



What's on the Horizon? A Viewshed Study Shows What Can Be Seen from Homestead National Historical Park

When you step onto the back patio of the Heritage Center at Homestead National Historical Park (NHP), the view draws you to the house of a homesteader. The house is surrounded by tools and equipment that would have helped the homesteader build their claim into a thriving farm. To one side of the house is an Osage orange hedgerow planted by the country's first homesteader, Daniel Freeman. To the other side is an orchard containing apple, plum, peach, and cherry trees, many of which are varieties that Freeman and other homesteaders could have planted. This powerful, intentional scene gives visitors a glimpse of homestead life and tells the story of the 1862 Homestead Act.

The law that created the National Park Service (NPS)—The Organic Act—states that the mission of the NPS is “....to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.” But what does it mean to conserve the scenery? How can NPS managers take actions to leave the scenery unimpaired for future generations? These are questions that park managers face on a regular basis.

To help answer these questions at Homestead NHP, park managers and their partners conducted a study of the Homestead NHP viewshed. The study's purpose was to estimate the effects of development and other forms of landscape change on historic, scenic views within the park. They wanted to determine how tall a structure needs to be for it to be visible from various observation points within the boundary of Homestead.

How Did They Study the Viewshed?

The NPS partnered with a researcher at the University of Nebraska, Lincoln, to map what can be seen from



Sunrise illuminates the Palmer-Epard cabin at Homestead National Historical Park. The cabin, farming tools from the 1800s and early 1900s, and orchard, give visitors a sense of time and place. Photo: ©Mel Mann

the park. The researcher used geographic information system (GIS) software to work with two types of elevation data: one type that shows the land as if it were bare, and another type that includes trees and buildings to reflect real-world visibility. These data were then used to model the minimum analyzed height at which objects could be seen within a 30-mile radius of the park.

The researcher and park managers chose four important observation points spread throughout Homestead for the study—the Heritage Center patio, the Freeman School, the Prairie Plaza, and a trail near the south boundary of the Freeman Homestead Claim. For each of these locations and elevation datasets, the researcher created maps that show the visibility of structures of different heights. The observation points were also combined into composite maps to provide a broader view of visibility across the park. The heights analyzed were bare ground, 10 feet, 20 feet, 100 feet, 200 feet, 300 feet, and 400 feet.

What Did the Viewshed Study Reveal?

Development Near the Park

Development and/or elements outside of the park that can impact park views include housing developments, communication structures, roads and traffic, and other human-made facilities (such as outbuildings and silos associated with farms) (Jones et al. 2019). The historic and scenic views at Homestead NHP are especially at risk from the construction of tall structures. The park is within a prairie landscape, where the land is mostly flat and open. In these wide, horizontal spaces, the horizon becomes a dominant visual feature. For this reason, tall structures stand out more and can easily draw attention away from the natural and historic setting.

Overall Findings

Visibility varied depending on the location of the observation points and the distance of development from them. When the model included vegetation and structures, visibility was reduced compared to the bare-earth model. The study, therefore, provides a good idea of the extent to which existing trees and park buildings screen the views of development outside of the park. In some areas, the impact of development is less than it otherwise would be due to the shielding effect of trees or existing structures.

How Tall Does a Structure Need to Be to Be Visible?

In much of the area within a 10-mile radius of the park, a structure would only need to be 20 feet tall to be visible (Figure 1). Between 10 and 20 miles from the park, mostly taller structures—100 feet or more—would likely be visible, except in small areas to the east and north where 20-foot structures might still be seen. Beyond 20 miles, mostly very tall structures (400 feet or more) are likely to be visible.

What Did Researchers Conclude?

By combining the views from the four observation points, as in Figure 1, planners can better understand how development outside the park might affect the viewshed. The study maps show whether a structure of a certain height would be visible from the park. However, visibility depends on more than just distance. In flat prairie landscapes, the horizon is a strong visual element. When a structure breaks that clean line, it draws attention—even from far away. While shorter structures may blend into the background, features like flashing lights, reflective surfaces, or bright colors can stand out, especially at night or in open views.

With the help of data and models, such as those described here, managers can more accurately communicate concerns about the park's viewshed to decision makers. Protecting the views at Homestead NHP helps preserve the feeling of stepping back in time and seeing the land much like early homesteaders once did, relatively free of modern structures for as far as the eye can see.

For More Information

To learn more about how siting, design, and color influence what we see in the landscape, check out the NPS Visual Quality Best Practices document available on the [NPS Scenic Views Best Practices page](#).

Literature Cited

Jones, D.S., R. Cook, J. Sovell, C. Herron, J. Benner, K. Decker, A. Beavers, J. Beebe, and D. Weinzimmer. 2019. Natural resource condition assessment: Homestead National Monument of America. Natural Resource Report NPS/HOME/NRR—2019/2049. National Park Service, Fort Collins, Colorado. Available at <https://irma.nps.gov/DataStore/Reference/Profile/2267804>.

This brief is based on the following report, funded by the NPS Natural Resource Condition Assessment Program:

Uden, D.R. 2025. 2024 viewshed analysis of Homestead National Historical Park: Updated to include screening provided by trees and structures. Science Report NPS/SR—2025/311. National Park Service, Fort Collins, Colorado. <https://doi.org/10.36967/2313523>.

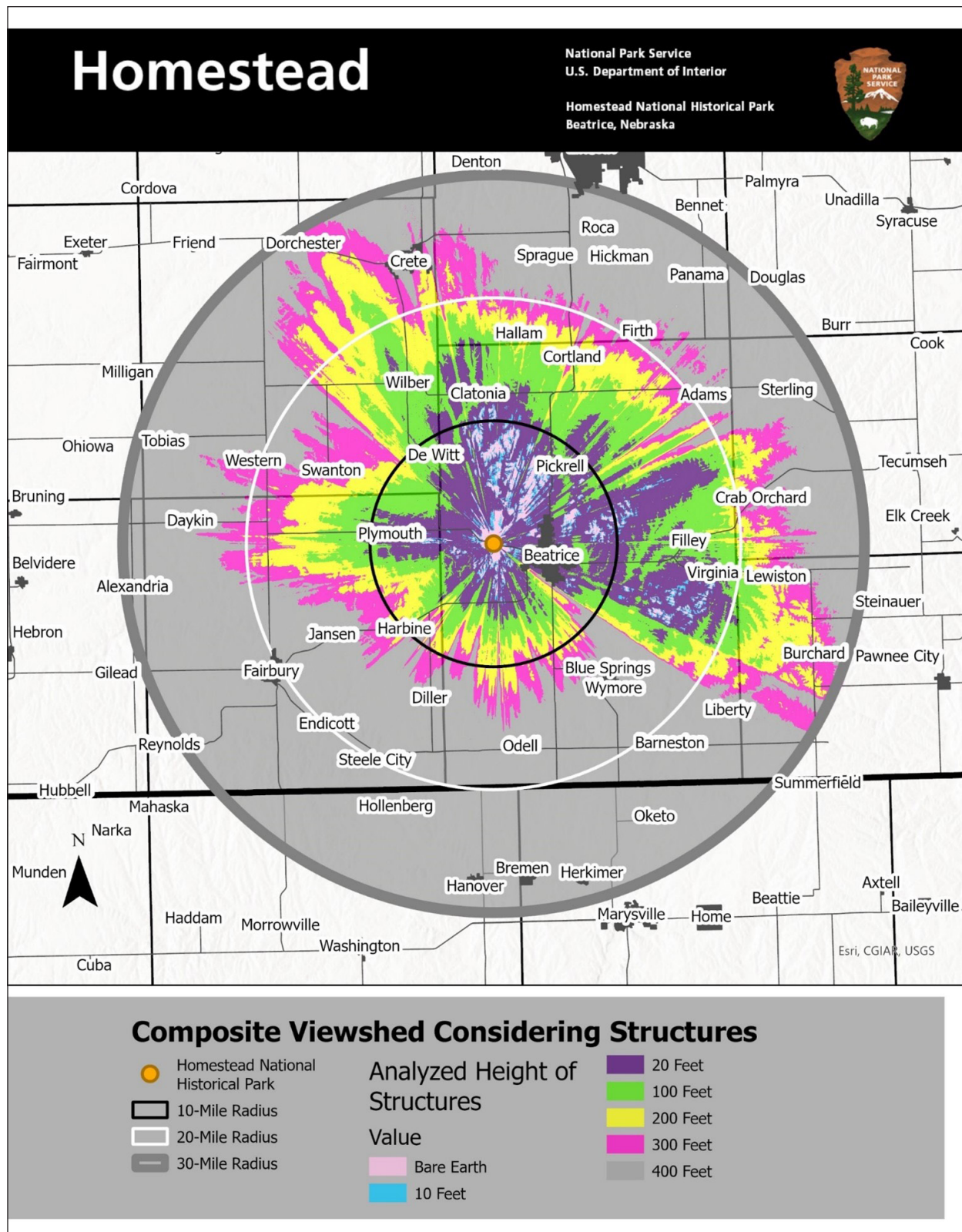


Figure 1. Composite viewshed map that shows the minimum analyzed height of a structure for it to be visible from one or more of the four observation points within Homestead NHP. This map takes into account the screening provided by trees and existing structures. Figure credit: NPS/Jesse Bolli, based on Uden (2025).