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*If you have any questions about this letter

These comments are also submitted on behalf of Stephen Krichbaum, PhD

Sep. 16, 2019

ATTN: North Shenandoah Mountain Draft EA
Mary Yonce, District Ranger
Kevin Kyle
North River RD-GWJNFs-FS-USDA
401 Oakwood Dr.
Harrisonburg, Va. 22801

Ranger Yonce and Mr. Kyle:

The following are comments submitted on behalf of the Virginia Chapter of Sierra Club regarding the North Shenandoah Mountain Draft EA.

This set of comments includes some larger issues we hope will be taken into consideration in planning the project. We are supportive of the collaborative nature of the project and look forward to positive results from this kind of process, incorporating many diverse stakeholders.

Given the collaborative nature of this project, the District should commit in the Decision Notice to continuing this collaboration throughout implementation, as the Warm Springs District did with Lower Cowpasture project. This should include commitments to notifying project participants when any of the North Shenandoah projects are scheduled for implementation, when cutting units are open, and when logging operations are planned. The District should also commit to hosting and inviting project participants to fieldtrips to discuss sale preparation activities such as unit layout, marking, stream management cones, the location of temporary roads and skid trails. These should occur before the sale is advertised for bids. Post-sale field trips should also occur. We will stay involved throughout implementation.

No Biological Evaluation, Roads Analysis, Old Growth Surveys, Watershed Assessments, Monitoring Records for SBAs and VA DNH identified areas for this Project

These have not been prepared. The NEPA analysis and Roads analysis for this project is therefore incomplete. In our November 6, 2017 letter to you, we requested copies of the biological evaluation, economic analysis, roads analysis, old growth surveys, monitoring records for special biological and Natural Heritage-identified areas in the area, and watershed assessments for priority watersheds in the area, as soon as they come available. We have not received these and did not find them on the project analysis webpage for this project on the George Washington and Jefferson National Forests website. Therefore we assume that if they had been prepared, they would have been sent to us pursuant to our request, or otherwise, no such documents exist. A new draft EA (DEA) informed by these documents should be prepared and the public should be allowed a comment period on the EA, once it is prepared.

In addition, we have learned the Southern Environmental Law Center (SELC) also requested the BE/BA and did not receive a copy (we signed onto SELC's 2017 scoping comments).

In addition, according to SELC, the Virginia Division of Natural Heritage seems not to have not received notice of the project as of Sep. 11, '19 and was unaware of the project. Given the fact that the official comment

period for the Draft EA began on August 15, '19 and given the fact that this project has been underway since 2017 or before, we are highly concerned.

Roads impacts; project should be informed by a roads analysis

We are pleased that this project would include 13.5 miles of road decommissioning and includes the decommissioning of Root Run road. However, the amount of roads to be decommissioned is merely a drop in the bucket compared to the extensive road system the Forest Service plans to build or reconstruct. According to the DEA, 19.1 miles of roads would be reconstructed, 2.5 miles of new permanent roads would be constructed, 15 miles of new “temporary” roads would be constructed, and we are concerned that additional bulldozed fire lines could accompany this project – well over 2 ½ times the road decommissioning mileage.

We object to the term “temporary” roads, as this term often does not reflect the on-the-ground nature of such roads. There is no mandated sunset for closure accompanied by restoration of temporary roads. Temporary roads often adversely impact soils, watershed, aquatic species, recreation, increased access (impacting wildlife) for decades. The FS should disclose the timetable for closure accompanied by restoration of all so-called temporary roads. The FS should disclose the impacts of soils, watershed, aquatic species, recreation, increased access (impacting wildlife) and other environmental impacts from temporary roads, road reconstruction and bulldozed firelines.

A number of roads in this area have been identified as roads that should potentially be closed due to environmental impacts, costs of upkeep, and other factors.

(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).

- 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.

Caves/Karst

Please thoroughly explore whether this project could impact any cave or karst areas. How will these resources be impacted by the project? 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 DEA states that there are not “any sinkholes, limestone caves or other karst features in proposed timber harvest units (502 and 505) or in any area of the proposed action.” (p. 70 and Geology Rpt).

The Shenandoah Valley and surrounding areas in western Virginia in the vicinity of the project area are underlain with karst geology. Karst topography is a landscape formed from the dissolution of soluble rocks such as limestone, dolomite, and gypsum. It is characterized by underground drainage systems with sinkholes, dolines, and caves. Dissolution of the carbonate bedrock leads to the development of karst features and subsurface karst aquifers. Karst aquifers are characterized as having complex flow pathways that can transmit groundwater at significantly higher flow rates than that of typical clastic or crystalline aquifers. As a result of their typically high hydraulic conductivities, karst aquifers have the ability to rapidly transmit contamination through the aquifer. According to the Virginia Department of Conservation and Recreation (VDCR), the most important current and future environmental issue with respect to karst is the sensitivity of karst aquifers to groundwater contamination, since water can travel rapidly through solution conduits with relatively little time for natural filtering (VDCR 2015).

One of the more interesting features of karst topography is undoubtedly the limestone cave formations associated with large groundwater flows in Karst terrains. Caves are elongate cavities in limestone produced by solution and aided by mechanical erosion. They form along paths of greatest groundwater solution, usually along joint planes as water circulates through the fractures. Cave entrances and terminations can be found in the bottom of dolines, on hillsides, in quarries, at various other exposed locations. Cave passages can be determined in one of three ways, Linear, Angulate, and Sinuous. Linear is a straight linear passage with no change in ground level. Angulate is a passage consisting of sharp almost 90 degree changes in cave path, both up and down. Sinuous is a curved path of very smooth changes in height. The cave pattern depends directly on the mode of groundwater recharge in the area.

Because the land beneath karst topography is very unstable, it has a tendency to become too fragile to support the surface, and will collapse, creating a sink hole.

All cave systems in the area should be identified and analyzed. The Forest Service should consult – Henry H. Dougl, *Caves of Virginia*, Virginia Region of the National Speleological Society, 1964; John R Holsinger, *Description of Virginia Caves*, Virginia Division of Minerals 1975. Undoubtedly other cave systems and karst areas have been discovered since the publication of these books so the FS should consult other more up-to-date sources.

Impacts of roads and other infrastructure on karst, caves, sinkholes, the more pollution- and sediment-sensitive watersheds of karst, and wildlife and aquatic species associated with karst, caves and sinkholes.

Black bear is an MIS here and throughout the GWNF (GWNF Plan MIS List). Black bears were seen or detected in the project area (DEA 108). Yet, there is little, if any analysis of impacts to the black bear (DEA 115). 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).

- 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 JNF 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. There is an extensive road network in this area (see SN and GWNF maps). 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 Bear hunters (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.

Invasive Species

Invasive species have been identified in the project area. The DEA states that invasive spp. infestation is one of the greatest threats to cove forests, oak forests and other forests in the project area. “The presence and threat of non-native invasive plants has increased over time, particularly in areas where the forest canopy has opened. (DEA p. 14). Yet the purpose of this project is to create thousands of acres of such habitat (See photo on the cover of the DEA (desired conditions in the project area), with the natural forest conditions depicted on DEA p.8 (undesired conditions). The purpose and need for this project need to be question, as promoting this type of habitat continues us on the treadmill of creating more vectors for invasive species.

The FS should analyze the potential for this logging project to open up habitat and create conditions for the introduction and spread of invasive species.

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 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))

"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 FS is required to comply with presidential 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 invasive 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 the 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.

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 FS should have also disclosed 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.

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 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 § 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 § 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 invasive 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 the 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.

Salamanders

We are pleased that the FS has dropped some activities in Cow Knob salamander habitat (DEA 57) and upon discovery of new populations, will treat habitat in these areas as if they were MA 8E7 (DEA 94).

Several salamander species have been seen or detected (DEA 108). Yet it is unclear how thoroughly the FS surveyed for Cow Knob salamanders and other salamanders, whether salamanders could be directly or indirectly harmed by the project, or what steps the FS will take to protect salamanders, and the effectiveness of these measures, since we have seen no BE/BA for the project.

The Forest Service should sufficiently examine and consider the potential impacts upon salamanders. 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 or tiger salamander habitat, then the MIS (viz., black bears, pileated woodpeckers) and other birds listed in the GWNF Plan 2-9 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 insure 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).

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", Petranks et al, 1993, *Conserv. Biol.* 7:363-370; "Effects of Timber Harvesting on Low Elevation Populations of Southern Appalachian Salamanders", Petranks 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 clear-cut 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 clear-cut 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 clear-cuts.

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.

"Movements were about 1 m and were similar to other species of terrestrial plethodontid salamanders [citations omitted]... The limited movements have implications in the potential fragmentation of *P. hubrichti* populations. Timbering operations that occur in the [Peaks of Otter] salamander's range may not only eliminate animals from the cut areas (Pough et al. 1987, Ash, 1988), but might also create barriers between populations. Recolonization after forest recovery, and the reestablishment of contact between separated populations, might be a slow process due to the limited movements of this salamander. In addition, the Blue Ridge Parkway, logging roads, and other alterations to the forest may produce impassible barriers, thus causing fragmentation of the population (J. Mitchell, pers. Comm.) Effectively salamander populations may become fragmented and genetically isolated. Loss of genetic variability associated with genetic drift could then occur thereby decreasing the long-term probability of survival for this species (Soule, 1983). For this reason, forestry management

practices should include prevention of further fragmentation of the already isolated populations of *P. hubrichti*" (Kramer et al., Jour of Herp. Vol. 27, No. 4, pp. 431-435, 1993).

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.

TESLR Species

TESLR species may occur in the vicinity of the project area or in the project area. See, eg, occurrence records for these sub watersheds and this county at "<http://www.dcr.state.va.us/dnh/>" 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.

It is unclear how thoroughly the FS surveyed for TESLR species, whether TESLR species could be directly or indirectly harmed by the project, or what steps the FS will take to TESLR species, and the effectiveness of these measures, since we have seen no BE/BA for the project.

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.

- 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. The DEA states that "any identified [cultural] resources will be avoided" (DEA 70).

However, the FS does not disclose how far cultural/archaeological resources are from the extensive road/fire line system for this project or from cutting units, and does not analyze whether the increased access will heighten the likelihood that existing cultural resources will be discovered and harmed. 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 have been 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.

Cerulean Warblers and other NTMBs

Several neotropical migratory songbirds and TESLR birds are documented in or have the potential to occur in the project area (DEA 98). Analysis of impacts to NTMBs and other TESLR birds is lacking or wholly inadequate (DEA 106).

It is unclear how thoroughly the FS surveyed for neotropical migratory songbirds and TESLR birds, whether these species could be directly or indirectly harmed by the project, or what steps the FS will take to these species, and the effectiveness of these measures, since we have seen no BE/BA for the project.

There is a potential for the cerulean warbler to be found in the PA and vicinity. 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 than 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 do 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 experts be 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.

Riparian Areas

According to the FS, "Many existing roads are within riparian corridors; some have been poorly maintained and are causing resource damage, including sediment delivery, erosion, and aquatic organism passage barriers." (DEA 17). Since this road system is already creating adverse impacts, we do not understand how building and reconstructing more miles of roads, well over the miles of roads to be decommissioned, would restore or protect the riparian areas of the project area. (Cumulative impacts should also be considered.)

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 are delineated. 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 GWNF Plan requires the FS to delineate riparian areas (RxA 18 areas) based on on-the-ground conditions, but this has not been done (GWNF Plan 3-92). RxA 18 areas have not been disclosed to the public or decisionmaker in maps or by any other means. Proper disclosure has not occurred; the FS cannot assure the public and decisionmaker that the Plan is being properly implemented.

Vehicular use would not necessarily be avoided in delineated riparian areas and they can be adversely affected. And road construction, reconstruction, or re-opening may occur in riparian areas. The precise location of all the project area riparian areas in relation to cutting units and road sites is not disclosed. The FS does not explain why the full riparian areas are not being fully protected. The FS does not properly or accurately disclose foreseeable impacts. 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 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, *Virginia's Endangered Species* (1991)) Given the presence of this very rare, sediment-sensitive species, the FS should have considered additional riparian zone/streamside zone protection. . Roughhead shiner habitat could even potentially exist in the streams within the project area. It is entirely appropriate for the FS to implement such protection here.. And as stated in Chamberlain, et al. 1991 (in the FS's possession, as this paper was referenced in the JNF Plan Revision/DEIS): "Increases in soil water content and groundwater levels can indirectly affect fish habitat... On logged hill slopes, moist soil is vulnerable to mass movements (O'Loughlin 1972; Swanston 1974)""The frequency of mass erosion events in forested watersheds is strongly linked to the type and intensity of land treatment in the basin (Rood 1984). Although most mass movements are associated

with roads and their drainage systems, many originate on open slopes after logging has raised soil water tables and decreased root strength(O'Laughlin, 1972)"

TESLR Bats

The Indiana bat, northern long-eared bat, eastern small footed bat, tri colored bat and other TESLR bats may be directly or indirectly impacted by this project. Because ESA protected species' "may be present" the letter and intent of the ESA must be followed. See *Thomas v. Peterson* (1985) and 16 USC 1536(c)(1).

It is unclear how thoroughly the FS surveyed for TESLR bats, whether these species could be directly or indirectly harmed by the project, or what steps the FS will take to these species, and the effectiveness of these measures, since we have seen no BE/BA for the project.

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 close by 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 TESLR 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 BE and Plan amendment). "If . . . active roost trees are identified" there will be a 1/4 mile or two mile buffer established around the tree. (BE, 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 species' 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).

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 Revision pp. 19&20) but there is no record if surveys have been conducted in and around the

GWNF 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 *Babbitt 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 cannot 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, but are not limited to, the Dice Run, Open Trail, Johnson Mtn., Shady Mtn., Enterprise, Sugar Tree, Lip Trap, Hiner Hollow, Jehu Hollow, Apron, CMB, Bark Camp, Hagan Hall, Chestnut Ridge #2, Sandtrap, Nutters Mtn., Panhandle, Barn Hollow, Rogers Road, Peter's Ridge, Peters Mtn., Taylor Branch, Broad Run, Bear Trap, Hoover Creek, Canbe, Enterprise, Johnson Mtn., Uneven Steven, Open Trail, Slate, and Mulligan TSs on 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 I Bat 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 cannot 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 close by (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 (1990’s) 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 close by 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.

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; Tuttle 1964; 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 outcrops The 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/or only 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.

Plan

The FS should demonstrate how the project is consistent with the GWNF Plan. The FS should analyze how [What surveys have been completed for these attributes and what do they show?]:

How will riparian areas, springs and seeps be affected by the project?

How will snags and den trees be retained?

How is it demonstrated that utilized veg mgmt. contrast reducing treatments will achieve visual quality goals in this particular area?

Has the FS identified areas with high potential for disturbance? Areas with high potential for significant historic and prehistoric sites in this area? How will these areas be affected?

How will sites on the National Register of Historic Places (or eligible areas) be affected?

Will any aspect of the project increase the likelihood of vandalism or destruction of cultural sites due to greater access, greater visitor use, or greater visibility?

Is the project consistent with the preservation/maintenance plan for historic administrative and recreational facilities if any exist nearby? Is there a plan in effect for such sites?

How will non-motorized trails be closed to authorized or unauthorized use?

Will any trails or trail corridors (or vicinity) be used by motor vehicles? How will this affect user experiences? How will this affect remote trails that attract more experienced hikers and users, those attracting those who desire a remoter experience? How will the trail system in the area provide or not provide for a variety of trail users and experience levels?

How will management activities be implemented with sensitivity to users? What mitigation measures are proposed and how is their effectiveness demonstrated?

How will the FS keep roads from being vegetated by invasive vegetation?

Are roads being constructed to the lowest standard appropriate for this area?

Have order II soil surveys been completed for this area (and every area of the Forest) by 2003, as required?

Do any eroding lands exist in the project area and how will they be inventoried, improved, and maintained?

How will wetlands be identified and protected?

How will the organic layer, topsoil, and root mat be impacted?

Remote Areas

The FS states that inventoried roadless areas are: “not present or directly or indirectly impacted by the alternatives and not further analyzed or whose analysis was out of the scope appropriate for this project” (DEA 70). The FS does not make clear which applies (not present or directly or indirectly impacted) or (out of scope).

The issue related to Virginia mountain treasure areas and remote habitats was identified in DEA p. 135.

Since this is a large-scale project, approaching a landscape-wide scope, the Forest Service should recognize the uniqueness and rarity of the Shenandoah Mountain Complex and ensure that large blocks of remote habitat and linkages between remote habitat blocks are protected.

As stated in “Virginia Mountain Treasures: The Unprotected Wildlands of the George Washington National Forest,” The Wilderness Society et al.:

“The Shenandoah Mountain Complex is one of the most significant concentrations of wildlands in the Southern Appalachians. ...[I]t holds eight inventoried roadless areas...There are an additional ten uninventoried areas that meet or exceed roadless rule requirements.

“The concentration of unroaded and undeveloped lands on approximately 400,000 acres of the George Washington National Forest constitutes a core of native forestland with resources for native species habitat, recreation, hunting, fishing and clean water.

“The most prominent feature of the area is the mountain massif known as Shenandoah Mountain. This mountain runs sixty miles from the southwest to the northeast within the Ridge and Valley ecoregion.

“This area contains some of the highest elevations in the state. Shenandoah Mountain is over 4000 feet for much of its length.

“This high concentration of roadless areas and high elevations contributes to the region’s significant biodiversity. The area is important for Neotropical song birds, Black Bear, and other species that need unfragmented habitat.

“The relatively undisturbed landscape also provides spectacular scenery, over 170 miles of trails, and excellent hunting and fishing.

“Finally, there is a probably a higher concentration of old growth on Shenandoah Mountain than any other portion of the George Washington/Jefferson National Forest.” (p. 30).

The Northern Shenandoah Mountain Cluster within the Shenandoah Mountain Complex contains “seven [Mountain Treasure] areas of over 58,000 acres....These headwaters of the North Fork of Shenandoah and South Fork South Branch of Potomac Rivers are all part of the Ridge and Valley physiographic province.” (p. 31).

Unroaded Mountain Treasure Areas within the Northern Shenandoah Mountain Cluster include, 17,152 acre Beech Lick Knob area, spanning from the Blue Hole area of German River to the Forest Service boundary south of Stony Run. (p.32); 5,335 acre Little Cow Knob, the area east of Camp Run and Rt. 152 (p. 33); 9,299 acre Hogpen Mountain area, the area southeast of Gauley Ridge Rd. and east of Rt. 240 (p. 34), and 6,677 acre Kretchie Mountain area, the area east of Rt. 72, south of Rt. 87, and west of the powerline near Rt. 240 (p.35).

Yet the FS does not examine the direct or indirect impacts to any Virginia mountain treasure areas and remote areas except Beech Lick Knob (pp. 135 et seq). The discussion omits Little Cow Knob, Hogpen Mountain, Kretchie Mountain and other areas. And despite the fact that this is a large-scale project that lends itself to landscape wide analysis and larger issues, the FS does not examine the cumulative landscape-scale effects including impacts to the defacto regional network of interconnected reserves and appropriate linkages that exist in the area.

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.

Impacts of species vulnerable to climate change should be examined.

- 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 eligibility.

-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, Sunderland, 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 Fragmentation 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 projects 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 JNF. NEPA demands such. See e.g., *City of Tenakee Springs v. Clough*, 915 F. 2d 1308, 1312-1313 (9th Cir. 1990) (finding Forest Services 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 must 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.

For example, logging these adjacent or marginal places will degrade the roadless/unroaded area's special ecological, recreational, and scenic values; the roadless area will in effect be diminished in size as visitors will have to retreat further and further into the interior in order to escape "sights and sounds of civilization". This and other relevant impacts are not assessed by the planners. The cumulative effects of these actions are important and relevant.

NEPA requires that the Forest Service consider the best available scientific and technical information in making its decisions. See, e.g., *Warm Springs Dam Task Force v. Gribble*, 621 F. 2d 1017, 1023 (9th Cir. 1980). The scientific literature on biological diversity makes it clear that logging project assessments should consider, among other things, size distribution and connectivity for various types of habitat patches, amount and distribution of important types of such patches (such as roadless areas) which have been reduced by prior human activity, disturbed and historic vegetative mosaic patterns across the forest, cumulative effects of past activity from a watershed or regional ecosystem level, and edge effects of further forest fragmentation. See, e.g., Noss, R.F. 1990. Indicators for Monitoring Biodiversity: A Hierarchical Approach. *Conservation Biology* 4(4): 355-364.

The best science states that a major focus of analyses such as this should be to find ways to connect and buffer roadless areas with other undeveloped land to assure species viability and ecosystem functioning is perpetuated. In short, take a "hard look" at the cumulative impacts of allowing logging and road building in unroaded areas and in roaded areas providing corridors or linkages between core roadless areas. See *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976); *Save the Yaak*, supra, 840 F. 2d at 718-719. State-of-the-art conservation biology and the principles that underlie the agency's own new policy of "ecosystem management" dictate an increasing focus on the landscape-scale concept and design of large biological reserves accompanied by buffer zones and habitat connectors as the most effective (and perhaps only) way to preserve wildlife diversity and viability. See, e.g., Noss, R.F. 1993. The Wildlands Project Land Conservation Strategy. *Wild Earth Journal*, Special Issue: 10-26; Baker, W.L. 1992. The Landscape Ecology of Large Disturbances in the Design and Management of Nature Reserves. *Landscape Ecology* 7(3): 181-194; Graham, R.W. 1988. The Role of Climatic Change in Design of Biological Reserves:

The Paleocological Perspective from Conservation Biology. *Conservation Biology* 2(4): 391-394; Noss, R. 1995. Maintaining Ecological Integrity in Representative Reserve Networks. World Wildlife Fund, Washington, DC. 77 pp..

Over 95% of the 37 million acre southern Appalachian region is roaded (SAA, 1996). Only 12% of the total area is national forest land, so there are fewer opportunities to protect roadless habitat across the landscape here than in the west. While there are 103.6 million acres in the wilderness system only 4.5% is east of the Mississippi, and there is only 428,545 acres of wilderness in the southern Appalachians. (SAFC, "SAA Highlights" and SAA). All existing roadless areas should be protected to the highest levels possible.

Forest Service projections for the southern region estimated that 1.4 million acres of wilderness would be needed to meet recreational demands and "carrying capacity" of wilderness. (Morton, 1994.

The Living Landscape, The Wilderness Society). A 1993 FS study estimates that backpacking in the south will increase 238% by the year 2040. (SAFC, "SAA Highlights" and SAA)

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.

Trout Streams, Trout, Aquatic Species and Amphibian Species

The FS states: "the current conditions with impaired water quality parameters and watershed condition classes listed as functioning-at-risk do not meet the desired conditions as described by the Forest Plan. These conditions have further negative implications for other species such as brook trout that utilize these systems. " (DEA 21)

The Virginia Department of Game and Inland Fisheries classify wild trout streams as follows:

"Wild natural trout streams.

"Class ii. Stream contains a good wild trout population or the potential for one but is lacking in aesthetic quality, productivity, and/or in some structural characteristic. Stream maintains good water quality and temperature, maintains at least a fair summer flow, and adjacent land is not extensively developed. Stream would be considered a good wild trout stream and would represent a major portion of Virginia's wild trout waters.

"Class iii. Stream which contains a fair population of wild trout with carrying capacity depressed by natural factors or more commonly man-related land use practices. Land use activities may result in heavy siltation of the stream, destruction of banks and fish cover, water quality degradation, increased water temperature, etc. Most streams would be considered to be in the active state of degradation or recovery from degradation. Alteration in land use practices would generally improve carrying capacity of the stream." (9 VAC 25.60 Virginia Water Quality Stds)

There are several class ii-v trout streams in the project area. For example, Camp Rader run is a class ii stream, German River is a class iv stream, Carr Run is a class iv stream, Gate Run is a class iv stream, Bible Run is a class iii stream, Long Run is a class iv stream, Slate Lick is a class iv stream, and Rocky Run is a class iii stream.

There are a high number of high quality trout streams in the project area. 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.

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 GWNF 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).

"Habitat objectives for this management indicator species [brook trout] include water temperature below a maximum temperature of 69 degrees Fahrenheit, dissolved oxygen values greater than 7.0 parts per million, and sedimentation rates that are in equilibrium with the watershed and stabilize or improve the biological condition of the stream. Optimal habitat would also include greater than 200 pieces of large woody debris per stream mile." (DEA 111).

Although the DEA proposes a very high level of logging (at least 3,878 acres of logging, 2,777 ac w/no fire and 1,101 ac w/fire) and a very high level of roadbuilding, road reconstruction and fireline construction (see above) across the landscape – 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.

Wood Turtles

According to the FS, “The two primary species associated with the project area that depend on aquatic habitat include the wood turtle and wild brook trout.” (DEA 18).

Wood turtles occur in and around the waterways of this project area. The Wood Turtle, listed as a Threatened species in Virginia, is known from this project area. The Wood Turtle was once found as far south as Georgia and Tennessee. Now Pendleton and the adjacent Rockingham county of Virginia is the southernmost extent of its global range. The Shoemaker River section of the project area and vicinity is the southernmost portion of the wood turtle’s global range. Wood turtles may also be found in the German River watershed and other portions of the project area. It is only found in five to seven counties in the entire USFS Southern Region, so its viability is an obvious concern.

It is also on the GWNF list of Locally Rare species. As a Threatened, Sensitive, and/or Locally Rare species the agency has special obligations to the Turtles as regards protecting their habitat, distribution, and viability.

Regardless of the Turtles’ management category, the agency is responsible for ensuring the viability of all native vertebrates on the planning area. By not properly considering this species, a decision here would be in violation of the NFMA.

The GWNF is increasingly crucial as a refugium for the Turtle. "Rapid residential and commercial development in northern Virginia is destroying much of the available habitat of the wood turtle. Recent development in Fairfax and Loudoun counties threatens the existence of 33 percent of the reported localities in Virginia, and three additional unreported populations in Fairfax and Arlington counties have disappeared since 1979 because of habitat destruction. . . . As the human population of northern Virginia continues to spread westward, colonies of the wood turtle in the Shenandoah Valley may be threatened or eliminated." (Ernst, C.H. and J.F. McBreen, 1991, pp. 456-57 in Terwilliger (coord.), Virginia's Endangered Species , McDonald and Woodward Publishing Co., Blacksburg, VA)

The project area, including proposed cutting sites, contain suitable habitat for this species. According to experts Ernst and McBreen, Wood Turtles are "found in and near clear brooks and streams in deciduous woodlands in Virginia. . . . All known colonies should be protected." (p. 456-7 of "Virginia's Endangered Species")

They habitually use terrestrial habitat and are certainly not confined to streams or “riparian areas” (see, e.g., "Reptiles of Virginia" by Joseph Mitchell; also, "it frequently wanders far afield through woods" in Conant's "Field Guide to Reptiles and Amphibians"). Experts make clear that in “in the range where conifer stands or alder thickets are absent, such as in . . . northern Virginia, deciduous woods are heavily used.” (Ernst, C.H., and J.E. Lovich and R.W. Barbour, 1995, *Turtles of the United States and Canada*, Smithsonian Institution Press, Washington, D.C.)

This species is known to typically wander for hundreds of meters in its terrestrial habitat. Turtles would have no problem negotiating their way into the project area in their upstream and/or downstream meanderings within the watershed. The project area would be easily accessible for their seasonal dispersal and wanderings.

Implementation of the proposed project may foreseeably harm their habitat, populations, viability and distribution. Thorough surveys, population inventories, and viability analyses for this species need to be accomplished by competent personnel to reasonably establish the effects of these proposals. The status of the Turtles at this specific site must be definitely established by the agency before moving forward with this project.

Project implementation may result in increased recreational visitor access. The detrimental effects of human recreation upon Wood Turtles are well documented. See Garber, S.D. and J. Bugar, 1995, “A 20-yr study documenting the relationship between turtle decline and human recreation”, *Ecological Applications* 5(4): 1151-

1162. This study clearly shows that Wood Turtle populations may suffer from increasing recreational use (e.g., hiking and fishing); the two discrete study populations declined by 100% in ten years. The “improvements” resulting from implementation of this proposal could clearly result in increased recreational use and impacts (e.g., collection, general disturbance, road mortality) here and upon Wood Turtles that may live here. The planners must fully and fairly consider this significant affect.

Wood Turtles do not confine themselves to waterways or narrow “riparian” zones. Studies clearly show that they commonly range “over 500 m[eters] from the streams” (Foscarini, D.A. and R.J. Brooks, 1997, “A Proposal to Standardize Data Collection and Implications for Management of the Wood Turtle, *Clemmys insculpta*, and other Freshwater Turtles in Ontario, Canada”, pp. 203-209 in J. Van Abbema(ed.), Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles – An International Conference, New York Turtle and Tortoise Society, New York) and up to 600 meters (Kaufmann, J.H., 1992, “Habitat use by wood turtles in central Pennsylvania”, *Journal of Herpetology* 26(3):315-321). Sites proposed for cutting here are well within the movement distance from streams that the Turtles are documented to use.

Its home range has been estimated at approximately 90,000 square meters (Strang, C.A. 1983. "Spatial and Temporal Activity Patterns in Two Terrestrial Turtles." *Journal of Herpetology*. Vol. 17(1): 43-47). "Home ranges of 0.4- 2.4 hectares have been estimated for northern populations" (Mitchell, J.C., 1994, The Reptiles of Virginia, Smithsonian Institution Press, Washington D.C.).

Proposed cutting sites within the 600 meter zone from streams in the project area include forested habitat suitable for use by the Turtles. “Several proposed units in the project area are adjacent to streams known to support wood turtles.” (DEA 105). Also, a review of project maps shows that the FS is proposing logging precisely too close to streams. This upland habitat is particularly suitable as it is in close juxtaposition with the stream channels; i.e., “Optimal: Areas are contiguous, with few to no roads between them” (Whitlock, A.J and J.S. Larson, 1997, “Development of Predictive Models for Wetland-Dependent Turtles in New England”, pp. 247-251 in J. Van Abbema (ed.), Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles – An International Conference, New York Turtle and Tortoise Society, New York). The Wood Turtles trailed by Strang (1983) in south-central Pennsylvania were in oak and oak-pine forest, with a preference for lower elevations near the creek. This is the type of forest found here. And that study area is part of the Ridge and Valley Section "ecological unit" just as is the project area of this proposed timber sale.

These turtles’ occupation of habitat varies depending on seasonal, diurnal, and weather-related factors. They spend most of their time in the water when temperatures are low (late October through March). Terrestrial activity increases with ambient temperatures. "In Virginia the terrestrial phase occurs from April through November" (Mitchell *op cit*).

Wood Turtles show a tendency to burrow under vegetation during periods spent on land (Kaufmann *id.*). This cryptic behavior has clear implications for this management proposal. Presence of the Turtles could easily be overlooked during walk-through “surveys” unless they were actively searched for. Plus, this species is small and cryptically-colored. Systematic, rather than casual, surveys are far superior for confirming the presence of Wood Turtles; see R.R. Beuch *et al*, 1997, “Identification of Wood Turtle Nesting Areas for Protection and Management”, pp. 383-391 in J. Van Abbema (ed.), Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles – An International Conference, New York Turtle and Tortoise Society, New York. And "[t]he chance of finding wood turtles is increased when surveys are conducted during the spring nesting season" (*id.*).

In addition, the Turtles are not highly mobile animals like deer or birds. They are very vulnerable to on-site disturbance such as road building or logging operations. It is not just the loss and degradation of habitat that would result from implementation of the proposed logging that threatens the Turtles should they be here. Direct mortality from being crushed by heavy equipment or felled trees is a reasonable expectation should Turtles be present since they cannot run or fly away and would probably not be seen by loggers (even if these persons wanted to avoid killing them). Thresholds for population viability could easily be exceeded.

“Because of the longevity, delayed maturation, and high juvenile and egg mortality of [this] species, populations cannot sustain heavy adult mortality” (Herman, T.B., 1997, “Life on the Edge: Managing Peripheral Populations in a Changing Landscape”, pp. 372-376 in J. Van Abbema (ed.), Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles – An International Conference, New York Turtle and Tortoise Society, New York) Field studies and statistical analyses clearly show that even modest mortality rates (intentional or incidental) of adult turtles can lead to strong declines in populations. See J.D. Congdon *et al*, 1993, “Delayed sexual maturity and demographics of Blanding’s turtles (*Emydoidea blandingii*): Implications for conservation and management of long-lived organisms”, *Conservation Biology* 7: 826-833; and J.D. Congdon *et al*, 1994, “Demographics of common snapping turtles (*Chelydra serpentina*): Implications for conservation and management of long-lived organisms”, *American Zoologist* 34: 397-408; and J.P. Gibbs and G.D. Amato, 2000, “Genetics and Demography in Turtle Conservation”, pp. 207-217 in M.W. Klemens (ed.), Turtle Conservation, Smithsonian Institution Press Washington D.C. Researchers found that the accidental loss of even one adult box turtle every year could not be sustained by the population; see Doroff, A.M. and L.B. Keith, 1990, “Demography and ecology of an ornate box turtle (*Terrapene ornata*) population in south-central Wisconsin”, *Copeia* 1990: 387-399. “Therefore, conservation efforts *must focus on protection of the adult population*” (Foscarini and Brooks, *id.*, at pg. 207).

Adult Turtles are also vulnerable to being killed by vehicles when crossing roads (see, e.g., R. R. Buech *et al*, 1997, “Wood Turtle Habitat Research”, pp. 475-476 in J. Van Abbema (ed.), Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles – An International Conference, New York Turtle and Tortoise Society, New York). We have seen Box Turtles crossing roads in this District and sitting in puddles in roads. Logging operations, including road construction, are proposed for richer habitat around stream channels. Wood Turtles may be displaced from this habitat and have to disperse to habitat on the other side of or on roadways. Potential for mortality (*viz.*, road kill) would thereby be greatly increased.

Wood Turtle nests and young are very vulnerable to predators such as opossums, raccoons, and skunks (see Beuch *et al*, *id.* and Mitchell *op cit*). Implementation of this proposal would foreseeably result in increased presence of such predators here.

Also, “studies demonstrate how relatively subtle shifts in plant community structure, resulting in shifts in microclimate and altering life history, can lead to steep population declines.” Curtin, C.G., 1997, “Biophysical Analysis of the Impact of Shifting Land Use on Ornate Box Turtles, Wisconsin, USA”, pp. 31-36 in J. Van Abbema (ed.), Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles - An International Conference, New York Turtle and Tortoise Society, New York.

Studies indicate where wood turtles are found and where wood turtles are not found. Wood turtles tend not to be found in logged-over areas and that is the type of habitat that this project is creating extensively as part of this project.

The Wood turtles on the GWNF are at the southernmost periphery of their range. “The persistence of a population depends upon a balance of the factors that comprise its demographic environment. In this study we have investigated these factors in turtle populations close to the edge of their range, where either marginal habitat or marginal climatic conditions present challenges to population survival apart from human interference. . . . We have demonstrated that free-living populations of snapping turtles in the northern areas of their range cannot [reproductively] respond to reduction in density and must have high adult and juvenile survivorship to persist.” Galbraith, D.A. *et al*, 1997, “Can Management Intervention Achieve Sustainable Exploitation of Turtles?”. pp. 186-194 in J. Van Abbema (ed.), Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles - An International Conference, New York Turtle and Tortoise Society, New York.

“We want to stress that most populations of turtles exist as ‘metapopulations.’ According to Levins (1970), a metapopulation refers to a collection of populations that exist within a landscape matrix and are separated by areas of different or unsuitable habitat. However, for small populations to persist, some exchange of individuals between populations must occur (Gilpin, 1987; Primack, 1993).” Buhlmann, K.A., *et al*, 1997, “New Approaches for the Conservation of Bog Turtles, *Clemmys muhlenbergii*, in Virginia”, pp. 359-363 in J. Van Abbema (ed.), Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles - An International Conference, New York Turtle and Tortoise Society, New York.

“Little attention has been paid to the greatest threat to the wood turtle’s survival, the continued loss and

fragmentation of its habitat. This species has suffered severely from the effects of habitat fragmentation in many parts of southern New England. In these areas, a combination of habitat loss, road mortality, and collection have resulted in a rate of adult turtle loss which surpasses the capability of the population to sustain itself through reproduction. This has resulted in localized extinctions as well as functional extinct populations of aged adults with negligible recruitment of young turtles (Klemens, 1989). The loss of adult turtles is particularly deleterious to wood turtle populations, as this species takes well over a decade to reach sexual maturity and has a low reproductive output, and is long-lived." (Klemens, M.W. 1993. Amphibians and Reptiles of Connecticut and Adjacent Regions. State Geological and Natural History Survey of Connecticut. Bulletin No. 112)

"Effective management and conservation programs will recognize the integrated nature of life histories and the extreme limitation that the evolution of longevity has placed on the ability of populations of long-lived organisms to withstand and respond to increased mortality or reduced fecundity of any life-history stage. In addition, programs developed to aid in the recovery of depleted populations of long-lived organisms must recognize that there will be long delays before population responses can be detected." (Congdon *et al* 1993, *op cit.*)

"Managers should not be lulled into thinking that because adults are present, the population is doing well. Wood turtles commonly live 30 years or longer. If recruitment is inadequate, many years could pass before attrition would become evident in the population. The viability of wood turtle populations is already a concern because of direct and indirect impacts of human activity." (Beuch *et al*, *op cit.*)

[all above references in section (e) incorporated by reference]

(f) action may significantly effect

As populations of this species are small in number and very localized, site-specific management actions that directly result in mortality, or that disturb habitat causing indirect mortality or impeding interactions of reproductive individuals, can significantly impact the viability of the Turtles on this Forest.

It is unclear how thoroughly the FS surveyed for wood turtles, whether these species could be directly or indirectly harmed by the project, or what steps the FS will take to these species, and the effectiveness of these measures, since we have seen no BE/BA for the project.

Although the DEA proposes a very high level of logging (at least 3,878 acres of logging, 2,777 ac w/no fire and 1,101 ac w/fire) and a very high level of roadbuilding, road reconstruction and fireline construction (see above) across the landscape – this in addition to previous logging and roadbuilding – the FS fails to adequately analyze the total impact on wood turtles including impacts to habitat where wood turtles are known to be found. The analysis does not examine the site-specific impacts of a project of this scale or cumulative impacts.

Special Biological Areas

There are several special biological areas within the project area (SN, DEA 92-93, Maps). The FS should ensure the public that activities (including proposed logging, burning at foreseeable intensities, roadbuilding, skid trail construction, dozer lines, and other infrastructure) are consistent with Virginia Natural Heritage recommendations for these areas. The FS should ensure the public that activities will not adversely impact the biological resources, aquatic resources, and other resources found within and around these special biological areas. For example, Va. Her. Tech. Rpt. 91-1 (Biological Diversity Protection on the George Washington National Forest) states that within the Cow Knob Conservation Site, "Research has indicated that these salamanders do not move far, therefore, areas of unsuitable habitat may present insurmountable barriers (Harris, 1984)." (p. 41). The FS should follow all recommendations and proposed monitoring for the Cow Knob Conservation Site in Va. Her. Tech. Rpt. 91-1 The GWNF Plan states: "Sufficient canopy trees and large woody debris on the forest floor are maintained to reduce drying of subsurface soils." (DC 8E7-03). Therefore, when planning any prescribed burns within the area, the character and intensity of the fire should be assessed to ensure that an unacceptably high level of canopy tree removal will not be caused by the fire and to ensure that adequate levels of large woody debris will remain on the forest floor to reduce drying of subsurface soils on which salamanders rely. Also, "new plow lines for containing prescribed burns in or near bogs or seasonal ponds are prohibited to avoid disrupting hydrology. Use existing roads, firelines, or streams to contain burns where possible. Favor construction of new firelines by using less intensive methods such as wetline, handline, and cutting back flashy fuels. Heavy mechanized equipment ... may be used only if compatible with the values for

which the management prescription area was created.” (8E-013).

There is a Research Natural Area between several working areas of the Project. The FS should ensure that adverse spillover effects (e.g. fire, impacts to aquatic resources, impacts to populations of species that utilize the RNA and surrounding areas during different parts of their life cycle, etc.) do not directly or indirectly impact the RNA. Although the FS would not allow project activities to occur within Little Laurel Run RNA (DEA 93), the FS does not prescribe measures that would prevent direct impacts to the RNA or species and habitats found within it and the FS does not prescribe measures that would prevent accidental spillover impacts (direct impacts) to the RNA or species and habitats found within it.

Old Growth

Based on FS stand data, there appears to be extensive tracts of potential old growth throughout the Camp Run/Mitchell Knob working area (SN maps, GWNF “Existing Potential Old Growth Using Region 8 Guidance – GWNF – N. Half” map, Jul. 26, ’06) submitted with our 2017 scoping comments for this project. Potential old growth appears to be widely distributed throughout this area. There are also, to a lesser extent, potential old growth throughout the Slate Lick/Cross Mtn. WA, Feltz Ridge/Leading Ridge WA, German River WA, and West Side WA. See also the map of stands older than 140 years old I mapped, based on FS layers from James Ohear, prior to the release of the GWNF Plan Revision. Although, as stated in our comments with SELC, potential old growth acreage may overstate the amount of actual old growth, once it is surveyed, it appears that there is a potential for the project to impact large-, medium- and small-sized old growth tracts in these working groups.

According to the Forest Service’s Southern Region guidance on old growth (FR-62), old growth in the eastern U.S. comprises approx. 0.5% of the old growth that historically existed in the southeastern US. Much of it was cut down in the early part of the 20th century.

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 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 DEA provides no information indicating that this was done.

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. The DEA provides no information indicating that this was done.

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). The DEA provides no information indicating that this was done. 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. The DEA provides no information indicating that this was done.

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.

Given the very high level of logging (at least 3,878 acres of logging, 2,777 ac w/no fire and 1,101 ac w/fire) and a very high level of roadbuilding, road reconstruction and fireline construction (see above) across the landscape 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.

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.

Steep Slopes

Landslides occur within the project area (DEA 71). "Human activities (such as roads, log landings and timber harvest) have altered conditions affecting slope stability in many parts of the project area." (DEA 71).

As stated in our scoping comments with SELC, "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.'"

Given the very high level of logging (at least 3,878 acres of logging, 2,777 ac w/no fire and 1,101 ac w/fire) and a very high level of roadbuilding, road reconstruction and fireline construction (see above) across the landscape in this project, the FS needs to disclose whether this project would put a greater (or significantly greater) proportion of the project area watersheds at risk and the impacts of such landslides and slope failures on soils, water quality, aquatic species, wildlife and other resources. Cumulative impacts and risk analysis should be disclosed.

I have personally seen the impacts of slides that originated in cutting units that were too steep for logging (Big Stony Timber Sale, Clinch RD). As an ecological restoration project, the FS should be careful to avoid creating new damage in new areas as other portions of the project area are restored.

Range of Alternatives

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).]

A full range of alternatives has not been considered. Only a single action alternative and a no-action alternative is studied. (DEA). Other alternatives could have been considered that better protect caves and karst; black bears; native species susceptible to invasive species; salamanders; TESLR species; bats; cerulean warblers; NTMBs; cultural resources; riparian areas; remote habitat and Virginia mountain treasure areas; trout; aquatic species; amphibians; wood turtles; old growth; steep or landslide prone slopes, and other issues raised in our

comments. No action alternative except the single extensive-logging/high roadbuilding action alternative was considered.

The FS relies on an “objective” and “purpose and need” that forces a pre-determined outcome. Moreover, the FS labels this project a “restoration” project but does not disclose whether the overall project area and surrounding watersheds will in fact be in a better, restored condition, or whether some portions of the project area would be in a worse condition and would require future restoration activities not part of this project.

Thank you for the opportunity to comment.

Sincerely yours,

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