

Preserving a Sense of Remoteness: Viewsheds at Hovenweep National Monument

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Abstract

Unobstructed natural views are important because they contribute to a sense of remoteness, solitude, and timelessness – fundamental qualities of the Hovenweep experience. Outside entities have begun using the open, seemingly empty nearby lands for commercial development. This trend is expected to increase, resulting in escalating impacts to natural viewsheds. Two critical viewsheds were identified by the planning team as deserving protection because they are important to the visitor experience. After key observation points were digitized, the viewsheds were created and analyzed with ArcMap and ArcScene. Because the monument's units are small, most of the views are of non-NPS lands. GIS was used to determine ownership of the lands falling within the viewsheds to create cooperative management strategies for long-term protection of the natural landscapes.

Maintaining natural views is essential to preserving the character of the region surrounding Hovenweep National Monument. Unobstructed natural views are important because they contribute to feelings of remoteness, solitude, and a sense of timelessness – fundamental qualities of the Hovenweep experience. As expressed through a recent visitor survey and other comments received from the public, these qualities are desired and sought after by monument visitors. However, because the monument's units are so small in size, most of the views are of non-NPS lands. This analysis was prompted by the general management planning effort for the monument that is currently underway.

Description of the Monument

Hovenweep National Monument consists of six detached land units in southeastern Utah and southwestern Colorado (Figure 1). It was established to protect 13th Century pueblo standing towers and villages at canyon head locations. The Hovenweep structures are the best preserved and most visually striking and accessible examples of 13th Century pueblo architecture and community locations within the San Juan River basin. The Goodman Point unit was the first archeological site in the country to be set aside by the federal government and is one of the largest 13th Century villages in the San Juan River basin. The monument also contains some outstanding examples of ancient astronomical calendars that mark important seasonal events using interrelationships between architecture, rock art, and sunlight.

Hovenweep is located on the eastern side of the Colorado Plateau and surface topography is composed of relatively flat plateaus cut by occasional steep-walled canyons. Exposed sandstone bedrock (also known as "slickrock") is common along the canyon rims, making the scenery colorful and rugged.

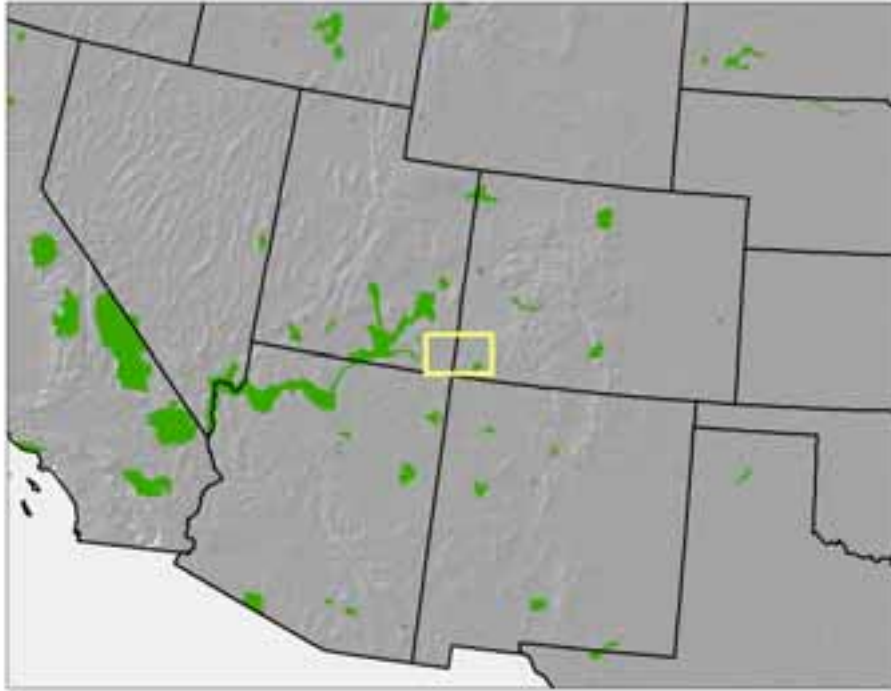


Figure 1. Location of Hovenweep National Monument

Issue

A regional pattern of development evolving during the past decade indicates that there is probable future land use pressures on Hovenweep National Monument from both the eastern and western boundaries. The expanding population of the Navajo Nation is reflected in the related growth of homesteads on reservation lands bordering the Utah units of the park. Residential expansion from Cortez is impacting the traditional farmlands and pinyon-juniper uplands surrounding the Colorado units. In both states, outside entities have begun using the open, seemingly empty nearby lands for commercial development. Pressure to develop oil and gas leases in this region is high. The influence of all these factors is only expected to increase during the upcoming years, resulting in increased adverse impacts to natural viewsheds.

Viewsheds

Natural views are important at all of the monument's units but two critical viewsheds were identified by the planning team. A *viewshed* is defined as the entire landscape seen from a key observation point.

The first critical viewshed is from the back of the visitor center at Square Tower Unit looking due south to due east. Square Tower Unit is the most heavily visited unit of the monument. This landscape is expansive and includes Little Ruin Canyon in the foreground extending out to Sleeping Ute Mountain, 20 miles away (Figure 2). Currently, there are very few modern impacts on this natural setting with the exception of the interpretive trail and a power

transmission line. Lands seen in this viewshed are owned by the Bureau of Land Management, both states, and private entities.

The second critical viewshed is that seen from the trailhead at the Goodman Point Unit including a similar vista from the large central pueblo ruin (Figure 3). From the trailhead, and to a lesser extent from the primary ruin site, one can see more than 180 degrees to the west through the south and to the east with the dramatic profile of Sleeping Ute Mountain dominating the southern horizon. Lands seen in this viewshed are owned by the Bureau of Land Management and private owners. A concern here is the private land on the ridge top east of the unit. The landowner has plans for a golf course and resort here and has already built a lodge structure that is visible from both viewpoints. There is another structure on private land to the southeast that has a highly reflective metal roof.

Analysis

Each viewshed was divided into different view *grounds* because the impact of a structure or land modification diminishes with distance. For example, a structure located one quarter of a mile away has more of an impact on the view than if the same structure was further away. For the purpose of analysis, the *foreground* is defined as that part of the viewshed from the observation point to the first horizon/line of sight (e.g. a ridge top) or an arc 2 miles away, whichever is closer. *Middleground* is the viewshed that is 2 to 5 miles from the observation point. The *background* is everything more than 5 miles away from the observation point.

GIS was used to calculate the viewshed visible from selected key observation points, and then to determine the land ownership within each viewshed. Key observation points were identified on the ground and recorded with GPS. These points were entered into ArcMap. A digitized elevation model (DEM) base layer and 3DAnalyst was used to create the viewsheds for the each point. Buffers of 2 miles and 5 miles from the observation points were created and used to “cut” the viewshed layer to establish the boundaries of the foreground and middleground (Figures 1 and 2). Ownership of visible land was obtained by using the **Intersect** tool with a land ownership layer and the viewshed layers (converted to polygons from the original raster data).

Because the monument’s units are so small in size, most of the views are of non-NPS lands which presents management challenges when attempting to protect resources and values. Table 1 shows the viewshed acreage by land owner. Since the background can feasibly extend as far as the curvature of the Earth allows, determination of land ownership in this viewshed category was not practicable.

Square Tower Viewshed
Hovenweep National Monument

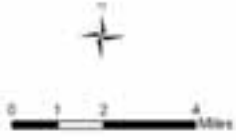


Figure 2. Square Tower Unit

HOVENWEEP
National Monument

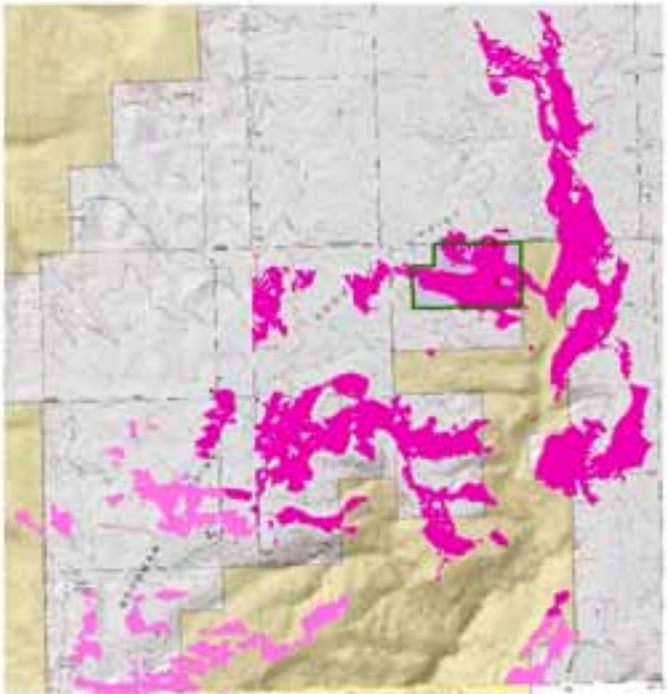


Figure 3. Goodman Point Unit

Table 1. Viewshed Ownership

Square Tower Viewshed (Acres)		
LANDOWNER	Foreground	Middleground
NPS	82	2
BLM	553	494
State (CO and UT)	8	0
Indian Reservation	3	92
Private	179	50
Goodman Point Viewshed (Acres)		
LANDOWNER	Foreground	Middleground
NPS	95	0
BLM	89	87
State (CO)	0	95
Private	722	191

Management Strategy

Protective guidelines proposed in the *Hovenweep General Management Plan* to protect the viewsheds are shown in Table 2.

Table 2. Viewshed Protection Guidelines

	DEVELOPMENT ALLOWED	EXAMPLES	POSSIBLE MITIGATION
Foreground (up to 2 miles from viewpoint or line of sight)	Small-scale developments	Trails, signs, benches, water spigots, wire fences.	<ul style="list-style-type: none"> • low-profile signs • winding trails
Middleground (2 to 5 miles away)	The above plus medium-scale developments or temporary large-scale developments	Small structures, campgrounds, picnic areas, local utility lines, dirt roads, low-profile storage tanks, temporary drilling rigs, drilling pads, vegetation treatments	<ul style="list-style-type: none"> • vegetative screening • paint structures with landscape-neutral colors • non-specular utility lines
Background (more than 5 miles away)	All the above plus large-scale, permanent developments	Radio towers, major powerlines, paved roads, golf courses, storage tanks, landscape manipulation (e.g. tree chaining or leveling for agriculture)	<ul style="list-style-type: none"> • locate large structures or utility lines off of ridge tops • paint towers and storage tanks a neutral color

Several tools and methods are available to implement these guidelines. First and foremost would be cooperative agreements between the National Park Service and Canyon of the Ancients National Monument, Monticello Field Office (Utah BLM), the Navajo Nation, local governments, and private landowners. These agreements would establish the rights and responsibilities of each party regarding management of the viewshed. For example, an agreement might stipulate that a landowner would first contact the NPS before construction of a proposed structure or change in land use occurs to consult on identifying and mitigating the potential scenic impacts from the proposal. GIS would be used to analyze potential impacts from the proposal.

Another tool would be for the NPS to obtain scenic or conservation easements on non-NPS lands. These easements could be a part of a cooperative agreement. Protection methods could include acquisition through a supporting third party like the Archeological Conservancy, the Trust for Public Lands, or the Nature Conservancy.

Conclusion

ArcGis proved to be an invaluable tool in calculating and visualizing the two critical viewsheds. By identifying the land ownership of the foreground and middle ground, the National Park Service can move forward in working with landowners in implementing scenic conservation measures to preserve the sense of remoteness that is important to Hovenweep National Monument.

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