



Resource Management

Mile-a-Minute Weed Invades Shenandoah National Park

By Ron Nemes

The Shenandoah National Park Exotic Vegetation Crew is dedicated to the task of suppressing or eradicating invasive nonnative plant species that exist within the

Mile-a-minute weed is an annual, herbaceous, trailing vine, native to eastern Asia.

Park. Its purpose is to protect native plant habitats that would otherwise be overrun by exotic species. This is an outflow of the National Park Service mission to preserve and protect our natural and cultural resources.

In the spring of 2002, the Crew found a nonnative plant at Shenandoah not previously known to exist within the Park. Mile-a-minute weed (*Polygonum perfoliatum*) was on the Park's watch list as the plant had been seen in the Piedmont region adjacent to Park property. An infestation has now been identified in the North District.

The Plant

Mile-a-minute weed is an annual, herbaceous, trailing vine, native to eastern Asia. It has distinctively triangular-shaped light green leaves. The stems and leaves are armed with recurved prickles. While the small white flowers are generally inconspicuous, the spherical fruits (about 4mm diameter) are metallic blue with a black seed.

Plants grow in open areas, requiring in excess of 60 percent of the available light, and can survive in



Mile-a-minute weed (*Polygonum perfoliatum*). The triangular leaves are light green and the fruits are metallic blue. The stems have recurved prickles and are sometimes reddish. Photograph taken by James Akerson.

environments with relatively low moisture and poor soil structure.

The Problem

As its name implies, mile-a-minute weed grows very rapidly (up to 15cm per day). Vines cover shrubs and other vegetation in dense mats, and climb to heights of 4-6m.

It is a prolific seed producer, from June to October in Virginia. Birds, squirrels, and deer consume and ultimately disperse the seeds.

This killer weed poses dire consequences for native plant habitats if left unchecked. It is believed to have the ability to outcompete much of our native flora. Herbaceous and woody vegetation covered by mile-a-minute weed will eventually

succumb after being deprived of life-giving sunlight.

As its name implies, mile-a-minute weed grows very rapidly (up to 15cm per day).

The Solution

Fortunately, individual mile-a-minute weed plants are fragile and easy to kill. The plants have weak, shallow root systems that can be easily pulled up by hand. While effective, this method of control is labor-intensive. Repeated mowing is also effective where practicable.

Traditional herbicides (such as Roundup) may be applied; however, at Shenandoah we have elected to use a biodegradable soap (containing about two percent active ingredient) to treat mile-a-minute weed. This mild soap solution burns back the delicate leaves of mile-a-minute weed in less than 24 hours. And, there is nominal effect (usually just minor leaf spotting) on hardy herbaceous and woody native species. This is a great advantage when spraying in that such nontarget species covered by mile-a-minute are not adversely affected. Of course, care must be exercised if more sensitive herbaceous species are within the treatment area.

Dense thickets require more than one treatment to kill all plants as the initial spray cannot penetrate all of the layers of the thick mats that form. Seed banks in the soil may take several years to deplete. However, in time and with vigilance, the infestation may be eradicated.



Dense mile-a-minute weed thicket completely covering all ground vegetation and climbing trees. Photograph taken by James Akerson.

Where mile-a-minute weed has already destroyed all underlying native vegetation, we are employing a cultural method of control by planting native grass seed. This will discourage reestablishment of mile-a-minute weed within the treatment area.

Ron Nemes is a Biological Science Technician.

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News From the Ashes — Forest regeneration and exotic species invasion after the Shenandoah Complex Fire

By Wendy Cass

Two years ago we watched the Shenandoah Complex Fire grow larger and larger until it had charred 23,109 acres within the Park's central district. As the fire grew, it was hard not to think about other disturbances impacting Park forests, and question how this latest change might further influence forest composition. Once the fire was controlled, a Burned Area Emergency Rehabilitation (BAER) plan was completed to outline ways to assess and mitigate the fire's impacts. One recommendation of the BAER plan was that the Park monitor vegetation in areas of the burn previously damaged by gypsy moths. The fire appeared to have burned more intensely in areas of gypsy moth tree mortality, and it was thought that this may have impacted woody plant regeneration, and increased the

susceptibility of the areas to exotic species invasion.

Monitoring was completed in June and July of 2001 and 2002 using BAER project funding and staff from the botany and forest health programs. Field samples were collected at five study sites; Hot Mountain, Hazel Mountain, Buck Ridge, Pinnacle Ridge, and Old Rag. All study sites were dominated by red oak (*Quercus rubra*) or chestnut oak (*Quercus prinus*) forest that had been defoliated for two or more consecutive years during the gypsy moth outbreak of the 1990s. At each study site, transects and plots were used to measure the composition and cover of trees, shrubs, and woody regeneration, and to document the abundance of 26 target exotic species known to be invasive (Figure 1 a-b).

The effects of the gypsy moth infestation were measurable at the five study sites. Canopy cover averaged only 52% reflecting the large gaps resulting from gypsy moth tree mortality. Common overstory species included red and chestnut oak with white pine (*Pinus strobus*) on poorer sites and tulip poplar (*Liriodendron tulipifera*) on richer sites. Other associated species included black birch (*Betula lenta*), basswood (*Tilia americana*), and white oak (*Quercus alba*).

Low intensity surface fires like the Shenandoah Complex burn kill the above-ground portions of most saplings and shrubs, but ultimately stimulate understory growth. Ample evidence of this trend was found in our study. Shrub/sapling density increased significantly from 2001 to 2002 (Figure 2), and was $18,207 \pm 6004$ stems per hectare in 2002. The most common species were red oak, sassafras (*Sassafras albidum*), blackberry (*Rubus allegheniensis*) and black locust (*Robinia pseudoacacia*). The number of shrub/sapling species found at each site also increased notably between years from an

average of 7 ± 3 species in 2001 to 16 ± 3 species in 2002.

Small tree seedlings and other woody vegetation are easily killed by fire,

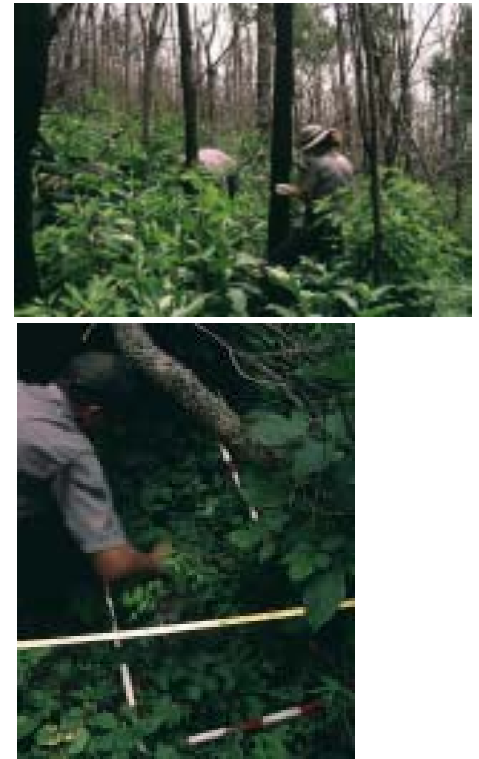


Figure 1. Vegetation sampling in plots (a) and along transect (b) at the Hazel mountain site within the Shenandoah Complex burn.

allowing possible changes to forest composition as more aggressive species become established. Our monitoring found that woody seedling regeneration was strong at all study sites averaging $271,947 \pm 25,516$ stems per hectare in 2001 and $226,182 \pm 11,041$ stems per hectare in 2002. Blackberry, mountain laurel (*Kalmia latifolia*), sassafras and black birch were the most common seedlings. Seedling establishment of canopy species appeared adequate. Red oak and chestnut oak seedling numbers increased between sample years and were 5702 ± 1502 se, and 4289 ± 2084 se stems per hectare respectively in 2002.



National Park Service
U.S. Department of the Interior

Shenandoah National Park lies astride a beautiful section of the Blue Ridge, which forms the eastern rampart of the Appalachian Mountains between Pennsylvania and Georgia. In the valley to the west is the Shenandoah River, from which the park get its name, and between the north and south forks of the river is Massanutten, a 40-mile-long mountain. To the east is the rolling Piedmont country. Providing vistas of the spectacular landscape is Skyline Drive, a winding road that runs along the Blue Ridge through the length of the park.

Address
Shenandoah National Park
3655 Highway 211 East
Luray, VA 22835

The National Park Service cares for the special places saved by the American people so that all may experience our heritage.

Moderate evidence of exotic species invasion was found within the study sites. Fourteen percent of plots had one or more target exotic species in 2001 and 15.6% of plots had one or more target exotics in 2002. However, the coverage of non-native herbs was low and averaged only 3% each year. The overall frequency of occurrence for individual exotic species varied little between years. A surprising trend was the decrease in the frequency of occurrence for several particularly noxious exotic species. Garlic mustard (*Alliaria petiolata*) was found in 9.5 % of the subplots in 2001 and in only 5.3% of the subplots in 2002. Tree-of-heaven (*Ailanthus altissima*) was found in 2% of plots in 2001 and in only 0.5% of plots in 2002. Mullein (*Verbascum thapsus*) was found in 1.8% of plots in 2001 and in only 0.2% of plots in 2002. These decreasing frequencies may

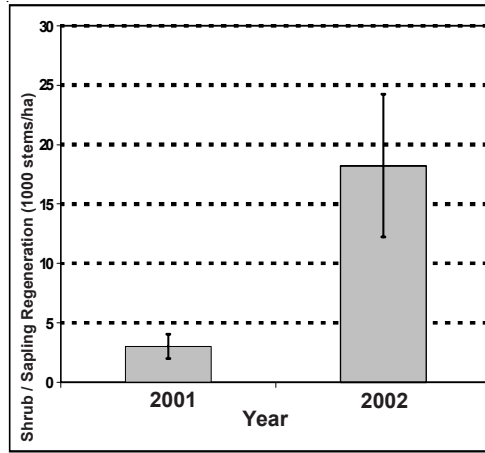


Figure 2. Average shrub / sampling regeneration in 2001 and 2002 within gypsy moth damaged areas of the Shenandoah Complex burn. Paired t-test found a significant difference between years at the alpha = 0.04 level.

have been caused by several factors. The plots could have been placed in slightly different locations thereby missing stems found in clumped distribution, or the sprouts from 2001 could have been killed by environmental factors such as overshading or the continued drought of 2002.

The results of this study indicate that exotic species invasion is a factor within the gypsy moth mortality areas of the burn, but that there is no evidence of large-scale infestations. It was encouraging to see the low and decreasing cover of several exotics, but sobering to see the increasing frequency of occurrence for exotic species. New epicenters of invasive species may still be small and difficult to detect, so it is imperative that we remain vigilant of these areas for future problems. Fortunately the strong seedling and shrub regeneration trends provide clear evidence that the native species are making a good recovery.

Wendy Cass is a Botanist.

Integrated pest management planning with ARAMARK

By James Åkerson

ARAMARK Sports & Entertainment Services, Inc. is the concessioner providing guest services for food, lodging, and entertainment within the Park. As such they manage 149 buildings in their operations, including five restaurants/cafes, two lodges, 284 guestroom units, and a horse stable. It's a big operation made all the more complicated by being spread out along 56 miles of Skyline Drive. Effectively managing pest problems to minimize public health issues and guest complaints is an important aspect of the operation.

The Park and ARAMARK staffs are working together on a revised Integrated Pest Management (IPM) plan to replace their first plan completed in 1998. The earlier document was one of the first park-concession IPM plans in the National Park Service and has been used by many parks around the country as a benchmark for their planning.

IPM is a way of working *with* nature rather than fighting it. IPM requires site monitoring and environmental engineering to reduce the potentials for pest outbreaks, thus minimizing the need for pesticide applications. A forestry example of IPM might include cultivation and fertilization to enhance tree vigor. Many bark beetles and root rots are actually nature's way of recycling dead or dying biomass into building blocks for new growth. Trees in excellent health are less likely to attract insects and diseases.

In home or concession settings, making sure that food isn't left out on counter tops to attract ants and small mammals goes a long way in avoiding pest problems. Those creatures in a home are considered "pests" but in nature they are merely cleaning up and using available food, water, and cover. A big part of IPM is to help us work within nature (*especially in a national park*), avoid problems where we

may, and use generally environmentally friendly pesticides if it finally comes to that need.

IPM planning with ARAMARK is needed at this time for two reasons. There is a programmatic requirement to update IPM plans every four years. And sadly, the former ARAMARK pest management operator, Karl King, died earlier this year after many months of health problems. IPM planning is bringing the Park, ARAMARK and its new pest management operator, EcoLab, to the table to come to terms on current pest problems, IPM-related maintenance needs, pesticide use clearances, communications tools, and monitoring and suppression reporting, to name just a few items.

James Åkerson is a Forest Ecologist.

Forest health — gypsy moth update

By Mary Willeford Bair

The gypsy moth is still present in Shenandoah National Park. The last tree defoliation seen in aerial surveys was in 1995. The Virginia Division of Forestry mapped 3,164 acres of significant defoliation in Shenandoah National Park in 2002 (Figure 1) but the actual total is slightly higher since small pockets missed by the aerial survey were not documented.

A fungus that attacks the gypsy moth almost exclusively, *Entomophaga maimaiga*, decimated the moth population during the wet years of 1995 and 1996. Drought in the late 1990s allowed the moth population to rebound. Although burlap band and pheromone trap monitoring indicated an upsurge in gypsy moths in 1999 and 2000, the gypsy moth population did not become a devastating problem due to fungus proliferation caused by rains in 2001 and 2002. Unfortunately the gypsy moths located in drier areas, especially on the western side of the ridge, were not as affected by the fungus in 2001; therefore, we had significant spots of defoliation in 2002.

Why do we still have defoliation even though the fungus is present? First, it helps to understand the life history of the fungus. Primary infection is by resting spores that produce germ conidia one to two days after significant rainfall. These attach to caterpillars when they crawl on the ground and the infected caterpillars eventually die. After death, production of either conidia or resting spores or both occurs. Light and short-lived conidial spores tend to be discharged from early caterpillar life stages (instars) with massive numbers produced if rain, heavy dew, or extended periods of high humidity exist. Secondary infection is from these “conidial clouds”. Caterpillars infected during third and fourth instars tend to produce more of the heavy and long-lived resting spores as opposed to the ephemeral conidial spores. The resting spores that are washed to the

ground remain viable for at least eight years but probably longer. All they need is a good rain shower to become active. Unfortunately, spring rains do not always coincide with gypsy moth egg hatch. Also, depending upon the temperature, amount and periodicity of rains, the fungus may not afflict and kill the insect until after the caterpillar has reached late instar or pupal stages. Areas defoliated one year may not be defoliated the next since moth reproduction may have been minimal due to fungus-caused mortality.

There will always be a potential for defoliation in the future since gypsy moth populations will fluctuate in up and down cycles. However, I doubt we will experience situations like in 1988 when

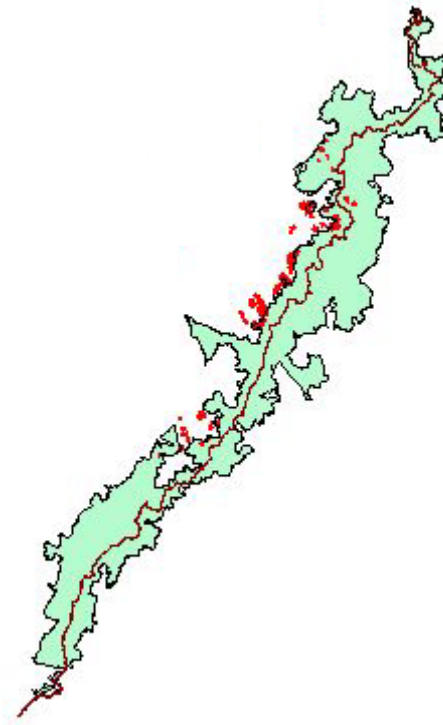


Figure 1. Locations of significant gypsy moth defoliations in 2002.

Skyline Drive at Milepost 14 was covered with so many caterpillar cadavers the road was slick as ice. Severe outbreaks seen in the late 1980s and early 1990s are unlikely because there are many enemies of gypsy moths present now that weren't as prevalent then. There are predators of all life stages: egg, larva, pupa, and adults. Parasitoids, such as flies and wasps, attack eggs and caterpillars. Cuckoos, blue jays, and rufous-sided towhees feed on the caterpillars. Mice, shrews, voles, and other small mammals feed on both caterpillars and pupae. Both the adults and larvae of the introduced *Calosoma* beetle feed almost exclusively on the gypsy moth caterpillars and pupae. Many native beetles, ants, and predatory stinkbugs are also important predators. Pathogens, like the fungus and nucleopolyhedrosis virus (NPV), are especially effective in controlling gypsy moth outbreaks. Unfortunately, NPV is effective only after the insect population reaches high densities. During a study in Shenandoah in 2000 with Dr. Ralph Webb, USDA, we found the fungus effective regardless of gypsy moth population. In areas where the fungus has been unable to proliferate and the population has reached levels high enough for significant defoliation to occur, it is likely that the virus will eventually suppress these populations.

In spite of recent tree defoliation, Park suppression activities will be considered only when it complies with the goals stated in the Gypsy Moth Management Plan. Even if the areas defoliated this year experience some tree mortality, they were not located such as to pose a threat to visitor safety, cultural resources, or endangered species; therefore, no suppression activities are planned for 2003.

Mary Willeford Bair is a Biological Science Technician.

What is IPM?

By James Åkerson

Integrated Pest Management (IPM) was formally instituted in the Federal government by Presidential Order in 1979 under the Carter Administration. IPM has lasted through the years and political swings because it makes sense and works. IPM is a systems approach rather than merely identifying a “bug” and spraying to kill it. It is a system that can be used for any pest, whether insect, disease, animal, or plant. Integrated pest management includes a nine-step process for evaluation, consensus building, action, and improvement (see table). Whether in a “plan” or in day-to-day practice, managers and staff are required to approach pest problems in a holistic fashion that seeks to avoid problems and minimize impacts so that direct controls and pesticide usage are minimized.

Step	Planning/Action Item
1	Build consensus on stated problems and treatments
2	Review appropriate Federal & State laws and NPS policy
3	Identify specific pests as appropriate
4	Establish priorities through a hierarchy of pest control needs
5	Establish action thresholds
6	Monitor pests and the environment
7	Apply indirect and direct suppression as needed: --Applying non-chemical methods as the first course of action; --Obtaining prior approval and applying pesticides if they are still needed
8	Evaluate effectiveness
9	Keep records for annual reporting and the public's "right to know"

The Park pest management objectives include the following:

- Prevent organisms from becoming pests
- Train personnel to operate within a framework of IPM methodologies
- Determine the thresholds of unacceptable injury and need for action for various pests
- Conduct treatments when action thresholds are reached
- Provide adequate documentation of monitoring and actions at each location for evaluation and improvement, and
- Maintain good communications between the Park, ARAMARK, and the Pest Management Operator.

An Outline of IPM Action

- Monitor an area for pre-identified and new pests.
 - Determine the damage threshold for action (accounting for intolerable resource damage, as well as available funds, time and facility to respond with controls). A completely pest-free environment is not practical. Aim for control to tolerable levels.
 - Spot treatment to determine an optimal method to kill or remove the pest and not create associated impacts.
 - Select the least disruptive control and prepare to implement.
- Implement controls and document the approach, methods, and volumetrics used.

• Monitor the area for the identified pests – population trends. Evaluate the action effectiveness.

• Educate the people involved as to how they can make a difference.

IPM Treatment Options

Indirect Control Methods

- Do habitat control. Modify landscaping so it discourages animals and other potential pests from gaining

close access to buildings.

- Do host control. Reduce attractive habitat within buildings. Store papers, artifacts, and equipment in a way that discourages pests. Small mammals use loose papers for nesting.
- Change human actions that encourage pests. Don't leave food on counter tops. Store lunches and snacks in refrigerators or tightly sealed containers rather than in desk drawers. Many pests are allowed in or transported into otherwise uninfested areas by people. Close doors as you enter buildings. Take care to inspect items

shipped to offices before unloading and storing.

- Create buildings or outdoor settings that do not invite trouble. Don't build new buildings near existing snake denning areas, etc.

Direct Control Methods

- Create physical barriers. Conduct building maintenance to exclude potential pests. Fill exterior wall voids. Make sure doors and windows are well sealed when closed. (3/8" is enough space for mice to squeeze through.)
- Use traps. Snap traps, live traps, glue boards, and sticky tape can be used for a wide variety of rodents and insects.
- Use biological controls. This is a fast growing approach. Approval at the national level is needed for many biological methods to ensure that sufficient scientific care has been taken to avoid introducing new problems with the control.
- Use chemical controls. Chemicals are still appropriate. With the IPM approach, however, they are the last resorts after other methods have either been tried or proven elsewhere to be ineffective.

In the end, IPM is most effective when people incorporate themselves into the environments in which they live and work. We are part of the natural world. On the one hand, we have a responsibility to live conscientiously. We ought not attract species to our environs and then blast them when they do come. On the other hand, choosing to live as if outside of nature would cause us to use maximal pesticides in a never-ending assault. Truly, there isn't enough pesticide in the world to kill every insect and rodent. We'll just have to live smarter.

James Åkerson is a Forest Ecologist.

Shenandoah crew inventories fish species in five other Virginia parks

By Jim Atkinson

In addition to scheduled fisheries monitoring in 24 Park streams in 2002, Shenandoah's 2002 fish crew jumped at the opportunity to apply their skills to different habitats and fish species within Virginia parks in the Mid-Atlantic Network.

Favorable conditions for electrofishing Shenandoah streams this summer combined with a veteran crew of second and third season people served to set the stage for initiating fish species inventories at Fredericksburg/Spotsylvania, Richmond and Petersburg Battlefields, Appomattox Court House and Booker T.

Washington National Monument.

Preliminary plans for conducting fish species inventories within Mid-Atlantic Network parks were an outcome of a network scoping session held at Richmond in April, 2001. By April, 2002, regional inventory money was available to cover costs associated with travel and for extending seasonal appointments for several members of the crew. During late May, each of the five parks was visited to assess aquatic habitats present in terms of relative size, area, access and whether backpack or boat mounted electrofishing gear would be most appropriate for sampling.

Another drought year throughout the entire Mid Atlantic region facilitated the timely completion of Shenandoah streams and rendered a number of sites at Fredericksburg and Richmond accessible with backpack gear that would have otherwise been very difficult to either access or sample. By early August, the crew

was in position to start sampling at Fredericksburg. Several sites along Hazel Run and Wilderness Run, both of which are direct tributaries of the Rappahannock River, were sampled initially. At Appomattox Court House, several sections of the upper Appomattox River were sampled and at Booker T. Washington, several sections were sampled along Gills

Creek and Jack-o-lantern Branch. Whereas the Appomattox is a major tributary of the James River (Chesapeake Bay Watershed), the streams within Booker T. Washington are part of the Roanoke Drainage which ultimately flows into

Albemarle Sound in North Carolina.

Within the stratified confines of Richmond Battlefield, five streams were sampled including Beaverdam Creek, Boatswain Creek, Bloody Run, Western Run and Crewes Channel. These are all direct tributaries of either the James River to the south or the Chickahominy River to the North. At Petersburg, Harrison Creek and Poor Creek (Appomattox River tributaries) were sampled.

During late August and early September, the crew returned to Fredericksburg and sampled a beaver-dammed section in the upper Ni River system and a section of Lewis Run. These are the only two systems sampled during

this initiative that are components of the York Drainage, the smallest of the principal Chesapeake Bay drainages within Virginia.

Substrates encountered within all of the various sites ranged from sand and silt to muck and gravel/cobble. In addition to the challenges of sampling deep cut, murky streams with muck substrates, the crew was immediately challenged with a large range of fish species dissimilar to those commonly encountered in Shenandoah streams. Roanoke Drainage streams included a number of species that either were not otherwise observed during this initiative, or do not occur within the Chesapeake Bay Watershed. Assistance with species identifications involving some of the more challenging cases was provided by area fisheries biologists with the Virginia Department of Game and Inland Fisheries and ultimately by Dr. Robert Jenkins at Roanoke College. Dr. Jenkins is principal author of the comprehensive [Freshwater Fishes of Virginia](#) published in 1994.

A total of 59 fish species was identified from among thousands of individual fish captured at all of the sites combined during 2002. Species diversity within individual parks ranged from 8 at Petersburg to 31 at Fredericksburg. At Richmond, 24 species were identified. Appomattox and Booker T. Washington each contained 28 species. Species diversity appeared to be most influenced by the number of streams present within each park, stream size and/or diversity of habitat types within/between streams.

Species diversity ranged from those that are commonly encountered in



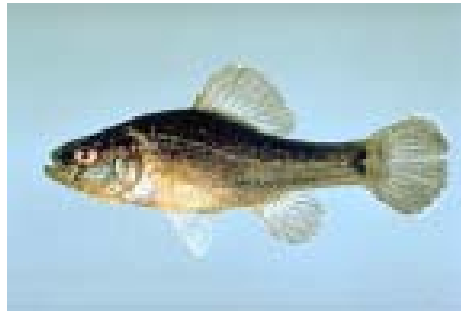
Black jumprock (*Scartomyzon cervinus*)



Bluespotted sunfish (*Enneaceathus gloriosus*)

Shenandoah streams including blacknose dace (*Rhinichthys atratulus*), bluehead chub (*Nocomis leptocephalus*), common shiner (*Luxilus cornutus*) and tessellated darter (*Etheostoma olmstedii*) to those that Shenandoah crews have never encountered and are not likely to encounter including sea lamprey (*Petromyzon marinus*), eastern mudminnow (*Umbra pygmaea*), pirate perch (*Aphredoderus sayanus*), bluespotted sunfish (*Enneacanthus gloriosus*), black jumprock (*Scartomyzon cervinus*), and quillback (*Carpionodes cyprinus*). One particular highlight was the reconfirmation of the presence of ironcolor shiners (*Notropis chalybaeus*) in Beaverdam Creek at Richmond. The original record there was from 1976 and represents the only known record of this species from the entire James River Drainage. Other scattered populations of ironcolors exist elsewhere in the coastal plain of Virginia.

This initiative was both exciting and fun for everyone involved. In most cases, these parks now have a fairly



Pirate perch (*Aphredoderus sayanus*)

comprehensive list of fish species present within their respective areas. Plans for this year include sampling some of the larger systems at Richmond and Petersburg that could not be adequately sampled with

backpack gear. These are streams with wide, deep cut channels or beaver pond impoundments which will require the use of a boat shocker. This work will be done in cooperation with Region V personnel of the Virginia Department of Game and Inland Fisheries who have generously offered both their time and equipment. The Five Forks Unit at Petersburg includes a beaver-dammed section of Hatcher Run which is in the Chowan Drainage and therefore not part of the Chesapeake Bay Watershed. This system will likely boost the number of fish species associated with Petersburg Battlefield considerably. (Photographs courtesy of Virginia Tech, EFISH.)

Jim Atkinson is a Wildlife/Fisheries Biologist.



Carol and William Sours of Bentonville, Virginia, hiked over 500 miles in Shenandoah National Park last season. Unlike most hikers, the Sours' backpacks are fitted not for food, but their dogs. Carol carries Isabella; William carries Isaiah. Photos taken by John Amberson, VIP, Park Archives. (Permission granted to publish, JA on 1-14-2003.)



Isaiah, looking spiffy in turtleneck and visor, loves nothing more than an escorted hike on a mountain trail.

Two new fish species confirmed in Shenandoah National Park

By David Demarest

In the past two years, the fisheries crews have electroshocked three new drainages in Shenandoah National Park (SNP). This and a trip to Roanoke College by Jim Atkinson (Fish and Wildlife Biologist, SNP) to talk with Robert Jenkins, one of the authors of *Fishes of Virginia*, has confirmed two new fish species in two of those streams. Bluntnose minnows (*Pimephales notatus*) were found in Happy Creek near Front Royal, and Hawksbill Creek south of Elkton. Potomac sculpin (*Cottis girardi*) were found in Hawksbill Creek and confirmed in the West Branch of Naked Creek.

The bluntnose minnow is a warm water species that reaches a maximum length of about 110mm. It is found throughout the middle and eastern United States. Instead of creating a nest, it deposits its eggs in a small crevice or tunnel. Bluntnose minnows (Figure 1) can be described as a small blunt-nosed chub-like minnow with a



Figure 1. Bluntnose minnow. Photo courtesy of Konrad Schmidt.

dark lateral line (Jenkins and Burkhead, 1993). The bluntnose minnow spawns in June or July when the water temperature reaches 19 to 31 degrees Celsius.

The Potomac sculpin is found in West Virginia, Virginia, Pennsylvania, and Maryland. They can get quite large for a sculpin, up to 137mm. It is considered a coolish water species that spawns on the underside of rocks when the water temperature is about 6 to 16 degrees Celsius. The Potomac sculpin (Figure 2) is differentiated from the mottled sculpin (Figure 3) by two



Figure 2. Potomac sculpin. Photo courtesy of Virginia Tech, EFISH.

main features. Potomac sculpins have faint grayish mottling on the chin, mottled's do not. The second distinguishing feature is the band on the tail. Both species have bands, but the mottled sculpin's band is straight while the Potomac sculpin has more of a



Figure 3. Mottled sculpin for comparison. Photo courtesy of Virginia Tech, EFISH.

flying gull shape (Jenkins, communication with Atkinson, 2002).

In the past, streams were electroshocked if they were thought to contain brook trout (*Salvelinus fontinalis*). Data are needed from all of the streams in the Park and the fisheries crews will continue to search out new waters to inventory as time allows. It is doubtful that other "new" species will be found in the Park but the chance always exists.

David Demarest is a Biological Science Technician.

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Use of recreational Global Positioning System (GPS) equipment for resource management projects

By Alan Williams

Resource managers have been using GPS solutions for many years to assist in data collection for use in geographic information system (GIS). The ability of the user to collect positional information in the field and then quickly integrate that information into a GIS has enabled any number of cartographic and analytical projects. When used in ideal conditions, they can produce very accurate data that would be very costly to produce using traditional survey techniques. However, GPS receivers traditionally used by resource managers are expensive and require a good deal of training and experience to operate. Now lower cost alternative GPS solutions exist that may meet the needs of some users.

In the last few years, a number of factors have converged to boost the use and availability of recreational GPS receivers. One of the most important was the discontinuation of Selective Availability (SA) May 2, 2000 for the civilian GPS signal. This dramatically improved the positional accuracy and thus usability of the “lower-end” GPS receivers. Since then, as the technology has improved and the number of users have increased, the receiver prices have dropped. This has not changed the fact that for most GIS projects, it is still preferable to use the more sophisticated equipment to collect quality GPS data. However, there may be some projects where the accuracy requirements are low enough to take advantage of the benefits offered by the recreational units.

In the past few years at Shenandoah National Park (SNP), protection rangers, wildland firefighters, archeologists and vegetation mapping technicians have begun to use recreational GPS units for navigation to, and “marking” of locations in the park. The main benefits that have been cited are: size, cost and ease

of use. For most of these applications, coordinate information was not collected previous to the use of the GPS units, because of the time, expense, or lack of availability of traditional GPS equipment. Now using free communication software from the internet, data from a small GPS unit can quickly be integrated with an existing GIS. The level of accuracy that is achievable with these units is dependent on many factors, including terrain, canopy cover, and the satellite constellation at the time of the data collection. However, in general, positions in the open are expected to be within +/- 10 meters, while positions in a closed canopy should be within +/- 20 meters.



Various GPS units used by park employees to collect field data. Photograph courtesy of U.S. Department of Agriculture, Forest Service.

Below are some recommendations and considerations when planning to use a GARMIN GPS unit with ArcView 3.x on a personal computer (PC).

The GPS Receiver

The most important feature for improving accuracy is “waypoint averaging”. Waypoints are how GARMIN stores

point locations. Averaging takes multiple positions or fixes that the GPS unit continually calculates, and averages them into a single coordinate, improving confidence in the point. The GARMIN eTrex GPS units do not have this feature but most of the others do. The GPS V and the GPSMAP 76s are two models I like. They are both weatherproof and have easy to use controls. The GPS V has slightly better reception, while the GPSMAP 76s has a built-in magnetic compass and a barometric altimeter. Both come with the cable for connecting to a PC and have optional external antennas for improving satellite reception.

The Communication Software

For uploading and downloading data to and from your GPS unit, you will need some software. There are a few different choices but I prefer DNR Garmin, developed by Minnesota Department of Natural Resources. It consists of a communication program for exchanging data between the GPS unit and the PC, and an extension for moving data between the communication program and ArcView 3.x. They are relatively easy to install, learn and use. The online help is thorough and covers the features of the software.

If you do not have ArcView, the communication part of the DNR Garmin can manage waypoints and tracks without the GIS. Also, the GARMIN units often come bundled with a “MapSource” CD-ROM that has software that allows the user to manage background maps, waypoints, and other aspects of the GPS unit.

Procedures

Allow the GPS to “warm-up” for 5 to 10 minutes after turning it on before starting to “mark” or collect a waypoint. This allows the unit to find satellites and

improve its accuracy. If you do not wait, you may include some positions with very poor accuracy in your waypoint data.

When collecting point locations, use the “Average Waypoint” option to collect 100 or more positions. To illustrate the benefit of averaging, stand in one location and set the “track log” in the GPS unit to collect a position every second. Begin averaging a new waypoint for 100 points and save the waypoint and the track log. Then bring them both into ArcView as points. You should see the waypoint sitting somewhere in the middle of a “halo” of track log points. The individual track log points represent only snapshots and could be quite inaccurate, depending on the conditions. The averaged point is not necessarily more accurate but it represents a better estimate of the position than any single position.

Avoid using the NAD27 datum. Though the GARMIN receivers and DNR Garmin can use it there are small predictable errors that may be present in the data. In SNP, we found errors of about 25 meters. Evidently, these errors arise out of the quick but imperfect conversion solution that both the GARMIN GPS receivers and DNR Garmin use to get to and from WGS84 (the native GPS datum). The amount of error is

variable depending on where you are in the United States, so do some testing if you plan on using NAD27. Instead of NAD27 we set everything to NAD83 and then used the ArcView Projection Wizard to convert between the two.

Finally, it is a good idea to test your GPS unit using some known locations or bench marks in a familiar area before relying on it for navigation. Take the time to read the manuals and become familiar with the features you will want to use. Then collect some test data, use DNR Garmin to bring it into ArcView and compare it to reference data to evaluate if the accuracy will meet your needs. Consult the publications below for details about assessing positional accuracy.

Alan Williams is a Ecologist/Data Manager.

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GARMIN site for comparing features of their GPS receivers.

<http://www.garmin.com/outdoor/compare.jsp>

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The Hogcamp Branch stabilization project — an update

By Rolf Gubler

Due to past human disturbances and major floods, channel erosion had removed much of the large rock from a 330-foot section of Hogcamp Branch near Big Meadows and thereby compromised much of its natural armoring ability. The riparian system was also being impacted due to the instability along this reach. This section of incised channel threatened to lower the



Lower headcut - 1998

water table of the Big Meadows wetland located only 345 feet upstream. This event was likely to occur within the next 25-50 years through upstream erosion. The Big Meadows wetland is a rare, high-elevation ecosystem upon which unique flora and fauna are dependent. With technical assistance from National Park Service (NPS) Water Resources Division staff and through the Environmental Assessment process, the Park chose a stabilization alternative that involved installing two sloping rock drop structures and seven rock checkdams. These structures were designed to halt the ongoing erosion and to withstand flows that are likely to occur in this watershed. With time, the checkdams should collect sediments, protect downstream areas such as the Rose River and Chesapeake Bay, and re-establish a stable stream grade.

2002 Construction Phase — Construction of the sloping drop structures and checkdams took place between June and August 2002. The drought conditions in summer 2002 were ideal for a stream stabilization project of this magnitude/complexity on an intermittent stream. Working with NPS Hydrologist, Mike Martin, we were able to minimize site impacts by narrowing our streambank excavation areas (hydrologic design) and overall rock (rip rap) requirements. Having an experienced equipment operator who could skillfully use an excavator with **thumb** was critical for “hand placing” the rock in the stream channel (rip rap was “tightly nestled” so that future floods are not likely to uproot any rocks). We were

A headcut is loosely defined as localized channel degradation in the form of an eroded drop-off and splashpool that occurs directly in the stream channel. Headcuts are usually caused by flooding and/or manipulation of the stream channel.

able to reduce impacts on the northern side of the branch by utilizing the long boom on the excavator, which allowed us to work the project from one stream side only. The bases of both headcuts were lined with geotextile filter fabric (to reduce undercutting/scour beneath the structures) prior to installing the sloping drop structures. The areas below each sloping drop structure were bolstered with native greenstone rock (class II rip rap).

Seven checkdams were installed throughout the 330-foot reach. The checkdams were constructed by digging



Excavator with thumb is essential for proper rock placement.

keys into both banks and filling them with class I and II greenstone. The checkdams are built in such a way that the water is concentrated through a notch in the middle of the dam so the lower rock apron (that extends ~10 feet below) serves to protect the structure from undercutting during floods). Checkdams help to build up the stream channel and trap sediments. Additionally, a downstream area of instability with a rock shelf and scour pool (called a nickpoint) was stabilized by bolstering with large greenstone rocks.

2002 Rehabilitation Phase — Drainage dips (erosion control) were installed every 100 feet along the lower equipment route. Erosion fencing was installed in the lower stabilization area to control run-off. The construction areas and equipment routes were naturalized and de-rocked by hand crews and equipment.

2002 Re-planting Phase — Native vegetation (trees, shrubs, grasses, wildflowers) was planted along the bank edges, equipment routes, and in all other disturbed areas. Five feet tall protective metal fencing was installed around all newly planted trees/



Geo-textile filter fabric secured with gravel.

shrubs to eliminate deer browsing. The fencing will be in place long enough to ensure that the trees are tall enough to withstand heavy browsing. In fall 2002, we had good survival of planted native vegetation. Regular watering was necessary during the drought. Native grasses were beginning to emerge as early as September. Native wildflowers were locally collected and seeded in September and October. Herbaceous species include little bluestem grass, switchgrass, timothy grass, fly poison, native yarrow, common daisy, hare figwort, and various milkweeds.

Future Work — Staff will continue to bolster rock checkdams that need shoulder, or notch repair work. We will continue to monitor and manage any exotic vegetation (e.g., Japanese stiltgrass). Staff will continue to plant native trees, shrubs, grasses, and wildflowers in areas of poor re-establishment or germination. We will repair/replace metal tree protectors and install stem protectors to eliminate future

tree damage from buck rub and continue to take photopoints to document stream recovery. (Photographs by SHEN staff.)

Rolf Gubler is a Biologist.



Constructing the base of a sloping drop structure.



Big Meadows tree nursery -- combination of native and locally-grown trees/shrubs.



Use of straw mats is essential for reseeding native grasses on steep banks.

2002 Ozone Season

By Shane Spitzer

In the spring 2002 edition of the newsletter, the new ozone advisory system for Shenandoah National Park was introduced. The advisory system, now an official Park directive, outlines the steps to be taken when ozone levels are expected to or have exceeded the Environmental Protection Agency's human health based standards for ground level ozone. Shenandoah National Park (SNP) did not issue an ozone advisory under this system in 2002. Although SNP had six times when ozone levels were high enough to warrant an advisory, none of the high ozone levels were recorded during peak activity times, but rather all were overnight (see Table 1). This differs from ozone exceedances observed in the late 1990s, when several hours of the 8-hour period occurred in daylight hours. In each of 2002's incidences, ozone levels were steadily dropping by the morning when the advisory would be called, and weather patterns indicated that ozone levels would

continue to fall. This pattern of high overnight ozone concentrations is not the same pattern that urban areas display. Generally, ozone concentrations exhibit a strong diurnal pattern, with ozone concentrations rising after sunrise and steadily increasing to a peak around late afternoon or early evening. At night, ozone formation ceases (because sunlight is required to form ozone) and ozone reacts with another pollutant, nitrogen oxide (NO), causing levels to drop. Big Meadows, however, does not display the typical pattern. The relatively high elevation at Big Meadows (3520 feet) generally puts it above inversion layers that trap nighttime pollutants, including NO needed for ozone destruction. In addition, Big Meadows is relatively removed from strong local sources of fresh NO. All these factors serve to disrupt "normal" ozone cycles, usually resulting in elevated ozone concentrations throughout the night. High overnight concentrations

make predicting ozone levels for the ozone advisory difficult. We will continue to refine our methods in the years to come, and continue to pursue extending current ozone forecast areas into the Park.

Date	Time Of Max 8 Hour Average	Maximum 8 Hour Average (PPB)*
7/15/02	23:00-06:00	89
7/16/02	17:00-00:00	86
7/18/02	01:00-08:00	86
8/13/02	21:00-04:00	85
9/9/02	20:00-01:00	87
9/10/02	19:00-01:00	101

Table 1. 2002 Ozone Exceedences *85+ parts per billion (PPB) exceed EPA standards.

For statewide ozone exceedence, see: <http://www.deq.state.va.us/ozone/ozone-t4.html>

Shane Spitzer is a Physical Scientist.

The way we were: women and the National Park Service

By Reed Engle & Carrie Janney-Lucas

Possibly with little fanfare, the year 2003 will mark the 25th anniversary of an event of which few Service employees under fifty years of age will relate—the official recognition of a Service woman’s right to “look like a ranger.” In that year, women were allowed to cast off their unique polyester knit, “fast food worker’s” uniforms (Bicentennial replacements for the earlier “stewardess” garb), and wear the same official uniform Service men had always worn. They also were given the right to wear the official badge, as opposed to the former diminutive replica, and the regular, rather than the earlier lightweight and flimsy, Stetson. It had taken sixty-two years, an Act of Congress, a ruling by the U.S. Attorney General, and much quiet internal protest for women to gain the right to be perceived by the public as National Park Service rangers.

The changes of May 1978 began in 1960 when the Committee on Interpretive Standards was established. Composed of male park historians and interpreters, the Committee came to an agreement in 1962 that the “Service must make up for lost time and an unperceptive attitude by initiating a strong program of recruiting *young* [emphasis by author] women for some types of interpretive work.”¹ The report was “generally acceptable” to most superintendents and regional directors, all white males in 1962. The Report saw women as competent to be interpreters in historical parks, but not in the military or traditional “natural” parks where the prevailing ethic still saw a uniformed ranger as a white

male. There is little doubt that the primary reason the Committee forwarded their recommendation is that the male-dominated Service saw interpretive programs at historical parks as similar to those given by volunteers at historic shrines and local historical societies. They were willing to concede these positions as a sop to women’s rights. Women hired for these positions, however, would not wear a standard Service Class “A” uniform, but one of polyester knit uniform with a pillbox hat based on that worn by airline stewardesses (unofficially known as a “buffalo chip”).

In 1962 Attorney General Robert Kennedy handed down a ruling invalidating an 1870 law that allowed federal agencies to limit job offerings by sex; in 1965 Congress repealed the 1870 law. Although Kennedy’s

ruling forbid “male only” job announcements as did Title VII of the Civil Rights Act of 1964 two years later, the Service continued to do so on ranger positions. In 1967 Secretary of the Interior Stewart Udall responded to a discrimination complaint by a woman wanting to apply for a ranger position by stating that it was “our concern and affection for girls that prevents our saddling them with the full load of ranger duties.”² Udall continued by welcoming the woman to apply for naturalist or historian positions which while also done by males could be “done just as well, and indeed, often better by, women.”³ Udall echoed the prevailing feeling in the Service that women were better at public interpretation of “touchy-feely” sites that dealt with culture, society, or sensitivity, but that men were better at interpreting nature and war, and certainly with law enforcement.

In 1964 the first two Service women were admitted to the Albright Training Center ranger training. They ended up as a ranger-naturalist or ranger-historian, hyphenated positions, unlike the men’s. It was not until 1969 that the Office of Personnel Management (OPM) issued new standards for the ranger series that allowed a woman to hold a ranger position without a hyphen. It was not until 1971 that the first woman was allowed to take law enforcement training and commissioned to carry a gun. And it was not until 1978 that women in the Service gained the right to wear the “man’s” uniform, the Service badge, and the “man’s” Smokey Bear hat.



The NPS woman’s “airline stewardess” uniform was introduced in 1961.

¹ Final Report of the Committee on Interpretive Standards, NPS, May, 1962, page 125 in Polly Wells Kaufman, National Parks and the Woman’s Voice, Albuquerque, 1996. Kaufman’s work is the definitive history of women in the National Park Service.

² *Loc. Cit.*, p. 126

As with all history, the changing roles of women in the National Park Service must be placed in context. Prior to 1962 it was not just the National Park Service men that were products of their times and backgrounds, but often the Service wives. Those in positions of authority and their wives had grown up in time when protest was rare. The sixties changed that forever, but it would take those in authority in the Service and many other federal agencies a



Until 1974, NPS women were required to wear skirts in the field, making for many awkward moments.

decade to catch up with society. A case-in-point is that in February 1967 the park superintendents in the Southwest Region held their yearly conference in Tucson, Arizona. The attending wives developed a nationally distributed “National Park Service Wives and Women Employees Handbook”⁴ that included the following guidance:

“You are married to a very special man, or you would not be reading this letter. The Park Service challenges men who are intelligent, able to communicate and get along with people, and who also have a special love for our USA wonderlands, the National Park areas. As the wife of such a man, you are also challenged!”

“Most men choose the Park Service as a career because of a special interest or skill. They quickly become involved in their work. If you don’t want to be left out, share his interests, read everything you can get your hands on that pertains to his field of work, listen to him.”

“Just one word of caution. The job is his, not yours. Don’t intrude into official duties.”

“Whatever your husband’s position, how he looks on the job is important. . . . As a Park Service wife, it is your responsibility to see that his clothes are ready when needed, clean and neatly pressed. He will

appreciate this more than you’ll ever know.”

“A park community differs from most communities because the people not only must live together, they also work closely together. It is not fair for wives to burden husbands with complaints about a neighbor when he has to work with the same man all day. Practice patience and understanding and try not to let coffee chats degenerate into gossip sessions or comparisons of advancement and careers.”

“Wives, sometimes more than husbands, color the community’s impression of the NPS. There may be a place where you will have to live down or make up for mistakes of wives who’ve gone before you. This isn’t easily done. Be yourself, be honest, and try very hard to avoid self-centeredness.”

“There will come times when you will want to conk your beloved on his pointed little head for ever getting you into this NPS way of life! You will wonder if he’ll ever come home in time for dinner, just once even, but fire season, ski patrol, or rains which bog down unwary visitor’s cars shall pass, and you’ll have plenty of time to subdue and arrange your feelings and laugh at it together.”

We have come a long way.

Reed L. Engle is a Landscape Architect and Carrie Janney-Lucas is an Historian.



The uniform introduced in 1970 included “go-go” boots or pointed-toe shoes. The dress fabric was found to melt when subjected to high temperatures.

³ *Loc. Cit.*, p. 126

⁴ Copy in the Shenandoah National Park Wives Club Scrapbook Collection in the Shenandoah National Park Archives.

The Massanutten Lodge restoration nears end

By Reed Engle

Massanutten Lodge was built for Addie Nairn Pollock in 1911 shortly after her marriage to George Freeman Pollock. The rustic house was built from plans drawn by Victor Mindeleff, an early cabin owner at Skyland, architect for the United States Coast Guard, and President of the Washington DC Watercolor Guild.

Addie was a smart and wealthy divorcee who married George when she was in her early forties; he was 44. She retained title to her cabin and she received the funds from its condemnation for park establishment. Addie grew tired of George's flamboyance and economic impracticality and after six to seven years



of marriage, George took up residence in the adjacent "Annex" cabin.

Massanutten Lodge was used in varied ways after park establishment. At times it was used as staff housing, staff offices, and for concessionaire housing. The original open stone entry porch was enclosed to create a kitchen and the pine and oak interiors painted gray. The upper and lower roads adjacent to the lodge were widened and parking areas installed, significantly impacting both Addie's original garden and the stone retaining walls.

An *Historic Structure Report on Massanutten Lodge* was written in the 1970s and efforts at structural stabilization were undertaken. The work included the reconstruction of the cantilevered porch from the living room and the installation of

interior steel supports. The work, however, did not include removal of the non-historic kitchen, interior paint, or repairs to the retaining walls.

In 1997 with the advent of new interpretive themes and the availability of FeeDemo funding, the decision was made to



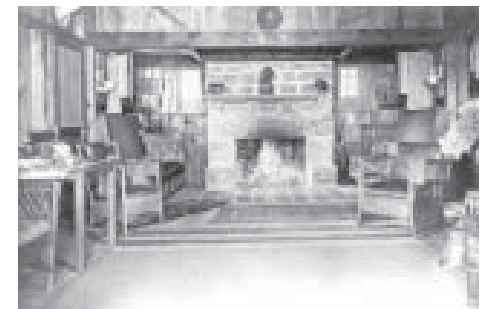
One of the panels for the new Women of Skyland exhibit.

complete the restoration of Massanutten Lodge to its known appearance in 1916 and to include exhibits that focused on the untold story of the "Women of Skyland." Initial research for the project included the contracting of an *Historic Furnishing Plan* and in-depth research of Skyland's early female cabin owners and guests (much undertaken by an Albright-Worth fellowship). Harpers Ferry Center and the Northeast Museum Services Center were awarded contracts for exhibit development and implementation of the *Furnishing Plan* recommendations.

The park's building maintenance staff were called upon to implement the architectural restoration. The original stone porch was restored by the removal of later additions and the original wood flooring reconstructed while providing subtle Americans with Disabilities Act (ADA) accessibility. The interior gray paint was removed and the floor in Addie's bedroom refinished. Inappropriate modern lighting was removed throughout and historic fixtures installed. Replacement of the aging exterior bark siding has been completed and the exterior has been repainted its historic colors.

The most obvious exterior change, however, was created as the upper roadbed was reduced to its original width by the removal of approximately 5 feet of later asphalt. The reduction in width allowed park masons to recreate Addie's original stone retaining walls and an ADA accessible version of the original walkway. Restoration of the walkway required the restoration of the side porch and steps, which originally only provided access to the flower gardens beside the house. Some historically appropriate perennials have been planted along the walk and others will follow.

April 2002 saw the culmination of four years of research with the installation



Interior of living room, 1916.

of both the permanent exhibit and the historic furnishings. The exhibit is housed in Addie's bedroom for which no adequate factual information as to furnishings existed. The living room and entry are furnished in accurate reproductions or originals from 1916 or earlier. Based on historic photographs, we feel confident Addie would feel at home.

Massanutten Lodge is a milestone for Shenandoah: it is the first park house museum. It is a project that has been truly interdivisional and has required the expertise and assistance of many. It should provide visitors with an enriching experience and broaden their understanding of the park's rich history.

Reed Engle is a Landscape Architect.

[Note: Ranger-led tours of Massanutten Lodge will be part of the regular Skyland tours conducted during the season.]

Why not Panorama?

By Carrie Janney-Lucas

In 1935 George Freeman Pollock, proprietor of Skyland Resort, wrote an article for the Potomac Appalachian Trail Club Bulletin entitled “Why Skyland?” proclaiming that his mountain top resort was the primary reason Congress had chosen the Blue Ridge for a national park. “If there had been no Skyland,” he wrote, “then there would have been no Shenandoah National Park.”¹ While his claims have been proven to be exaggerated as they ignore the work of Ferdinand Zerkle, the Shenandoah Valley Inc., and others, most people still recognize Skyland as the premier mountain retreat in the area. But Skyland was not the only resort on the Blue Ridge during the 1920s and 1930s, although it was the only one chosen by park creators to remain after the park’s establishment.²

On July 20, 1924, Panorama Resort opened its doors to guests. Managed by J. Allen Williams of Luray, the resort was located seven miles east of Luray. Straddling Page and Rappahannock counties, the property occupied approximately 350 acres including Mary’s Rock. The site had been purchased in 1923 by Williams, his brother-in-law Paul Taylor of Washington, D.C., and R. L. Cheatham and A.M. Priest of Washington, Virginia. By 1928 the resort included a Tea Room, summer hotel, five cottages, dining room,

bath house, miniature golf course, tennis court, and various other service buildings. The bungalow-style hotel, with fourteen guestrooms and four baths, was the largest building. Like many of the structures at Skyland, the hotel had been built using rustic verandas affording guests “opportunities for entrancing and unrestricted view[s] of undulating mountains and valleys that stretch to all horizons.” The cottages, also of bungalow type, were built in a semi-circle and were completely furnished ranging in size from two bedrooms, living room, and bath to six bedrooms, living room, and two baths. The Tea Room had



The fourteen guestroom hotel was the largest structure at the resort. The hotel, in Rappahannock County, sat just above the current entrance station at Thornton Gap, eye level with Mary’s Rock Tunnel. Photo courtesy of Shenandoah National Park Archives.

accommodations for over-night guests, but also served regular meals and a la carte service. All together, the resort provided accommodations for 75 guests and dining facilities for over 200.³

Not only did Panorama provide accommodations for guests, but the resort also offered a wide variety of attractions including miniature golf, horseback riding, and several caged bears. The bears, however, proved to be a troublesome source of entertainment for the resort’s managers. In 1935 John Nichols, a guest, brought a suit against Panorama to recover damages for personal injuries sustained when he was attacked by a bear kept at the resort. According to Nichols, the resort encouraged their guests and the general public to feed soft drinks, ice cream, etc. to the bears. While Nichols was standing near the bears’ enclosure preparing to feed them, “one of the bears sprang on the fence, pushed his paw through the wire enclosure and tore [Nichols’s] face, painfully and seriously injuring him.”⁴ Although Panorama’s owners claimed that Nichols had been intoxicated and was in fact teasing the bear, the court ultimately found in favor of Nichols and awarded him \$200 in damages. Despite this incident, it appears that the bears remained at Panorama until they were released by members of the Civilian Conservation Corps later in the 1930s.⁵

¹ G. Freeman Pollock, “Why Skyland,” in Potomac Appalachian Trail Club Bulletin, October 1935.

² Black Rock Springs Hotel was another mountain resort situated along the Blue Ridge within current park boundaries. Black Rock Hotel, however, burned in 1909. Darwin Lambert, *The Undying Past of Shenandoah National Park* (Roberts Rinehart, Inc. Publishers, 1989), pp. 190-191.

³ Page News & Courier, 8 June 1924 and 1 July 1932. State Commission on Conservation and Development Records. SNP Archives; During the same period in which Williams et al developed Panorama, Skyland was undergoing a similar boom. Pollock notes that around 1923 he added waterworks, sewers, and a large dining hall. Pollock, “Why Skyland?”

⁴ Court records indicate that Panorama purchased the bears around 1933 when they were small cubs. The resort testified that the cubs had been raised by them, were tame, and had never shown any disposition to attack any one. *Panorama Resort vs. John Nichols*, Supreme Court of Virginia, 165 VA. 289, 182 S.E. 235, 14 November 1935.

⁵ *John Nichols vs. Panorama Resort*, Page County Circuit Court, April 1936. Reports that the C.C.C. released the bears appear in records at the National Archives, College Park, Maryland.

Regardless of the problem with the bears, Panorama seems to have been a thriving summer retreat with guests traveling from as far as New York to spend their summers.⁶ So why were the hotel and cottages not maintained for park visitors? Although park developers generally agreed that Skyland would remain a visitor facility after the park's establishment, they did not always see eye-to-eye regarding the fate of Panorama. As early as 1926 Ferdinand Zerkle, chairman of Shenandoah National Park Association, Inc., insinuated to his close friend William Carson, chairman of the Virginia State Commission on Conservation and Development (SCCD), that both Skyland and Panorama would be exempt from purchase by the state. Zerkle informed Carson that both of these resorts should be "the subject of some special lease or contract by the National Park Service," thereby relieving the state commission of the financial burden required to purchase the properties.⁷ Statements such as these may have fueled Pollock and Williams's belief that they could continue to operate their respective resorts following park establishment.⁸

Despite Zerkle's inclination that the properties would not become part of the new park, following the 1927 Condemnation Act commissioners from the SCCD performed mandatory property surveys to determine all property values within the proposed park boundaries. Dissatisfied with the appraised value of \$16,987 for the entire property and improvements, in September 1932 Williams, Cheatham, and

Priest filed exception for the valuation in the Page County Circuit Court claiming the value "grossly inadequate." The exception was the first formally filed against such appraisals in Page County, and perhaps the political move that cost the owners their opportunity to maintain the resort.⁹

By mid-1932 it was clear that Arno Cammerer, Director of the National Park Service, would not allow Williams and Associates to continue operating Panorama once the park had been established. While the condition of Panorama's buildings accounted for part of Cammerer's reasoning, his motive in closing the resort was much more political. Cammerer bluntly stated that Panorama was "not to be continued for two reasons: first because it is right on the highway in a commanding position that should be kept free from such buildings, and secondly because the present owners have done nothing except try to block the park project." Although



Located near the present day Panorama Restaurant, the Tea Room was the last remnant of resort. Virginia Sky-Line Company continued to serve park visitors in this facility until construction of the Highway 211 overpass necessitated its removal in the late 1950s. Photo courtesy of Shenandoah National Park Archives.

Cammerer felt that Williams and Cheatham were "nice fellows," he believed they held "the wrong point of view." He recommended that the owners be paid the full price for their holdings, but should receive nothing more. Skyland, however, should be maintained "due to Pollock's pioneering work and wonderful cooperation with park authorities."¹⁰

Although it seemed clear by the spring of 1934 that Panorama would never see the admiration Skyland received, numerous park creators saw the merits of a visitor facility at the intersection of Skyline Drive and Lee Highway (Route 211). Ralph Lassiter, Engineer in charge of Shenandoah, wrote to Cammerer in March suggesting that the Tea Room, filling station, and comfort station be maintained to provide for the crowds of visitors now touring the mountain by way of the Skyline Drive. While the "flimsy hotel and cottages higher on the hill" could be demolished, Lassiter believed that the other buildings were essential for hungry and tired visitors. Likewise, Lassiter noted that Roy Cheatham was "anxious to operate...individually and not as a continuation of the partnership," perhaps an indication that he recognized the potential benefits of playing along with Cammerer and others.¹¹

Still, Cammerer maintained his position. Wilbur Hall, Carson's replacement as chairman of the SCCD, nevertheless wrote to Cammerer as late as August 1935 practically begging the National Park Service not to destroy the hotel given the tourist traffic in the area. Since the govern-

⁶ Conversation with Paul Williams, Jr., July 2002 (nephew of part owner, Paul Taylor).

⁷ Ferdinand Zerkle to William Carson, July 30, 1926. Ferdinand Zerkle Collection, SNP Archives, box 9, folder 8.

⁸ For discussion of Pollock's belief that he would continue to operate Skyland, see Reed Engle L., "An Historical Overview." On October 15, 1925, Pollock wrote to all former Skyland guests and present property owners, requesting that they contribute to the Shenandoah National Park Association. He stated that although "It is true you will have to share the joys of this lovely retreat with many others...[there is] enough for all for many years to come." Copy of letter in Zerkel files, SNP Archives.

⁹ Page News & Courier, 6 September 1932.

¹⁰ Cammerer to Demaray and Moskey, July 15, 1932. Cammerer to Albright, November 30, 1932. Quoted in Darwin Lambert, Administrative History of Shenandoah National Park, unpublished, pp. 253-254.

¹¹ Ralph Lassiter to Arno Cammerer, March 27, 1934. Resource Management Records, SNP Archives.

ment was allowing Pollock to continue, Hall requested that the NPS grant a permit to Williams allowing him to operate until the federal government took legal control.¹² If the park did not want to keep the hotel, Hall believed that the buildings should be sold for relocation rather than destroyed. Within three days Cammerer responded to Hall noting that “the two areas are in entirely different status.” While Skyland would be continued at its present location, Cammerer held that Panorama, “is not desired to be perpetuated by the NPS since it does not fit into our plans.” This time, however, Cammerer did not mention Williams and Cheatham’s efforts to thwart the park movement. Rather, he simply commented that the park was considering constructing its administrative buildings in that area and it would be necessary to raze the present structures. Cammerer told Hall to inform Williams “to move out equipment and furnishings without delay.”¹³

Despite Cammerer’s harsh words to Hall, four months later he told Lassiter

that he was “willing to approve the temporary continuance of the Skyland Camp and Panorama Tea Room operations on the grounds that these [buildings] fulfill a public necessity.” While the park searched for a single concessionaire, Williams and Cheatham continued to operate the Tea Room through 1936 although the hotel and cottages were not used after the fall of



During the 1930s Panorama Resort encouraged their visitors to buy food and drinks for several bear cubs kept on the property. While several ladies from Luray seemed to enjoy watching the cubs drink milk, a less fortunate guest was attacked by one of the bears in 1935. Photo courtesy of Shenandoah National Park Archives.

1935. Finally, in February 1937 the Virginia Sky-Line Company of Richmond won the contract for concessionaire taking over the reins of both Skyland and Panorama.¹⁴ Virginia Sky-Line Company continued to operate the Tea Room until the Park Service razed the structure in 1958 to make way for the clover-leaf intersection which now occupies the site of the former resort.¹⁵

Today Skyland remains an integral part of Shenandoah’s landscape and remembered past, while most visitors and employees know Panorama only as an ARAMARK gift shop and restaurant. Panorama Resort’s short and soon forgotten lifespan is testament to the ways in which personalities and politics shaped the existing structures and boundaries of Shenandoah.¹⁶ Pollock’s political connections and constant self promotion helped assure “why Skyland,” while Williams and Associates’ resistance to park development insured their removal. As with so many instances of life, a little politics can go a long way.

Carrie Janney-Lucas is an Historian.

¹² The federal government granted Pollock permission to continue operation Skyland until October 31, 1934. By 1935, however, Pollock was still managing his resort under a temporary concessions agreement. Lambert, Administrative History, pp. 245-256. Wilbur Hall to Cammerer, August 9, 1935. Resource Management Records, SNP Archives.

¹³ Cammerer to Hall. August 12, 1935. Resource Management Records, SNP Archives.

¹⁴ Cammerer to Lassiter, December 4, 1935. Lambert, Administrative History, pp. 356-260. While the hotel was razed, the Park Service continued to use several of the cabins as offices for the local Bureau of Public Roads and as employee housing through 1939. Resource Management Records, Box 82, Folder 1, SNP Archives.

¹⁵ Resource Management Records, Building Files, Box 10, Folder 1, SNP Archives.

¹⁶ For discussion of how money and politics determined the southern portion of Skyline Drive in the 1930s, see Reed L. Engle, “Skyline Drive: Road to Nowhere?” August 2000.

George Freeman Pollock and Stony Man Camp

By Reed Engle

With no cash but great desire, George Freeman Pollock was convinced that the Stony Man Park Association started by his father and Stephen Allen could be a viable project. He managed to forestall the 1896 public sale of the property, and the Court Commissioners agreed to allow him to buy it “on time.” But by March 1900, the Chevallier lawyers were back in Chancery Court because of Pollock’s non-payment of his father’s and Allen’s debts. The Chancery Judge ruled on October 19, 1900:

G. F. Pollock [*sic*] the purchaser of the land sold in this cause . . . has failed to show any cause why the said land should not be sold for his default. . . and the Court being of the opinion that no sufficient reason has been given by said Pollock why a resale of the land purchased in this cause should not be ordered, doth adjudge, order, and decree that said land be resold.

But if the said Pollock shall within 10 days after the adjournment of this Court pay the ammount [*sic*] for purchase money which is past due. . . the said sale may be dispensed with until further order of this Court.¹

The following July 1 Pollock was back in Court, having paid \$275.96 and given the Commissioner 10 bonds for \$250.00 [\$5,242.86--all figures in square brackets are 2003 dollar equivalents] plus 6% interest, due every six months. The money paid was probably part of the \$500 he had borrowed from guests Eleanor and Cora Brinton the previous month (See

Table 1). The Judge relieved Commissioner Harmon of his responsibility to the Court and appointed County Sheriff L. C. Watts receiver, meaning that Watts was responsible for the collection of the bonds “as they fall due.” The Court stated that when all of the bonds had been made good, the deed to the Stony Man property would revert to George Freeman Pollock.²

Still without a deed or control of the property, in October 1902 Pollock returned to Chancery Court and proposed that he be authorized to sell lots and acreage to raise money to pay off his debts. The Court allowed that he could sell “not more than one fourth of an acre lots [for] as much as \$100 [\$2,056.42 or \$10,225.62/acre] per lot” with the funds to go directly to Sheriff L. C. Watts to pay off the outstanding balance due Alzire A. Chevallier.³

On February 1, 1904, Pollock was again in Court to request approval to sell 337 acres to J. S. Comer of Luray, Virginia. The Court found that a value of \$1.00 an acre was “the full value” of the land and approved the sale as long as it was “applied as a credit to the balance due.”⁴

Finally, on June 7, 1906, the Chancery Court judge ruled that the Chevallier claim against Allen and Pollock was fully paid and that the “suit be stricken from the docket.”⁵ In theory, Pollock owned the Stony Man lands. But during the time he paid the \$6,364 outstanding balance and interest due Miss Chevallier, he had accumulated \$5,526 [\$108,376.94] in debts to miscellaneous Stony Man Camp guests and investors, most secured by mortgages on the property. A year later these debts were cleared by a “consolidation loan” from

his future brother-in-law, Harrison G. Dyar, for \$7,250 [\$135,896.82], secured by title to Pollock’s 5,033 acres, and with a due date of 1916. Within a year of gaining his deed, Pollock was more in debt than he had been 10 years earlier. It was a cycle from which he would never escape.

Over the 28 years (1906-1934) that Pollock held deed to Skyland, he was frequently sued for non-payment of debts. In 1905, before Pollock had clear title, Page County resident Casper Fox obtained from the courts a deed of sale for “all furniture and fixtures of Skyland . . . which sale was made to Fox to satisfy certain debts due by the said Pollock to said Fox.”⁶ In lieu of giving up items critical to Skyland’s functioning, Pollock deeded six lots worth \$100 each to Fox to satisfy the \$247 debt. In 1921, it appears that his wife, Addie, was not willing to bail him out of his financial difficulties: the Page County court recorded a Deed of Sale for \$2,500.00 [\$40,733.00] in a suit for non-payment brought against him by several claimants:

Washington Star, Thomas F. Keane, J. M. Stein & Co., Saks & Co., Engle Bros., the *Evening Telegraph*, Huylers Inc., the *Times Dispatch Publishing Co*, FrieDman [*sic*] Inc., Mfg. Co., Berry Kimmerle Co., Royal Coffee & Tea Co., *The Evening Post*, the Standard Oil Company, Where-to-Go-Bureau Inc., *Public Ledger Co.*, The Mail and Express Co., *New York Evening Post*, the *Brooklyn Daily Eagle*, and Colgate and Co.

¹ Albemarle County Chancery Book 20, p. 48.

² Albemarle County Chancery Book 20, p. 65.

³ Albemarle County Chancery Book 20, p. 435.

⁴ Albemarle County Chancery Book 22, p. 8. Land was actually sold to A. J. Comer, D. N. Hook [Hoak?], and J. S. Comer.

⁵ Albemarle County Chancery Book, p. 329.

⁶ Page County Deed Book 58, p. 322, October 23, 1905.

Table 1: Major creditors who held mortgages on the Stony Man Camp/Skyland property under George Freeman Pollock's ownership.

DATE	LENDER	AMOUNT	DATE DUE	DATE REPAID
6-23-1901	Eleanor & Cora Brinton	\$500.00	6-23-1909	11-02-1907
9-21-1901	Augustus G. Heaton	\$385.00	9-9-1902	10-8-1907
10-25-1901	Henry F. Brinton	\$500.00	7-10-1903	11-16-1904
1-18-1902	Henry F. Brinton	\$735.00	9-18-1902	11-16-1904
8-23-1902	Robert F. Leedy	\$860.20	8-23-1903	9-4-1903
9-01-1903	George W. Johnston	\$1210.93	9-1-1904	1-9-1906
9-16-1903	George W. Johnston	\$320.25	12-15-1903	1-9-1906
10-10-1903	Henry & Cora Brinton	\$3,500.00		10-1907
11-12-1903	Philip Metzger	\$341.00	8-25-1904	12-27-1907
8-31-1904	George W. Johnston	\$800.00	8-31-1905	11-19-1907
10-14-1907	Harrison G. Dyar	\$7,250.00	11-15-1916	1927 LAWSUIT
9-20-1909	Harrison G. Dyar	\$850.00	11-15-1916	10-4-1912
9-23-1909	H. Seymour Cragin	\$260.00	6-19-1910	10-5-1921
10-4-1909	H. Seymour Cragin	\$260.00	10-4-1910	10-5-1921
12-21-1910	Robinson Bosler	\$19,000.00	12-21-1911	12-20-1912
5-3-1911	Robinson Bosler	\$2,000		1927 LAWSUIT
6-1-1911	Robinson Bosler	\$12,500.00		9-26-1921
11-11-1911	Henry & Matilda Brinton	\$350.00		2-8-1912
1-4-1912	Addie Nairn Pollock	\$15,000.00		Never Paid
1-4-1912	Harrison G. Dyar	\$15,000.00	10-1-1919	10-15-1919
10-4-1912	Harrison G. Dyar	\$850.00		1927 LAWSUIT
10-10-1912	Addie Nairn Pollock	\$7,000.00		Never Paid
10-16-1912	Harrison G. Dyar	\$7,000.00	3-16-1920	10-15-1919
10-16-1915	Harrison G. Dyar	\$1,474.00	10-16-1916	3-9-1920
1-25-1917	Robinson Bosler	\$6,500.00		3-10-1920
10-15-1919	Harrison G. Dyar	\$15,680.00	10-15-28	1927 LAWSUIT
11-5-1920	Harrison G. Dyar	\$2,500.00		1927 LAWSUIT

The companies included clearly demonstrate the extent of Pollock's advertising to attract new Skyland guests. The suit awarded the claimants the following items:

1 E.H. Droop piano, 1 Frederick Piano Company piano (one of the said pianos is in the Dining Room Hall, the other is in the Dancing Hall [Pastime Hall] of said Pollock), 20 beds (white metal enameled), one Refrigerator manufactured by McCray, 20 Ostermoor felt mattresses, 1 gray mare named Fly—eight years old, 1 chestnut mare named Fannie, 3 more mares, all said property is located upon the premises of G. F. Pollock at Skyland, in Page County, Virginia.⁷

The most serious suit against Pollock's business, however, was brought on December 2, 1927, by N. H. Clark and 38 others⁸ just before the Virginia legislature passed the law allowing for the blanket condemnation of land for the creation of Shenandoah National Park. Pollock's creditors had to establish their prior liens against the Skyland property so that they would be paid by condemnation funds before their distribution to Pollock. The participants in this suit were the wealthy, the corporate, and the attuned: many, many small local businessmen and/or contractors never had the opportunity to bring claims against Pollock under this legal action.

One such small claim was sent to William Carson, Chairman of the Commonwealth of Virginia Commission charged with park establishment:

Dec 30, 1932

Mr. W. E. Carson
 My dear Mr. Carson
 I have the honor to call to your attention the following facts. We now have in our hands several checks from Mr. G. F. Pollock proprietor of the Stony Man Mountain Hotel which are not good and we have ask [sic] the Page Valley Bank what we must do to collect them as the hotel is closed down [due to the winter season] & no money in the Bank to pay them. The cashier of the Bank advise [sic] us to call attention to the facts to your administration that Mr Pollock own [sic] about 20,000.00 [dollars] of property there at the hotel beside his concession to the government. [illegible] to pay him for his land to grant us the favor we will

⁷ Page County Deed Book 75, p. 451.

⁸ There were actually many more than 38 other claimants as several individuals/companies were often lumped into a single lien based on filing claims on the same day.

Table 2. Liens against property of George Freeman Pollock et al. as determined by Page County commissioners' decree January 26, 1929

Lien 1:	Taxes to Madison County 1902-1916,	\$2,185.99
Lien 2:	Mortgage to Harrison G. Dyar (10/14/1907)	\$7,250.00
Lien 3:	Mortgage to Harrison G. Dyar (9/20/1909)	\$850.00
Lien 4:	Mortgage to Robinson Bosler (5/3/1911)	\$1,000.00
Lien 5:	Mortgage to Addie Nairn Pollock (1/4/1912)	\$15,000.00
Lien 6:	Mortgage to Addie Nairn Pollock (10/10/1912)	\$7,000.00
Lien 7:	Mortgage to Robinson Bosler (10/15/1917)	\$6,500.00
Lien 8:	Mortgage to Addie Nairn Pollock (10/15/1919)	\$15,680.00
8A:	Mortgage to Harrison G. Dyar (11/5/1920)	\$2,500.00
Lien 9:	Judgment for Vogue Co., Inc (3/21/1921)	\$868.91
Lien 10:	Judgment for <i>Brooklyn Daily Eagle</i> (2/15/1921)	\$150.84
Lien 11:	Judgment for Mims & Emerson (1/1/1921)	\$139.15
Lien 12:	Judgment for Foster & Reynolds Co. (2/15/1921)	\$250.00
Lien 13:	Judgment of Mims & Emerson (7/15/1920)	\$500.00
Lien 14:	Judgment of The News Publishing Co. (10/15/1920)	\$147.00
	Judgment of Where-To-Go-Bureau, Inc. (8/5/1922)	\$1,044.00
	Judgment of the Stone Printing and Mfg. Co. (11/15/1921)	\$598.10
Lien 15:	Judgment of Thomas Somerville (11/15/1921)	\$233.81
15A:	Judgment of J.S. Miller (1/15/1923)	\$744.00
Lien 16:	Judgment of Sola K. Sours (12/1/1921)	\$521.00
	Judgment of N. H. Clark (1/1/1921)	\$1,410.00
16A:	Judgment of C. O. Buracker (7/23/1921)	\$4,919.91
Lien 17:	Judgment of Wade H. Bates (10/17/1923)	\$934.73
Lien 18:	Judgment of Katherine J. Gilman (8/15/1921)	\$437.78
Lien 19:	Judgment of <i>The Record</i> Publishing Co. (7/1/1922)	\$189.70
Lien 20:	Judgment of <i>The North American</i> (2/1/1924)	\$73.50
	Judgment of S.N. Meyer, Inc. (5/8/1923)	\$29.50
	Judgment of James T. Swann (2/11/1924)	\$30.09
	Judgment of Razo Manufacturing Co. (9/11/1924)	\$21.75
	Judgment of American Automobile Association (6/10/1925)	\$228.40
Lien 21:	Judgment of S.B. Sexton Stove & Mfg. Co. (5/15/1925)	\$233.00
	Judgment of Harner Bros. Woolen Mills, Inc. (6/18/1925)	\$36.00
	Judgment of E.A. Lycett (9/25/1921)	\$35.00
	Judgment of E.L. Mayer (5/19/1925)	\$125.00
Lien 22:	Judgment of Luce's Press Clipping Bureau (7/31/1925)	\$113.50
Lien 23:	Judgment of Private Estate Coffee Co. (11/15/1925)	\$63.60
Lien 24:	William F. Keyser trustee for Harrison G. Dyar	\$15,680.00
	William F. Keyser trustee for Harrison G. Dyar	\$2,500.00
Lien 25:	Judgment of G.T. Chapman (9/19/1926)	\$738.00
	Judgment of H.C.Fox, Admr. (9/11/1925)	\$1,000.00
Lien 26:	Judgment of <i>The Brooklyn Daily Eagle</i> (7/9/1926)	\$160.00
	Judgment of Curtis Martin Newspapers, Inc. (9/1/1925)	\$70.00
Lien 27:	Judgment of <i>Times-Dispatch</i> Publishing Co., Inc. (5/23/1927)	\$248.45
Lien 28:	Judgment of Lansburg & Bros. (6/1/1927)	\$200.00
	Judgment of W. S. Cogwell (6/1/1927)	\$89.65
	Judgment of The American Forestry Association (9/1/1926)	\$50.00
Lien 29:	Judgment of Katherine J. Gilman (8/15/1925)	\$323.86
	Judgment of the National Republican Publishing Company (8/1/1925)	\$410.53
Lien 30:	Judgment of the Harrisonburg Baking Co. (8/1/1925)	\$43.00
Lien 31:	Judgment of Irving-way Hill Co. (4/5/1927)	\$85.00
Lien 32:	Judgment of <i>The Brooklyn Daily Eagle</i> , Co. (8/5/1927)	\$50.00
	Judgment of R. H. Emmons trading as Oxhart Celery (11/1/1926)	\$24.00
Lien 33:	Judgment of H. F. Fox, Admr., for H. C. Fox, dec'd (9/11/1925)	\$1,000.00
	Judgment of Gertrude P. Hill (10/10/1925)	\$523.50
Lien 34:	Judgment of J.O. Bailey (1/1/1928)	\$3,469.55
Lien 35:	Judgment of T.J. Berrey Ins. Agency (9/15/1925)	\$210.00
Lien 36:	Judgment of <i>The Brooklyn Daily Eagle</i> (8/9/1929)	\$170.00
Lien 37:	Judgment of J.S. Price Admr. Of C.O. Buracker, dec'd	\$1,457.00
Lien 38:	Judgment of <i>The Evening News</i> Company (12/30/1931)	\$136.40
	Judgment of <i>The Philadelphia Inquirer</i> (8/11/1931)	\$53.45
	Judgment of Byron S. Adams (7/1/1929)	\$71.74
	Judgment of Curtis Newspapers, Inc. (6/1/1931)	\$72.25
	Judgment of <i>Washington Post</i> Company (6/25/1931)	\$222.50
	Judgment of the <i>New York Tribune</i> , Inc. (6/7/1931)	\$64.50
	Judgment of Wade Bates (9/4/1926)	\$934.73

NOTE: None of these liens includes interest (5% or 6%) or court and other costs accrued since the dates of judgment. All are itemized in Page County Chancery Court Order Book 18, page 87, 12/2/1927.

greatly appreciate of if it is out of your jurisdiction would you kindly advise us what we must do to collect same. The amnt involved is about \$191.00 [\$2,481.96]. Appreciating in advance your kindness and courtesy Kindly accept dear Sir the assurance of our highest respect.⁹
Sincerely yours
[Illegible]

On February 24, 1928, the Chancery Court accepted \$67,107.22 [\$693,370.13] in liens against Pollock pending the award for condemnation by the Commissioners after appraisal and evaluation of all real estate and buildings at Skyland and on the former Miners Lode Copper Company land.

The N. H. Clark suit against Pollock became even more complex in 1931 when Francis C. Heigle brought suit against the Commissioners for \$31,096.41 he claimed was a legal court-awarded first lien against Pollock's estate. Heigle had won a suit in New York City in 1928 against Harrison G. Dyar, Pollock's brother-in-law,

for non-payment by Dyar of a debt to Heigle. Dyar, however, died in January 1929 without repaying Heigle. Heigle claimed that Wellesca Pollock Dyar, Harrison Dyar's widow, fraudulently had transferred the \$26,280 in bonds given by Pollock to Dyar to Dyar's sister to avoid payment of the Heigle claim against Dyar's estate. Although possibly a valid claim, the Chancery Court refused on a technicality to honor it--Heigle had not filed the claim in a timely manner.

On June 15, 1934, the Chancery Court finally made its decision on the Clark suit based on the final appraisals of the Commissioners and a review of all outstanding debts. Pollock's entire holdings were worth \$29,383.23 [\$388,981.81]. After payment of court costs and taxes, \$26,073.99 [\$345,160.24] was left to satisfy the creditors. Only 13 liens were paid; 25 creditors lost almost \$41,000 [\$542,767.22]. Pollock had mortgaged Skyland for two and one half times its value. He personally received nothing for Skyland proper or for the old copper land in Madison, Page, and Rappahannock Counties.

It is tempting to write this all off as many Pollock legends have, by stating that George was just "a poor businessman." This, unquestionably, is true. But what the legends fail to note is that George, just as the copper companies did earlier, hurt many, many small and large investors in his dream. He shared a charm, quick wit, and irresistible sales pitch with the earlier officers of the Stony Man and Dark Hollow Mining Company. The difference, however, is that they made their fortunes before their house of cards collapsed.¹⁰

[Note: This article is an excerpt from [In the Light of the Mountain Moon: An Illustrated History of Skyland, 1853-2003](#) to be published by the Shenandoah National Park Association in early summer.

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⁹ Copy of letter from the Grocery Company, Novum, Virginia to Carson in John Dodd, *Massanutten Lodge Historic Structure Report, 1978, APPENDIX J.*

¹⁰ When George Pollock died in 1949 his entire estate was appraised for the Page County Chancery Court as worth \$3,542.34 [\$26,324.09]. Of this, approximately 65% was the value of George's remaining Skyland furniture [\$16,276.07].

The purpose of the Shenandoah National Park Resource Management Newsletter is to convey information on Shenandoah's natural, cultural, and backcountry/wilderness resources, issues, and programs to park employees and the interested lay public. We will strive to present a mix of current activities, research and monitoring findings, and basic information about the park's resources in an informal publication on a biannual basis. We welcome short articles meeting this purpose from both park staff and cooperators. Paper copies of the newsletter will be distributed to park employees and others upon request, and will be distributed with permission by the Shenandoah National Park Association to its members.

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