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Comments: Electronic Comment on Northern Shenandoah Mountain Project Draft Environmental Assessment of August, 2019

<https://cara.ecosystem-management.org/Public/CommentInput?Project=50342>

The cover photo with the caption, "Desired stand conditions with open vegetation and diverse understory" is alarming. It shows an extremely simplified, depauperate stand of spindly trees with nothing in the understory but a monoculture of an unidentifiable ground cover. Yet an abundant literature in peer-reviewed scientific journals states that structural complexity of mature temperate, deciduous is a defining characteristic of the highest net primary productivity of the stand including habitats for biodiversity and carbon sequestration and storage. The most recent of these publications is titled, "High Rates of Primary Production in Structurally Complex Forests," by Chris Gough, et al., in *Ecology*, 100(10), 2019.

<https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/ecy.2864>

In the face of science to the contrary, why does this project aim at simplifying the structural complexity of long-lived forest tree species just beginning to develop it barely a century after most of the area was deforested? Much of the southern end of Cross Mountain already has this "savanna-like" condition with poorly formed, widely spaced trees and joint grass understory due to careless logging, grazing and burning in the past. Why should that abused and degraded condition be considered "restoration" and the "desired condition" to be replicated elsewhere? A framed photo in the Bridgewater office shows cattle on top of Shenandoah Mountain with deadened trees ca. 1900. Why try to reestablish "grasslands" that were cut out of the original forest in the 1800s by settlers of European extraction for livestock? In addition, if Japanese joint grass isn't what's shown in the cover photo, it very soon will be, because that kind of opening is an invitation to it and other invasives. The policy of opening up the canopy of natural, well-established oak-hickory-white pine forests for poorly defined and scientifically questionable "restoration" purposes, then planning the endless eradication of invasives through applications of herbicides, seems ecologically irresponsible with potential long-term detriments to the ecosystem.

In researching GWNF history and ecology, two themes of critical importance emerge that the draft EA, nor any Forest Service activities, consider. First, the historically well-documented 1880-1930 era of deforestation of the Southern Appalachians caused immense loss of topsoil. JMU archaeologist Dr. Carole Nash recently said that "The logging of our mountains let loose soils that are now on the South Fork floodplain. Archaeological excavations on the South Fork of the Shenandoah River consistently demonstrate the impacts of logging on mountain soils. It is common to document three feet of alluvial deposits over the earliest levels of historic occupation in the 1740s. Below that, only an inch of soil takes you back in time a thousand years before then." Initially impounded in thousands of downstream mill ponds, the sediments began moving downstream when water milling ended and the abandoned mill pond dams failed. Now called "Legacy Sediments," they are still moving and polluting mid-Atlantic streams and coastal bays and "will remain a water quality problem for centuries to millennia."¹ Decades of regrowth now obscure the reduced fertility, but in 1943, a Forest Service report on the Virginia mountains noted that "Small sizes and low quality characterize the saw timber ... In some cases, locations ... of better sites because of fire or other past abuses are of low productivity ... A low average volume per acre clearly shows the depleted condition of the forest resource."² After such massive soil loss due to logging and burning, centuries of leaf fall, root growth, and protection from soil disturbance are needed to rebuild fertility. Despite assurances in the draft EA, no BMPs will avoid the compaction and degradation of soil and the top layers of leaf litter during logging or burning. The better part of true conservation would be to protect soil and the soil-building potential of undisturbed, natural forest stands. How can the Forest Service best address this most fundamental problem of soil and forest productivity?

Second, climate change poses the greatest challenge to forest management. With virtually one voice, scientists around the world state that efforts to preserve and restore natural, native forests on every continent are critical to mitigating the impacts of climate change, while deforestation and forest degradation are major contributors to increased carbon dioxide. I understand from the Atlanta office that carbon assessments have now been completed on the plan level for every national forest in Region 8. How much carbon will be emitted from the planned prescribed burns, and how does that amount compare to carbon now and potentially in the future being sequestered and stored in soil by the existing mature trees if allowed to grow old? Mature and old trees in temperate, deciduous forests are exceedingly well-documented to sequester more carbon than any other forest phase, and to store more carbon in soil than any other natural system.³ As stated above and documented in numerous scientific researches, structural complexity of forests is key to addressing both carbon sequestration and biodiversity, and allowing this complexity to develop naturally also allows the necessary rebuilding of soil. Yet in virtually every activity outlined in the draft EA, the Forest Service proposes to simplify forest structure. The draft EA proposes not only to release as-yet-unaccounted tons of CO₂ through burning, logging, and soil disturbance, but to degrade those thousands of acres and substantially reduce their potential for future sequestration. Please provide data on the estimated loss of carbon from proposed burning and the rate of sequestration now being performed in those stands as part of the analysis.

Historical research attempting to justify repeated burning of thousands of acres is sketchy at best. In addition, the literature on the success of repeated burns to stimulate oak regeneration, one of the main reasons given for burning, is extremely mixed. Another reason was given at a Forest Service meeting last year, when I heard a USFS official say that prescribed burns were necessary to reduce woody debris that could fuel a catastrophic fire in the future. But just a few minutes later, in response to a question about the planned logging, the same official said that the woody debris of tops and limbs left by logging did not represent a fire threat because in our relatively humid climate they would "melt down" quickly. This contradiction is at the heart of the Forest Service approach to prescribed burning.

Recently, retired Lee District Ranger John Coleman, who has been a mentor in forest history for decades, sent me two graphs on lightning fires in the GWNF. The graph from 1925-2012 indicates an average of less than 5 "natural" i.e., lightning caused fires, per year over the entire GWNF for nearly a century. Acreages are not given on that graph, but on a second one he sent showing all fires from 1975-2002, the average is barely 2 lightning fires per year and the largest acreage amount burned is 300, with no acreage given for many of the lightning fires apparently because they were so small. As for Native American burning, Brose's synthesis reports that "fires only occurred where and when there were American Indian tribes. In the absence of American Indian activity, fire was a rare occurrence." Has the Forest Service archaeologist investigated Native American presence and burning in the proposed burn areas? If so, where is the resulting report, and if not, why not, since this is a major factor in location of historical burns? Why is prescribed burning presented as "natural" and "restorative" when this approach is contradicted by historical data? And where in the plans is Brose's stated need for at least 40 years between burns to allow oak saplings to grow thick enough bark to withstand low level fires accommodated?

On April 13, 2018, the Gate Mountain Fire was reported south of SR 259 near Fulks Run on Gate Mountain in Rockingham County, VA. The fire was 1125 acres. Cause unknown. <https://inciweb.nwcg.gov/incident/5744/> (the month of May is incorrectly given on the Incident Report). With no storms present, the cause was undoubtedly anthropogenic. The draft EA states that this fire "did not intersect with any of the proposed management units," yet it was of the low severity the FS aims for and "did move stands towards desired conditions." Is the FS so inflexible that a fire of over 1,000 acres accomplished with little Forest Service investment and achieving FS goals cannot be counted against the total proposed by the Forest Service for this project, and monitored for results?

The goal of creating more habitat for deer is frightening. The draft DA itself cites the many times deer were seen during field surveys. Did the field personnel not also see the browse lines evident in so many places in the Northern Shenandoah Mountain area? One huge reason for poor oak regeneration is deer consumption of

acorns and browsing of young trees. We need more doe hunting days, not more deer.

Monitoring for results of logging and burns is critical. The draft EA mentions 24 Management Indicator Species, but in the plan referred to, on page 213 only 14 are listed. Recent data on the loss of approximately 3 billions birds since 1970 should be included to make planning current with what's actually happening. In general, the planning for the Northern Shenandoah Mountain Project relies on outdated scientific findings and contradictory research.

I would greatly appreciate answers to the questions posed above. Thank you for the opportunity to ask them. Please note that while I disagree on the basis of scientific and historical evidence with the basic premises that drive the Northern Shenandoah Restoration Project, my comments are in no way personal. I respect and admire the Forest Service and feel incredibly fortunate to live near a national forest.

1. Karl Wegmann, Dept. of Marine, Earth, & Atmospheric Sciences, North Carolina State University, PPT, n.d.
2. Lotti, Thomas and Thomas C. Evans. "The Forest Situation in the Mountain Region of Virginia, A Forest Survey Progress Report." Forest Survey Release No. 15. USDA Forest Service, Appalachian Forest Experiment Station, Asheville, NC, 1943.
3. Barton, Andrew M. and Keeton, William S., eds. Ecology and Recovery of Eastern Old-Growth Forests. Washington: Island Press, 2018.
4. Brose, P.H, et al. (2014). The Fire-Oak literature of eastern North America: synthesis & guidelines. Newton Square, PA: U.S. D.A., Forest Service. Gen. Tech. Report NRS-135.