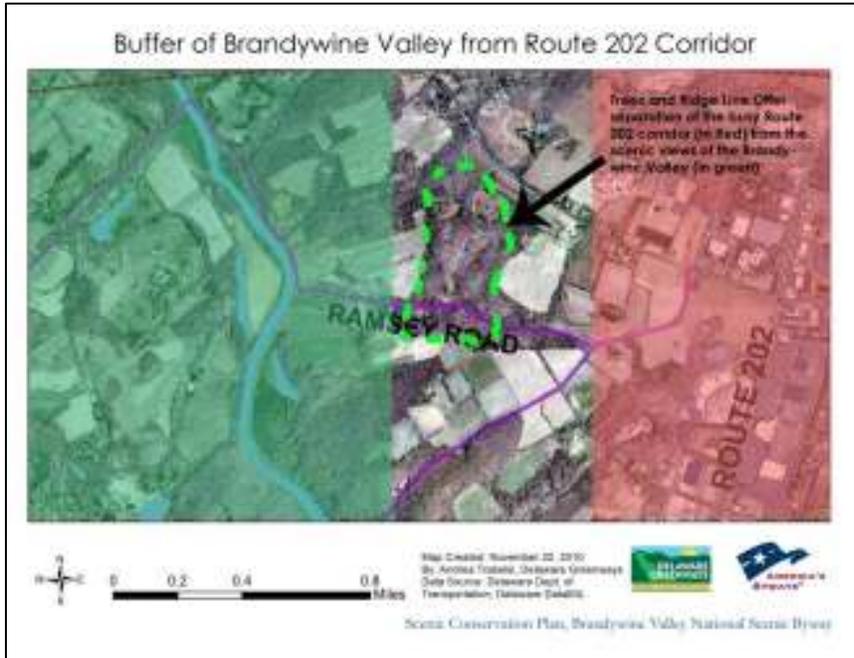


- The grassy area next to the creek and separated from the road by the boulders offers non-motorized travelers a place of refuge. Using a grassy walkway and Boulders to delineate a walkway rather than asphalt helps keep the area looking natural and rustic, while also providing for pedestrian safety. While there is a small parking area at a scenic part of Beaver Valley Road, along the majority of the road there is no place to safely park on the roadside and there are no pedestrian facilities leaving much of the road inaccessible to pedestrians.



## VIEWSHED ANALYSIS REPORT

- Zone M areas were well insulated from the noise and busyness of the developed areas (i.e. Route 202 and shopping strip) within a half mile to the east; forested areas provided visual and auditory insulation. Maintaining forested buffers of sufficient width will provide a solution for accommodating development as well as protecting the Byway character.



### Undesirable visual elements

Viewshed analysis volunteers also identified and documented specific visual elements found in the study area that detracts from scenic quality. The following undesirable elements that take away from the experience of the BVNSB landscapes include:

- Unsightly, degraded reinforced shoulder at Montchanin Road and Thompsons Bridge Road



- Overabundance of signage (both traffic signage and commercial signage) at Montchanin Road and Thompsons Bridge Road



## VIEWSHED ANALYSIS REPORT

- Railroad bridge covered with graffiti crossing Adams Dam Road northwest of intersection with Montchanin Road



- The approximately 15 foot high wooden and chain link fence along Beaver Dam Road, and the stagnant water and litter are particularly unpleasant. Private property/no trespassing signs were posted all along the fence.



- Unsightly Jersey barriers on Thompson Bridge Road at Brandywine Creek State Park



- Using a natural material for bridges and guardrails would be more aesthetically pleasing.



Other undesirable areas were mentioned by Committee members that were not in the specific area of the viewsheds investigated and documented at the field view. One in particular that was mentioned was the section of Mt. Lebanon Road as it approaches the village of Rockland.

The following comments for improving enjoyment of the BVNSB's scenic beauty were repeated in viewshed questionnaires filled in by the volunteers:

- Make roadways safer for bicyclists and pedestrians
- More trails, and more sidewalk, trail, and secondary road connections
- Create parking/pull-off zones at or near the best views
- More interpretive signs describing the historic/natural/cultural significance of the views
- Reducing the amount or and/or restricting the type of signage
- Make roadways safer for pedestrians and cyclists

## 4. CONCLUSIONS

The technical and qualitative analyses conclude that the viewsheds of the Brandywine Valley are significant both individually and collectively. In fact, the viewshed field day volunteers were clear that while they thought some viewsheds like Granogue could be considered more important than others, all were important and should be preserved to the extent possible and if preservation is not possible, each should be protected with good design. Many viewsheds that can be seen in winter months when the leaves are off the trees are not likely able to be seen in summer months, which implies that while long views and vistas are highly valuable aesthetics in the leaf-off months, aesthetic details and immediate roadside/trailside views will be of most scenic value in the summer (leaf-on) months.

The field views of the study area were replete with elements of good design and examples of how good design can be applied. Also evident was that a definition of sustainability was not complete if it didn't include preservation of the intrinsic values of the viewsheds. The following specific conclusions were derived from the technical analysis and the work of the viewshed volunteers:

- Highly valuable viewsheds identified in this study that are not protected or are under-protected should be considered for placement in total or in part into a preservation program in a fashion that preserves the value of the land for the underlying landowners, including:
  - Portions of the Granogue estate
  - Biderman Golf Course
  - Woodlawn Trustees land
  - Ramsey Farm

## VIEWSHED ANALYSIS REPORT

- Viewpoints identified in this study should be field verified and protected as part of any development plan.
- Additional field verification of other View Zones in the BVNSB study area should be undertaken as the study proceeds and thereafter including scenery along trails.
- Landscapes that buffer developed areas from valuable views help achieve sustainable development. Buffer zones should be identified and protected or enhanced. One example is the areas east of the vantage point in Zone M, where the crest of a hill and a tract of trees separate the views of the Brandywine Valley from the developments along Route 202 to the east.
- The possibility of a Rail-with-Trail line along the track of the East Penn Railroad that runs adjacent to Granogue should be explored.
- Explore the possibility of paving the Northern Delaware Greenway Trail spur between Ramsey Rd and Thompson's Bridge Road to improve access and usability for additional modes and users (e.g. skateboards, rollerblades, wheelchairs, etc.); some feel that this would detract from the natural/rustic character of the surroundings, so consider conducting a survey or focus group of populations that are currently excluded to determine the value of paving the path.

## 5. BIBLIOGRAPHY

- Balling, John D., and John H. Falk. "Development of visual preference for natural environments." *Environment and Behavior*, Volume 14 No. 1. January 1982.
- Blau, David H., Michael C. Bowie, and Frank Hunsaker. "Visual resource inventory and Imnaha Valley study: Hells Canyon National Recreation Area."
- Brown, Terry, Tim Keane, and Stephen Kaplan. "Aesthetics and management: Bridging the gap." *Landscape and Urban Planning*, 13(1986), 1-10.
- La Cour, Sarah. *Battles of Saratoga Viewshed Inventory and Analysis*. Accessed November 18, 2010 at: [http://www.clemson.edu/caah/cedp/cudp/pubs/alliance/13\\_lacour.pdf](http://www.clemson.edu/caah/cedp/cudp/pubs/alliance/13_lacour.pdf)
- Suh, Won-Woo. *Assessment of Visual Resources Desirable for Tourism and Recreational Uses along the Site of Lake Choon-Chon in Korea*.
- USDA Forest Service. "Landscape Aesthetics, A Handbook for Scenery Management." *Agriculture Handbook*, Number 701. December 1995.
- Zube, E.H., Pitt, D.G., and T.W. Anderson (1974) *Perception and Measurement of Scenic Resources in the Southern Connecticut River Valley*. Amherst: Institute for Man and His Environment, University of Massachusetts.

SCENIC CONSERVATION PLAN, BRANDYWINE VALLEY NATIONAL SCENIC BYWAY

## VIEWSHED ANALYSIS REPORT

## APPENDICES

## APPENDIX A: TECHNICAL ANALYSIS DETAILS

Each of the four categories (land form, vegetation, historic features, and aquatic features) that were combined to create the composite scenic value ranking map characteristics were identified and evaluated using a computer-based Geographic Information System. The categories were individually analyzed on a scale of one to three based on a set of decision rules, with a higher number indicating greater scenic value. The decision rules and resulting scenic quality rankings are provided below.

### *LANDFORM RANKING:*

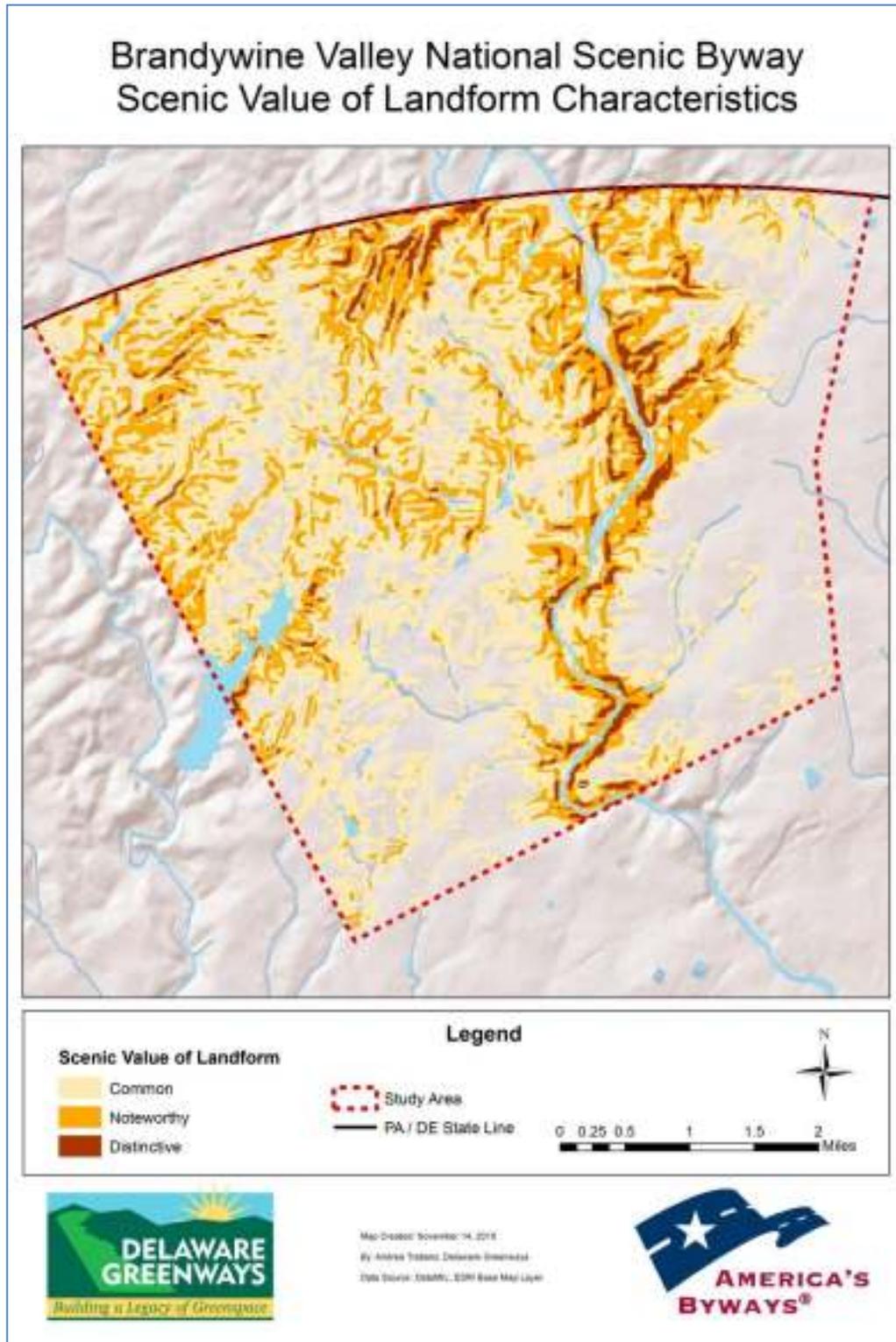
The scenic value of landform characteristics in the study area were ranked according to the slope (or elevational change) of the land. The ranking criteria are shown in Table A. Map A shows the scenic value of the landscape according to its landform.

Table A: Landform Criteria

Slope %*	Scenic Value	Value ranking
5-12%	notable	1
12-25%	distinctive	2
25 % +	outstanding	3

\* A 25% slope is a slope that rises 25 feet vertically in 100 feet horizontally.

Map A



## VIEWSHED ANALYSIS REPORT

## VEGETATION RANKING

The scenic value of vegetative land cover was determined based on vegetation type, area of contiguous coverage of that vegetation type, and the distance at which the vegetation is located from the viewer. The criteria used to rank the vegetative land cover types are defined in Table B.

Table B: Vegetation Criteria

TYPE*	AREA	PROXIMITY		
		Immediate (within 300 ft.)	Foreground (300ft - 0.5 mile)	Mid-ground (0.5 - 4 miles)
Forest	> or = 10 acres	Notable	Outstanding	Outstanding
	< 10 acres, > or = 5 acres	Notable	Distinctive	Distinctive
	< 5 acres	Notable	Notable	Notable
Pasture	> or = 10 acres	Outstanding	Outstanding	Outstanding
	< 10 acres, > or = 5 acres	Outstanding	Distinctive	Notable
	< 5 acres	Outstanding	Notable	Notable
Rangeland**	> or = 10 acres	Outstanding	Outstanding	Outstanding
	< 10 acres, > or = 5 acres	Outstanding	Distinctive	Notable
	< 5 acres	Outstanding	Notable	Notable
Recreational***	> or = 10 acres	Notable	Distinctive	Distinctive
	< 10 acres, > or = 5 acres	Notable	Notable	Notable
	< 5 acres	Notable	Notable	Notable
Marsh	> or = 10 acres	Notable	Distinctive	Distinctive
	< 10 acres, > or = 5 acres	Distinctive	Distinctive	Notable
	< 5 acres	Notable	Notable	Notable

\* Land Cover information acquired through the Delaware DataMIL and is based on aerial imagery taken in the summer of 2007

\*\* unmanicured shrubs, grasses, and other low growth vegetation

\*\*\*includes golf courses, parks, and other manicured vegetation

All areas with predominantly vegetative land cover were at least given a ranking of notable (worth a value of 1 on a scale from zero to three). Forest, rangeland, and pasture received higher rankings overall, as studies show that such vegetation types are often preferred.

Areas not defined as primarily vegetative by the 2007 Land Use and Land Cover data set<sup>13</sup>, including suburban areas with vegetation and buildings, were given a ranking of zero. Although some suburban developments and other lands with buildings may contain significant vegetation

<sup>13</sup> Data sourced from the state's primary GIS online data repository Delaware DataMIL

## VIEWSHED ANALYSIS REPORT

that contributes to positive scenic landscape values, the technical analysis did not distinguish such details. The scenic beauty of those areas will be considered in the qualitative portion of the viewshed analysis.

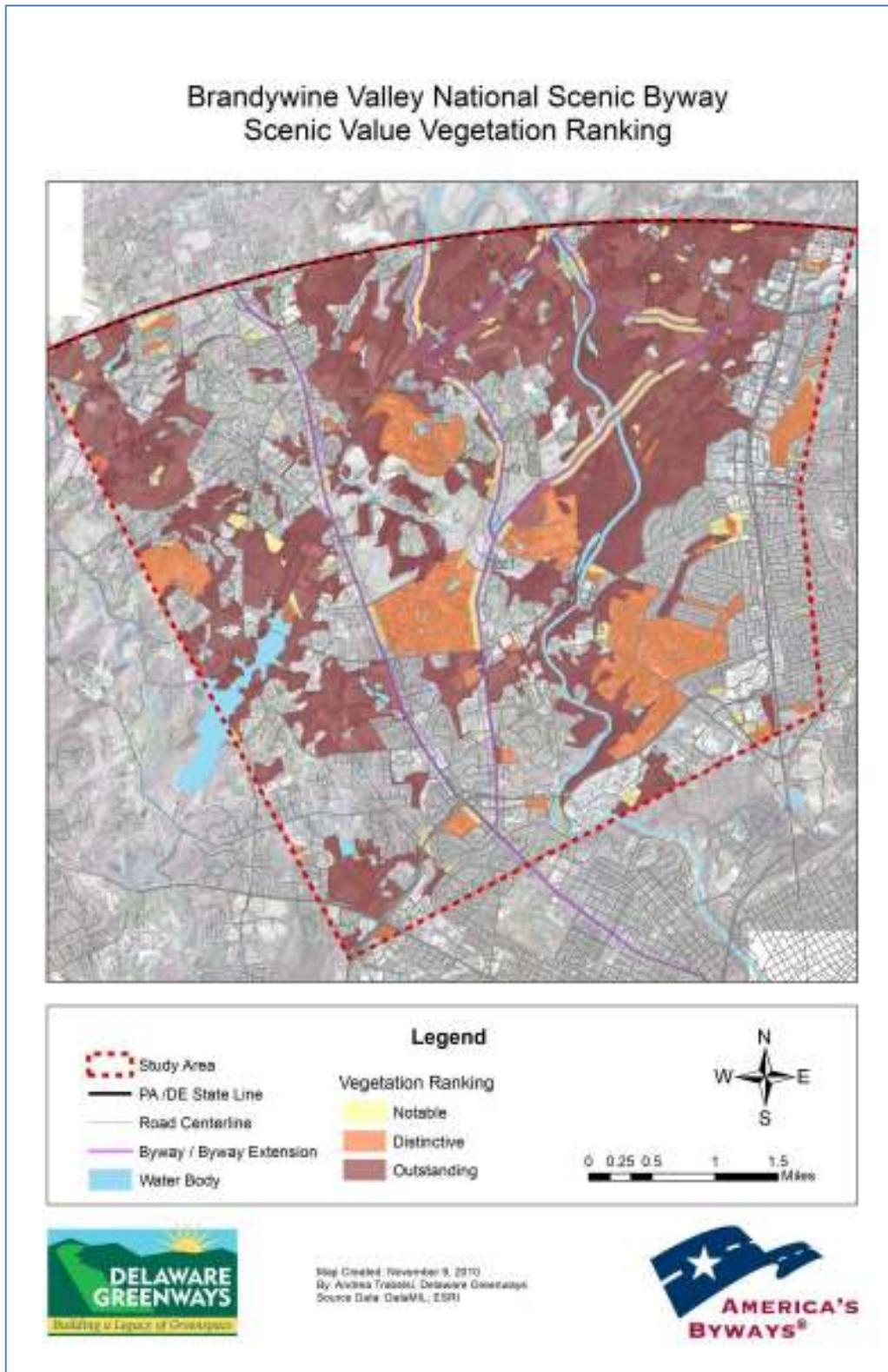
The US Forest Service's handbook for scenery management (US Department of Agriculture, 1995) provided much of the rationale for the proximity criteria in the vegetation category. The handbook defines the qualities of scenery at different distances, which affect how the scenery impacts visual quality, as follows:

- Immediate Foreground (approx. 300 ft.)—fine detail is perceived
- Foreground (300 ft.- 0.5 mile)—Shapes, sizes, and relationships between individual elements define scenic quality
- Middle Ground (0.5 mile - 4 mile)—patterns and topography define the visual quality
- Background (4 miles +)—color, large patterns, and topography define scenic quality

The size of the contiguous patch of a vegetation type and its viewing distance were ranked based on theories of visual composition. For example, larger forested patches often provide a picturesque backdrop (i.e. when seen at a distance); however, up-close views in a forest are often less valuable as views are limited by the dense vegetation.

Given the context of the BVNSB corridor and the study area, the “background” view is not factored into the technical analysis, as the majority of land cover at distances beyond four miles is highly developed, with the exception of land to the north in Pennsylvania. Efforts should be made, however, to collaborate with counterparts in Pennsylvania's Brandywine Valley Scenic Byway Commission to identify and protect valuable scenery that impacts the background condition of views in Delaware, as well as the overall cohesiveness of the bi-state Scenic Byway corridor.

Map B



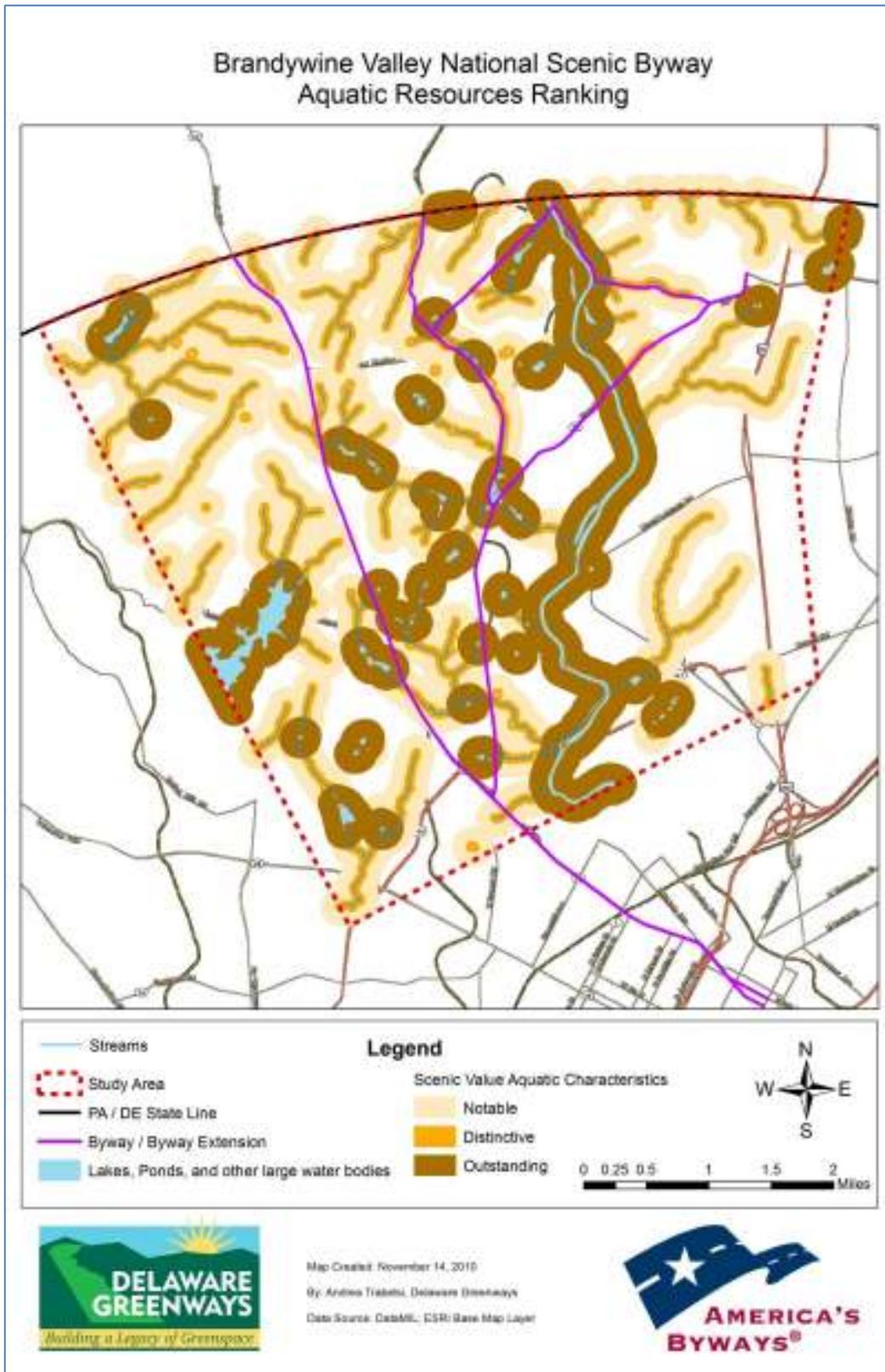
*AQUATIC FEATURES*

Aquatic features rankings were derived based on the accepted standard that views with water are particularly picturesque. Therefore, any areas within 800 feet of a water feature received at least a ranking of Notable (numerical ranking of 1). Larger water features (area greater than 0.5 acres) received the highest ranking, while smaller lakes and ponds, or streams, received lower rankings. The criteria are listed in Table C and rankings for scenic quality with regards to aquatic features are shown in Map C.

Table C: Aquatic Features Criteria

TYPE	SIZE	PROXIMITY	
		Within 200 ft.	200-800 ft. away
Lake, pond, river/creek	< 0.5 acres	Distinctive	Notable
Lake, pond, river/creek	0.5 acres +	Outstanding	Outstanding
stream	undefined	Distinctive	Notable

Map C



*HISTORIC FEATURES*

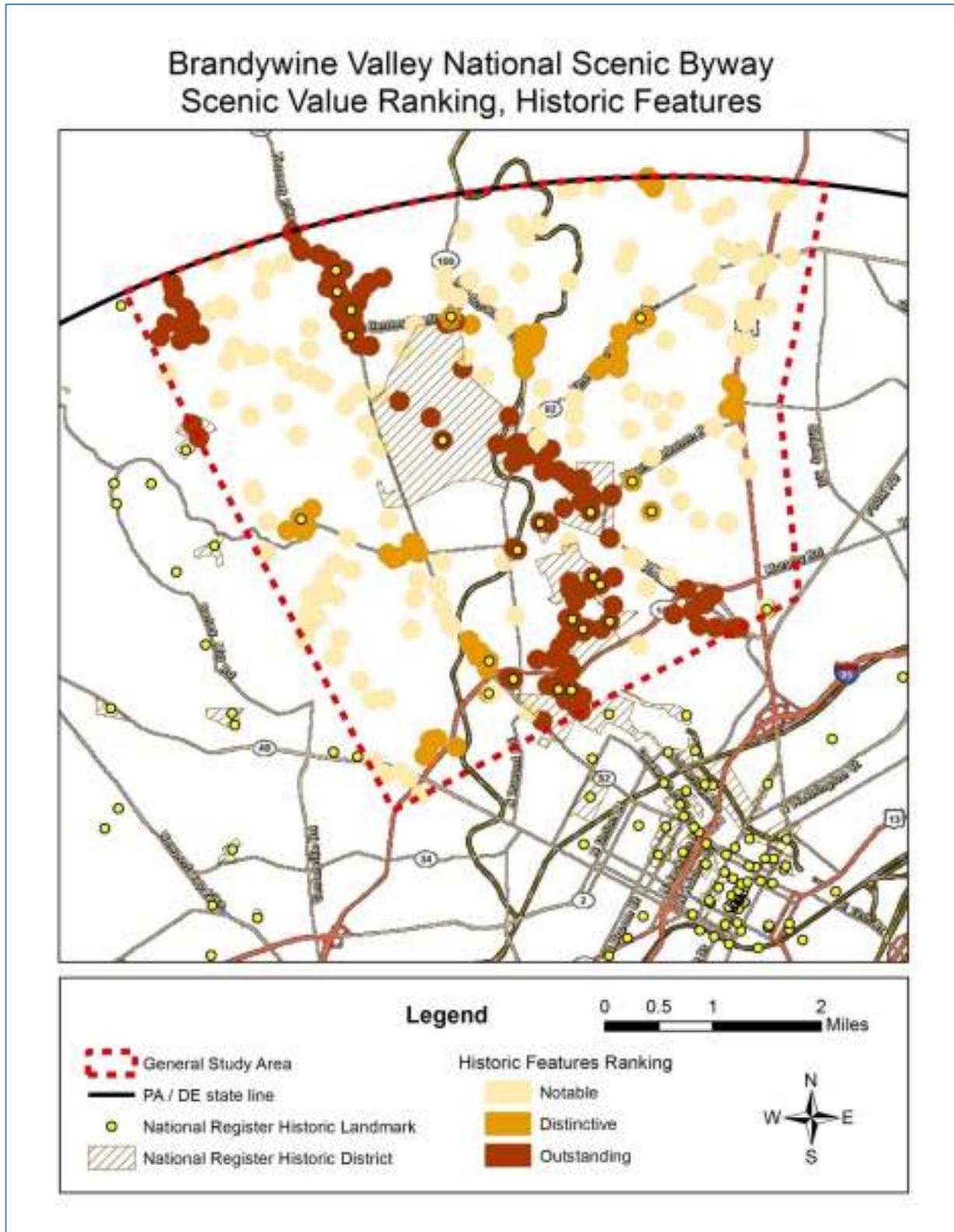
The scenic value of the landscape based on historic features was determined based on the decision rules given in Table D. The areas with most scenic value based only on historic features are shown in Map D.

Historic site locations and data were acquired from the State Office of Historic Preservation. GIS data layers of National Register sites contained very specific attribute information, including the site name and associated dates. All other historic sites come from the state's historic site inventory, which are only identified by a database number; other information about the historic quality of the sites could not be obtained for this analysis.

Table D: Historic and Cultural Characteristics Criteria

Areas within 500 feet of 1-4 sites that are clustered within 1000ft of next nearest site, no National Register sites, and not in National Register historic district	Notable
Areas within 500 feet of 5-10 sites that are clustered within 1000 feet of next nearest site, or a National Register site standing alone (not within 500 feet or a cluster)	Distinctive
Areas within 500 feet of a site located within National Register historic district, or within 500 feet of a cluster of more than 10 sites within 1000 ft. of nearest site (either including or not including a National Register site)	Outstanding

Map D



## APPENDIX B: VIEWSHED ANALYSIS FIELD DAY

### *INTRODUCTION*

The Field Day involved a brief training session, followed by two hours of site visits, and a follow-up discussion and questionnaire.

A total of 11 volunteers participated in the analysis, which took place on Saturday, December 4, 2010. Volunteers were all from northern New Castle County, but the demographic composition of the group varied with regard to familiarity with the study area and special knowledge relevant to scenic conservation issues. The gender make-up was 50% male and 50% female. Group assignments and information obtained from the preliminary survey of volunteers are provided in the list below. Information about the volunteers was provided by the volunteer.

### *FIELD VIEW GROUPS*

#### **Group 1: Zone K and L**

Guide: Bob Weiner (resides at corner of Silverside and Foulk Roads.; Resident of Delaware for most of his life; ancestors arrived in Delaware in 1892; County Councilperson for eastern portion of study area; expertise in land use law, development, smart growth)

- Photographer: Jaynine Warner
- Recorder: Ellie Maroney (resident of Centreville; has resided in Delaware entire life; in the study area every day, going anywhere/everywhere)
- Recorder: James Willson (resident of New Castle; has resided in Delaware for five years; travels through the study area occasionally; expertise in bicycling)

#### **Group 2: Zone L and M**

- Guide: Jeff Greene (Delaware Greenways staff)
- Photographer: Sally DeWees (Resident of Centreville; has lived in DE for 20 years; frequently uses the study area for shopping, visiting friends, taking children to school; expertise in nature/wildlife and photography)
- Recorder: Miguel Pena (Resides near intersection of Foulk and Silverside Roads; has lived in Delaware for 38 years; travels through study area primarily to avoid Route 202)
- Recorder: Jack Hunt

#### **Group 3: Zone M and K (only were able to review zone M)**

- Guide: Andrea Trabelsi (Delaware Greenways staff)
- Photographer: Winnie Li (Resides adjacent to Brandywine Town Center; resident for less than one year; has only traveled in the study area a few times for hiking and biking)
- Photographer: David Zylstra (Resident of Wilmington for approximately 10 years; bicycles regularly in study area; artist)
- Recorder: Janet Kilpatrick (Resident of Hockessin; serves on New Castle County Council; lived in Delaware for 30 years)
- Recorder: Paul Morrill (resident of Delaware City; DE resident for 23 years; has traveled to the study area on occasion; expertise in historic preservation and serves on the Greenway and Trails Council)

## VIEWSHED ANALYSIS REPORT

The teams listed above were assigned two of the three view zones (K, L, or M) and were told to analyze the first view zone assigned, and if time allowed, to analyze the second. General instructions were given to the groups to drive to the assigned view zone, navigate the area by car to get oriented, and then find a safe place to park within a reasonable distance of the areas highlighted for analysis on the assigned view zone maps. The following instructions were given to each group:

**VIEWSHED IN-THE-FIELD ANALYSIS FORM**

This form is to be used for analyzing the views in your assigned view zone. Please follow the instructions below and answer the questions in this form.

In addition to this form, we have provided you with additional forms, maps, and note-paper on which you should document the following (if relevant):

**Views within the study area, but not in your assigned view zone**--Be thinking about the quality of viewsheds and the related characteristics throughout your journey, including travel between DGI and your View Zone. If you notice particularly scenic viewsheds anywhere in the Scenic Conservation Plan study area (i.e. you see something beautiful and it is not highlighted on your View Zone map) we want to know. We also want to know about areas with particularly unpleasant views or features that significantly detract from a view. Please document these elements in a similar fashion as you are for the sights in your assigned View Zone.

**Differences of opinion**--If team members are not in agreement about the quality of a view, the attractiveness of certain features, or other aspects of surveying, please record/document the contrasting viewpoints either within this form or on a separate note page.

**Instructions**

1. Drive to the View Zone
  - ✓ Make note of & photograph any particularly pleasant scenery along your way
  - ✓ Make note of & photograph any particularly unpleasant scenery or characteristics that detract from scenery
2. Find a safe place to park within a reasonable distance of the areas highlighted on the map
3. Make your way around your assigned View Zone (on foot, if safe and access is available, by car, or both ways, to give you a full understanding of how the view can be accessed and aspects from which it can be seen). Think about the following questions and then proceed to answer the questions on the following pages.
  - ✓ How can the views be accessed?
  - ✓ Is access difficult or limited? Why?
  - ✓ Is access for a particular mode of transport better than for others? Why?
  - ✓ Make note of and photograph particularly pleasant views (and viewing points)
  - ✓ Make note of and photograph particularly unpleasant views (and viewing points) or characteristics that detract from a view

This form contains analysis relating to view zone\_\_\_\_\_.

This form was filled-out by \_\_\_\_\_.

**Best View in the View Zone**

1. The most beautiful view in this view zone that we were able to see is located... (Please identify approximately the area you are viewing and the location from which you are viewing on map. Also, please supplement with verbal description)

I have taken a photo of this view and it is my \_\_\_\_\_ image of the day; the view location is indicated as \_\_\_\_\_ on the map.

VIEWSHED ANALYSIS REPORT

2. The view was visible / accessible by \_\_\_\_\_ (e.g. bicycle, walking/hiking, roadway, trail, all of the above, etc.).

3. Please explain how immediately visible the view is:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

4. Based on your familiarity with the Brandywine Valley and its environs, on a scale of 0 to 4 how do you rate this view? (0 = not valuable scenery compared to other views I know of in the Brandywine Valley, 1 = scenery below average quality compared to other views in the area, 2 = scenery of average quality compared to other views in the area, 3 = scenery of above average quality compared to other views in the area, 4 = scenery of the highest quality in the area.

5. The specific characteristics of this viewshed that leads me to give it the above rating are... (please select one or more characteristics and explain specifics in adjacent space)

- a.  historic features
- b.  well-preserved and pristine nature
- c.  unique/special vegetation
- d.  visual composition (unity or contrast)
- e.  setting
- f.  viewshed expanse
- g.  topography
- h.  topography
- i.  other

6. This viewshed could be improved/enhanced by...

- a. (Please explain below, considering factors such as unsightly signage, proximity to disjointed/clashing land uses, planting more trees, etc.)

*The previous six questions were also asked in regard to the second and third best views*

**Particularly Unpleasant Views**

1. I noticed the following unpleasant views or characteristics of views in the view zone... (Please identify approximately the area you are viewing and the location from which you are viewing on map. Also, please supplement with verbal description)

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

\_\_\_\_\_ I have taken a photo of the above and it is my \_\_\_\_\_ image of the day; the view location is indicated as \_\_\_\_\_ on the map.

2. Please indicate what is particularly unpleasant and to what degree you think the view could be improved, and also please explain how it could be improved.

**Other aspects of scenery I noticed**

Certain details of the landscape/scenery I noticed, which are particularly appealing:

I have taken a photograph of the above element and it is the \_\_\_\_\_ photo of the day. The viewshed (subject) and the viewing point from which the subject was viewed are indicated on the map as \_\_\_\_\_.

Please share anything else relating to scenic quality and your experiences today that you think may be of interest with regard to scenic characteristics and qualities of the Brandywine Valley area.

*FINDINGS***Group 1 Findings for Zones K and L**

<b>Best View:</b> view from water tower on Smith Bridge Rd. overlooking Granogue and Jamie Wyeth property	
Rating:	4/4; scenery is of the highest quality in the area, based on familiarity with the Brandywine Valley
Valuable Characteristics:	Historic features, well-preserved and pristine nature, visual composition, setting, viewshed expanse, and topography
<b>Second Best View:</b> Smiths Bridge Rd. near the bridge and along the floodplain	
Rating:	4/4; scenery is of the highest quality in the area, based on familiarity with the Brandywine Valley
Valuable Characteristics:	Historic features, well-preserved and pristine nature, visual composition, setting, viewshed expanse, and topography
<b>Third Best View:</b> Ramsey Road and Creek Road looking along the Brandywine	
Rating:	4/4; scenery is of the highest quality in the area, based on familiarity with the Brandywine Valley
Valuable Characteristics:	well-preserved and pristine nature, visual composition, setting, viewshed expanse, and topography

**Group 2 Findings for Zone L and M**

<b>Best View:</b> Approximately where Smith Bridge Road crosses the railroad tracks (houses on SE side and railroad on NW side), looking up toward Granogue	
Rating:	4/4; scenery is of the highest quality in the area, based on familiarity with the Brandywine Valley
Valuable Characteristics:	the long views, historic feature (remnants of rail signage), well-preserved and pristine nature (open space/farmland), unique/special vegetation, visual composition, topography
Opportunities for enhancement:	improved access, including vehicle parking, bike/walking paths, possibly monthly periods of restricted auto access; perhaps the railroad right of way may eventually provide room for ped/bike trail?
Other:	<ul style="list-style-type: none"> <li>The view is accessible by roadway, including biking. Walking would be difficult/dangerous with little shoulder room on the road;</li> <li>In leaf-off season, direct views are seen from the road. Views are likely blocked or partially blocked in full foliage seasons</li> </ul>
<b>Second Best View:</b> Beaver Valley Road at Beaver Dam Road	
Rating:	3/4; scenery of above average quality compared to other views in the area
Valuable Characteristics:	historic features; well-preserved/pristine nature; unique/special vegetation; viewshed expanse; small Woodlawn Trustees parking area available with view of old mill house and the creek

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## Group 3 Findings for Zone M

<b>Best View (Tie):</b> From the hilltop of Woodlawn Trustees property (across from Ramsey Farm) looking west over the Brandywine to Granogue	
Rating:	4/4; scenery is of the highest quality in the area, based on familiarity with the Brandywine Valley
Valuable Characteristics:	the long/wide views, historic features (nearby boarded up farm house), well-preserved and pristine nature, visual composition, setting, topography
Other:	<ul style="list-style-type: none"> <li>It was unclear whether the property was public or private when the group originally accessed the area</li> </ul>
<b>Best View (difference of opinion):</b>	Stream along Beaver Valley Road toward Ridge Road intersection where elevation changes and there is a waterfall
<b>Second Best View:</b> Beaver Valley Road with creek and grassy area protected by rocks, with waterfall across the road	
Rating:	3/4; scenery of above average quality compared to other views in the area
Valuable Characteristics:	historic features; well-preserved/pristine nature; topography
<b>Second Best View (difference of opinion):</b> Beaver Valley Road at Beaver Dam Road, looking down on the old mill house from the west (up on the hill)	
Rating:	3/4; scenery of above average quality compared to other views in the area
Valuable Characteristics:	historic features; well-preserved/pristine nature; topography (unique viewing aspect)
<b>Third Best View:</b> emerging from the woods on the Woodlawn Trustees Trail, heading toward the old mill house at Beaver Valley Road/Beaver Dam Road intersection	
Rating:	3/4
Valuable Characteristics:	historic features (red barn glimpsed through trees); well-preserved/pristine nature; unique/special vegetation (erosion control fields)

## APPENDIX C: LIST OF SCENIC VIEWS FROM THE CORRIDOR MANAGEMENT PLAN

The following list of high quality views is from Chapter 5 (pages 5-21 to 5-23) of the Corridor Management Plan. The list was informed by the *Brandywine Valley Scenic River and Highway Study*, published by New Castle County in 1987.

### *HIGH-QUALITY VIEWS ON KENNETT PIKE*

#### *Brook Valley Road*

Between Brook Valley Road and Campbell Road (Route 82), the open landscape and wetlands of the scenic Twin Lakes property are clearly visible. It is the first large DuPont estate and open space on the Byway as you leave the village of Greenville and head out into the countryside. Five generations of DuPont's have lived here and the viewshed has remained largely the same. Sixty two acres of the property was recently sold to the State of Delaware to preserve it as open space. Children and families can be seen skating on the ponds, creating a bucolic winter scene. This view still retains the characteristics that identified it as a visual accent in the Brandywine Valley Scenic River and Highway Study published by New Castle County in 1987. For about 200 years a colonial pear tree grew near the entrance to Twin Lakes and became a landmark on the Scenic Byway. The old tree was patched and repaired with cement, but it finally came down in 1967. A new pear tree grows in its place from the old roots. The old pear tree was carefully avoided when the road shoulders were widened and was allowed to remain as an historic landscape feature.

#### *Canby Park*

The pasture north of Center Meeting Road and Twaddell Mill Road is a scenic view that was not identified in the 1987 study. Despite that fact, this view is significant because it includes a grassland meadow, an important environmental feature.

#### *Lower Brandywine Church*

Lower Brandywine Church and Cemetery between Old Kennett Road and Pyles Ford Road is a significant historic resource as well as a high-quality view. The church, the cemetery, and the trees on the property (especially oaks and cherries) were identified as visual accents in 1987. North of the Lower Brandywine Cemetery is a view of a pond, long meadow, and nineteenth-century barn. This view is one of the most reproduced scenes along the byway.



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### *Snuff Mill Road*

North of Snuff Mill Road is a pasture that was once associated with the Oberod estate and extensive property that includes the Lunger mansion built in the late 1920s. The 1987 study identifies this location as a “vista point.”



### *Wilmington Country Club and Winterthur*

Views east toward Wilmington Country Club and Winterthur between Campbell Road and Pyles Ford Road were identified in the 1987 study as one of the scenic highlights of the area.



### *HIGH-QUALITY VIEWS ON MONTCHANIN ROAD*

Many of the views along Montchanin Road are enclosed by trees. Locations of open views include the following:

### *Brandywine Creek State Park / Winterthur*

A series of views between Adams Dam Road and the railroad bridge at Guyencourt Road is highly significant to the character of the byway. The 1987 study identified this area as “one of the most powerful and visually significant landforms in all of Delaware: the Great Broadloaf Hill opposite the Adams Dam Road intersection.” Other visual accents identified in the 1987 study include a large white oak tree, a grove of tulip, beech, and oak trees, and two



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bridges. Although the bridges at this intersection have now been replaced, the new bridges evoke the character of earlier bridges.

### *Smith's Bridge Road*

The 1987 study identifies the intersection of Montchanin Road and Smith's Bridge Road "as perhaps the most visually significant crossroads landscape of the entire area... [T]his juncture features a wealth of field, forest, swampland, large trees, stone bridges, and old buildings and barns."

### *Twaddell Mill Road*

Views north of Twaddell Mill Road near the Delaware-Pennsylvania state line include a grassland meadow. Although this view was not identified in the 1987 study, it appears to meet criteria for a scenic view.