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Ranger Kyle:

The following are comments submitted on behalf of the Virginia Chapter of Sierra Club regarding the Dunlap Creek project Draft Environmental Assessment.

We are opposed to the extensive logging and clearing (1105 acres), roadbuilding (16.4 miles of skid trails and 3.1 miles of roads) and extensive habitat disturbance proposed in the environmental assessment (EA). This project takes place in and near a 4,051 acre conservation site identified by Virginia Department of Conservation and Recreation as one of the largest intact patches of old growth forest in Virginia and possibly the central Appalachians. This project takes place in and near the Snake Run Ridge and Slaty Mountain Virginia mountain treasure areas that are high priorities for the public and the Virginia conservation community.

National Environmental Policy Act
The National Environmental Policy Act ("NEPA") is the nation's basic charter for the protection of the environment. NEPA makes it national policy to "use all practicable means and measures * * * to foster and promote the general welfare [and] to create and maintain conditions under which [humans] and nature can exist in productive harmony."7 NEPA's purposes are to "help public officials make decisions that are based on [an] understanding of environmental consequences, and to take actions that protect, restore, and enhance the environment."8

1. "Hard Look"
To accomplish these purposes, NEPA requires all agencies of the federal government to prepare a "detailed statement" regarding all "major federal actions significantly affecting the quality of the human environment."9 This statement is commonly referred to as an Environmental Impact Statement ("EIS"). NEPA further provides that agencies "shall * study, develop, & describe appropriate alternatives to recommended courses of action in

3 5 U.S.C.A. § 706(2)(A).
4 (Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Auto. Ins. Co., 463 U.S. 29, 43 (1983), citing Burlington Truck Lines v. United States, 371 U.S. 156, 168 (1962).
5 Motor Vehicle Manufacturers Association of the United States v. State Farm Mutual Auto InsuranceCompany, 463 U.S. 29, 43 (1983).
6 Pacific Coast Fed'n, 265 F.3d at 1034.
7 42 U.S.C. § 4331(a).
8 40 C.F.R. § 1500.1(b)-(c).
9 42 U.S.C. § 4332(C).

any proposal which involves unresolved conflicts concerning alternative uses of available resources."10

An EIS must describe (1) the "environmental impact of the proposed action," (2) any "adverse environmental effects which cannot be avoided should the proposal be implemented," (3) alternatives to the proposed action, (4) "the relationship between local short- term uses of [the] environment and the maintenance and enhancement of long-term productivity," and (5) any "irreversible or irretrievable commitment of resources which would be involved in the proposed action should it be implemented."11
NEPA's disclosure goals are two-fold: (1) to ensure that the agency has carefully and fully contemplated the environmental effects of its action, and (2) to ensure that the public has sufficient information to challenge the agency's action. The Council on Environmental Quality ("CEQ") - an agency within the Executive Office of the President - has promulgated regulations implementing NEPA that are binding on all agencies.12

The CEQ regulations provided that the direct, indirect, and cumulative effects of the proposed action must be analyzed under NEPA.13 When the agency prepares an EIS, it must take a hard look at the impacts of the action and ensure "that environmental information is available to public officials and citizens before decisions are made and before actions are taken," and the "information must be of high quality."14
In preparing NEPA documents, federal agencies "shall insure the professional integrity, including scientific integrity, of the discussions and analyses" and "identify any methodologies used and * * * make explicit reference by footnote to the scientific and other sources relied upon for conclusions * * * ."15

NEPA requires that the Environmental Impact Statement contain high-quality information and accurate scientific analysis.16 If there is incomplete or unavailable relevant data, the Environmental Impact Statement must disclose this fact.17 If the incomplete information is relevant and essential to a reasoned choice, and costs are not "exorbitant," the information must be compiled and included.18

Request for Information as it comes available
We request copies of the biological evaluation, economic analysis, roads analysis, old growth surveys, notes from plant/wildlife/aquatic surveys, monitoring records for special biological and Natural Heritage-identified areas in the area, and watershed assessments for priority watersheds in the area be sent to us, as soon as they come available. We will comment further on these issues once we receive this requisite information.

Lack of adequately detailed information in the EA
The scoping is lacking basic information we often see in other EAs. For example, the unit maps (even the "unitnumber" maps in the public on-line file) are unclear and do not include such basic information as Forest Service boundaries, names of streams, management prescription area boundaries, and topographic lines that show slope, stand ages, and other details. We will comment further later when adequate information is provided.

The EA is so lacking that no member of the general public could ascertain what is being planned here, or the significant resources and conservation sites in the project area and vicinity (see below).

Old Growth and Conservation Sites

Old growth is a significant issue in this project.

An "intensive vegetation survey"… "part of a cooperative effort, jointly funded by USDA Forest Service and the Department of Conservation and Recreation's Division of Natural Heritage, to classify and produce maps of Ecological Land Types" took place in this proposed SIA… (report due out in May 1996)" (Apr. 2, '96 letter). The

FS should ensure that no permanent plots are directly or indirectly damaged, or that nearby activities do not compromise the research going on in these plots. See DCR-Division of Natural Heritage Natural Heritage Technical Report 00-07:

"Old-Growth Forests of the Peters Mountain Study Area
Data collected during this project provide compelling evidence that large, rugged areas on the Peters Mountain ridges have never been logged. Two stands are present. Excluding five relatively small clearcuts and one selectively cut site, the first unlogged forest covers ca. 1455 ha (3,600 ac) on the northern ridge (Fig. 11). Old-age, generally oak-dominated forest covers ca.1130 ha (2,800 ac) of this area; the remaining 325 ha (800 ac) supports younger, pyrogenic forests that have regenerated following intense disturbance by fires."

"It should be noted that the birth dates of many of these trees either predate or coincide with the earliest settlement of the county from 1730-1750 (USDA Forest Service, unpublished data). During this period, the first land patents were granted and farming began in the fertile valleys. With vast amounts of tall, mesophytic timber available at the lower elevations of the county, it seems reasonable to assume that the relatively poor timber on steep, rocky slopes of Peters Mountain was not disturbed during the early decades of European settlement. Forests of the mountain slopes were cut and disturbed later, during the 19th and early 20th century when iron ore was extensively mined. The legacy of these disturbances is manifest on the lower slopes of Peters Mountain by the dominance of trees <130 years old and the absence of other old-growth indicators."…..

"In terms of patch size, each of the area's discrete old-growth patches would qualify as medium-sized. Both, however, rank among the largest old-growth patches documented to date in the George Washington and Jefferson National Forests (J. Overcash, pers. comm.). [underlining for emphasis]

"Old-growth forests have unique biological, scientific, educational, recreational, economic, cultural, and spiritual values (Whitney 1987, Davis 1996, USDA Forest Service 1997). Forest Service guidelines for the conservation and management of these forests are less clear than the operational criteria for their identification. We would state unequivocally that the outstanding size and internal community type diversity of the Peters Mountain old growth warrants its exclusion from the timber base and justifies formal protection of some kind. Although the amount of old growth in the central and southern Appalachians may be underestimated due to lack of recognition and inventory, estimates of the amount of existing old-growth oak and oak - hickory forest are generally low (Davis 1996, Parker 1989, Smith 1989). Moreover, the remaining stands are subject to increasing fragmentation, as well as compositional changes resulting from fire suppression and the invasion of more mesophytic successors. Because of these factors, collection of baseline data from larger old-growth oak forests is becoming critical. The inclusion of smaller-scale, young patches that have been impacted by natural disturbances such as destructive fires within the unlogged stands on Peters Mountain adds value to these areas. According to White and White (1996),

"Oak and hickory trees can live at least 200 to 400 years, so for most areas we are still within the period for which old-growth forests can have individual trees that predate European settlement. As these trees age and die, emphasis must shift from the question of whether the forest has continuously existed from presettlement times with no direct harvest of trees. Forests that have existed continuously as forests (even if they have changed with such factors as changing climates, chestnut blight, fire suppression, and air pollution) are valuable for research. By recognizing such forest sites, we are essentially recognizing that the forest can be older than the current generation of trees on the site .... Such forests are valuable for their species composition and their ancient undisturbed soils, even if they are not now dominated by old trees or characterized by compositional stability. If we set high priorities only on the patches currently holding large trees, we will miss the full mosaic of patch states .... Such sites are important for understanding natural vegetation.

"One of the more valuable assets of the Peters Mountain old-growth forests is preserved evidence that elucidates the former distribution and abundance of Castanea dentata. Except where localized fires have destroyed wood

debris, the rotting boles of this species - many of them obviously once massive - still lie where they fell after succumbing to the blight more than 60 years ago. " pp. 179-182

The DCR-Virginia Division of Natural Heritage identified a 4,051 acre Conservation Site in the vicinity of the project. See Natural Heritage Technical Report 00-10). "Site Description: This site encompasses an unusually large contiguous stand of old-growth oak-dominated forest. The old growth occurrence occupies approximately 3600 acres on the crests and middle to upper slopes of the northernmost ridge of Peters Mountain. Most of the old growth stand has never been logged and is in near pristine condition, and has sustained little fragmentation." "This site is recommended for S[pecial] I[nterest] [A]rea, "

On Apr. 2, '96, DCR-Division of Natural Heritage wrote to James River RD Ranger Cynthia Snow that the area is a "significant community…This community is considered to be a heritage resource because, covering 3600 acres, it is one of the largest known contiguous occurrences of Appalachian oak forest in old-growth condition in Virginia and perhaps in all of the central Appalachians."

On Dec. 18 '23, DCR-Division of Natural Heritage wrote to District Ranger Kyle, "According to the information in our files, the Peters Mountain North - Bennetts Run Conservation Site is located within both the Central and East Units… Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. The Peters Mountain North - Bennetts Run Conservation Site has been assigned a biodiversity rank of B1, which represents a site of outstanding significance…. Additionally, the documented occurrence of the Central Appalachian / Inner Piedmont Chestnut Oak Forest within the project has been identified by a DCR biologist as one of the largest intact patches of old growth forest in Virginia and possibly the central Appalachians. DCR recommends that no activities that result in tree clearing, which would include both thinning and forest regeneration treatments, occur within or around this occurrence. DCR recommends excluding any harvesting treatments for this project and any future projects from this community occurrence and the conservation site to protect the old growth forest."

On Apr. 24 '24, DCR-Division of Natural Heritage wrote to District Ranger Kyle, "According to the information in our files, the Peters Mountain North - Bennetts Run Conservation Site is located within both the Central and East Units….. DCR recommends avoiding any forest treatments that involve tree removal and thinning within the Peters Mountain North - Bennetts Run Conservation Site."

This 4,051 acre Conservation Site and any other Conservation Sites in the area should fully protected from logging, roadbuilding and skid trail construction.

The FS should also ensure that no permanent plots associated with the study are directly or indirectly damaged, or that nearby activities do not compromise the research going on in these plots.

On Dec 15 '23, Southern Environmental Law Center wrote: "Among the most important attributes of [Slaty Mountain and Snake Run Ridge] areas is their old growth forest. Both Slaty Mountain and Snake Run Ridge contain identified old growth stands, and the Snake Run Ridge area "includes tracts of old growth that the Virginia Division of Natural Heritage identifies as perhaps the most extensive in [the] Central Appalachians."3 Old growth communities are "rare or largely absent in the southeastern forests of the United States" and any proposal that would affect this "missing portion of the southern forest ecosystems" requires careful analysis and merits close scrutiny.4

"Among other things, the District must adhere to the old growth survey protocol and recording requirements in the Forest Plan and clarification letter,5 and disclose the old growth tally sheets. The Forest Plan recognizes that individual old growth patches contribute to a network of small,

medium, and large patches embedded in a matrix of mid- and late-successional forest.6 Both Appendix B and the Region 8 Guidance for Conserving and Restoring Old-Growth Forest Communities on National Forests in the Southern Region ("Region 8 OG Guidance") explain that different sized patches play different roles in the network, and that the spatial distribution of those different sized patches within the network affects the network's integrity.7 In short, the old growth network is more than just the sum of its parts. Understanding how a proposed action will affect old growth resources requires understanding not only how much old growth there is, but also where old growth patches of different sizes are located throughout the analysis area and how the proposed action will affect the network."

3 See Virginia's Mountain Treasures: The Unprotected Wildlands of the George Washington National Forest, available at https://www.vawilderness.org/uploads/1/7/4/4/17446555/southern_allegheny.pdf.
4 U.S. Forest Service, Guidance for Conserving and Restoring Old-Growth Forest Communities on National Forests in the Southern Region: Report of the Region 8 Old-Growth Team at 1 (June 1997).
5 See Letter from H. Thomas Speaks (USFS) to Record Regarding Clarification of the 2014 George Washington National Forest Revised Land and Resource Management Plan 2 (July 29, 2015), available at https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3850362.pdf.
6 See, e.g., GW Forest Plan App. B at B-5.
7 See, e.g., GW Forest Plan App. B at B-5 to B-6 (explaining the different functions of different sized patches); Region 8 OG Guidance at 15 (addressing "the effective patch size, the distribution of patches across the landscape, the relationship of the patches to the adjacent forest matrix, and the relationship or connectivity of the patches").

The attached map shows several stands in the project area that are 150 years old or older based on Forest Service GIS data obtained from James Ohear (original maps from 2010 showing stands 140 years old or older at the time). These or other stands (or portions of stands) may be old growth forest when examined.

As part of this analysis, the Decisionmakers should identify all old growth of any size (including within-stand old growth and old growth partially within multiple stands). Old growth components and old growth habitat value of all old growth of any size should be adequately protected. The FS should protect mature Mature and Old-Growth Forest adjacent to or near existing old growth may be important ecological components that should be protected, as well. The FS should provide figures on the size, distribution, and age of trees to be cut. The FS should disclose the impacts on old growth and disclose whether the treatments could preclude or delay the attainment of old growth status.
The agency should examine whether there is any within-stand patches of OG or relic trees that should be protected or buffered from disturbance. It is possible that some old growth may exist within whole stands, partial stands, or portions of stands adjoining other stands. If any inclusions of an older age are found in the course of surveys, it would be proper to change the stand layouts and dimensions and numbers to incorporate this new data also
The agency should examine the spatial arrangement of OG and surrounding mid- late-successional habitat, to determine whether any such areas should be protected or buffered from disturbance. Even if these areas did not meet operational criteria for old growth, given the obvious shortage of old growth in this area (and throughout the Appalachians) the FS should also consider designating some of the best areas as small, medium or large old growth tracts.
In FR-62, the Southern Region of the FS includes the following "considerations for old-growth forests during project-level planning:""When developing overall management strategies for an area, care should be taken not to isolate the medium- and small-sized old growth patches from the mid- and late-successional forests." (pp. 26-7). National Forests need to "provide for ... representation of all old growth forest community types" (FR-62 p14) and

"consider underrepresented old growth forest community types" (FR-62 p17) in planning.
Thorough old growth surveys should be conducted which include a record of where each of the plots were taken, a record of how each of the criteria for old growth were determined, and whether the FS ensured that the criteria used were appropriate for this geographical area and the old growth types found here.
In addition, the cumulative impacts of logging forests hundreds of years old in the past Hematite timber sale that took place here should be analyzed. These forests are irreplaceable and we will never get them back.

in this project, the FS needs to consider the degree to which large- and medium-size old growth tracts could be dissected or reduced (or if this project would delay the attainment of large- or medium-size old growth tracts in the future. Cumulative impacts be disclosed.

How would the logging impact the habitat and mobility of salamanders and other species that are known to occur in these areas? What are the cumulative impacts of this project, combined with climate change, and the need to travel across forests to higher elevations or forests with different moisture regimes?

We have identified several units in the proposed project that are within or very close to the boundaries of the conservation area or tracts that are 150 years or older. These include stands north of Rt. 600 in the East Unit; stands on Rt.277 west of the junction of Rt. 277 and Rt. 277-A in Central Unit; and the northernmost stand(s) on both sides of Rt 603 in West Unit. Other areas may contain old growth or mature forests (such as the stands near Little Crow Run (Central Unit) and stands around Rt 602 (West Unit).

Old growth should be surveyed and avoided. The FS should carefully examine the configuration and old growth forest types of old growth to avoid fragmenting large and medium sized old growth tracts and significant and large/medium sized mature forest/old growth tracts. The FS must avoid logging rare or underrepresented old growth forest types and higher elevation old growth forest.
We applaud the Forest Service's decision to exclude several sites that are between less than an acre and 10 acres in size (EA 19). However, although we requested this information last year, the Forest Service has not provided us with old growth survey reports. Certainly, additional areas in or adjacent to old growth forest tracts may have been missed or left out of the acreage in EA 19. This ranger district has a history of denying it is cutting old growth, when it, in fact, is (as in the Hoover Creek project, Hematite project, and others).
The EA is wholly inadequate in terms of analyzing old growth. Given the significance of this area [see comments above], the Forest Service should have analyzed the configuration of old growth to avoid fragmenting large and medium sized old growth tracts and the configuration of significant and large/medium sized mature forest/old growth tracts and addressed the other issues raised above [see comments above in full]. The DCR-Natural Heritage reports are not mentioned, let alone cited in the EA. Other reports cited by the commenters are not mentioned, let alone cited in the EA. There is no map of the Peters Mountain North Conservation Site, no map of the existing large tracts of old growth in the area, and no map of other Conservation Sites in the area, to show how proposed activities could impact these areas. Here we are in an area with "one of the largest intact patches of old growth forest in Virginia and possibly the central Appalachians" (Va. DCR), but old growth is entirely swept under the rug by the agency. The agency must do better.

Mature and Old-Growth Forests

In addition, on December 20, '23, two days after the comment period ended for scoping for this project, the U.S. Forest "Service issued a Notice of Intent to prepare an environmental impact statement applying to all national forests nationwide regarding "Land Management Plan Direction for Old-Growth Forest Conditions Across the National Forest System." The Forest Service is determining how the agency "should adapt current policies to protect, conserve and manage the national forests and grasslands for climate resilience, so that the Agency can provide for ecological integrity and support social and economic sustainability" in the face of our changing climate.
The Land Management Plan Direction is proposed in order to provide "consistent direction to conserve and

steward existing and recruit future old-growth forest conditions and to monitor their condition across planning areas of the National Forest System… [and] foster the long-term resilience of old- growth forest conditions and their contributions to ecological integrity across the National Forest System." (Federal Register/Vol. 88, No. 243) Therefore, if this project is to be implemented after the new land management plan direction goes into effect, the Forest Service should consider how it can best recruit future forests with old-growth conditions and foster old growth forests' contributions to ecological integrity (ibid, p.88042), particularly in the Southern Appalachians, where this project takes place. This approach necessitates looking in full detail at the interconnectivity of old-growth forests and mature forests in the vicinity of the highly significant Peters Mountain North Conservation Site, Snake Run Ridge and Slaty Mountain areas identified above and below in this comment letter.

Mature and old-growth forests in the East, and in the Southern Appalachians in particular, are of extremely high value for biodiversity and carbon storage, not to mention recreation, clean drinking water, scenic, and economic uses. Second, because of a history of logging that far exceeded natural disturbance levels, Eastern forests overall are in younger condition than they ought to be, and there is therefore extraordinary potential for increasing the proportion and improving the condition of mature and old-growth forests on these lands-and the many values that come with those forests. Third, as compared to forests nationwide, Eastern forests have a low risk of climate-driven catastrophic disturbance, which means that the benefits of conserving mature and old-growth forests will be relatively stable and long term. And, fourth, the greatest ongoing threat to mature and old-growth forests in the East is logging.

a.The value of Southeastern MOG forests

Southeastern mature and old-growth forests play an outsized role in providing habitat, carbon storage, climate resilience benefits, and connection with nature. To design a policy that effectively protects these forests and evaluate the tradeoffs necessary to do so, it is important to understand the nature and scale of these values. Below, we briefly survey the benefits healthy MOG forests in our region provide and highlight how these benefits are largely irreplaceable and irreplicable on relevant timescales.

i.Current and future carbon storage

Forests are the largest form of terrestrial biomass globally, as well as the most significant terrestrial contributor to atmospheric carbon removal. Each year, forests remove about a third of the atmospheric carbon emitted through combustion of fossil fuels worldwide and 10-15 percent of the United States economy's total greenhouse gas emissions. In the United States, federal forestland is the largest carbon sink in the federal government's control. Some 45% of all above-ground, living biomass in the continental United States is in national forests.

And within that landscape, mature and old-growth forests do the heavy lifting. The largest 1% of trees store between one third and one half of the above-ground carbon in North American forests. "Mature, multi-aged forests" store far more carbon per unit of land area than young forest.

The forests of the East, and particularly those of the Southern Appalachians, are home to unique ecosystems and a startling number of species of plants and animals, many of which are imperiled or whose Southern Appalachian populations are globally significant. Where north-south and elevational corridors are maintained, they provide resilience by facilitating migration. At higher elevations, the Southern Appalachians serve as the southernmost extent of many species' ranges. And because these southern populations and ecosystems are often isolated from their northern counterparts, threats to MOG forest (including climate change) threaten their extirpation from the Southeast, making the entire species more vulnerable.

Without discounting the importance of other structural conditions to overall species richness, MOG forests are primarily responsible for providing the distinct conditions that support our region's rare species. Mature and old-growth forests contain complex ecosystem dynamics important to the life cycles of a broad range of terrestrial and aquatic taxa. Simply put, large old trees "are not simply enlarged versions of young trees and large young trees cannot duplicate all the functional roles that large old trees can play." Instead, older trees and mature forests are integral to complex ecosystem dynamics. For example, living older trees offer nesting habitat to interior forest species, whereas both standing snags and downed stumps of dead mature trees provide habitat for imperiled species that is not found elsewhere.

Old-growth and mature forests are especially invaluable to imperiled species: As forests age, they become more

spatially and structurally heterogenous and complex, providing more species with more of the microhabitats and resources necessary in different periods of their life histories. Older forests nationwide are essential for the conservation of threatened and endangered species, and Eastern forests in particular are disproportionate reservoirs of amphibian, bird, and carnivore diversity, including imperiled species. For example, "most vulnerable bird species need large intact forests," and even "relatively small fragments [of mature forest] can still have substantial biodiversity value if protected at the highest levels." The sheer number of at-risk species in the Southern Appalachians drives home how important these older forests are. . The George Washington National Forest identified 295 listed or at-risk species on a similarly sized forest. The vast majority of these species are associated, at least for some critical portion of their life cycle, with mature or old-growth forests. The need for stable old-growth and mature forest conditions will only increase as the climate crisis accelerates and pressure on at-risk species intensifies.

Extractive logging is not additive to the ecosystem services provided by the national forests; it is in tension with those other services. Logging and associated roads result in area closures, noise and scenic impacts, and growth of thickets of vegetation that can choke trails and are nearly impassable for recreational users. It often causes sedimentation of trout streams and generally degrades the natural setting and remote character for recreational use.

Second, mature and old-growth forests on Eastern national forests provide the critical ecosystem service of clean drinking water. Drinking water from headwaters in national forests had an estimated economic value to the communities it serves of $3.7 billion per year as of 2014, according to the Forest Service. According to the Forest Service, 180 million people (more than half of the United States) "rely on federal forestlands to capture and filter their drinking water." In the South, water from NFS lands in and upstream of the Southern Region serves at least 19 million people. The Forest Service identifies its Pacific Northwest, Eastern and Southern regions as having "the most watersheds with very high importance to surface drinking water supplies." Of those, the Southern region is home to the greatest number of "high" quality watersheds for clean water and the fewest watersheds rated "very low" for water quality.

The proposed Land Management Plan direction also requires an adoptive strategy that "Effectively braid[s] place-based Indigenous Knowledge and Western science to inform and prioritize the conservation and recruitment of old- growth forest conditions through proactive stewardship." (Federal Register/Vol. 88, No. 243, p. 88047). Proactive stewardship includes strategic pro-forestation activities where warranted, as laid out by Krichbaum in his scoping comments. The current approach to old-growth identification and conservation used by the managers of the George Washington and Jefferson National Forests is a reductionist approach. It is more concerned with what is "out" of old growth, than what is "in," in order that more logging can take place. It uses the presence of old roads to exclude areas (almost all lands in the Appalachians have some roads and are in a state of recovery). It is more concerned with sharp borders between old growth areas and non-old growth areas rather than the natural features of the land… rather than what tract is adjacent to an old growth tract and what that tract is next to… and how they (and the plants, wildlife, water resources and communities in them) are connected. The existing proposal in no way considers place-base indigenous knowledge. The existing proposal also does not fully consider science either - such as the 2010 J. Wyatt and M. Silman paper, "Centuries-old logging legacy on spatial and temporal patterns in understory herb communities" (Forest Ecology and Management 260: 116-124) and other papers cited by Krichbaum.

The proposed Land Management Plan direction also includes the following Desired Condition- "The amount and distribution of old- growth forest conditions are maintained and improved relative to the existing condition over time, recognizing that old-growth forest conditions are dynamic in nature and shift on the landscape over time as a result of succession and disturbance." (Federal Register/Vol. 88, No. 243, p. 88047). The purpose and need for this project clearly does not recognize that forests are "dynamic in nature and shift on the landscape over time." If it did, it would recognize that tree-fall gaps, within- stand openings created by natural disturbance, and even powerline right-of-ways, and the like, contribute to early successional habitat. However, the Forest Service arbitrarily excludes these from its calculations when determining early successional acreages and uses this to justify more logging in mature and old growth forests.

Climate Change

In the recent COP26 Summit in Glasgow, the United States committed "to work[].. collectively to halt and reverse forest loss and land degradation" and "conserve forests and other terrestrial ecosystems and accelerate their restoration."
(https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/

It is shocking that our government has pledged to end deforestation, but also to pay other countries to end deforestation around the globe, yet American citizens are asked to pay for subsidized logging would undoubtedly occur in projects like this. National Forest timber sales almost always lose money and the federal government's accounting system is so bad that it often hard to ascertain how much it loses, so the agency rarely discloses this important information. Large-scale timber sales and timber sales in sensitive, remote areas are increasing on the George Washington and Jefferson National Forests in recent years, so we ask the agency to disclose the cumulative impacts projects [such as Devils Hen (Clinch), Potts Creek (James River), North Shenandoah Mountain (North River), Archer Knob (North River), Insect and Disease II (Dismal Creek)(Eastern Divide), Green Hill project, also in the Maury River watershed (Glenwood) and other projects across the forest on the ability to "conserve forests and other terrestrial ecosystems."

Logging and other land uses have a significant impact on climate and carbon stores. The EA states that "From 2000 to 2009, forestry and other land uses contributed 12 percent of the human-caused global CO2 emissions3 (IPCC 2014)." (EA-150)

The Forest Service should include an alternative that mitigates or improves the balance of relationships between species, forests and climate change.. These would include, but not be limited to
-Eliminating actions which do not maximize carbon storage in vegetation and in soils
-Eliminating actions where extracted forest products result in reduction of biomass and carbon storage in vegetation and soils
-Eliminating actions which accelerate the rate of evaporation of soils and can potentially increase erosion
-Eliminating actions which remove, facilitate removal or make available forest projects that could be incinerated for any purpose.
-Considering the cumulative impacts of all aspects of the project with regard to carbon storage, carbon released and carbon dioxide released on forest, landscape, state, federal and global scales.

Habitat fragmentation is a direct result this project as proposed. (See also comments on old growth)
Roadbuilding, roadwork and the creation of early successional habitat create and promote habitat fragmentation. As restoration efforts are dominated by actions that attempt to remedy actions and past projects by the agency that have resulted in, promoted or implemented habitat degradation and fragmentation of ecosystems, an alternative must be considered that does not contribute to continued habitat fragmentation.
It would be inappropriate to take steps to restore fragmented habitat in one place while continuing to promote and implement projects that continue to fragment habitat somewhere else or to attempt to mitigate climate change on one hand while exacerbating it at the same time with the other hand. Yet these are conditions that would be allowed to continue and proliferate with this project.
Among other measures, the Forest Service should plan for climate change by (1.) protecting core roadless and remote areas, (2.) reducing forest fragmentation and (3.) decreasing and eliminating non-climate stresses such as logging and logging road/skid trail building.

Any alternative selected by the Forest Service should be (1) informed by the most up-to-date science, including identification and designation of core areas, corridors, and analysis of the connectivity within Forest Service lands and connectivity of the Forest with other lands, (2) include an audit of activities permitted in the project to ensure

that activities do not increase carbon emissions and do not decrease carbon sequestration, (3) incorporate monitoring and adaptive management to ensure that if climate-related conditions or indicators are worse than expected, appropriate stronger measures will be applied her and elsewhere. "Identification …. of core areas, corridors, and analysis of the connectivity within Forest Service lands and connectivity of the Forest with other lands" is especially important here.

The Forest Service already recognizes the need for careful climate change analysis and planning. For example, recent guidance has acknowledged that the Forest Service should "identify ecosystems that are most at risk due to climate change," should analyze "conditions and trends of carbon stocks and fluxes on the planning unit, and greenhouse gas emissions influenced by the management of the planning unit," and should use the best available science in forest planning for the George Washington and Jefferson National Forests, among other things. See "Considering Climate Change in Land Management Planning," Joel Holtrip, Deputy Chief, Mar. 2, '10 and accompanying "Climate Change Considerations in Land Management Plan Revisions" Jan. 20, 2010. The Project-Level Carbon Assessment Report does not identify ecosystems that are most at risk due to climate change and does not include identification of core areas, corridors, and analysis of the connectivity within Forest Service lands

The FS commonly asserts that only a very small portion of the GWJNFs would be logged as part of this project. Cumulative effects of multiple projects across the ranger district and GWJNFs should be examined for their impact on climate. And the significant of logging areas with large acreages of intact and old-age forests - such as those in the project area (see old growth section above and roadless/remote habitat section below), should be considered. As we mentioned above, large-scale timber sales and timber sales in sensitive, remote areas are increasing on the George Washington and Jefferson National Forests in recent years, so we ask the agency to disclose the cumulative impacts of projects [such as Devils Hen (Clinch), Potts Creek (James River), North Shenandoah Mountain (North River), Insect and Disease II (Dismal Creek)(Eastern Divide), and other projects across the forest.

The FS also asserts and implies that the presence of older forests is a detriment "Over half of the stands in the George
Washington NF are middle-aged and older (greater than 80 years) and there has been a sharp decline in new stand establishment in recent decades (Birdsey et al., 2019). If the Forest continues on this aging trajectory, more stands will reach a slower growth stage in coming years, potentially causing the rate carbon accumulation to decline." (EA 151). However, as stated in Moomaw, Masino and Faison, (https://www.frontiersin.org/articles/10.3389/ffgc.2019.00027/full) "The carbon significance of proforestation is demonstrated in multiple ways in larger trees and older forests. For example, a study of 48 undisturbed primary or mature secondary forest plots worldwide found, on average, that the largest 1% of trees [considering all stems =1 cm in diameter at breast height (DBH)] accounted for half of above ground living biomass (The largest 1% accounted for ~30% of the biomass in U.S. forests due to larger average size and fewer stems compared to the tropics) (Lutz et al., 2018). Each year a single tree that is 100 cm in diameter adds the equivalent biomass of an entire 10-20 cm diameter tree, further underscoring the role of large trees (Stephenson et al., 2014). Intact forests also may sequester half or more of their carbon as organic soil carbon or in standing and fallen trees that eventually decay and add to soil carbon (Keith et al., 2009). Some older forests continue to sequester additional soil organic carbon (Zhou et al., 2006) and older forests bind soil organic matter more tightly than younger ones (Lacroix et al., 2016)."
The EA does not analyze the additive impacts of logging combined with prescribed burning. The FS proposed to log and remove the larger mainstems of trees in the cutting units. In addition, "timber harvest and prescribed fire can also affect the carbon stored in the understory and forest floor organic layer" (EA 151) and "a large portion of the emissions associated with prescribed fires is from duff, litter, and dead wood" (EA 152).

The FS should disclose how this project would affect lands needed for protection in the Administration's 30 by 30 or "America the Beautiful" initiative. This initiative recognizes the important role of intact forests in carbon

sequestration and sets goals. Status 1 areas under the USGS Protected Areas Database are areas "have permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a natural state within which disturbance events (of natural type, frequency, intensity, and legacy) are allowed to proceed without interference." Since current acreage of 30 x 30 protected areas type 1 & 2 exists in the U.S (and underrepresented areas) than is needed under the 30 x 30 plan, additional areas should be protected. The FS should identify what areas should be protected as status 1 and status 2 areas. A smaller acreage is currently protected across the U.S. and across the southeastern U.S. than areas protected as roadless in the Roadless Area Conservation Rule. Therefore, additional areas should be identified as Protected Areas. As stated above, this is a unique project area with RARE II areas, potential wilderness areas, DCR Conservation Sites, Mountain Treasure Areas identified as having remote or other sensitive habitat and other important features across the interconnected landscape. This area is one such area that should be identified and protected.

Purpose and Need for Project

The purpose and need section states: "The proposed action would allow for development of early successional habitat and late open conditions, as outlined in the Forest Plan" (EA 2). However, this is already taking place on its own. Elsewhere, the EA states: "In the absence of timber harvests, the forests where this proposed action would take place will thin naturally from mortality-inducing natural disturbances and other processes" (EA-150). And as stated by Krichbaum in his scoping comments, "A major problem with this proposal is that the FS does not properly consider the contribution of natural processes to maintaining wildlife habitat, such as "early successional habitat", on the project area." And "If this agency can scientifically and logically establish that there is not enough [Early Successional Habitat (ESH)] in this project area (including that occurring from natural disturbance processes) and that more is needed in order to "restore" it, then develop and completely [analyze] an alternative that turns already existing early- and mid- successional stands (a significant % of the project area) into new ESH."
The purpose and need is constructed so artificially narrow, that it precludes consideration of any alternative that excludes heavy-handed logging in the project area.

Cerulean Warbler and TESLR bird species

There is a potential for the cerulean warbler to be found in the PA and vicinity. See EA-38. See VaFWIS Report West End and VaFWIS Report Central and East End

The cerulean warbler has exhibited the greatest rate of any warbler species and the cerulean is declining at the center of its range. (Robbins, Fitzpatrick and Hamel, 1989, " A warbler in trouble: Dendroica cerulea") There are viability concerns for cerulean warblers, other species of interior forest-dwelling warblers, species of cuckoos, and other interior-forest dwelling songbirds listed as declining in BBS (or other ornithological data) that must be taken into consideration.
The cerulean is recognized by the FS and others as an area-sensitive species (SAA, Terrestrial Rept, Robbins et al., Cove Creek BE, 1995, Clinch RD, J&GWNFs, Maple Springs Branch BE, Clinch RD, J&GWNFs). Other species are listed as area sensitive species in the SAA. The FS should consider the impacts to these area-sensitive species.
The FS found that cerulean warblers "tended to be older, large diameter stands with tall trees, a deciduous understory, multiple layers and ages..." ((Cerulean Warbler Interim Mgmt Strategy, Clinch RD, GWJNFs, p. -7)
"Trees 18.2 in. in diameter composed greater than one-fourth of the overstory trees in the stands." (CW IMS-7)
The IMS documents that research characterized "suitable cerulean warbler habitat as mature forest with a high, closed canopy and a large number of stems greater thatn 12 in. diameter..." (CWS IMS-8)
The proposed logging and roadbuilding could impact birds that have different stratigraphic preferences, niches, and life cycle needs. What are the stratigraphic preferences and vegetative preferences of cerulean warbler and other birds? How would the project affect birds with different stratigraphic preferences and vegetative

preferences of birds other than and including cerulean warblers?
The proposed logging, roadbuilding and associated activities could impact birds during the time that birds are seeking mates, breeding, nesting, rearing their young, or migrating. During what period due forest interior birds seek mates? Breed? Migrate? How would the project affect these factors? The project may involve a taking under the MBTA if birds are killed in nest trees or nearby trees
What activities are affecting the forest interior birds throughout their breeding range? Wintering range? How do these activities cumulatively affect birds?
- What are current browse levels? Is natural disturbance incorporated in the figures provided?
- How would the project affect cove hardwoods, northern hardwoods, boulder fields, seeps, riparian areas, old growth and other special or unique habitat? Underrepresented habitat? Special, unique or underrepresented habitat with few nearly mature/mature/old growth stands remaining?
How will state-listed species (DNH lists of rare animals, rare plants, state-endangered and threatened species), species listed in Terwilliger, Virginia's Endangered Species and other sources) and species acknowledged as rare by expertsbe affected by this project? How will plant and animal species with economic value that are vulnerable to overharvesting affected by this project? How will habitat, foraging sites, and nesting sites be affected? Genetic viability? Competition from other species? Freedom from disturbance? Visibility?
The 2001 Executive Order on Migratory Birds states: "Sec. 3. Federal Agency Responsibilities. (e) Pursuant to its MOU, each agency shall, to the extent permitted by law and subject to the availability of appropriations and within Administration budgetary limits, and in harmony with agency missions:
(1) support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions;…
(4) design migratory bird habitat and population conservation principles, measures, and practices, into agency plans and planning processes (natural resource, land management, and environmental quality planning, including, but not limited to, forest and rangeland planning, coastal management planning, watershed planning, etc.) as practicable, and coordinate with other agencies and nonfederal partners in planning efforts;…
(6) ensure that environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern;…
(9) identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. With respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the Service. These principles, standards, and practices shall be regularly evaluated and revised to ensure that they are effective in lessening the detrimental effect of agency actions on migratory bird populations. The agency also shall inventory and monitor bird habitat and populations within the agency's capabilities and authorities to the extent feasible to facilitate decisions about the need for, and effectiveness of, conservation efforts;"…
Sec. 2 i) "Species of concern" refers to those species listed in the periodic report "Migratory Nongame Birds of Management Concern in the United States," priority migratory bird species as documented by established plans (such as Bird Conservation Regions in the North American Bird Conservation Initiative or Partners in Flight physiographic areas), and those species listed in 50 C.F.R. 17.11." Several birds listed in Bird Species of Conservation Concern (USF&WS) 2002 are potentially found in this area (see BSCC p. 51). Impacts to these NTMBs should be analyzed.

Impacts of the project on the cerulean warbler were not specifically analyzed. Only impacts to ill-defined "many avian species" were mentioned in a short, cursory way (EA-38). No effects analysis was undertaken.

Salamanders

The Forest Service should sufficiently examine and consider the potential impacts upon salamanders. Salamanders - Jefferson salamander, marbled salamander, and long-tailed salamanders may occur in the project area (See EA-7, VaFWIS Report West End and VaFWIS Report Central and East End). This concern is significant here given the agency's intent to destroy, degrade, or fragment suitable salamander habitat. Populations in the project area could be centered in, perhaps even be only found at, the particular places targeted for intense manipulation. They have very small home ranges with limited abilities of mobility (see attachments). They are susceptible and vulnerable to severe site-specific harm to their habitat and numbers; harm that would occur should the decision be implemented.
Their life history requirements and characteristics greatly restrict their abilities to "recolonize" areas. If this PA contains tiger salamander habitat or other MIS or TESLR salamander habitat, the FS should examine impacts in full. If this project area or the cutting units do not contain Cow Knob salamander habitat, then the MIS (viz., black bears, pileated woodpeckers) and other birds listed in the GWNF Plan are of limited, even misleading, use for gauging impacts to site-sensitive salamander populations. Additional salamander/amphibian/reptile MIS need to be considered in this analysis.
The MIS are also insufficient for gauging impacts to truly area-sensitive species of mature interior forest (such as various warbler or tanager species). The MIS are not strictly interior species and/or are more habitat generalists and/or are not area-sensitive and/or are not site-sensitive.
The use of these species does not accurately gauge the impacts to small site-sensitive species of low mobility such as salamanders and turtles. Management plans must ensure research on and (based on continuous monitoring and assessment in the field) evaluation of the effects of each management system to the end that it will not produce substantial and permanent impairment of the productivity of the land.
Present MIS do not allow for the accurate monitoring and assessment of management impacts to salamander populations in the RD where POS do not occur. Then some other indicator of effects needs to be used; the project's and Plan's MIS are deficient. 16 U.S.C. 1604(g)(3)(C).

In addition, the impacts of burning combined with the large-scale logging proposed here should be analyzed with respect to salamander habitat.

Impacts to site-sensitive creatures such as salamanders should be properly monitored and assessed. These creatures are very important components of forest ecosystems. The biomass of salamanders in a northern hardwood forest was twice that of the bird community during the breeding season and nearly equal to that of small mammals (see Burton and Likens, 1975, Copeia: 541-546). While in southern Appalachian forests, salamander biomass may exceed that of all other vertebrates combined (see Hairston, 1987, Community Ecology and Salamander Guilds). It is clear that they play key roles in ecosystem dynamics. Abundant studies reveal the severe impacts of logging upon salamander populations and their preference for older forest sites. See "The Relationship Between Forest Management and Amphibian Ecology", 1995, deMaynadier and Hunter, Environmental Reviews 3:230-261 (incorporated by reference). See also "Effects of Timber Harvesting on Southern Appalachian Salamanders", Petranka et al, 1993, Conserv. Biol. 7:363-370; "Effects of Timber Harvesting on Low Elevation Populations of Southern Appalachian Salamanders", Petranka et al., 1994, Forest Ecology and Management 67:135-147; and "Plethodontid Salamander Response to Silvicultural Practices in Missouri Ozark Forests", 1999, Herbeck and Larsen, Conservation Biology 13:3, 623-632) (these are standard journals readily available to the agency; the agency is already in possession of this info as the studies took place on and were funded by NFs; info incorporated by reference). See also the "Conservation Assessments/Agreements" for the Peaks of Otter and Cow Knob Salamanders on the J-GWNFs (incorporated by reference).
Terrestrial salamander abundances are affected by forest thinning. See Grialou, J.A., West, S.D., and R.N. Wilkins. 2000 ("Relative comparisons revealed that red-backed salamanders were influenced by forest thinning. The difference in relative capture rates because the thinning treatment was minor. The observed decline in red-backed salamanders may be explained by direct machine impacts and soil compaction from skidders") The effects of forest clearcut harvesting and thinning on terrestrial salamanders. Journal of Wildlife Management

64(1): 105-113); incorporated by reference. See also Harpole and Haas, "Effects of Seven Silvicultural Treatments on Terrestrial Salamanders, For. Ecol. & Mgmt. 114:349-356 (1999) ("Salamander relative abundance was significantly lower after harvest on the group selection (p‹0.005), shelterwoods (P‹0.007 and p‹0.015), leave-tree (p‹0.001), and clearcut treatments(p‹0.001)").; incorporated by reference. Here, researchers in Virginia found that relative abundance of salamanders based on area-constrained searches decreased on group selection cuts, 12-14 sq. m shelterwood cuts, 4-7 sq. m shelterwood cuts, leave tree cuts, and clearcuts. Large plethodontid populations declined in group selection cuts after the Daves Ridge TS (Mt Rogers NRA; Daves Ridge Group Selection "Project Overview"). See the 1994 SO monitoring and evaluation report, section on Daves Ridge TS and James Organ's report on salamanders and related issues in the Daves Ridge area ("Salamander Survey in Connection with Daves Ridge Timber Sale"). "For future Environmental Assessments involving salamanders, Sensitive or of Special Concern," Dr. Organ recommended, for terrestrial salamanders to "keep regeneration areas small, one to three acres in size, maintain large undisturbed tracts of forest between regeneration areas to permit salamanders to freely move around regeneration areas rather than to be trapped by a checkerboard pattern of thermal and low moisture barriers, do not disturb existing down and decaying logs within the regeneration area if possible…"as well as other recommendations. These documents, already in possession of the GWJNFs, are incorporated by reference.
The FS proposed to log and remove the larger mainstems of trees in the cutting units. In addition, "timber harvest and prescribed fire can also affect the carbon stored in the understory and forest floor organic layer" (EA 151) and "a large portion of the emissions associated with prescribed fires is from duff, litter, and dead wood" (EA 152).

It is apparent that the proposed operations have the potential to significantly harm the habitat of and thereby the distribution and viability of some salamander species. This issue should be fully and fairly considered by the agency here.

Roads impacts; project should be informed by a roads analysis

Over three miles of roads, 16.4 miles of skid trails and 0.2 miles of dozer lines are being proposed here (EA 5-6). In addition there may be roads in the project area that are creating adverse effects on the environment and should be considered for decommissioning.

Whether roads/skid trails, rightly or wrongly, are called temporary, these roads/trails can have impacts on a number of resources for a certain amount of time. Please examine and disclose all effects of temporary roads, including impacts on hydrology, springs and seeps, streams, wildlife, geology, caves, motorized use, non-motorized and primitive backcountry users, invasive and non-native plants, native plants, cultural resources, and other key resources. Please disclose how long these roads will impact resources of concern.

(b) Road System--(1) Identification of road system. For each national forest, national grassland, experimental forest, and any other units of the National Forest System (§212.1), the responsible official must identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands. In determining the minimum road system, the responsible official must incorporate a science-based roads analysis at the appropriate scale and, to the degree practicable, involve a broad spectrum of interested and affected citizens, other state and federal agencies, and tribal governments. The minimum system is the road system determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan (36 CFR 219), to meet applicable statutory and regulatory requirements, to reflect long-term funding expectations, to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance.
-Identification of unneeded roads. Responsible officials must review the road system on each National Forest

and Grassland and identify the roads on lands under Forest Service jurisdiction that are no longer needed to meet forest resource management objectives and that, therefore, should be decommissioned or considered for other uses, such as for trails. Decommissioning roads involves restoring roads to a more natural state. Activities used to decommission a road include, but are not limited to, the following: reestablishing former drainage patterns, stabilizing slopes, restoring vegetation, blocking the entrance to the road, installing water bars, removing culverts, reestablishing drainage-ways, removing unstable fills, pulling back road shoulders, scattering slash on the roadbed, completely eliminating the roadbed by restoring natural contours and slopes, or other methods designed to meet the specific conditions associated with the unneeded road. Forest officials should give priority to decommissioning those unneeded roads that pose the greatest risk to public safety or to environmental degradation.36 C.F.R. 212.5.

"When proposed road management activities (road construction, reconstruction, and decommissioning) would result in changes in access, such as changes in current use , traffic patterns, and road standards, or where there may be adverse effects on soil and water resources, ecological processes, or biological communities, those decisions must be informed by roads analysis (FSM 7712.1).

The FS did not examine an alternative that would decommission roads on based in part on the asserted "need for future forest-management activities" (EA 9). This is made on the blanket assumption that logging and "forest-management" activities are needed without examining whether any past, present or future roads associated with logging and "forest-management" activities are causing adverse effects to soil and water resources, ecological processes, or biological communities. Impacts on unroaded and remote areas and small, medium and large blocks of intact forest were not considered. The impacts of roads and their associated edge effects upon populations of biota (vertebrates, invertebrates, flora), habitat loss, habitat degradation, habitat fragmentation, and forest fragmentation must be fully considered, disclosed, analyzed, and evaluated in the EA/EIS. See Krichbaum scoping letter on the subject of impacts of roads to various resources.
The FS did not examine whether proposed new roads and other reconstruction and work on roads would cause adverse effects to soil and water resources, ecological processes, or biological communities. Impacts on unroaded and remote areas and small, medium and large blocks of intact forest were not considered. The impacts of roads and their associated edge effects upon populations of biota (vertebrates, invertebrates, flora), habitat loss, habitat degradation, habitat fragmentation, and forest fragmentation must be fully considered, disclosed, analyzed, and evaluated in the EA/EIS. See Krichbaum scoping letter on the subject of impacts of roads to various resources.
The FS did not disclose what specific road segments were examined, or how needs for private inholdings, needs for forest-maangement activities, impacts to plant and animal species, soil and water resources, ecological processes, biological communities, changes in current use, maintenance and traffic patterns were considered for specific road segments.

Black bear is an MIS here and throughout the GWNF (GWNF Plan MIS List). Issues of negative impacts to the MIS black bear due to increased disturbance, stress, vulnerability which the project could foreseeably facilitate should receive a hard look. See also 36 CFR 219.19(a)(4). Black bears occupy only 5-10% of their former range in the southeast and "would now likely be totally extirpated in this region were it not for federal lands containing designated wilderness or de facto wilderness" (Pelton, "Habitat needs of black bears in the east," in Wilderness and Natural Areas in the Eastern United States, Kulhavy and Conner, eds., 1984).

In addition, 3.1miles of roads and 16.4 miles of skid trails are being proposed here.
- Foreseeable negative impacts from the proposed action to most MIS must be thoroughly analyzed in the EA or

EIS. For example, agency planners must use the latest scientific information when assessing impacts to MIS black bears and their habitat. A report published in 1991 by Steven Reagan, "Habitat use by female black bears in a southern Appalachian bear sanctuary", analyzes how logging adversely affects black bears. The agency is already in receipt of this information; it was delivered to the GWJNF Supervisor's office (currently the GW&JNFs SO) several years ago by the Southern Appalachian Biodiversity Project. We incorporate it by reference into the administrative record. One significant finding of this research was that black bears were not taking advantage of food and habitat in even-age logging sites as was anticipated. He also found that such logging results in a dramatic increase in female black bears' home range. The same potential result can reasonably be expected to occur here from this proposed even-age logging. The outcome would be increased competition for a limited food and habitat supply. The potential clearly exists for significant impacts to black bear viability here. There must be hard inventory and population data for this MIS to provide an accurate picture.
-Bears need security. Black bears are classified as "wide ranging area sensitive species" (SAA Terr Rpt 154&158). Areas of grapevines and large denning trees are key habitat components. Large hollow den trees are the preferred den sites of black bears (see eg JNF Plan Rev DEIS 3-177). Grapes are a soft-mast food source of black bears (see JNF Plan Rev DEIS 3-177). Hollow trees, existing stumps, snags, shallow holes, and rock outcrops are potential bear den sites. These must be protected from logging. There must be analysis of the loss of interior and remote habitat that will occur and has already occurred here The road density, when both legally and illegally used motor routes are considered, may be in excess of that found to be desirable for bears. (there is little info in the SN) And the affects of miles of nearby access roads. must be properly analyzed. Portions of some motorized routes lie in this watershed or in the vicinity of this project, but have been excluded from the arbitrarily drawn PA) Use of this rt. and other rts. (and associated noise, disturbance, and partying) create constant disturbance which may impact black bears. And "closed" roads are known to be violated by vehicle use here and elsewhere. Temporary and closed roads facilitate more access and disturbance and mortality.). Road densities must meet Plan objectives for these important habitat components in the PA. And the agency's own "Wildlife Population Data Working Paper" (Goetz and McEilwane - incorporated by reference) shows that the impacts to bears becomes negative when the proportion of suitable acreage in regen areas exceeds 10%.). If recent even-aged cuts, grassy areas around roads existing and proposed roads, existing and proposed landings, and natural within stand openings are included in these figures, The criteria data and amount of suitable land here should be disclosed to the public
- Above ground den trees are important to black bears in the Appalachians. Data from a study in the Allegheny mountains of Virginia, for example, "show 93 percent of denned bears denned above ground in standing hollow trees." (GWNF Hoover Creek timber sale EA-57; incorporated by reference) Trees of sufficient size for bears to den are old large trees. Yet the agency's action would remove these key elements, habitat significant to viability. The analysis must fully and fairly consider this factor.
- These foreseeable direct, indirect, and cumulative impacts must be adequately considered and analyzed by the planners.
- The FS should provide hard inventory and population data for this MIS.

- Bears need security. There is must be meaningful analysis of the loss of interior and remote habitat that will occur and has already occurred here. And "closed" roads are known to be violated by vehicle use here and elsewhere "Temporary" and "closed" roads facilitate more access and disturbance and mortality. The bears' present population numbers in this analysis area must be disclosed.
- A clear goal for black bear conservation is "promoting remote forest conditions when managing forests (e.g., minimizing forest fragmentation, limiting road development)." Rudis, V.A., and J.B. Tansey. 1995. Regional Assessment of Remote Forests and Black Bear Habitat from Forest Resource Surveys. J. Wildl. Management 59(1): 170-180 (written by FS researcher; incorporated by reference).
- U.S. Forest Service EAs acknowledge that timber sale operations in an area results in increased hunting pressure there. Logging operations can be seen to make an area more desirable for humans (e.g., providing easier access for humans, attracting Bears to so-called "escape" habitat that does not actually provide an escape), but this does not equate to being better for Bears.
- The FS recognizes that new or reconstructed roads serve to increase access into a project area (see GWNF

West Dry Branch EA-42). The FS is also well aware that roadways can foreseeably be used for legal and illegal access. See also Jefferson NF Wilson Mtn. TS EA-69 - "roads and forwarder trail could increase hunting/poaching pressure".
- Present roads and additional "temporary" and permanent road construction/reconstruction will facilitate entrance into an area by hunting groups and hounds. They will be able to more easily interfere in Bears' lives during chase season, kill season, and by illegal poaching.
Poaching and other wildlife disturbing activities are not even mentioned. These relevant factors must be fully and fairly considered.

The EA states: "Black bear uses a wide variety of habitats in the southern Appalachians and is often found in large,
contiguous tracts of forested lands and smaller blocks of forested habitat linked by forested corridors." (EA-30). However, aside from a brief introductory statement on this page of the EA that does not address black bears or factors associated with black bears in this project area and vicinity, the EA is silent on the impact of the project on black bears. What are the black-bear-specific impacts associated with large, contiguous tracts of forested land, linked forested corridors, habitat use by female and male black bears, Large hollow den trees, snags, rock outcrops, grapes and grapevines, access roads, illegal use of closed roads, poaching or noise and road use and traffic changes?

Invasive Species
Surveys found autumn olive (Elaeganus umbellate), tall fescue (Festuca arundinacea), silky bush clover (Lespedeza cuneata), spotted knapweed (Centaurea stoebe), and multiflora rose (Rosa multiflora), Japanese barberry (Berberis thunbergia), tree of heaven (Ailanthus altissima), (Microstegium vimineum) stiltgrass and other species in the project area (EA 20-21). The FS should analyze the potential for this logging project to open up habitat and create conditions for the introduction and spread of invasives.

"All proposed action treatments would require herbicide treatments and post-treatment monitoring for non- native invasive species" and even under the no-action alternative, "the introduction, establishment, and spread of non-native invasive species would continue to occu" in part via "forest visitors using the road systems traversing the project area" (EA 25)

Researchers have found that logging, roadbuilding, and other similar activities create the conditions in which invasives can thrive. For example, logging simplifies structural diversity and eliminates microhabitats, thus decreasing species richness. As a result, communities are more prone to invasion by one or a few dominant species (Elton 1958). Habitats most likely to have an invasive species presence have been correlated with the following attributes: "vacant niches, lack of biotic constraints (predation, parasitism and disease), lack of community richness (biodiversity & structure), and disturbance." Logging is known to cause all four factors in forest ecosystems (Mack et al. (2000)). The introduction and spread of invasive species is linked to poor logging practices (poor replanting practices, road construction, & movement via machinery and tools) (Aber et al. 2000). Invasives, and vectors for the spread and introduction of invasives, must be fully considered. Mitigation measures must be established to reduce invasives. Additional alternatives with less disturbance should have been considered to reduce the introduction and spread of invasives.
Mack et al. (2000) found that the habitats that invasive species have successfully invaded in the past were qualified to as to their characteristics by Mack et al. (2000). Positive correlations were found between susceptibility to invasion and:
1.vacant niches
2.lack of biotic constraints (predation, parasitism and disease)
3.lack of community richness (biodiversity & architecture)
4.disturbance
All of these phenomena are created in extreme fashion by logging practices. The EA did not analyze the degree to which this (above) would occur in the action and no-action alternatives, or the impacts on resources.

The FS should consider the full impacts of invasive plants in this area, the degree to which projects such as this one (by itself and cumulatively) will contribute to the spread of invasive plants. The FS has not demonstrated that the mitigation measures effectively eliminate the causes of noxious weed spread. logging, roadbuilding, and skid trail use and heavy vehicle traffic spread existing weeds, and probably introduce new species of weeds,

The Forest Service should consider all reasonable measures that could reduce the potential spread of noxious weeds. Failure to consider strong mitigation measures violates NEPA requirements to minimize adverse effects: Use all practicable means, consistent with the requirements of the Act and other essential considerations of national policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment. (40 CFR 1500.2(f))

A mere listing of mitigation measures is insufficient to qualify as a reasoned discussion by NEPA. EISs must analyze mitigation measures in detail and explain the effectiveness of such measures [Northwest Indian Cemetery Protective Ass'n v/. Peterson 795 F.2d 688 (9th Cir. 1986)]. Forest Service NEPA documents describe possible mitigation measures but do not discuss them in adequate detail nor do they discuss or disclose the costs, effectiveness or efficacy of the mitigation measures. The long-term effectiveness of herbicides and other noxious weed treatments are still seriously questionable.

NFMA regulations relevant to noxious weeds include:

"Management prescriptions, where appropriate and to the extent practicable, shall preserve and enhance the diversity of plant and animal communities, including endemic and desirable naturalized plant and animal species, so that it is at least as great as that which would be expected in a natural forest . . ." (36 CFR 219.27(g)). The EA did not analyze the degree to which this (above) would occur in the action and no-action alternatives, or the impacts on resources.

"Provide for and maintain diversity of plant and animal communities to meet overall multiple-use objectives, as provided in paragraph (g)" (36 CFR 219.27 (a)(5)) "[D]iversity shall be considered throughout the planning process. Inventories shall include quantitative data making possible the evaluation of diversity in terms of its prior and present condition." (36 CFR 219.26)

"[V]egetative manipulation of tree cover shall" "[p]rovide the desired effects on water quantity and quality, wildlife and fish habitat, regeneration of desired tree species, forage production, recreation uses, aesthetic values, and other resource yields." [36 CFR 219.27 (b)(6)]. The EA did not analyze the degree to which this (above) would occur in the action and no-action alternatives, or the impacts on resources.

Cutting units and bulldozed skid trails (such as that planned here) appear to play a role in the known occurrences of noxious weeds and may play a further role in the presence of yet uninventoried infestations that are out there. We challenge the FS to give an accurate percentage of the miles of roads on the FS that have never had noxious weeds. The EA does not do so. Likewise, these infestations on the roads readily expand into cutting units, especially the more intensive the logging done in the particular units. Typically, the FS just throws up its hands and accepts that they will be carrying out management activities that inevitably cause more spread of weeds. Instead, a genuine prevention strategy is need and this needs to be incorporated into the analysis.
The premier tool of prevention of new noxious weed invaders deserves the highest priority. Instead, all prevention strategies assume weeds will invade, then prescribe expensive control methods of unknown efficacy after the fact.
Without first significantly reducing the type of soil disturbing activities that facilitate noxious weed invasion, the proposed treatment effects may be negated, indeed, overwhelmed by the spread of weeds caused by more of

the same road building and logging. By arbitrarily not considering these measures, the FS has failed to show a genuine, pressing need to risk the ecosystems by applying poisons. The EA did not analyze the degree to which this (above) would occur in the action and no-action alternatives, or the impacts on resources.

The FS should also disclose what herbicides and biocides would be necessitated by this project. Cumulative and connected actions should be analyzed. could be the direct result of the types of activities proposed here. This should also include the public health impacts of Round-up and similar herbicides, since Round-up application has been found to contribute to disease and other public health impacts in recent months, since the time that the scoping notice was released. This new information should be incorporated into the analysis.

The FS should consider preventive measures, including foregoing or greatly reducing the footprint of this project, in order to better address the problem of invasive plants.
The EA or EIS for this project should address the potential spread of invasives (& noxious weeds) from the activities proposed as part of this project. We feel that the introduction and spread of invasives are some of the greatest threats to our public lands. In addition to addressing current weed infestations foreseeable from implementation of this project, the NEPA document should be focused on stemming the increasing infestation and spread of noxious weeds in the project area. The NEPA document should include measures to limit future ground disturbing and weed spreading activities. For example, all livestock that use the trail should be required to use certified weed-free hay. The NEPA document should examine and address the most prevalent ways that soil disturbances are created which lead to weed invasions. This should be recognized in terms of costs to the taxpayer, impacts on biodiversity, and the likely need for doing even more weed control in the future. It makes absolutely no sense to analyze controlling weed invasions that exist now without taking a full and honest look at how to prevent new sites from being invaded. While limiting future land disturbance should be the foremost priority, prevention measures associated with land disturbing activities that do occur should also be outlined in the NEPA document. The past effectiveness of the proposed prevention activities should be discussed. Roads and trails likely have the greatest potential for spreading noxious weed seeds. The EA did not analyze the degree to which this (above) would occur in the action and no-action alternatives, or the impacts on resources.

Road- work, logging, and open woodland creations and other major activities contribute to the spread of invasives & should be fully examined. A comprehensive, integrated policy that specifically includes the halting or significant curtailment of logging, roadbuilding, road construction, grazing allotments, mineral development, ORV riding and other activities that contribute to the spread of noxious weeds should have been considered. The premier tool of prevention of new noxious weed invaders deserves the highest priority. Too often the Forest Service has relied on ineffective stop-gap measures - at the same time it has allowed some of the worst ground disturbing activities to continue. The EA did not analyze the degree to which this (above) would occur in the action and no-action alternatives, or the impacts on resources.

The NEPA document must meet NEPA's requirements that a reasonable range of alternatives be fully analyzed. The Forest Service Handbook, chapter 20, section 23.2 states that the purpose and intent of alternatives are to "ensure that the range of alternatives does not foreclose prematurely any option that might protect, restore and enhance the environment." Under NEPA, an environmental impact statement must contain a discussion of "alternatives to the proposed action" [42 U.S.C. 4332(2)(D)]. As interpreted by binding regulations of the CEQ, an environmental impact statement must "(r)igorously explore and objectively evaluate all reasonable alternatives" [40 C.F.R. 1502.14(a)]. The importance of this mandate cannot be downplayed; under NEPA, a rigorous review of alternatives is "the heart of the environmental impact statement." 40 C.F.R. 1502.14. Similarly, case law has established that consideration of alternatives that lead to similar results is not sufficient to meet the intent of NEPA. [Citizens for Environmental Quality v. United States, 731 F.Supp. 970, 989 (D.Colo. 1989); State of California v. Block, 690 F.2d 753 (9th Cir. 1982).]

NEPA regulations at 40 CFR ß 1502.4(a) state:
Agencies shall make sure the proposal which is the subject of an environmental impact statement is properly

defined.

And at 40 CFR ß 1508.25, NEPA regulations state:
Scope consists of the range of actions, alternatives, and impacts to be considered in an environmental impact statement. . . To determine the scope of environmental impact statements, agencies shall consider:
(a) Actions (other than unconnected single actions) which may be:
(1) Connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they:
(i) Automatically trigger other actions which may require environmental impact statements.

The FS is required to comply with presidential
Executive Order 13112. The FS does not assure the public that the proposal is consistent with the following sections of Executive Order 13112:

Section 5: (b) The first edition of the Management Plan shall include a review of existing and prospective approaches and authorities for preventing the introduction and spread of invasive species, including those for identifying pathways by which invasive species are introduced and for minimizing the risk of introductions via those pathways, and shall identify research needs and recommend measures to minimize the risk that introductions will occur. Such recommended measures shall provide for a science-based process to evaluate risks associated with introduction and spread of invasive species and a coordinated and systematic risk-based process to identify, monitor, and interdict pathways that may be involved in the introduction of invasive species.

Or,
Sec. 2. Federal Agency Duties. (a) Each Federal agency whose actions may affect the status of inv
1asive species shall, to the extent practicable and permitted by law,

(1) identify such actions;

(2) subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and th
e means to address them; and

(3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its

determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

The EA did not analyze the degree to which this (above) would occur in the action and no-action alternatives, or the impacts on resources.

Even though "All proposed action treatments would require herbicide treatments and post-treatment monitoring for non- native invasive species" and even under the no-action alternative, "the introduction, establishment, and spread of non-native invasive species would continue to occu" in part via "forest visitors using the road systems traversing the project area" (EA 25), the FS failed to compare the degree to which the activities under the action alternative would increase pathways for the introduction and spread of non-native species compared to the no action alternative.

TESLR Species

According to Natural Heritage Tech Rpt 00-07: "Four taxa recorded in sample plots are considered state rare and monitored by DCR-DNH (Killeffer 1999). Two of the rare plants, Arabis serotina (shale barren rockcress, G2S2; Wieboldt 1991a) and Scirpus ancistrochaetus (northeastern bulrush, G3S2; Wieboldt 1991b), are also considered rare throughout their ranges by the Natural Heritage network. Both are listed as endangered under the federal Endangered Species Act and by the Commonwealth of Virginia. The remaining two rare plants, Cheilanthes eatonii (chestnut lipfern, G5?S2) and Erysimum capitatum var. capitatum (western wallflower, G5T5S2; Wieboldt 1991c) are common throughout their ranges but occur in highly localized, disjunct populations in Virginia. Arabis serotina, Cheilanthes eatonii, and Erysimum capitatum var. capitatum are associated with shale barrens and outcrops in Virginia, while Scirpus ancistrochaetus is restricted to natural mountain ponds.

"Seven additional species recorded in plots are considered uncommon or somewhat rare in Virginia and are maintained on a separate "Watch List": Anemone quinquefolia var. minima (dwarf anemone, G3QS3), Chenopodium simplex (giant-seed goosefoot, G5S3), Glyceria acutiflora (sharp-scaled mannagrass, G5S3), Heuchera hispida (purple alumroot, G3?S3?), Juglans cinerea (butternut, G4S3?), Panax quinquefolius (American ginseng, G4S4), and Sisyrinchium montanum (G5SU). Refer to Killeffer (1999) for definitions of Natural Heritage rarity ranks." (p. 17)

The EA lists northern long-eared bat, Indiana bat, tricolored bat, James spinymussel, roughhead shiner, eastern-small footed bat, little brown bat, regal fritillary, northern metalmark, Appalachian grizzled skipper, monarch butterfly, turgid gayfeather, sword-leaf phlox, Coopers hawk and sharp-shinned hawk (EA 35-39)

These and other Threatened, Endangered, Sensitive and Locally Rare (TESLR) species may occur in the vicinity of the project area, in the project area or downstream from the project area. See, eg, occurrence records for these subwatersheds, this county and this geographical area of this project at https://vanhde.org/species-search/, https://vanhde.org/content/map , and records in Terwilliger, 1991, VSO Virginia's Breeding Birds Atlas, Atlas of the Flora of Virginia, Harvill et al., Strasbaugh and Core, and other sources of information on occurrence records and potential habitat in the area. See also list of species that may occur in the area in the Virginia Fish and Wildlife Information System (VaFWIS). See VaFWIS Report West End, VaFWIS Report Central and East End, Tier I & II Observation map, Tier I & II Habitat map and T&E Waters Map, attached._ Other species or species habitat not on these reports or documents may occur as well, once proper surveys or analysis is undergone.

The FS should conduct thorough surveys and analysis of TESLR species should be conducted. Many TESLR

species on the GWNF require special techniques for detection or are not easily observed at certain times of the day or times of the year. Appropriate surveying techniques should be utilized and these should be utilized at appropriate times of the year and times of the day. Persons with the requisite training for identification of TESLR species likely to be found in the area should conduct the surveys. An adequate amount of time should be spent in the field conducting surveys.

The FS states: "The James River Ranger District supports known occurrences and suitable habitat for several TES species, all of which have been considered in this analysis." (EA 35). However the FS has not disclosed what all of these species are, and we do not know if some species not included in this list may occur in this area, or could have been detected if adequate surveys were conducted, but were not conducted. Therefore, we will comment further once this information is disclosed to the public.

A Biological Assessment and Biological Evaluation are non-existent for this project. The Forest Service stated that the "full Biological Assessment" and "Biological Evaluation" are "relevant resource information" that the Draft EA "will include." (EA-112). However, they are non-existent at this stage. See full Draft EA (pp.1-156) presented to the public during this comment period, with no BA or BE. This Draft EA should have been informed by a BA and BE and the public should have been allowed to comment. Once the Biological Assessment and Biological Evaluation are full, we ask that you provide them to the public and provide a 30 day comment period on the EA. This comment period should be provided as a separate comment period before the Objection period.

Where TESLR species may be harmed by activities, these activities should be avoided in areas with TESLR habitat or known occurrences of TESLR species. Adequate mitigation measures must be established.

Cultural Resources
-Cultural Resources may be impacted.
There may be sites of concern in the project area. The direct and indirect impacts on cultural (heritage) resources resulting from the logging, roadbuilding, current road system and other activities should be thoroughly analyzed. Complete cultural resources surveys should be completed which satisfy the terms of the National Historic Preservation Act, and other laws regarding cultural resources, Native American cultural resources, religion, and traditional practices and their implementing regulations. Thorough surveys should be done. The FS should consult with Native Americans and others who are knowledgeable regarding cultural resources that are found or might be found in the project area. The FS should include in its documentation, the survey methodology used, a copy of any Memoranda of Agreement with the State Historic Preservation Office, and the qualifications of the people doing the survey work. Thorough mitigation measures should be used and those mitigation measures should be demonstrated to be effective.

Riparian Areas
Riparian areas and water resources occur in this project area. Riparian resources and associated aquatic and terrestrial species are important in this area . All portions of riparian areas need to be thoroughly delineated in the field. Impacts to plants, animals, and biological communities in and around these areas needs to be thoroughly evaluated. The management prescription area for riparian areas needs to be clearly delineated and followed in this project area. The document with the scoping notice did not contain maps of these areas. We would be happy to comment further once these maps are completed.
It is unclear how riparian management areas, and stream conservation zones have been delineated thus far. Many of the resources associated with these features (and the natural shade within them) may be impacted by this project. How would resources associated with large or old trees such as these be affected? How would LWD be affected?
Many species and biological communities rely on the health of riparian areas. See Jan 13, '04 USF&WS BO for the JNF p. 2 bottom paragraph and p. 3 top paragraph; and Seth Wenger, 1999, "A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation", Institute of Ecology, University of Georgia, 59 pp.

(both incorporated by reference). Headwaters and small streams are particularly sensitive: "The effects of sediment delivered to a stream channel diminish as watershed size increases. Most vulnerable are small sensitive headwaters catchments where concentrated timber harvest activity can have profound results. . . . After four years, sediment rates are normally back to predisturbance levels. However, once sediment is deposited in a stream channel, its effects can persist for decades or even centuries (Frissel, 1996)." (JNF Enterprise TS EA-42; incorporated by reference). "Generally the headwater fish populations are the most threatened." (GWNF FEIS J-8). For information regarding salamander use of headwater stream habitat see <http://www.epa.state.oh.us/dsw/wqs/headwaters/TechRep_FishAmphibian_2002.pdf> (incorporated by reference). This information needs to be fully considered and incorporated into the analysis. Expanded no cutting or no disturbance zones around stream courses needs to be implemented here.

Riparian areas must be fully surveyed.

The Plan requires the FS to delineate riparian areas based on on-the-ground conditions . Because of their importance (e.g., habitat, feeding fisheries, downstream TESLR species habitat) and the drier site conditions that can be found elsewhere at these units, all riparian areas should be avoided by cutting and vehicles.

- Springs and seeps should be identified during wet weather (See Va. BMPs, incorporated by reference). In order to comply with BMPs, the project area should have been surveyed during wet weather, when springs and seeps are most likely to be detected. There are no survey records to document this.

- Logging is allowed around springs and seeps. These areas are a component of landscape diversity and are very important for maintaining the population viability and distribution of salamanders, frogs, crayfish, box turtles, ruffed grouse, turkeys, and other species (see JNF Hagan Hall TS EA -43, 44, 46; incorporated by reference). Removal of their canopy cover impedes and disrupts the natural ecological succession of these areas. Implementation of the proposed alternative/mitigation is not compliant with the DFC for these microhabitats. These areas should be absolutely off-limits to cutting and removal and vehicles; and the no-disturbance zone should be more than just the "immediate" wet area due to hydrological, shade, and drying concerns. "Elimination of terrestrial vegetation around aquatic breeding sites causes amphibian populations to decline [citations omitted]. Thus, maintenance of amphibian biodiversity depends on the protection and management of both aquatic breeding sites and the surrounding terrestrial habitat." "Factors influencing amphibian and small mammal assemblages in central Appalachian forests", Mitchell et al, Forest Ecology and Management 96: 65-76 (1997). (research conducted on the GWNF, incorporated by reference).

"Downed material in these spots is providing cover which was formerly provided by a forest canopy. This downed material is retaining the cooler temperatures and higher humidity associated with springs and seeps." (Hagan Hall Wildlife Existing Condition report, Aug. 1998). "Removal of material from these sites [seeps, springs, bogs, and forested wetlands], particularly where most of the tree canopy is now gone, would increase the solar radiation causing warming temperatures and less humidity. . . . increased temperatures and drier air can affect the presence of certain amphibians and small mammals." (Hagan Hall EA-47). Ecosystem management should recognize that there is more to seeps, springs, bogs, and forested wetlands than just their physical characteristics. If these locations become unusable or unattractive to some amphibians, mammals, or other taxa that would be expected here, then they are not fully functional. And there is no analysis or citation to studies to corroborate the assertion that retention of 20% (or whatever basal area the cutting method retains) of the overstory cover shading these sites is enough to maintain their full functioning and attain their DFC.

Surveys to identify these areas must be carried out during wet periods when they can be properly detected (see state BMP manual). "Seeps and other wetlands ... are best located during rainy season as many wetlands are difficult to identify during dry periods." - Forestry Best Management Practices for Water Quality in Virginia Technical Guide at pg. 42 (incorporated by reference). The FS claims to be complying with state BMP guidelines (e.g., EA13&14), but it is not clear that compliance has occurred. If the habitats are not properly identified and inventoried, they cannot be properly protected, mitigated, and monitored.

Seep areas provide critical riparian habitat. A VDGIF biologist states they should be protected "by a minimum of 100 feet on each side (preferably 200-300 feet)" (see GWNF Johnson Mtn. timber sale project file at tab 20; incorporated by reference). This 200-300' zone should be applied here. See also Jan 13, '04 USF&WS BO for the JNF p. 2 bottom paragraph and p. 3 top paragraph; and Seth Wenger, 1999, "A Review of the Scientific

Literature on Riparian Buffer Width, Extent and Vegetation", Institute of Ecology, University of Georgia, 59 pp. (both incorporated by reference).
-There is a documented occurrence of the roughhead shiner, a sensitive species in this county and watershed. The

TESLR Bats

TESLR bats may occur in this area (EA 35-39). See, also, e.g., occurrence records for these subwatersheds, this county and this geographical area of this project at https://vanhde.org/species-search/, https://vanhde.org/content/map , and records in Terwilliger, 1991, VSO Virginia's Breeding Birds Atlas, Atlas of the Flora of Virginia, Harvill et al., Strasbaugh and Core, and other sources of information on occurrence records and potential habitat in the area. See also list of species that may occur in the area in the Virginia Fish and Wildlife Information System (VaFWIS). See See VaFWIS Report West End, VaFWIS Report Central and East End.

There may be hibernacula nearby in or adjacent to project area. The FS should disclose whether these species could be directly or indirectly harmed by the project, what steps the FS will take to protect these species and the effectiveness of these measures

The agency should consult with the USFWS on this specific project. The necessary biological opinion must be obtained. The proper Biological Assessment must be performed. 16 USC 1536(a)(2). This was not done. See Section 7 of the ESA.
(2) Project Area
There is a possibility of usage of the project area by this species. Karst cave entrances, blowholes, and sinkholes may exist nearby and may provide habitat for TESLR bats. The cutting sites forests are mature forests, with canopy gaps and snags and trees with exfoliating bark, that are the habitat known to be preferred by this species. Implementation of the proposed action would remove and damage this habitat. In addition, all the proposed cutting sites are adjacent to riparian corridors, habitat this species is known to prefer.

Because the project area and project is so close where TESLR bats have been observed roosting in trees in the Forest, the FS should have determined and disclosed the distance of the project from the cave and other roost sites, & properly analyze effects.
(3) Need to Obtain and Analyze Scientific Information
The agency often claims to be following the guidelines of the Indiana Bat Plan Amendment EA. The explicit objectives of this Plan are the identification, protection, and promotion of foraging areas, roost sites, maternity sites, and swarming areas. (pg.2) Establishment of whether these units and project area are actual roost sites or foraging or maternity or swarming areas is necessary so as to be consistent with the IBRS, NEPA, NFMA,APA and/or the ESA. This is especially important due to the closeby location of hibernacula. The requisite full, intensive, and competent surveys, inventories, and data gathering to ascertain use of this area by the Bats should have been performed.
The proposal does not accomplish the goals of the IBRS or ESA or NFMA (viability [36 CFR 219.19]). The clear potential for adversely affecting a threatened or endangered species is present. By failing to properly consider, provide for, or protect the Indiana Bat and other T&ESLR bats, this proposal may violate the NFMA [36 CFR 219.19(a)(7)] in addition to the ESA.
Although not explicitly stated in the documents, planners frequently act as if Indiana Bats may occur throughout the GWJNFs (see, e.g.,numerous past BEs from this RD). Activities are often explicitly restricted around roost trees (see BEs and Plan amendment). "If . . . active roost trees are identified" there will be a 1/4 mile or two mile buffer established around the tree. (BEs, amendment). But this measure is weightless as the Forest Service is not taking active measures (as they should be if the Bats were being accorded the requisite top priority) to

ascertain the actuality of this "if". "We are not required to survey our project areas for presence of Indiana Bats." (GWNF Mulligan TS EA App.B). This statement is not only false (see section C(3) of this appeal), it is also not the full and fair consideration demanded by law. See Village of False Pass v. Watt (1983) and Conservation Law Foundation v. Watt (1983).

The Forest Service does not seem to recognize the precariousness of the Indiana Bats population in Virginia. Here on the periphery of their range, the Bats' numbers have plummeted. A net loss of 1300 Bats since counts were initiated in VA winter hibernacula (IBat EA-11), a decline of approximately 75% in this state. Bat populations in Starr Chapel Cave have plummeted from 600 bats in the early 60s to 54 bats by 1996-97. . Bat populations in Mtn. Grove Cave have declined from 23 bats in 1992 to 2 bats by 1997-98 (IBAt EA-11). And populations are at higher risk today due to white nose syndrome.

The FS ignores new information since the release of the 90s era BO and since the release of the IBAt EA-DN. For example, new Indiana bat hibernacula have been identified in the Jefferson NF]" (January 13, 2004 BO on the JNF Plan Revisionpp. 19&20) but there is no record if surveys have been conducted in and around the JNF to identify new hibernacula there. The Brack and Brown (2002) study cited in the above BO discloses that less than half of identified roost trees are shagbark hickory, but here the FS mainly only protects shagbark hickories in its inadequate mitigation measures with no assurance that adequate other potential roost trees are protected. Recent research in Indiana and Kentucky indicates that bats range up to 5 mi. from hibernacula during fall and spring swarming periods (ibid p. 25). Clawson(2002) reported an 80% decrease in bat populations over the last 40 years in the southern portion of the bats' range (Alabama, Arkansas, Kentucky, Missouri, Tennessee, and Virginia) (ibid, 13).

The "plain intent" of Congress in enacting the ESA was to reverse species extinction trends "whatever the cost." And substantive protection under the Act applies to species habitat - see Babbit v. Sweet Home (1995). The ESA "indicates beyond doubt that Congress intended endangered species to be afforded the highest of priorities." TVA v. Hill(1978) The FSM requires the agency to "[p]lace top priority on conservation and recovery of endangered, threatened, and proposed species and their habitats..." FSM 2670.31.

If the FS does not perform the needed surveys and inventories of the area and its habitat (the proper site-specific good faith "hard look" by qualified personnel using valid methods) necessary for clearly establishing the status of the Bat here, it is clear the agency would not be placing the requisite highest priority on the Indiana Bat and other T&E bats and their habitat. Past dereliction as regards proper survey information was articulated at the appeal resolution meeting for the Chestnut Ridge #2 TS on the GWNF Deerfield RD where agency personnel declared that it "wouldn't do any good to determine if Indiana Bats are using this area." And it is not clear how (or what or if) a 'contract inspection' can be relied upon for obtaining adequate Bat population and habitat mitigation monitoring. Maintenance of NFMA mandated viability would not be ensured, let alone the reversal of trends and recovery of populations demanded by the ESA. Top priority also must be given to the Endangered Virginia Big-Eared Bat; this has not occurred here

(4) Harm to Bats

The proposed logging would adversely affect roosting (sheltering), maternity (breeding), foraging (feeding), and swarming habitat of the Indiana Bat and other T&E bats. This timber sale could "take" the Indiana Bat and other T&E bats in that it could result in significant habitat modification or degradation, a violation of section 9 of the ESA. See also 40 CFR 1508.27(a&b), and 36 CFR 219.19. An unknown quantity of Bats may also be directly killed by implementation of the proposed logging.

This sale would remove the very trees (large mature with broken tops and cavities and snags and exfoliating bark) with the characteristics known to be used or favored by the Bats. Top priority is not being given to the Bats.

This felling/removal also ignores the Bats' known loyalty to habitat. The must address the impact of removing a roost tree when the bats are not there. There is lots of research that shows this would harm or indirectly kill bats. There is the need to consider, loyalty to the roost trees, stress of finding new roosts, and the impacts of removing trees next to roosts or potential roosts (i.e., making the tree more susceptible to windthrow and changing the thermal dynamics). Yet the issues were simply ignored.

Ignored also is the fact that the Bats are known to especially use riparian and stream corridors for dispersal and

feeding. All forested habitat is not "equal', yet the agency's EA/BE analysis traditionally acts as if it is. The agency is proposing to disturb and degrade areas of Forest that are particularly important to the Bats. Most, if not all, of the tracts proposed for logging are adjacent to streambeds.
This area may be critical summer habitat for the Bats. A petition for designation of summer "critical habitat" is currently before the USFWS. Implementation of this proposal may result in foregoing opportunities to protect areas critical to the Bats recovery. This factor is totally ignored in the assessment and decision-making here.
The figures and narrative in the EA establish that the FS decision intends to remove and/or cut down a large amount of the potential Indiana Bat and other T&E bats' habitat at these cutting sites. The amount of disturbance proposed is not consistent with a FONSI or "no adverse effects to" Indiana Bats and other T&E bats.
(5) Mitigation
Efficacy of proposed mitigation measures for the Bat must be explained, and they must completely compensate for potential adverse effects. For example, the increased susceptibility of remnant leave trees to windthrow should be assessed. Efficacy of retaining only shagbark hickory trees is unsubstantiated; the Bats are known to use other tree species that are present here that the cuts will remove. See Table 4 at pg. 21 of GWJNF IBRS. White, chestnut, and northern red oaks, species which are prevalent here, are "Class 1 Tree Species" and are likely to be used for roosting and maternity sites. The effectiveness of retaining a certain number of snags per acre should be substantiated. If the Bats were receiving the required "top priority" all snags and large potential den trees would be retained. See Bensman v. USFS (1997). The mitigation may not necessarily retain the large old or dead/damaged trees of greatest benefit to the Species. And concern over low snag amounts (and quality) are not merely conjectural. See the information found in USDA FS General Technical Report SE-94 "Biodiversity and Coarse Woody Debris in Southern Forests" (incorporated by reference).
Another mitigation often offered for I. Bat roost trees is in effect no mitigation. "If during implementation active roost trees are identified. . ." Loggers or timber officers can not be expected to be qualified at identifying or locating TESLR species or roost trees. And there is no assurance that they would notify proper authorities if they did find anything. Reliance upon such mitigation for a FONSI is unreasonable and/or arbitrary and capricious.
There is no mitigation requirement for examining cut trees to ascertain if "incidental take" or significant harm to Bats should occur. In a meeting attended by members of the appellants on July 26, 2002 at the GWNF Deerfield RD office, the agency timber sale administrators and contract inspectors present made it quite clear that they "do not monitor or track wildlife killed" at logging sites. In the absence of any documentation to the contrary, the same behavior can be presumed to be operating at this RD. Therefore the agency would not be assuring compliance with the ESA or the viability requirements of the NFMA.
Section 9 of the ESA states that it is unlawful to "take" listed species. 16 USC 1538(a)(1) "`Harm' in the definition of `take'... may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering." 50 CFR 17.3.
As the recent finding of IBats in North Carolina shows, one tree may harbor more bats than is allowed to be "incidentally" taken. Proper surveys have not been done here and are not being done here to ascertain whether Bats are present in or using cutting units. Nor is it proposed that proper monitoring by qualified personnel of trees if they are cut be accomplished to ascertain if incidental take requirements are not exceeded.
(6) Cumulative Impacts
Of particular concern are cumulative impacts to the IB. The proposed action, in concert with other past, present and future actions, could result in CIs to the Bat. Past actions have already harmed Bat habitat in this analysis area. There is clear evidence that further habitat modification (e.g., cutting of trees for sale) is foreseeable here and elsewhere in the Bats' habitat in this Forest and ranger district. The agency's assertion that CIs will not result to the Bat's populations here or in Virginia must be explained & substantiated. The Bats' viability is particularly at risk here due to it being on the edge of its range and its small population in Virginia.
The agency is at present modifying and/or damaging and/or degrading and/or destroying IB habitat (or contemplating such) throughout its range. These actions include timber sales throughout the J-GWNFs. Yet the significant CIs accruing from all of this (and other agency and non-agency actions) these must be analyzed and disclosed in the EA or EIS.

(8) Need to Consult with USFWS

The ESA requires agencies to reenter consultation when there is new information. The effect to Indiana Bats is "beyond that which is already disclosed" in the FWS BO/incidental take statement and GW-JNFs' IBat EA/BA/DN.

And the recent finding of IBats in North Carolina shows that one tree may harbor more bats than is allowed to be "incidentally" taken. As the Bats may be adversely affected, formal consultation with USFWS on this project needs to be reentered before any management ground disturbance activities occur.

NEED TO ENSURE VIABILITY OF THE INDIANA BAT and other T&E bats ON THE PLANNING AREA

The findings in the USFWS BO & Incidental Take statement and in the GWNF EA/BA for the Indiana Bat pertained to jeopardy to the species as a whole, NOT to its specific viability on the GWNF. These are separate issues, and the Forest Service is not fully and fairly considering impacts to the Bats' viability on this particular Forest. The discussion, findings and claims in the EA/BE for this project rely upon and reiterate the discussion, findings and claims that refer to jeopardy to the Bats as a whole, not to its viability on this particular Forest. The Forest Service may not be harming "critical habitat" for the species or be jeopardizing the "continued existence" of the species overall, yet its viability on this particular Forest may still be jeopardized. NFMA requires that viability be maintained on this particular planning area, not just somewhere on the species entire range. It is this NFMA mandated viability on this particular Forest that the agency is not ensuring in this decision.

Because of the species propensity for using the habitat of the type proposed for logging here(e.g., old age/mature sites, forest types, stream corridors), these proposed cutting sites have a high potential for occupancy by the Bats.

The planners often do not seem to recognize the precariousness of the species' population on this Forest. Here on the periphery of their range, the Bats' numbers have plummeted. A net loss of 1300 Bats since counts were initiated in Virginia winter hibernacula (GWJNF IBat EA-11), a decline of approximately 75% in this state.

(1)Lack of viability analysis

Yet there is no viability analysis for the Indiana Bat and other T&E bats for this specific proposal or for the GWNF in the administrative record. There is not even an estimate of a viable population in the FEIS, or where this population is distributed. Nor has an extinction threshold for the Bats on this Forest been established. And there is no analysis of cumulative impacts to the Bats' actual population on the GWNF in the administrative record for this sale. In addition, proper surveys have not been done here and are not being done here to ascertain whether Bats are present in or using cutting units. Nor is it proposed that proper monitoring by qualified personnel of cut trees be accomplished to ascertain if Bats are being "taken" or harmed. Nor is it proposed that qualified personnel ascertain if roost trees are being cut during sale implementation.

(2) Insufficient mitigation

The mitigation for the Bats offered by the agency does not accomplish compliance with the NFMA. Often the chief mitigation offered for I. Bat roost trees is in effect no mitigation. "If during implementation, active roost trees are identified. . ." And the other frequent so-called mitigation measure ("If during implementation of the project any TES species are located . . ." -) is likewise vacuous. Loggers or timber officers can not be expected to be qualified at identifying or locating TES species such as Indiana Bats and other T&E bats or Indiana Bat and other T&E bats roost trees or maternity roosts. And there is no assurance that they would notify proper authorities if they did find anything. Reliance upon such so-called mitigation is unreasonable and arbitrary and capricious. Reliance upon such so-called mitigation does not ensure that significant affects to the Bats' viability on this Forest would not occur.

Further, there is no mitigation requirement for examining cut trees to ascertain if "incidental take" of IBats and other T&E bats has occurred.

(3) Data not obtained - Non-compliance with Plan

Hard data on their population status in this project area has not been gathered, nor has a rigorous viability analysis been performed. Population inventory information of the Bats using this Forest in spring, summer, and fall have also not been obtained. The project area, including proposed cutting units, is habitat for the Indiana Bat. "When adequate population inventory information is unavailable, it must be collected when the site has a high

potential for occupancy by a threatened, endangered, proposed, or sensitive species." See Std. 240 at GWNF LRMP 3 - 14. This information, required for a well-informed well-reasoned decision, must be gathered here.

Top priority also must be given to the Endangered Virginia Big-Eared Bat; must occur here. This species is listed as "Endangered" federally and by the state of Virginia. There is no population, monitoring, survey, or viability information on the species in the FEIS, the Forest Monitoring Reports.
This Bat is known to use the type of forest habitat proposed for intensive disturbance here.
It is possible that an unknown cave hibernaculum used by this species exists closeby (it is known that Bats in West Virginia "travel up to 6 miles from their caves to forage" - see pg. 63 of "Biological Assessment for Threatened and Endangered Species on the Monongahela National Forest West Virginia November 2000"; document incorporated by reference).
This species is known to use "tree crowns" in "forest habitat" to forage in summer (MNF BA at pg. 62). During summer foraging a radio-tracked Bat "spent most of its time in wooded areas" (id at pg. 66). More specifically this species is known to use mixed oak or oak/pine sites for foraging (id.), the very forest types found in this project area and proposed "cutting units".
Research shows that these Bats "forage only after dark." (id. at pg. 62) So they cannot reasonably be expected to be detected by "walking through" "field surveys" conducted in the daytime.
In addition, Townsends big eared bats (Corynorhinus townsendii) have recently been found use large hollow boles of trees for roosting elsewhere in their range in the U.S. For example, the Idaho Habitat Conservation Assessment/Conservation Strategy contains information on recent discoveries (1990s) of Corynorhinus townsendii roosting in cavities in trees in the western U.S. The FS should have determined whether there is a potential for Virginia big eared bat to roost in the trees, or in boles of large trees, here.
Establishment of whether these units and project area are actual foraging areas is necessary so as to be consistent with the NEPA, NFMA, APA and/or the ESA. This is especially important due to the closeby location of a critical hibernaculum and the even closer occurrence record. The requisite full, intensive, and competent surveys, inventories, and data gathering to ascertain use of this area by the Bats must be performed. By not performing the needed surveys and inventories of the area and its habitat (the proper site-specific good faith "hard look" by qualified personnel using valid methods) necessary for clearly establishing the status of the Bat here, it is clear the agency would not be placing the requisite highest priority on the "Endangered" Virginia Big-eared Bat and its habitat.

The Indiana bat and other PTESLR bats, cave- and karst-related species, and cave- and karst-related biological communities may be found in or downstream from the PA. The eastern small footed bat (Myotis leibii) may occupy and/or forage in the area. According to Burt and Grossenheider, Peterson's Field Guide to the Mammals of North America (1976), the habitat for this bat includes caves, crevices in rocks, and forested areas (p. 33).

The northern long-eared bat has declined 99% in the Northeast, 96% in Virginia, roughly 68% in West Virginia. Unlike the little brown bat, which is showing signs of stabilization in areas longest affected by white nosed syndrome, the northern long-eared bat population does not appear to be stabilizing anywhere. Northern long-eared bat populations are starting to show increasing mortality in the Southeast and Midwest. Twenty- five states in its 38 state range are now affected by white nosed syndrome, and 5 Canadian provinces in its range are also now affected by white nosed syndrome.

There is currently no Forest Plan provision for protecting the Northern long eared bat than required for the Indiana bat. Forest clearing proposed in the Alternatives could adversely affect roosting (sheltering), maternity (breeding), foraging (feeding), and swarming habitat of the northern long-eared bat and other T&E bats. Logging could remove the very trees (large mature with broken tops and cavities and snags and exfoliating bark) with the characteristics known to be used or favored by the Bats. Top priority should be given to the Bats.
This felling/removal also ignores the Bats' known loyalty to habitat. The agency must address the impact of removing a roost tree when the bats are not there. There is the need to consider, loyalty to the roost trees, stress of finding new roosts, and the impacts of removing trees next to roosts or potential roosts (i.e., making the tree

more susceptible to windthrow and changing the thermal dynamics).
Efficacy of proposed mitigation measures for the Bat must be explained, and they must completely compensate for potential adverse effects. For example, the increased susceptibility of remnant leave trees to windthrow should be assessed. Efficacy of retaining only shagbark hickory trees is unsubstantiated; the Bats are known to use other tree species that are present here that the cuts will remove. See Table 4 at pg. 21 of GWJNF IBRS. White, chestnut, and northern red oaks, species which are prevalent here, are "Class 1 Tree Species" and are likely to be used for roosting and maternity sites. The effectiveness of retaining a certain number of snags per acre should be substantiated. If the Bats were receiving the required "top priority" all snags and large potential den trees would be retained. See Bensman v. USFS (1997). The mitigation may not necessarily retain the large old or dead/damaged trees of greatest benefit to the Species. And concern over low snag amounts (and quality) are not merely conjectural. See the information found in USDA FS General Technical Report SE-94 "Biodiversity and Coarse Woody Debris in Southern Forests" (incorporated by reference).
Another mitigation often offered for bat roost trees is in effect no mitigation. "If during implementation active roost trees are identified. . ." Loggers or overseers can not be expected to be qualified at identifying or locating TESLR species or roost trees. And there is no assurance that they would notify proper authorities if they did find anything. Reliance upon such mitigation for a FONSI is unreasonable and/or arbitrary and capricious.
Of particular concern are cumulative impacts to the northern long eared bat. The proposed action, in concert with other past, present and future actions, could result in CIs to the Bat. Past actions have already harmed Bat habitat in this analysis area. There is clear evidence that further habitat modification (e.g., cutting of trees for sale) is foreseeable here and elsewhere in the Bats' habitat in this Forest and ranger district. The agency's assertion that CIs will not result to the Bat's populations here or in Virginia must be explained & substantiated. The Bats' viability is particularly at risk here due to declines from white nosed syndrome in Virginia.
The FS should have analyzed the particular habitat needs of the long-eared bat and should have analyzed how the project would impact the bat and its habitat.. ÒCompared to random trees, roosts of northern long-eared bats were within intact forests (x2 = 10.56, d.f. = 1, P = 0.001). Amount of obstruction and decay differed; roosts of M. sodalis typically were less cluttered and more decayed than those of M. septentrionalis (x2 = 38.63, d.f. = 2, P < 0.001). Indiana bats roosted almost exclusively under exfoliating bark of bottomland snags, whereas northern long-eared bats also made extensive use of cavities and crevices.Ó ÒNorthern long-eared bats used five identified species of trees for roosting; nine roosts were in pin oak, five in elm, two in unidentified snags, and one each in sweetgum, oak, and hawthorn (Cratagus spp.).Ó ÒComparing roosts of Indiana bats and northern long-eared bats (Table 3), two variables were significant (x2 = 38.633, d.f. = 2, P < 0.001). Degree of roost obstruction was greater around northern long-eared bat roosts than around Indiana bat roosts (x2 = 14.954, d.f. = 1, P < 0.001), and M. septentrionalis roosts were less decayed than those of M. sodalis (x2 = 4.876, d.f. = 1, P < 0.027).Ó(Timothy C. Carter , George A. Feldhamer, ÒRoost tree use by maternity colonies of Indiana bats and northern long-eared bats in southern Illinois,Ó Forest Ecology and Management 219 (2005) 259Ð268).
-The FS should consider the differences between northern long-eared bats and Indiana bats and their use of habitats.
From Northern long-eared bat (NLEB) comparisons with the Indiana bat (Ibat) Appendix B:

Canopy cover around roost trees
Northern long-eared bats: They appear to select roosts with generally more canopy cover than Indiana bats do. Canopy coverage at NLEB roosts has ranged from 56 percent in Missouri (Timone et al. 2010), 66 percent in
Indiana bats: Mean values of canopy cover are highly variable among studies, ranging from <20 to 88 percent (FWS 2007).
FWS (2007) ÒFirst, some variation undoubtedly is related to differences in
Food sources:
Arkansas (Perry
and Thill 2007), greater than 75
percent in New Hampshire (Sasse and
Pekins 1996), to greater than 84
percent in Kentucky (Lacki and

Schwierjohann 2001).
Examples of studies that compared NLEB and Indiana bats directly:
¥ Indiana bat 25% vs. NLEB 56% (Timpone et al. 2010)
¥ Indiana bat 18% vs. NLEB 44% (Carter and Feldhamer 2005)
Northern long-eared bat: Similar to Indiana bat. Beetles, mayflies, moths (Brack and Whitaker 2001, Lee and McCracken 2004, Feldhamer et al. 2009) Potential differences Indiana bat, as gleaners, NLEB eat more arachnids (spiders) (Feldhamer et al. 2009) and more orthopterans than Indiana bat (Lee and McCracken 2004).
Indiana bats: Flying insects. Consistent use of moths, flies, beetles, and caddisflies throughout the year at various colonies suggests that Indiana bats are selective predators to a certain degree, but incorporation of ants into the diet also indicates that these bats can be opportunistic (Murray and Kurta 2002). Hence, Brack and LaVal (1985) and Murray and Kurta (2002) suggested that the Indiana bat may best be described as a Òselective opportunist,Ó as are a number of other Myotis species (Fenton and Morris 1976).
Foraging behavior:
Northern long-eared bats: Nocturnal. Both hawking and gleaning (Brack and Whitaker 2001, Feldhammer et al. 2009, Fenton and Bogdanowicz 2002; Ratcliffe and Dawson 2003). Within canopy more than Indiana bat (Nagorsen and Brigham 1993).

The 2001 DCR Eastern Small Footed Bat Conservation Agreement states: " When timber harvesting activities occur near summer bat roosts, caves, and foraging areas, use of buffers and minimal disturbance zones is strongly recommended. Timber harvesting techniques that leave snags,and trees with cavities and exfoliating bark are potentially beneficial, and are recommended in areas known to support eastern small-footed myotis. " The conservation agreement states that "Summer roosts are often in trees,buildings, behind loose bark, on rock outcrops, and on rocky ridges (Barbour and Davis 1969; Tuttle1964; Whitaker and Hamilton 1999)." The FS must perform the requisite surveys using advanced methods to determine in the eastern small footed bat exists in the area. The project area contains rock outcropsThe FS should ensure that "buffers and minimal disturbance zones" were implemented or adequate. The should require the recommended " timber harvesting techniques that leave snags,and trees with cavities and exfoliating bark" be implemented as mitigation measures around these areas. Habitat for small footed bats, also other species that rely on forested rocks and boulders (e.g., the Allegheny woodrat, rattlesnakes, southern rock voles, coal skinks, eastern ribbon snakes, mountain earthsnakes, pine snakes, turtles, salamanders, and other species) could also be affected. Only a limited number (and/oronly limited types of species) trees and snags in these categories were protected. The eastern small footed bat and other species (and their habitats) are not adequately considered or protected.

Roadless Areas, Potential Wilderness Areas and Remote Areas

The Forest Service should examine remote habitat, on a landscape scale, and ensure that sufficient large blocks of remote habitat and linkages between such blocks of habitat remain. Areas such as the 4,043 ac Slaty Mountain and 8166 Snake Run Ridge (Peters Mountain North) Virginia Mountain Treasure area and any de facto roadless areas of any size and configuration in the vicinity of this project area should be examined. See Virginia's Mountain Treasures: The Unprotected Wildlands of the George Washington National Forest, The Wilderness Society et al. pp.88-89.

Slaty Mountain treasure area "includes both Slaty Mountain and Dameron Mountain….Falls Hollow cuts a 600 ft canyon between Dameron Mountain and Slaty Mountain… the area just to the south of this roadless area was recently donated to the Nature Conservancy" p. 89. The southern most unit in the West Unit may be within or near this mountain treasure area.

See discussion of Snake Run Ridge (Peters Mountain North) area in the Old Growth section of these comments above.

There is potential for unroaded or remote areas not officially recognized by the Forest Service to exist in the area. Virginia DCR maps the Peters Mountain North (Snake Run Ridge area has an Outstanding ranking and the Slaty Mountain area as having a Very High ranking within the area (Virginia Natural Landscape Assessment map (2017) attached).

According to DCR Natural Heritage (Apr 24 24) "Ecological Cores are areas of at least 100 acres of continuous interior, natural cover" Units in the Central and Eastern portion of the project area include some Outstanding ranking core areas and Units in the Western portion of the project area include some Very High ranking core areas. See Virginia Natural Heritage Data Explorer, http://vanhde.org/content/map.

We are concerned that uninventoried roadless areas in the vicinity have been inadequately analyzed, have not been properly inventoried as roadless in their entirety, and that certain portions of this project area have been excluded from these roadless areas. We are concerned that roadless areas are not being protected, in accordance with the strong will of the American people. The FS should examine whether any areas outside of the boundaries of inventoried roadless areas could or should fall within these roadless areas (eg. roadless areas may meet road density standards for roadless areas in the east even with the roads included, roads may be non-existent or unimproved, etc). We would like to know what the largest possible roadless area(s) in the vicinity of the project area are and whether any portions of the project area, cutting units, or infrastructure may be included in these areas.

Portions (or all) of stands proposed for logging may be within the aforementioned Virginia Mountain Treasure Areas.
-
Some of the relatively flat areas (including several remarkable areas in and around streams) below the current FS identified roadless areas and PWAs on Slaty Mountain and Snake Run Ridge were improperly excluded from the roadless area and PWA inventory. These relatively flat areas may contain important habitat for wildlife. They should not be excluded from roadless area designation and protection.

- Would any roadless or unroaded areas in the vicinity of the project be impacted? How would roadless, unroaded, remote, or area sensitive habitat, recreational, watershed and other values be impacted?
-The FS has acknowledged the importance of roadless areas for a number of resources and values on NFS lands (See Federal Register Notice, Roadless Area Conservation Rule (RACR), January 2001). The FS should identify all inventoried roadless areas, uninventoried roadless areas, and unroaded areas (as defined in RACR, the RACR FEIS or similar guidance) of any size, should identify the roadless characteristics of all of these areas, and should analyze the impacts of this project and other activities/events on these areas. The FS should analyze the impacts of the project on wilderness el igibility.
-The Forest Service should recognize and consider the unique ecological values associated with designated and de facto roadless areas within what is otherwise a heavily roaded and fragmented national forest system. The Forest Service continues to resist change, excluding a sound application of "ecosystem management" that looks at the role of the increasingly scarce roadless resource in sustaining ecosystems far into the future. Scientists both inside and outside of the Forest Service have come to recognized that such undisturbed areas provide critical habitat for the maintenance of biological diversity and population viability. See, e.g., Wilcove, D.S., C.H. McLellan and A.P. Dobson. 1985. Habitat Fragmentation in the Temperate Zone. In: M.E. Soule, ed. Conservation Biology: The Science of Scarcity and Diversity. Sinauer Associates, Sundland, Mass.; Noss, R.F. 1987. Protecting Natural Areas in Fragmented Landscapes. Natural Areas Journal 7(1): 2-13; Saunders, D.A., R.J. Hobbs and C.R. Margules. 1991. Biological Consequences of Ecosystem Fragmentation: A Review. Conservation Biology 5(1): 18-32; Harris, L.D. and G. Silva-Lopez. 1992. Forest Fragmentatio
n and the Conservation of Biological Diversity. In: P.L. Fiedler and S.K. Jain, eds. Conservation Biology: The Theory and Practice of Nature Conservation, Preservation, and Management. Chapman and Hall Publishers,

New York, NY. pp. 197-238.
The establishment of a regional network of interconnected reserves and appropriate linkages is considered, by many scientists, to be critical to managing for genetic, species, and landscape diversity on our public lands. See, e.g., Noss, R.F. 1983. A Regional Landscape Approach to Maintain Diversity. Bioscience 33(11): 700-706; Hudson, E.E. 1991. Landscape Linkages and Biodiversity. Island Press, Covelo, Cal., 195pp. You should consider the unique functions of roadless areas as refugia for solitude-dependent wildlife and at-risk fisheries, reservoirs of undisturbed genetic material, connecting corridors within an increasingly fragmented landscape and natural "control" areas for experimental "management" and scientific research.
You must address project's impact on these critical ecosystem features by closely examining land beyond the immediate analysis area and considering the cumulative landscape-scale effects of continued habitat destruction within and adjacent to unroaded forest land in the GWNF. NEPA demands such. See e.g., City of Tenakee Springs v. Clough, 915 F. 2d 1308, 1312-1313 (9th Cir. 1990) (finding Forest Service"s cumulative impact analysis inadequate under NEPA and citing LaFlamme v. Federal Energy Regulatory Commission, 852 F.2d 389 (9th Cir. 1988) for the proposition that remand to the agency for further consideration of cumulative impacts is appropriate where the agency examined single projects in isolation without considering net impacts of all past, present and future projects in the area); Save the Yaak Committee v. Block, 840 F. 2d 714, 721 (9th Cir. 1988); 40 CFR € 1508.27(a) ("the significance of an action m
ust be analyzed in several contexts"). These cumulative impacts include not only present and foreseeable future effects, but also the accumulated, incremental effects of past human activity, including prior degradation or destruction of undisturbed habitat. See 40 CFR € 1508.7.
Remaining roadless areas provide essential area-sensitive species habitat, wildlife corridors, clean water, high quality fisheries, clean water sources for freshwater mussels, and habitat for wide-ranging, disturbance-sensitive herbivores, omnivores and carnivores like elk, bears, wolves, and cougars, etc. (both existing and extirpated species). Black bears occupy only 5-10% of their former range in the southeast and "would now likely be totally extirpated in this region were it not for federal lands containing designated wilderness or de facto wilderness" (Pelton, "Habitat needs of black bears in the east," in Wilderness and Natural Areas in the Eastern United States, Kulhavy and Conner, eds., 1984) Other such species have been extirpated or are barely surviving in the east.

The Forest Service has not disclosed or completed the requisite analysis of Roadless Areas, Potential Wilderness Areas, unroaded areas and Remote Areas, or for the potential for these areas to exist therein, in this project area. Accordingly, the Forest Service has not protected the resources or recreation opportunities in Roadless Areas, Potential Wilderness Areas, unroaded areas and Remote Areas areas.

Eligibility for Wilderness

"[T]he decision to harvest timber on a previously undeveloped tract of land is 'an irreversible and irretrievable decision' which could have 'serious environmental consequences." (National Audubon Society vs. U.S. Forest Service, 1993)

FS should examine whether any activities approved as part of this project could impact the any area's future eligibility for wilderness.

Before approving any activities in the project area, the FS should examine whether any activities approved as part of this project could impact the areas' future eligibility for wilderness. "An area recommended as suitable for wilderness must meet the tests of capability, availability, and need. In addition to the inherent wilderness quality it possesses, an area must provide opportunities and experiences that are dependent upon or enhanced by a wilderness environment. Also consider the ability to manage the area as wilderness" (See FSH 1909.12 ch. 70 Environment 2. Challenge. 3. Outdoor Recreation Opportunities 4. Special Features & 5. Manageability).

See FSH 1909.12 ch. 70.2 Definition of Forest Road. See FSH 1909.12 ch. 70.22b Other improvements: "Powerlines with cleared rights-of-way, pipelines, and other permanently installed linear right-of-way structures should not be included." See also FSH 1909.12 ch. 71.21, "according to the Wilderness Act, a wilderness area "[h]as at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition" (16 U.S.C. 1131c).
"Areas to be included in the inventory must be federal lands and must meet one of the following size criteria:
"1. The area contains 5,000 acres or more.
"2. The area contains less than 5,000 acres but is of sufficient size as to make practicable its preservation and use in an unimpaired condition, including but not limited to areas contiguous to an existing wilderness, primitive areas, administratively recommended wilderness, or wilderness inventory of other Federal ownership."
.
Several of these factors make it less likely that Slaty Mountain and Snake Run Ridge areas could be recommended for wilderness or designated wilderness if the activities took place.

Due to the clear potential for significant harmful impacts from this proposal, and the uncertainties involved, the environmental impact statement (EIS) needs to expressiy examine this issue. Projects in roadless areas that would alter the area's undeveloped character require an EIS. (National Audubon Society vs. U.S. Forest Service, 1990) See also FSH 1909, 8.12 ch 20. An agency must prepare an EIS if "substantial questions are raised as to whether a project may cause significant degradation of some human environmental factor" (LaFlamme vs. FERC,1988) See also 42 USC 4332(2), 40 CFR 1508.27, and Thomas vs. Peterson, 1982) "[T]he decision to harvest timber on a previously undeveloped tract of land is 'an irreversible and irretrievable decision' which could have 'serious environmental consequences." (National Audubon Society vs. U.S. Forest Service, 1993)
The decision for extractive development in the area would substantially alter the undeveloped character of the area.
This is a significant issue that should have been addressed in the EIS: (a.) Logging in roadless areas is highly controversial. Michael Dombeck, Chief of the Forest Service addressed Congress by saying that the USFS "suffers a credibility gap.... Until we rebuild that trust and strengthen those relationships, it is simply common sense that we avoid... old growth and roadless areas." (Scott Sonner, AP 2/25/97)

The Forest Service has not disclosed or completed the requisite analysis of, or for the potential for wilderness eligible areas to exist in this project area. Accordingly, the Forest Service has not protected the resources in wilderness eligible areas.

Trout Streams, Trout, Aquatic Species and Amphibian Species

There is trout habitat in this area. Crow Run, Little Crow Run, and other streams in the area are identified as trout streams. Adequate protection of these and other trout streams in the project area should be a high priority. Perennial, intermittent, and ephemeral tributaries of trout streams should also be considered because these play an important role in downstream water quality. See VaFWIS Trout Waters map, attached._

Wide stream buffers should be considered. Many species and biological communities rely on the health of riparian areas. See Jan 13, '04 USF&WS BO for the JNF p. 2 bottom paragraph and p. 3 top paragraph; and Seth Wenger, 1999, "A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation", Institute of Ecology, University of Georgia, 59 pp. (both incorporated by reference). And The Virginia Department of Game and Inland Fisheries (VDGIF) stated its position that the proposed riparian corridors in the

draft revised Jefferson LRMP were not sufficient to protect threatened and endangered aquatic species. See Comment letter 2575 on the draft revised Jefferson LRMP, William Woodfin, Jr., Virginia Department of Game and Inland Fisheries, already in the FS's possession, incorporated by reference. Instead of the proposed riparian standards, the VDGIF recommended increasing the standard buffers with an allowance to reduce the buffers on a site-specific bases after consultation with all cooperating agencies. Id. Wider streamside buffers than those proposed here (EA 13&14) should have been considered and implemented.

Headwaters and small streams are particularly sensitive: "The effects of sediment delivered to a stream channel diminish as watershed size increases. Most vulnerable are small sensitive headwaters catchments where concentrated timber harvest activity can have profound results. . . . After four years, sediment rates are normally back to predisturbance levels. However, once sediment is deposited in a stream channel, its effects can persist for decades or even centuries (Frissel, 1996)." (JNF Enterprise TS EA-42; incorporated by reference). "Generally the headwater fish populations are the most threatened." (GWNF FEIS J-8). For information regarding salamander use of headwater stream habitat see <http://www.epa.state.oh.us/dsw/wqs/headwaters/TechRep_FishAmphibian_2002.pdf> (incorporated by reference). This information needs to be fully considered and incorporated into the analysis. Expanded no cutting or no disturbance zones around stream courses needs to be implemented here.

The Plan requires the FS to delineate riparian areas and this should be done as part of the proposed project through maps and other documentation.

- Springs and seeps are a component of landscape diversity and are very important for maintaining the population viability and distribution of salamanders, frogs, crayfish, box turtles, ruffed grouse, turkeys, and other species (see JNF Hagan Hall Timber Sale EA -43, 44, 46; incorporated by reference). Removal of their canopy cover impedes and disrupts the natural ecological succession of these areas. Implementation of the proposed alternative/mitigation is not compliant with the DFC for these microhabitats. These areas should be absolutely off-limits to cutting and removal and vehicles; and the no-disturbance zone should be more than just the "immediate" wet area due to hydrological, shade, and drying concerns.

"Elimination of terrestrial vegetation around aquatic breeding sites causes amphibian populations to decline [citations omitted]. Thus, maintenance of amphibian biodiversity depends on the protection and management of both aquatic breeding sites and the surrounding terrestrial habitat." "Factors influencing amphibian and small mammal assemblages in central Appalachian forests", Mitchell et al, Forest Ecology and Management 96: 65-76 (1997). (research conducted on the GWNF, incorporated by reference).

"Downed material in these spots is providing cover which was formerly provided by a forest canopy. This downed material is retaining the cooler temperatures and higher humidity associated with springs and seeps." (Hagan Hall Wildlife Existing Condition report, Aug. 1998). "Removal of material from these sites [seeps, springs, bogs, and forested wetlands], particularly where most of the tree canopy is now gone, would increase the solar radiation causing warming temperatures and less humidity. . . . increased temperatures and drier air can affect the presence of certain amphibians and small mammals." (Hagan Hall EA-47). Ecosystem management should recognize that there is more to seeps, springs, bogs, and forested wetlands than just their physical characteristics. If these locations become unusable or unattractive to some amphibians, mammals, or other taxa that would be expected here, then they are not fully functional. There should be analysis or citation to studies to corroborate the assertion that retention of 5-15% (or whatever basal area the cutting method retains) of the overstory cover shading these sites is enough to maintain their full functioning and attain their DFC.

Surveys to identify these areas should have been carried out during wet periods when they can be properly detected (see state BMP manual). "Seeps and other wetlands ... are best located during rainy season as many wetlands are difficult to identify during dry periods." - Forestry Best Management Practices for Water Quality in Virginia Technical Guide at pg. 42 (incorporated by reference). If the habitats are not properly identified and inventoried, they cannot be properly protected, mitigated, and monitored.

Seep areas provide critical riparian habitat. A VDGIF biologist states they should be protected "by a minimum of 100 feet on each side (preferably 200-300 feet)" (see GWNF Johnson Mtn. timber sale project file at tab 20; incorporated by reference). This 200-300' zone should be applied here. See also Jan 13, '04 USF&WS BO for the JNF p. 2 bottom paragraph; and Seth Wenger, 1999, "A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation", Institute of Ecology, University of Georgia, 59 pp. (both in your possession

and incorporated by reference).
Although the FS proposes a high level of logging ,roadbuilding, road reconstruction and other activities- this in addition to previous logging and roadbuilding - the FS fails to adequately analyze the total impact on water quality, aquatic health, trout populations, other aquatic species populations and amphibian species populations, including impacts to headwaters, small streams, ephemeral streams, seep areas, areas around aquatic breeding sites for amphibians, sedimentation, and water temperature. The analysis does not examine the site-specific impacts of a project of this scale or cumulative impacts.

There is potential for TESLR aquatic species such as James spinymussel, yellow lance, Atlantic pigtoe, Virginia pigtoe, roughhead shiner, triangle floater mussel and green floater or other TESLR species to occur in the streams within the project area or within streams or rivers downstream from the project area. See VaFWIS T&E Waters Map, attached._ See VaFWIS report Central and East End and VaFWIS report West End attached.. Surveys for James spinymussel and other species that historically occurred within the area should be conducted as well.

The roughhead shiner may be found in the project area. See EA 35-39. See VaFWIS report Central and East End and VaFWIS report West End attached. "The roughhead shiner is confined to the Ridge and Valley province of the upper James drainage, Virginia…The contiguity within subpopulations and the sharp limits of the range of the species indicate that high gradient and small size of stream, turbidity, and siltation variously combine to effect the tight distribution of the roughhead shiner (Jenkins and Burkhead, 1975a)" Terwilliger (1991). The FS should analyze the potential impacts of this project on water quality and the roughhead shiner and its habitat. In addition, other TESLR mussels and aquatic species could be impacted by the project. The Virginia pigtoe "appears to be restricted to the headwaters of the James River" (Terwilliger, 1991 p. 280). The Atlantic pigtoe is known from the "James River …[system] in Virginia" (Terwilliger, p. 276). The yellow lance occurs in the "James River" (BE A-2). Green floater occurs in the "James …[drainage] of Virginia" Terwilliger 269). All of the above TESLR species (see GWJNFs TESLR species lists, incorporated by reference) are known to have historical distributions that include all or portions of the upper James River drainage. It is reasonable to expect surveys for these and other TESLR aquatic species. Otherwise, the FS cannot ascertain whether its activities are impacting or could impact TESLR species, pursuant to NEPA.

Thorough surveys for James spinymussel and other TESLR mussels should take place and the FS should thoroughly analyze the impacts on mussels, effectiveness of protective measures. Consultation with US Fish and Wildlife Service should take place.
According to a study commissioned by the American Fisheries Society Endangered Species Committee, there are "297 native freshwater mussels [in the U.S. and Canada], of which 213 taxa (71.7%) are considered endangered, threatened, or of special concern... and only 70 (23.6%) as currently stable... Freshwater mussels (also called naiads, unionids or clams) of the families Margaritiferidae and Unionidae are worldwide in distribution but reach their greatest diversity in North America with about 297 recognized taxa... During the past 30 years, numbers both of individual and species diversity of native mussels have declined throughout the United States and Canada. Freshwater mussels (as well as other aquatic species) are emperiled disproportionately relative to terrestrial species... This alarming decline, the severity of which was not recognized until recently, is primarily the result of habitat destruction and degradation associated with adverse anthropogenic activities." (Williams, Warren, Cummings, Harris and Neves, 1993)
At its peak, the James spinymussel (Pleurobema collina) was distributed from a location a few miles upstream of Richmond, Va. and throughout the James River basin upstream. Since that time, its range has been reduced by approximately 90% (Clarke and Neves, 1984) The James spinymussel now survives in a few tributaries of the James. (Terwilliger, 1991).
Efficacy of proposed mitigation measures for the mussel must be explained, and they must completely compensate for potential adverse effects.
Cumulative effects of Forest Service activities in combination with other past, present, and reasonably activities

and events in this watershed should be analyzed in accordance with NEPA. There is a possibility that FS activities in combination with non-FS activities or events may already be contributing significant levels of sediment, affecting the viability of the James spinymussel. Rapid declines of the mussel in portions of this watershed and other nearby watersheds may be indicators that this mussel (and other aquatic species) may be in serious trouble. FS activities may need to be curtailed.
In addition, the James spinymussel depends on fish species such as the bluehead chub (Nocomus leptocephalus), rosyside dace (Clinostomus funduloides), satinfin shiner (Cyprinella analostana), rosefin shiner (Lythurus ardens), central stoneroller (Camptostoma anomalum), blacknose dace (Rhinichthys atralulus) and mountain redbelly dace (Phoxinus oreas) in order to reproduce, so potential impacts to these fish species should have been considered as well. These fish serve as the prime fish hosts for young developing mussel larvae, called glochidia (Terwilliger, 1991, p. 254; Hove and Neves, 1994) See also George Washington and Jefferson National Forest T & E Mussel and Fish Conservation Plan (Mussel and Fish Conservation Plan), 6 & 31: " The decline of fish host species may present a problem in mussel reproduction."
Appropriate surveys and analysis of impacts on fish host species should take place.

. The FS must also follow the monitoring provisions of the Cons Plan.
" Monitoring:
Implementation
Annual implementation monitoring will be conducted for projects within the Conservation Zone in watersheds listed in Appendix E to determine if standards are being followed. Implementation monitoring is done one time for a project. See Appendix G for an example of a monitoring checklist. Results of this monitoring will be sent to the U.S.D.I. Fish and Wildlife Service.
Effectiveness
Effectiveness monitoring will be conducted within the watersheds listed in Appendix E and will consist of:
1. Direct monitoring of threatened and endangered mussel and fish populations in conjunction with Virginia Department of Game and Inland Fisheries (lead agency).
2. Direct monitoring of James spinymussel populations and habitat on Forest Service property.
3. Indirect monitoring of aquatic fauna through the use of macroinvertebrates as bioindicators of the effects of management activities on stream biota (using EPA's Rapid Bioassessment Protocol II, see Objective 3.01).
Inventory
The Forest Service will continue to inventory potential Federally listed mussel and fish habitat on Forest Service land and assist the state in additional surveys."(Cons Plan 23).
There is nothing in the EA or DN that refers to a monitoring plan for T&E mussels and fish. No monitoring plan has been established.

The FS should have analyzed how the project (including forest clearing, roads, and other infrastructure) affect sediment-sensitive species such as trout, and other aquatic species, including any TESLR fish species found downstream in Dunlap Creek and other waterways downstream from the project area.
Cumulative effects of the project, other land disturbing activities in combination with other past, present, and reasonably activities and events in the range of the candy darter should be analyzed in accordance with NEPA. There is a possibility that these activities in combination with non-FS activities or events may already be contributing significant levels of sediment, affecting the viability of TESLR aquatic species.

Steep Slopes

The District needs to analyze the slopes and soils in the project area and to consider avoiding riskier sites or adding mitigation. Much of the information needed to conduct this analysis is readily available for download and GIS analysis … Conducting these important analyses as early in the process as possible will help the District plan and thus expedite the project and improve management. Further, the Forest Plan requires compliance with Virginia's Forestry Best Management Practices for Water Quality (BMPs), which provide that logging plans should consider 'steep slopes, highly-erosive or hydric soil types.'

Trails

The FS should disclose how trails and proposed trails could be directly and indirectly impacted by the project. We are concerned that the project may impact the visual/aesthetic values, recreational resources, and/or ecological resources of key areas within and around the project area. Consider the project's and other cumulative activities'/events' impacts on visual/aesthetic sensitivity, recreational resources, and/or ecological resources of key areas of the area and vicinity, including old growth areas, proposed designated old growth areas and other specially designated areas under alternatives considered in the plan revision, proposed or eligible W&S Rivers, lookouts/recreational sites, any areas of any size that meet road density stds. and minimum logging thresholds for roadless areas in the east, and all other recreation areas, fisheries, trails, access roads to trails and trailheads, campgrounds, primitive and dispersed campgrounds, roads used by hunters and recreationists, trail corridors, sites visible along the length of all sites/trails/corridors, archaeological sites, seasonal differences, viewpoints, recreation facilities, airplane-visible areas and airplane-routes, prominent ridges and features, important biological/birding/wildflower/nature-walk areas, areas used by groups/special events (such as backpacking routes for summer camps, club hikes, routes of wildflower pilgrimages, etc.), hiking shelters, (DNH) special biological areas, national recreation trails, streams, proposed recreation sites, and proposed trails, scenic byways and connectors. Consider direct impacts to all of the above. Indirect impacts. Consider impacts to the entire primitive, dispersed and non-motorized recreational experience associated with the above. Consider impacts to remote or rarely-visited areas. Use the SMS regarding aesthetics. Consider sight, sound, and the full range of aesthetic experience. Use up-to-date information and science regarding aesthetics. Consider the quality of the overall scenic/aesthetic experience regarding the James River RD, the project area and project area. What values should be protected? What are people's expectations?

Range of Alternatives and Forest Plan

The NEPA document must meet NEPA's requirements that a reasonable range of alternatives be fully analyzed. The Forest Service Handbook, chapter 20, section 23.2 states that the purpose and intent of alternatives are to "ensure that the range of alternatives does not foreclose prematurely any option that might protect, restore and enhance the environment." Under NEPA, an environmental impact statement must contain a discussion of "alternatives to the proposed action" [42 U.S.C. 4332(2)(D)]. As interpreted by binding regulations of the CEQ, an environmental impact statement must "(r)igorously explore and objectively evaluate all reasonable alternatives" [40 C.F.R. 1502.14(a)]. The importance of this mandate cannot be downplayed; under NEPA, a rigorous review of alternatives is "the heart of the environmental impact statement." 40 C.F.R. 1502.14. Similarly, case law has established that consideration of alternatives that lead to similar results is not sufficient to meet the intent of NEPA. [Citizens for Environmental Quality v. United States, 731 F.Supp. 970, 989 (D.Colo. 1989); State of California v. Block, 690 F.2d 753 (9th Cir. 1982).]

By including only an action alternative with heavy amounts of logging and a no-action alternative, the Forest Service has arbitrarily precluded consideration of a full range of alternatives (EA 5 - 8). The no action alternative is rarely ever chosen at all. Other alternatives could have been considered that, for example, avoid logging in the North Mountain North Conservation Site and the remote Slaty Mountain area; provide enhanced buffers around trout streams; or avoided karst areas.

Other alternatives should be considered that strongly protect black bears; native species susceptible to invasive species; salamanders;TESLR species; bats; cerulean warblers; NTMBs; cultural resources; riparian areas;; trout; aquatic species; amphibians; old growth; steep or landslide prone slopes, and other issues raised in our comments.

We are particularly concerned about whether any proposed activities take place in MRxA 4D areas, Riparian Areas, or other sensitive management prescription areas, or whether the activities meet the objectives, standards and guidelines of any management prescription areas or the GWNF as a whole.

Caves/Karst
According the DCR, "This project is situated on karst-forming carbonate rock and can be characterized by sinkholes, caves, disappearing streams, and large springs. The Virginia DCR, Division of Natural Heritage karst staff screened this project against the Virginia Speleological Survey (VSS) database, the Virginia Department of Energy (VDE) sinkhole coverage, and other karst layers for documented sensitive karst features.

"All units have intersected the karst bedrock and VDE sinkhole screening layers. Sinkholes mapped by the Virginia Department Energy are within the project site (see Sinkhole layer on the Natural Heritage Data Explorer at vanhde.org). Typically, additional, smaller unmapped sinkholes can also be present in the vicinity. Sinkholes are areas where surface material has collapsed into the subsurface and into underground watercourses. Sinkhole areas are places where surface water directly affects groundwater quality and flow. What goes into sinkholes comes out in wells and springs, and can degrade drinking water, springs and spring-fed surface waters, and the habitat of subterranean creatures." (Dec. 18 '23 comment letter).

. There are caves and karst areas in this county and, likewise, there may be caves and/or limestone areas in the vicinity of the project area.

The possible presence of karst resources necessitates a high level of NEPA analysis and protective measures. For example, in the Hagan Hall project in the Clinch RD, Tom Collins, JNF SO Geologist recommended that the following mitigating measures be considered in one or more of the action Alternatives: "no landings or roads in the karst area, no timber ... harvested in the karst area, [and] no helicopter service area ... in the karst area." due to the sensitivity and rarity of these terrains on FS land (Hagan Hall EA Geol. Ex. Cond.-1, already in your possession, this volume is incorporated by reference in its entirety) Collins says "Karst and karst ecosystems are unusual, involving a complex interaction of surface and subsurface processes." Collins describes how easy it is for surface water, including sediment and contaminants, to enter ground water in karst terrain. Ground surface also has the potential to collapse, creating new sinkholes. (Geol. Ex. Cond.-2-3) The mitigation methods do not avoid all the problems Collins refers to: increased trash at the logging sites, risk of contaminants from helicopters, chainsaws, etc., damage to the subterranean groundwater system, etc. (Geol. Ex. Cond.-5 and throughout) Logging and skidding in these areas, esp. near sinkholes, will have long-term negative impacts to karst. We are concerned that after the project is complete, skid trails and other logging infrastructure will remain a long-term source of sediment and contaminants that cannot be mitigated. And there is the potential for sinkhole expansion and new sinkholes near roads, skid trails, and landings and other disrupted areas. (Geol. Ex. Cond. bottom of p. 2 and top 1/3 of p. 3. Collins defines karst as "a type of topography formed in limestone and dolomite (carbonate bedrock) by the desolving of bedrock, eroding of underground spaces, and collapsing of the ground surface. Karst terrane is characterized by sinkholes, caves and underground drainage. Karst lands are unusual, involving a complex interactionof surface and subsurface process...)" (Geol. Ex. Cond.-2)
-The DNH's 11/13/98 letter regarding the karst area in the Hagan Hall raises other concerns about karst that should be considered in the Dunlap Creek analysis, since there may be karst here as well: "The springs which feed… fisheries-supporting tributaries …should be monitored for visual turbidity and temperature over time by Forest Service staff familiar with the historical range of flow conditions associated with these streams. These streams are most likely connected to the cave environments in some way and should be assessed during pre-planning, harvest and post-harvest stages of this project. …. The integrity of karst groundwater is vital to the viability of the various aquatic habitats discussed in the EA. These springs, as well as well as those on down gradient private lands, could exhibit adverse adverse impacts even though the documented sinkholes are buffered from land disturbing activities." (underlining for emphasis)
And in its 11/18/98 comments on the Little Mtn. project, New Castle RD, another project with a down-gradient

karst/cave environment, the DNH recommended "that the pre-harvest site evaluation include an inventory of sinkholes, springs, and other karst features on both public and private properties below the 2400 ft. contour elevation... [to be] accomplished through aerial photographic analysis and field reconnaisance.... A thorough evaluation of the karst areas on and adjacent to the proposed harvest sites will facilitate the design of effective BMPs and minimize damage to karst and water supplies."
"Caves and springs many miles away can be affected by logging 20 or more miles away and in different watersheds. For example, a timber sale could result in increased water entering a cave and in a major storm event, the increased water could result in a flood large enough to kill (i.e., drown) or harm creatures in the cave. Or it could kill someone exploring the cave. It could also adversely affect or kill creatures living in a cave or a spring by changing the temperature or increasing the sediment. The analysis of effects must also consider groundwater and subsurface water flow." 10/27/98 Heartwood comments on the Hagan Hall project in the Clinch RD, p. 8. These issues should be considered in this particular area as well.

If there are caves in the area, there is a possibility that portions of these caves could underlie the project area, the cutting units, roads, , or downstream areas; there is a possibility that discovered or undiscovered entrances or blowholes may exist in the area, providing access for TESLR species (which could potentially be disturbed by this project).

Other Issues:
- The project could potentially impact numerous rare animals and plants, including salamanders, rare plants, rattlesnakes, coal skinks, Allegheny woodrats, and other species.
- Consider the cumulative impacts all activities/events, including logging, roadbuilding, herbicide spraying, prescribed burns, private lands activities and other activities/events in and adjacent to the project area and adjacent areas.
- We are concerned about how this project could impact various aspects of the ecosystems in this area. How will the project impact forest fragmentation, the introduction and spread of non-native and exotic plants, black bears, forest interior, early successional habitat, grass-forb habitat, mature/old growth forests, MISs, PETS species, locally rare species, species recognized by experts as rare, state-listed species, species with viability concerns, disjunct species, species near or at the edge of the limits of their range, species with special habitat needs (such as freedom from disturbance, uncompacted soil, wildlife corridors and mobility needs, sediment-free water, unpolluted water, area sensitive habitat, forest interior habitat, old growth habitat, and/or mature forest habitat,etc.)?
- We are concerned that this project could adversely affect soil resources and aquatic resources. What effect will the project have on soil productivity and water quality?
- We are concerned that motorized recreation could adversely affect non-motorized recreation, wildlife, and other resources. Develop alternatives that feature/protect the primitive experience of non-motorized hiking trails and that mandate some road closure, obliteration, and revegetation where appropriate in this analysis. What are the impacts of the project on black bears, black bear habitat, other remote habitat species, trout, and other aquatic species? What are the impacts of roads on the quality of the hiking or backcountry experience? How great is hunting pressure in the project area? Near the project? Have any open or closed roads been used for poacher access or illegal ORV access?
- We are concerned about the impacts of this project on hunting, fishing, other recreation and wildlife. What conflicts with hunting, fishing, other recreation and wildlife does logging and roadbuilding create?
- We are concerned about the impacts of this project on fish and fish habitat. What wild trout waters, stocked trout waters, and other fisheries exist in the project area and downstream? What is their present condition? How will they be impacted
- We are concerned that there is a potential for the project to impact perennial streams, intermittent streams, other streams, seeps, springs, and riparian areas of all forms. Virginia BMPs, p. 5, describe the important role of intermittent streams, "which despite not having water in them for parts of the year, can contribute significantly to

water quality." "Sensitive areas such as wetlands, bogs, seeps, and marshes are found in all watersheds and should be treated with care and receive special protection." (BMPs, p. 5) This project should not be undertaken unless it can be demonstrated that the project will maintain or enhance water quality, trout populations, fisheries, aquatic species, riparian areas, bogs, wetlands, seeps, ephemeral streams, intermittent streams and perennial stream in the and project area.
- This project should be in compliance with the antidegradation policies of the commonwealth, the DEQ (above, pp.4-5) and the Clean Water Act. "As a minimum, existing instream use and the level of water quality necessary to protect existing uses shall be maintained and protected." (DEQ, p. 4) Some streams receive a higher level of protection. The FS should ensure that all aspects of this project are consistent with these laws and policies.
- We are concerned about the impact of the project on resources and users that are sensitive to roads, other motorized travelways, and motorized use. How will these resources and users be protected?
- We are concerned that the project may impact the visual/aesthetic values, recreational resources, and/or ecological resources of key areas within and around the project area. Consider the project's and other cumulative activities'/events' impacts on visual/aesthetic sensitivity, recreational resources, and/or ecological resources of key areas of the area and vicinity, including old growth areas, proposed designated old growth areas and other specially designated areas under alternatives considered in the plan revision, proposed or eligible W&S Rivers, lookouts/recreational sites, any areas of any size that meet road density stds. and minimum logging thresholds for roadless areas in the east, and all other recreation areas, fisheries, trails, access roads to trails and trailheads, campgrounds, primitive and dispersed campgrounds, roads used by hunters and recreationists, trail corridors, sites visible along the length of all sites/trails/corridors, archaeological sites, seasonal differences, viewpoints, recreation facilities, airplane-visible areas and airplane-routes, prominent ridges and features, important biological/birding/wildflower/nature-walk areas, areas used by groups/special events (such as backpacking routes for summer camps, club hikes, routes of wildflower pilgrimages, etc.), hiking shelters, (DNH) special biological areas, national recreation trails, streams, proposed recreation sites, and proposed trails, scenic byways and connectors. Consider direct impacts to all of the above. Indirect impacts. Consider impacts to the entire primitive, dispersed and non-motorized recreational experience associated with the above. Consider impacts to remote or rarely-visited areas. Use the SMS regarding aesthetics. Consider sight, sound, and the full range of aesthetic experience. Use up-to-date information and science regarding aesthetics. What values should be protected? What are people's expectations?
- We are concerned that the project may directly or indirectly impact the whole recreational experience as well. Consider the impacts to the recreational experience along or associated with all of the areas and types of areas listed in the above paragraph. Consider indirect impacts. Consider impacts of logging in the proximity of the above sites and campsites, etc. accessed from the above sites. Consider impacts to the entire primitive/dispersed recreational experience associated with the above. Consider impacts to remote or rarely-visited areas. Use the SMS re. aesthetics. Consider sight, sound, and the full range of aesthetic experience. Use up-to-date information and science re. aesthetics. What values should be protected? What are people's expectations? Cumulative impacts should be considered.
- We are concerned that the project may impact soil resources, watersheds, and aquatic resources. How will the project affect steep slopes, erosive soils, soils where soil movement may occur, soils with compaction hazards, soils with puddling hazards, rocky soils, soils with equipment limitations, soils at risk of losing organic material, soils with low levels of organic material, karst and cave areas, and other sensitive soils along the creeks in this project areas and their tributaries? What portion of the rts are on steep slopes? Identify these areas. Do not merely take an average of slope. Will the project affect poorly drained floodplain soils? Soil Productivity? How will this affect soils in the project area?
-How will the project affect watershed quality? Woody debris recruitment?
- We are concerned that the project may impact existing or needed buffer zones around several types of resources in the area. How will the project affect riparian buffer zones? Old growth buffer zones? Potential old growth buffer zones? Riparian forests and other such forests are valuable resources in their own right and deserve their own insulating buffers from disturbance.
- We are concerned that the project may impact various aspects of soil resources, watersheds, and aquatic resources. .How will the project affect watershed quality and woody debris? The organic content of soils? Pit

and mound topography? Large boles on the forest floor? Snags? Nurse logs? How will this affect soils in the project area?
- We are concerned that this project may have cumulative effects in combination with other activities and events. What are the cumulative impacts of this project along with those of ozone, acid rain, hemlock adelgid, paucity of old growth trees and interior forest habitat, poor water quality, effects of roads, slowing tree growth rates and other legitimate forest health problems not thoroughly recognized by the Forest Service to date? How will this affect the project area? Please examine forest health in an ecological manner, in terms of the health of the entire forest, not just individual trees. How will the project contribute to the above forest health problems, including impacts to water quality, increased road densities in the forest, and the spread of exotics?
- We are concerned that the project could adversely effect many important habitat components for wildlife. Examine whether the project could lead to a hiatus in mast production. Den trees. Large above-ground den trees. Bear wallows. Examine how the project will impact mast utilization. Den tree utilization? Early successional habitat and grass-forb utilization? Stream and riparian area utilization? Foraging, feeding, breeding, nesting, denning and shelter? Wildlife corridors? Dispersal and interaction among isolated and connected populations, families, individuals and other groups of wildlife? Other habitat components for black bears, turkey, pileated woodpecker and other wildlife.
- We are concerned that the project could adversely effect many important habitat components for wildlife. How will species' vulnerability to hunting, poaching, and disturbance be affected?
- How would the project affect old growth, potential old growth, and old growth reserves? Would the project affect the size of any old growth tracts, old growth reserves, or buffers (as habitat value)? The project impacts some of these areas directly. Would cutting or trail construction be taking place in or near any old growth tracts? How would the protect affect potential old old growth levels for turkeys? Bear? Salamanders? Songbirds? Ceruleans? Other key species? TESLR species?
-This project may have both direct and indirect effects. Biological and resource surveys should be conducted throughout the entire project area, not just along the immediate trail route or its immediate vicinity.
- We are concerned that the project could adversely effect populations, individuals or habitat of PTESLR species. How will PTESLR (TES, locally rare species, and proposed species, including candidate species), PTESLR species habitat, PTESLR viability and T&E species survival and recovery be affected by the project and all cumulative effect and connected actions? How will MISs, MIS habitat, and MIS viability be affected by the project and all cumulative effect and connected actions? What are the populations of these species? What are the population trends for these species? What are levels of habitat for these species? What are the habitat trends for these species? How has this information been gathered and are monitoring techniques adequate? Over what period of time have trends been measured? Is this adequate? What conservation agreements, recovery plans, and critical habitat designation agreements have been approved and established for TES species? Are the FS and other parties abiding by these? Are all TES species protected here through the establishment of enforceable conservation agreements, recovery plans, and critical habitat designations?
-We are concerned that the project could adversely effect populations and habitat for PTESLR species. How will Indiana bats and other PTESLR bats be affected by this project and other activities? What surveying for habitat or bats, using up-to-date methods, will take place? Has there been any new information regarding Indiana bat occurrences or Indiana bats? Have Indiana bat mortality thresholds, or other thresholds, been exceeded in any areas? Has monitoring regarding Indiana bat thresholds been adequate? How do bats respond to disturbance and how would they be affected?
-How do other rare species respond to disturbance and how would they be affected?
- How would the project affect components of natural forests? Components of natural disturbance? How would the project affect the natural functioning of a forest? How would pit and mound topography, large woody debris on the forest floor, coarse woody debris, nurse logs, snags, components of the food chain and components of decay be affected?
- How would the project affect cove hardwoods, northern hardwoods, boulder fields, seeps, riparian areas, old growth, caves, blowholes and other special or unique habitat? Underrepresented habitat? Special, unique or underrepresented habitat with few nearly mature/mature/old growth stands remaining?
How will state-listed species (VDNH lists of rare animals, rare plants, state-endangered and threatened species,

species listed in Terwilliger, Virginia's Endangered Species and other sources) be affected by this project? How will habitat, foraging sites, and nesting sites be affected? Genetic viability? Competition from other species? Freedom from disturbance? Visibility?
- How will the project bring non-native plants into the area? How have projects affected non-native species in the past? How will the overall project affect populations of non-native plant species? Will it reduce them or increase them? What native plants could be impacted by loss of habitat or competition?
- We are concerned that the project could impact soil resources and soil productivity. Consider how the project would affect soil stability, moisture retention capability, erosion, nutrient leaching rates, roots, soil niches, soil structure, and biological productivity.
- We are concerned that the project could impact soil resources and watersheds. How much of the project area would be compacted as a result of the project?
- - We are concerned that the project could impact soil resources and watersheds. We request that the FS provide maps of the soil type, erodibility, and slope for all sections of the cutting units to allow the public and decisionmakers to better gauge the impacts of the project on particular soil resources.
- We are concerned about the adverse effects of the project that on soils and organisms that utilize particular soil and forest niches. What are the impacts on soil build-up and mycorhyzae of proposed activities? What is the impact on litter detritivores and ground floor invertebrates and micro-organisms?
What are the impacts higher up the food chain?
- We are concerned that the project could adversely effect water quality. What effect will the project have on coarse particulate organic matter, fine particulate matter, algal abundance, temperature extremes, turbidity, nutrient input into streams, amount of suspended solids, stability of substrate and banks, uniformity of water depth, flow extremes, diversity of microhabitat velocities, abundance of shredders vs. scrapers, and abundance of omnivores vs. piscivores? How will the project affect all sediment-sensitive aquatic species?
- We are concerned that the project could adversely effect water quality, watersheds, and riparian areas. What wetland and riparian buffers are provided? Would adequate buffers be provided sufficient to protect riparian dependent resources? Include maps with adequate detail and scale of all riparian areas/wetlands, riparian areas/wetlands types, and proximity to cutting units and associated infrastructure.
-How do the proposals for this project provide for that which cannot be provided for on private land? (i.e. high quality non-motorized trails and viewsheds, extensive wildlands, PETSLR habitat, bear habitat, high quality watersheds, old growth habitat, unfragmented habitat)?
- The activities proposed may affect biological diversity on a number of levels. These activities and other activities throughout the GWJNFs may also affect biological diversity on a number of levels. Consider biodiversity on all levels - genetic, population, species, community, ecosystem, and landscape levels.
- We are concerned that the project (and roads and infrastructure associated with it) may lead to other problems. Disclose how the project will affect potential poaching access, illegal road use, litter problems, and noise.
- We are concerned that this project may affect archaeological and cultural sites of significance to society as a whole, or to persons with special ties to this area. We are concerned that the area where this project is planned has a large number of large boulders, rock outcrops, and potential rock shelter sites. We are concerned that given the long history of Native American, European and African-American settlement in this area, a number of historical sites could be impacted. Adequately monitor, inventory and protect all historic and prehistoric archaeological/cultural sites. Respect and protect all native American archaeological/cultural/religious sites and all native American and non-native- American cemeteries/graves.
- We are concerned about the impacts of existing and proposed roads and skid trails on a number a resources. Include a listing of all system and non-system roads in the project area, information on ROWs, lease, and permit terms, frequency of use, litter, noise, and wildlife disturbance problems, and no. of mi. these roads contribute to road densities. Are road densities within plan limits in this analysis area? Do any roads warrant closure due to impacts, plan requirements, user conflicts or other considerations? Consider all of these issues in the transportation analysis for this NEPA document and roads analysis for this area. Conduct a roads analysis, and allow public comment, in order to determine whether any roads should be considered for decommissioning due to environmental impacts, fiscal costs of maintenance or other factors.
- We are concerned about the impact of the project on wildlife. Would the proposed activities displace any

wildlife? What types of wildlife? How so? How would wildlife be affected?
-All Va. BMPs should be met or exceeded throughout the planning, project implementation and project use stages. The FS should adequately monitor BMPs. We are concerned that, without specific and rigorous mitigation measures incorporated into this NEPA mitigation measures will not be conducted or they may not accurately reduce impacts to resources or avert declines/degradation of these resources as part of this project and in future projects. All Va. BMPs should be met or exceeded throughout the planning, project implementation and post-sale stages. The FS should adequately monitor BMPs. All BMPs should be specifically examined by the FS and followed throughout the process. Past FS activities in the project area should be examined to see if they complied with BMPs. If not, these problems should be corrected and a decision should be made as to whether to proceed with planning with this TS. Pre-sale planning and layout BMPs, adequate, repeated monitoring, and all post-sale BMPs should be followed. Specific BMPs regarding road grades, road construction, stream crossings, road placement, cold water stream buffers, rehabilitation of bare areas, and identification and avoidance of riparian areas, seeps and intermittent streams should be carefully followed.
-- We are concerned that, without specific and rigorous monitoring requirements and mitigation measures incorporated into this NEPA document, adequate monitoring and mitigation measures will not be conducted or they may not accurately gauge impacts to resources or avert declines/degradation of these resources as part of this project and in future projects. Adequately monitor, inventory and protect all biological, watershed, recreational and geological resources/values.
- We are concerned about impacts on natural areas in the project area and vicinity. According to Division of Natural Heritage reports to the FS, what special biological areas are recommended for special interest area and/or research natural area designation? What other important areas or important species/resources are identified in the project area? How will portions of the project in or around these areas affect the areas or the species/resources associated with these areas? What other natural areas could exist in the area (including natural areas containing habitat for species or representations of species/biological communities similar to those in other SBAs in the James Rivers RD and elsewhere)
- We are concerned about the impact of the project on non-motorized recreation. We are concerned about the impacts of the project on existing recreational uses. How will the project affect recreational sites? Trails near these sites? How will views be affected? Will people be more or less encouraged to go for a hike, hunt, fish, experience or learn about nature? Will people get an artificial view of how nature works?
- We are concerned about the impacts of this project on soil resources and various soil components and the species that utilize them. What changes in moisture and microclimate would occur in the soil in the top/middle/lower zones? How would the organic content of soils be affected? Plants, including herbaceous understory plants? Burrowing animals?
- We are concerned about how the project might affect deep forest raptors and owls.

Thank you for the opportunity to comment.

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Sincerely yours,

Sherman Bamford
Forests Issues Chair
Virginia Chapter Sierra Club