

Battles of Saratoga Viewshed Inventory and Analysis

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Abstract

The Revolutionary War history of the Old Saratoga region of New York is unique in having the protection of the Saratoga National Historical Park (SNHP). Although rich in historic and scenic value, the region is one of the fastest-growing areas in the state and much of the surrounding contextual landscape is threatened by development. The identification and analysis of significant historic resources and viewsheds related to the Revolutionary War outside the existing protected area is the first step in the long-term preservation and protection of additional lands that contribute to the SNHP. Developing a preservation strategy that crosses municipal boundaries and understands and engages the diverse interests of multiple stakeholders is critical to the protection of this region for the future.

Key Words

Battlefield protection, viewshed, Geographic Information Systems (GIS), scenic analysis,

Introduction

Widely acknowledged for its rich history and scenic character, the Old Saratoga on the Hudson region of New York is also one of the fastest growing areas in the state. Beautiful farmland, breathtaking views, and critical cultural sites are being compromised at a rapid rate by development. Luckily, many of these extraordinary landscapes on which major Revolutionary War events occurred have been protected by the Saratoga National Historical Park since 1938. The circumstances surrounding the battles, siege and ultimate surrender of British General Burgoyne in July and August of 1777, considered by many historians as events that turned the tide of the war, were strongly influenced by the landscape features of the area. The topography of the region and the confluences of the Hudson River and Fish and Batten Kills, provided a unique terrain for strategic troop movements and positioning.

The identification and assessment of significant historic resources outside of SNHP boundaries provides an opportunity for a collaborative approach to their protection. Because the extent of the resources and their associated viewsheds cross six municipal boundaries (including the towns of Saratoga, Stillwater, Northumberland, Greenwich and Easton and the Village of Victory), as well as the jurisdiction of many non-profit land conservation organizations (including Saratoga

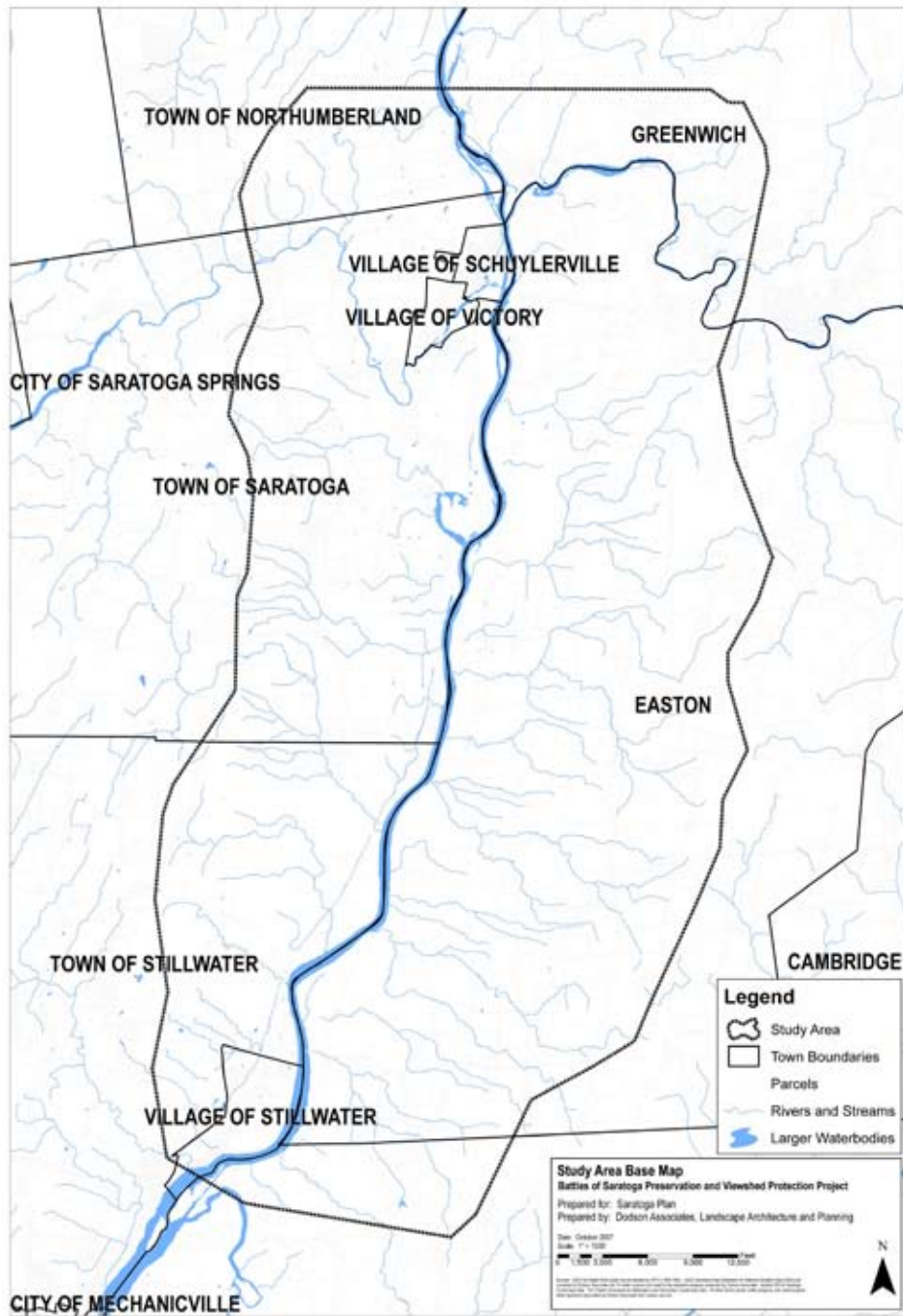


Figure 1. Battles of Saratoga location map with viewshed boundaries. (Dodson Associates, Ltd.)



Figure 2. View from Saratoga National Historical Park, Stillwater, NY. (Dodson Associates, Ltd.)

Plan, the Agricultural Stewardship Association, the Battenkill Conservancy, and the Land Trust Alliance), a unified and coordinated effort to preserve them is critical.

This paper describes the approach that Dodson Associates used to provide the inventory and analysis foundation for future development of a comprehensive historic and scenic resource preservation planning strategy. The approach included an in-depth inventory and assessment process, public participation, and mapping and visual analysis using Geographic Information System technology. As a result, historic resources were identified and

prioritized for conservation, and a basis was established for the development of a future regional, community-based preservation plan.

Inventory and Analysis

The inventory and analysis process looked at two types of resources: historic resources and scenic resources. For each resource type, existing data were identified, reviewed, and mapped. Although the data collection and analysis process was similar for both historic and scenic resources, each resource type had its own unique criteria and assessment factors, as described more fully below.

Historic Resources: Inventory

The first step in the Historic Resources Viewshed Analysis was to inventory and compile existing data from previous studies and plans that included information regarding the battles, siege, and surrender at Saratoga. This step also included secondary source data from the National Park Service (NPS) American Battlefield Protection Program (ABPP) project completed in 2001, the Saratoga County Green Infrastructure Plan, the Agricultural Stewardship Association, and input from many local town historians. In-depth research to identify new primary resource sites was not part of this scope of work.

In reviewing the data, gaps in information were found relative to the battles, siege, and surrender. In an attempt to fill some of these gaps, documents such as historic maps and diaries were reviewed at the Saratoga National Historical Park archives. To provide a regional and diverse perspective, an Advisory Committee of key stakeholders was created to inform the process. The Committee consisted of local planning professionals, representatives from Saratoga County government and several regional non-profit land trusts. With the updated data in hand the Committee, defined a historic timeframe of interest, as well as physical boundaries for the study area. The defined period of significance started generally with British and American encampments along the Batten Kill prior to General Burgoyne's crossing the Hudson River and his initial march to Stillwater in early September 1777, and continued through the surrender on October 17, 1777. The majority of historic sites associated with this timeframe are concentrated within the Hudson River Valley and the corridor formed by the topography of the north-south ridgelines.



Figure 3. Cemetery and Monument at Site of Colonel Morgan's Riflemen, Saratoga, NY. (Dodson Associates, Ltd.)

Historic resources were then divided into three categories for inventory, assessment, and mapping purposes: primary resources, secondary (associated) resources, and geographic context (viewshed) resources (Table 1). All of the resources were recorded on a Historic Resources Inventory Map. During the inventory process, several additional historic sites were identified, and needed further documentation and research to determine their location and/or significance to the battles, siege and surrender at Saratoga. The additional sites were identified separately on the Historic Resource Inventory Map (Figure 4).

Categories of Historic Resources	
Primary Resources	Sites with direct historic value related to the battles, siege, and surrender at Saratoga as documented in the ABPP project, New York State (NYS) Museum State Historic Markers, and sites listed on the NYS or National Register of Historic Places. Examples of these sites included American and British troop movements and encampments outside of the SNHP boundaries, and many sites in Victory and Schuylerville relating to the siege and surrender.
Secondary (Associated) Resources	Historic places and landscapes that have a tangible connection or contextual relationship to the battles, siege, and surrender at Saratoga. These include farmsteads such as the Becker Farm in Easton, ferry sites, historic roads, and natural or geographic features that were present and significant to Revolutionary War events related to the battles, siege, and surrender.
Geographic Context (Viewshed) Resources	Larger geographic area that surrounds the primary and secondary historic resources and contributes to their cultural significance. This area includes the Hudson River Valley corridor from southern Greenwich to the village of Stillwater and extends out to the ridgelines to the east and west, including Willard Mountain.

Table 1. Categories of Historic Resources

Historic Resources: Assessment

The second step in the Historic Resource Viewshed Analysis was evaluation of the resources. The assessment was based on the *U.S. Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. The guidelines define seven factors that assist in understanding the historic value of sites and the significance of natural and man-made changes over time. Those factors include: response to natural features, change and continuity, integrity and existing conditions, and geographical context. The four factors used by the team in the process of this project are summarized in Table 2.

Based on these factors, five criteria were then defined to rate historic sites and determine their priority status for future preservation and protection activities. Those five criteria were historic significance, integrity, context, continuity, and accessibility. Within each of the five criteria there was a ranking of high, medium, and low (with related point values for each rank) to quantify the results of all primary and secondary historic resources. The criteria and the ranking system are summarized in Table 3.

Although all historic sites identified in the original ABPP project were included in the inventory, only sites not already owned by the NPS were assessed. Those owned by the NPS were assumed to meet the highest criteria and hence were considered to be of high ranking.

Factors Used to Assess Historic Resources	
Change and Continuity	The natural processes and human activities that change and shape the cultural landscape, including the widening of roads and the loss of open space to general growth and development.
Integrity and Existing Conditions	The physical evidence of historical features and their current condition, such as earthworks and structural remnants that are still discernable.
Geographical Context	The surrounding cultural landscape that, through its continuity, contributes to the significance of historic sites such as the remaining farmland in Easton and Colonel Morgan's knoll above the Saratoga monument.
Natural Features	The historic character based on human response to natural features and systems such as the Hudson River, the Fish and Batten Kills and the topography of the region including Willard Mountain.

Table 2. Factors Used to Assess Historic Resources

From the ranking criteria and point system, the highest-ranked historic sites were those with most historical significance, highest integrity and/or the highest contextual value. Examples of those types of resources include General Fellows' lines and fortifications in Easton; Colonel Morgan's line and entrenchments in Saratoga; bridge and ferry sites along the river; and natural features of cultural significance such as the Fish and Batten Kills and Willard Mountain.

Historic Resources: Viewshed Analysis

The final step of the process was a viewshed analysis. Those historic sites with a ranking of 10-14 points were used as observation references to determine the overall geographic context and significance of the associated cultural landscape in the valley. The viewshed analysis was

conducted using GIS and the National Elevation Dataset (NED) available for download from the United States Geologic Service (USGS) Seamless Distribution System. To assist the process, a viewshed grid with a cell size of 10 meters was used within the study area along the north-south corridor between Schuylerville and Stillwater.

Although the resulting information can be displayed in a number of ways, two aspects were most useful. First, the viewshed was displayed in the simplest terms of "visible" and "not visible." Any point of land that would be visible from any one of the observation points was considered visible; this was based on topography only, not accounting for buildings and vegetation. Second, the displayed data was categorized by the number of observation points visible from any given point in the study area. The resulting map depicts a range of categories from a low ranking of no points visible (the same as

the “not visible” areas from the first map) to a high ranking of 13 points visible (the most observation points visible from a single location). This categorization allowed for the ranking of areas of land based purely on the impact they are likely to have on the collective viewshed of the historic sites. In viewing the GIS maps, note that the darkest area indicates the areas of highest sensitivity, hence highest priority to conserve.

Scenic Resources: Inventory

In order to analyze effectively the scenic landscape character within the region and its relationship to the historic resources, a scenic inventory and assessment were completed. The scenic landscape inventory began with the identification of visual districts—areas that have a cohesive visual appearance or character. The visual districts were identified through site visits, aerial photo analysis, and review of historic documents. For the purposes of this project, scenic visual districts were identified only within the historic corridor study area. Similar visual patterns and edges were identified and mapped on aerial photos. The edges of visual districts consisted of physical barriers (buildings, vegetation, terrain) or of changes in visual characteristics (land use or land cover). Visual districts can be large areas such as the stretches of farmland east of the Hudson River or small areas such as a street, neighborhood, or forestlands. Whether large or small, visual districts share a single, unified visual appearance.

Scenic Resources: Assessment

Similar to the historic resources assessment process, the visual districts were ranked by using a series of criteria. The criteria for the scenic resource

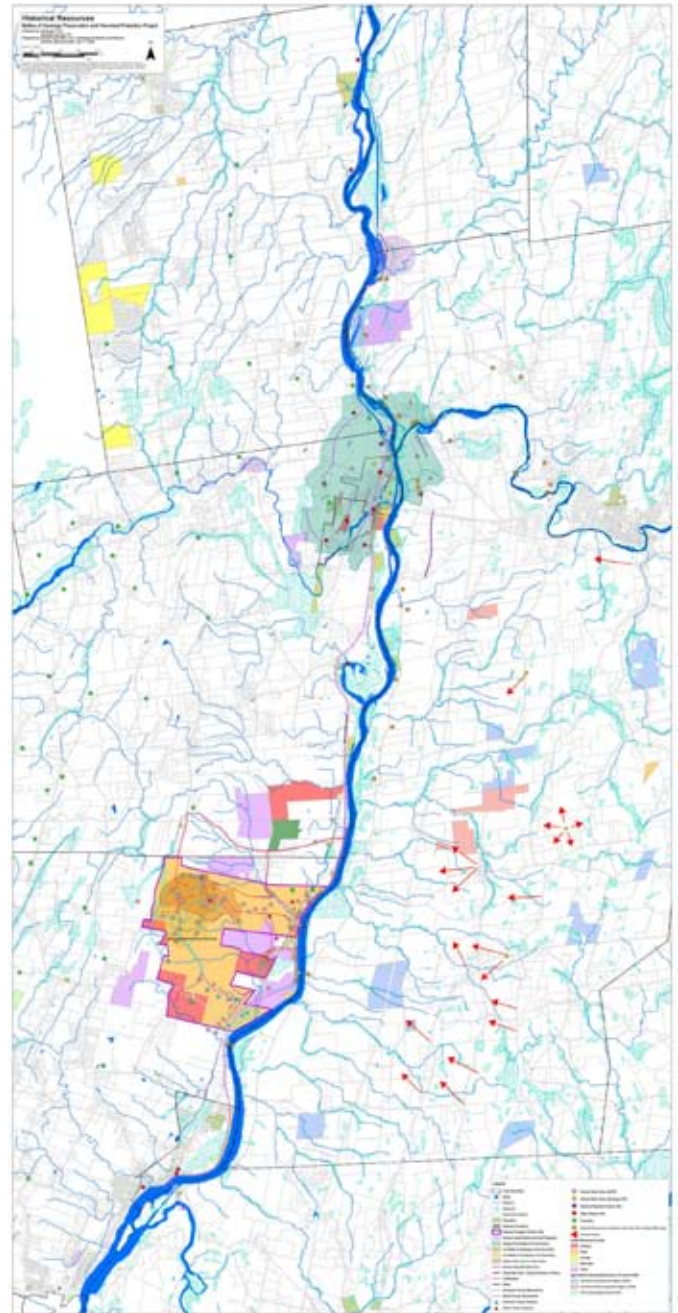


Figure 4. Historic Resources Inventory Map. Potential historic sites that will need further research and documentation are indicated on the map by a red asterisk. (Dodson Associates, Ltd.)

Criteria Used to Rank the Priority Status of Historic Resources	
<i>Historical Significance</i>	
High (3)	Contains direct historical significance to the battles, siege, and surrender at Saratoga based on actual events or activities that took place there.
Medium (2)	Contains indirect historical significance to the events of the battles, siege, and surrender based on its relationship to the larger context of the Revolutionary War along the Hudson River Valley.
Low (1)	Contains cultural significance based on its existence during the Revolutionary War period.
<i>Integrity</i>	
High (3)	Contains clear physical remnants of events or activities related to the battles, siege, and surrender at Saratoga.
Medium (2)	The general landscape configuration and character as it was during the battles, siege, and surrender is apparent.
Low (1)	Does not contain any physical remnants or general landscape character.
<i>Context</i>	
High (3)	A majority of adjacent parcels remain undeveloped and in the same general landscape character as during the battles, siege, and surrender.
Medium (2)	Some adjacent parcels remain undeveloped.
Low (1)	No adjacent parcels remain undeveloped.

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<i>Connectivity</i>	
High (3)	Is located within one-quarter mile of another historic resource or site.
Medium (2)	Is located within one-half mile of another historic resource or site.
Low (1)	Is farther than one-half mile from another historic resource or site.
<i>Accessibility</i>	
High (3)	Is both physically and visually accessible.
Medium (2)	Is either physically or visually accessible, but not both.
Low (1)	Is neither physically nor visually accessible.

Table 3. Criteria Used to Rank the Priority Status of Historic Resources

assessment were developed by Dodson Associates in coordination with the NYS Department of State, Division of Coastal Resources Scenic Areas of Statewide Significance Program. Furthermore, a public image poll was conducted to indicate the visual preferences of the local community. The results of that poll indicated that the highest-ranked visual features were predominately undulating and rolling hills, cultural and historic features, agricultural land, large tracts of woodland and forest, and long views. Ultimately, seven criteria were defined for the scenic assessment: landform, vegetation, water, land use, cultural/historic character, views, and composition. Within those seven criteria, a ranking of high, medium and low (with associated point values) was defined (Table 4).

Composite Analysis

For the final analysis, the historic value and scenic quality map layers were overlaid. Additionally, a visual threat analysis of the most historic and scenic areas vulnerable to development was prepared. Another consultant, the LA Group, identified parcels determined to be the highest priority for preservation within those lands currently owned by the SNHP in Stillwater and Saratoga.

In order to perform a composite analysis that would compare “like to like,” all polygon layers from the previous maps were converted to raster so that Dodson Associates could proceed with a “raster math” analysis in ArcGIS. For the composite analysis all three datasets were reclassified to equalize the individual ranking systems to a scale of zero (0) to twenty (20). A high score

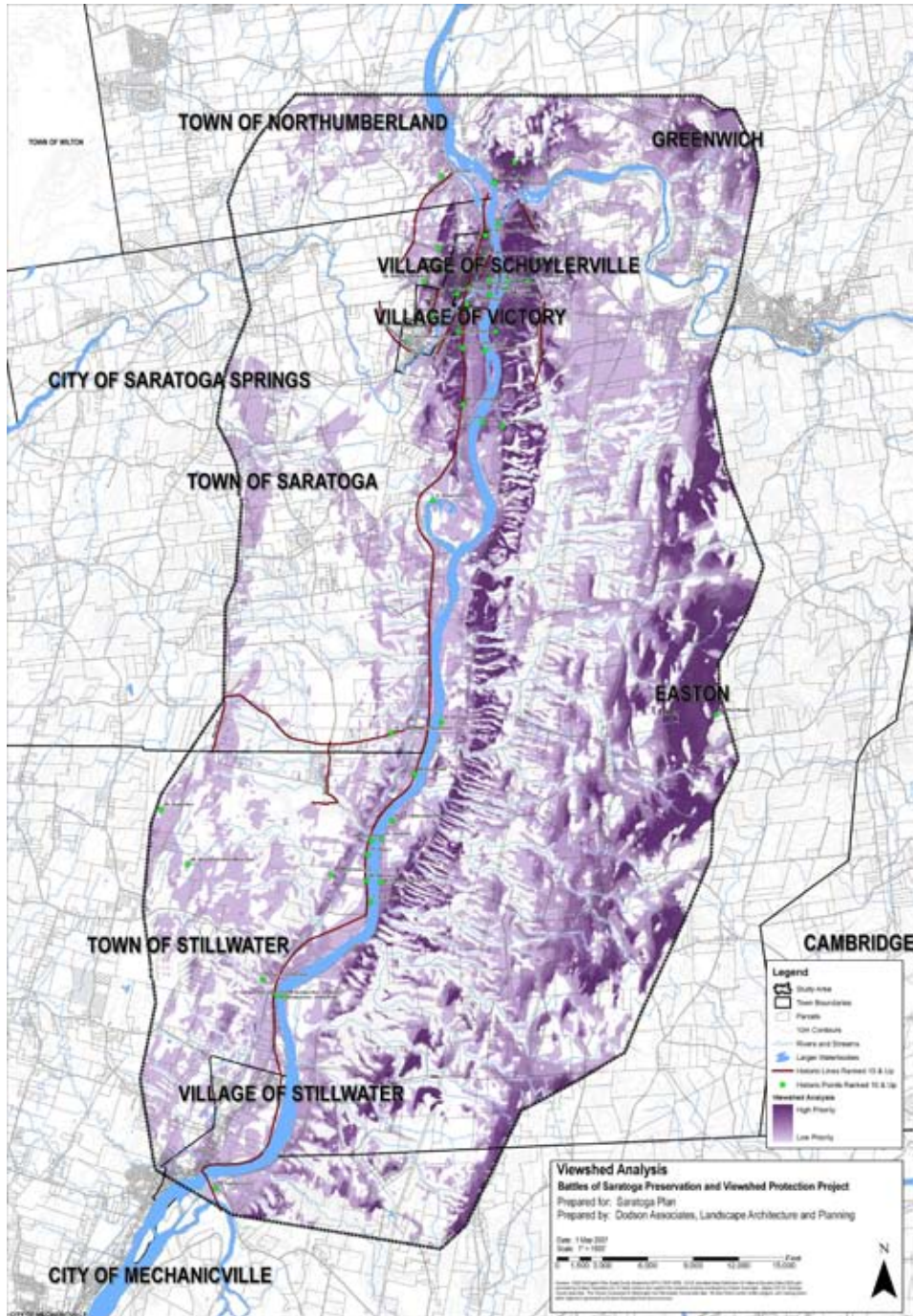


Figure 5. Historic Sites Viewshed Analysis Map. (Dodson Associates, Ltd.)

Criteria Used to Rank the Priority Status of Scenic Resources	
<i>Landform</i>	
Distinctive (3)	Prominently undulating hills in and along the river valley.
Noteworthy (2)	Gentle slopes and rolling hills.
Common (1)	Predominantly flat terrain.
<i>Vegetation</i>	
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.
<i>Water</i>	
Distinctive (3)	River predominant within foreground view.
Noteworthy (2)	River/creek in the view.
Common (1)	No water.
<i>Land Use</i>	
Distinctive (3)	Agricultural land.
Noteworthy (2)	Parkland, open space, and natural areas.
Common (1)	Modern residential development and streetscapes.

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<i>Cultural/Historic Character</i>	
Distinctive (3)	Predominant features related to the Revolutionary War.
Noteworthy (2)	Other regional, cultural, and historic features.
Common (1)	Few cultural or historic features.
<i>Views</i>	
Distinctive (3)	Long and wide.
Noteworthy (2)	Medium and/or narrow.
Common (1)	Short.
<i>Composition</i>	
Distinctive (3)	Significant unity and contrast.
Noteworthy (2)	Some unity, contrast and variety.
Common (1)	Lack of unity, contrast and variety.

Table 4. Criteria Used to Rank the Priority Status of Scenic Resources

of twenty (20) represented the most visible lands from historic sites, the most scenic, and the most threatened within the individual reclassified datasets. A low score correspondingly represented the least scenic, least threatened, and least visible lands. All three of the separate datasets were combined to create a resulting dataset with values from zero (0) to sixty (60), where areas with high scores represent the most scenic, most threatened, and most visible lands. For the composite analysis, each of

the previously completed analyses was weighted equally. Each analysis can be utilized on an individual basis for planning purposes, or the analyses can be overlaid in various combinations, such as the historic and scenic layers.

Ultimately, this use of GIS allowed a rigorous viewshed analysis that lead to a refined system of conservation prioritization across political and ownership jurisdictions. Unlike other viewshed

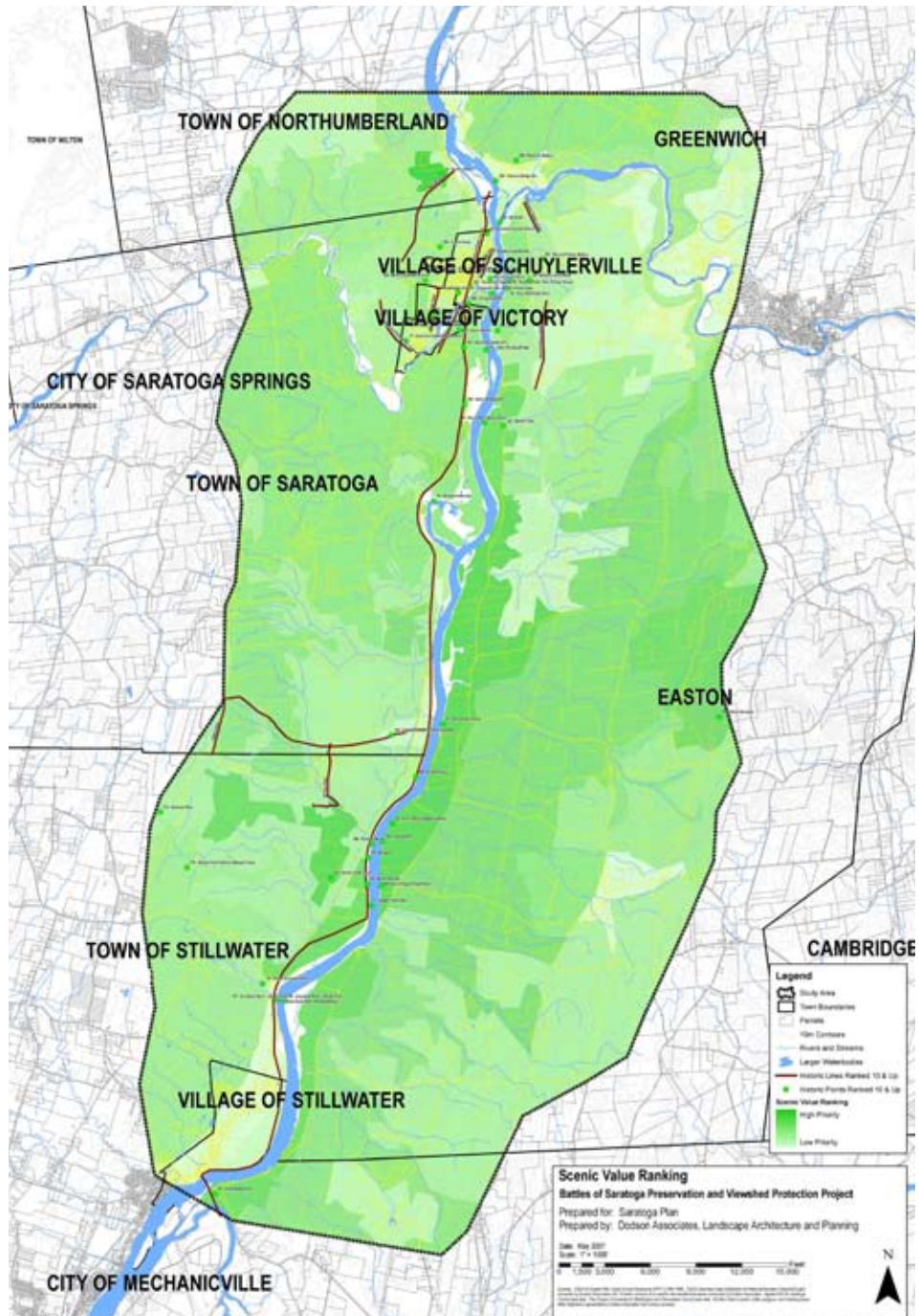


Figure 6. Scenic Resource Viewshed Analysis Map: Criteria used in the analysis process included Landform, Vegetation, Water, Land use, Cultural/Historic Character, Views and Composition. (Dodson Associates, Ltd)

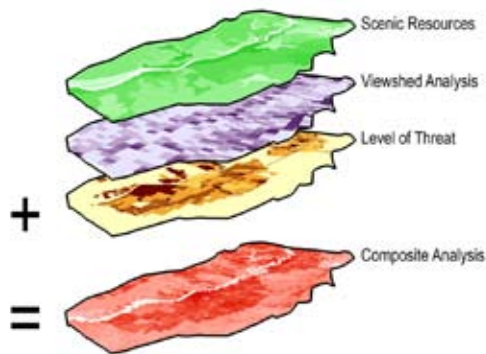


Figure 7. Composite Layered Analysis. (Dodson Associates, Ltd)

analyses which calculate the view from several points within a single parcel – such as studies done at Monticello, Mount Vernon and the Olana State Historic Site on the Hudson River in Hudson—this approach calculated viewshed extents from multiple parcels within a large geographic corridor. The composite analysis therefore identifies the cultural landscape areas and individual features with the highest priority (because they provide a broader contextual setting for interpretation of the events associated with the battles, siege, and surrender at Saratoga). These areas include much of the farmland along the Hudson River in Easton, the ridgelines that topographically define the corridor and the concentrations of historic sites in and around Schuylerville and Victory.

Conclusion

Future preservation planning activities by individual municipalities, the NPS, and private groups such as local non-profits and land trusts within the region can now focus on the conservation priority areas identified in the composite analysis. Working together, these groups can develop regional pres-

ervation strategies that protect not only their individual historic resources but the integrity of the broader contextual landscape. Already, the Saratoga and Washington County land trusts are working with the NPS and NYS to ensure the protection of farmland found to be critical to the interpretation of Revolutionary War events within the area.

The next step of the planning process is to identify specific preservation planning tools for use by both the communities and stakeholders. The plan will also develop a long-term implementation strategy for the protection of prioritized historic and viewshed resources. Working together to formulate overall preservation policies for the region will provide the most comprehensive and successful approach to the future protection of the cultural landscapes that makes this region so nationally significant.

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