Tom Blount

Shaver Hollow Research Natural Area

A Case Study for the Protection of Natural and Cultural Resources

Shaver Hollow, a steep 700-acre watershed on the west side of Shenandoah National Park, is drained by the North Fork of Dry Run. The land and forests are typical of much of the park and show evidence of past land use, such as log drags and logging roads. The drainage is bordered on the south by the Crusher Ridge trail, which was once a historic road used for travel and to haul tanbark. After some improvements by a contractor in 1931, equipment and personnel were hauled up and down the mountain for development of the Skyline Drive. Today, other than a single foot trail that winds between research sites, no public accessible trails cross the area.

Shaver Hollow was the first designated Research Natural Area in the National Park Service located in an eastern deciduous forest. The site was designated in August 1985 by NPS Director William Penn Mott. A Research Natural Area or RNA by definition (NPS-77) is "a physical or biological unit established within a typical example of an ecological community type, preferably one having been little disturbed in the past, and in which current natural processes are allowed to continue." A RNA in a park is designated by the National Park Service and is not based on any specific law. The intent is to set the area aside permanently to be managed exclusively for approved non-manipulative research. Shaver Hollow was considered an important area for the study of acid deposition and potential resource effects; and although heavily impacted by humans in the past, it has since recovered to a completely forested watershed.

Shaver Hollow was recommended and selected as a RNA because the area (1) represented typical forest communities and fauna of the park, (2) was inaccessible to the public due to lack of public access at the boundary and lack of developed trails inside the watershed, (3) had power for instrumentation from a powerline extending through the area, and (4) was located where "the signs of the past have largely faded from the scene." Based on previous cursory archeological investigations in the park, no major pre-historic archeological sites were found in the area (Dave Haskell, personal communication). Also, due to the steepness and shallow soils of Shaver Hollow, culturally significant sites were considered unlikely. Since Shenandoah was recovering ecologically from the past disturbances and the visually recognizable signs of cultural habitation were diminishing, the area met the resource criteria for establishment of a Research Natural Area. Although not the same standard of pristine as found in the west, this definition of minimum disturbance is in line with the establishment of legally-designated Wilderness in the eastern parks by the Wilderness Act.

Research efforts in Shaver Hollow were intense during the following 11 years after it was designated a RNA. Geology, soils, vegetation, atmospheric inputs, water quality, and fauna were measured and monitored through the University of Virginia and, to a lesser extent, by the park through various funding sources. Many of the research results led to graduate theses and published articles which have become critical cornerstones in developing an air quality protection strategy for the park and the National Park Service. All research efforts were done under the supervision of the park's resource management specialist with an effort to avoid manipulation of the resources. This included the establishment of three metal towers which extended above the tree canopy for the use of measuring atmospheric inputs and weather at three different elevations and a trail which connected the towers. Although the research was done scientifically and carefully, no cultural resource compliance was prepared. Did the lack of visual signs of previous human habitation or the lack of archeological sites based on previous cursory archeological efforts imply that careful placement and implementation of research activities provided the necessary protection for cultural resources?

In the fall of 1995, Lisa Chang, a graduate student from the University of Virginia, requested a research permit to study nutrient cycling in the soils of Shaver Hollow. As a result of the increased awareness of cultural resource issues in the park since the arrival of the park's cultural resource specialist, a plan was initiated to integrate both cultural and natural resource concerns before approv-

ing the necessary research permits. Dave Orr, chief, Division of Archeology and Historic Architecture, Valley Forge National Historic Park, met with park staff to discuss the concerns and review the site in an attempt to determine the limits of acceptable work that could be accomplished within the watershed without impacting the cultural resources.

After discussing the nature of the research done in Shaver Hollow, reviewing the maps of the watershed, and hiking briefly through the area, Orr, in consultation with the Virginia State Historic Preservation Office archeologist, Ethel Eaton, determined that the area of cultural resource concern was minimal and specific to areas at the top of the watershed and the lower center of the watershed where slopes were 5%* or less. Based on this determination, we developed a set of guidelines which will allow us to continue ongoing research and approve or disapprove new research without the need for detailed archeological surveys. The guidelines consist of: avoidance of ground disturbing activities in areas with less than 5% slope; staying out of old road beds; minimizing holes to less than 3" in diameter; and dispersing holes 30' apart. Any work that would be requested on areas less than 5% slope would be reviewed for cultural resource conflicts and, if necessary, preceded by an archeological survey.

A Geographic Information System map is being developed using slope percentages which will outline areas of concern. By using this map and the guidelines, we will be able to plan future research and monitoring activities in Shaver Hollow with a greater confidence that culturally significant resource areas are being adequately protected. This effort not only insures better protection of all resources but is extremely valuable in educating the research community to be more sensitive to cultural resource areas which may not be apparent. Because of the ongoing research focus in the RNA, the park also determined that the next high priority area for archeological survey would be the Shaver Hollow watershed. This model, which integrates natural and cultural resource planning, will be extended to other areas where intense research efforts will be planned in the future.

* This percentage is specific to the topography of Shaver Hollow. In other park areas, 15% is the guideline for survey decisions.

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GIS as a Preservation Tool at Shenandoah

Managing the protection and preservation of archeological resources is an important theme reflected in Shenandoah National Park's General Management Plan (USDOI, 1983), Wildland Fire Management Plan (USDOI, 1993), Mission Goals Statement (USDOI, 1996), and Backcountry and Wilderness Management Plan (USDOI, 1997). Although each addresses different levels of concern in its management objectives, all agree that these resources are at risk from both natural and unnatural causes. These same concerns are recognized throughout the park's surrounding communities, whose citizens have requested that old homesites somehow be identified (USDOI, 1995).

Supporting the park's interdisciplinary need to protect cultural resources requires understanding where these resources are located. A Geographic Information System (GIS) is an integrated mapping system which uses input and analysis of spatial features from many different sources to create efficient, accurate, and consistent map products. The GIS program at Shenandoah maintains an extensive database of information supporting all management disciplines, including natural and cultural resource management, fire management, visitor protection, backcountry management, pest management, and facilities management. Using this data, geo-relational models can be constructed by superimposing attributes that describe forest quality, ecological value, wildlife