

GETTING IN THE GAME: A NATIONAL PARK SERVICE APPROACH TO VISUAL RESOURCES INVENTORY

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Abstract.—In 2013 the National Park Service launched a visual resources inventory method designed to capture visual experiences accurately and consistently across diverse landscapes. In the inventory process, each view is mapped and described from the viewers' perspective. Views are also evaluated to capture scenic quality and importance to the visitor experience. Because of the scale of many park landscapes and the dynamic nature of visual resource pressures, park staff must be able to conduct inventories in a modular way. Inventory data can be used in spatial analysis to show where views overlap, which portions of the landscape are visible from a given view point, and what is the composite value of all intersecting views. Robust inventory information allows managers to integrate visual resource considerations into park planning and management. This is important when working with partners beyond park boundaries to target critical areas for visual resource protection. The National Park Service visual resources inventory method has proven effective in diverse park landscapes and is gaining traction.

INTRODUCTION

Some of the Nation's most spectacular and historically significant landscapes are entrusted to the National Park Service (NPS). People experience and learn about these places largely by traveling through a park landscape and observing scenes within and beyond park boundaries. In fact, a review of 91 visitor surveys from parks across the country (1988–2011) found that 90 percent of visitors identify scenic views as very or extremely important. Over half of the people surveyed considered scenic views the first or second most important resource to protect (Kulesza et al. 2013). Every unit of the National Park System has visual characteristics that influence how people experience it.

But landscapes around parks are changing. Renewable and conventional energy development, urban growth, and internal park changes are some of the pressures creating visual change. Without thoughtful involvement, these activities threaten to degrade the most valued park scenery, which in some cases, is the very reason for the park's existence.

Therefore, the NPS recently launched a systematic, servicewide approach to managing scenery as a resource (Sullivan and Meyer 2016). This enables parks to actively engage in scenic stewardship and integrated resource management. It also supports the NPS's ability to identify shared values and support strategic growth with stakeholders.

The first step in managing scenery as a resource is learning what's out there. The NPS visual resources inventory (VRI) is a systematic process for documenting and evaluating scenic resources within and beyond park boundaries that is designed to meet park management and protection goals. The VRI was developed specifically to meet the unique needs of National Parks and the NPS. Capturing visual experiences accurately and consistently across diverse landscapes is a key goal. Because most visitors experience parks first through their eyes, their visual experience of a park is often essential to enjoyment and appreciation of park resources.

Comprehensive management of visual resources is a relatively new concept for the NPS as an agency. For some NPS staff, it can be difficult to think about scenery as a "resource." But this concept is key to successfully integrating it as part of park management. As a resource, scenery can be measured, managed, and protected. It is also finite and can be damaged or lost.

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AN NPS APPROACH

The concept of an inventory of the visual landscape, and its subsequent management as a resource, has been in place at the Federal agency level since the 1970s (Bureau of Land Management 1984, 1986; USDA Forest Service 1974, 1995). The Bureau of Land Management (BLM) and the USDA Forest Service (FS) have each developed and implemented visual resources programs to manage the scenic values of the large areas of lands they manage, and both of these programs include an inventory process (Bureau of Land Management 1984, 1986; U.S. Forest Service 1995). The new NPS system includes elements from these well-established visual inventory programs but is customized to meet specific NPS needs. Park managers, landscape architects, and planners, as well as natural and cultural resource specialists, all contributed to the development of the NPS visual inventory methodology.

Visual resources inventory information provides:

- A baseline for monitoring changes over time
- An additional layer of information for evaluating potential visual impacts of projects
- A basis for incorporating visual resources in park management and planning
- Resources for engaging in collaborative scenic conservation

Key Concepts

The following key concepts underlie the approach taken in designing the NPS VRI.

Unit of Inventory

Individual views comprise the basic unit of inventory in the NPS system and each view is mapped and described from a viewer's perspective. As an inventory unit in the NPS VRI, a view consists of the viewpoint (where the viewer is standing) and the viewed landscape (what they are looking at) as defined by left and right bearings. The decision to inventory and assess individual views is based on the way in which viewers experience a scene, and thus directly supports the NPS goal of providing for visitor enjoyment of scenery. This is a major distinction between the NPS VRI and the BLM and USFS systems. In other agency systems, the visual characteristics of relatively

large areas on the landscape are evaluated and the boundaries of these areas may not directly correspond to a viewer's experience of the landscape from a fixed viewpoint.

Geographic Scope

Important park views often extend both across and beyond park owned property. For this reason, it can be essential for the NPS to look beyond its boundaries when considering visual resources. People don't "see" management boundaries when they visit parks. It is the NPS's responsibility to document and evaluate the visual resources in a way that reflects the visitor experience. It is also important to note that visual inventory results do not dictate management actions on either NPS or other lands. Instead, inventory results are used to help the NPS understand and communicate visual resource values.

Scenic Quality and View Importance

Park views are not entirely about aesthetic beauty. Some views may be highly prized because of their historic context or interpretive potential rather than (or in addition to) their purely scenic quality. In the NPS VRI system, each view is assessed to capture two distinct and equally weighted values of the view:

- 1) What is its scenic quality?
- 2) How important is it to the visitor experience and the park's purpose and goals?

Giving equal value to scenic quality and view importance allows the NPS to assess and understand visual resources in a more complete and holistic way. In other words, in the NPS VRI, nonscenic quality values, which include a number of items relevant to historic and cultural values, count as much as the scenic quality in determining the total value of the view (Sullivan and Meyer 2016).

Works in All Types of Landscapes

Breathtaking natural landscapes, historic battlefields, archaeological sites, urban corridors, and wilderness areas all have visual resource values. These values must be considered in context of their primary landscape character type (e.g., natural, agricultural, urban) rather than compared against a single standard. The NPS VRI system does not value natural scenery more than historic or cultural views which often include development or other human-made features. This

philosophy reflects the NPS need to value differing visual expectations appropriately across the wide variety of park landscapes.

Regional Context

Views are evaluated in the context of the NPS unit and surrounding landscape. The system does not compare NPS units to one another even when they have the same landscape character type. For example, a predominantly natural scene at Denali National Park and Preserve would not be rated in comparison to a predominantly natural scene at Cape Cod National Seashore. This is important because it allows for the application of consistent methodology that respects and recognizes regional differences in landscape character.

Approachable

Volunteers and/or park staff from any background can gain the skills to conduct an NPS visual resources inventory with relatively brief training and field practice. A training workshop is the standard model for providing a foundation of visual resource knowledge. Workshops equip teams with the skills needed to continue inventory work in the future. Because of the vast scale of many park landscapes and the dynamic nature of visual resources, the capacity of park staff and volunteers to conduct an inventory without the direct assistance of a visual resource specialist is a necessary part of making this system work for the NPS.

VISUAL RESOURCES INVENTORY STEPS

Conducting a visual resources inventory is a relatively straightforward process. Parks identify the need for an inventory and select viewpoints that address potential challenges and/or resource goals including the establishment of baseline condition information. Inventory teams visit identified viewpoints, spatially define each view, describe them in a systematic way, and rate the scenic quality on defined criteria. Next, a team of local experts document viewpoint and viewed landscape significance before rating the importance of each view for park purpose and visitor experience based on established metrics. Scenic quality and view importance ratings are then combined into an overall scenic inventory value that can be represented on maps and applied to a variety of spatial analyses.

The datasheets, rating guides, and instructions used to support the NPS VRI are available through the Visual Resource Clearinghouse hosted by the BLM Wyoming State Office (<http://blmwyomingvisual.anl.gov/vr-inventory/nps/index.cfm>).

Inventory Design and Planning

View Selection

Views may be selected to establish a baseline for monitoring visual change over time or to capture the current state of visual resources in an area facing immediate development pressures. Views may be selected to comprehensively assess the quality of the visitor experience or to document the character of a wilderness area. None of these approaches is wrong. Park staff are encouraged to select key views that will help them address their visual resource challenges and goals.

Interdisciplinary Teams

The NPS VRI can be implemented by nonvisual resource experts. It has proven effective to have team members with a variety of backgrounds participate in inventory work. Park staff from natural and cultural resources as well as interpretation, facilities, law enforcement and administration can all provide valuable input to the process, particularly in assessing view importance. Volunteer, partner, and stakeholder participation in the inventory is an excellent way to enhance staff capacity. Inviting these participants also facilitates shared understanding of visual resources and helps build relationships that ultimately strengthen the park's ability to achieve visual resource management goals.

Scenic quality field teams are ideally composed of 4–8 members to ensure balanced discussion and reasonable maneuverability. The scenic quality field work often provides the best opportunity to involve volunteers, partners, and stakeholders. Everyone who has participated in training will be equally qualified to assess the characteristics of what they see. It is strongly recommended that at least one local park staff person participate in each field team since knowledge of local landscapes and park protocol are essential. Additionally, NPS staff participation in the inventory will lend greater credibility to the inventory results.

View importance evaluation teams do not necessarily have to be the same people who participated in scenic

quality field work. Group size is less significant but should include staff with different expertise (e.g., cultural resource specialists, interpreters, and natural resource specialists) because it is essential to capture nonscenic values of both the viewpoint and viewed landscape. In-depth local knowledge is critical for well-rounded discussion and efficient completion.

Timing

The NPS VRI captures the scenic quality and importance of views from the viewer's perspective, and it is important to do the landscape description and scenic quality evaluation at a time that reflects the average visitor experience. To the extent possible, the timing of the inventory should avoid fall color, wildflower blooms, and other ephemeral phenomena that could substantially affect scenic quality ratings. Situations such as smoke from a fire or very hazy days should also be avoided. Many parks have visitors year round and in some cases it may be desirable to inventory specific views under "leaf on" and "leaf off" conditions to capture the different viewing experiences.

Scenic Quality

Scenic quality data are collected in the field, on-site at selected viewpoints. By using a standardized approach, the process collects consistent descriptions and defensible ratings of scenic quality. Employing these methods lends credibility to the inventory of views by minimizing individuals' opinions.

Robust scenic quality information can provide:

- A baseline for monitoring changes to scenic quality over time
- Information needed for visual impact assessment of proposed projects
- Support for visual impact mitigation, restoration, or actions to improve existing views

Scenic quality evaluations describe and rate the landscape as it is observed at the time of inventory. When conducting an inventory, it is important not to imagine future conditions or rate based on memories of past conditions. Rather, the inventory data are a snapshot in time reflecting the visual observations on the day they were collected.

At each viewpoint a recorder documents the observation data and completes a structured landscape description while the other team members rate the scenic quality. The recorder then facilitates a consensus discussion among all team members and identifies the final team score and rationale for each rated element of scenic quality.

Observation Data

Information about the view point location, view boundaries, evaluation team, and conditions at the time of assessment are recorded as observation data (Fig. 1).

Landscape Description

Describing landscapes is complex and lacking a systematic method, individuals might approach it in many different ways. This can make it difficult to get consistent information about landscapes. Therefore, the NPS VRI process implements a standard format for describing the physical and aesthetic characteristics of a view. This structured description does not have any direct bearing on the numeric scenic quality rating. Rather, the landscape description is useful for documenting current conditions and may be useful for informing land use planning or project-specific impact assessment and mitigation. Landscape description information is recorded on the view description and scenic quality data sheets as shown in Figures 2 and 3.

Key aspects of the landscape description include:

- **View Type**—The view type is a general descriptive term for the viewing experience of the landscape, based on the spatial relationship of elements within the viewed landscape, and the spatial relationship of the viewer to those elements. The view types in the inventory process are panoramic, enclosed, focal, feature, framed, and canopied.
- **Landscape Character Type**—Landscape character is an overall visual and cultural impression of the landscape, and embodies distinct landscape attributes that exist throughout an area. It is a product of both the natural and human influences on the landscape. The landscape character types in the inventory are natural/natural appearing, pastoral, agricultural, rural, suburban, urban, and industrial.

Observation Data				
NPS Unit:		Date:		Time:
Viewpoint Name:		Recorder:		
Viewed Landscape Name (if needed):				
Evaluators:				
Viewpoint Coordinates:	☐ UTM, Zone:	/		
	☐ Lat./Long.			
View Geometry Bearings ☐ Magnetic or ☐ True N	Left:	Center:	Right:	
Weather: ☐ Sunny/Clear ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy/Overcast ☐ Cirrus				
Observer Position: ☐ Looking down at scene ☐ Looking at eye level ☐ Looking up at scene				
Photo Record				
Photographer:		Camera/Lens 1:	Camera/Lens 2:	
Camera	Photo Number(s)	Pano	Notes	

Figure 1.—Excerpt of the view description and scenic quality data sheet showing the observation data section.

- **Distance Zones**—The delineation of distance zones—foreground, middle ground, and background—for a view is related to the visibility of landscape elements and the degree to which landscape details can be discerned. At shorter distances, the details of the landscape are more visible.
- **Landscape Elements**—The landscape elements are specific features of the view that give it its unique characteristics and contribute to its value as a scenic view. Landscape element types include landform, land cover, land use, and structures. For each of these landscape element types, a list of possible landscape elements is provided in a checklist.
- **Design Elements**—Form, line, color, and texture are design elements used to describe the primary visual attributes of features in the landscape. The inventory process records the most prominent design elements in view to provide a baseline for identifying the important elements that could be affected by changes to the viewed landscape.

Scenic Quality Rating

For each view, individual raters assess the following indicators of scenic quality:

- **Landscape character integrity:** How intact is the landscape character? Is the landscape character impacted by elements that are inconsistent with the landscape character? What are the quality and condition of the elements in view?
- **Vividness:** Does the view have strong focal points? Does the view have bold forms and lines? Are there memorable, striking colors or contrasts?
- **Visual harmony:** Are elements of the view in scale with each other? What is the quality of the spatial relationships? Do the colors in the scene work well together?

Using the established guidelines described below, team members independently assign a numeric score of 1–5 to each of the components that make up the scenic quality indicators identified above. Note that even numbers and half point scores are allowed. The full team then discusses each component and agrees on a team rating.

Landscape Description															
View Type: ☐ Panorama ☐ Feature ☐ Framed ☐ Focal ☐ Enclosed ☐ Canopied															
Landscape Character Type: ☐ Natural/Natural Appearing ☐ Pastoral ☐ Agriculture ☐ Rural ☐ Suburban ☐ Urban ☐ Industrial															
Are seasonal/ephemeral effects (e.g., wildflower displays, snow, haze) important to the scenic quality of the view? ☐ Yes ☐ No															
If yes, please describe:															
Notes:															
Extent of Distance Zones															
Foreground:															
Middle ground:															
Background:															
Landscape Elements															
	Distance				Distance				Distance				Distance		
Landform	F	M	B	Landcover	F	M	B	Land Use	F	M	B	Structures	F	M	B
Mountains				Development				Natural Areas				High Rise - Residential			
Hills				Barren				Timber				Low Rise - Residential			
Buttes				Forest - Deciduous				Grazing/ Rangeland				High Rise - Commercial			
Mesas				Forest - Evergreen				Agriculture				Low Rise - Commercial			
Valleys				Forest - Mixed				Mining				Farm Buildings			
Ridge				Shrub/Scrub				Industrial				Misc. Industrial (Factories, etc.)			
Cliffs/Bluffs				Grassland				Office/Retail				Power Plants			
Canyons				Pasture/Hay				Urban Residential				Wind Turbines			
Plains				Cultivated Crops				Suburban Residential				Solar Facilities			
Beaches				Wetland/Bog				Rural Residential				Communication Towers			
Sand Dunes				Ocean				Transportation				Oil/Gas Wells			
Islands				Lake/Pond				Parks/ Recreation				Local Roads			
Headlands				River/Stream				Urban Center				Highways			
Water								Small Town				Transmission/ Substations			
								Energy Generation				Unidentifiable Structures			
								Transmission							

Figure 2.—Excerpt of the view description and scenic quality data sheet showing the first part of the landscape description.

Prominent Design Elements			
FORMS		LINES	
Descriptor	Elements	Descriptor	Elements
Rolling		Vertical	
Blocky		Horizontal	
Rugged		Curving	
Angular		Undulating	
Conical		Angular	
Pyramidal		Diagonal	
Rounded		Broken	
Circular		Irregular	
Flat			
COLORS		TEXTURES	
Color	Elements	Descriptor	Elements
		Smooth	
		Rough	
		Medium	
		Coarse	
		Fine	
		Patchy	
		Stippled	
		Random	
		Uniform	
		Ordered	
Brief Narrative			

Figure 3.—Excerpt of the view description and scenic quality data sheet showing the second part of the landscape description.

Landscape Character Integrity

When people recognize the landscape character of an area, they expect that views in the area will conform to that character. When the visible elements of the landscape conform to the identified landscape character, are relatively free from elements that do not conform to the expected landscape character, and are in good condition, the result is usually a pleasing view. In the best cases, this type of view can be thought of as the ideal “postcard” view of that type of landscape.

Landscape character integrity for individual views is assessed by evaluating:

- Landscape character elements
- Inconsistent elements
- Quality and condition of elements

The guidelines for rating these components of landscape character integrity are shown in Figure 4.

LANDSCAPE CHARACTER INTEGRITY				
Landscape Character Elements	Identify the degree to which the full range of important desirable landscape character elements, e.g., natural features, land use types, structures, is plainly visible in the view.			
	Few elements are plainly visible and/or many elements are missing. (1)	Some elements are present, but some elements are missing. (3)	Most or all elements are plainly visible. (5)	RATING
Rationale:				
Inconsistent Elements	Identify the degree to which inconsistent elements, e.g., agricultural fields in an urban landscape or industrial facilities in a natural landscape, are plainly visible in the view.			
	Many or major inconsistent elements are plainly visible & may be dominant features. (1)	Some inconsistent elements are plainly visible. (3)	Only a few, minor inconsistent elements are plainly visible. (5)	RATING
Rationale:				
Quality and Condition of Elements	Assess the quality and condition of all landscape elements, including natural and human-made features. (Do not lower the rating for historic structures, if their condition is appropriate to setting.)			
	Most elements are of poor quality and/or are in poor condition. Natural appearing elements look very unhealthy, seriously damaged, or in poor condition from pollution, or the presence of debris or litter. Built elements appear to be of poor quality, or are in an advanced state of disrepair. (1)	Most elements are of fair quality and/or in fair condition. Some natural appearing elements do not look healthy, have some damage visible, or have some pollution, debris, or litter evident. Some built elements may be of lower quality, are of unfinished construction, or not well cared for. (3)	Most elements are of high quality and in good condition. Most natural appearing elements look healthy, undamaged, clean, and free of debris. Built elements are of high quality with appropriate materials, designs, and finishes; and appear to be well cared for. (5)	RATING
Rationale:				
LANDSCAPE CHARACTER INTEGRITY TOTAL RATING				

Figure 4.—Excerpt of the scenic quality individual rating data sheet showing the rating guidance and worksheet that individual evaluators use when rating landscape character integrity.

Vividness

In considering vividness, and later visual harmony, as part of scenic quality, evaluators are looking at the components of the landscape much as an artist would. For vividness, the NPS VRI analyzes the aspects of views that contribute to how visually striking or memorable a view is. This can be thought as measuring

the “Wow factor” of the view. Striking views have elements that attract and hold attention, including strong focal points as well as bold forms, lines, colors, or textures. Where views lack elements that strongly attract the eye, and have weak forms, lines, colors, and textures, the view will usually be perceived as unremarkable.

VIVIDNESS				
Focal Points	Identify the degree to which focal points attract visual attention.			
	The view has weak focal points, or does not have any features that attract and hold attention.	The view has a moderately strong focal point, or has multiple focal points and attention is focused on each one roughly equally.	The view has one very strong focal point that attracts and holds visual attention.	RATING
	(1)	(3)	(5)	
	Rationale:			
Forms & Lines	Identify the degree to which landforms, lines, structures, or water elements add interest to the view.			
	Landforms, lines, structures, and water elements are weak, poorly defined, or insignificant. These elements add little interest.	There are one or more moderately bold and distinct landforms, lines, structures, or water elements that add interest	There are very bold and distinct landforms, lines, structures, or water elements that add strong visual interest.	RATING
	(1)	(3)	(5)	
	Rationale:			
Color	Identify the degree to which the view includes bold colors, and prominent textures or moving elements. Texture and movement are secondary considerations for this component.			
	Colors are generally muted and there are minimal textures or moving elements.	There are moderately bold colors, textures and/or prominent moving elements.	There are very bold or striking colors, textures, and/or moving elements.	RATING
	(1)	(3)	(5)	
	Rationale:			
Are seasonal/ephemeral effects (e.g., wildflower displays, snow, haze) affecting the scenic quality of the view? ☐ Yes ☐ No				
If yes, please describe:				
VIVIDNESS TOTAL RATING				

Figure 5.—Excerpt of the scenic quality individual rating data sheet showing the rating guidance and worksheet that individual evaluators use when rating vividness.

Vividness for individual views is assessed by evaluating:

- Focal points
- Forms and lines
- Color vividness

The guidelines for rating each of these components are defined in Figure 5.

Visual Harmony

When landscape elements in the view exhibit a consistent, orderly, or pleasing arrangement of parts and colors, the scene has strong visual harmony. This can be thought of as a measure of the quality of the visual composition, much as one might assess a painting or a photograph. Generally, views that are balanced (but not necessarily symmetrical), ordered, have elements in good size proportion to one another, and colors that seem to “fit together well,” have higher scenic quality.

VISUAL HARMONY				
Spatial Relationship	Identify the degree to which the spatial arrangement of landscape elements makes the view seem structured, ordered, and balanced.			
	The arrangement of elements appears random or chaotic, and the view has little evident order, discernable pattern, or balance between elements.	The arrangement of elements shows some structure or discernable pattern, but one or more elements seem out of place, making the view appear somewhat disordered or unbalanced.	The arrangement of elements appears to have an easily discernable structure, pattern, and organization that make the view seem well ordered and balanced.	RATING
	(1)	(3)	(5)	
	Rationale:			
Scale Relationship	Identify the degree to which the sizes of landscape elements, relative to each other and to the view as a whole, make the view seem well-proportioned and balanced.			
	One or more elements appear substantially larger or smaller than desirable, and seem significantly out of scale with other elements or the view as a whole.	One or more elements appear somewhat larger or smaller than desirable, and seem out of scale with other elements or the view as a whole.	The elements are in excellent size proportion to one another and to the view as a whole, making the view seem well-proportioned and balanced.	RATING
	(1)	(3)	(5)	
	Rationale:			
Color Harmony	Identify the degree to which the view includes a range of compatible colors and pleasing color contrasts where they occur.			
	One or more major colors clash strongly and unpleasantly with the overall color scheme of the landscape, and /or there is a very limited range of colors.	One or more major colors is somewhat incompatible with the overall color scheme of the landscape, and /or there is a somewhat limited range of colors.	The visual elements of the landscape display a wide range of compatible colors or pleasing color contrasts.	RATING
	(1)	(3)	(5)	
	Rationale			
VISUAL HARMONY TOTAL RATING				

Figure 6.—Excerpt of the scenic quality individual rating data sheet showing the rating guidance and worksheet that individual evaluators use when rating visual harmony.

Visual harmony for individual views is assessed by evaluating:

- Spatial relationship
- Scale relationship
- Color harmony

The guidelines for rating each of these components are defined in Figure 6.

Team Consensus

For each inventoried view, the team recorder facilitates a consensus discussion among all team members and identifies the final team score and rationale for each rated element of scenic quality. This provides an opportunity for real-time quality assurance and quality control of ratings among individual team members and results in strong adherence to the established

Scenic Quality		
Scenic Quality	Rating	Rationale
Landscape Character Integrity		
Landscape Character Elements		
Inconsistent Elements		
Quality and Condition of Elements		
Integrity Total		
Vividness		
Focal Points		
Forms/Lines		
Color Vividness		
Vividness Total		
Visual Harmony		
Spatial Relationship		
Scale Relationship		
Color Harmony		
Harmony Total		
TOTAL		
SCENIC QUALITY	☐ E (9-15)	☐ D (16-23) ☐ C (24-30) ☐ B (31-38) ☐ A (39-45)

Figure 7.—Excerpt of the view description and scenic quality data sheet showing the scenic quality rating section where rationale and team consensus scores for each scenic quality indicator are recorded. Component scores are summed to identify the overall scenic quality rating.

rating guidelines among rating teams. Team ratings are recorded along with a brief rationale on the portion of the view description and scenic quality data sheet shown in Figure 7. Team ratings for the scenic quality indicators are then summed into an overall scenic quality rating which is recorded and identifies the scenic quality category for that view.

View Importance

View importance data are compiled for each inventoried view as an office exercise following the scenic quality assessments. As with the scenic quality portion of the inventory, parks gain consistent descriptions and defensible ratings of view importance by using a standardized approach.

Evaluating and documenting view importance provides:

- A measure of the value of views to visitors and to the NPS in addition to their inherent scenic quality

- A structured and defensible approach to identifying and communicating the nonscenic value of views
- Information useful in prioritizing areas for visual impact mitigation, for viewpoint and viewed landscape protection and restoration, or actions to improve existing views

The view importance assessment focuses on the unseen values of the view – that is, things that make the view important to visitors and to NPS, but are not necessarily apparent in the view itself. While the view importance assessment does record information about certain elements of the view, such as designated or nondesignated scenic or historic/cultural elements in the view, this information requires research or knowledge beyond what is apparent to the casual observer (Sullivan and Meyer 2016). The view importance evaluation can be thought of as roughly analogous to the sensitivity assessment and concern level of the BLM and USFS inventory systems respectively (Bureau of Land Management 1986,

USDA Forest Service 1995). The view importance evaluation captures information about the relative number of viewers and view duration, as well as information about the importance of the view to the NPS unit's goals for visitor experience.

Viewpoint and Viewed Landscape Descriptions

The viewpoint and viewed landscape descriptions record information about applicable scenic, historic/cultural, or other special designations. The information that is recorded in this section is not scored, but is used to provide context and supporting material for the rating process. Designated scenic, historic/cultural, or otherwise significant features or locations are recorded for each view as they pertain to the viewpoint and/or viewed landscape. This information is recorded through a series of check boxes with opportunities to record details such as name and resource identification number for the designated/significant components.

View Importance Rating

For each view, the full team evaluates the following indicators of view importance:

- **Viewpoint importance:** How well publicized is the viewpoint as a viewing destination? What level of effort goes into managing the viewer experience at the viewpoint? What level of interpretive services are offered at the viewpoint?
- **Viewed landscape importance:** How well publicized is the viewed landscape? What portion of the view is comprised of designated or significant scenic, historic, scientific, or cultural components? How well does this landscape illustrate park purpose or interpretive themes?
- **Viewer concern:** What is the relative annual visitation for the viewpoint? What is the relative view duration at the viewpoint? To what degree are the activities that viewers are engaged in at the viewpoint tied to the visual experience?

Using the established guidelines described below, evaluation teams assign a numeric score of 1–5 to each of the components that make up the view importance indicators identified above.

Viewpoint Importance

The location from which one experiences a view can contribute to the overall importance of a view. Some viewing locations are well known as destinations

for experiencing scenic views. Some viewpoints reflect significant investments in management or infrastructure. Some viewpoints provide a venue for important interpretive services. Viewpoints with all of these characteristics contribute positively to overall view importance ratings.

For each inventoried view, viewpoint importance is assessed by evaluating viewpoint:

- Viewpoint publicity
- Management
- Interpretive services

The guidelines for rating these indicators of viewpoint importance are defined in Figure 8.

Viewed Landscape Importance

Just as the viewpoint characteristics affect the importance of a view, the content of the viewed landscape does as well. Some views are classic and well-publicized examples of geologic phenomena or historic events, or are renowned for their scenic beauty. Some views may contain a significant feature or even be entirely composed of a designated or significant area. Some views perfectly illustrate interpretive themes in a park or perhaps the very purpose for which the park exists. Viewed landscapes with these attributes will contribute positively to the overall view importance rating for a view.

For each inventoried view, viewed landscape importance is assessed by evaluating:

- Viewed landscape publicity
- Designated areas
- Interpretive themes

The guidelines for rating these indicators of viewed landscape importance are defined in Figure 9.

Viewer Concern

The number of viewers that come to experience a view, how long they spend viewing the landscape, and the types of activities in which they are engaged are all proxy evidence for how sensitive these viewers may be to a change in the landscape. For example, it is reasonable to conclude that in highly visited locations where landscape photographers spend hours to capture the perfect lighting, viewers are likely to be concerned about potential changes to the view.

VIEWPOINT IMPORTANCE			
Viewpoint Publicity	Identify the relative extent to which the viewpoint is promoted as a viewing destination in visitor communications (e.g. brochures, park Web sites) or receives external recognition in media (e.g. hiking guides, history pubs, Web sites, movies).		
	Viewpoint receives little or no mention in visitor communications or external media. (1)	Viewpoint is noted but not strongly promoted in visitor communications or external media. (3)	Viewpoint is well publicized in both visitor communications and external media. (5)
Viewpoint Management	For this park, identify the relative extent to which the park has expended time, funds, and effort into planning the viewpoint visitor experience and/or that the viewpoint is managed to enhance or preserve that experience.		
	The visitor experience at the viewpoint is not planned and there is little or no maintenance of grounds or facilities for the viewpoint. (1)	Moderate effort has been undertaken to facilitate visitor experience at the viewpoint. This may include addition of some infrastructure, and/or occasional maintenance. For example, occasional trash removal, adding/maintaining portable toilets, mowing/tree trimming, or erosion repair. (3)	Extensive effort has been undertaken to facilitate visitor experience at the viewpoint. This may include addition of substantial infrastructure, frequent maintenance, removing intrusive elements to maintain a natural setting, extensive vegetation/trail management, or operation of a backcountry permit system. (5)
Viewpoint Interpretive Services	For this park, identify the relative level of interpretive services offered at the viewpoint, and the extent to which they contribute to the visitors' enjoyment of scenic, historic, cultural, scientific, or other park values.		
	No interpretive services are offered. (1)	Some interpretive services are offered, such as brochures, park newspapers, interpretive panels, or digital media. (3)	Extensive interpretive services are offered, such as talks, major interpretive panels, or kiosks. (5)

Figure 8.—Excerpt of the view importance rating guide showing the guidance that view importance assessment teams use when rating viewpoint importance.

Conversely, viewers may be less concerned about potential changes to views that are briefly visible while commuting to work.

Viewer concern for individual views is assessed by evaluating:

- Visitation
- View duration
- Viewer activities

The guidelines for rating these indicators of viewer concern are defined in Figure 10.

Team Consensus

For each inventoried view, team ratings for the view importance indicators are discussed and agreed upon by the full view importance evaluation team. Ratings are recorded along with a brief rationale on the portion of the View Importance Data sheet shown in Figure 11. Indicator ratings are then summed into an overall view importance rating that identifies the view importance category for that view.

VIEWED LANDSCAPE IMPORTANCE			
Viewed Landscape Publicity	For this park, identify the relative extent to which the viewed landscape is publicized for visual qualities (scenic, historic, cultural) in visitor communications or receives external recognition in media.		
	The viewed landscape receives little or no mention in visitor communications or external media. (1)	The viewed landscape is noted but not highlighted in visitor communications or external media. (3)	The viewed landscape is well publicized in both visitor communications and external media. (5)
Designated Areas	Identify the extent to which the viewed landscape includes all, or parts, of specially designated areas, or nationally/regionally significant scenic, historic, cultural, or scientific features or landmarks.		
	There are no known designated areas, significant features, or landmarks within the viewed landscape. (1)	The viewed landscape has some designated lands, but they do not constitute most of the view and the view is without plainly visible significant features or landmarks. For instance a small portion of the view is comprised of a wilderness area but no significant landscape features are visible. (3)	The viewed landscape consists primarily of designated areas and/or has significant features or landmarks plainly visible. For instance, the view consists largely of a designated wilderness area or cultural landscape. (5)
Interpretive Themes	Identify the degree to which features within the viewed landscape illustrate the unit's purpose or interpretive themes.		
	The viewed landscape is clearly incompatible with the unit's purpose or interpretive themes, such as large industrial or residential developments seen from a unit emphasizing natural processes or cultural landscapes. (1)	The viewed landscape is partly compatible with the unit's purpose and interpretive themes, but may have some incompatible elements, such as some modern roadways seen from a unit emphasizing natural processes or historic landscapes. Alternatively, the viewed landscape is not relevant to the unit's interpretive themes, but does not detract from the themes. (3)	The viewed landscape clearly illustrates the unit's purpose and/or interpretive themes, such as a canyon landscape illustrating erosion and geologic processes. (5)

Figure 9.—Excerpt of the view importance rating guide showing the guidance that view importance assessment teams use when rating viewed landscape importance.

VIEWER CONCERN			
Visitation	For this park, estimate the relative annual visitation for the viewpoint.		
	Viewpoint is in the bottom one third of viewpoints with respect to visitor use, i.e., it is relatively lightly visited. (1)	Viewpoint is in the middle one third of viewpoints within the unit with respect to visitor use. (3)	Viewpoint is in the top one third of viewpoints with respect to visitor use, i.e., it is relatively heavily visited. (5)
View Duration	For this park, estimate the relative view duration for visitors at the viewpoint.		
	Viewpoint is within bottom one third of the park viewpoints for view duration, i.e., on average, views are of relatively brief duration. (1)	Viewpoint is within middle one third of the viewpoints for view duration. (3)	Viewpoint is within top one third of the viewpoints for view duration, i.e., on average, views are of relatively long duration. (5)
Viewer Activities	Considering the majority of visitors and the activities they engage in at the viewpoint, identify the degree to which most viewers would likely be sensitive to incompatible visual intrusions within these viewed landscape categories: Natural – Visitors seek natural appearing views, without visible human-made elements. Historic – Visitors seek to recreate the visual experience of the landscape as seen during a historically significant event or time period. Human Influenced – Visitors appreciate the existing human-influenced landscape character (e.g., pastoral, agricultural, urban) as a particularly important part of the view.		
	Most viewers likely have low sensitivity to incompatible visual intrusions. The primary activities of viewers are <i>relatively</i> independent of the visual setting, for example, where most viewers are workers or commuters. (1)	Most viewers would likely be moderately sensitive to incompatible visual intrusions. While the visual setting is important, it is not the focus of activities, for example fishing, hiking, or wildlife viewing. (3)	Most viewers would likely be highly sensitive to incompatible visual intrusions. The primary activities at the viewpoint are directly tied to the scenery, such as landscape photography, seeking wilderness experiences, or viewing historic landscapes. (5)

Figure 10.—Excerpt of the view importance rating guide showing the guidance that view importance assessment teams use when rating viewer concern.

VIEW IMPORTANCE					
Importance Factors	Rating	Rationale			
Viewpoint Importance					
Viewpoint Publicity					
Viewpoint Management					
Viewpoint Interpretive Services					
Viewpoint Total					
Viewed Landscape Importance					
Viewed Landscape Publicity					
Designated Areas					
Interpretive Themes					
Viewed Landscape Total					
Viewer Concern					
Visitation					
View Duration					
Viewer Activities					
Viewer Concern Total					
VIEW IMPORTANCE TOTAL					
VIEW IMPORTANCE RATING	☐ 5 (9-15)	☐ 4 (16-23)	☐ 3 (24-30)	☐ 2 (31-38)	☐ 1 (39-45)

Figure 11.—Excerpt of the view importance data sheet showing the view importance rating section where rationale and consensus scores for each view importance indicator are recorded. Component scores are summed to identify the overall view importance rating.

PRODUCTS

The NPS VRI provides a mechanism for park staff to use in documenting and analytically assessing visual resources. The maps and data that come out of this process can then become powerful communication tools that inform critical thinking about how the NPS manages internal resources and how the agency approaches neighbors to find shared values and mitigate or avoid visual impacts where possible.

Scenic Inventory Value

The scenic inventory value (SIV) is the combination of the scenic quality rating and view importance rating into a single measure for each inventoried view. The SIV is derived using a matrix (Fig. 12) to identify one of five possible values ranging from very low (VL) to

very high (VH). By combining scenic quality and view importance, the SIV provides an easy way to categorize and discuss the overall assessment of each view. It is important to note that the scenic quality and view importance ratings that determine the final SIV are retained for all future analyses.

Scenic Quality	View Importance Rating				
	1	2	3	4	5
A	VH	VH	VH	H	M
B	VH	VH	H	M	L
C	H	H	M	L	L
D	H	M	L	VL	VL
E	M	L	VL	VL	VL

Figure 12.—Scenic inventory value (SIV) matrix. This table identifies the combinations of scenic quality and view importance ratings that indicate overall SIV categories ranging from very low to very high.

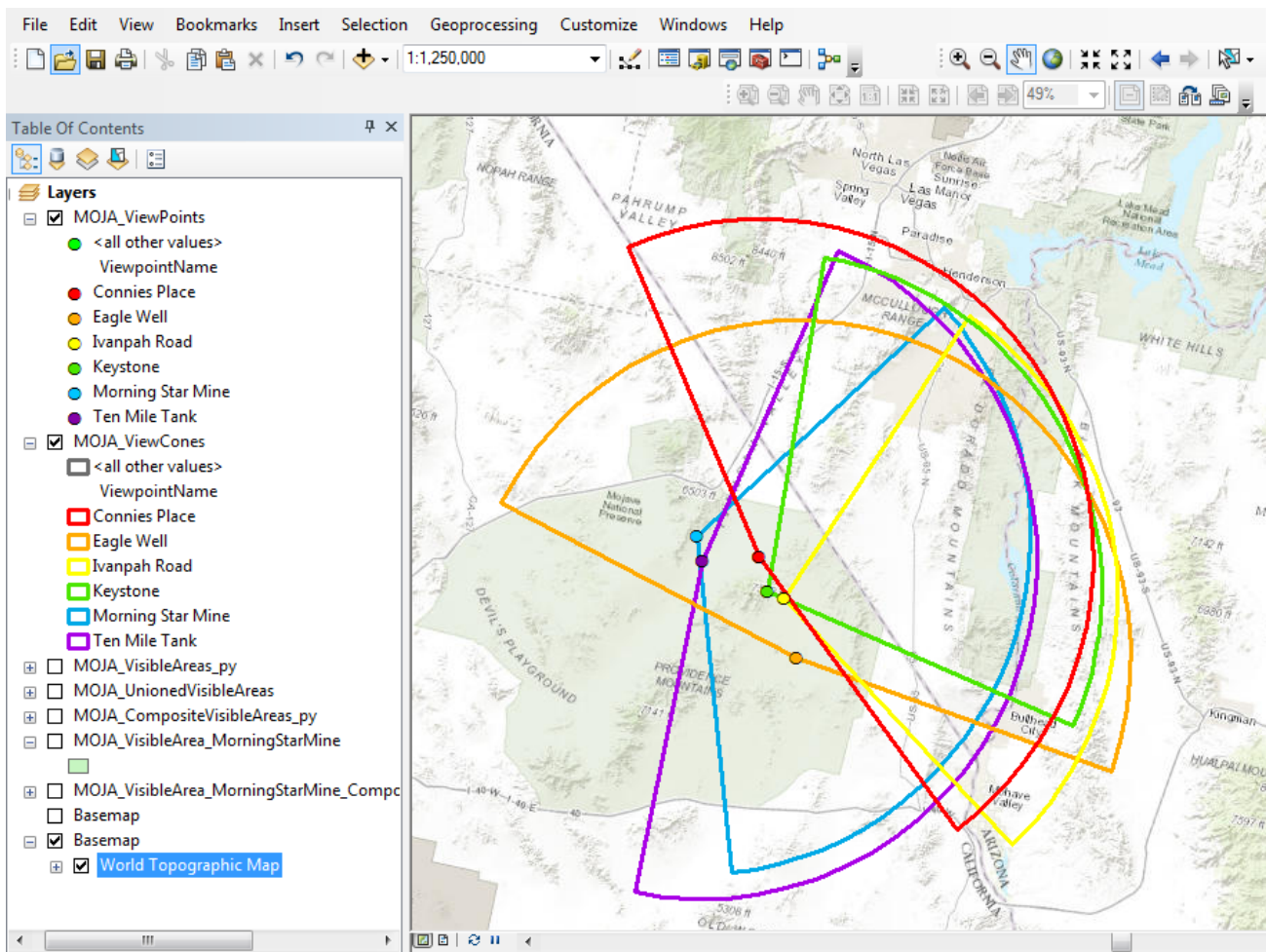


Figure 13.—Viewpoints and view cones. ArcGIS screen shot showing an example of viewpoints and view cones generated using NPS VRI data and spatial analysis tools for Mojave National Preserve, California. For this illustration a view distance of 50 miles was used. Source: National Park Service.

Data

Each view inventoried necessitates the creation of data which include:

- Spatial Data
 - o View Point Locations
 - o View Cones (generated by recorded bearings)
- Photographic Record
 - o A panoramic photo
- Scenic Quality
 - o Description
 - o Rating
- View Importance
 - o Information
 - o Rating

These data are entered into and stored in a geospatially enabled online database. This database serves as the national repository for all NPS visual resource data and is currently only accessible to NPS employees. The database also has reporting capabilities, and several types of standardized reports can be run for individual views or by park unit.

Geospatial Products

An “Enjoy the View” toolkit has been developed that uses NPS VRI data and ArcGIS software (ESRI, Redlands, CA) to automate the creation of several map products on a park by park basis. Viewpoints and view cones (depicting the left and right bearings of each inventoried view as identified in the field in combination with a user defined distance) are created directly from inventory data (Fig. 13). With the addition of a digital elevation model some further analyses are possible (described below).

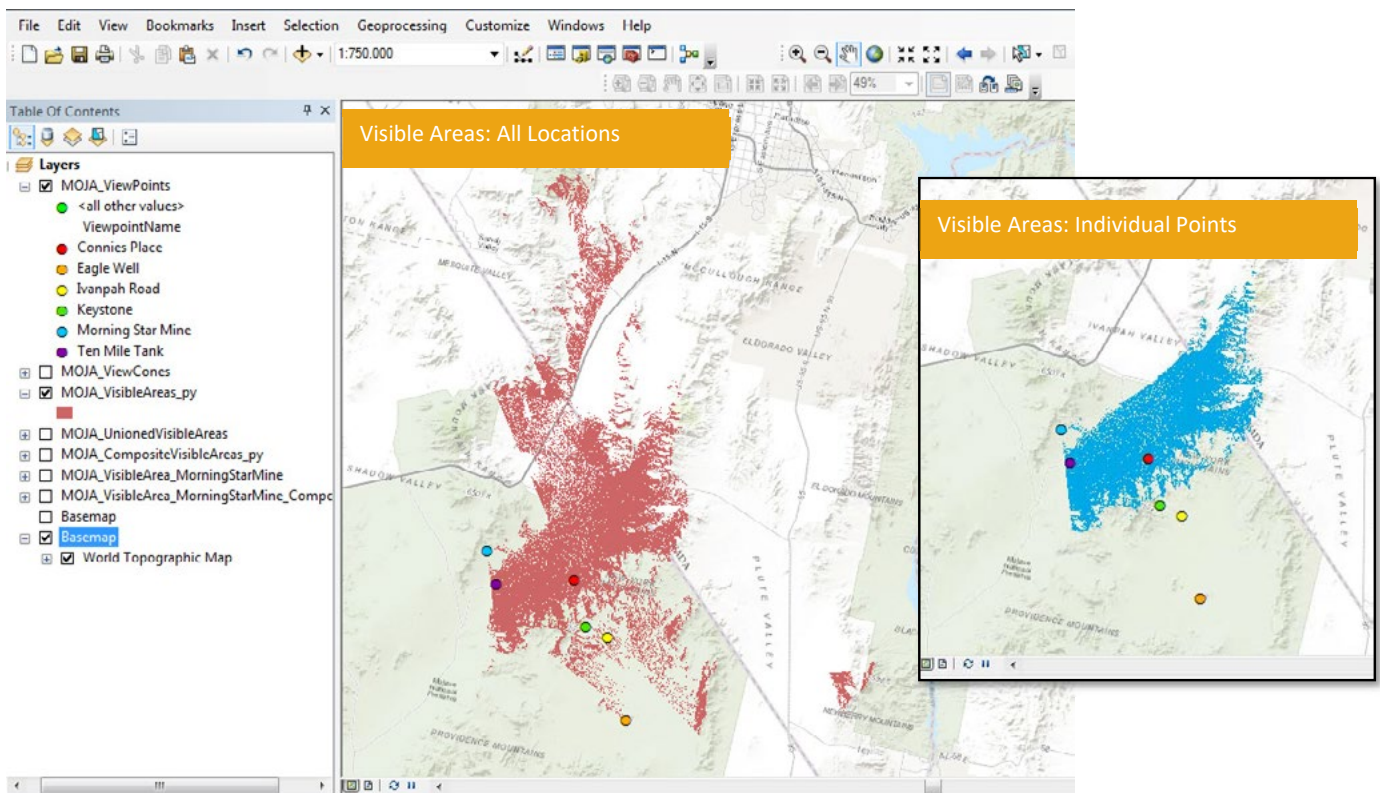


Figure 14.—Visible areas. ArcGIS screen shot showing an example of visible areas from all views and from an individual view inventoried as part of the NPS VRI for Mojave National Preserve, California. Source: National Park Service.

Visible Areas & View Counts

This tool runs a traditional viewshed analysis from each inventoried viewpoint and then clips the results using the view cones. The result is identification of visible areas seen from each of the individual viewpoints and a combined viewshed showing which parts of the landscape are visible from any one of the inventoried views (Fig. 14). In the combined visible areas product, each visible area has “count” information revealing how many views can see that location (Fig. 15). Information about which specific views contribute to the view count is also retained.

Scenic Inventory Composite

This analysis takes the combined viewshed for a park to the next level by developing a composite SIV value for each visible area. To do this, the highest scenic quality rating and highest view importance rating from each contributing view is selected to create a new SIV for the visible area (Fig. 16). The contributing ratings from all views are retained so that this can be used as a summary or data exploration product.

SUMMARY AND CONCLUSION

The NPS is responsible for managing some of the nation’s most iconic and treasured visual resources and has developed a VRI method to meet the unique needs of park managers. In the NPS VRI, each view is mapped and described from viewers’ perspectives. Views are also evaluated to capture both scenic quality and importance to the visitor experience. This approach allows the NPS to assess and value visual resources in a holistic way.

Inventory data can be used in spatial analysis to quickly show where views overlap, which portions of the landscape are truly visible from a given view point, and what the composite SIV of all intersecting views is. Robust inventory information allows managers to integrate visual resource considerations into park planning and management. This is especially important when working with partners beyond NPS boundaries to affect project proposals and target critical areas for visual resource protection.

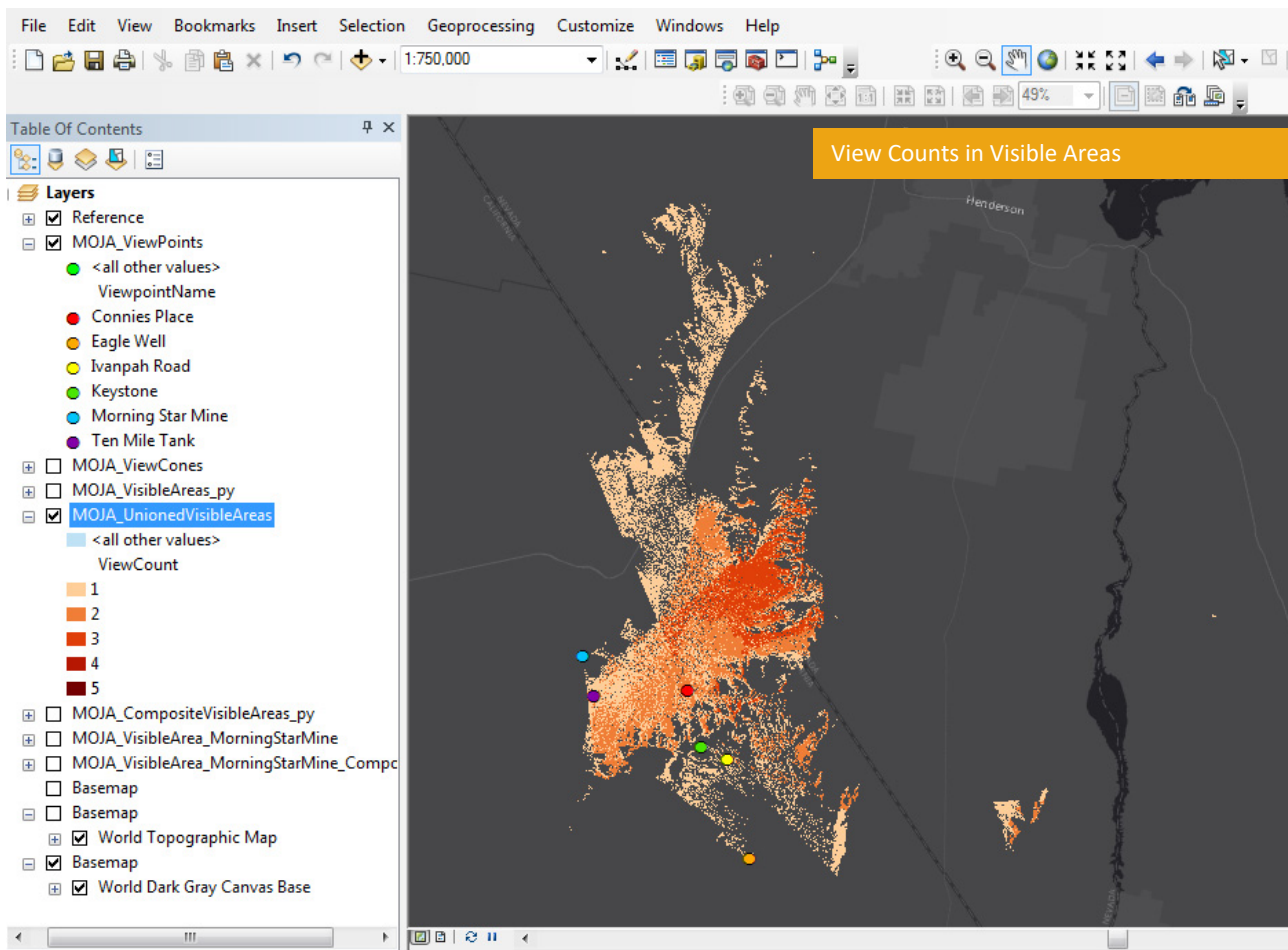


Figure 15.—View counts in visible areas. ArcGIS screen shot showing view count information for areas visible from one or more views inventoried as part of the NPS VRI for Mojave National Preserve, California. In this illustration, areas shown in a darker red color are visible from a greater number of inventoried views. Source: National Park Service.

The NPS VRI has already been implemented in over 30 parks, has proven effective in diverse park landscapes, and is gaining more traction. Experience has shown that park staff from any background can gain the necessary skills to conduct a VRI with relatively brief training and field practice. Also, the VRI has emerged as a modular solution for parks in that it has proven useful for targeted projects that require a limited inventory data set for analysis as well as for establishing more comprehensive baseline condition information. The vast scale of many park landscapes, the dynamic nature of visual resource pressures, and

the capacity of park staff to conduct inventories, all lend weight to the value of a system that can be implemented in a modular fashion. Across the service, parks are welcoming a systematic process of VRI that supports the NPS role in preserving and protecting visual resources. This information will inform internal management decisions, communication with neighboring landowners about shared visual resource values, and ultimately may positively affect the continued viability of NPS areas as places of national significance.

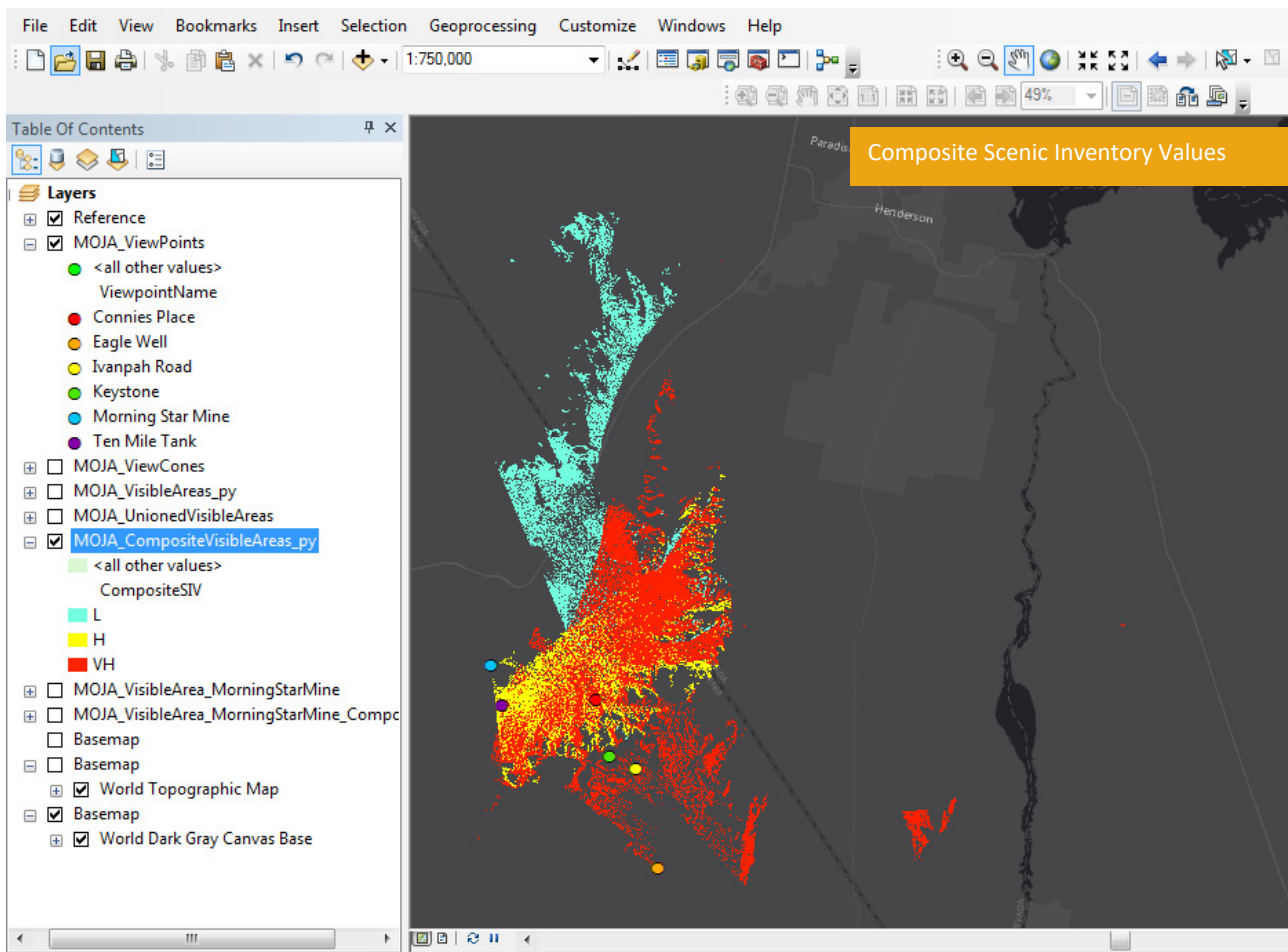


Figure 16.—Scenic inventory composite. ArcGIS screen shot showing composite SIVs for areas visible from one or more views inventoried as part of the NPS VRI for Mojave National Preserve, California. In this illustration, areas shown in blue have a composite SIV of low, areas shown in yellow have a composite SIV of high, and areas shown in red have a composite SIV of very high.

LITERATURE CITED

- Bureau of Land Management. 1984. **Visual resource management**. BLM Manual Handbook 8400, release 8-24. Washington, DC: U.S. Department of the Interior, Bureau of Land Management.
- Bureau of Land Management. 1986. **Visual resource inventory**. BLM Manual Handbook 8410-1, release 8-28. Washington, DC: U.S. Department of the Interior, Bureau of Land Management.
- Kulesza, C.; Le, Y.; Hollenhorst, S.J. 2013. **National Park Service visitor perceptions & values of clean air, scenic views, & dark night skies; 1988-2011**. Natural Resource Report NPS/NRSS/ARD/NRR-2013/632. Fort Collins, CO: National Park Service. 70 p. <https://www.nature.nps.gov/air/pubs/>
- [pdf/NPS-VisitorValueOf-CleanAir-ScenicViews-DarkSkies_2013_web.pdf](https://www.nature.nps.gov/air/pubs/pdf/NPS-VisitorValueOf-CleanAir-ScenicViews-DarkSkies_2013_web.pdf). (accessed Sept. 20, 2018).
- Sullivan, R.G.; Meyer, M.E. 2016. **The National Park Service visual resource inventory: capturing the historic and cultural values of scenic views**. Environmental Practice. 18: 166–179. <https://doi.org/10.1017/S1466046616000260>.
- USDA Forest Service. 1974. **National Forest landscape management, volume 2**. The visual management system (Chapter 1). Washington, DC: U.S. Department of Agriculture, Forest Service.
- USDA Forest Service. 1995. **Landscape aesthetics: a handbook for scenery management**. Agric. Hndbk. 701. Washington, DC: U.S. Department of Agriculture, Forest Service.

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