

# Exhibit 1



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*By Web Submittal and U.S. Mail*

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**Re: Foothills Landscape Project Scoping Comments**

Dear Ms. Jewett and Ms. Bell:

Please accept these comments submitted on behalf of Georgia ForestWatch (“GFW”), the Georgia Chapter of the Sierra Club (“GCSC”), and the Southern Environmental Law Center (“SELC”). GFW’s mission is to promote sustainable management that leads to naturally diverse and healthy forests and watersheds within national forest lands in Georgia; to engage and educate the public to join in this effort; and to promote preservation of this legacy for future generations. The Sierra Club’s mission includes exploring, enjoying and protecting the wild places of the earth, and practicing and promoting responsible use of the earth’s ecosystems and resources. GFW’s and GCSC’s members routinely visit the Foothills area to hike, hunt, fish, view wildlife, and botanize among other activities. Management activities on the national forest can, and have in the past, impacted GFW’s and GCSC’s members use and enjoyment of the national forest in both positive and negative ways. The membership of each organization depends on GFW and GCSC, in part, to represent its interests to the Forest Service. We appreciate the opportunity to submit these comments and, as always, remain available to further discuss any of these issues with the Forest Service.

## **Executive Summary**

GFW, GCSC, and SELC have been involved with the Foothills Landscape for over 30 years. Our members routinely hike, hunt, and otherwise recreate on this section of national forest, and many live in the landscape. We are personally committed to seeing successful management of the landscape.

We support the agency's effort at conducting landscape-scale analysis but the lack of specific information in the proposed action has impaired the public's ability to provide constructive feedback on this project, far more so than in previous projects. While this project may be planned on a larger scale it still requires fine-scale, site-specific information and analysis. Without knowing the specific location of treatments, we cannot assess plans for individual stands or the scale of the project. When visiting individual stands in the field, we have not been able to determine which treatment is most likely, only a range of treatments. When considering watersheds and other larger units, we cannot assess cumulative impacts.

Being able to visit stands to be treated is indispensable for constructive public participation in public lands management in the Southern Appalachians. On past projects, stand specific information has led to beneficial public comments on rare and at-risk resources, and the efficacy of proposed treatments. Visiting stands allows the public to check the quality of data supporting plans. Location of treatments, independent of what is being treated, impacts how adjacent resources will hinder or facilitate treatment and how a treatment will interact with nearby treatments. Trying to account for all of these variables in advance is impossible and misses the point that it is often the unforeseen factors that turn out to be the most important.

We support the agency's desire to collaborate and recognize the benefits of having different groups work together for a common goal. But collaboration is not a substitute for National Environmental Policy Act ("NEPA") compliance. More specifically, the promise of future collaboration on site-specific decision making is not a substitute for considering site-specific issues now, during the NEPA process. We are confident that we can work with other forest stakeholders to develop a consensus-based project and ask that the agency facilitate that outcome. As part of that, the agency should focus discussion more on points of common ground rather than contention, which we fear will ultimately undermine efforts at collaboration. We continue to believe that clearly stating the agency's constraints for performing work in the Foothills would channel discussions in a more productive direction. Since the agency's descriptions of "collaboration" have shifted away from "build[ing] and promot[ing] a collective vision," we would appreciate the agency clarifying what it is seeking through collaboration.

We support true restoration, but we remain unsure of how the agency understands "restoration" when describing "[t]he Foothills Landscape project [as] a restoration project." The agency has described the project as both "functional restoration" and "ecological restoration,"

which are not synonymous. Forest Service Manual prerequisites for applying functional restoration have not been satisfied. References to “achievable future conditions” in project documents add further confusion to the agency’s approach to restoration. We continue to believe that the agency should define its restoration goals using applicable guidance from the agency’s 2012 Forest Planning Rule. More clarity on these issues would help the public better understand and evaluate this project.

This project includes over 20 potential silvicultural treatments. We are concerned the scale of treatments, up to 90,000 acres, threatens water quality, wildlife populations, invasive species control, and recreation while contravening the public’s desires for the landscape. Similarly, the extent of herbicide use, potentially over 60,000 acres, presents qualitatively different risks than found in previous, smaller projects.

We are also concerned that in trying to promote a few common desirable species, many desirable but less common species will inadvertently be harmed, such as serviceberry and persimmon. Plans to harvest older mid-successional forests (100-120+ years old) will perpetuate the shortage of truly late successional forests (though the project does preserve some the most important old forests, existing old-growth, which we support). Many treatments in this project make commitments to follow up actions which have been promised in the past but not always fulfilled. The agency should consider the effects of the treatments if follow-ups cannot be implemented due to future budgetary or logistical restrictions. Applying prescribed fire before rather than after timber harvests may increase the effectiveness of treatments for multiple reasons. The experimental treatments, scale of the project, and novel conditions on the landscape make monitoring for this project more important than ever.

We appreciate the agency’s focus on southern yellow pines. They may have expanded some in response to past land use, but there is a shortage of regeneration across the Foothills. Where prescribed fire is available for pine maintenance, we believe that in the long-term, fire alone would produce more effective restoration than the proposed combined fire and timber treatments. Where expanding gaps treatment is used for maintenance, thinning the surrounding stand will interfere with producing the desired stand conditions. We support the southern yellow pine restoration treatments, but we are concerned about the vulnerability of the resulting stands to southern pine beetle. The proposed action appears to omit some of the best opportunities for restoration treatments, in pole aged stands. In the natural regeneration version of the treatment, removing the residual seed trees is completely counterproductive and will harm biodiversity. We support the thinning of pine plantations.

Oaks play many important roles in ecosystems, including as wildlife resources. Their decline also deserves management action. Similar to southern yellow pine maintenance, oak maintenance treatments would benefit from relying on prescribed fire where available and excluding thinning the surrounding stand from the expanding gaps treatment. Our views of the oak restoration treatments also parallel our views on the pine treatments—general support with

concern about locations. We have no specific issues with the crown touch release treatment and believe oak restorations of pine plantations are likely to be some of the most consistently successful treatments.

The woodlands workshop appears to have been productive as the woodlands description in the proposed action is the best we have seen in any scoping document. Unfortunately, without knowing specific locations, we cannot tell if any of the proposed woodland treatments are suitable. To better understand the agency's view of woodlands, we would appreciate knowing more of the original research or accounts that underlie its view.

We recognize that early successional habitat ("ESH") may be departed from natural levels in some parts of the forest. The proposed action appears to omit several important sources of ESH, so the extent of the problem is overestimated. Stands that developed following agricultural abandonment would be good places for ESH on mesic habitats. Care needs to be exercised in producing ESH along existing edges, because the process could establish large non-native invasive species populations. We see no reason to produce new permanent openings. Permanent openings are not restoration and provide inferior habitat. Changing management of right-of-ways also seems unnecessary as they are already in the desired condition. Finally, ESH should not be created in older forest. To the extent ESH is departed from natural levels, older forest is even more highly departed.

As proposed, the canopy gap treatment also does not appear to be restoration. The proposed gaps are larger, as a rule, than those produced by natural events. Literature also suggests the target wildlife species prefer smaller gaps.

The general forest health maintenance treatments cannot be evaluated without additional information. Additional information on location, species, and interaction with other treatments is needed.

Non-native invasive species ("NNIS") are one of the biggest issues facing the Foothills. We realize the agency does not have resources commensurate with the magnitude of the problem, but the landscape scale approach is an ideal opportunity to more effectively deal with the problem. Mapping existing NNIS populations and prioritizing treatments are essential steps that collaborators can help with. More effective monitoring and follow-up of contracted treatment is also needed. Finally, there is a dire need to have plans in place before anticipated non-native pests and pathogens arrive.

We are glad to see efforts to restore wetlands, canebrakes, and American chestnut included in this proposal. We support research efforts on using high-light treatments to facilitate field insectories and predator beetle control of the adelgid, but strongly urge the agency against trying to use high light levels as a stand-alone treatment to save hemlocks. Without other interventions, hemlocks exposed to the hemlock woolly adelgid die regardless of light level. We

believe out-planting hemlocks is premature (unless part of a larger research effort), but support expanding hemlock conservation areas. All rare habitat treatments should include thorough monitoring.

We support the use of prescribed fire to reduce the risk of wildfire *where prescribed fire can be effective*. In general, there is not enough information on the use of prescribed fire to offer constructive feedback. The full fire regime—frequency, intensity, season, size, and location—needs to be supplied, because fire effects depend on these variables.

Climate change will affect every ecosystem, species, and activity in the Foothills. Its impacts on the landscape and proposed treatments need to be carefully considered. The increasing precipitation variability that has been observed in the region suggests that the impact of commercial timber harvests on soils and streams will increase. The impacts of treatments, particularly at the scale proposed, on salamanders will also be more severe.

The proposed road maintenance level changes will help maintain water quality and access to more important areas of the forest. These changes will also help limit illegal dumping on the forest. Felling multiple trees across the road is likely the most effective way to close them. We feel Rock Flats Road (630D) should remain closed as it penetrates an otherwise exceptional block of core habitat.

Throughout our letter we raise concerns about compliance with various legal standards. We emphasize two here. First, the proposal to sign a decision document without knowing where actions will occur on the ground, and what those actions may be, prevents the agency from assessing project impacts and the potential to mitigate those impacts in compliance with NEPA. Second, given the scale of this multifaceted project it is guaranteed to have a significant impact on the human environment. To move forward with the project as planned the agency must prepare an Environmental Impact Statement.

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## I. Introduction

GFW, GCSC, and SELC appreciate the agency's efforts during the past year to include public input in the development of the Foothills Landscape Project. We support efforts at collaboration and believe it can bring significant benefits to project development. The transparency of the process has helped us better understand the agency's priorities forest-wide as many of the important ideas and values relevant to this project are relevant to all national forest projects. Combined with details provided in the current version<sup>1</sup> of the Draft Foothills Restoration Plan ("Restoration Plan"), the discussions improved our understanding of why the agency selected particular priorities for the Foothills Project. We do not mean to suggest that we embrace all activities outlined in the Restoration Plan but that the process allowed us to better understand why the agency believes those actions are needed, which is valuable in itself.

If conversations and the Restoration Plan helped answered why, then the proposed action scoping document for the Foothills Landscape Project ("Proposed Action") helps answer how. We appreciate what specifics are included in the proposed action. Knowing basal area targets, herbicide use, and connected actions helps us envision, in a general sense, how the planned treatments could lead to the desired conditions. We particularly appreciate the Forest taking into account whether or not prescribed fire is available in combination with certain proposed treatments.

Despite those details, we have had a difficult time understanding what the project will actually accomplish on the ground and the effects of that effort. We support landscape-scale analysis but not at the expense of site-specific analysis. Before the first machine enters the woods, we try to envision the project in detail and anticipate macro and micro, planned and unplanned, outcomes. We try to identify the unspoken activities that necessarily follow from the plans, *e.g.* the log truck rumbling past a campground to implement a timber harvest. That information is essential for developing project alternatives and comparing the impacts of project alternatives. On that front, this project has presented great difficulties for the public. Project results are intrinsically linked to on-the-ground project locations. Forest stands are not interchangeable.

Each forest stand is the result of a unique mix of history and site conditions. The impact of managing a stand depends not only on stand-specific conditions, but also on surrounding conditions. How a stand differs from or connects to the surrounding landscape is critical information for developing any successful project. In other words, assessing stand-specific conditions is necessary not only to evaluate a treatment's effects on that specific stand but also to

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<sup>1</sup> To our knowledge the current version of the Restoration Plan is the version linked to in the proposed action.

evaluate the overall impact of the entire project. Without this information, the public cannot make well-informed comment or alternative suggestions. We cannot overemphasize that point.

As a result, we have tried to offer feedback on the general concepts presented in the agency's proposed action but have been unable to offer our perspective on the most critical issue – what impact (beneficial or adverse) these proposed treatments will have on the ground.

Not knowing where the treatments will take place has also created difficulty by obscuring the scale of the project. All treatment acreages in the proposed action are listed as “up to.” We truly do not know if treatments will total 900, 9,000, or 90,000 acres and it appears the agency does not either. This situation is markedly different from past projects. As discussed elsewhere, this unprecedented scope also affects the agency's NEPA obligations. Past projects identified specific stands that we could compare to other projects to estimate how much of a stand would actually be treated. In other words, using past examples we could approximate the percentage of a stand that would receive a proposed thinning treatment and the percentage of the stand that would be left alone. This allowed us to better understand a project's true scale. We have no precedent for knowing how much of the area that fits the Foothills' preliminary GIS criteria will be chosen for treatment – particularly when even the maps generated as part of that process are explicitly not “treatment location maps.” Proposed Action, 6. At community conversations, agency staff indicated they would like to treat as much of the potential acreage as they can. As of today, we have no information that would rule out treating the full acreage. Consequently, we have no choice but to essentially assume a maximum impact scenario and evaluate the project as if the full acreage will be treated.

As discussed elsewhere, knowing the scale of the project is essential for considering cumulative impacts. Even knowing the total acreage of the project for the landscape would not be sufficient to adequately identify cumulative impacts. Cumulative impacts occur at different scales. Watersheds of all orders may be subject to cumulative impacts. Cumulative impacts that may not raise concerns for a sixth order watershed may still impair a fifth order sub-watershed. Being able to evaluate cumulative impacts at different scales requires knowing not only the total extent of treatments, but also knowledge of the sites proposed for treatments, and how those treatments are spatially distributed across the landscape.

Our basic process for evaluating agency proposals involves examining what proposed treatments will mean for actual stands in the field, not just considering impacts revealed through desktop analysis. This involves going into the forest and looking at actual stands. To submit the most meaningful scoping comments we tried to replicate that process with this project. With descriptions of treatments in hand and a flowchart for determining which treatment would be applied, we visited various areas in the Foothills. Looking at actual stands though, we could not tell what treatment would be applied. For example, we would locate an oak stand that fit the basic requirements for treatment as articulated in the proposed action, but could not determine whether the stand would undergo midstory reduction, thinning, daylighting, or an expanding gap

treatment. In some instances, one or more of the treatments looked like it may be effective while others would put the stand on an undesirable trajectory. In other instances, one treatment appeared most likely, but that treatment would likely produce undesirable results. More pointedly, the impact on other resources (soil, water quality, etc.) often turns on the type of treatment applied; we were largely unable to estimate what those impacts would be. How can the public have an effective voice in the face of such great uncertainty?

For the most part we have organized our comments by focusing on general issues first, moving to more specific issues, and ending with concerns related to compliance with various applicable legal requirements. As the Forest well knows these concerns are all interrelated. Embracing the concept of yellow pine restoration, for instance, does not mean that it is appropriate in all or even most circumstances. We have tried to forthrightly respond to the agency's proposal, but as mentioned throughout, that effort is seriously hampered by lack of specificity in the proposal.

Finally, we note that the Oct. 30, 2017 scoping alert states that “[i]ssues to be raised in objections must be based on previously submitted specific written comments regarding the proposed project and attributed to the objector, unless the issue is based on new information that arose after a designated opportunity to comment.” Oct. 30, 2017 Letter from B. Jewett, 2. We understand the Forest Service will offer a second opportunity for public comment associated with the publication of its environmental analysis document, which we appreciate. But because the agency has included this reference to 36 C.F.R. 218.8(c) as part of this comment period we feel the need to underscore that because many of our concerns are directly related to where specifically a project is sited on the landscape, any information about where the project will occur will constitute “new information” and may raise additional issues we did not have the opportunity to raise here.

## **II. The Forest Service Must Complete an Environmental Impact Statement**

“The National Environmental Policy Act (“NEPA”) is our basic national charter for protection of the environment.” 40 C.F.R. § 1500.1(a). It “contains ‘action-forcing’ provisions to make sure that federal agencies act according to the letter and spirit of the Act.” *Id.* One of those “action-forcing” provisions is the requirement to prepare an Environmental Impact Statement (“EIS”). To continue with the Foothills project as planned, the Forest Service must prepare an EIS.

An EIS must be prepared for all “major Federal actions significantly affecting the quality of the human environment.” 42 U.S.C. § 4332(C). “Affecting” includes actions that “will *or may* have an effect.” 40 C.F.R. § 1508.3(emphasis added); *see Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1149 (9th Cir. 1998), *overruled, in part, on other grounds Lands Council v. McNair*, 537 F.3d 981 (9th Cir. Idaho 2008)( An EIS “*must* be prepared if substantial

questions are raised as to whether a project . . . *may* cause significant degradation of some human environmental factor”)(internal citation omitted) (emphasis in original).

“Human environment” is a “comprehensive[]” term that includes “the natural and physical environment and the relationship of people with that environment.” 40 C.F.R. § 1508.14. Nearly all actions on national forest system lands impact the “human environment” to some degree.

“Major Federal action includes actions with effects that may be major and which are potentially subject to Federal control and responsibility. Major reinforces but does not have a meaning independent of significantly (§ 1508.27).” 40 C.F.R. § 1508.18. The Foothills project is unquestionably a federal action; it is certainly “subject to Federal control and responsibility.” *Id.* Whether the action is considered “major” is determined based on whether the effects will be “significant.” *Id.* In summary, because the Foothills project is 1) a federal action that 2) affects the human environment, an EIS must be prepared if those effects will be “significant.” Indeed, determining “whether a proposed project will ‘significantly affect’ the environment” is the “threshold question” “triggering the requirement for an EIS.” *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir. 1998).

Significance, as used in NEPA, is determined based on “context” and “intensity.” 40 C.F.R. § 1508.27. The Council on Environmental Quality’s (“CEQ”) NEPA regulations provide a list of factors to consider when evaluating “context” and “intensity.” Substantial risk of a significant effect can be determined based on just one of those factors. *See Ocean Advocates v. U.S. Army Core of Eng’rs*, 402 F.3d 846, 865 (9th Cir. 2004). The Foothills project triggers many of them.

To evaluate “context” “the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality.” 40 C.F.R. § 1508.27. “Both short- and long-term effects are relevant.” *Id.* “Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole.” *Id.* In other words, “[c]ontext refers to the scope of the agency’s action, including the interests affected.” *Montana Wilderness Ass’n v. Fry*, 310 F. Supp. 2d 1127, 1144 (D. Mont. 2004). The context of this project is addressed throughout these comments but this is undoubtedly a significant project in the affected region, across various affected interests, and in the locality. In many ways the Forest Service has promoted the project by highlighting its significance and unprecedented nature. The project is the first of its kind on the Chattahoochee National Forest “developed with collaborative input” over the course of a year. Proposed Action, 4. The project is the largest that we are aware of in the history of the Chattahoochee National Forest, aiming to conduct “restoration activities within [a] 143,000 acre project area.” *Id.* For perspective, the project area is nearly three times larger than the entire Uwharrie National Forest in North Carolina. The project touches every ranger district on the forest and is

spread across eight counties. *Id.* The project proposes to utilize a new “toolbox approach” during implementation; a significant departure from past practice. *Id.* at 6. The project purposefully impacts nearly every “interest” on the national forest with recreational, logging, road building, wildlife, conservation, and restoration aspects to name a few. And the project is intended to identify forest management activities to be completed over the course of a decade or more. In the context of the Chattahoochee National Forest, it is difficult to imagine a more “significant” action.

“Intensity” “refers to the severity of impact.” 40 C.F.R. § 1508.27(b). The CEQ provided 10 factors to consider when analyzing the “intensity” of an action. *Id.* “The presence of one such factor may be sufficient to deem the action significant.” *Klamath-Siskiyou Wildlands Ctr. v. U.S. Forest Serv.*, 373 F. Supp. 2d 1069, 1079 (E.D. Cal. 2004). Nearly all of the CEQ’s ten factors are triggered by this project but at least seven are especially relevant.

First, a project may be significant based on the intensity of “impacts” including both “beneficial and adverse” impacts. 40 C.F.R. § 1508.27(b)(1). While many impacts of the Foothills project have not been disclosed, the sheer scope of the project makes significant impacts unavoidable. The project contemplates as much as 90,000<sup>2</sup> acres of vegetation management, including possibly 51,000<sup>3</sup> acres of high-impact industrial logging. The project contemplates as much as 50,000 acres of prescribed burning and associated impacts. Proposed Action, 19. The project will make on-the-ground changes to the forest road system (Proposed Action, 30, 40), recreational facilities (Proposed Action, 31-36), and anticipates application of large quantities of herbicide and pesticide (Proposed Action, 40). This work will occur across a range of (yet undisclosed) ecosystems significantly impacting forest ecology, terrestrial and aquatic species likely including threatened, endangered, and rare species (collectively “TES”), and soil and water resources, as examples. With past projects, the agency has frequently concluded that impacts will not be significant because they will be mitigated. As discussed elsewhere in this letter and in Attachment A, the agency cannot reach that conclusion with the Foothills project, because the agency will not know where project activities will occur and what the “on-the-ground conditions” are in those areas until project “implementation.” Proposed Action, 6. The agency cannot reasonably conclude that mitigation will be effective if it does not even know where activities will occur.

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<sup>2</sup> This was calculated by adding the proposed acreage for all treatments but excluding 1) the acreage proposed for oak restoration which we understand to be the same as the acreage proposed for southern yellow pine restoration, and 2) the acreage proposed for woodland restoration which we understand to be included in the acreage proposed for oak and/or pine restoration. This does not include any acreage under the category of “general forest health maintenance.”

<sup>3</sup> We expect this number to underestimate what is actually set forth in the proposed action. The estimate includes the southern yellow pine restoration treatments, oak maintenance treatments without advance regeneration, pine plantation treatments, and young forest treatments. We understand woodland and canopy gap treatments would also likely be commercial but that acreage is not included here.

Finally, we note that impacts<sup>4</sup> are significant “even if the Federal agency believes that on balance the effect[s] will be beneficial.” 40 C.F.R. § 1508.27(b)(1). We support the agency’s effort to conduct landscape-scale analysis in concept but pursuing such a large suite of management activities across an expansive area necessitates preparation of an EIS. Even if every impact of the project was beneficial (which is not the case) an EIS would be necessary due to the sheer size of this project.

Second, projects can also be significant based on “[u]nique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.” 40 C.F.R. § 1508.27(b)(3). The Foothills area has many unique characteristics including but not limited to the wild and scenic Chattooga River corridor, historical and cultural resources, old growth forest, rare habitats and ecosystem, suitable habitat for TES, and potential wilderness areas. Given the proposed scope of the Foothills project, several of these unique characteristics are likely to be impacted.

Related to unique areas, Forest Service NEPA regulations explain that included in the classes of actions “normally requiring environmental impact statements” are timber and road building projects that impact potential wilderness areas. 36 C.F.R. § 220.5(a)(2). Potential wilderness areas are those areas that “may have wilderness characteristics as defined in the Wilderness Act” and meet the wilderness inventory criteria in Forest Service Handbook § 1909.12, Chapter 70. There are several potential wilderness areas in the Foothills project area as discussed *infra* Section XV(b)(2). Given those areas’ special qualities, impacting them creates the presumption that an EIS is necessary.

Third, evaluation of intensity requires consideration of the “degree to which the effects on the quality of the human environment are likely to be highly controversial.” 40 C.F.R. § 1508.27(b)(4). “The term ‘controversial’ refers to cases where a substantial dispute exists as to the size, nature, or effect of the major Federal action rather than to the existence of opposition to a use.” *Sierra Club v. U.S. Forest Serv.*, 843 F.2d 1190, 1193 (9th Cir. 1988). We are not opposed to landscape-scale projects and embrace more of an “all lands” approach to project planning, but do not believe the size of this project is ecologically appropriate for the Chattahoochee National Forest.

The dispute over size is directly related to a dispute over the effects of the action. We have minimal information about this project, including no information on where highly impactful activities such as industrial-scale logging and road building will occur on the ground. But based on what the agency anticipates in its proposed action it does not seem possible for these activities to be carried out without causing highly significant effects. The agency does not appear to share this perspective, otherwise it should already be moving forward with preparing an EIS.

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<sup>4</sup> NEPA uses impacts and effects interchangeably as we do throughout this comment. 40 C.F.R. § 1508.8.

Finally, there is a substantial dispute over the “nature” of the project as reflected in the nearly 400 comments embedded in the Restoration Plan debating various aspects of the proposal. Many of those comments dispute whether portions of the project are necessary at all, and question whether the recommended actions will have the desired effect. Indeed, according to the proposed action the very purpose of the yearlong process of seeking collaborative input was to “*debate* the restoration needs on the landscape and the potential tools to improve ecosystem’s resilience to disturbance and sustainability.” Proposed Action, 4 (emphasis added). While inciting debate is not necessarily problematic for NEPA purposes, it suggests that the agency realizes the project is controversial, necessitating substantial analysis of the project in an EIS.

Fourth, a project may trigger the need for an EIS if it “may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.” 40 C.F.R. § 1508.27(b)(6). This project does both. The new “toolbox approach,” enhanced adaptive management techniques, and delay in assessing “on-the-ground conditions” (and related impacts) until “implementation” are all significant new approaches to forest management on the Chattahoochee that may establish a precedent for future actions. The decisions made in the Foothills NEPA documents also purport to make decisions in principle (e.g., that commercial logging will occur) about future considerations (where the logging will occur).

Fifth, as discussed elsewhere in this letter the Foothills project is likely to result in cumulatively significant impacts. 40 C.F.R. § 1508.27(b)(7). Sixth, while it is unclear because the locations of proposed management activities have not been determined, given the scale of the project, it seems likely that “the action may adversely affect an endangered or threatened species.” 40 C.F.R. § 1508.27(b)(8). And seventh, the project may “threaten” a violation of other laws including but not limited to the Clean Water Act, Endangered Species Act, National Historic Preservation Act, and Georgia Erosion and Sedimentation Control laws. 40 C.F.R. § 1508.27(b)(10).

Currently, the agency plans to prepare an Environmental Assessment (“EA”) as part of this project. Proposed Action, 1. Of course preparing an EA is not a bar to subsequently preparing an EIS. Preparation of an EA can lead to one of two outcomes: a Finding of No Significant Impact (“FONSI”) or preparation of an EIS. A FONSI can only issue if the project “will not have a significant effect on the human environment.” 40 C.F.R. § 1508.13. Unless the agency substantially changes this project it *will have* a significant effect on the human environment barring issuance of a FONSI and requiring the subsequent preparation of an EIS. Rather than spend time on the EA now only to have to prepare an EIS later, the more prudent approach is to begin preparing the EIS now. A decision not to prepare an EIS is unreasonable “[i]f substantial questions are raised regarding whether the proposed action may have a significant effect upon the human environment.” *Save the Yaak Committee v. Block*, 840 F.2d 714, 717 (9th Cir. 1988) (internal citations omitted).

### **III. Support for Adaptive Management**

We support efforts at adaptive management and note that the Forest Plan “represents an adaptive management approach for the Chattahoochee-Oconee National Forests.” Forest Plan, 1-1. The proposed action describes adaptive management as a way of tailoring treatments to site conditions. We agree that adapting management to site conditions is an integral part of adaptive management necessary for good results. Indeed, issues of mismatch between treatments and site conditions have been the core of most of our comments on past projects on the Forest. That pattern of concern convinces us that the public needs site-specific information about treatments to be able to understand the project and comment effectively. Stated differently, the public needs that information to evaluate whether the “adapted management” can be successful. The public’s ability to comment is hamstrung if it is not provided with the information that has proven the most useful in evaluating projects including their adaptive proposals.

But from our perspective, what the agency has proposed as an adaptive management technique goes significantly beyond that concept. The agency is essentially asking for a blank check – it hopes to sign a decision document authorizing unchosen treatments in unspecified locations across an unspecified acreage. Proposed Action, 6. Unbounded management opportunities are not necessary to implement adaptive management. The agency can easily design a smaller subset of projects in the Foothills area, complete landscape-scale and site-specific analysis on those projects impacts, implement the projects, monitor them, and then adapt future projects based on the monitoring results. Moreover, any adaptive management approach will take time to implement. Implementing a treatment in one location, then replicating it elsewhere a year later is not adaptive management – enough time has not passed for the agency to meaningfully evaluate and learn from the initial treatment. Because adaptive management takes time there is no need to authorize a project across the entire landscape at once.

This is concerning, in part, because the agency does not appear to be embracing the concept of adaptive management even in its initial proposed action and Restoration Plan. The Forest Service Handbook presents several questions relevant to evaluating adaptive management techniques, including: 1) Are the actions being taken having the desired effect?; 2) Are conditions moving in the desired direction?; 3) Is there progress towards achieving desired conditions?; and 4) How can management be improved so that it is more effective? *See* FSH 1909.12. § 06.2. But the agency does not appear to be asking these questions about its past management efforts. For example, the Brawley Mountain Project used herbicides to control woody vegetation with the goal of promoting grass and forb dominance to create a woodland ecosystem. That treatment did not work. Woody sprouts remain dominant at Brawley despite herbicide use and the additional stress provided by prescribed fire. The Foothills proposed action uses similar language to describe herbicide application to control woody sprouts to create woodlands across as much as 7,400 acres. What lessons learned from the Brawley Mountain Project will be used to ensure that herbicides will be more effective in this project? A more



prudent approach would be to proceed with smaller projects and provide the public the opportunity to analyze the effects and make informed comments on future proposals. If the agency wants to pursue adaptive management it should start by assessing its past actions across the forest and evaluating how it can better achieve its objectives, not by asking the public to endorse a management proposal with no specifics or concrete commitments under the justification that the agency will use that authority to pursue adaptive management in the future.

#### **IV. Support for Collaboration and Ways to Improve the Process**

Collaboration is a challenging process. Gathering stakeholders with different viewpoints, getting them to have open discussions on sometimes difficult subjects, collecting and synthesizing ideas discussed, and incorporating new ideas into existing approaches and constraints all takes time and effort. The agency obviously committed substantial resources to this process, and facilitated conversations by sponsoring a number of different, inclusive public participation formats. The agency also has made a concerted effort to keep the conversation and process transparent. We appreciate these and other efforts by the agency and participating stakeholders that have gone into this collaborative.

For how different the process was, the outcome—the proposed action—seems surprisingly familiar. The scale of the project is different, but many of the assumptions and approaches are indistinguishable from other recent projects. The meetings spent considerable time discussing values, but we have trouble recognizing how those are reflected in the proposed action. Instead, priorities and treatment approaches seem similar to past projects. We know many staff members were listening, because we had good, deep conversations with them. But we are struggling to see these conversations incorporated into the project development. The proposed action reflects a Forest Service-developed project as much as most projects, not a collaboratively-developed project.

As an example, one meeting in Clayton put forth the question “should commercial treatments be considered in ‘unsuitable’ prescriptions?” As much as any issue in these meetings, there was consensus around this question. The reaction was that it made no sense to treat in unsuitable prescriptions when there was so much other acreage available. Why risk conflict when there was so little to be gained? In the proposed action, we do not see a commitment to honor the collaborative group’s wishes on this and other topics. Unsuitable prescriptions seem to be on the table just as much as suitable prescriptions leaving us to wonder what was gained from the discussion in Clayton.

Nevertheless, as we have tried to articulate by letter and in person since the beginning of this process, we believe there is much to be gained from collaboratively developing projects on the Chattahoochee. We also understand that this is a learning process. In that spirit, we continue to offer suggestions on how to improve the collaborative process and remain available to discuss with the agency ways to achieve truly collaborative outcomes. From our perspective, the

Foothills process has not fully achieved all of the benefits of collaboration though some are within reach.

Our thoughts on collaboration are influenced by two overarching concepts which may be obvious but we restate them here for clarity. First, collaboration is not a replacement for the NEPA process. To the contrary we think collaboration can improve NEPA analysis and forthright impacts and alternatives consideration. Second, increased transparency, trust building, and discussion with various stakeholders and the agency are valuable pursuits, but those actions are not – in and of themselves – collaboration. In other words, just because trust has been built between various groups does not mean they have collaborated. The main objective of collaboration must be to achieve a common end by working together, and we are willing to engage in that process. Trust building is important, but from our perspective, if at the end of this process all we have to show is accumulated trust, and not a shared project objective, we will not have successfully collaborated.

One of the main benefits of collaboration is that it can help us move beyond the status quo of sorting out project controversies relatively late in the agency's project planning process. In the past, the agency generally sought public comment after investing substantial resources in developing a project proposal. Sometimes disagreements would be inefficiently resolved by changing or abandoning aspects of projects after agency resources had been invested. True collaboration lets us avoid these late-in-the-game disagreements (and resulting need to change projects) by designing a project that all parties can embrace from the beginning. Certainly collaboration is not a fix for ideological disagreement, but it allows stakeholders and the agency to recognize those disagreements, identify common ground, and design projects where each party feels their priorities are supported and the greatest potential conflicts are avoided.

There are many opportunities for this type of agreement in the Foothills area and we do not fully understand why the agency has not pursued that outcome. Some of these opportunities could be embraced relatively quickly. For instance, the Forest has preliminarily identified approximately 13,800 acres of pine plantations that may be suitable for commercial timber harvest. Proposed Action, 20. There is widespread support for manipulating plantations (assuming other conditions do not prohibit harvest), which are highly departed from natural conditions, to improve their ecological integrity and create a variety of wildlife habitats. If harvests can be completed commercially as the agency predicts, they will produce income for local loggers. This scenario seems like a win-win-win outcome. At the current pace of logging on the Chattahoochee, 13,800 acres could provide nearly a decade of timber sales. Embracing this type of action would allow the Forest to start implementing a project on the ground quickly, giving the collaborative community the time necessary to discuss other, more difficult issues.

We continue to believe that additional time to discuss issues in the collaborative setting could lead to more shared understanding and less controversy. The agency has referenced the Four Forest Initiative project multiple times as embodying the NEPA process the agency is

replicating here. But it took approximately four years to collaboratively develop that project in a less complex, less diverse ecosystem. We have some sense that the Foothills project has proceeded on a faster pace because of agency time and personnel constraints, which may indicate that such a large project is not an ideal first collaborative project on the Forest.

Aside from additional time, reaching agreement on other issues will depend on how the agency structures conversations amongst diverse interests. We now understand that the purpose of the community conversations over the past year was, in part, to “debate the restoration needs on the landscape and the potential tools to improve the ecosystem’s resilience.” Proposed Action, 4. Some debate may naturally occur, but it should not be an agency objective as debates tend to focus discussions on areas of disagreement rather than overlapping interests. It seems unlikely that approach will lead to a shared understanding between groups with ideological differences. It also seems unnecessary in many instances as diverse stakeholders do not have to reach agreement on all issues to develop a collaboratively-supported project. Just as we believe there is common ground between all forest stakeholders, we recognize that there are some issues we will likely never agree on. Moving forward in the collaborative process, we ask that the agency focus conversations on shared objectives between groups, and how to best reach those objectives, not debates.

Also as we have articulated before, we continue to believe that more transparency regarding the agency and public’s decision space could lead to better, more collaborative outcomes. This is particularly true of agency financial limitations. Between 2004 and 2015 the highest annual commercial timber harvest acreage was 1,415 acres. *See* Attachment B. A conservative estimate of the amount of commercial timber harvest contemplated in the Foothills project is 40,000 acres.<sup>5</sup> At a 1,400-acre-per-year pace, the Foothills project would provide approximately 28 years of timber harvests. Assuming the project does not last longer than 10 years, the agency would have to increase the scale of logging to nearly three times the highest acreage it achieved over the course of a decade, and cease logging on the rest of the Forest. Does the agency have the financial and logistical capability to harvest that much timber? If not, why is it being considered? It will be easier for diverse interests to come to collaborative agreement on a plan to log 1,400 acres per year (if that is a more accurate estimate) rather than 4,000 acres.

Finally, it is critical that the agency fully define what it means by “collaborate.” When we began this process we assumed “collaborate” meant working toward some sort of consensus-based outcome. Indeed, documents distributed in the initial community conversation meetings described “the goal of collaboration [as] build[ing] and promot[ing] a *collective vision* for how to manage the land. Through collaboration, groups that may disagree are able to explore their differences, identify common interests, and *seek common-ground solutions*.”<sup>6</sup> Those

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<sup>5</sup> The actual number appears to exceed 50,000 acres. *See supra* footnote 3.

<sup>6</sup> [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5388734.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5388734.pdf) (emphasis added).

explanations are similar to Forest Service regulations defining collaboration as a “structured manner in which a collection of people with diverse interests share knowledge, ideas, and resources while working together in an inclusive and cooperative manner *toward a common purpose*.” 36 C.F.R. § 219.19. It is now abundantly clear, as was stressed during the October 2017 community conversations, that the Forest Service is not seeking any sort of consensus, common purpose, collective vision, or common-ground solution. Yet seeking those outcomes appears to be the foundation of collaboration. If that is no longer the agency’s goal, what is it seeking through collaboration?

We raised this question in our September 28, 2017 comments on the Draft Restoration Plan and were referred to the CEQ’s “Collaboration in NEPA: A Handbook for NEPA Practitioners” (October 2007). Restoration Plan, Comment CONF47.<sup>7</sup> The Handbook underscores our point. It outlines four levels of public engagement in NEPA processes ranging from “inform” as the least engaging to “collaborate” as the most engaging. *Id.* at 11. Collaboration involves “working together towards agreement” on most issues, which is explicitly not what the Chattahoochee is pursuing. Instead, the public appears to be playing more of a consulting role where the agency “keeps parties informed and consider[s] their concerns and suggestions.” *Id.* at 13. Of course, there is nothing inherently wrong with the public playing a consulting role, it is just not collaboration. Pointedly, “[t]he mistrust created by promising collaboration and only delivering information . . . can ruin an agency’s relationships with parties and potentially undermine the agency’s credibility.” *Id.* at 12. We ask that the agency fully and finally explain what it envisions when it discusses public collaboration.

## **V. The Forest Service Needs to Clearly Define Restoration and Related Objectives**

Also unclear is how the Forest Service understands “restoration” when describing “[t]he Foothills Landscape project [as] a restoration project.” Proposed Action, 1. The agency should more accurately define that term which will allow the public to better understand the underlying purpose of the project and alternative methods to achieve that purpose.

We submitted two sets of comments on the Draft Restoration Plan: one on June 9, 2017, and another on September 28, 2017. At the agencies request, our comments for the latter submission were articulated in Word Doc “comment bubbles.” Both letters are attached (Attachments C and D) and incorporated herein.

In each letter we asked the agency to more clearly define “restoration” to allow us to better understand its proposed actions. To be transparent, we support restorative activities on national forest system lands, but do not support activities that are restorative in name only; *i.e.* that do not have actual restorative impacts on ecosystems. Because of the potential for

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<sup>7</sup> Hereafter we reference comments in the Draft Restoration Plan as CONF\_\_ or GFW\_\_.

misunderstanding about what is and is not “restorative” we renew our request for clarity in how the agency understands that term and what it believes its actions will achieve. We recognize the restorative aspects of parts of the Foothills proposal, but there are several aspects that appear to have little restorative impact. We are trying to reconcile that difference.

We continue to believe that the agency should define its restoration goals using applicable guidance from the agency’s 2012 Forest Planning Rule (36 C.F.R. § 219 *et. seq.*). See June 9, 2017 Letter 7-9, Attachment C. The agency has thus far refused our request, most recently by stating that: “36 CFR Section 219 is the regulation regarding National Forest System Land Management Planning. The Foothills Landscape project is not a Forest Plan revision process, it is a restoration project. We are working under the definition of restoration from the Forest Service Handbook 2020.5.” Comment CONF52. Whether the definition is pulled from the regulation or the Handbook is beside the point. Forest Service Manual 2020.5 incorporates “[t]he definitions at the Land Management Planning Handbook, FSH 1909.12, zero code chapter, section 05.” *Id.* That section defines ecological restoration by citing to and repeating the definition of “restoration” from the 2012 Forest Planning Rule. FSH 1909.12, § 05. The Planning Rule is relevant if for no other reason than the definition in the Handbook is copied from the regulation. Moreover, the proposed action makes plain that the “Foothills Landscape project is a restoration project intended to assist in the *‘recovery of an ecosystem that has been degraded, damaged, or destroyed. Ecological restoration focuses on reestablishing the composition, structure, pattern, and ecological process necessary to facilitate terrestrial and aquatic ecosystems sustainability, resilience, and health under current and future conditions.’*” Proposed Action, 4 (emphasis added). The italicized text is also quoting the 2012 Forest Planning Rule as replicated in the Forest Service Handbook. According to the proposed action, this is an ecological restoration project as defined in the 2012 Planning Rule incorporated in the Forest Service Manual and Handbook – that guidance should guide evaluation of the project.

The agency suggests its restoration objectives are “framed” by Forest Service goals to protect watersheds found in the Forest Service Manual 2520. Proposed Action, 4. We are confused by that reference. Forest Service Manual 2520 is about watershed conditions, not ecological restoration. Restoration is defined in that chapter but only in connection to emergency stabilization of burned areas. See FSM 2523.05. Please clarify how the agency understands the interaction between Forest Service Manual chapters 2520 and 2020.5 as applied to restoration.

More problematically, in the Restoration Plan the agency explains that it is relying on the definition of “functional restoration,” not “ecological restoration” from the Forest Service Handbook even though “ecological restoration” is what is presented in the proposed action. Compare Comments CONF 58 and CONF 60 with Proposed Action, 4. Per agency guidance, functional restoration and ecological restoration are not the same. The agency must decide and clearly explain whether it is pursuing functional or ecological restoration and how its proposed activities meet either definition.

Functional restoration is the “[r]estoration of abiotic and biotic processes in degraded ecosystems.” FSH 1909.12, § 05; *see* FSM 2020.5. In other words, “[f]unctional restoration aims to restore functions.” *Id.* Functions are the “[e]cological processes that sustain composition and structure, such as energy flow, nutrient cycling and retention, soil development and retention, predation and herbivory, and natural disturbances such as wind, fire, and floods.” *Id.* Aside from use of prescribed fire and potential reintroduction of predators and herbivores, there is little connection linking many of the Foothills project’s proposed actions to functional restoration. At the very least, the agency has not articulated a connection. Much of the timber activity appears to be aimed at, for instance, “encourage[ing] [ ] diversity in the age” of trees. Proposed Action, 7. But manipulating forest age classes is related to forest structure which is an element of ecological restoration, not functional restoration. *See* FSH 1909.12, § 05. Restated, whereas ecological restoration may provide a basis for manipulating forest structure (e.g., age diversity), functional restoration reestablishes the *processes* that sustain that structure.

Importantly, the Forest Service Manual only allows functional restoration “[w]hen ecosystems have been altered to such an extent that reestablishing key ecosystem characteristics within the NRV *may not be ecologically or economically possible.*” FSM 2020.3(6)(emphasis added). In other words, functional restoration is available to only the most degraded ecosystems that cannot be ecologically restored. To pursue functional restoration the agency must explain why “reestablishing key ecosystem characteristics within the NRV” (i.e., ecological restoration) is not “ecologically or economically possible.” This is a multistep process including at least these steps: 1) determining the ecological reference condition, 2) assessing potential to restore to that condition, 3) instead of implementing restoration to that condition explaining why it is not ecologically or economically possible, and 4) determining and explaining functions to be restored instead.

Both ecological and functional restoration require identification and restoration to a reference condition. That condition must be justified in light of the requirements above. The Forest Service should clearly explain what reference condition it is using.

While unclear, the Forest may be seeking to restore to an “achievable future condition.” *See, e.g.,* Proposed Action, 7. We are not familiar with that terminology and cannot find it defined in the Forest Plan or agency’s regulations and directives. Further explanation of that term is necessary to understand what is being proposed, the best methods for meeting that end, if the project impacts are justified by achieving the “achievable future condition,” and to evaluate project success. Any “achievable future condition” should be one that is self-sustaining. In other words, it is questionable how “achievable” a condition is if it requires continuous manipulation to maintain a certain condition. If the agency is attempting to use “achievable future condition” as a reference condition for restoration purposes it must ensure identification of the “achievable future condition” meets the requirements for identifying reference conditions from applicable sections of the 2012 Planning Rule, Forest Service Handbook, and Manual. The

“applicable sections” may depend on whether the Forest Service is pursuing ecological or functional restoration.

The term “achievable future conditions” may have come from a recent paper in *Forest Ecology and Management* titled “Achievable future conditions as a framework for guiding forest conservation and management.”<sup>8</sup> See S.W. Golladay *et al.* 2016, Attachment E. Our understanding is the approach set forth in that article: 1) compares current conditions to conditions that are likely to occur in the future as a result of climate change and land use changes, 2) identifies ecosystem services that may be lost as a result of those changes, and 3) sets management goals intended to protect those ecosystem services. But that process has not occurred here so it does not appear the concepts discussed in the paper can be applied. Please provide further explanation of what the agency means by “achievable future condition” and how that term comports with applicable agency guidance.

These differences are more than semantics; they matter legally and practically. As explained in the Restoration Plan linked to in the proposed action, the Forest Service is relying on its Manual and Handbook to justify and explain this project. In relying on those documents, the agency must explain how its actions comply with them. Additionally, we cannot understand: 1) what this project is intended to accomplish, 2) how the proposed activities will further that goal, 3) if project impacts are justified by the objective, and 4) how project success is determined if it is not clear what the agency means by “restoration.”

Related, the proposed action also relies on the definition of biologic integrity that states communities should “reflect, as best as possible, natural processes.” Proposed Action, 7. We believe that is an appropriate goal for this project and evaluate the treatments proposed through that lens.

## **VI. General Issues with Timber Treatments**

By our count, this project includes over 20 distinct timber treatments. While they vary greatly in post-treatment stand structure, several themes cross all of the treatments. Probably most obviously, the treatments primarily aim to maintain currently dominant species that are declining in abundance, specifically oaks and pines. We agree that the decline of these species is one of the major issues facing this forest, and should be a management priority. We also see a role for timber harvests in managing those species.

The proposed treatments also take into account a number of critical factors that will shape how stands respond to timber harvests. Modifying treatments to account for prescribed fire,

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<sup>8</sup> Golladay SW, KL Martin, JM Vose, DN Wear, AP Covich, RJ Hobbs, Kier Klepzig, GE Likens, RJ Naiman, & AW Shearer. 2016 Achievable future conditions as a framework for guiding forest conservation and management. *Forest Ecology and Management* 360: 80-96.

varying levels of site productivity, and the presence or absence of advance regeneration of desired species will result in both more effective treatments and a more diverse landscape. We believe accounting for these factors is necessary for effective management, and are glad to see this positive step included in this project.

Despite these positive elements, other patterns in the treatments raise concerns. As we have discussed previously, we are troubled that the tailoring of treatments to stand conditions will not occur until after the public's options for recourse are closed. Additionally, treatments that are beneficial in isolation may cause problems in aggregate.

*a. Scale*

We are deeply concerned by the sheer extent of the treatments proposed. For decades, timber harvests on Forest have been scattered across a watershed at a time. The proportion harvested was often around 10%. Local areas of more intense harvest were sometimes problematic. This project not only applies that more intense approach across a broad area, but in several adjacent areas simultaneously, all of which could have negative impacts on sensitive watersheds. We recognize benefits of landscape-scale analysis and management decisions, but the risks associated with landscape-sized activities are significantly heightened. Timber harvests, when limited in extent, produce a number of negative effects that systems can sometimes absorb, or the effects can be mitigated when they are minor. However, when clustered, those negative effects can overwhelm ecosystem resistance and response capacity.

Correctly functioning best management practices (“BMPs”) reduce erosion and sedimentation from ground-based timber operations. Critically, BMPs do not eliminate erosion or sedimentation. And their effectiveness changes with site conditions. Soils are still degraded and sediment still enters streams, despite BMPs. When many stands in the same area are cut, a sediment-laden stream does not flow into a clear stream, but instead frequently meets another sediment-laden stream. Streams can only move so much sediment. Sediment on the stream bed, instead of being flushed by storm events, gets covered with more sediment from the next tributary. Larger and larger spaces between cobbles are filled, and animals gradually lose their habitat. That scenario plays out even where BMPs work as designed.

But when a rain event occurs that exceeds the design standard, BMPs can be overwhelmed. Those events lead to excessive sediment in not only one stream but in many streams, because BMPs for different stands frequently do not fail independently. As an example, Hurricane Irma severely impacted two-thirds of the Foothills at once. Spreading harvests across 10 years will help with this issue, but it will not eliminate it. Spreading out harvests also creates other risks— increased vulnerability over a longer time period (i.e. ten years) instead of shorter (five years).



Timber harvests also have direct negative impacts on many wildlife populations, particularly soil-dwelling organisms and species with small home ranges and limited dispersal capacity, such as salamanders<sup>9</sup> and frogs<sup>10</sup>. See Semlitsch *et al.* 2009, Attachment F; Connette & Semlitsch 2013, Attachment G. Their limited physiological mechanisms to prevent water loss necessitate the use of relatively cool, moist forested habitats, in conjunction with the use of underground refuges or coarse woody debris to maintain high moisture. Not surprisingly, mortality is highest in clearcuts because of higher ground temperatures and desiccation. Partial canopy retention (leaving 50% or more) increases chances of survival in the short-term, as does leaving slash and coarse woody debris for cover and migration. Having adjacent undisturbed areas nearby allows for migration and re-establishment of populations, but recovery of some populations can still take decades or even over a century. Harvesting too much of the landscape at once disrupts this recovery process and can lead to species-impooverished stands.

Habitat fragmentation presents a related problem. Many species avoid crossing disturbed areas. In a more limited project, species could use undisturbed areas to simply go around a disturbed area. However, the scale of this project removes that option, and migration becomes much more difficult. Treated areas aligned along a road could act as a wall and separate habitats and populations on either side of the road.

At the same time, timber harvests help non-native invasive species spread. Disturbance is often the prime reason for the spread of NNIS. In that light, all the proposed treatments should be vetted as to the possibility for NNIS spread. Since the location of all non-native invasive species populations are not mapped or known, the failure of the agency to identify precise areas to be treated makes more specific comments impossible.

Treating all possible areas at once also seems like a risky approach just in terms of ensuring the desired outcomes. What options will be left if treatments do not have the desired effect? We have observed in some recently treated areas and on roadsides that red oak advance regeneration is common, but white oak saplings are rare, despite being common in the overstory. That raises the potential of not having white oak regeneration, while having all the best sites for regenerating white oaks already occupied by regenerating red oaks. A similar scenario could occur with Virginia pine regenerating rather than other southern yellow pines. Even if these specific scenarios do not occur, using a truly adaptive management approach calls for the agency to conduct treatments slowly and purposefully, ensuring its actions will have the desired effect

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<sup>9</sup> Connette GM & RS Semlitsch. 2013 Life history as a predictor of salamander recovery rate from timber harvest in Southern Appalachian forests. *Conservation Biology* 27(6): 1399-1409,

<sup>10</sup> Semlitsch, RD, BD Todd, SM Blomquist, AJK Calhoun, JW Gibbons, JP Gibbs, GJ Graeter, EB Harper, DJ Hocking, ML Hunter, Jr, DA Patrick, TAG Rittenhouse, & BB Rothermel. 2009 Effects of timber harvest on amphibian populations: Understanding mechanisms from forest experiments. *BioScience* 59: 853-862.

and not unintended effects. Because the project is focused on vegetation management, results of certain actions will not be apparent for years.

Conducting tens of thousands of acres of timber treatments also threatens to interfere with recreation in ways that past treatments have not. In the past, campers at a particular campground might have had to contend with log trucks rumbling past for a couple of years. Now that scenario threatens to play out at all the campgrounds and popular recreation spots in the Foothills. Encountering tractor trailers on Forest Service roads can be an unnerving and difficult experience, particularly for infrequent visitors. People may forego going to a favorite area only to find the same intrusions at their alternative destination. Confining activities to non-holiday weekdays will lessen, but not eliminate the issue. And timing restrictions will do nothing to help visual impacts. Piles of slash and active timber operations are not visually appealing to most people. These factors may impact recreation and tourism which are the biggest industries in the Foothills.

On a more basic level, is extensive logging what people want done with their national forests? The agency went to great lengths to let the public know about and have their say about this project. Despite that commendable effort, we did not see the average forest user at the community conversations. While there is obviously a wide range of desires among the public, we still do not see a reason to believe they want this much timber management. We understand timber harvests will be used as part of this project, but the current proposal seems excessive.

#### *b. Herbicide use*

Using herbicides is risky. Sometimes they do only what they are intended to do. However, other times they have unintended consequences. Using herbicides on hundreds of acres is risky, but using them on an entire landscape represents a fundamentally different risk. If unintended consequences do occur, entire forest types will be degraded; entire watersheds may be compromised. How much herbicide an organism is exposed to can depend on more than just how much is applied to a particular acre. Animals as diverse as bears and bees increase their exposure as more of the landscape is treated.

We used to take some comfort in knowing that most herbicides used on the Forest are plant hormone mimics. The ecosystem, we reasoned, should be able to handle compounds similar to those that are already ubiquitous. History undermines that logic. As one of many examples, *trans*-fats were once commonly added to processed foods. They are compositionally identical to the *cis*-fats found in natural foods. However, *trans*-fats act differently in the human body and were found to have significant health risks. As a result, they have largely been removed from foods. As another example, thalidomide is infamous for causing birth defects. What is not always appreciated is thalidomide comes in right- and left-handed versions. The two versions have identical chemical formulas and are simple mirror images of each other. One is a

medicine for morning sickness while the other causes birth defects. Chemical similarity to a benign compound is no guarantee of a chemical being harmless.

History is replete with examples of herbicides and pesticides that were used for decades and considered to be safe only to be banned or restricted when problems were identified. For example, glyphosate has been used for decades, and was considered safe. However, current research from the World Health Organization identifies the herbicide as a likely carcinogen.

Even if the active ingredient in an herbicide turns out to be safe, that finding does not mean the herbicide is safe. Other chemicals are added to herbicides to make the active ingredient disperse or for other physical effects. These secondary chemicals are trade secrets. Consequently, we do not know what is being sprayed on thousands of acres of forest. The overall point is that there is risk inherent in using herbicides whether those herbicides are perceived to be well understood or not. That risk drastically increases when herbicides are applied over a large area, which counsels against applying herbicide on a landscape scale as is proposed here.

Additionally, some stands may not allow use of herbicides for even their intended purpose. Stands with very dense evergreen understories, either white pine or heath shrubs, are common in the Foothills. Prescribed fire can help control them, but they will still present fierce competition for desired species in other areas. The proposed action implies herbicides would be used to control these dense understories. The leaf area and stem density is so high in these stands that it seems unlikely that these competitors could be controlled without exceeding the gallons/acre limit on herbicide application. Assuming herbicide labels are followed, we do not see how treatments in these stands could be effective without prescribed fire.

Finally, different herbicides pose different concerns. The proposed action does not identify the herbicides to be used in association with American chestnut orchard, mechanical fuel reduction, or right-of-way maintenance. The primary herbicide identified for silvicultural use, triclopyr, does not adsorb to sediment and may contaminate surface waters (particularly considering the mass quantities proposed to be administered as part of the project). The ester formulation has been found to affect plant species in semi-aquatic areas at all application rates suggesting its use should be completely avoided in some areas.

*c. Importance of focusing on ecological processes*

This project appears to treat the symptoms of poor forest health, but do little to address the root causes. For instance, the project plans to foster oak regeneration by harvesting timber to increase light levels and by using herbicides to control competition. However, those actions do not address why light levels are low or why competition was limiting. They will not help the next generation of oaks.

As we brought up in regards to the Restoration Plan, we believe the long term benefits of this project would be much greater if more attention were paid to forest processes. Thus far, analysis of the Foothills has been overly focused on current physical conditions. Stand structure and species composition are certainly important, but they are not the greatest influences on future forest conditions. Important processes that appear to have received only minimal attention include soil formation, canopy gap formation, beaver activity, and nutrient cycling (including components such as flowering dogwood acting as a calcium pump).

Prescribed fire is an important exception. By using prescribed, the Agency has begun to address the root cause of several different issues facing the Foothills. Prescribed fire likely fosters oak regeneration, but at the same time promotes grasses and aster family wildflowers. To have the most beneficial effects and avoid unintended negative effects, prescribed fire use still needs to be modeled on the conditions that Foothills species evolved under.

*d. Picking winners and losers*

The combined effect of all the treatments seems to pick winners and losers across the landscape. The individual trees to remain in the overstory will be chosen during timber harvests. The individual plants to remain in the understory and midstory will be chosen during herbicide application or directly planted. To some extent, this happens with any timber harvest, but the scale of the Foothills project makes these decisions more consequential. Across tens of thousands of acres, the only woody plants remaining will be those that have specifically been chosen. As the agency points out in comments on the Restoration Plan, conditions are changing; invasive species are spreading, climate is changing, and ecosystems are reshuffling. Is now the time to conclude that we know, on a grand scale, which plants should be where? Moreover, the agency should explain how these decisions comport with restoration objectives.

We also worry that many desirable species will be lost by accident. We know oaks, hickories, and pines will be slated for retention and red maple, sweetgum, and black gum targeted for removal. What will happen, though, to serviceberry, hornbeam, dogwood, southern crab apple, persimmon, red bud, mulberry, black cherry and sprouts of American chestnut? What about elderberry, witch hazel, and hazelnut? Will the crews applying herbicide be able to identify all of these species? Will they be able to tell red maple from maple-leaved viburnum? Will we lose these species, valuable for wildlife and biodiversity, from a landscape?

Special consideration should be given to flowering dogwood. If declines in species like white oak, shortleaf pine, and Kentucky warbler drive management decisions, then flowering dogwood should drive management decisions as well. The species has recently undergone a precipitous decline due to dogwood anthracnose. Dogwood has a number of attributes that make them important for “the health and ecological integrity of forest ecosystems throughout the

eastern U.S.”<sup>11</sup>. The high-fat fruits are particularly well suited for fueling migratory flights, and they ripen just as migratory birds arrive. Unlike most other trees and plants, dogwoods have the ability to “mine” calcium from soil and rocks, and their decomposing leaves, fruits and roots then make calcium more available to other plants. Their abundance in ornamental settings and appearance as the state tree of two states also attests to their popularity. Dogwoods grow scattered in the understory rather than forming a continuous canopy layer, so retaining them will not interfere with regenerating other species.

*e. Old forest*

Models of the natural range of variability of forests have indicated that watersheds on the CONF have a shortage of old forests (*see* Upper Warwoman Landscape Management Project Environmental Assessment and Cooper Creek Watershed Project Environmental Assessment). The models overestimate the impact of disturbance (by ignoring the understory among other factors), so that finding is all the more striking. The proposed action indicates the agency plans to protect the most important of the existing old forests by designating existing old-growth for old-growth management (see below). We wholeheartedly support that decision.

But we have a remaining concern: how will the gap be closed between the current proportion of older forest and the proportion indicated by the natural range of variability? Closing that gap requires most of the forests that are currently over 100 years old not to be harvested. That will allow them to continue aging into a *true* late successional phase, including the fine scale patchiness, species composition, and ecosystem processes characteristic of late succession. Most of the Foothills’ treatments target “mid to late successional” forest. While some treatments, like the midstory reduction, would not interfere with stands aging into older age classes, many other treatments would functionally convert stands to much younger ages—old trees would not dominate the stand. To prevent that outcome more intensive treatments should generally avoid older stands. Attempts to address a shortage of young stands should not perpetuate the shortage of old stands.

Beyond stand age, this project’s effects on habitat resources associated with older forests should also be kept in mind. Cavity trees, snags, and coarse woody debris all provide habitat for a wide variety of animals and are concentrated in old forests. Coarse woody debris is critical cover for soil dwelling organisms during prescribed burns.<sup>12</sup> *See* O’Donnell *et al.* 2015 in Attachment I. These old forest habitats are artificially scarce in the Foothills, since the vast majority of stands are only old enough to produce them at diminished rates. Even partial harvests reduce the future abundance of these wildlife resources. For instance, harvesting an

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<sup>11</sup> Holzmueller EJ, S Jose, & MA Jenkins. 2010 Ecological consequences of an exotic fungal disease in Eastern U.S. hardwood forests. *Forest Ecology & Management* 259(8): 1347-53, Attachment H.

<sup>12</sup> O’Donnell KM, FR Thompson III, & RD Semlitsch. 2015 Prescribed fire and timber harvest effects on terrestrial salamander abundance, detectability, and microhabitat use. *Journal of Wildlife Management* 79(5):766–775.

acre with 100 trees averaging 13.5 inches diameter (1 ft<sup>2</sup> basal area) to 50 ft<sup>2</sup>/acre basal area, will reduce by half the number of trees present to make gaps, make cavities, and make coarse woody debris. Snags can be retained during harvest, but once they fall, there will on average be half as many snags as in an unharvested stand with the same attributes. The rate of cavity tree, snag, and coarse woody debris will be reduced, on average, since the processes that create those resources have less raw material to act on. This reduction happens in a landscape that is already depleted in these resources. Moreover, older stands naturally create fine scale early successional habitat through gap-phase dynamics more readily than middle-aged or younger forest, such that allowing stands to age also leads to more naturally-created ESH. Again, the effects of harvest can be minimized by focusing treatments on younger stands that are common in the Foothills Landscape and far from producing these resources at a substantial rate.

*f. Back-loading obligations*

In some ways, we understand the agency's reluctance to get into the fine details of its logistical constraints at public meetings. However, logistical constraints are likely to influence how treatments are carried out, and hence their ultimate effects. Put another way, logistical constraints may cause proposed treatments to differ from the treatments that are actually applied. We cannot provide realistic feedback on the planned treatments without considering logistical constraints. Not knowing the location of stands adds additional uncertainty to the logistical constraints and further hinders the public's ability to provide meaningful feedback.

Many of the treatments included in the proposed action include long-term obligations. These include herbicide and manual release treatments, and pre-commercial thinning. Those treatments represent a financial liability. The effectiveness of the proposed treatments will be compromised if future agency personnel decide they do not want to, or cannot, spend resources on follow-up treatments. We note that roughly half of the pine plantations in the Foothills are considered inoperable. Those plantations have not and are not receiving the follow-up treatments that were planned when the original plantation-establishing project was implemented. As another example, the prescribed burns associated with woodland creation in the Brawley Mountain Project were not completed on schedule which may have given stands an additional growing season making them more resistant to fire. The reasons for failing to implement treatments varies over time—*e.g.* instead of steep slope restrictions, road conditions may be limiting—but the agency should consider the full range of possible outcomes in planning these treatments. In other words, what effect will a treatment have if the agency cannot implement follow-up treatments used to justify the action originally? In accordance with its adaptive management approach, that question should be answered considering the outcome of past projects that failed to implement planned follow-up treatments.

*g. Relative timing of prescribed fire and timber harvest*

The proposed action does not appear to make a definitive statement, but the plans for treatments in new prescribed burn units seem to be to harvest timber before beginning burning. Burning before harvesting has a number of advantages, and it would be helpful for the agency to clarify its position.

Controlling woody sprouts of undesirable species is often challenging. If burns occur first, overstory shade will create a stressful environment for sprouts to recover. Sprouts will have less energy available to use for recovery. Conversely, if harvests occur first, the high light conditions will provide sprouts more energy to recover. Larger sprouts will also require more herbicide and may be more difficult to ultimately control with herbicide.

Burning first allows harvests to be planned taking into account actual burn capabilities. Burn unit boundaries often require tweaking after the initial burn to produce safer and more manageable fire lines. Those changes may result in harvest stands moving in or out of the burn unit. As the proposed action shows, whether a stand can be burned or not changes the appropriateness of proposed treatments. Burning first, and knowing for certain which areas can be managed with prescribed fire, allows the agency to better evaluate if it should move forward with the rest of the planned treatment despite the lack of burning. Some treatments in the proposed action also specifically plan on growing season burns. When we have discussed growing season burns with the agency, wildland firefighters being deployed for the western fire season and the scarcity of days with suitable burn conditions have been mentioned as factors limiting growing season burn capacity. To make sure the plans for growing season burning match capacity, the full round of burns should be completed first. If all stands cannot be burned in the growing season, treatments can be adjusted appropriately.

Related, just because a stand is in a prescribed burn unit does not mean the stand will actually burn. Completing a prescribed burn first allows silvicultural treatments to be planned around parts of the unit that actually burned. While some variation is expected from one burn to the next due to weather, the initial burn can reveal areas that are surprisingly inherently fire prone or fire resistant.

Finally, this project is largely about maintaining the status quo. The goal is to roughly keep the proportion of oaks and pines on the landscape that regenerated 100 years ago. Logging after repeated burning, in the era prior to fire suppression, produced the modern oak and pine forests.

*h. Monitoring*

In several places the proposed action mentions the need for monitoring. Monitoring is even more important in this project than it has been in past projects. First, the scale is bigger.

There is simply more at stake. But there is also greater opportunity given the adaptive management approach. Issues caught early can be acted upon, and the improvements will play out over a large area.

Second, this project involves many new treatments. Even the most carefully researched and thought out plans can go awry in such a complex environment. The only way to tell for certain whether a treatment will work is to record what happens when it is implemented. As such, experimental treatments should be a manageable size to ensure that monitoring can be completed.

Third, every treatment in this project is occurring in a changed environment. Climate change is the most obvious factor, but NNIS are also fundamentally altering ecosystems. These ecosystems are at a unique point in their history. They have never had fire reintroduced after so long without it, and each subsequent burn is a novel treatment. These new factors are also interacting with each other. Due to all this change, treatments that worked in the past may no longer work. Monitoring is necessary to make sure treatments still have the desired effects.

## **VII. Specific Timber Treatments**

Concerns outlined in this section are general in nature, assuming an “average” stand within the class targeted by each treatment. In other words, the concerns are focused on the conceptual treatments, but we are unable to offer thoughts on whether they are appropriate on specific areas or what the direct, indirect, and cumulative impact of the treatments may be. Particular stand conditions will dictate whether these treatments appropriate or inappropriate. Nevertheless, we offer our thoughts on ways to modify and improve the general conceptual proposals.

### *a. Southern yellow pine maintenance*

Like the agency, we have noticed a lack of shortleaf, pitch, and table mountain pine regeneration in the Foothills. These species appear in need of help, and creating the conditions that allow those species to regenerate will produce immediate benefits for the landscape. We question whether timber harvest is necessary in that process though. Yellow pine can be maintained relying on prescribed fire without including timber harvests. Prescribed fire gradually thins the duff layer and eliminates the midstory. As an example, in the Buffalo Range burn unit, a site in the Foothills that has been burned 13 times, shortleaf pine seedlings are common and Virginia pine is not regenerating. Occasional shortleaf saplings at the site indicate prescribed fire and naturally occurring gaps are sufficient to regenerate shortleaf pine. As a result, thinning to 40-60 ft<sup>2</sup>/acre basal area is unnecessary for yellow pine maintenance in prescribed burn units. The restoration plan also notes that maintenance “is not a regeneration treatment,” so there is no impetus for immediate results.



Thinning in prescribed fire stands will likely also have negative impacts on biodiversity. While the Restoration Plan describes harvesting “Virginia pine, white pine, and other less desirable species,” many yellow pine stands have oaks as associates or have basal areas greater than 60 ft<sup>2</sup>/acre. Hence, thinning is likely to remove desirable species now without increasing desirable species in the future. We understand thinning would be conducted to increase seed production and remove undesirable species. But seed production in these species is already sufficient to perpetuate stands. The threat of “undesirable” species is not their presence, but their potential to take over these stands. Fire will keep them in check, and create conditions for southern yellow pine to regenerate. By definition, less desirable species are a minority of the overstory of these pine stands. In that role, they increase the diversity of wildlife resources.

Changing wildlife habitat to benefit particular species also does not justify the thinning component of this treatment. We are not aware of any severely declining species that are specifically associated with or dependent on the type of habitat that including thinning would produce. Species either have robust enough populations that the slower thinning produced by prescribed fire should meet their needs, or are dependent on other kinds of habitat. Other treatments described in the proposed action do a better job of addressing wildlife habitat concerns.

We appreciate that the description of the treatment includes some description of the fire regime, rather than just stating that prescribed fire will be used. Knowing how “appropriate burning season” will be determined would help us better understand the treatment. The long-term planning implicit in applying fire treatments “less frequently” “upon achievement of the desired conditions” is also encouraging. We believe that step is critical in long-term ecosystem maintenance.

Openness to new ideas creates opportunities for improvement. Hence, we are glad the agency is collaborating with Southern Research Station scientists and conducting field trials on new treatments. While we support trying the expanded gaps treatment, we believe it should be attempted on a much more limited basis for two reasons.

First, the treatment is experimental with no record of success in the Southern Appalachians. Between the oak and pine versions, expanding gaps appears to be the largest treatment in the entire project, possibly exceeding 20,000 acres. That scale hardly seems like an initial trial. Treating such a large area should be reserved for approaches that have a proven track record based on scientific studies in this region. A recent review of gap-based silviculture in the journal *Forestry*<sup>13</sup> cautions that regeneration outcome of management are often inconsistent with theoretical predictions. See Kern *et al.* 2017 in Attachment J. These

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<sup>13</sup> Kern CC, JI Burton, P Raymond, AW D’Amato, WS. Keeton, AA Royo5, MB Walters, CR Webster, & JL Willis. 2017. Challenges facing gap-based silviculture and possible solutions for mesic northern forests in North America. *Forestry* 90: 4-17.

inconsistencies could be due to other gap characteristics (*e.g.* shape, aspect<sup>14</sup>) or forest conditions (*e.g.* seed bed, seed source, advance regeneration, competing vegetation, herbivores). This review reinforces the need for conducting research trials on a smaller, more manageable scale in the Foothills.

Second, the conditions in the Foothills make us question whether this treatment is likely to work here. The stands we observed had few to no young pines to place the gaps around, and we would not anticipate pine regeneration in those stands. The stands often had a dense understory. Even if the treatments were successful in the initial gap area, the surrounding thinning seems certain to release an abundance of white pine or red maple. That release would lead to a stand with little yellow pine. Herbicides would likely be overwhelmed in the face of so much existing advanced regeneration of competitors. Proceeding at a more modest pace, which would allow both the public and the agency to examine completed projects, would be more productive.

We also do not understand why the surrounding stand would be thinned to 50-70 ft<sup>2</sup>/acre basal area. A gap is an area without trees surrounded by areas with trees. This level of thinning would remove half the trees from many stands. Hence, this is a different use of the word “gap” than commonly found in the scientific literature. The expanded gap could also cover up to seven acres, many times larger than typical gaps in this region.

Related, the agency should explain how the “need for structural diversity” (Proposed Action, 8, 10) would be determined, and where southern yellow pine regeneration is anticipated that it does not currently exist. In our field visits, most areas did not have advanced yellow pine regeneration, so we could not tell where expanding gaps would be placed. Assessing how the treatment would affect individual stands was difficult (or impossible) without being able to estimate where gaps would be placed.

As an alternative to the large acreage proposed for this treatment, we recommend allotting approximately 600 acres for experimental trials of this treatment. That is enough acreage to include three to five stands on each ranger district. An experiment is only as good as the quality of the data collected from it, and data quality is limited by the resources available to collect it. Monitoring results on a larger area as proposed is unrealistic based on past monitoring on this forest. If there is a specific need for more canopy gaps, we suggest they be modeled on the distribution of canopy gap sizes found after natural disturbances.

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<sup>14</sup> Prévost M & P Raymond. 2012 Effect of gap size, aspect and slope on available light and soil temperature after patch-selection cutting in yellow birch–conifer stands, Quebec, Canada. *Forest Ecology & Management* 274: 210–221.

*b. Southern yellow pine restoration*

Southern yellow pine communities are in clear need of restoration in the Foothills and we are glad to see this concept included in the project. Past land use has left many of these communities heavily altered. As such, they should be among the highest priorities for management in the Foothills. We agree with the general view of the kind of sites that should be targeted for restoration. The targets should be further refined, though, to ensure that all treatments are in fact restoration, and that the sites most in need of restoration are not omitted.

Pole age (10 to 40 years old) Virginia and white pine should be included. Concentrated in the Blue Ridge but present on all districts, stands in this age range appear to be among the most departed from natural conditions. They typically have low species and structural diversity and contrast sharply to adjacent older stands in species composition. Omitting them would mean passing over many of the areas where this treatment could do the most good.

Older (greater than 80 years old) white pine stands should be closely examined before concluding that they were once yellow pine or yellow pine-oak stands. Hardwood stands on this Forest with dense white pine understories typically have some white pine in the overstory suggesting that white pine is dispersal limited. There needs to be mature white pine nearby, within a few hundred feet to provide adequate seed for white pine to colonize a disturbed area or an understory. Areas of dense older white pine likely had some white pine in the canopy prior to fire suppression. In the Foothills, we have seen these sites associated with large streams that would have acted as natural fire breaks.

The value of the artificial regeneration treatments appears to depend not only on the sites chosen, but also the follow-through after the initial treatments. We are concerned about the effect of this treatment if connected actions, such as noncommercial or potentially commercial thinnings, are not carried out as planned. Will that put these stands on a trajectory towards poor health that requires intervention to save them? Decade-old paperwork gets buried and budgets shrink, but southern pine beetle will still be here. Failure to follow through with future treatments may make these stands more susceptible to outbreaks.

We also question how the biodiversity of artificially regenerated stands will be encouraged. We understand restoring yellow pine stands requires walking a fine line. If the agency fails to foster the pines enough it will wind up without a pine stand. If it fosters the pines too much, it will end up with a plantation. While encouraged by the flexibility in the planting layout, we remain concerned that the current plans will shift the stands too much towards the plantation end of the spectrum. Given the emphasis on adaptive management, restoration, and lessons from past practices, the agency cannot justify creating plantations, intentionally or unintentionally.

In the natural regeneration version of yellow pine restoration, “a follow up harvest to remove the residual seed trees” appears completely counter-productive. To begin with, the seed trees are by definition the desired species. Removing them in no way restores the site. Perhaps more importantly, the seed trees are critical for the diversity of the stand. Without them, where will cavity nesters live? Without them, where will snags come from? Without them, where will bats find loose bark to roost under? Without them, where will coarse woody debris come from? If a wildfire sweeps through the stand killing the young pines, where will the next generation of pines come from? Treatments should add, not remove, complexity, including structural complexity. Removing the residual seed trees is not good for the forest.

We support thinning pine plantations to reduce southern pine beetle infestation risk. Since these stands are likely the most departed from the natural range of variability of all stands in the Foothills, they should be restored wherever feasible. Where adjacent areas lie outside of prescribed fire units, care should be taken that treatment of adjacent stands does not promote the recruitment of off-site loblolly pines.

Finally, we find it odd that southern yellow pine restoration is separated from oak restoration. Southern yellow pines typically occur mixed with oaks in the Foothills. That co-occurrence reflects broad overlap in their tolerance for drought, tolerance of fire, associated mycorrhizae, and need for light. The similarities suggest they could be restored together. Doing so would increase the landscape diversity of restored stands, produce more natural restored stands, decrease the risk of southern pine beetle attack, and provide the diversity necessary to adapt to a changing climate on a finer scale. We are not suggesting that all restoration should include both genera, but including mixed restoration would improve the overall project.

*c. Oak and oak-pine maintenance*

As we have pointed out on other projects, oaks play an out-sized role in providing resources for wildlife. A multitude of different wildlife species feed on acorns, and acorns often make up a large portion of their diet, especially in winter. In that role, they have become only more important with the decline of chestnut. We have also seen the scientific literature document the scarcity of oak regeneration across the eastern United States. Our own observations in the Foothills and rest of the forest generally match those findings. We are glad to see the agency taking oaks seriously.

All of our concerns about midstory reduction to maintain oaks on moderate to productive sites relate to broader issues. Please see our comments on herbicide use and retaining desirable species in the midstory and understory.

The agency proposes to regenerate, by a commercial harvest to 15-20 ft<sup>2</sup>/acre basal area, sites with “an adequate population of oak seedlings.” But those sites appear to already be in good condition and meeting the stated goals of the treatment. Both the overstory and the

understory are in the desired condition. Avoiding the soil erosion, stream sedimentation, water flow disruption, extensive herbicide use, and other impacts associated with such an intensive logging treatment should take precedence over conducting these unnecessary treatments.

Most of our concerns on maintaining southern yellow pines with fire treatments also apply to the maintenance of oaks with fire treatments. Again, commercial thinning and midstory reduction are not needed when prescribed fire will increase light levels. Most low to moderate productivity oak stands are strongly dominated by oak and other desirable species. Thinning these stands would remove desirable trees for no long-term gain. Midstory reduction would be a financial cost for no additional benefit in stand condition.

The specifics of the burn plans have multiple positive elements. Initial dormant-season burns should allow trees to redistribute their root systems lower so that no burn causes excess root mortality. Later shifts to growing season burns should be more effective at controlling competing vegetation and more closely match the burn regime that the ecosystem is adapted to, driven by summer lighting. Finally, we agree that building in some longer fire return intervals is essential for some trees growing large enough to withstand fire and perpetuate the canopy.

Our concerns about using the expanding gap treatment to maintain southern yellow pines, as described above, also apply to using this treatment to maintain oaks. On the Blue Ridge Ranger District in particular, stands that appeared to be candidates for this treatment had understories dominated by white pine. Even if the gaps in these stands were successful at regenerating oak, the thinning would release the pine understory and allow white pine to dominate the surrounding stand. At a stand level, this treatment appears unlikely to be successful on such sites.

Finally, we recognize the benefits of crown-touch release in immature oak stands. We remain concerned, however, about the excessive use of herbicide as outlined earlier, and recommend mechanical/manual treatments where possible.

#### *d. Oak and oak-pine restoration*

As we noted in our comments on the draft Restoration Plan, we understand how creating young oak stands would increase age class diversity on the landscape. It is true that if some pest or pathogen wiped out the roughly 100-year-old oak forests, having some young oak stands would keep oaks on the landscape. Young, even-aged, stands are one way to address this issue. But these stands have other problems that outweigh this perceived strategic benefit. Even-aged young oak stands are structurally simple, providing a relatively limited variety of wildlife habitat. It is also difficult for us to understand how creating these conditions could be restorative. Quite the opposite, it runs the risk of creating the need for restoration.

The better option is to foster advance oak regeneration across the landscape. That objective leads to all aged stands that provide more complex and diverse habitat. All aged stands are the historic condition of oak forests in the region. The Abrams studies that helped established lack of oak regeneration as a cause for concern were completed in old-growth, oak dominated forests, and those studies show stands dominated by oaks of many different ages. That the Foothills is currently dominated by even aged oaks stands is an artifact of past land use.

Focusing on advance regeneration also addresses the landscape-scale age distribution issues. Whenever disturbances, such as Hurricane Irma, impact the landscape, a new generation of oaks would be released across the landscape in naturally-created openings. If some pest or pathogen spread across the Foothills affected only one age class it would wipe out entire stands in the even-aged model. But all-aged stands would only lose scattered trees. Those trees would fall, continuing the gap-phase dynamic process. In that scenario the pest or pathogen would actually perpetuate, not diminish, oaks by facilitating the release of a new generation of oaks. Why settle for even-aged stands when we can have all-aged stands?

Our concerns with restoring oaks in Virginia and white pine stands match those described above for restoring southern yellow pine in these stands. We believe oak restoration in pine plantations is likely to be a very successful treatment, and are glad to see it included in this project. We have observed that where southern pine beetle or intense fires have killed the overstory in pine plantations, oaks often dominate the regeneration.

*e. Woodland restoration*

The description of woodlands in the Foothills proposed action is perhaps the best we have seen conceptually in any scoping document on the Chattahoochee-Oconee National Forest. The description lays out the relevant information without overstating points. The workshop on this topic seems to have been productive and brought us closer to a mutual understanding of the role of woodlands in the Foothills.

Description of how the treatment is carried out also generally appears straight-forward, though earlier comments on herbicides and the order of timber harvests and prescribed fire are still applicable here. But perhaps more than any other treatment whether this treatment is appropriate, and can be successful, or not, comes down to the sites selected. Converting all 7,400 acres preliminarily identified as potential woodland sites seems unrealistic, and could do more harm than good, such as draining financial and other resources, and ultimately failing. Success requires choosing sites that were historically woodland and that naturally tend toward woodland rather than forest. However, based on the information in the proposed action, particularly the lack of site-specific information, it is impossible for us to predict whether these treatments will be beneficial or not.

Our main quibble with the methods presented in the proposed action is related to the issue of characteristics of degraded woodlands on the CONF and the viability of commercial timber harvest. Woodland treatments should be planned under the assumption that they will be noncommercial. We are not necessarily opposed to commercial harvests—if the infrastructure supports commercial harvest and commercially valuable trees are present. But tall, straight trees, the kind that are commercially valuable, reflect at least a minimal level of site productivity. Stands with many of these trees indicate higher levels of site productivity which in turn suggests the site is naturally forest rather than woodland. There will be exceptions, such as where extreme soil conditions limit tree regeneration, but an abundance of commercially-valuable trees should be a red flag for woodland treatments. Creating excessive fuels through noncommercial harvest should also not be a concern in these stands. Only the exterior of boles are consumed in prescribed fires, and boles do not drive fire behavior. The slash produced in a commercial harvest would present essentially the same fire concern as the slash produced in a noncommercial treatment.

Since the woodland scoping discussion explicitly links to the Restoration Plan woodland discussion, we feel the need to clarify some points we made there. In our comments on the Restoration Plan, we asked “what is the [considerable evidence] for ‘extensive’ woodlands in the southern Appalachians”. Our focus here really is on the “evidence” question. In other words, what in the physical world supports the claim that extensive woodlands were present in the Southern Appalachians, and by extension on the Chattahoochee?

The agency put forth Delcourt and Delcourt 1997, Van Lear and Waldrop 1989, Rankin and Herbert 2014, and Wear and Greis 2002 as evidence in response to our question. Three of those four - Van Lear and Waldrop 1989, Rankin and Herbert 2014, and Wear and Greis 2002 - are summaries. They do not contain original research or put forth any new evidence themselves. With regards to woodlands, citing these articles is an appeal to authority. Those authorities are knowledgeable, and their conclusions certainly warrant serious consideration. What we want to do is seriously consider their conclusions. Does the evidence bear them out?

Delcourt and Delcourt 1997 is the only authority cited by the agency that presents actual evidence—the authors went into the field, collected data, and analyzed that data. That type of research certainly provides a foundation for evaluating the agency’s claims.

That said, the claim that there were extensive woodlands in the southern Appalachians is an extraordinary claim. The proposition asks us to believe that the landscape and dominate ecosystems we see today were completely different in the recent past. Such a bold claim requires strong evidence that, from our perspective, Delcourt and Delcourt 1997 does not provide.

For starters, the findings are based on *a single peat core from a single site*. All the usual caveats about small sample sizes apply. Randomness plays a large role in small samples, and

often leads to them not reflecting the broader population they are intended to represent. According to the agency's response in the Restoration Plan, the key supportive findings are the abundance of grass and oak pollen going back thousands of years. Grass accounted for less than 10% of the pollen for most of the core, but spiked to 30% at one point. But 30% pollen in one peat core does not mean that 30% of an entire landscape was grass - not even as an oversimplification. Grass, like all other vegetation, is spread unevenly over the landscape. The amount of pollen in the bog the Delcourts sampled is highly dependent on the proximity of concentrations of grass to the bog. A small amount of grass nearby or a lot of grass far away could produce the same pollen record.

Additionally, assuming that the pollen proportions the Delcourts found are representative of the landscape leads to other contradictions. For instance, the Delcourts also found an abundance of chestnut pollen, even after the chestnut blight. Rather than make the claim that a high number of chestnuts withstood the blight, the Delcourts attributed the abundance of chestnut pollen to an abundance of another species in the same genus with indistinguishable pollen, Allegheny chinquapin. If a significant amount of grass pollen suggests that grass was dominant on the landscape then a significant amount of Allegheny chinquapin pollen should suggest it was also dominant on the landscape. To the contrary, Allegheny chinquapin is a shrubby species that does not form dense stands and does not dominate individual stands, much less large portions of the landscape. Thus, there is good reason to question whether an abundance of grass pollen necessarily means grass was abundant on the landscape.

Overall, the evidence for widespread woodlands in the Southern Appalachians is weak. Several other lines of information—historical accounts, historical photographs, differences in climate relative to other regions with woodland, lack of physical legacies, etc.—support the conclusion that forests have dominated the southern Appalachians for millennia and woodlands were scarce.

To be clear, we are not arguing that there were no woodlands, only that woodlands were rare. That does not mean woodlands are not valuable. They certainly can provide valuable habitat. We go to such lengths in this discussion 1) in an attempt to be clear about our position, and 2) because of the focus on “achievable” conditions throughout the description of the Foothills Project. We worry that an overly enthusiastic view of woodlands will lead to overly ambitious woodland creation attempts on sites that were not woodlands and that will fight to be forests. We have previously identified to the agency sites that we believe were historically woodlands that we would like to see restored to that condition. We hope these sites will be prioritized.

#### *f. Pine plantations*

We support the pine plantation thinning treatments. Plantations are often the most departed stands on the forest and where restorative treatments can accomplish the most good.



They are also often most at risk for disease and pest outbreaks. For off-site plantations, most likely loblolly, we suggest taking precautions against regenerating the species. Prescribed fire is one likely option, but some sites may need to retain enough basal area to keep light levels below seedling requirements. Taking these steps should make the process of moving these stands closer to their natural condition (i.e., restoring them) more successful.

*g. Early Successional Habitat*

We recognize both the value of ESH and its departure from natural levels on some parts of the landscape. Many natural processes that produce early successional habitat, such as fire and beavers, have been greatly reduced on the landscape. We favor the restoration of those processes to the extent possible. However, we recognize that ESH dependent species have immediate needs, and that timber harvests can produce ESH.

The first step in planning young forest and ESH creation should be assessing the types and quantities of ESH on the landscape. Since plants, birds, small mammals, and other wildlife are all notoriously bad at recognizing property boundaries, ESH assessment should take an all lands approach. We recognize that ESH on private land is often qualitatively different from ESH produced by agency projects, but it still provides good habitat for some species. ESH on private land should be assessed as part of a diverse spectrum of ESH. There is also some ESH on private land that resembles agency produced ESH which should be considered, such as abandoned fields on the Etowah River just downstream of the project.

As we noted in comments on the Restoration Plan, the initial tally of ESH on agency land left out several important sources. Recent projects, particularly along Water Gauge Road, have produced extensive early successional habitat. Powerlines, due to their length, accrue a surprising amount of ESH. Both the Upper Warwoman and Cooper Creek projects noted that prescribed burning has produced ESH. In the Foothills, the Hickory Ridge Burn Unit appears to have on the order of 200 acres of ESH. Existing burn units will periodically provide ESH and new burn units will provide additional ESH. These sources should be accounted for in calculating ESH on the landscape. Naturally-occurring ESH should be accounted for as well.

Even accounting for these sources of ESH, some prescriptions will fall short of their maximum-level ESH limits. At a base level, timber harvests for ESH favor the existing understory over the existing overstory. Hence, we recommend producing ESH in areas where the understory has a more desirable species composition than the overstory. The southern yellow pine and oak regeneration treatments outlined in the proposed action generally meet that criterion.

Creating ESH in mesic stands could also meet that criterion, depending on the stands chosen. Old field stands would be a good choice for this treatment. They tend to have

overstories with both low species and low structural diversity. In the Foothills, we have seen tuliptree stands of that type on the Blue Ridge and white pine stands on the Chattooga River.

Treating edges of permanent openings (*e.g.*, wildlife openings, roads, etc.) to create ESH has the advantage of leaving undisturbed areas intact and concentrating disturbances in already disturbed areas. However, the treatment also has the potential to make NNIS problems worse. Invasive species should be removed from edges before the area is treated. The invasives should not simply be treated first, but completely eliminated, with elimination confirmed by monitoring. Initial treatments often leave residual populations of invasives, which are still fully capable of colonizing the new ESH area.

We still see no reason why new permanent openings are needed in the Foothills. Despite much emphasis on establishing clover and numerous attempts over the decades, nearly all openings consist of non-native low value fescue. It is difficult to see what would change in the future and the agency does not appear to have considered how to prevent this recurring outcome despite the emphasis on adaptive management. As we pointed out repeatedly and in different ways in our comments on the Restoration Plan, the bigger concern is that permanent openings provide the worst form of ESH available. They provide the least habitat value to wildlife, even though providing habitat to wildlife is the whole point of wildlife openings. Permanent openings do not resemble natural habitats, and thus no species are specifically adapted to them. As such, they cannot be justified as restoration. They are also the most similar to the ESH that is provided abundantly on surrounding private land.

While the agency's mandate "to contribute to the viability of native and other desirable wildlife species" may explain producing some form of ESH, there is no reason it needs to be the worst option – permanent openings. This is particularly true given that the proposed action provides other, better options for creating ESH, such as oak and yellow pine restoration. These options provide more complex habitats, better habitats for declining species like prairie warbler, and habitats that are less likely to be found on private lands. Our wildlife deserve these better options.

At the very least, the agency should ensure that existing wildlife openings are functioning properly and beneficially before new permanent openings are created. Autumn olive, an NNIS commonly planted in wildlife openings in decades past, still infests many openings. In many cases, the species has spread into adjacent areas and has completely taken over some abandoned openings. The invasive should be eliminated from these areas before new openings are created.

We appreciate the agency examining already disturbed areas, such as right-of-ways, and considering ways they could be managed to provide higher quality wildlife habitat. That approach seems to be the most likely to actually improve overall wildlife habitat rather than merely trade one type of habitat (older forests for instance) for another (younger forests).

However, we are also surprised and somewhat confused by the plans for right-of-ways. For years, the agency has told us about the value of early successional *forest* habitat and how it provides benefits not found in other forms of ESH. We have been told that while there is an abundance of ESH on the landscape, such as fields, there is a shortage of early successional forest habitat. On the Watergauge field trip, we stood in a recently harvested stand dominated by woody regeneration and heard it described as high-quality ESH. The discussion of right-of-ways seems to take the exact opposite approach. Now tree saplings are the enemy and entirely herbaceous areas are the goal.

We agree with the position the agency has held elsewhere, that woody early successional communities provide valuable habitat, and we believe it unwise to eliminate them from areas where they are maintained by default, such as right-of-ways. Even the report cited in this section of the Restoration Plan argues for the value of woody vegetation in right-of-ways. The report contains a photo labeled “ROW with *minimum* shrub cover for golden-winged warbler” (emphasis added).

Perhaps more important, the existing conditions in Foothills right-of-ways are the desired conditions as described in the proposed action. We examined a mile of power line right-of-way south of Macks Mountain and a quarter mile of power line right-of-way north of Stonewall Falls. Grasses and forbs dominate the Macks Mountain right-of-way and grasses, forbs, and low bush blueberry dominate at Stonewall Falls (low bush blueberry provides habitat similar to a forb since it is low-growing and flowers and fruits within the maintenance cycle of a right-of-way). Pine seedlings were also common at Macks Mountain, but they were scattered within the matrix of grass and forbs and are suppressed as easily by herbicides as by mowing. There were patches dominated by tree saplings, but these were largely restricted to very steep slopes (>60%), likely because close mowing was impractical in those areas. Invasive species were restricted to scattered individuals except for two patches of honeysuckle and a patch of shrub lespedeza associated with a road crossing.

Overall, managing right-of-ways with herbicides appears unlikely to improve wildlife habitat. In fact, the proposal would homogenize habitat and eliminate a valuable form of ESH. As discussed elsewhere in this document, herbicides pose a significant risk to ecosystems and should be avoided where possible. We see the right-of-way herbicide treatment as offering no gain while creating a significant risk.

#### *h. Canopy gap creation*

We are glad the agency recognizes the importance of gap dynamics but we are having trouble understanding the justification for this treatment and where it will occur. In response to our comments on the Restoration Plan, the agency listed three declining species as targets: cerulean, Kentucky, and hooded warblers. As far as we know, cerulean warbler does not occur in the Foothills, and has not been recently extirpated from the area. Attempts on this Forest to

create habitat for cerulean warblers using gap based silviculture were successful in areas that already had a population but not in areas where the bird was not already present. The Foothills does not seem like an appropriate area for cerulean-based treatments. Kentucky warblers are declining. According to the North American breeding bird survey, hooded warblers are common and increasing. We routinely hear them in areas with dense heath understories.

The proposed half acre to two acre gaps appear too large when compared to gap sizes documented in several scientific studies, particularly for cerulean warbler. Researchers from various agencies and institutions, including the Forest Service, found that cerulean warblers typically breed in “landscapes that are primarily forested (e.g. >75% forest cover within ~6 miles of the project area). ... Nests are typically in the largest trees available at the site. ... [They] favor the complex canopy structure characteristic of uneven-aged stands and old growth and prefer canopy gaps ~400-1,000 ft<sup>2</sup> in size,” with vegetative growth within them.<sup>15</sup> See Wood *et al.* 2013 in Attachment K. Another study found that “cerulean warblers preferred bottomland forests containing tall (> 95 ft), large diameter, well-spaced (> 117 ft<sup>2</sup>/acre) deciduous trees with greater canopy cover (≥ 90%), closer (< 65 ft) canopy gaps, fewer snags (≤ 10/acre), and a moderately complex canopy structure.”<sup>16</sup> See Carpenter *et al.* 2011 in Attachment L. “They are known to associate with small canopy gaps and small internal forest openings.”<sup>17</sup> See Wood *et al.* 2006 in Attachment M.

The smallest canopy openings proposed in the Foothills Project (0.5 acres or 21,780 ft<sup>2</sup>) are **22-54 times larger** than preferred canopy gap size, and reduction of basal area to < 60 ft<sup>2</sup>/acre may be too great. That mismatch between the proposed treatment and the natural range of variability makes us question the effectiveness of the treatment not only for ceruleans, but for a broad range of species. The treatment description also does not discuss the current structure of targeted stands. Some stands on the landscape have a relatively simple and uniform structure, while others already have many gaps in them. This proposed treatment will impact those areas differently, making site-specific knowledge of the area where the treatment will be applied necessary to providing informed comments.

It is also unclear exactly what the treatment entails. The proposed action describes “retaining variable tree densities” but that sounds more like a thinning than a gap treatment. If gaps are placed too close together, they will not function as gaps.

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<sup>15</sup> Wood *et al.* 2013. Management guidelines for enhancing Cerulean Warbler breeding habitat in Appalachian hardwood forests. American Bird Conservancy. The Plains, Virginia. 28 pp.

<sup>16</sup> Carpenter *et al.* 2011. Avian Community and Microhabitat Associations of Cerulean Warblers in Alabama. The Wilson Journal of Ornithology. Vol.123, pp. 206-217.

<sup>17</sup> Wood *et al.* 2006. Cerulean Warbler Abundance and Occurrence Relative to Large-Scale Edge and Habitat Characteristics. The Condor Vol. 108, pp. 154-165.

The proposed action and Restoration Plan also do not explain why the treatment is better than the alternative of letting gaps form naturally. That should be addressed in the agency's environmental analysis. Gaps are inevitable in these forests as trees die and fall. Naturally formed gaps will provide a greater variety of habitats. Some will include standing dead trees while others will be produced by falling trees. Some of the falling trees will uproot, which is not the case with cut trees. Some gap makers will survive after falling and provide particularly dense cover near the ground. Artificially produced gaps only simulate the scenario where a tree snaps and dies immediately. Without more details on what the treatment entails and what stands will be targeted, we cannot support this treatment even in concept.

*i. General forest health maintenance*

This proposed treatment is particularly unclear. As far as we can tell, the general forest health maintenance treatment seems targeted at regenerating oaks and pines. Whether cutting down or herbiciding the midstory is beneficial overall, or not, depends on many factors such as what species are in the overstory and midstory, whether there a dense evergreen understory, whether trails or fires would be affected by the dead midstory, etc. The proposed action provides even less information on treatments that would occur after natural disturbances. What are the desirable species and why? What species would be planted? Would the treatment differ if it were in a prescribed fire unit? Without this missing information, information on where this treatment would occur, and total acreages treated, there is no way to evaluate this proposal.

## **VIII. Old-growth designation**

We appreciate the agency taking its old-growth obligations seriously and following applicable guidance. We also appreciate the agency specifically highlighting old-growth in the community conversations and workshops. We hope those conversations gave other stakeholders a clearer view of what old-growth in the Foothills looks like and helps people understand the requirements for the agency to designate old-growth.

The agency's openness to considering all available information concerning old-growth in the Foothills is commendable. We know it would have been faster for the agency to consider only data from FS Veg. By including information from local surveys targeted at locating old-growth, we believe the designations better meet the intent of the Region Eight old-growth guidance and the desires of the public. The Carlson study of old-growth in the Chattooga Watershed is currently being digitized, and we urge the agency to also designate stands identified in that study when the information becomes readily available. Finally, as discussed below, we believe that agency is still obligated to conduct old-growth surveys in areas slated for timber management.

## **IX. Non-native invasive species**

Globally and in the Foothills, non-native invasive species are one of the biggest threats facing natural ecosystems. They have the capacity to completely eliminate entire species from the landscape and destroy existing ecosystems. NNIS also threaten many of the other treatments in this project. What good is prescribed fire if it just allows the area to be taken over by princess tree? The same question can be asked for canopy gap treatments that fill with oriental bittersweet and thinning treatments that become dominated by Chinese silvergrass; and those are just examples.

We understand that resources for dealing with NNIS are limited. We also know that many people within the agency care deeply about NNIS. We have seen the agency keep hemlocks on the landscape in the face of a fast moving and uniformly lethal NNIS. We have seen the agency do yeoman's work in protecting rare habitats. And we know that we will simply have to live with some invasive species.

However, we feel this project represents a unique opportunity to confront invasive species, and time is precious in addressing NNIS. They represent an inherently landscape scale threat. They do not respect boundaries and many are highly mobile. To deal with them effectively, they must be controlled across the landscape.

In our discussions with the agency about specific NNIS populations, we are often told the agency cannot respond or cannot respond quickly because it does not know exactly where to treat NNIS. Forest stakeholders can help with that. The Foothills (and the rest of the forest) is a big area to record NNIS, but every day people traverse the places most likely to support NNIS. Digital applications and databases for documenting NNIS locations are provided by the Center for Invasive Species & Ecosystem Health at the University of Georgia. Although our understanding is that the agency compiles a separate database, University of Georgia staff in Tifton provide public training on how to identify NNIS and load that information into relevant databases and applications. Agency staff and contractors also repeatedly visit treatment sites and can help identify invaded areas. The Foothills Project is an ideal opportunity to use a landscape-scale approach to monitor the spread of NNIS and to coordinate with state-wide partners like UGA to control their spread. We are more than happy to help facilitate that process.

We were glad to see in the Restoration Plan that the agency is contemplating how to prioritize NNIS. That still needs to be coupled with an assessment of what NNIS can realistically be removed. The efficiency of controlling individual populations also needs to be accounted for. On a Foothills field trip, we saw a small population of Japanese spirea along a Forest Service road on the way in to the site. The particular district previously used timber receipts to treat a larger roadside Japanese spirea population elsewhere in the district. We support the decision to treat the larger population but note that while treating smaller populations

may seem like doing less, it is generally much more cost efficient. Small populations turn into large and difficult to control ones quickly.

Related, we noticed that some NNIS contract work does not appear to be effective in the long term, because portions of the NNIS population are missed. In these cases, the NNIS just spreads from the remnant population, and in a few years things are back where they started. In other areas where the initial treatment was thorough, a few individuals are inevitably missed or come back from the seed bank. We realize that the agency already follows up after treatments, but that follow up period needs to be extended, which will require more careful data tracking. Failing to complete adequate follow-up treatments risks invalidating the initial treatment entirely.

By gathering stakeholders, the Foothills also presents a good opportunity to look for creative solutions to particularly challenging NNIS. Hog damage last year was the worst in recent memory. Hogs' intelligence, broad diet, and wide roaming make them a challenge to control. Many different stakeholders are upset and focused on them right now. Bringing those stakeholders together to brainstorm about how to control hogs may generate a novel solution. It also may not, but the cost to ask people is very low and a solution would be extremely valuable.

The proposed action barely mentions the impending arrival of several tree pests. Thousand canker disease is on the forest's doorstep and emerald ash borer is likely already here. Laurel wilt is also impending, and others like sudden oak death and Asian long horn beetle may still wreak havoc. The time to plan for these species is before they get here. Relying on general tree health to combat these species is an ineffective strategy as many non-native invasive pests and pathogens attack even healthy trees. The agency's response to hemlock wooly adelgid is a good model to follow in combination with applying the best available science for each species. Note that no hemlocks were saved on the upper Chattooga River because the adelgid hit that area before a plan was in place to save trees. Some of the other non-native invasive pests and pathogens will be even more difficult to combat, but some trees can be saved. The Nantahala-Pisgah National Forest is already treating ash along the Appalachian Trail to protect them from emerald ash borer.

We recognize that we do not have all, even many, answers on NNIS. But collectively, given the risks NNIS pose for the forest, the agency and stakeholders must come together to attempt to develop a plan to combat these pests. The Foothills project seems like too good of an opportunity to pass up to get that conversation started in earnest.

## **X. Rare habitats**

We appreciate the efforts described in the proposed action to maintain or restore rare communities and ecosystems. They contribute to landscape level biodiversity far out of proportion to their limited spatial extent. They also harbor rare species with no other options for

survival and enjoy broad public support. As such, they are great opportunities for maximizing limited resources through partnerships and volunteer labor.

Monitoring should be integrated into all of these restoration activities but particularly for rare habitats. Due to the rarity of these areas, techniques for their restoration are often experimental. Lessons learned from these restoration efforts may also help save these communities in other regions. Careful records of what was done and the outcomes would facilitate that sharing of information. Monitoring could also help identify problems in these habitats before they become irreversible.

We support efforts to restore bog (fen) and other wetland communities. Restoration of hydrology should be a top priority. Many other issues, including woody encroachment and NNIS invasion are facilitated by altered hydrology. Ongoing work to maintain these sites such as brushing back woody growth should be continued.

Beavers should be reintroduced or promoted wherever possible. Beavers are ecosystem engineers with profound effects on both aquatic and terrestrial habitats. The shortage of ESH on mesic sites probably reflects the decline of beavers more than any other factor. Where they interfere with other resources, creative solutions should be sought. For instance, stand pipes may be able to lower water levels without disturbing the beavers. Beavers have already undergone dramatic population declines and only a fraction of their original habitat is now available to them.

The plans for canebrake restoration appear to have multiple positive features. Focusing on areas that already have some cane present suggests the projects are restorative and makes them more likely to succeed. Using a variety of different treatments also makes it much more likely that some successful method will be found. As mentioned above, regular monitoring should be part of this process. We also support making the cane available to the Revitalization of Traditional Cherokee Artisan Resources.

Installing a chestnut orchard is a necessary step towards restoring chestnut in the Southern Appalachians. The loss of chestnut continues to dramatically impact both wildlife and other plant species in the Foothills. The proposed actions are a reasonable contribution towards restoring this species.

We support efforts to find ways to improve small whorled pogonia habitat. We note that prescribed fire is suggested as a way reduce canopy. The population bottleneck could be seedling establishment, with duff character a critical factor. We suggest monitoring duff thickness and considering the way different prescribed fire regimes would interact with the duff.

We recommend any milkweed planting in canopy gaps be limited and carefully monitored. Forbs are typically common in canopy gaps that can support them. Milkweeds in



canopy gaps may not add appreciably to pollinator resources or may be outcompeted by other plants.

We commend the Forest Service and its partners for all they have done to combat hemlock woolly adelgid (“HWA”). HWA has been a catastrophe for this forest. We appreciate that the agency did not sit back and idly watch the destruction unfold, but instead aggressively fought to preserve hemlocks where possible. Healthy hemlocks on the forest, invariably with tags on them, remind us of the coordinated efforts of the Forest Service, Georgia Forestry Commission, researchers, beetle labs, and the community volunteers who provide both labor and financial resources to help with these efforts.

We also appreciate that the agency is not resting on these successes, but is looking for new ways to conserve hemlocks. Continuously striving for improvement, combining resources through partnerships, and open discussion of results will generate the best outcome for hemlocks, and ultimately, for the people who use the forest. That approach requires considering the latest research, taking a hard look at what is working and what is not working, and trying new approaches.

However, “looking to pursue many alternatives to [hemlock] conservation” does not guarantee that those alternatives will be successful or beneficial. Additionally, approaches that work in some contexts (environments) may not work in other contexts. We particularly caution against assuming that high light environments alone will save hemlocks.

We have seen hemlocks growing in high light conditions in the Foothills, for instance in the 2011 tornado path, that look surprisingly healthy. The thick upper crowns and rapidly growing leaders give the impression that those trees could mature and survive. But we have also seen that response before. In the Smokies, in the upper Chattooga River watershed, and elsewhere in north Georgia nature has already run the experiment to see if untreated hemlocks growing in high light environments would survive the adelgid. In those areas, hemlocks grew in natural canopy gaps, next to streams with full light on one side of the crown, and in large openings left by Hurricane Opal, but in each instance the hemlocks ultimately succumbed to the adelgid despite these high light environments.

The research of Brantley *et al.* (2017)<sup>18</sup> with hemlock seedlings assessed the question of whether high light could reduce HWA infestation and improve carbon balance of infested eastern hemlock seedlings. Leaf-level physiology and tissue nonstructural carbohydrate measurements are strongly affected by season, time of day, and light level, and growth is strongly affected by light level. Without a “no HWA” control at all light levels to tease out the interaction of HWA

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<sup>18</sup> Brantley ST, Mayfield III AE, Jetton RM, Miniati CF, Zietlow DR, Brown CL, & JR Rhea. 2017 Elevated light levels reduce hemlock woolly adelgid infestation and improve carbon balance of infested eastern hemlock seedlings. *Forest Ecology and Management*. Vol. 385: 150-160.

density and low light effects on these parameters, one needs to be cautious in interpreting their results.

Caution must also be exercised in extrapolating seedling responses under highly-controlled situations to field conditions. The hemlocks seedlings in the Brantley study were grown without below ground competition and were watered regularly. Perhaps more importantly, the seedlings were infested with adelgid for only 14 months. In the wild, adelgid populations build up over years, and often take several years to kill hemlocks. Finally, not all adaptive traits or responses in seedlings are good predictors of how mature trees will respond to the same stress in the field; consequently, these responses need to be tested on mature trees.

While a high light environment is not enough to save hemlocks, the improved health and slower adelgid growth in that environment raises the possibility that other treatments will be more effective in combination. The obvious place to start is to combine high light with predator beetle releases. Predator beetles may be able to keep up with the adelgid in that environment. Monitoring would be a crucial component to determine the impact combining these treatments. Identifying situations where existing biocontrol can be successful in keeping hemlocks alive would be an important step for hemlock conservation.

The other application of increasing light on hemlocks is field insectories, as identified in the proposed action. This treatment could not only make research more financially efficient, it could accelerate the process. Monitoring should also be fairly easy in this situation since people would already be going to the trees to collect beetles. We support treatments combining beetles with high light, but do not support high light treatments alone.

Areas where the adelgid killed hemlock forests are clear candidates for restoring hemlock. We hope hemlock is restored to those areas. The questions are “when” and “how”. As we stated in response to the Restoration Plan, we do not believe the answer to “when” is “now.” There is no urgency for restoring these areas. The hemlocks that have been saved should survive for decades or centuries. At the other end of the spectrum, we are aware of no recent development that makes outplanted trees likely to survive on their own. Any hemlock planted would be on life support and a resource drain. And as we discuss elsewhere in this document, those same resources could go to protecting individuals of other threatened species, species without any protected individuals.

It is not our intent to quell research, but to offer our feedback on a topic of great interest to us. We support the agency working with research institutions to implement well designed studies—where sites are carefully chosen so that inferences can be made about where results apply and where they may not, where appropriate controls are included to evaluate treatments against, and where metrics are regularly tracked to quantify the impact of treatments. That is the right approach and should be a high priority. Our concern is that the proposals for thinning around hemlocks and outplanting hemlocks do not sound like they are confined to such

meaningful studies. We caution against simply implementing treatments anywhere that look good, assuming positive results, and not monitoring.

Finally, we support the plans to expand existing hemlock conservation areas. The existing areas have worked well, and provide a unique benefit.

## **XI. Prescribed fire**

Having a safe and effective prescribed fire program is one of the most important management challenges facing the Foothills. Fire poses an obvious threat to life and property, and fire is one of the most widespread causes of disturbance on the landscape. Fire is not an on-or-off phenomenon. The effects depend not simply on whether or not there is fire, but on the fire *regime*. The ecological effects of fire depend on the season, intensity, scale, location, and frequency of the burns. This basic information is missing from the proposed action. Some of the silvicultural descriptions contain pieces, but the complete information is not provided for any burn units. This information has been provided, at least in general, by past scoping notices. Without this information, neither we nor other stakeholders can evaluate the prescribed fire plans.

We are left to suggest some general best practices for prescribed fire in the Foothills. We confine these suggestions to the variables list above, since we have generally found the burns to be implemented in a highly professional manner with good mechanisms for error correction.

The first burn in a unit should be during the dormant season. This minimizes the stress from the first burn and allows fine roots to be redistributed deeper in the soil profile so that future burns will produce less stress. In general, we recommend low intensity burns unless the goal is to produce ESH or regenerate species adapted to high intensity burns, like table mountain pine. We have noticed moderate to high intensity burns used after some timber treatments. These burns may kill residual overstory trees, but do little to control woody sprouts. Even in pine beetle killed table mountain pine stands that burned in the Gatlinburg Fire, mountain laurel sprouted back after the fire. We recommend modeling frequency on the fire regime most species in this region evolved under. The fire return interval in this regime, which would be dominated by lightning fires, is poorly known, but would likely have been on the order of 20 years on many southern Appalachian sites. The first few burns may need to be more frequent while duff thickness and sensitive understory species like white pine are reduced. Scale and location will likely depend on the location of fire breaks.

The additional information regarding how prescribed burn units will be placed to reduce wildfire risk to structures is reassuring. Using SouthWrap and targeting areas like “National Forest Lands located down slope of developed private lands” sound like effective steps in reducing risk. The Protecting Communities from Wildfire section generally sounds well thought out, but still, we lack information necessary to fully evaluate these proposals. We suggest the

prescribed fire planning be further strengthened by more careful consideration of the role of fuel mitigation in different vegetation types. Pine fuels can build up and increase in vertical spread over several years. Dense evergreen heath understories create ladder fuels that can lead to intense crown fires. Prescribed fires in these areas can alter fire behavior for several years. Hardwoods develop continuous fuels very quickly. Hardwood litter also quickly decays into fuels that do not promote high intensity fires. Hence, the effects of prescribed fire in hardwood forests on wildfire behavior largely last only until the next fall.

Researchers in northern Mississippi mixed hardwood pine forests—the study in the ecosystems most similar to the Foothills—found that prescribed fire did not reduce wildfire extent or intensity. We do not have hard data, but our observations from last fall’s wildfires seem to support that finding. The Rough Ridge Fire, burning largely through hardwood forests, showed small areas of higher intensity associated with yellow pines. In the Rock Mountain Fire, larger high intensity areas were associated with exceptionally steep slopes and dense mountain laurel understories. In the Gatlinburg Fire, which had the most extreme weather conditions, fire intensity high enough to kill canopy trees was largely restricted to southern yellow pine stands and their immediate vicinity. Intense fires were associated with specific vegetation types. Leaf fall has already restored fuel continuity for lower intensity fire.

Our point is not that prescribed fire in hardwood forests is pointless. We still support prescribed fire in hardwood forests for ecological reasons. Rather, resources are limited and the stakes are high, so for wildfire mitigation prescribed fire should be used in the areas where it has the greatest effect. Prescribed fire can do more to reduce wildfire risk in yellow pine and/or mountain laurel than it can in open-understory hardwood forests.

## **XII. Climate change**

Climate change is one of the biggest problems facing the ecosystems of the Foothills. It will affect terrestrial and aquatic communities and every species in them. We are glad to see the agency identify many of the processes and specific components of the ecosystem that climate change will affect. We also are eager to see the agency’s analysis of the climate impacts of the various proposed timber treatments and prescribed burning.

Impacts may be even more severe than described in the proposed action. Precipitation records from Coweeta show that precipitation in this area has become more erratic over the past 75 years (Laseter et al. 2012)<sup>19</sup>. See Laseter *et al.* 2012 in Attachment N. Annual precipitation totals are becoming more variable over time, with wetter wet years and drier dry years. Drought severity and frequency have increased with time, and rain events have become more intense.

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<sup>19</sup> Laseter SH, Ford CR, Vose JM, & LW Swift Jr. 2012. Long-term temperature and precipitation trends at the Coweeta Hydrologic Laboratory, Otto, NC, USA. *Hydrology Research* Vol. 43.6: 890-901.

This Forest has witnessed such events in the deluges experienced in December of 2015 that swept away parts of several roads on the Conasauga District.

These risks counsel that less ground disturbance is better. The Foothills Landscape Project, however, proposes timber harvesting over tens of thousands of acres. Timber harvesting requires temporary roads, skid trails, log landings and heavy truck traffic. All of this ground disturbance leaves areas vulnerable to landslides and erosion during major rain events. Since the exact areas to be harvested are not identified, it is difficult to comment precisely as to the extent of this danger.

The question of carbon storage as a result of this project may be explored later, but the fact of the matter is that timber harvests decrease aboveground long-term carbon storage. Smaller branches and other woody debris left on the forest floor decompose and the regenerating forest does not sequester the same amount of carbon as the mature stand that was removed. This deficit can last for decades. Timber harvesting with skidders and truck traffic adds more carbon to the atmosphere.

The proposed action also perpetuates a common misconception about carbon sequestration. Increases in carbon sequestration by individual trees are not meaningful on their own. The important variable is ecosystem level carbon uptake or carbon sequestered per unit area. If trees take up carbon twice as fast, but there are half as many trees, then there is no change to the amount of carbon sequestered in that stand.

The proposed action also points out that climate change may be a particular challenge for amphibians. What are the impacts of this proposal on amphibians? Both timber harvests and prescribed fire appear to promise drier forest floors and a reduction in leaf litter. Recovery of amphibian populations from timber harvests in the Southern Appalachians can take up to a century<sup>20</sup>. The Connette and Semlitsch study also found that estimated abundance of stream-breeding salamanders in young forest stands was negatively associated with distance to adjacent forests—a result suggesting immigration has a role in recovery of these species. The extent of the harvests in this project, leaving parts of the landscape with little undisturbed area, will only make salamander recovery more difficult. This diverse and abundant group of species should not have to bear so many stresses at once.

As we discuss above, the uncertainty associated with climate change and other novel conditions makes monitoring even more important. The climate change section of the proposed action mentions the need to monitor for new NNIS. The NNIS section of the proposed action, however, makes no plans for how to deal with invasive species whose arrival is imminent. To mitigate the impacts of NNIS, monitoring for new NNIS needs to be coupled with a response.

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<sup>20</sup> Connette GM & RD Semlitsch. 2013. Life history as a predictor of salamander recovery rate from timber harvest in Southern Appalachians. *Conservation Biology* Vol. 27(6): 1399-1409.

### **XIII. Recreation**

As recreational use of the forest continues to become increasingly important, we are pleased to see the agency seriously consider feedback from the many recreational users who participated in the Foothills Collaborative. In general, we agree with the suggested changes to the various trail systems and camping areas, including the decommissioning of low use trails and campgrounds. These plans to improve the recreational experience while simultaneously focusing on maintaining sustainability are a move in the right direction. We appreciate the efforts made to find local partners to assist the Forest Service in maintaining and protecting some of these areas. We appreciate the systematic, objective, and transparent process outlined in Table 3 to evaluate recreation areas for reduction in services or decommissioning. We suggest that the accessibility of some of the recreation sites be considered in the site assessments. For example, a site like Warwoman Dell is easily accessible for the public and requires only a very short distance on a gravel road. It is close to a large mountain city (Clayton), provides quick access to 3 waterfalls within a short hiking distance on a historic trail (Bartram), has significant historic structures (CCC shelter and fish hatchery), and is known as hallowed ground to Native Americans. These kinds of factors need to be considered when making decisions regarding reductions in services or decommissioning. As recreational pressures on this forest steadily increase we continue to suggest that, particularly in some of these high use areas, it makes more sense to find ways to increase the presence of Law Enforcement Officers, than to try to decommission areas that the public obviously loves to visit. The steady decline of LEO's around the forest is negatively impacting the public's ability to access the forest. The mere presence of LEOs is a deterrent to illegal acts, such as trash dumping, that degrade these areas. We would like to see the Forest Service push for more LEO funding.

Finally, we believe fostering sustainable recreation on the forest is the best way to encourage public investment in public lands. In other words, recreating on the national forest is the way most people connect to these lands. Recreation also provides the highest economic impact for local counties and communities and should remain a priority for the Forest Service.

### **XIV. Roads**

The road closures, decommissioning, and maintenance level changes proposed in the project are a huge step in the right direction, and we appreciate the agency's efforts to implement the recommendations in its Transportation Analysis Process Report. A large part of the current road system was created in the 1970s and 1980s to harvest timber and paid for with timber receipts. It is unclear how the agency, at the time, anticipated maintaining these roads, but it is clear now that the Forest does not have the funds to do it adequately. Scarce funds must be used to maintain major arteries such as FS 64, 42 and 28, leaving secondary roads with unfunded maintenance needs to be either decommissioned or reserved for administrative use.

Decommissioning and maintenance level changes will have direct, immediate benefits. Many of the roads proposed for closure now act as literal dumping grounds. It is hard to think of a worse use for national forest land. Many of the roads are also in bad condition. They contribute tons of sediment to nearby streams, impairing both wildlife and recreation.

The decision to close roads raises the question of how to close them in an efficient and effective fashion. Gates are expensive and the Forest is experiencing a rash of torn down and cut gates. The rise of light-weight battery powered metal cutting tools has exasperated the problem. Discussions with staff indicate that there is not enough money to even purchase the necessary gates. Boulders are expensive and require moving a piece of heavy equipment to set in place. Berms also require heavy equipment. The best and least expensive solution is cut timber barriers. As the Conasauga District has learned in Cashes Valley, timber barriers need to be robust. Violators will cut up a few downed trees but not a dozen felled one atop of another. If the agency is serious about closing roads either permanently or for administrative reasons, it is hard to see any other way. Of course, full-scale decommissioning is always the best option where funding allows.

We ask that the agency reconsider plans to improve the Rocky Flats road 630 D. The road currently is impassable because of a sinkhole and was formerly primarily used as an ATV area. Why convert what is now a trail back to a road and risk the danger of illegal ATV use and consume scarce funds? We realize that the road is located in a Wildlife Management Area but it could be promoted as a walk-in hunting trail. This roadway also lies adjacent to the most pristine part of the Foothills. This area represents a unique opportunity to preserve core habitat, which would be disturbed by using Rocky Flats as a road.

## **XV. National Environmental Policy Act Compliance**

### *a. The Forest Service Should Clarify the Purpose and Need for the Project*

NEPA documents must include a statement of purpose and need which “shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action.” 40 C.F.R. § 1502.13; *see* FSH 1909.15 § 11.21. Purpose and need statements play a critical role because “the available reasonable alternatives are dictated by the underlying purpose of the proposed action.” *Wilderness Soc. v. U.S. Forest Serv.*, 850 F. Supp. 2d 1144, 1163 (D. Idaho 2012). “[A] purpose can [] be unreasonable if the agency draws it so broadly that an infinite number of alternatives would accomplish [it] and the project would collapse under the weight of the possibilities.” *Webster v. U.S. Dep't of Agric.*, 685 F.3d 411, 422 (4th Cir. 2012)(citation omitted). Purpose and need statements are also necessary to inform the public exactly what the agency intends to do. “NEPA forces agencies to explain what it is they seek to do, why they seek to do it, what the environmental impacts may be of their proposed action, and what alternatives might be available to the agency that might lessen environmental impact. Without a clear ‘what and why’ statement, the public is kept in the dark.”

*Soda Mountain Wilderness Council v. Norton*, 424 F. Supp. 2d 1241, 1262 (E.D. Cal. 2006). Here, because the “what and why” statement provided by the agency is vague, unexplained, and extremely broad it is unclear exactly what exactly the agency is proposing to do. Put another way, based on the purpose and need statement it is unclear what the agency *does not* intend to do as part of this project.<sup>21</sup>

The agency’s proposed action suggests the project is intended to meet “four primary needs” but we are unable to find articulation of what those four needs are. Proposed Action, 5. The notice also provides that the “proposed action for the Foothills Landscape project is organized to first describe the overall need of the project.” *Id.* But it is also unclear exactly what that is referencing. As best we can tell, the project purpose was identified “incorporate[ing] the objectives from the Forest Plan, the U.S. Forest Service Watershed Condition Framework, Georgia’s State Water Regional Plans, the Georgia State Wildlife Action Plan, Community Wildfire Protection Plan, Georgia’s Forest Action Plan, Shortleaf Pine Restoration Plan, Recovery Plans for Threatened and Endangered Species in the project area and information provided through collaborative effort.” *Id.* That list is so broad as to make the project purpose virtually anything. Are all of the objectives of those documents incorporated as a purpose of this project? Such an expansive purpose makes it difficult for the public to offer helpful feedback to the agency about alternative ways to achieve the agency’s goals. And because alternative consideration is tied to the purpose and need statement, the agency will be required to assess a significant number of alternatives that may meet this very broad purpose. As defined by the purpose and need, the scope of this project is unprecedented as will be the agency’s obligation to consider reasonable alternatives. “[A]n infinite number of alternatives would accomplish” the project purpose which may cause the analysis to “collapse under the weight of the possibilities.” *Webster*, 684 F.3d at 422. The agency should revise, clarify, and narrow its statement of purpose and need.

*b. The Forest Service Must Complete Adequate Impacts Analysis*

1) The Forest Service Must Assess Direct, Indirect, and Cumulative Impacts

As articulated in our October 16, 2017 letter, the process set forth by the agency, as we understand it, cannot comply with NEPA’s requirements to adequately consider direct, indirect, and cumulative project impacts. *See* Attachment A. We will refrain from rehashing our concerns in detail here but our opinions have not changed and we incorporate our October 16 letter herein. In short, NEPA requires the agency to take a hard look at the direct impacts of a project. *See* 40 C.F.R. § 1508.8. Particularly in an environment as complex and diverse as the Chattahoochee National Forest the agency cannot adequately assess direct impacts without knowing where project activities will occur. Direct impacts analysis requires site-specific

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<sup>21</sup> We note that we are responding to this project as best we can in good faith despite the lack of clarity in the overall project purpose.



knowledge considering the impact of a specific activity on a specific place. Here, the agency plans to conclude its NEPA responsibilities before knowing not only *where* project activities will occur, but even *what* those activities (i.e., types of treatments) will be. The “what” and the “where” of the action will be undecided and unassessed at the time the agency proposes to reach a final decision. The agency’s own analysis demonstrates that this is insufficient to understand the effects of the project: “We acknowledge that the data is dated and may not be totally accurate . . . This inaccuracy in the data is one of the reasons . . . to treat according to on the ground conditions rather than the existing data alone.” CONF5. We agree. NEPA requires that the agency consider and disclose that information “*before* decisions are made and *before* actions are taken.” 40 C.F.R. § 1500.1(b)(emphasis added).

Guidance in the agency’s Forest Service Handbook is also instructive here. Projects are to identify (among other things): 1) “WHAT is the action being proposed?” 2) ‘HOW will the action be accomplished?’ and 3) “WHERE is the action being proposed?”. FSH 1909.15 § 11.2 (emphasis in original). “In stating the ‘what’ of the proposed action, [the agency is to] focus as specifically as practicable on describing the activities.” *Id.* The “how” is “an integral part of the ‘what.’” *Id.* “The ‘where’ refers to the geographic location of the project” which should be described “as specifically as possible.” *Id.*

Site-specific information is necessary not just for legal compliance reasons, but because it can reveal a wide variety of relevant issues. We provide examples of the different ways this information has impacted our comments on past projects in the enclosed “Why site specific matters.” *See* Attachment O. These impacts fall into a few broad categories. Most directly, site specific features determine direct and indirect effects which in turn determine cumulative effects. For example, sensitive features may be found during site surveys that suggest a specific treatment is better suited elsewhere. Assessing that tradeoff requires knowing where treatments are proposed. Many issues we have encountered, however, stem not simply from what is in the individual stand, but rather from the interaction between the stand and its context. Adjacent resources may be impacted by treatments, or change how large of an impact a treatment will have. The values a particular stand provides depend on broader landscape context. As described elsewhere, assessing cumulative impacts requires knowing the spatial arrangement of all treatments.

The agency has suggested that sideboards will fix these issues, but sideboards by themselves are insufficient. For one, sideboards cannot compensate for use of inaccurate data that must be checked at the stand level. For example, the 2011 Forest Health Stewardship Project proposed to thin over 6,000 acres of overstocked pine stands, but public review (by ForestWatch) found the stands to contain little to no pine. Similarly, stands preliminarily proposed for old-growth designation in the Cooper Creek Watershed Project were identified as over 100 years old, but some had in fact been clear-cut after 1960. Even the Restoration Plan admits as much: “although Forest mapping data shows an abundance of young shortleaf pine stands in the Foothills Landscape, many are void or contain only a minor component of shortleaf

pine.” Assessment of impacts (beneficial and adverse) depends on site conditions; assessing impacts using inaccurate data will lead to inaccurate impacts considerations. These problems can only be solved by field checking the data not merely by providing sideboards (which will be irrelevant if based on incorrect data).

Assessment of indirect and cumulative impacts relies on adequate assessment of direct impacts. *See* 36 C.F.R. § 220.4(f). Without adequate consideration of direct impacts the agency has no basis to evaluate indirect or cumulative impacts.

Additionally, the agency must consider the cumulative impact of the many activities proposed as part of the Foothills project when added to impacts from past projects. *See* 40 C.F.R. § 1508.7. There have been a number of projects completed in the Foothills area since 2007 as reflected in maps distributed during the collaborative discussions.<sup>22</sup> The agency must consider the cumulative impact of the Foothills project in combination with these past projects.

The agency must also consider the cumulative impact of the Foothills project in addition to reasonably foreseeable future actions. 40 C.F.R. § 1508.7. Our understanding is the Forest Service intends to replicate the Foothills process across seven additional “landscapes” over the next few years.<sup>23</sup> Those activities are reasonably foreseeable as the agency has stated its intention to begin pursuing similar projects in those areas. What is the cumulative impact of the Foothills project in combination with those projects? If those projects resemble the Foothills project then upwards of half of the entire Chattahoochee National Forest may see active management over the next decade. That is a highly significant cumulative impact that must be disclosed and assessed.

Finally, we reiterate that the agency cannot issue a “Finding of No Significant Impact” if it does not know what the project impacts will be. Nor can the agency reasonably assure the public that impacts will be mitigated, and therefore a FONSI is warranted, if impacts are unknown. We remain available to discuss ways to resolve these concerns with the agency.

## 2) The Forest Service Must Consider Impacts to Georgia’s Mountain Treasures

Under NEPA, the Forest Service must disclose the presence of roadless areas when making project-level decisions and must consider and disclose the effects of logging and road additions or improvements on roadless areas’ characteristics, regardless of whether the areas are currently “inventoried” by the agency. *See The Lands Council v. Martin*, 529 F.3d 1219 (9th Cir. June 25, 2008) and *Smith v. U.S. Forest Service*, 33 F.3d 1072, 1077-79 (9th Cir. 1994) (both requiring consideration of impacts of timber sales on un-inventoried roadless areas).

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<sup>22</sup> [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd515005.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd515005.pdf).

<sup>23</sup> *See* [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd501294.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd501294.pdf).

Roadless areas have “many social and ecological benefits,” including the following: high-quality soil, water, and air resources; healthy watersheds that help maintain abundant and diverse populations of fish and other aquatic species; diverse native plant and animal communities and species; biological strongholds for threatened, endangered, and other rare species; large, relatively undisturbed landscapes important to biological diversity and long-term survival of many species; outstanding opportunities for dispersed outdoor recreation; bulwarks against the spread of non-native invasive species; and natural appearing landscapes with high scenic quality. Special Areas, Roadless Area Conservation, 66 Fed. Reg. 3244,3245 (Jan. 12, 2001) (summarizing findings of the Roadless Area Conservation Final Environmental Impact Statement).

There are several Georgia Mountain Treasures within the Foothills project area including: Grassy Mountain, Emery Creek, Five Falls, Thrifts Ferry, Big Shoals, and portions of the Mountaintown, Raven Cliff, Long Mountain, Lance Creek, Horse Gap, and Ken Mountain areas. These areas each qualify as “potential wilderness areas” under the FSH 1909.12 Chapter 70 wilderness inventory directives which replaced the roadless inventory directives. Because of their outstanding qualities mentioned above, these areas deserve special consideration and the environmental analysis for the project should fully analyze, disclose and consider the project’s effects on these and other roadless characteristics, including effects on each area’s naturalness, remoteness, generally unroaded and undeveloped condition, roadless status, and recreation opportunities and use (including any changes in actual or assigned recreation opportunity spectrum classes). While it is not currently clear if these areas will be impacted by the project, a reasonable alternative the agency should consider is developing a project that avoids these areas entirely.

### 3) The Forest Service Must Consider Impacts to Old Growth Under NEPA

In accordance with NEPA’s “hard look” requirement, the Forest Service must consider impacts to existing old growth. *See Nat’l Audubon Soc’y v. Dep’t of the Navy*, 422 F.3d 174, 184 (4th Cir. 2005). Old growth forest is “a valuable natural resource worthy of protection, restoration, and management.” Guidance for Conserving and Restoring Old-Growth Forest Communities on National Forests in the Southern Region, Report of the Region 8 Old-Growth Team (June 1997), 1. Existing old growth forest is exceedingly limited in the Southern Appalachian forests. The Region 8 Old Growth Guidance estimates that “[e]xisting old-growth communities may represent around 0.5 percent (approximately 676,000 acres) of the total forest acreage (approximately 109,400,000 acres) in the Southeast.” *Id.*

Failing to properly assess old growth and account for impacts has been recognized as a NEPA violation. *See Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1378 (9th Cir. 1998) (holding cumulative impact analysis of combined effect on depleting existing old growth habitat inadequate); *Bair v. Cal. Dep’t. of Transp.*, C 10-04360 WHA, 2011 WL 2650896

(N.D. Cal. July 6, 2011) (issuing injunction for road widening through old-growth redwood area for issuing a FONSI instead of producing an EIS); *Alliance for the Wild Rockies v. Wood*, CIV 07-452-EJL, 2008 WL 2152237 (D. Idaho May 21, 2008) (enjoining timber sale where method of calculating old growth scientifically flawed). In part because lost old growth forest takes hundreds of years to replace. *Neighbors of Cuddy Mountain*, 137 F.3d at 1382; *Idaho Sporting Congress v. Alexander*, 222 F.3d 562, 569 (9th Cir. 2000) *overruled on other grounds by Lands Council v. McNair*, 537 F.3d 981, 997 (9th Cir. 2008). We ask that the Forest Service conduct thorough old-growth field surveys, as required by the Region 8 guidance and the Forest Plan (Forest Plan at 2-17), and avoid any stands which meet or border on old-growth eligibility.

*c. The Forest Service Must Consider Ways to Mitigate Impacts*

As also articulated in our October 16 letter, the Forest Service's approach to meetings its NEPA obligations does not allow for adequate consideration of ways to mitigate impacts. See Attachment A. "[O]mission of a reasonably complete discussion of possible mitigation measures [ ] undermine[s] the action-forcing function of NEPA." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351 (1989). Discussion of mitigation measures shall include an estimate of the effectiveness of the proposed mitigation measures which in turns requires knowledge of where those measures will be applied. See *National Audubon Soc'y v. Hoffman*, 132 F.3d 7, 17 (2nd Cir. 1997); CEQ, 40 Most Asked Questions, 46 Fed. Reg. 18026; FSH 1909.15, Ch.10(15) (estimate the effectiveness of proposed mitigation measures). Consequently, "[a]n agency cannot [ ] avoid a detailed mitigation analysis simply by postponing it on the basis that the feasibility and success of mitigation would depend on site specific conditions" that will not be assessed until a later time. *High Sierra Hikers Ass'n v. U.S. Dep't of Interior*, 848 F. Supp. 2d 1036, 1053-54 (internal quotations omitted) *citing S. Fork Band Council of W. Shoshone of Nevada v. United States Dep't of Interior*, 588 F.3d 718 (9th Cir.2009) (concluding that EIS did not sufficiently address mitigation measures related to groundwater removal). That appears to be exactly what the agency is proposing here.

Again, the agency's Restoration Plan admits that site-specific information is necessary to adequately assess mitigation techniques: "site specific attributes would be used to quantify exact mitigation measures taken based on aspect, slope, soil type, amount and type of volatile mid-story fuels (rhododendron and mountain laurel), community attributes such as ingress/egress accessibility, existing housing materials and defensible space, probability of success from treatment, and opportunities to treat both federal and nonfederal lands." Restoration Plan, 88-89. The quoted text is in relation to prescribed fire but the same is true of timber harvests which in many ways have more significant on-the-ground impacts than fire. And while NEPA may not require preliminary identification of "exact" mitigation measures, it requires consideration of mitigation measures' effectiveness, which as explained in the Restoration Plan depends on site-specific attributes such as aspect, slope, and soil type (to name a few). The agency cannot know those site specific attributes (which are extremely varied across the Foothills) if it does not know where its proposed activities will occur; as a result it cannot adequately consider mitigation

measures. At most the agency can present a general list of mitigation techniques which it may or may not employ. This violates NEPA. Environmental analysis under NEPA “cannot merely assert a perfunctory description of mitigating measures.” *Neighbors of Cuddy Mountain*, 137 F.3d 1372, 1380 (9<sup>th</sup> Cir. 1998). “A mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA.” *Id.* Rather, mitigation must be detailed with enough specificity to “ensure that environmental consequences have been fairly evaluated.” *Carmel–By–the–Sea v. U.S. Dep’t of Transp.*, 123 F.3d 1142, 1154 (9th Cir.1997).

*d. The Forest Service Must Consider All Reasonable Alternatives*

NEPA requires federal agencies to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” 42 U.S.C. § 4332(2)(E). Agencies must “[u]se the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment.” 40 C.F.R. § 1500.2(e); *see also* 40 C.F.R. § 1508.9(b) (EAs must discuss alternatives); *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1229 (9th Cir. 1988)(federal action involving unresolved conflicts as to proper use of resources triggers NEPA's alternatives requirement, whether or not an EIS is also required). Accordingly, “[a]n agency must look at every reasonable alternative, with the range dictated by the nature and scope of the proposed action, and sufficient to permit a reasoned choice.” *Idaho Conservation League v. Mumma*, 956 F.2d 1508, 1520 (9th Cir. 1992) (internal citations omitted); *see also Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810, 816 (9th Cir. 1988), *rev'd on other grounds*, 490 U.S. 332 (1989) (reasonable range of alternatives framed by purposes of project). The failure to consider a “viable but unexamined alternative” will render the analysis inadequate. *Dubois v USDA*, 102 F.3d 1273, 1289 (1st Cir. 1996), *cert. denied sub nom. Loon Mt. Rec. Corp. v. Dubois*, 521 U.S. 1119 (U.S. 1997) (quoting *Resources Ltd. v. Robertson*, 35 F.3d 1300, 1307 (9th Cir. 1994)).

Given the expansive purpose and need for this project the Forest Service is obligated to consider a wide range of alternatives which avoid or minimize adverse environmental impacts. Accordingly, at a minimum we recommend that the Forest Service:

- Develop an alternative that discloses where site-specific activities will occur and assess the impacts of those activities in its environmental analysis;
- Develop an alternative using consensus-based treatments with widespread support (of which we think there are many) developed during collaborative discussions;
- Develop an alternative that focuses heavily on connecting people to the land through outdoor recreation opportunities which is the main way the public uses the national forest;

- Develop an alternative that will be implemented over a shorter time frame (*e.g.*, five years) particularly since the Forest Service believes that on-the-ground conditions are likely to change over the course of the next decade, and is in line with current budgetary expectations and restraints;
- Develop an alternative which avoids timber management activities in all prescriptions considered unsuitable under the National Forest Management Act and all potential wilderness areas;

*e. The Forest Service Must Use High Quality Information*

NEPA requires use of “high quality” information and “accurate scientific analysis.” 40 C.F.R. § 1500.1(b). Our understanding is much of the project so far has been built using FS Veg stand data. The agency’s preliminary analysis reveals that this information is not “high quality” or “accurate”: “We acknowledge that the data is dated and may not be totally accurate.” Comment CONF5. According to the agency “[t]his inaccuracy in the data is one of the reasons . . . to treat according to on the ground conditions rather than the existing data alone.” *Id.* In other words, the agency’s analysis underscores the need for collecting and assessing high-quality, accurate, site-specific data based on recent on-the-ground surveys before signing a project decision document.

Some proposed treatments also appear to be justified by inaccurate or missing data. For instance, in response to the suggestion that oak decline is “normal tree mortality” and thus there was no need to combat oak decline, the agency responded: “Give them a few more seasons of drought and combined with their age and we will see if elevated mortality doesn’t show up . . .” Comment CONF156. That justification does not present any data to support the treatment, only that “we will see” if some data points are available in “a few more seasons.” NEPA demands more of federal agencies. Projects require accurate, data-driven scientific analysis and justification.

Finally, it is unclear what “high quality data” and “accurate scientific analysis” the agency relies on when determining “desired conditions.” Proposed Action, 6. What are those “desired conditions,” how were they determined, and what data indicates that they are “desired”? There is a plethora of high quality data available to the agency to assess current conditions and departure from expected conditions including but not limited to: Steve Simon’s Ecological Zones in the Southern Appalachians, LiDAR data, departure and core forest analysis from The Nature Conservancy, information on the natural range of variation, USGS and NRCS soil data, USGS topographic and geologic data, and Southern Appalachian Man and the Biosphere report. The agency should incorporate that data into this project or at the very least explain why it refuses to do so.

## XVI. Compliance with the National Forest Management Act

Without knowing where specific activities will occur it is difficult to assess compliance with the National Forest Management Act's ("NFMA") substantive requirements (*see* 16 U.S.C. § 1604(g); FSM 1921.12a), and whether the project is consistent with the Forest Plan, as required by 16 U.S.C. § 1604(i). The environmental analysis must meaningfully assess consistency with NFMA, not only offer blanket assurance of compliance, demonstrate that consistency, and consider reasonable alternatives that would fulfill its goals with less harmful impacts. *See Lands Council v. McNair*, 537 F.3d 981, 994 (9th Cir. 2008) (Forest Service must support its conclusions that a project meets the requirements of the NFMA and relevant Forest Plan); *Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1377 (9th Cir. 1998) ("Forest Service must demonstrate that a site-specific project would be consistent with the land resource management plan"). Given the scale of the Foothills project the Forest Service should pay particular attention to the following issues.

### a. Soil and Water Protection

The agency should ensure it does not run afoul of NFMA's substantive protections for soil and water resources and the productivity of the land. Under NFMA, the Forest Service must "insure that timber will be harvested from National Forest System lands only where . . . soil, slope, or other watershed conditions will not be irreversibly damaged." 16 U.S.C. § 1604(g)(3)(E); *see also Sierra Club v. Martin*, 992 F. Supp. 1448 (N.D. Ga. 1998), *rev'd on other grounds* 168 F.3d 1 (11th Cir. 1999); *Sierra Club v. Espy*, 38 F.3d 792, 800 (5th Cir. 1994). Impacts on soil, slope, and watershed conditions - including cumulative effects on aggregated or clustered treatment areas - should be assessed as part of the agency's NEPA analysis. With that analysis in hand, the agency can then ensure it is not violating NFMA's requirements. But here the agency does not intend to identify treatment areas or assess impacts in specific locations as part of its NEPA analysis. Without that analysis it is unclear how the agency could conclude that its actions are consistent with NFMA.

Violations of the NFMA prohibition on irreversible damage to soils have been found where logging practices, which "compact the soil, displace nutrient-rich organic matter and upper mineral soil, and cause accelerated erosion" were located on sensitive soils contrary to the Forest Plan, and where the Forest Service engaged in timber harvesting practices "eroding nutrient-rich soil from the forest land," failed to "require post-harvest restoration of some areas affected by and contributing to erosion," and engaged in "management practices substantially and permanently reducing organic and other essential matter in the forest soils..." *Alleghany Def. Project, Inc. v. U.S. Forest Serv.*, No. 01-895, 2003 U.S. Dist. LEXIS 27151, at \*88-\*89 (W.D. Pa. Dec. 24, 2003), adopted, 2004 U.S. Dist. LEXIS 29698 (W.D. Pa. Mar. 24, 2004), *aff'd*, 423 F.3d 215 (3d Cir. 2005); *Sierra Club v. Glickman*, 974 F. Supp. 905, 924-25 (E.D. Tex. 1997), *aff'd*, 185 F.3d 349 (5th Cir. 1999), vacated, 228 F.3d 559 (5th Cir. 2000). Ultimately, the question comes down to whether "the evidence shows that, on-the-ground, the

Forest Service is []protecting the soil resource.” *Glickman*, 974 F. Supp. at 926. But how can the Forest make that showing if it does not know what will happen on the ground?

The productivity provision has been interpreted as a substantive requirement that the Forest Service must “maintain” and “ensure” soil productivity. *See Ecology Ctr., Inc. v. Austin*, 430 F.3d 1057, 1062 (9th Cir. 2005) (among the “substantive requirements” of NFMA, “the Forest Service must maintain soil productivity. 16 U.S.C. § 1604(g)(3)(C).”), *cert. denied sub. nom. Mineral County v. Ecology Ctr., Inc.*, 549 U.S. 1111 (2007), *overruled on other grounds by, Lands Council v. McNair*, 537 F.3d 981 (9th Cir. 2008).

Based on these obligations, the Forest Plan set standards for soil and water protection, including standards for timber harvest and prescribed burns, such as: FW-065 (organic layers, topsoil, and root mat must be left intact over at least 80% of an activity area); FW-190-192 (avoiding burning mesic forests), and FW-202 (retention of litter and duff on at least 85% of prescribed burn areas).

It is difficult or impossible to gauge compliance with these standards because we (nor the agency) know where specific activities will take place. We raise them here because we are concerned that the unprecedented scale of this project and lack of impacts analysis may lead to a violation of these standards. These issues should be carefully considered in the environmental analysis from both a NFMA and NEPA perspective.

*b. Species Diversity Requirements*

The Forest Service must also “provide for diversity of plant and animal communities...and provide, where appropriate, to the degree practicable, for steps to be taken to preserve the diversity of tree species similar to that existing in the region controlled by the plan.” 16 U.S.C. § 1604(g)(3)(B); *see Conservation Cong. v. U.S. Forest Serv.*, No. 2:12-cv-02800-TLN-CKD, 2014 U.S. Dist. LEXIS 68636, at \*43 (E.D. Cal., May 19, 2014); *see also Chattooga Watershed Coalition v. U.S. Forest Serv.*, 93 F. Supp. 2d 1246, 1249 (N.D. Ga. 2000). For example, if a stand “is properly a hardwood management site, it would be improper for the [Forest Service] to regenerate the site as a pine plantation.” *Chattooga Watershed Coalition*, 93 F. Supp. at 1249. Although not entirely prohibited, reductions in diversity must be well-justified and supported by significant analysis. *Glickman*, 974 F. Supp. at 922 (“Reductions in diversity – such as forest type conversions – are permitted only where needed to meet overall multiple-use objectives and must be justified by an elaborate analysis of potential consequences,” quoting CHARLES F. WILKINSON & H. MICHAEL ANDERSON, *LAND AND RESOURCE PLANNING IN THE NATIONAL FORESTS* at 195 (1987).

Again, due to the lack of site-specific disclosure it is unclear whether the agency is complying with this requirement but at least three project activities may decrease species diversity. First, some project activities appear to be intended to increase the relative abundance



of oaks and decrease “undesirable” – though native – species such as poplar, maple, black gum, and white pine. Based on the Forest Service’s own research regarding the lack of oak regeneration in heavily logged areas,<sup>24</sup> however, the elements of this project that involve more intensive cutting may backfire and significantly reduce or eliminate the oak component, instead. The environmental analysis should carefully consider the likelihood of success of these treatments given site-specific conditions and past efforts to recruit oaks. Second, the project contemplates creating up to 7,400 acres of woodlands. Proposed Action, 12. Our analysis suggests this far exceeds the amount of woodland that would naturally exist on the landscape and converting complex stands to woodland environments which naturally occur on less productive sites may violate NFMA’s diversity requirements. Third, the project contemplates an unspecified amount of “artificial regeneration.” If the agency pursues that option it should be careful not to reduce overall stand complexity.

*c. Restocking and Regeneration Requirements*

NFMA also instructs that “timber will be harvested from National Forest System lands only where . . . (ii) there is assurance that such lands can be adequately restocked within five years after harvest.” 16 U.S.C. § 1604(g)(3)(E)(ii); 36 C.F.R. § 219.11(a)(v) (lands unsuitable for timber production include those where there is no reasonable assurance that such lands can be adequately restocked within five years). This requirement applies to all timber harvests, not only the category of regeneration harvests.

As part of the Foothills project the Forest contemplates creating up to 7,400 acres of woodlands (Proposed Action, 12). If these conditions are created in appropriate areas they may be consistent with NFMA’s restocking requirements. But they may violate NFMA if they are forced onto inappropriate sites, requiring the Forest to continually use timber harvest, prescribed fire, mowing, and herbicide to suppress regrowth, thereby working against natural restocking and the innate productivity of the site. The environmental analysis should carefully consider the agency’s compliance with NFMA’s restocking requirements.

Finally, the agency should also carefully consider whether the project complies with NFMA’s conditions on regeneration timber harvests, such as: limits on the maximum size of cut area, blending cut area with natural terrain, interdisciplinary review assessing “the potential environmental, biological, esthetic, engineering, and economic impacts,” and that “such cuts are carried out in a manner consistent with the protection of soil, watershed, fish, wildlife, recreation, and esthetic resources and the regeneration of the timber resource.” 16 U.S.C. § 1604(g)(3)(F). The Forest Plan places a 40-acre limit on the size of an opening created by an

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<sup>24</sup> Katherine J. Elliott (USFS Coweeta), Lindsay R. Boring (UGA School of Forest Resources & Jones Ecological Research Center), Wayne T. Swank (Coweeta), Bruce R. Haines (UGA Botany Dept.), *Successional changes in plant species diversity and composition after clearcutting a Southern Appalachian watershed*, *Forest Ecology and Management* 92, pp. 67-85 (1997) available at [www.treearch.fs.fed.us/pubs/4558](http://www.treearch.fs.fed.us/pubs/4558).

even-aged or two-aged regeneration treatment. Forest Plan at 2-25. The agency has committed to limiting even-aged regeneration harvests to 40 acres as part of its preliminary design features (Proposed Action, 44) but it should assess compliance with these standards for two-aged regenerated harvests and be sure not to cluster harvests in such as a way to violate the 40-acre requirement.

*d. A Plan Amendment May be Required to Harvest in Unsuitable Prescriptions*

When developing a Forest Plan NFMA requires the Forest Service to “identify lands within the management area which are not suited for timber production, considering physical, economic, and other pertinent factors to the extent feasible ....” 16 U.S.C. § 1604(k). “Except for sales sales or sales necessitated to protect other multiple-use values, no timber harvesting shall occur on such lands . . .” *Id.* Restated, once lands are identified as unsuitable for timber production, NFMA prohibits all timber harvest, of any type, there, except under two narrow circumstances: (1) salvage sales or (2) “sales *necessitated* to protect other multiple use values.” 16 U.S.C. §1604(k)(emphasis added). Other than timber, multiple uses and values include: outdoor recreation, streams and watersheds, wildlife, fish, the diversity of plant and animal communities, and soil productivity. *See* 16 U.S.C. § 528 (1960); § 1604(e), § 1604(g)(3).

The Forest appears to be well aware of this requirement as it devoted a significant portion of the May 23, 2017 community workshop to discussing the parameters of NFMA’s unsuitable limitation. As we articulated at that meeting, what should or should not occur in unsuitable prescriptions is not a matter of public opinion. NFMA prohibits timber harvest in unsuitable prescriptions unless the harvest meets one of the two exceptions – period.

The Foothills project may be running awry of this requirement in at least two ways. First, given the large amount of ESH creation contemplated as part of the project it seems likely that some of that ESH will be located in unsuitable prescriptions. Creating ESH as the sole justification for logging (i.e., not as a byproduct of one of the two exceptions) is not allowed in unsuitable prescriptions on the Chattahoochee. Under the Chattahoochee Forest Plan creating ESH is the primary means by which timber will be produced from the forest. Plan FEIS at 3-541 to 542. In other words, creating ESH is the main vehicle for harvesting timber. The Plan designated approximately 367,000 acres of the Chattahoochee National Forest as suitable for timber production (about 49% of the Chattahoochee). Plan Appx. F-10. Most of the suitable acreage, approximately 270,000 acres (about 36% of the Chattahoochee) was placed within management prescriptions with minimum objectives to create early succession, primarily through timber harvest. Plan FEIS at 3-160 to 161. Those are the designated areas for “timber harvest” under the current Forest Plan, and creating ESH is the mechanism to harvest that timber; therefore it is prohibited in unsuitable prescriptions unless it meets one of the two exceptions.

Second, in response to a comment on the Restoration Plan from the Georgia Department of Natural Resources requesting that the Forest Service focus vegetation management activities

in suitable prescriptions (a recommendation we support for legal as well as practical reasons) the Forest Service responded that “[v]egetation management is a large part of the Foothills Landscape project and *it would need to occur across the landscape*. Leaving out tracks of land would not meet the goal of restoration.” Comment CONF64 (emphasis added). But leaving out “tracks of land” is what is required by the suitable/unsuitable distinction in NEPA for most timber activities. The agency’s response suggests that it does not view the difference between suitable and unsuitable lands under NFMA as a meaningful distinction. NFMA, the Chattahoochee Forest Plan, and the environmental analysis underlying the Forest Plan all view the distinction as meaningful. In other words, the Chattahoochee cannot simply decide that it needs or wishes to target unsuitable lands for a massive logging project such as this, throwing out a forest planning structure that assumed such logging would not occur on unsuitable lands, without thorough analysis of the implications for the forest plan and its effects as a whole. And simply referring to harvests as “restoration” does not excuse compliance with NFMA suitability provisions.

As noted earlier, proceeding with typical harvests on unsuitable lands also does not seem to match the opinion of the collaborative group which seemed to recognize ample harvest opportunities on suitable lands alleviating the need for attempting to force harvests on unsuitable lands. Nevertheless, if the CONF insists on proceeding with a proposal that contemplates extensive harvest in unsuitable prescriptions, a change which would significantly affect unsuitable lands in ways not considered in the Plan EIS, it will likely need to complete additional environmental analysis, such as a supplement to the Plan’s EIS, *see* 40 C.F.R. § 1502.9(c), to disclose the agency’s current intentions for logging on unsuitable lands and to analyze, consider and disclose the effects on the uses and resources for which the Plan designated those lands as unsuitable. Complicating matters, since forest planning assumed the unsuitable lands would be generally left undisturbed, these lands likely were relied upon in the plan EIS’ analysis of effects on various other resources, e.g., mature and interior forest wildlife habitat and species, cumulative effects on water quality and aquatic species and habitat, old-growth, etc. These conclusions will be cast into serious question, and would need to be reanalyzed, if extensive commercial harvest is now intended for the unsuitable lands. Any plan amendment would be subject to the new NFMA regulations. *See* 36 C.F.R. § 219.17(b)(2).

*e. Excessive Early Successional Habitat*

Finally, the Foothills project contemplates creating up to 9,500 acres of early successional forest habitat. Proposed Action, 23. As noted earlier, we continue to question whether there are only “500 acres of young forest habitat currently in the Foothills landscape” justifying creating 9,500 additional acres. *Id.* Moreover, the 500-acre estimate appears to have been developed using FS Veg data (*see* Comment CONF250), which the agency has admitted is inaccurate. This estimate also does not include naturally existing patches of ESH which the agency must consider when assessing compliance with maximum ESH acreages. Finally, it is unclear where project activities will occur and therefore unclear whether prescription-specific

ESH maximums in the Forest Plan will be exceeded. Authorizing a project that is inconsistent with the Forest Plan is a violation of NFMA. *See* 16 U.S.C. § 1604(i). The agency must disclose where its planned site-specific activities will occur to comply with NEPA's impacts assessment requirements and also to ensure compliance with NFMA.

Additionally, consistent with taking a landscape-scale approach, the Forest should identify and consider early successional conditions on nearby private land. Under NEPA, the agency must consider the cumulative impacts on wildlife and wildlife habitat of logging mature forest on the CONF to create ESH, when mature forest may be in short supply, and ESH in abundant supply across the landscape, including on nearby private lands, as a whole.

## **XVII. Compliance with other Laws**

### *a. Endangered Species Act*

The Endangered Species Act ("ESA") mandates that the Forest Service give the conservation of threatened and endangered species the highest priority, "above any of the agency's competing interests." *House v. U.S. Forest Service, U.S. Dept. of Agriculture*, 974 F. Supp. 1022, 1027 (E.D. Ky. 1997); *see Tennessee Valley Auth. v. Hill*, 437 U.S. 153, 175, 98 S. Ct. 2279, 57 L.Ed.2d 117 (1978) (The ESA's language "indicates beyond doubt that Congress intended endangered species to be afforded the highest priorities.")

Forest Service directives require the Forest Service to "avoid all adverse impacts on threatened and endangered species and their habitats . . ." FSM 2670.31 (4). The Forest, commensurate with these requirements, is also required to "[p]rohibit the taking of threatened and endangered species of plants and animals except under FWS or NOAA Fisheries permits." FSM 2670.46. Take of an endangered species is prohibited under Section 9 of the ESA, unless authorized by a permit. *See* 16 U.S.C.A. § 1538.

In order to carry out its obligations to prevent an unlawful take and to give threatened and endangered species the highest conservation priority, the Forest must also comply with Section 7 of the ESA. Pursuant to Section 7, the Forest Service must, in consultation with FWS, "insure" that its activities are "not likely to jeopardize the continued existence" of any threatened or endangered species in the Foothills area or "result in the destruction or adverse modification" of designated critical habitat. 16 U.S.C. § 1536(a)(2).

The proposed action indicates that threatened and endangered species and/or their habitat may be impacted by the Foothills project. *See, e.g., Proposed Action*, 12, 16. The Forest should initiate consultation with the Fish and Wildlife Service as soon as possible and conclude and disclose the outcome of that process prior to completing its environmental analysis. In line with its duty to maintain and conserve threatened and endangered species, the Forest should also assess project alternatives that avoid impacts to protected species and their habitats.

*b. Clean Water Act*

The Clean Water Act requires all federal agencies to comply with state water quality standards. 33 U.S.C. § 1323(a). This includes Georgia’s anti-degradation policy at Ga. Comp. R. & Regs. 391-3-6-.03(2)(b); *see, e.g., Save Our Cabinets v. United States Dep't of Agric.*, 254 F. Supp. 3d 1241, 1249 (D. Mont. 2017), *judgment entered*, No. CV 16-53-M-DWM, 2017 WL 2829681 (D. Mont. June 29, 2017)(applying state anti-degradation policy to the Forest Service).

In the Foothills project area there are over thirty miles of Clean Water Act § 303(d) listed streams and § 305(b) listed streams which are not meeting water quality standards. Restoration Plan, 68-69. We recognize and support the activities outlined in the Foothills project that are intended to alleviate impacts on these waterbodies. However, because we do not know where vegetation management activities will take place, it remains unclear as to whether any of these activities may cause water quality problems in listed or unlisted streams and/or violate Georgia’s anti-degradation policy. The agency’s environmental analysis should document compliance with these federal and state water quality provisions.

*c. National Historic Preservation Act*

Section 106 of the National Historic Preservation Act requires federal agencies to “take into account the effect of the undertaking on any historic property” “prior to the approval of the expenditure of any Federal funds on the undertaking.” 54 U.S.C. § 306108. An “undertaking” is “a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency.” 54 U.S.C. § 300320. The Foothills project is an undertaking. “Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe . . . that meet the National Register criteria.” 36 C.F.R. § 800.16(1)(1). The requirement to take effects on historic properties into account prior to expending federal funds on the undertaking “does not prohibit agency official[s] from conducting or authorizing nondestructive project planning activities before completing compliance with section 106, provided that such actions do not restrict the subsequent consideration of alternatives to avoid, minimize or mitigate the undertaking's adverse effects on historic properties.” 36 C.F.R. § 800.1.

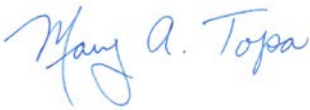
Our understanding is the Forest Service plans to sign a NEPA decision document authorizing a large, flexible project across the Foothills area. At the time a decision document is signed the Forest Service will not yet have determined on-the-ground treatment locations or considered on-the-ground impacts of those treatments, including impacts to historic properties. The Forest plans to begin implementing this project in phases such that the agency may begin

implementing phase 1 but not know where phase 2 will be located despite the fact that both phases will be authorized under the same NEPA document. The agency should assess how it can comply with National Historic Preservation Act requirements in light of that schedule. Once the agency begins implementing phase 1 it will be expending federal funds. Before it begins expending federal funds on this project, NHPA generally requires that it take into account the effect of the entire project on any historic properties. 54 U.S.C. § 306108.

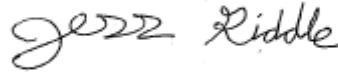
### **XVIII. Conclusion**

We appreciate the opportunity to comment on the Foothills project and that the agency sought public feedback on this project even before scoping the proposed action. We want to see this first collaborative effort on the Chattahoochee succeed. But we remain concerned about many aspects of this proposal, and we urge the agency to reconsider substantive parts of the proposal and the procedure for getting from proposed to implementable project. Please let us know if any of our concerns are unclear or if the agency wishes to discuss them further.

Sincerely,



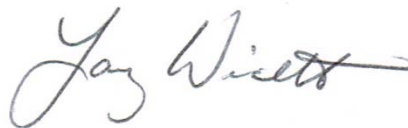
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# Exhibit 2

Chattooga Conservancy • Defenders of Wildlife • Georgia ForestWatch •  
Sierra Club • Southern Environmental Law Center •  
The Wilderness Society

*Via U.S. Mail and Electronic Mail*

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January 10, 2020

RE: Foothills Landscape Project Draft EA Comments

Dear Ms. Jewett:

Thank you for the opportunity to comment on the Foothills Landscape Project Draft Environmental Assessment (“Draft EA”). Please accept these comments on behalf of the Chattooga Conservancy, Defenders of Wildlife, Georgia ForestWatch, Sierra Club, Southern Environmental Law Center, and The Wilderness Society.

As you know, many of us have participated in the process to develop the Foothills Landscape Project (“Foothills Project” or the “Project”) from the very beginning. We have attended nearly every public meeting, field trip, workshop, and symposium. We submitted comments at every formal and informal opportunity and we participated in the agency’s online discussion forum. Every time we saw a problem, we named it; every time we could offer support, we did. We have done everything the agency has asked of us even when we questioned the value in it.

We continue to do that in this letter, recommending ways to improve the various proposed treatments even though we are deeply troubled by your approach to implementing those treatments.

The staff of the Chattahoochee-Oconee National Forest (“the Chattahoochee” or “the Forest”) has clearly put significant time and energy into this project, which we greatly appreciate. But they are being told to force a square peg through a round hole – and it shows. As a result, these comments are overwhelmingly critical of the analysis in the Draft EA but they are certainly not critical of the staff or the effort they have put forward. We know the agency can complete sufficient analysis; we have seen it do so before. Its flawed pursuit of condition-based management has led it far afield here.



Every major concern raised in this letter has been brought to your attention previously, most of them over two years ago. We paired our concerns with suggested resolutions that would allow the agency to expeditiously pursue its goals, including, in the spirit of partnership, goals we do not share. Regrettably, the Forest Service has wholly disregarded our core suggestions. The Draft EA is rife with errors stemming from the same fundamental problems we have been pointing out to you for years. If this project is delayed because the agency has to take extra time to resolve these problems, it is not because we have not been exceedingly upfront about our concerns.

What should we have done differently to bring these concerns to your attention? We too have invested significant time and energy in this process with the hope that it would succeed. You are of course free to ignore us but do not expect us to stop raising these concerns. We can have different opinions but our concerns are not “nonsense.”<sup>1</sup>

With this single project, the agency is proposing in 20% of the acreage of the Chattahoochee National Forest more logging than occurred from 2009-2019 on the Chattahoochee, Cherokee, George Washington-Jefferson, and Pisgah-Nantahala National Forests *combined*.<sup>2</sup> This is on top of 50,000 acres of prescribed burning,<sup>3</sup> up to 74,500 acres of herbicide application,<sup>4</sup> untold “new temporary” road construction,<sup>5</sup> potential undisclosed changes to over 100 miles of trails,<sup>6</sup> over 350 miles of new bulldozed fire lines,<sup>7</sup> and converting wood to chips on potentially 80,000 acres.<sup>8</sup> The list does not stop there. These activities will affect endangered and threatened species,<sup>9</sup> wetlands,<sup>10</sup> cultural resources,<sup>11</sup> a Wild and Scenic River,<sup>12</sup> and Inventoried Roadless Areas.<sup>13</sup> The proposal is “not constrained by a time limit”<sup>14</sup> and the “pace and scale” of work is predicted to remain the same<sup>15</sup> as the agency's present work on the Forest. At that rate, it will take more than 40 years to complete. Yet the agency has not proposed *any*

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<sup>1</sup> See Attachment 1.

<sup>2</sup> See Southern Appalachian Project Analysis, included as Attachment 2.

<sup>3</sup> Draft EA, App'x B.

<sup>4</sup> Vegetation Report, AP7.

<sup>5</sup> Soil Report, 22.

<sup>6</sup> Draft EA, App'x B.

<sup>7</sup> Soil Report, 32.

<sup>8</sup> Aquatic Resource Report, 25.

<sup>9</sup> See Terrestrial Wildlife Resources Report, Aquatic Resources Report, Botanical and Rare Communities Report.

<sup>10</sup> Botanical and Rare Communities Report, 12.

<sup>11</sup> See Cultural Resources Report.

<sup>12</sup> See Draft EA, 70; Draft EA Maps 15-17.

<sup>13</sup> See Inventoried Roadless Areas Report.

<sup>14</sup> Scoping Summary Report, 11.

<sup>15</sup> See Attachment 1 (Deciding officer: “As far as implementation, the pace and scale will be the same”).

specific locations for the work, just general concepts that will be pursued somewhere within a 157,000-acre area.

The agency hosted multiple public meetings to discuss these general concepts, and we appreciate that effort. But we have repeatedly raised concerns about the approach being implemented at these meetings and questioned whether the meetings were moving towards any specific conclusion.<sup>16</sup> The approach taken in the Draft EA – general concepts with no specificity, no timeline, and no NEPA-mandated public participation – is exactly what we spent all of that energy trying to avoid. The agency seems to expect the public to trade away its right to participate in decades of site-specific decision making—a right it is guaranteed under the National Environmental Policy Act (“NEPA”)—in exchange for a handful of meetings where concepts behind work already occurring on the forest were discussed.<sup>17</sup> Surely the agency sees that is a terrible trade for the public.

We understand the agency is promising to offer once-a-year meetings with the Districts as they implement this project, as well as the possibility of field trips. But NEPA defines meaningful public participation as requiring the agency to take a hard look at the impacts of its action, disclose its analysis to the public, respond to public concerns, and consider alternative methods of achieving its goals. Many of our concerns would evaporate if the agency would just commit to offer public participation opportunities under NEPA when it proposes site-specific actions in the future. Its refusal to do so forces us to conclude that the agency will not offer that caliber of opportunity. As we explain in these comments, that is illegal. For a steward of public lands, it is also wrong. As the agency’s first Chief said, “consult[ing] the public ... is what you are hired for.”<sup>18</sup>

After two years of little to no public involvement, the agency found it imperative to offer this comment period over holidays at the end of 2019 and beginning of 2020, which it knew was the hardest time of year for the public to devote attention to these issues. Numerous requests<sup>19</sup> from the public to delay the comment period until after the holidays were denied.<sup>20</sup> That does not inspire confidence that the agency is committed to widening public understanding. Nor does the agency’s attempt to satisfy NEPA by offering a single opportunity for public participation, now, for a decades-long project with no site-specific proposals. If you are not trying to remove

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<sup>16</sup> See, e.g., Patrick Hunter, SELC, phone call with Angie Bell, USFS Foothills Team Leader (Jan. 19, 2017); Letter from Chattooga Conservancy to Chattahoochee National Forest (March 19, 2017); Letter from Georgia ForestWatch et al. to Angie Bell, USFS Foothills Team Leader (June 9, 2017); Patrick Hunter, SELC, phone call with Betty Jewett, Angie Bell, and Nelson Gonzalez-Sullow, USFS (Aug. 15, 2017); Georgia ForestWatch et al. Comments on Draft Restoration Plan (Sept. 28, 2017); Letter from Chattooga Conservancy et al. to Angie Bell, USFS Foothills Team Leader (Oct. 16, 2017); Meeting at the Forest Supervisor’s Office to discuss the Foothills Project’s approach to NEPA compliance (Nov. 14, 2017); Letter from Georgia ForestWatch et al. to Betty Jewett, Forest Supervisor (Dec. 22, 2017); Letter from Georgia ForestWatch et al. to Stephanie Israel, USFS Foothills Team Leader (Feb. 1, 2019); numerous additional personal communications.

<sup>17</sup> See Attachment 1 (Deciding officer: “the work we are proposing is work we have been doing for years”).

<sup>18</sup> Gifford Pinchot’s 11 Maxims.

<sup>19</sup> See, e.g., Letter from Chattooga Conservancy, et al. to Betty Jewett (Dec. 6, 2019).

<sup>20</sup> See, e.g., Letter from Betty Jewett to Patrick Hunter (Dec. 13, 2019).

the public from the process of making site-specific decisions, why not alter your approach? We have long suggested other ways to increase the pace of work on the forest without cutting the public out.

Our repeated calls for meaningful public participation have not been calls for more meetings. We can meet until we are blue in the face but that is not a replacement for meaningful disclosure of critical information: specifically, *what* the agency is proposing to do, *when, how,* and *where*. We do not ask for this information as pointless specificity; these decisions, which the Forest Service wants to defer until a time when the public can no longer participate through NEPA, are consequential. Where, how, and when project activities occur (and how rapidly) matters immensely. The same actions in different locations often cause very different environmental harms in a landscape as complex, both ecologically and culturally, as the Foothills area. In such a complex area, site-specific information is the foundation of any public understanding of the actions envisioned under this project, but the agency has not provided it in the Draft EA or elsewhere. Lengthy analyses are not a substitute for quality analyses.

We remain confused by many decisions the agency has made with this project. Early on we suggested bypassing preparation of the Draft EA and moving straight to an Environmental Impact Statement (“EIS”). That would have saved significant time. The Draft EA only confirms the agency is going to have to take that step now, despite the deciding officer’s claim that the public can “see what happens . . . when I issue the [Finding of No Significant Impact].”<sup>21</sup>

We have repeatedly explained ways the agency could use a condition-based approach to accomplish work across a landscape in compliance with NEPA.<sup>22</sup> Those recommendations were ignored and the proposal reflected in the Draft EA does not come close to complying with many basic legal requirements. Again, we do not fault the staff here; they have been given an impossible task. To the extent the agency believes proposed revisions to its NEPA regulations— if approved – may allow it to implement these activities; the agency is taking a risky gamble.<sup>23</sup> Implementing an agency regulation before it is finalized is grounds for vacatur. It also makes a mockery of public comment periods which presumably could lead the agency to change or abandon its proposal. That is obviously not a possibility if the agency begins implementing the regulation *before* it is finalized. Regardless, if the Foothills approach to condition-based management is what the agency envisioned in its proposed NEPA Rule, then for all the reasons explained in this letter, condition-based management does not comply with NEPA or allow compliance with the National Forest Management Act.

As we cautioned at the very beginning of this process, the agency’s approach needlessly puts the public in a bind. If the Forest Service moves forward with this proposal, the public will have only one more opportunity guaranteed by law to have a say in the management of this area for potentially the next 40 years: filing an administrative objection. Even if members of the public agreed with every general course of action the Forest Service is proposing, should they

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<sup>21</sup> See Attachment 1.

<sup>22</sup> See *supra* n. 16.

<sup>23</sup> See Attachment 1 (Deciding officer: “We will have to see what happens . . . [with] the NEPA rule change.”).

trade away legal protections ensuring their say in the management of these lands for decades? Similarly, the statute of limitations for actions against the government is typically six years. This project would continue far beyond that – in what capacity is unknown, because the Draft EA contains no specific proposals. Should the public litigate now or trade away the option of legal recourse with the hope that decisions made ten, fifteen, or twenty years from now, by an entirely different staff, will be acceptable? That is a hard sell. We have no idea what may change in that timeframe.

Nor do we know what motivations the agency will have over that period. Maybe it will face even more pressure to log; maybe it will not commercially log at all. What is clear is that despite promises of transparency, the agency is not being transparent about all of its motivations *now*, for *this* project. Agency-wide, the Forest Service is under pressure to meet increased timber targets.<sup>24</sup> The Southern Region needs more NEPA-ready timber sales “on the shelf” to meet those targets.<sup>25</sup> And the Chattahoochee-Oconee’s Five-Year Timber Plan already incorporates specific sales from this project.<sup>26</sup> We understand that the agency needs to log to meet these targets but the agency needs to be upfront with the public about that reality. It shapes this project by forcing work into commercially viable stands of trees, not just those with ecological needs or that offer the greatest wildlife benefit. When the Forest Service asserts that all of its actions are restoration-focused, yet simultaneously admits it does not know “underlying causes of ecological degradation”<sup>27</sup> and fails to mention timber at all in its Draft EA, we question whether it is being totally forthcoming. To reiterate, we do not fault the agency for pursuing actions to meet assigned timber targets; it just needs to disclose that piece of the puzzle.<sup>28</sup>

Finally, we hope past experience on this Forest underscores why relying on computer analysis with no in-field review is not a substitute for a hard look. In 2011, the agency proposed a project to “thin 6,375 acres of over-stocked pine stands” identified using agency data.<sup>29</sup> Two years later it had to re-scope the project after “on-the-ground examination found that many of the stands” were not over-stocked pines.<sup>30</sup> The final project was only 713 acres. Using the agency’s data may be a great first step to identifying possible treatments, but it is not the final step for NEPA compliance.

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<sup>24</sup> See Forest Service Washington Office Memorandum, included as Attachment 3, discussing increased timber targets; see also Executive Order 13855 (Dec. 21, 2018), calling on the Forest Service to increase timber production to “at least 3.8 billion board feet” in fiscal year 2019.

<sup>25</sup> See *id.*

<sup>26</sup> See Attachment 4.

<sup>27</sup> Draft EA, 11.

<sup>28</sup> Even while this comment period was pending the Forest Service issued a press release celebrating that it “sold more timber in this year than we have in any of the past 21 years” and committing to do as much or more for 2020. See Forest Service Press Release (Dec. 19, 2019) available at <https://www.fs.usda.gov/news/releases/usda-forest-service-surpasses-goals-and-breaks-records-2019>. Clearly, timber—one of the “flagship targets”—is an important agency objective.

<sup>29</sup> See Attachment 5.

<sup>30</sup> See Attachment 6.

The deeply unfortunate part about all of this is that we support many of the priorities the agency is articulating. For example, we agree that some of the landscape would benefit from prescribed fire; that early-successional and other wildlife habitats are lacking; and that old pine plantations need to be restored. We understand the need to accomplish some of this work with commercial timber sales and that Congress has decided our national forests will be managed in part for timber purposes. And we recognize that the landscape would benefit from quick implementation of some of these activities. We have been involved in this project because we see value in those ideas and we have worked with the agency to see them successfully implemented in past projects. But priorities, even when we agree with them, are not projects. How and where the agency pursues these priorities matters. We support those efforts but we cannot support their implementation through the process the agency has chosen here.

Finally, because of the extent of the problems with the proposal and the inadequate time allotted, these comments may not be a model of clarity throughout. If we can answer questions or clarify concerns, please do not hesitate to ask.

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## **I. The Foothills Project May Significantly Affect the Human Environment, Necessitating Preparation of an Environmental Impact Statement**

NEPA requires federal agencies to prepare an EIS for any “major Federal actions significantly affecting the quality of the human environment.”<sup>31</sup> “Affecting” includes actions that “will *or may* have an effect.”<sup>32</sup> Restated, if a major federal action *may* have a significant effect on the human environment, federal agencies *must* prepare an EIS. A decision not to prepare an EIS is unreasonable “[i]f substantial questions are raised regarding whether the proposed action may have a significant effect upon the human environment.”<sup>33</sup> There is no question that the Foothills Project may have a significant effect upon the human environment.

### A. The Sheer Scope of Work Proposed Demands an EIS

As part of the Foothills Project the Forest Service is proposing (among other things):

- Over 60,000 acres of commercial timber harvest<sup>34</sup>
- Additional noncommercial timber harvest so that mechanized harvest would occur on up to 80,681 acres<sup>35</sup>
- 50,000 acres of prescribed burning<sup>36</sup>
- 360 miles of new bulldozer lines to facilitate prescribed burning<sup>37</sup>
- Up to 74,500 acres of herbicide application<sup>38</sup>
- Grinding vegetation to wood chips using industrial masticators on up to 83,850 acres<sup>39</sup>
- Building an undisclosed amount of “new temporary” roads<sup>40</sup>
- Rerouting up to 111 miles of trail though specific trails and reroute locations are undisclosed<sup>41</sup>

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<sup>31</sup> 42 U.S.C. § 4332(C).

<sup>32</sup> 40 C.F.R. § 1508.3 (emphasis added); see *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1149 (9th Cir. 1998), *overruled, in part, on other grounds Lands Council v. McNair*, 537 F.3d 981 (9th Cir. Idaho 2008) (An EIS “*must* be prepared if substantial questions are raised as to whether a project . . . *may* cause significant degradation of some human environmental factor”) (internal citation omitted) (emphasis in original).

<sup>33</sup> *Save the Yaak Committee v. Block*, 840 F.2d 714, 717 (9th Cir. 1988) (internal citations omitted).

<sup>34</sup> Draft EA, App’x B.

<sup>35</sup> Aquatic Resource Report, 25.

<sup>36</sup> Draft EA, App’x B.

<sup>37</sup> Soil Report, 32.

<sup>38</sup> Vegetation Report, AP7.

<sup>39</sup> Aquatic Resource Report, 25.

<sup>40</sup> Soil Report, 22.

<sup>41</sup> Draft EA, App’x B.

This will all occur in a 157,625-acre area.<sup>42</sup> Two out of every three acres in the area will see some type of active management likely involving the use of large-scale, mechanical equipment. Some as-yet-undetermined acreage will see repeat entries for multiple activities (e.g., logging, masticating, burning). The agency's highly conservative estimate is that this will result in long-term detrimental impacts to soils across at least 7,432 acres.<sup>43</sup> The activity risks degrading water quality in multiple streams below water quality standards assigned under the Clean Water Act.<sup>44</sup> The project is "not constrained by any time limit"<sup>45</sup> and at the current pace of logging on the forest<sup>46</sup> it will take more than four decades – an entire generation – to accomplish. Forest plans, by law, last for 15 years. In the fifteen years since the Chattahoochee-Oconee National Forest's Land and Resource Management Plan ("Forest Plan") was revised (the plan's entire lawful lifespan), the Forest Service has completed mechanical timber harvest on approximately 15,700 acres.<sup>47</sup> The Foothills Project proposes over quadruple the amount of mechanized harvest that has been completed over the entire life of the Forest Plan and will concentrate that work in approximately 1/5 of the forest acreage. If the Forest Plan required an EIS, *see* 36 C.F.R. § 219.15(a)(2), then certainly a single project four times as big and with work 20 times as densely concentrated as the entire plan does too.

Between 2009-2019, Southern Appalachian national forests in Georgia, Tennessee, North Carolina, and Virginia authorized approximately 37,373 acres of commercial timber harvest *combined*.<sup>48</sup> This has clearly and intentionally had a significant impact on the human environment. A federal action can have a significant impact necessitating preparation of an EIS even if the majority of effects are beneficial. The Foothills Project proposes to authorize more commercial logging than was authorized across six national forests in four states over a period of ten years. To say the scope of the work is unprecedented is an understatement. Undoubtedly, it may have a significant effect on the human environment.

The Forest Service is well aware that this scope of work necessitates preparation of an EIS. Across the country, the Forest Service routinely prepares EISs for projects of this magnitude.<sup>49</sup> The Chattahoochee National Forest does not typically prepare EISs but only

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<sup>42</sup> Draft EA, 1.

<sup>43</sup> Soil Report, 55.

<sup>44</sup> *See infra* 206-209.

<sup>45</sup> Scoping Summary Report, 11

<sup>46</sup> *See* Scoping Summary Report, Table 4.

<sup>47</sup> This number was developed using the information in Table 4 of the Scoping Summary Report and extrapolating the pace of work completed between 2004-2016 to include 2016-2018.

<sup>48</sup> *See* Attachment 2.

<sup>49</sup> *See, e.g.*, Bitterroot National Forest, Gold Butterfly Project Final Environmental Impact Statement (October 2019) (contemplating commercial logging on 5,621 acres); Umatilla National Forest, Ragged Ruby Project Final Environmental Impact Statement (September 2019) (contemplating commercial and noncommercial logging on

because this Forest does not typically propose such expansive projects. The fact that the Chattahoochee does not routinely prepare EISs does not excuse it from NEPA's clear requirement to prepare one in this instance. Notably, the Forest's preparation of DN/FONSI for prior projects establishes only that the Forest has *predicted* that its actions will have no significant impact. It does not have baseline or post-implementation monitoring data that is anywhere close to comprehensive, however, and the Forest has not shown why it can reliably extrapolate from the cherry-picked data it does collect to conclude that prior proposed activities have not caused significant impacts. Moreover, even if it could make that showing, the Forest *cannot* establish that the proposed activities will not have significant impacts in the future. As explained elsewhere in these comments, site-specific public input is the primary reason that previous projects have avoided significant impacts, and such input would be lost under Alternative 2.

The deciding officer for this project recently disclaimed the connection between a project's size and the potential for significant effects.<sup>50</sup> This is the connection: as the size of projects increase, more soils are adversely impacted through use of mechanical equipment, more habitat is changed (purposefully or otherwise) through timber harvest, there is more sediment runoff into streams, invasive species are spread across a greater area, more cultural resources are put at risk, and the likelihood of affecting rare species increases. We can disagree about the *degree* of impact commercial logging has on national forests but it indisputably has *some* impact. Surely it is not the Forest Service's position that commercially logging national forests has *no* impact on the environment. In fact logging activities are specifically intended *to have an impact* albeit one the Forest Service considers largely positive. But projects can cross the significance threshold even if their impacts are largely beneficial.<sup>51</sup> The more logging that occurs (i.e., the larger projects become), the greater impacts – intended or collateral – become. At some point, those impacts cross a significance threshold. This project is well over that line. Finally, with

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9,170 acres); Helena-Lewis and Clark National Forest, Castle Mountains Restoration Project Final Environmental Impact Statement (2019) (contemplating approximately 14,500 acres of commercial and noncommercial logging); Ochoco National Forest, Black Mountain Vegetation Management Project Final Environmental Impact Statement (July 2019) (contemplating commercial and noncommercial logging on 6,585 acres); Caribou-Targhee National Forest, John Wood Forest Management Project (April 2019) (contemplating commercial and noncommercial logging on 797 acres); Nez-Perce Clearwater National Forest, Little Boulder Project Final Environmental Impact Statement (February 2019) (contemplating commercial and noncommercial logging on 1,501 acres); Umatilla National Forest, Sunrise Vegetation and Fuels Management Project Final Environmental Impact Statement (December 2018) (contemplating commercial and noncommercial logging on 7,790 acres); Shawnee National Forest, Cretaceous Hills Ecological Restoration Project Final Environmental Impact Statement (April 2018) (contemplating commercial and noncommercial harvest on 3,200 acres); Rio Grande National Forest, CP District-wide Salvage Project Final Environmental Impact Statement (March 2018) (contemplating salvage logging across 17,000 acres). These EISs are all available here: <https://cdxnodengn.epa.gov/cdx-enepa-public/action/eis/search>. Please let us know if you would like us to provide an individual copy.

<sup>50</sup> See Attachment 1.

<sup>51</sup> 40 C.F.R. § 1508.27(b)(1).

larger projects comes increased possibility that something could go substantially awry leading to significant acute detrimental impacts.

In addition, this massive project contains no limitation on the pace of work. It authorizes the entire bolus of logging in a single decision, leaving it up to the agency's discretion how quickly, and in what areas, logging will occur. Indeed, because of the way "implementation areas" are set up, it is likely that harvest activities will be concentrated in smaller portions of the landscape area at any given time, with a pace and density of work at that scale which is far greater than other project activities in the past. In the past, the Forest has accomplished only 1,286 acres per year of harvest.<sup>52</sup> Even assuming that 1,286 acres of harvest per year has not had a significant impact, and assuming further that increasing the raw acreage of harvest will somehow avoid causing an increased impact, a faster pace of logging makes a significant difference. More logging *annually* will, for example, make a bigger difference in the age structure of the forest, shifting the balance from a forest that is slowly maturing and recovering from historical logging, to a much younger forest overall. While this may bring benefits for some wildlife species and forest communities, it will undoubtedly carry negative effects for others. Making these changes at the landscape level will profoundly alter the forest's age class distribution for over a century.

As discussed more below, significance for NEPA purposes is assessed according to two factors: context and intensity. Size relates to both factors. For instance, if the Forest Service proposed to complete all of the work considered in the Foothills Project during a 10- or 15-year period, it would constitute the most concentrated work effort the forest has seen in decades. Within a 157,000-acre area, more work would occur than has been completed across six Southern Appalachian national forests in four states over a similar time period. The "intensity" of the work would be unmatched on the Chattahoochee. Alternatively, if the Forest Service continued working at its same general pace (which we understand to be the plan), it would take four decades or more to complete the entire suite of work. Put in "context," the Forest Service would be seeking authorization for work that will not be completed for a generation. That is clearly significant. Either way, the potential for significant impacts increases as the size of a project increases.

#### B. Forest Service Regulations Require an EIS

One of the first steps in determining whether to prepare an EIS is to "[d]etermine under [Forest Service NEPA] regulations . . . whether the proposal is one which . . . [n]ormally requires an environmental impact statement."<sup>53</sup> Forest Service regulations establish that the Foothills Project is one that normally requires an EIS.

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<sup>52</sup> Scoping Summary Report, Table 4 (sum of annual harvest activities).

<sup>53</sup> 40 C.F.R. § 1501.4(a).

Under the agency's regulations that are two classes of actions "normally requiring environmental impact statements."<sup>54</sup> The second class includes "[p]roposals that would substantially alter the undeveloped character of an inventoried roadless area or a potential wilderness area. Examples include but are not limited to . . . [c]onstructing roads and harvesting timber in an inventoried roadless area where the proposed road and harvest units impact a substantial part of the inventoried roadless area."<sup>55</sup>

The Foothills Project contemplates performing various management activities in five inventoried roadless areas.<sup>56</sup> Two of the areas are located wholly within the Foothills Project boundary.<sup>57</sup> There are no concrete proposals for what will happen in these areas but the Forest Service appears to be contemplating mechanical timber harvest, road maintenance or reconstruction, and work on trails or recreation facilities.<sup>58</sup> The agency also seeks authorization to conduct untold work to "respond to insect and disease outbreak . . . on a case-by-case basis" in inventoried roadless areas even though it has submitted no evidence that there are insect or disease problems within these areas.<sup>59</sup> Because there is no time limit for this project,<sup>60</sup> the agency is apparently seeking NEPA coverage for these undisclosed amounts of management in inventoried roadless areas that may take place over the next several decades.

Because the Foothills Project does not include any site-specific proposals, we do not know how the agency could conclude that its proposal will "not substantially alter the undeveloped character of an inventoried roadless area."<sup>61</sup> The agency is reserving the ability to do undisclosed work at undisclosed locations within these areas. Without more specifics, the agency cannot know the effect its actions will have on the roadless character of these areas. If all the agency needed to do was promise that its work would not "substantially alter the undeveloped character" of the area, then the requirement at 36 C.F.R. § 220.5(a)(2) to prepare EISs for proposals that may alter the undeveloped character of an inventoried roadless area would be superfluous. The Roadless Rule already largely prohibits the Forest Service from pursuing road building or timber harvesting that would disrupt the undeveloped character of roadless areas. The point of 36 C.F.R. § 220.5(a)(2) is to require the agency to prepare a detailed analysis of whether its actions will violate that requirement *before* it authorizes them. It cannot sidestep the requirement with conclusory statements that nothing it authorizes will risk adversely affecting the roadless character of impacted areas.

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<sup>54</sup> 36 C.F.R. § 220.5.

<sup>55</sup> *Id.* § 220.5(a)(2).

<sup>56</sup> Inventoried Roadless Area Report, 2.

<sup>57</sup> Inventoried Roadless Area Report, 2.

<sup>58</sup> Inventoried Roadless Area Report, 4-6.

<sup>59</sup> Inventoried Roadless Area Report, 6.

<sup>60</sup> Scoping Summary Report, 11.

<sup>61</sup> 36 C.F.R. § 220.5(a)(2).

The agency recognizes that activities similar to those it is proposing – “harvesting activity” and work on “access roads,” in particular – can categorically result in a “noticeable intrusion” on the roadless character of these areas.<sup>62</sup> Even without knowing where these activities may occur in the roadless areas, the agency concludes that completing them at all will result in a “downward” trend in the landscape character and integrity of the area.<sup>63</sup>

Maps produced with the Draft EA indicate that substantial portions of the Miller Creek and Boggs Creek inventoried roadless areas may see mechanical timber harvest. For instance, according to the maps, both areas are appropriate for “yellow pine restoration.”<sup>64</sup> “Yellow pine restoration” is effectively described as clearcutting, where “the majority of the overstory trees would be removed.”<sup>65</sup> The maps also suggest the Forest Service plans “pitch pine maintenance” in these areas.<sup>66</sup> “Pitch pine maintenance” is not specifically described in the Draft EA but it appears to involve mechanically thinning half or more of the trees from a specific area.<sup>67</sup> Substantial woodland treatments are also proposed in the two areas.<sup>68</sup> This management technique involves removing approximately 2/3 to 3/4 of the trees from a specific area.<sup>69</sup> Canopy gaps are also proposed for the two areas.<sup>70</sup> This involves not only creating obvious gaps in the canopy but also mechanically thinning areas surrounding the gaps.<sup>71</sup> Finally, the Forest Service is proposing substantial “oak maintenance or regeneration” in both areas.<sup>72</sup> This management activity not only contemplates substantial mechanical tree harvesting, including near clearcutting to create early-successional habitat, but also mastication and widespread use of herbicide.<sup>73</sup>

All told, the maps attached to the EA – which are the most site-specific information the Forest Service has provided for this project – forecast mechanical harvesting in the *vast majority* of the Boggs Creek and Miller Creek inventoried roadless areas. Under the agency’s NEPA regulations, this requires preparation of an EIS.

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<sup>62</sup> Inventoried Roadless Area Report, 3.

<sup>63</sup> Inventoried Roadless Area Report, 8.

<sup>64</sup> Compare Draft EA, Map 18 with Inventoried Roadless Area Report, Map 1. We note that it is difficult to make this comparison given the maps the agency has provided and lack of any site-specific proposal.

<sup>65</sup> Draft EA, 48.

<sup>66</sup> See *supra* n. 64.

<sup>67</sup> Draft EA, 46.

<sup>68</sup> Compare EA, Map 20 with Inventoried Roadless Area Report, Map 1.

<sup>69</sup> Draft EA, 52.

<sup>70</sup> See *supra* n. 68.

<sup>71</sup> Draft EA, 52.

<sup>72</sup> Compare EA, Map 19 with Inventoried Roadless Report, Map 1.

<sup>73</sup> Draft EA, 48-51.



### C. The Forest Service Appears to Misunderstand its Obligation to Disclose Significant Impacts

Repeatedly in its analysis, the Forest Service concludes that impacts to the human environment will not be significant because of the existence of a legal prohibition or Forest Plan standard. To the contrary, NEPA exists *because* other laws allow agencies to undertake actions with significant impacts. If significant impacts were prohibited by other environmental laws, there would simply be no need for a law requiring agencies to disclose them.

The agency's assessment of impacts to roadless areas is no exception. The agency dismisses the severity of impacts in these areas pointing to "the limitations set forth in overarching law, policy and regulation"<sup>74</sup> and the existence of "Forest Plan standards."<sup>75</sup> This reveals a fundamental misunderstanding of the agency's obligation under NEPA which undermines the entire Draft EA. NEPA's requirement to assess and disclose environmental impacts, and to prepare an EIS when those impacts may be significant, is a separate, independent requirement from those established under other laws (such as the 2001 Roadless Rule) or agency documents (such as the Forest Plan). In other words, the existence of the Roadless Rule does not mean that impacts in roadless areas cannot rise to a significant level for purposes of NEPA; the Roadless Rule was not promulgated for purposes of NEPA effects analysis.

The Forest Service's regulation requiring preparation of an EIS when "harvesting timber in an inventoried roadless area where the proposed road and harvest units impact a substantial part of the inventoried roadless area" proves the point.<sup>76</sup> This regulation assumes the Forest Service is not trying to violate the 2001 Roadless Rule but recognizes that even if a project complies with the Roadless Rule it can still cause a significant impact necessitating preparation of an EIS.

Throughout the Draft EA, the Forest Service repeatedly concludes that effects will not be significant because of the existence of the Forest Plan. For instance, almost all impacts to soils are dismissed as insignificant so long as at least "85% of an activity area is left in a condition of acceptable potential soil productivity following land management activities."<sup>77</sup> The agency takes that threshold from its Forest Plan: "Per [Forest Plan] standard FW-068, detrimental soil disturbance must not exceed 15% of the activity area."<sup>78</sup> But compliance with the Forest Plan *does not mean that impacts will not rise to a level of significance for purposes of NEPA*. If all the agency had to do to conclude that effects would not be significant is point to the existence of

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<sup>74</sup> Inventoried Roadless Area Report, 1.

<sup>75</sup> Inventoried Roadless Area Report, 8.

<sup>76</sup> 36 C.F.R. § 220.5(a)(2).

<sup>77</sup> Soil Report, 2. The Forest Service uses the 85% threshold to find impacts "not significant" in Tables 16, 17, 18, 20, 21, 26, and 28 of the Soil Report.

<sup>78</sup> Hydrology Report, 22.

its Forest Plan, then there would be no need for impacts analysis under NEPA because the mere existence of the Forest Plan would decide the issue.

The agency knows that is not true and routinely assesses environmental impacts under NEPA for site-specific projects despite protective limits in its Forest Plan. The Plan itself defers the significance analysis to projects: “Any decisions on projects to implement the Plan are based on *site-specific* analysis in compliance with the National Environmental Policy Act.”<sup>79</sup> “Site specific analysis of proposed management actions will identify any protective measures needed *in addition* to Forest Plan standards.”<sup>80</sup> When the Forest Service revised its Forest Plan it reserved for itself significant flexibility to pursue a variety of actions on the landscape, some of which could have a significant effect on the human environment. Those projects must go through their own site-specific NEPA analysis to evaluate effects and the significance of those effects. Now that the agency is preparing those projects, it cannot attempt to point back to its Forest Plan to argue that the significance determination for site-specific projects was made there; it cannot reserve for itself in its Forest Plan the ability to implement projects that may have a significant impact on the environment and simultaneously argue that any action implementing the Forest Plan will not have a significant impact because of the existence of the plan. The existence of Forest Plan standards does not mean impacts from projects implemented under that Plan cannot be significant.

The Foothills Project illustrates why this approach will not work under the current Forest Plan. This Project will result in long-term detrimental impacts to at least 7,432 acres of soil.<sup>81</sup> The Forest Service considers the impact insignificant because the agency has given itself a 157,000-acre project area, asserts that 7,432 acres of impacts to soil across such an expansive area complies with the Forest Plan, and therefore is not significant for NEPA purposes. If instead this impact occurred in a 20,000-acre area it would unquestionably violate the Forest Plan (because detrimental soil disturbance would exceed 15% of the activity area) which would lead the Forest Service to consider it a significant impact for NEPA purposes. But the impact is the same – long-term detrimental impacts to soil across at least 7,432 acres. The significance of that impact is not decided by the Forest Plan. Nor does it turn on how expansively the Forest Service defines its project boundary. If that were the case the Forest Service could always avoid significant impacts simply by drawing larger project boundaries even if it had no intention of completing activities in the vast majority of the project area. The relevant question is whether for NEPA purposes 7,432 acres of long-term detrimental impacts to soils is a significant impact. Unquestionably, it is.

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<sup>79</sup> Forest Plan, 2-2 (emphasis added).

<sup>80</sup> FW-029, Forest Plan 2-13.

<sup>81</sup> Soil Report, 55.

This is such a fundamental error pervasive throughout the EA that it bears repeating: the agency cannot point to the existence of its Forest Plan or other legal standards to conclude under NEPA that impacts will not be significant.

D. The Foothills Project Meets the Council on Environmental Quality's Factors Necessitating Preparation of an EIS

As explained above, NEPA requires federal agencies to prepare an EIS for any “major Federal actions significantly affecting the quality of the human environment.”<sup>82</sup> “Human environment” is a “comprehensive[]” term that includes “the natural and physical environment and the relationship of people with that environment.”<sup>83</sup> Nearly all actions on national forests affect the “human environment” to some degree.

An action is a “federal action” for purposes of NEPA if it is “potentially subject to Federal control and responsibility.”<sup>84</sup> All actions on national forests are potentially subject to Federal control and responsibility.

The adjective “major” for purposes of NEPA “does not have a meaning independent of significantly.”<sup>85</sup> Significance is determined based on two factors: “context” and “intensity.”<sup>86</sup>

To evaluate “context” “the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality.”<sup>87</sup> “Both short- and long-term effects are relevant.”<sup>88</sup> “Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole.”<sup>89</sup>

The Foothills Project is significant in context. The Forest Service is proposing to log or burn 2/3 of a 157,000-acre area which will be the most significant impact this area has seen potentially since acquisition by the Forest Service. In many ways the Forest Service has promoted the project by highlighting its significance and unprecedented nature. The project is the first of its kind on the Chattahoochee National Forest “developed with collaborative input”

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<sup>82</sup> 42 U.S.C. § 4332(C).

<sup>83</sup> 40 C.F.R. § 1508.14.

<sup>84</sup> 40 C.F.R. § 1508.18.

<sup>85</sup> 40 C.F.R. § 1508.18.

<sup>86</sup> 40 C.F.R. § 1508.27.

<sup>87</sup> 40 C.F.R. § 1508.27.

<sup>88</sup> *Id.*

<sup>89</sup> *Id.*; see *Am. Rivers v. Fed. Energy Regulatory Comm'n*, 895 F.3d 32, 49 (D.C. Cir. 2018) (stating the same).

over the course of a year.<sup>90</sup> The project is the largest that we are aware of in the history of the Chattahoochee National Forest. The project touches every Ranger District on the forest and is spread across eight counties. The project proposes to utilize a new “toolbox approach” during implementation; a significant departure from past practice.<sup>91</sup> The project purposefully impacts nearly every “interest” on the national forest with recreational, logging, road building, wildlife, conservation, and restoration aspects to name a few. The project is the first under a new proposed “Integrated Landscape Restoration Strategy” that will apply forest-wide.<sup>92</sup> And the project identifies forest management activities to be completed over multiple decades. In the context of the Chattahoochee National Forest and the people who use it, it is difficult to imagine a more “significant” action.

“Intensity” “refers to the severity of impact.”<sup>93</sup> CEQ provided 10 factors to consider when analyzing the “intensity” of an action.<sup>94</sup> “Implicating any one of the factors may be sufficient to require development of an EIS.”<sup>95</sup> The Foothills Project triggers every factor.

The first factor clarifies that agencies must consider both adverse and beneficial impacts.<sup>96</sup> “A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.”<sup>97</sup> The entire purpose of the Foothills Project, as articulated by the Forest Service, is to have a significant beneficial impact. The project intends to “restore” an entire landscape.<sup>98</sup> It aims to further that objective through burning and mechanical harvesting on over 100,000 acres. There is no reason to pursue such a broad program of work if the Forest Service does not intend it to have significant impacts, whether beneficial or adverse.

The second factor considers the “degree to which the proposed action affects public health or safety.”<sup>99</sup> Many of the actions proposed as part of the Foothills Project are intended to affect public safety. There are actions to “improve public and firefighter safety,”<sup>100</sup> “reduc[e] hazards to visitors for safety,”<sup>101</sup> improve roads to reduce public “safety hazards,”<sup>102</sup> and change

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<sup>90</sup> Draft EA, 10.

<sup>91</sup> Draft EA, 10.

<sup>92</sup> Draft EA, 10.

<sup>93</sup> 40 C.F.R. § 1508.27(b).

<sup>94</sup> *Id.*

<sup>95</sup> *Nat'l Parks Conservation Ass'n v. Semonite*, 916 F.3d 1075, 1082 (D.C. Cir.), *amended on reh'g in part*, 925 F.3d 500 (D.C. Cir. 2019) (citation omitted).

<sup>96</sup> 40 C.F.R. § 1508.27(b)(1).

<sup>97</sup> *Id.*

<sup>98</sup> Draft EA, 10-12.

<sup>99</sup> 40 C.F.R. § 1508.27(b)(2).

<sup>100</sup> Draft EA, 57.

<sup>101</sup> Draft EA, 59.

recreational settings to “[m]itigate health and safety concerns.”<sup>103</sup> In fact, if the Forest Service does not implement Alternative 2, it predicts that “visitor safety . . . [is] likely to decrease over time.”<sup>104</sup> In other words, an underlying purpose of the project is to affect public health and safety. The significant amount of burning and logging proposed may affect the safety of visitors to the national forest. Finally, the proposal calls for application of herbicides at levels that exceed hazard quotients in some scenarios.<sup>105</sup>

The third factor to consider is the “[u]nique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.”<sup>106</sup> A stated purpose of the project is specifically “to improve, maintain or restore *unique* habitats.”<sup>107</sup> The project plans numerous changes to the Wild and Scenic Chattooga River corridor.<sup>108</sup> It also proposes harvesting existing old growth forest which is extremely rare in the Southern Appalachians.<sup>109</sup> The Forest Service estimates that the project area includes “more than 2,300 acres of wetland habitat including Bogs, Fens, Seeps, and Seasonal Ponds” and proposes specific management activities in those areas.<sup>110</sup> Other parts of the project are intended to “enhance rare communities.”<sup>111</sup> Some of these areas are identified as ecologically critical to the recovery of threatened, endangered, and rare species.<sup>112</sup> The agency also estimates that “a total of approximately 1,687 archaeological sites are present with Foothills area.”<sup>113</sup> Some of these sites may be destroyed as a result of the project.<sup>114</sup> And as mentioned above, the project plans impacts to several Inventoried Roadless Areas. The proposal will not only have collateral effects on the unique characteristics of the Foothills project area, but some of the proposed actions specifically target those unique areas.

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<sup>102</sup> Draft EA, 67.

<sup>103</sup> Draft EA, App’x E.

<sup>104</sup> Draft EA, 104.

<sup>105</sup> See Vegetation Report, App’x B.

<sup>106</sup> 40 C.F.R. § 1508.27(b)(3).

<sup>107</sup> Draft EA, 25 (emphasis added).

<sup>108</sup> Draft EA, 106.

<sup>109</sup> Vegetation Report, 290.

<sup>110</sup> Botanical and Rare Communities Report, 12; see also Draft EA, 8 (“Several rare communities such as mountain bogs, wetlands, canebrakes, caves, and rock outcrops are also found within the project area”).

<sup>111</sup> Botanical and Rare Communities Report, 2.

<sup>112</sup> Botanical and Rare Communities Report, 13 (discussing recovery potential for swamp pink); 14 (the same for white fringeless orchid).

<sup>113</sup> Cultural Resources Report, 12

<sup>114</sup> Cultural Resources Report, Table 3.

The fourth factor is the “degree to which the effects on the quality of the human environment are likely to be highly controversial.”<sup>115</sup> Apparently, the Forest Service designed the project in part to be controversial. The project was designed with “collaborative input” which was solicited in part to “debate the restoration needs on the landscape.”<sup>116</sup> If the Forest Service is seeking to instigate debate amongst its stakeholders, it must realize it is proposing a controversial action. The Forest Service is also seeking to utilize the same condition-based approach with Foothills that the agency is attempting to codify in revised NEPA procedures.<sup>117</sup> That proposal was controversial enough to garner over 100,000 public comments.<sup>118</sup> Finally, the effects of logging on climate change are subject to scientific controversy; their effects certainly cannot be limited to the perimeter of the Chattahoochee-Oconee National Forest.<sup>119</sup>

An action can also be “highly controversial where there is a substantial dispute about the size, nature or effect of a federal action.”<sup>120</sup> As pointed out elsewhere, there is a dispute about the size and effects of this action because they are unknown. The agency does not know where on the ground it will conduct certain activities and without that information cannot know what the effect of the action will be. The agency acknowledges as much, stating that “site characteristics . . . determin[ing] existing baseline conditions and . . . any underlying causes of ecological degradation” have not been assessed.<sup>121</sup>

The fifth factor is the “degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.”<sup>122</sup> This project easily triggers this factor. The Forest Service does not know where on the landscape it will implement certain actions. If it does not know where on the landscape it will take action, it cannot know what impact its actions will have or how to effectively mitigate impacts associated with that action. *See infra* Section XII(S) (discussion of the inadequacy of proposed mitigation). As an example, building a road on 30% slope with highly erosive soils adjacent to a trout stream has the potential for different impacts than building a road on 5% slope with stable soils nowhere near a stream. Until the Forest Service decides where its proposed actions will take place, the effects of those actions will remain highly uncertain. This is especially true considering the Forest Service is working with

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<sup>115</sup> 40 C.F.R. § 1508.27(b)(4).

<sup>116</sup> Scoping Summary Report, 1.

<sup>117</sup> *See* Proposed NEPA Revision, 84 Fed. Reg. 27,544 (June 13, 2019).

<sup>118</sup> *See* Federal Register Docket FS-2019-0010.

<sup>119</sup> Climate Change Report, 3.

<sup>120</sup> *Georgia River Network v. U.S. Army Corps of Engineers*, 334 F. Supp. 2d 1329, 1338 (N.D. Ga. 2003)

<sup>121</sup> Draft EA, 11.

<sup>122</sup> 40 C.F.R. § 1508.27(b)(5).

“imperfect information” including no assessment of “baseline conditions” or an understanding of “underlying causes of ecological degradation.”<sup>123</sup>

The Forest Service is also proposing some experimental treatments which by definition have unique or unknown risks. The agency is “working with the University of North Georgia, [Southern Research Station], Georgia Forestry Commission, and other specialists” to develop new “silvicultural treatments [for] the conservation of hemlock.”<sup>124</sup> The Forest Service is also proposing to utilize an “expanding-gap silvicultural method” in conjunction with the Southern Research Station.<sup>125</sup> This is also an experimental treatment; the Southern Research Station recently embarked on a “region-wide trial” for the approach.<sup>126</sup> Despite its experimental nature, the Forest Service proposes implementing this management technique across over 14,000 acres.<sup>127</sup> Applying a silvicultural approach that is still going through trials across 14,000 acres involves unique or unknown risks.

The sheer size of this project implicates unique or unknown risks. The agency is contemplating burning or logging approximately 100,000 acres across a 157,000-acre area. We are unaware of any project that has sought to so substantially and comprehensively alter the existing landscape in the Southern Appalachians. The effects of such an expansive approach are unknown.

The Forest Service appears to concede that the effects of its action are uncertain and involve unknown risks. For instance, the agency cannot fully evaluate the effect of the project on soil because (among other reasons) “at the time of this analysis it is difficult to infer which activities may actually overlap in space.”<sup>128</sup> In other words, without knowing whether a piece of ground will experience prescribed burning only, or prescribed burning in combination with commercial timber harvest, mastication, and herbicide application, the effects on soils remain relatively unknown. As mentioned above, the agency also admits that it does not currently know “baseline conditions and . . . any underlying causes of ecological degradation” in the project area.<sup>129</sup> How can the agency know the effects and risks associated with its actions if it does not know the condition of the area where the action will occur? Finally, the agency acknowledges

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<sup>123</sup> Draft EA, 11.

<sup>124</sup> Draft EA, 54.

<sup>125</sup> Draft EA, 57.

<sup>126</sup> See Lhotka, John M.; Saunders, Michael R.; Kabrick, John M.; Dey, Daniel C. 2013. Regenerating oak-dominated forests using irregular, gap-based silvicultural systems. In: Guldin, James M., ed. 2013. Proceedings of the 15th biennial southern silvicultural research conference. e-Gen. Tech. Rep. SRS-GTR-175. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 507-508.

<sup>127</sup> Draft EA, 50.

<sup>128</sup> Soil Report, 52.

<sup>129</sup> Draft EA, 11.

that additional “management or maintenance treatments” may be necessary depending on the “effects of activities” proposed in the project.<sup>130</sup> In other words, the Forest Service will respond to the effects of its proposed activities once it sees what those effects are – a clear indication that even the agency does not understand the possible effects of its actions.

Finally, the Forest Service recognizes that “[m]any of the Foothills proposed actions could potentially affect existing [non-native invasive species] or introduce [non-native invasive species].”<sup>131</sup> The effects of widespread introduction of non-native invasive species (“NNIS”) across a 157,000-acre area are both unknown and controversial.

The sixth factor is the “degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.”<sup>132</sup> This project has precedential value because the Forest Service plans to replicate this style of analysis across seven other landscapes on the Chattahoochee National Forest.<sup>133</sup> The Foothills Project is the first of those proposals to move through the NEPA process and will set a standard for future landscape-scale analyses. The Foothills project also represents a decision in principle about a future consideration. As discussed elsewhere, the Forest Service is proposing to log, burn, and build roads in several areas that currently qualify for inclusion in the agency’s next potential wilderness inventory.<sup>134</sup> By conducting intensive management activities in those areas now, the agency is making a decision in principle about how, and potentially if, they will be considered in the future for Wilderness or similar designations.

The seventh factor is “[w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment.”<sup>135</sup> The Foothills Project alone will cause a significant impact necessitating preparation of an EIS but that conclusion is even more inescapable when the effect of the Foothill Project is combined with other projects ongoing in the project area. Table 20 of the Draft EA lists *thousands* of acres of additional logging and burning that either have occurred in the recent past, are currently being implemented, or will be implemented in the future – all within or “touching” the project area.<sup>136</sup> As an example, in the 8,177-acre Sumac Creek watershed, the Forest Service is contemplating 6,654 acres of mechanical treatments as part of the Foothills project.<sup>137</sup> This is in addition to 6,213 acres of

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<sup>130</sup> Draft EA, 12.

<sup>131</sup> Non-native Invasive Species Report, 7.

<sup>132</sup> 40 C.F.R. § 1508.27(b)(6).

<sup>133</sup> See Chattahoochee-Oconee National Forest Integrated Landscape Restoration Strategy (Oct. 2017).

<sup>134</sup> See *infra* 162-165.

<sup>135</sup> 40 C.F.R. § 1508.27(b)(7).

<sup>136</sup> Draft EA, Table 20.

<sup>137</sup> Hydrology Report, Table 7.



past, present, or reasonably foreseeable actions already occurring or planned for the same watershed.<sup>138</sup> Nearly 13,000 acres of mechanical activity are anticipated for this 8,177-acre watershed. It is beyond reasonable to anticipate a cumulatively significant impact from these actions.

The eighth factor is the “degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.”<sup>139</sup> It is anticipated “that a total of approximately 1,687 archaeological sites are present with Foothills area.”<sup>140</sup> The Forest Service estimates that 489 of those sites are either eligible for inclusion in the National Register of Historic Places or require protection until their eligibility can be evaluated.<sup>141</sup> These sites “can be severely impacted by activities that disturb the ground surface.”<sup>142</sup> As a result, the agency predicts that “commercial timber harvest, road reconstruction, temporary road construction, plowing, and any other activity utilizing heavy machinery” will cause direct and indirect adverse effects to historical and cultural resources within the Foothills area.<sup>143</sup>

The ninth factor is the “degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.”<sup>144</sup> The project will affect numerous threatened and endangered species and the Forest Service has determined that the project will have an adverse effect on the endangered Indiana bat.<sup>145</sup> As discussed elsewhere,<sup>146</sup> the project also stands to impact designated critical habitat for the Fine-lined pocketbook (threatened), Alabama moccasinshell (threatened), Coosa moccasinshell (endangered), Ovate clubshell (endangered), Southern clubshell (endangered), Triangular kidneyshell (endangered), and Southern pigtoe (endangered); as well as the gray bat (endangered), swamp pink (threatened), white fringeless orchid (threatened), small whorled pogonia (threatened), and smooth coneflower (endangered).

The tenth factor is whether “the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.”<sup>147</sup> As discussed throughout

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<sup>138</sup> Hydrology Report, A9.

<sup>139</sup> 40 C.F.R. § 1508.27(b)(8).

<sup>140</sup> Cultural Resources Report, 12.

<sup>141</sup> *Id.*

<sup>142</sup> Cultural Resources Report, 27.

<sup>143</sup> Cultural Resources Report, 27.

<sup>144</sup> 40 C.F.R. § 1508.27(b)(9).

<sup>145</sup> Terrestrial Wildlife Resources Report, 43.

<sup>146</sup> *See infra* 209-210.

<sup>147</sup> 40 C.F.R. § 1508.27(b)(10).

these comments, this project threatens violations of numerous laws imposed for the protection of the environment.

The Foothills Project meets all of the criteria requiring preparation of an EIS.

#### E. The Requirement to Complete an EIS Has Substantive Implications

In our scoping comments, we raised the necessity of preparing an EIS for this project. The agency dismissed that concern as “a procedural concern which is already decided by law, policy, or regulation.”<sup>148</sup> To the contrary, a decision about whether to prepare an EIS is fact-specific, not wholly decided by law. But more to the point, we want to clarify that the distinction between preparing an EA and EIS is not just a procedural distinction but carries with it substantive obligations.

EISs and EAs serve two different purposes. An EIS must “provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.” 40 C.F.R. § 1502.1. An EA is ultimately meant to “provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement.”<sup>149</sup>

Because the documents serve two different purposes, different legal requirements attach to each. For instance, courts have found that “whereas with an EIS, an agency is required to rigorously explore and objectively evaluate all reasonable alternatives, with an EA, an agency only is required to include a brief discussion of reasonable alternatives.”<sup>150</sup> As another example, Forest Service regulations require longer comment periods for EISs than EAs.<sup>151</sup>

The agency’s effort to shoehorn this project into an EA shortcuts these requirements and harms the public by denying it the depth of analysis and opportunity for participation required by the statute for intensive projects like the Foothills Project. The agency must go back and prepare an EIS if it is to move forward with anything resembling the current form of this project.

## II. **The Proposed “Condition-Based” Decision is Unlawful**

As we have explained on a number of occasions, the Foothills Project, even if well intended, is conceptually flawed. The Project attempts to use a novel approach known as “condition-based” decision-making but implement it in a way that does not comply with NEPA.

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<sup>148</sup> Scoping Summary Report, 24.

<sup>149</sup> 40 C.F.R. § 1508.9(a).

<sup>150</sup> *N. Idaho Cmty. Action Network v. U.S. Dep't of Transp.*, 545 F.3d 1147, 1153 (9th Cir. 2008) (citations and quotations omitted).

<sup>151</sup> *See* 36 C.F.R. § 218.25(a).

We explain throughout these comments why its application in the Foothills leads to violations of other laws, but here we focus on the overall legal shortcomings of this approach.

Using this “condition-based” decision-making approach, rather than identifying particular sites where particular actions will occur, the Forest instead offers a kitchen sink of “conditions”—broad enough to apply to essentially every acre in the analysis area—and a “toolbox” of actions to address those conditions. Critically, the decision whether and how to act in specific locations would be deferred to the future. Any action that the Forest *might* want to take in this landscape in the next several decades would be authorized now, once and for all, by a decision unsupported by analysis of the individual and cumulative effects of those future site-specific choices. The theoretically “bounded” analysis offered now would address impacts only at the most general, abstract level, and would obscure the consequences of future choices. By approving this project, the Forest would write itself a blank check for decades’ worth of work.

As the Draft EA explains:

This ‘flexible toolbox approach’ allows land managers to choose the appropriate management activity for each specific location from a suite of potential treatment activities, or ‘tools,’ within the project area. The selected treatment activities have specified limitations, identified in the proposed action and project design features, and are only implemented if deemed appropriate upon evaluation of conditions on the ground. The [Summary of Alternative 2 Actions] represent[s] the maximum amount proposed and analyzed to meet the purpose and need of the project.<sup>152</sup>

The application of discretion at the site-specific level—i.e., gathering information, assessing needs, identifying treatments, and balancing site-level needs against landscape-level considerations—would occur during implementation, after the decision is final under NEPA:

In this approach to project-level planning, the condition of forest stands, and sites will be assessed prior to implementation to confirm the restoration needs align with the objectives identified and analyzed in this document. Site characteristics would be assessed to determine existing baseline conditions and understand any underlying causes of ecologic degradation. Examples of site characteristics may be stand composition, structure, stand health, age, slope, hydrologic or soil conditions. The existing conditions of a site are also evaluated in the larger context of desired pattern, composition, and structure of the landscape ecosystem.<sup>153</sup>

As proposed, the Foothills Project would undoubtedly authorize much good work: restoration of aquatic connectivity, realignment of roads and trails to make them more sustainable, beneficial ecological restoration on appropriate sites, and integration of silvicultural treatments with

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<sup>152</sup> Draft EA, 10.

<sup>153</sup> Draft EA, 11.

prescribed fire. Much of the work that could be done as part of the Foothills Project would have our support.

At the same time, much of the work that could be done under the Foothills Project will cause harm. Every action, even when taken with the best of ecological intentions, will cause ancillary impacts. Habitat created for one species is lost to another, for example. The degree of harm depends on both the location of the action and the spatial and temporal relationship of the action to other similar actions, including the overall pace of those actions at relevant scales. Deciding whether a proposed action's harms are outweighed by its benefits has always required, and still does require, timely, accurate, and *site-specific* information and analysis.

The Forest's decisions whether to act, how much action will generally occur in which management areas, and what broad sideboards will apply to those actions, have already been made in the Forest Plan. The remaining, critical decisions—location and pace—must be made with site-specific information, analysis, and consideration of alternatives. Yet these are precisely the decisions that the Forest is postponing in the Foothills Project. Those decisions would instead be made some time in the future, without any additional analysis or public participation under NEPA. Because such decisions are consequential, and because they are not categorically excluded from NEPA analysis, the Foothills Project cannot now authorize the actions that will flow from those future decisions.

A. The Proposed Condition-Based Approach Will Lead to Worse Outcomes on the Ground

The proposed condition-based decision-making process would eliminate one of the Forest's best sources of information about important ecological and social values—the input of forest users who care about those resources. As explained below in detail, public input has greatly improved site-specific proposals over time, helping the Forest avoid significant harmful effects. Without that input, future proposals would not be similarly improved.

Consequently, even if this project was legally compliant, it would not improve outcomes on the ground. We worry that in the views of some members of the agency, this boils down to “trust.” First, we are not sure who we are being asked to trust in this multi-decade project. The Forest Service today? The Forest Service fifteen years from now? The federal government generally? Even accepting the agency's good intentions to conduct ecologically beneficial actions, however, NEPA is still a critical step in applying those intentions to forest communities on the ground. The benefits of an action at any given location must be weighed against its harms to the forest's ecological, social, and economic values, each of which have different relative importance in different locations. Simply put, the Forest's good intentions do not excuse it from making informed, site-specific decisions.<sup>154</sup>

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<sup>154</sup> *Oak Ridge Env'tl. Peace Alliance (OREPA) v. Perry*, 2019 WL 4655904, \*51-52 (E.D. Tenn. Sep. 24, 2019) (“While [the agency's] present intentions ... are commendable, [they do] not allow it to avoid conducting a transparent and complete analysis in a timely fashion” that “help[s] the public fully comprehend the difference”

Informed decisions, moreover, require public input. The public provides information about these relative values that the Forest Service would not otherwise have. For example, members of the public often alert the Forest Service to the presence of rare and endangered species. It is difficult to ensure that rare species are actually found during surveys. These sometimes-elusive species can be overlooked simply because the survey does not occur at the right time of year, and different species may require surveys during different seasons. For example, just across the state line in the Nantahala National Forest's Southside project, rare green salamanders were initially missed because they were in an arboreal phase of their life cycle during the survey, and Forest Service staff were looking for them in the rock crevices where they nest at other times of the year. Examples of overlooked rare plants are even more common, and for similar reasons: seasonal morphological changes can make locating and identifying rare plants difficult and time consuming. Members of the public who study these species and value the opportunity to see them in the wild can supplement the Forest Service's own surveys and provide a backstop when occurrences are overlooked. The public also has proven more capable than Forest staff when identifying other rare ecological values, such as forests that qualify as existing old growth under the Region 8 guidelines. And finally, with significant turnover in the agency, the public simply knows these lands better - that is not a criticism of the agency but a testament to the public's interest in these lands.

Just as important, the public provides information about different sites' relative social and economic values. Many (if not most) management actions can be taken in any number of locations, with different effects to the resources that support social and economic uses. Recreation settings, scenic quality, and access are just a few of the resources that can be differently impacted by the same action in different locations. The choice of location therefore requires timely and specific information about what the public values in that location. Further, the choice requires public feedback on a concrete, site-specific proposal. The public cannot possibly be expected to provide feedback on how any possible action in any possible location might affect their values. That only produces academic or ideological debates better suited to forest planning if anywhere. Project design, by contrast, is supposed to be about refining and considering alternatives to specific, concrete proposals in light of a specific need.

Over time, public input has made a profound difference on the ground. Even though the Forest Service nationwide is looking for ways to avoid site-specific public input, such input has been effective in avoiding, minimizing, and mitigating the harmful effects of many agency proposals. If the Forest jettisons NEPA analysis for site-specific proposals, then similar improvements would not happen in the future. This is a tangible environmental consequence of the proposal—perhaps the most important consequence—and it is utterly absent from the Draft EA's analysis.

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between potential alternatives.”); *Richardson v. BLM*, 565 F.3d 683, 706 (10<sup>th</sup> Cir. 2009) (agency's intention “to minimize impacts” in the future did not excuse it from site-specific analysis).

We undertook a comprehensive review of all vegetation management projects completed on the Chattahoochee National Forest from 2009 to 2019. During that time, projects changed substantially from proposal to final decision. Cumulatively, at least 2,467 acres (14% of proposed acres) were either dropped or added to projects during NEPA processes.<sup>155</sup> More acres were dropped than added, with a net decrease of 2,226 acres of total harvest and 1,949 acres of commercial harvest.<sup>156</sup> In addition, in the eight projects completed during the decade, the Forest agreed to mitigate a number of potentially significant impacts: impacts to uninventoried roadless areas (once), to old growth (twice), to rare species (six times) and to water/soil (eight times).<sup>157</sup>

These improvements are consistent with the changes attributable to the NEPA process on other forests across the country. Based on the Forest Service's own random sample of projects, 17% of proposed harvest acres, on average, are dropped from final decisions.<sup>158</sup> Furthermore, 4 out of 5 substantive changes were driven by public comment, as opposed to internal project review.<sup>159</sup> Notably, none of these changes were the result of litigation. Where stands were dropped, it was because the Forest Service agreed that their harms outweighed their benefits, in light of input from the public.

Also notably, the improvement to these projects by reducing treatments is not fully measured by acreage numbers. This not a commentary on the concept of logging; less logging is not defined as being "better." Acreage reduction is just the best data we have. These changes represent improvements to projects because they addressed issues that were unknown when the agency initially scoped its proposal.

Clearly, line officers have benefitted from public input on the Chattahoochee and throughout the National Forest System. We are aware that the Forest believes that it can work at a "larger scale" without public involvement because the Forest routinely prepares DN/FONSI for its smaller scale projects. However, without the improvements prompted by public input, the Forest's projects would have included many more serious impacts to old growth, unroaded areas,

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<sup>155</sup> See Attachment 2. The actual total is likely higher, because this figure accounts only for the *net* changes in each project and does not count acres of stands that were dropped but replaced by other stands within the same project. It also does not account for changes made between the 2011 and 2013 version of the Forest Health Stewardship Project. Public involvement through NEPA was critical in uncovering that vegetation types in 5,662 acres proposed for treatment were wrongly identified in the agency's stand data. This saved the District the significant financial expense of preparing a timber sale it would not have been able to implement because the trees it was targeting were not there. Finally, in preparing this letter we noticed a mathematical error in the acreage number for the Chattahoochee. The Table shows a net decrease in harvest of 1,985 acres but summing the figures in the column produces a total of 2,226 acres; similarly the Table shows a decrease of 1,312 acres of commercial harvest but summing the decreases equates to 1,949 acres.

<sup>156</sup> *Id.*

<sup>157</sup> *Id.*

<sup>158</sup> *Id.*

<sup>159</sup> *Id.* Of the 68 sampled projects, 54 changed substantively between proposal and decision; 43 projects changed due to public input, while only 11 changed due solely to internal review.

rare habitats, and soil and water. Over time, repeated impacts to these values raises, at the very least, the *potential* for significant impacts.<sup>160</sup>

No amount of “trust building” can eliminate the need for, or the utility of, this input. There is no distrust of the Forest Service because people think it is *trying* to adversely impact unique values and needs to be checked. Nor can the improvements attributable to site-specific NEPA be replaced by informal, unstructured public input. Although the Forest has made vague promises of future input, it has committed only to an annual notification of the upcoming year’s work plan.<sup>161</sup> And the fact that there is no plan for how this would occur suggests it is not a Forest Service priority – it is another in the long litany of aspects of this project that will be figured out sometime later. Regardless, notice is meaningless unless it is disseminated in a predictable way that is calculated to reach all interested persons. Even when appropriately disseminated, notice without an opportunity to comment is meaningless. Likewise, an opportunity to comment and offer alternatives is meaningless without a concomitant obligation by the agency to take a “hard look” at those comments and make an informed choice between the alternatives. And the obligation to take a hard look is meaningless without an explanation of how the agency resolved competing considerations.

These, of course, are the simple and fundamental requirements of NEPA. If the Forest intends to provide *meaningful* public participation on site-specific proposals, then it will have to meet or exceed these minimum requirements of NEPA, which are the irreducible essentials of public involvement. In that case, the Forest would gain nothing by declining to comply with NEPA’s formalities. If on the other hand the Forest does *not* intend to provide meaningful public participation, then it cannot assume that its own internal processes will be adequate to prevent significant impacts in the future.<sup>162</sup>

Unfortunately, the Forest has indicated that it will bypass formal public participation so that line officers can move forward with stands that, if the public were involved during NEPA, might have been dropped, modified, or would have at least required further consideration and analysis. The deciding officer asserts that “public engagement will be strong post decision,” but simultaneously observes that Alternative 2 will allow the Forest to overcome its “biggest challenge”—namely, “groups [who] believe the only way to influence us is during the NEPA process and court.”<sup>163</sup> Those groups’ involvement in project development sometimes involves asking the agency to drop or trade stands with sensitive ecological or social values like old growth, rare species habitat, or presence of an undeveloped area with backcountry character. Stated differently, therefore, the Forest hopes to avoid attrition during the preparation of future

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<sup>160</sup> See 40 C.F.R. §§ 1502.3; 1508.3.

<sup>161</sup> Draft EA, AP50.

<sup>162</sup> See *United Keetowah Band v. FCC*, No. 19-1129, slip op. at 26 (2019) (“The lack of significant impact should be a testament to the value of the review process in these instances, not negate its necessity.”).

<sup>163</sup> See Attachment 1.

timber sales; if the public lacks the right to object, then even the riskiest and most controversial stands can move forward unimpeded.

Again, the Forest not committed to *any* public engagement except annual updates on the Districts' work plans, unaccompanied by any right to comment or object as would be available in the NEPA process.<sup>164</sup> A single field trip is "expected" in each district, where the District Ranger believes "public input would be valuable."<sup>165</sup> It is troubling that the Forest believes "strong" public engagement can exist without meaningful rights of public participation: to understand the proposal's intent and effects, to offer concerns and alternatives, to have those concerns met with answers, and, if needed, to object and even challenge the decision in court. . If the agency has no obligation to respond to public concerns and explain its choices, then it can simply ignore input with which it disagrees. That is not public participation.

To be clear, public participation does not turn on the number of meetings the agency holds. The agency could have *no* meetings but provide quality information on the issues that matter, and respond to issues raised, and still have meaningful public participation. The agency could have endless meetings but never discuss the substantive issues (like locations of treatments) and have ineffective public participation (which is what we fear has happened here). In our experience, face-time with the agency is not, standing alone, what most of the public wants; the public wants to be involved in the decision-making whether that happens through meetings, letters, tweets, or any other avenue.

The Forest Service would apparently prefer to remove their ability to make the public's preferences (or at least the entirety of the public, not just select portions) known. The agency appears to believe that if it has the *discretion* under the Forest Plan to implement the treatments it will propose in the future, then it should be able to do so with no further input, analysis, or consideration of alternatives. To the contrary, NEPA applies to those future decisions *because* the Forest Service will be exercising its discretion. The Forest Service is obligated to "study, develop, and describe appropriate alternatives" to any proposal, whether significant or not, if it is applying discretion in the use of agency resources.<sup>166</sup> It is troubling that the Forest does not appreciate this basic premise. Interested members of the public "ha[ve] expertise" and "should be at the table in discussing and planning [forest management] projects."<sup>167</sup> This includes the ability to present location alternatives for management activities that could meet the agency's stated goals.<sup>168</sup>

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<sup>164</sup> Draft EAAP, 50.

<sup>165</sup> *Id.*

<sup>166</sup> 42 U.S.C. § 4223(2)(E).

<sup>167</sup> *Klamath Siskiyou Wildlands Ctr. v. BLM*, No. 1:17-cv-997, Dkt. 57, slip op. at 14 (D. Or. Feb. 20, 2019) (R&R adopted Dkt. 67).

<sup>168</sup> *Id.* at 14-15.



In short, the NEPA process—informed public input and reciprocal agency obligations to consider that input and explain decisions—leads to beneficial changes on the ground. To be sure, NEPA does not prohibit unwise action; it instead prohibits uninformed action.<sup>169</sup> Yet compliance with the NEPA process does in fact lead to better outcomes—wiser actions—just as Congress intended.<sup>170</sup> NEPA works by exposing unwise actions, forcing agencies to change course or face public accountability.<sup>171</sup>

In addition, bad ideas are more difficult to move through the NEPA process than good ones, and that is by design. NEPA creates friction around agency proposals when their impacts are uncertain, unnecessary, or unresolved. First, if a project’s risks are uncertain, then they are more likely to be significant.<sup>172</sup> To avoid preparing an EIS, agencies must conduct additional analysis to show that the risk is nonsignificant. For example, if logging is proposed on soils and slopes that caused substantial impairment of soil productivity in a recent logging project, the agency’s analysis would need to distinguish the new proposal and show how similar impacts will be avoided in the future. Second, if a project’s impacts are unnecessary, either because they could be avoided by adopting an alternative or otherwise be mitigated, then the analysis must develop, describe, and study the alternative(s).<sup>173</sup> For example, if the Forest Service proposes to create needed young forest habitat by logging existing old growth, yet could accomplish the same purpose by restoring a degraded pine plantation, then the analysis must disclose and compare the relevant, site-specific effects of the choice. Finally, if a project proposal implicates landscape-level issues that have not been resolved at a prior, programmatic level of decision-making (usually the forest plan), then the agency must analyze the relationship of the specific proposal to the landscape-level issue.<sup>174</sup> For example, if a programmatic analysis defers a decision whether to develop a particular area with roads and timber harvest, then a site-specific proposal to take such an action could not “tier” to the prior decision, but would instead be required to analyze the effects to roadless characteristics and eligibility for future designation.<sup>175</sup>

The process envisioned by the Forest Service for this project would undermine NEPA’s role in “foster[ing] excellent action.”<sup>176</sup> It would break the feedback loop that otherwise would

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<sup>169</sup> *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351 (1989).

<sup>170</sup> *See, e.g., United Keetowah Band, supra*.

<sup>171</sup> *Richardson v. BLM*, 565 F.3d 683, 703 (10<sup>th</sup> Cir. 2009) (explaining that NEPA’s guarantee of public involvement ensures that impacts are disclosed so that the “political process [can] check [agency] decisions”).

<sup>172</sup> 40 C.F.R. § 1508.27(b)(4), (5).

<sup>173</sup> 42 U.S.C. § 4332(2)(E).

<sup>174</sup> Memorandum from Michael Boots, CEQ, to Heads of Federal Departments and Agencies, “Effective Use of Programmatic NEPA Reviews” at 15 (Dec. 18, 2014) (explaining that issues deferred from the programmatic to the site-specific level must be evaluated at the time the agency proposes to make an irreversible and irretrievable commitment in the use of resources).

<sup>175</sup> *E.g., Lands Council v. Martin*, 529 F.3d 1219 (9<sup>th</sup> Cir. 2008).

<sup>176</sup> *See* 40 C.F.R. § 1500.1.

alert the Forest Service that its proposals are unnecessarily risky or harmful. It would also remove transparency and accountability in decision-making, increasing the likelihood that unwise proposals move forward unchecked. In the longer term, it would destroy any trust that the Forest Service has earned, as stakeholders begin to see more harmful on-the-ground impacts, particularly through a process that shuts the public out.

The Draft EA does not acknowledge the impacts that will result from the elimination of public input. Some of these impacts are qualitative, such as the loss of trust over time, but many are quantifiable. Indeed, we have quantified them in the analysis summarized above. Over a decade of projects, the Forest dropped 2,226 acres of total harvest out of 17,669 proposed and 1,949 acres of commercial harvest out of 15,549 proposed.<sup>177</sup> In other words, the Forest dropped 12.5% of all harvest acres and also 12.5% of commercial harvest acres. The Forest also changed its projects to mitigate 31 potentially significant impacts (from roadless area impacts to rare species to soil and water), avoiding a potentially significant impact for approximately every 500 acres commercially harvested. Had these impacts not been avoided or mitigated, they would have been significant. Their significance is all the more obvious when considered at the scale of work anticipated by the Foothills Project. According to Appendix B, the Foothills Project would authorize up to 60,000+ acres of commercial harvest. Based on prior performance, therefore, site-specific public input would result in dropping or substituting over 7,500 of those acres, along with other project changes that would mitigate up to 120 potentially significant impacts.

The Forest cannot plausibly argue that impacts of this type and at this scale are not significant. Accordingly, as explained more fully elsewhere in these comments, this project cannot proceed without an EIS. If the Forest continues by preparing an EA, however, the EA must at least attempt to characterize and quantify the project improvements that would not occur under Alternative 2, as opposed to continuing to do the same type of work with site-specific NEPA processes.

B. The Foothills Project is a Premature and Unlawful Attempt to Implement Proposed Agency-wide NEPA Regulations

We understand that the Forest is developing this project in anticipation of new agency-wide NEPA regulations. As proposed, those new regulations purport to authorize the use of condition-based decision-making:

*Condition-based management.* A system of management practices based on implementation of specific design elements from a broader proposed action, where the design elements vary according to a range of on-the-ground conditions in order to meet intended outcomes. Condition-based management stems from the recognition that the environment is dynamic, changing as ecosystems respond to changing natural and human caused events.

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<sup>177</sup> See Attachment 2.

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The proposed action and any alternatives may include condition-based management. A condition-based management alternative must clearly identify the management actions that will be undertaken, and any design elements that will be implemented, when a certain set or range of conditions are present. The NEPA analysis must disclose the effects of all condition-based actions, taking into account design elements that limit such actions. Such proposal or alternative must also describe the process by which conditions will be validated prior to implementation.<sup>178</sup>

To begin with, the reasons for condition-based management in the Foothills Project do not fall within the scope of the reasons for the proposed authority.<sup>179</sup> The Forest has not made any case that a flexible approach is needed to respond to changing conditions during the implementation phase, nor is the proposal tailored to respond to the kinds of conditions that the agency reasonably foresees may change in the short term. Instead, the Forest is attempting to create a long-term procedural shortcut to overcome its lack of capacity.

Even if the Foothills Project were within the scope of the proposed authority, the Forest should not make decisions now in reliance on a regulation that is not likely to be finalized or survive legal challenge. The proposed authorities are as yet speculative. The process for revising NEPA regulations is governed by the Administrative Procedure Act (“APA”). According to that statute, agencies are required to follow formal requirements when they engage in substantive rule makings.<sup>180</sup> In addition to providing notice of the rule making,<sup>181</sup> the agency must “give interested persons an opportunity to participate in the rule making through submission of written data, views, or arguments with or without opportunity for oral presentation.”<sup>182</sup> The agency must then consider public comments and respond to it by “incorporat[ing] in the rules adopted a concise general statement of their basis and purpose.”<sup>183</sup> The agency must then publish the final rule, which cannot become effective until at least 30 days following publication.<sup>184</sup>

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<sup>178</sup> 84 Fed. Reg. 27544, 27552-53 (proposed 36 C.F.R. §§ 220.3; 220.4(k)).

<sup>179</sup> *See id.* at 27550 (condition-based approach “provides flexibility to account for changing conditions on the ground over time”).

<sup>180</sup> *See* 5 U.S.C. § 553. There is also no question that the proposed rule is a substantive rule, not an interpretative rule. *See id.* § 553. The rule is intended explicitly “to increase the pace and scale of forest and grassland management operations on the ground.” *See* 84 Fed. Reg. at 27,550. And the agency clearly intends the rule to have the force and effect of law and be accorded weight in adjudicatory processes. *See Perez v. Mortg. Bankers Ass’n*, 575 U.S. 92, 97 (2015) (stating interpretive rules do not have the force and effect of law and are accorded no weight in adjudicatory processes).

<sup>181</sup> *Id.* § 553(b).

<sup>182</sup> *Id.* § 553(c).

<sup>183</sup> *Id.*

<sup>184</sup> *Id.* § 553(d).

A fundamental tenet of this process is that an agency may not propose a rule and then begin implementing that rule before it finishes the rule-making process.<sup>185</sup> The condition-based approach is novel; it is not an authority that the Forest Service currently has. If the agency felt it had sufficient authority to pursue this practice, there would be no need for a formal rule making. While a few projects are being developed using this approach now, their lawfulness is in serious doubt. Other agencies' attempts to conduct analogous processes have been struck down.<sup>186</sup>

Jumping the gun by implementing a proposed rule would not only be unwise; it would also make a mockery of the APA's formal requirements for the rule-making process. Numerous commenters wrote the agency during the comment period on the proposed revisions explaining why the agency's attempt to codify condition-based management for site-specific decisions violated NEPA's statutory requirements. Similarly, many commenters also explained why the proposed categorical exclusions are unlawful. Those commenters and others are dutifully awaiting the agency's response to their concerns. Presumably, the agency is still contemplating the public's concerns. In response, the agency may choose to abandon the condition-based approach or modify it to comply with NEPA, such as limiting its application only to programmatic (not site-specific) analyses or requiring that specific sites be identified for prescriptive but adaptive treatments.

Nevertheless, while the public waits for a response to its comments, the Forest Service is moving full steam ahead with applying this proposed management practice here. The Foothills Project "is a condition-based restoration project where specific geographic locations (i.e., stands, in the case of vegetation management) for proposed activities, with a few noted exceptions, are not specified."<sup>187</sup> As explained in the "Frequently Asked Questions" brochure distributed by the Forest Service at recent public meetings: "For the first time in Georgia . . . [a] project uses condition-based planning."

To put a point on this, the Forest Service is going through formal rule-making procedures under the APA to create new authority for "condition-based management." Many members of the public have asked that the Forest Service abandon or amend that approach in formal comments. The agency has not responded to those comments, nor finalized its proposed rule, and is yet already implementing the very practice it is attempting to codify. It is beyond the pale that an agency would propose a new rule, seek public feedback, and then simply start implementing that rule before responding to public concerns and concluding the rule making.

As we wrote to the Secretary regarding the rule making, the Forest Service will not conclude the NEPA rulemaking successfully. The proposed rule is deeply and fatally flawed in its current form. The final rule will likely differ from the proposal and, if it does not, it will be

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<sup>185</sup> See, e.g., *Paulsen v. Daniels*, 413 F.3d 999, 1005 (9th Cir. 2005) ("It is antithetical to the structure and purpose of the APA for an agency to implement a rule first, and then seek comment later").

<sup>186</sup> E.g., *OREPA*, 2019 WL 4655904.

<sup>187</sup> Vegetation Report, 10.

invalidated by the courts. The Forest should not overextend its legitimate authority in reliance on regulations that are themselves unlawful.

Additionally, this Forest's actions in this project threaten the rulemaking process. The Foothills example makes it impossible for the Forest Service to claim that it will use the authority in a judicious or limited manner. If this is what the agency means by condition-based decision-making, then the entire concept risks being invalidated. There are lawful ways to use condition-based frameworks within the bounds of NEPA, explained further below, but this project's approach is far beyond the agency's lawful authority. In addition, the agency's actions with respect to the Foothills Project strongly suggest that the agency intends to charge ahead with its proposed rule regardless of public feedback, showing that the agency has already made its decision before complying with the APA's required procedures. This is an independent basis for invalidating the rule.

### C. The Proposed Condition-Based Approach Violates NFMA's Plan-to-Project Decisionmaking Structure

Under NFMA, each national forest unit must develop a forest plan.<sup>188</sup> The plan provides broad guidance for the unit, including “forest management systems, harvesting levels, and procedures.”<sup>189</sup> Projects must be “consistent” with the forest plan.<sup>190</sup>

Since at least the 1980s, forest plans have uniformly been conceived of as programmatic documents, and analyses of those plans have accordingly committed to further analysis and public participation for site-specific decisions. The Forest Service Chief explained that forest plans are programmatic documents in 1988, in “landmark” appeal decisions for the Idaho Panhandle and Flathead National Forest plans.<sup>191</sup> As programmatic documents, forest plans are not self-implementing. Implementation—defined as “the activity to accomplish the management direction of a forest plan”—occurs at the site-specific level.<sup>192</sup>

Under the 1982 planning rule, which provides the context for interpreting the Chattahoochee National Forest's Forest Plan, implementation begins with identification of a proposed action—a specific action in a specific location that could help to achieve the plan's goals and objectives.<sup>193</sup> The proposed action is then subject to “analysis and evaluation ... to make site-specific decisions” based on “site-specific data.”<sup>194</sup> The analysis is conducted by an interdisciplinary team, and it is used to determine whether the proposed action would be

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<sup>188</sup> 16 U.S.C. § 1604(a).

<sup>189</sup> *Id.* § 1604(e)(2).

<sup>190</sup> *Id.* § 1604(i).

<sup>191</sup> *See* 58 Fed. Reg. 19,369, 19,370 (1993).

<sup>192</sup> 53 Fed. Reg. 28,807, 26,836 (1988).

<sup>193</sup> *Id.*

<sup>194</sup> *Id.*

consistent with the plan, among other things.<sup>195</sup> While this analysis dovetails with NEPA’s review and public participation process, it is separately required under NFMA to support the agency’s substantive responsibilities, including consideration of other multiple use goals, potential harms, stand-level effects to residual trees, effects to site productivity and soil and water resources, and the site-dependent costs of transportation and sale administration.<sup>196</sup>

The courts have uniformly agreed with the Forest Service’s longstanding interpretation of forest plans as requiring site-specific implementation. As the Supreme Court has summarized:

Although the Plan sets logging goals, selects the areas of the forest that are suited to timber production, and determines which “probable methods of timber harvest” are appropriate, it does not itself authorize the cutting of any trees. Before the Forest Service can permit the logging, it must: (a) propose a specific area in which logging will take place and the harvesting methods to be used; (b) ensure that the project is consistent with the plan; (c) provide those affected by proposed logging notice and an opportunity to be heard; (d) conduct an environmental analysis pursuant to [NEPA] to evaluate the effects of the specific project and to contemplate alternatives; and (e) subsequently make a final decision to permit logging.<sup>197</sup>

Consistent with these legal requirements, which have prevailed throughout the time period when current plans were adopted, forest plans across the country have been built around this two-stage decisionmaking process, expressly deferring site-specific analysis to the project level. In 2006, the Forest Service analyzed a random sample of 20 forest plans to determine whether they followed the two-stage approach.<sup>198</sup> Every single one of the 20 plans adopted the programmatic framework and committed to future site-specific analysis for the purposes of complying with NEPA and/or NFMA. The Chattahoochee’s Forest Plan is typical of plans nationwide. As the Plan EIS explains:

*“Land management activities on national forest lands are conducted only after appropriate site-specific NEPA analysis has been conducted. This provides opportunities to identify and minimize direct, indirect, and cumulative*

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<sup>195</sup> *Id.*

<sup>196</sup> *Id.*; 36 C.F.R. § 219.27(b) (1982).

<sup>197</sup> *Ohio Forestry Ass’n v. Sierra Club*, 523 U.S. 726, 729-30 (1998) (internal citations omitted); *see also Idaho Cons. League v. Mumma*, 962 F.2d 1508, 1511-12 (9th Cir. 1992) (describing the “two-stage approach” and further affirming that site-specific assessment is needed for both NFMA and NEPA compliance at the project level.); *Citizens for Better Forestry v. USDA*, 481 F. Supp. 2d 1059, 1064 (N.D. Cal. 2007) (“NFMA envisions a two-stage approach . . . . [I]mplementation of the LRMP occurs at a second stage, when individual site-specific projects are proposed and assessed.”).

<sup>198</sup> “The Evolution of National Forest System Land Management Planning and Results of the Review of Revised Land and Resource Management Plan Environmental Impact Statements” (May 2006). All of the sampled plans are still in effect with the exception of the Francis Marion National Forest’s plan, which was again revised in 2017.

environmental effects that cannot be specifically determined or analyzed at the large scale of this FEIS.”<sup>199</sup>

As CEQ has explained, programmatic analyses should be explicit about what decision is being made at the broad scale, and what decision space is deferred to a future project: “If subsequent actions remain to be analyzed and decided upon, that would be explained in the programmatic document and left to a subsequent tiered NEPA review.”<sup>200</sup> Because site-specific impacts cannot be assessed at the programmatic level, as the Chattahoochee’s Forest Plan explains (like all other forest plans explain), those impacts must be evaluated “when the agency proposes to make an irreversible and irretrievable commitment of the availability of resources which usually occurs following a tiered site- or project-specific NEPA review.”<sup>201</sup>

Consistent with this guidance, forest plans and their associated NEPA documents also contain specific descriptions of issues that are deferred to the site-specific level, with commitments to conduct further analysis of those issues, consider alternatives, and provide additional opportunities for public input. The Chattahoochee Forest Plan’s EIS specifically defers, for example:

- Location/site of harvest;<sup>202</sup>
- Harvest method;<sup>203</sup>
- Site-specific transportation decisions (e.g., construction of new roads or related facilities);<sup>204</sup>
- Site-specific soil protection measures;<sup>205</sup> and
- Survey and identification of old growth reserves.<sup>206</sup>

In sum, the Chattahoochee Forest Plan is programmatic in nature, meaning that it does not resolve conflicts about site-specific actions and impacts. The Plan EIS therefore contains explicit commitments to conduct future analysis with public involvement. These commitments are important safeguards for forest resources, which vary in importance from location to location. Future site-specific analysis and public participation is not offered gratuitously, nor is it simply a matter of NEPA compliance; it is understood to be critical to meeting the requirements

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<sup>199</sup> Chattahoochee-Oconee National Forest Plan ROD FEIS, 3-78 (2004) (emphasis added) (“FEIS”).

<sup>200</sup> Memorandum from Michael Boots, CEQ, to Heads of Federal Departments and Agencies, “Effective Use of Programmatic NEPA Reviews” at 15 (Dec. 18, 2014) incorporated as Attachment 7.

<sup>201</sup> *Id.* at 27.

<sup>202</sup> FEIS, App’x G at 7-40.

<sup>203</sup> FEIS, 3-545.

<sup>204</sup> FEIS, App’x G, G-108.

<sup>205</sup> FEIS, 3-27.

<sup>206</sup> FEIS, App’x G at 7-81 (2004).

of NFMA and other environmental laws. These commitments to process are just as integral to ensuring project-level decisions are consistent with the forest plan as any other standards or guidelines.

The Foothills Project would disregard the plan-level commitment to conduct future site-specific NEPA processes. Any project that purports to shortcut site-specific project development cannot tier to the Plan EIS. The Foothills analysis, therefore, is incomplete because it does attempt to tier to the Plan EIS. The Foothills Draft EA also reproduces portions of the Plan EIS. If the analysis was not specific enough to support site-specific action in 2004, it remains inadequate for that purpose now.

Essentially, the Forest is attempting to make its plan self-executing. If Alternative 2 is chosen, the Forest would not make any further decision under NEPA before conducting work on the ground. But the decisions proposed in this project, along with the supporting analysis, are effectively programmatic decisions, not site-level project decisions. Setting condition-based objectives is a legitimate and helpful step in identifying needed actions. For example, the Cherokee National Forest's Forest Plan Goal 17 and its nested objectives are condition-based, covering many of the same ecological priorities that the Foothills Project proposes to address. But they are *plan*-level goals, which still require site-specific implementation. The Foothills Project's goals are no different.

D. The Foothills Project Approach is Inconsistent With the Balancing Act Required by NFMA.

NFMA's multiple-use mandate requires the Forest Service to optimize the uses of national forest lands—to make the “most judicious use of the land,” with discernment of the “relative values of the various resources” in particular areas.<sup>207</sup> In this balance, “each of these resources is by statute to be given equal consideration with the others.”<sup>208</sup> But Congress did not tell the agency where and how to meet this mandate, nor could it. The relative values of the uses, both “tangible and intangible,”<sup>209</sup> will “vary locality by locality and case by case ... because of particular circumstances.”<sup>210</sup> Accordingly, the Forest Service enjoys considerable discretion at the site-specific level,<sup>211</sup> subject to compliance with NFMA and other laws like the Endangered Species Act and Clean Water Act.

The agency's unambiguous duty to maximize benefits (and as a corollary, to minimize harm to competing uses) can be reconciled with its broad discretion only because of the advent

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<sup>207</sup> 16 U.S.C. §§ 529, 531.

<sup>208</sup> Senate Agriculture and Forestry Committee Report Accompanying S.3044 (May 23, 1960).

<sup>209</sup> Senate Agriculture and Forestry Committee Report Accompanying S.3044 (May 23, 1960).

<sup>210</sup> House Agriculture Committee Report Accompanying H.R. 10572 (April 25, 1960); Senate Agriculture and Forestry Committee Report Accompanying S.3044 (May 23, 1960).

<sup>211</sup> See *e.g.*, *Perkins v. Bergland*, 608 F.2d 803 (9th Cir. 1979).



of strong procedural requirements. First and foremost among them is openness to and consideration of alternatives. If the Forest Service has the discretion to choose where it will pursue a given use, but different locations for the activity would lead to different levels of harm for other, co-equal uses, then the decisionmaker needs to know what the options are.<sup>212</sup> Closely related, the decisionmaker needs to be able to compare the impacts of those options.<sup>213</sup> Third, because the statute is concerned with “relative values” that cannot be measured in objective terms,<sup>214</sup> the Forest Service must consult the public to understand their subjective preferences. And, finally, because these values vary by area,<sup>215</sup> the need for public involvement is ongoing, decision by decision and at each relevant scale, including the site-specific.

As the Forest Service itself has observed, “Congress sought to create mechanisms for conflict resolution, thereby obviating the need for direct congressional intervention to resolve disputes. To some degree, Congress seems to have favored a complex public process over other, more efficient management models.”<sup>216</sup> Those more efficient models, of course, would include, on the one hand, prescriptive Congressional instructions such as a hierarchy of uses or, on the other hand, unbounded Forest Service discretion. Congress affirmatively rejected these alternative approaches.<sup>217</sup>

The Forest Service cannot meet its obligations to balance the need for a particular action against the relative values present in different locations unless it gathers public input and considers alternatives at the site-specific level. Accordingly, the Foothills Project not only misses the mark under NEPA, but also falls short of NFMA’s requirements.

E. The Agency’s Use of the Condition-Based Framework Violates NEPA’s Requirement for Site-specific Analysis to Support Site-specific Decisions

If it proceeds, the Foothills Project would give the agency discretion to exercise discretion to make consequential decisions that are not categorically excluded from NEPA, without vetting those decisions in the NEPA process. This is a plain violation of the law.

1. *The Foothills Project’s Process Purports to Allow the Forest Service to Make Consequential Decisions Without a NEPA Decisionmaking Process*

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<sup>212</sup> *E.g., Meister v. USDA*, 623 F.3d 363 (6th Cir. 2010) (explaining that the duty to consider alternatives flows from the discretion to choose between them).

<sup>213</sup> *Sierra Club v. Butz*, No. 71-2514 (9th Cir. 1973) (requiring that the Forest Service establish knowledge of ecological consequences and consideration of alternatives that would have met timber goals with greater protection to other values); *Klamath Siskiyou Wildlands Ctr. v. BLM*, No. 1:17-cv-997, Dkt. 57 (D. Or. Feb. 20, 2019) (R&R adopted Dkt. 67) (same).

<sup>214</sup> 16 U.S.C. § 529

<sup>215</sup> *Id.*

<sup>216</sup> USDA Forest Service, *The Process Predicament: How Statutory, Regulatory, and Administrative Factors Affect National Forest Management* (June 2002).

<sup>217</sup> *See id.* at n.10 (quoting Hummel and Fleet for the proposition that broad Forest Service discretion was problematic because it “did not provide a way to surface differences, much less work through them.”).

The Foothills Draft EA describes a laundry list of “conditions” that may be treated using any of the prescriptions in the agency’s “toolbox.”<sup>218</sup> The Draft EA also identifies a broad landscape where work may occur under the project if any of these conditions are found.<sup>219</sup> The Forest has provided maps showing where it believes the conditions are most likely to occur, but Alternative 2 would not limit the agency to the maps, which are based on models.

The “conditions” themselves are incredibly broad. The Project’s implementation process for vegetation management consists of four broad flowcharts: Immature Pine, Mature Pine, Mesic Condition, and Non-Mesic Condition.<sup>220</sup> This is already an extreme oversimplification of the best available science. Simon’s model includes about 20 ecozones in the project area. Each of these ecozones has a different characteristic species composition and disturbance regime. Designing treatments for ecological restoration is much more complicated than the flowcharts would suggest. The four tautological categories used for this project, by definition, include every single forested acre on the Chattahoochee. All pine-dominated forests are either mature or immature. All hardwood-dominated forests are either mesic or non-mesic. Further, the categories are broad enough that many stands could be shunted into multiple categories, depending on the judgment of the prescriptionist, such as dry pine-oak stands.

Once a particular flowchart is chosen for a particular stand, the decision of whether to treat it and which treatment to apply is subject to considerable discretion. The flowcharts do suggest that treatment is “required” in some cases, but the implementation plan overall is not prescriptive. According to the senior staff, the “[d]ecision matrices ... would be used to *validate* that the actions taken are most appropriate, according to best available science, to achieve the desired conditions of each stand or site.”<sup>221</sup> Even if the flowcharts were intended to be binding, they cannot be applied rigidly, because ecological restoration cannot be automated; it requires the use of professional judgment at every step when answering the flowchart’s questions.<sup>222</sup> Are “woodland indicators” present in sufficient quantity? Is oak regeneration being inhibited, and to what degree? Are oaks being suppressed, and to what degree? Are there grouse habitat indicators, such as grouse in the “vicinity”? How structurally diverse is the stand? Why are yellow pine species absent from the understory? Which sites are likely to be “most successful” as woodlands?

In addition, the prescriptionist must consider not only current conditions, but must also determine the reference condition. As the Forest acknowledges, restoration assists the recovery of a damaged or degraded ecosystem.<sup>223</sup> To the extent that the flowcharts suggest that current

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<sup>218</sup> Draft EA, App’x B.

<sup>219</sup> Draft EA, App’x A, AP6-AP18.

<sup>220</sup> Draft EA, App’x E.

<sup>221</sup> See Attachment 1.

<sup>222</sup> See Draft EA, 45 et seq., App’x E.

<sup>223</sup> Forest Service Manual 2020 (“FSM”).

conditions (e.g., stem counts, basal area, etc.) can objectively generate a restoration prescription, they are inconsistent with agency guidance that requires an understanding of the reference condition, which will often be no more than an educated guess. For example, the applicable flowcharts are based on an assumption that immature forests are “most likely” the result of past even-aged logging. However, immature forests can also result from other disturbance events, including wildfire, storms, or pests. As another example, the Districts must also take reference condition into account in order to avoid inadvertently xerifying sites. Species characteristic of woodlands also occur in non-woodland sites, and rote application of the flowchart could lead to significant impacts and forest-type changes that would violate NFMA.

More importantly, however, the flowcharts ignore the primary way that the Forest Service exercises discretion in developing its proposals: the choice of which stands will be evaluated by the prescriptionist in the first place. The Forest Service no longer has the capacity, if it ever did, to maintain a continuously updated inventory of forest conditions. In other words, when developing a site-specific proposal, the Forest is not looking at each and every stand in the analysis area and deciding which stands make the most sense for which treatments in light of Forest Plan goals and objectives. Instead, a prescriptionist will visit a small subset of all the stands in a project area. Under the Alternative 2 framework, even if the flowcharts could be applied objectively, site-specific proposals would vary locally depending on which stands the prescriptionist visited before “maxing out” the allowable levels of ESH for the relevant prescription/management areas. And the decision about which stands to visit would also be determined, in part, by the commercial value of the stand and its potential to satisfy timber targets.

This overall problem is especially obvious when considering the Forest Service’s approach to creating young forest habitat. The Draft EA indicates that the Forest will attempt to meet ESH objectives first by looking for restoration opportunities.<sup>224</sup> But the proposal does not otherwise limit the Forest’s ability to create ESH in mature, characteristic forest with no identified restoration need, up to the maximum levels contemplated by the project and allowed by the Forest Plan. Even if the Forest intends to create ESH as a byproduct of other restoration activities, it will not have the information to know whether such opportunities exist in stands that staff do not visit.

As a result, the consequences of the Forest’s program of work under Alternative 2 could vary significantly based on the invisible but consequential decision of which stands to visit during project development. Visiting different stands or more stands could generate a set of treatments that would meet the same goals as well or better, with less harm to other values. The public has the right, under NEPA, to present such alternatives.<sup>225</sup>

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<sup>224</sup> Draft EA, App’x B (stating ESH will be created “where restoration needs overlap”).

<sup>225</sup> 42 U.S.C. § 4332(2)(E); *Klamath Siskiyou Wildlands Ctr.*, No. 1:17-cv-997, Dkt. 57, slip op. at 14-15 (D. Or. Feb. 20, 2019) (R&R adopted Dkt. 67).

In addition to location, the Forest's choices with respect to the pace of work would also be consequential. Under the current approach, if the Forest Service accelerated or decelerated the pace of work, the public would be able to provide feedback iteratively. For example, if an increase in the pace of harvest began to adversely affect scenic resources that are important to local tourism economies, the public could raise the concern when additional work was proposed in the same area. Under Alternative 2, however, the pace of work would be chosen without public input. The Draft EA analyzes maximum levels of logging and purportedly authorizes the agency to harvest "up to" that maximum acreage, with no limits on the timeframe for the project.

As acknowledged by the Forest, these consequential choices of location and pace would be made outside of the NEPA process, during implementation:

The implementation of management activities proposed in Alternative 2 would be ... prioritized and sequenced using a systematic process (implementation plan) that evaluates restoration needs, determines appropriate treatments to address those needs (through use of decision matrices) and balances implementation of those activities across the three ranger districts with operational feasibility, agency capacity, and social considerations, to the extent possible.<sup>226</sup>

In summary, under Alternative 2 the Forest would exercise tremendous discretion outside of the NEPA process, including whether and how to treat stands based on other considerations besides those provided in the flowcharts. Again, as the Draft EA explains, the Forest would "determine[] appropriate treatments to address [restoration] needs ... and balance[] implementation of those activities across the three ranger districts with operational feasibility, agency capacity, and social considerations, to the extent possible."<sup>227</sup> In other words, the flowchart is not intended to be fully prescriptive; the Forest intends to exercise discretion for a broad set of reasons, which could include ease of access and commercial viability, as well as any number of "social considerations." Although not mentioned by the Draft EA, we also hope that the Forest would take other ecological considerations into account. There is more to a Southern Appalachian forest than pine and oaks. As written, the decision would seem to compel the Forest to log less common but characteristic hardwood species in the name of oak restoration, which cumulatively would diminish the species diversity on the landscape. We hope that is not the Forest's intent, but it is yet another example of why the full palette of ecological and social considerations that influence project proposals cannot be built into a flowchart. Other examples include the relative importance of areas as habitat for disturbance-sensitive species or the cumulative effects of temporary roads on the dispersal of terrestrial and aquatic species. The reality is that managing a forest for multiple uses is complicated and requires discretion. But with broad discretion comes the potential for harmful impacts, and with the possibility of

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<sup>226</sup> Draft EA, 46.

<sup>227</sup> Draft EA, 46.

harmful impacts comes the responsibility to conduct an open, transparent NEPA process to look for alternative ways of avoiding or minimizing them.

Fundamentally, the Southern Appalachians are uniquely complex, crowded both ecologically and recreationally, with the potential for very different consequences depending on where timber harvest is located and the pace at which it occurs. As a result, it is a uniquely poor choice for condition-based decisionmaking.

## 2. *This Project's Future Site-specific Choices Will Be Agency Decisions for Purposes of NEPA*

The Forest Service's decisionmaking process is a funnel: At the top, the broadest level, is the multiple-use mandate. At the spout is concrete, on-the-ground action. In between are several opportunities to narrow the decision space: the planning rule, forest plans, other programmatic decisions, and finally site-specific projects. Each narrowing of the decision space—each exercise of discretion—requires a NEPA process appropriate to the scale of the decision and the significance of its potential impacts. The lower the decision begins in the funnel, the smaller the volume of analysis.

Here, the Foothills proposal simply does not get to the funnel's "spout." Future decisions are necessary to determine which actions (and therefore which environmental consequences) will occur on the ground.

A "proposal" exists when the agency "has a goal" that requires the application of discretion, and is "actively preparing to make a decision" on how to exercise that discretion.<sup>228</sup> "A proposal may exist in fact as well as by agency declaration that one exists."<sup>229</sup> Here, the Forest Service does not acknowledge that its future site-specific choices are "proposals," but the site-specific level is, "in fact," the stage at which the Forest will be "actively preparing to make a decision."

Unless "a valid agency decision already exists ... to authorize an action in a specific area, such as livestock grazing or a special use," then a new decision is necessary.<sup>230</sup> The new decision can be "tiered" to a broad programmatic decision, if one exists, but a new decision process is nonetheless required for the narrower, tiered decision.<sup>231</sup> As a feature of programmatic analysis, the concept of condition-based decisionmaking would offer considerable efficiencies and could be implemented without shortchanging public participation. All that would be required is that the Forest Service conduct a narrow EA to involve the public in the development of successive site-specific proposals. As conceived by the Forest, however, the Foothills Project would be used in *contrast* to programmatic analysis, as a once-and-for-all

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<sup>228</sup> 40 C.F.R. § 1508.23; FSH 1909.15 § 05.

<sup>229</sup> *Id.*

<sup>230</sup> Forest Service Handbook 1909.15 § 11.23 ("FSH").

<sup>231</sup> *See* FSH 1909.15 §§ 11.4; 11.41.

decision that skips over the need for subsequent, site-specific analysis, public involvement, and decision. These proposals would therefore endorse and codify a controversial approach that violates NEPA for failing to take the required hard look at site-specific impacts.

Proposed agency actions must be published on the SOPA, scoped, and then proceed to decision through the EIS, EAs or CE process, as appropriate.<sup>232</sup> EAs must be prepared for any action that is not eligible for a categorical exclusion but for which the need for an EIS has not been determined.<sup>233</sup> For an EA, the Forest must include a discussion of the proposal's need, effects, and alternatives as required by 42 U.S.C. § 4332(2)(E).<sup>234</sup> The Forest's future decisions about site-specific actions on the Foothills Landscape would not meet any of these requirements.

### 3. Location Matters

Site-specific action requires a site-specific decision, and site-specific decisions require site-specific analysis. Disclosure and analysis of "general type of impact" or a "category" of impacts anticipated is not enough:

NEPA does not permit an agency to remain oblivious to differing environmental impacts, or hide these from the public, simply because it understands the general type of impact likely to occur. Such a state of affairs would be anathema to NEPA's 'twin aims' of informed agency decisionmaking and public access to information.<sup>235</sup>

Agency decisions are arbitrary and capricious if "if the agency (1) 'entirely failed to consider an important aspect of the problem,' (2) 'offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise,' (3) 'failed to base its decision on consideration of the relevant factors,' or (4) made a 'clear error of judgment.'"<sup>236</sup> Failure to weigh different impacts of choices between alternative locations for treatment constitutes a failure to consider an important aspect of the problem the agency is proposing to solve.

As noted by the *Richardson* court, NEPA has two "twin aims": "(1) to ensure that the agency will have *detailed information* on significant environmental impacts when it makes decisions; and (2) to guarantee that this information will be available to a larger audience."<sup>237</sup>

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<sup>232</sup> FSH 1909.15 §§ 06; 11; 11.6.

<sup>233</sup> *Id.* § 41.

<sup>234</sup> FSH 1909.15, Ch. 40.

<sup>235</sup> *Richardson*, 565 F.3d at 707. *See also* *Balt. Gas & Electric Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 100 (1983) ("Congress did not enact NEPA, of course, so that an agency would contemplate the environmental [effects] of an action as an abstract exercise."); *Ilio'ulaokalani Coalition v. Rumsfeld*, 464 F.3d 1083, 1095-97 (9th Cir. 2006).

<sup>236</sup> *Richardson*, 565 F.3d at 704.

<sup>237</sup> *Envtl. Prot. Info. Ctr. v. Blackwell*, 389 F. Supp. 2d 1174, 1184 (N.D. Cal. 2004) (emphasis added) (*quoting* *Neighbors of Cuddy Mt. v. Alexander*, 303 F.3d 1059, 1063 (9th Cir. 2002)); *see also* *Earth Island v. United States*

Accordingly, NEPA’s review obligations are more stringent and detailed at the project level, or “implementation stage,” given the nature of “individual site specific projects.”<sup>238</sup> Courts hold that agencies must take a hard look at site-specific impacts in EAs as well as EISs.<sup>239</sup> “[G]eneral statements about possible effects and some risk do not constitute a hard look, absent a justification regarding why more definitive information could not be provided.”<sup>240</sup>

Analyzing and disclosing site-specific impacts is critical because where (and when and how and how close in geographic and temporal proximity) activities occur on a landscape strongly determines the nature of the impact. The actual “location of development greatly influences the likelihood and extent” of impacts.<sup>241</sup> For example, “[d]isturbances on the same total surface area may produce wildly different impacts on plants and wildlife depending on the amount of contiguous habitat between them.”<sup>242</sup> As an extreme example, “building a dirt road along the edge of an ecosystem” and “building a four-lane highway straight down the middle” may have similar types of impacts, but the extent of those impacts – in particular on habitat disturbance – is different.<sup>243</sup> Indeed, “location, not merely total surface disturbance, affects habitat fragmentation,” and therefore location data is critical to the site-specific analysis NEPA requires.<sup>244</sup> Merely disclosing the existence of particular geographic or biological features is

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*Forest Serv.*, 351 F.3d 1291, 1300 (9th Cir. 2003) (“NEPA requires that a federal agency ‘consider every significant aspect of the environmental impact of a proposed action ... [and] inform the public that it has indeed considered environmental concerns in its decision-making process.’”) quoting *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1066 (9th Cir. 2002); *Stein v. Barton*, 740 F. Supp. 743, 749 (D. Ak. 1990) (NEPA requires site-specificity to ensure that agencies are making informed decisions prior to acting and that the public is given a meaningful opportunity to participate in those decision-making processes); *City of Tenakee Springs v. Block*, 778 F.2d at 1407 (reasoning that an EIS must give decisionmakers sufficient data).

<sup>238</sup> *Ecology Ctr., Inc. v. United States Forest Serv.*, 192 F.3d 922, 923 n.2 (9th Cir. 1999); see also *Friends of Yosemite Valley v. Norton*, 348 F.3d 789, 800-01 (9th Cir. 2003); *Richardson v. BLM*, 565 F.3d 683, 718-19 (10th Cir. 2009) (requiring site-specific NEPA analysis when agency did not propose to undertake a future NEPA process).

<sup>239</sup> *Colo. Env'tl. Coal. v. Ofc. of Legacy Mgmt.*, 819 F. Supp. 2d 1193, 1209-12 (D. Colo. 2011) (requiring site-specific NEPA analysis in an environmental assessment even when future NEPA would occur because “environmental impacts were reasonably foreseeable”); *Western Watersheds Project v. Abbey*, 719 F.3d 1035, 1953-54 (9th Cir. 2013) (concluding agency failure to address site-specific alternative in an environmental assessment violated NEPA); *Fund For Animals v. Mainella*, 283 F. Supp. 2d 418, 433-34 (D. Mass. 2003) (ordering agency to prepare an environmental assessment to evaluate site-specific impacts where programmatic EIS failed to address those impacts and deferred such analysis to a later review). *Klamath Siskiyou Wildlands Ctr.*, No. 1:17-cv-997, Dkt. 57, slip op. at 14-15 (D. Or. Feb. 20, 2019) (R&R adopted Dkt. 67).

<sup>240</sup> *Or. Natural Res. Council Fund v. Brong*, 492 F.3d 1120, 1134 (9th Cir. 2007) (citation omitted); see also *Or. Natural Res. Council Fund v. Goodman*, 505 F.3d 884, 892 (9th Cir. 2007) (holding the Forest Service’s failure to discuss the importance of maintaining a biological corridor violated NEPA, explaining that “[m]erely disclosing the existence of a biological corridor is inadequate” and that the agency must “meaningfully substantiate [its] finding”).

<sup>241</sup> *Richardson*, 565 F.3d at 706.

<sup>242</sup> *Id.*

<sup>243</sup> *Id.* at 707.

inadequate—agencies must discuss their importance and substantiate their findings as to the impacts.<sup>245</sup>

Site-specific considerations requiring NEPA analysis and public input include habitat impacts (connectivity, permeability, and fragmentation at scales relevant to both broad-ranging and dispersal-limited species); rare habitats and species occurrences; geology, soil, aspect, elevation, and slope position, and how each affects the site’s reference condition; disturbance history; current stand conditions and suitability for maintenance and restoration of old-growth conditions; potential for needed follow-up treatments; risk of NNIS; sensitivity of receiving waters; archeological resources; access considerations; scenic integrity; and recreation settings. Because site-specific information is essential for a meaningful analysis of impacts and alternatives, a condition-based approach that does not provide such information at the landscape analysis phase or, later, in tiered projects, would violate NEPA.

#### 4. *Timing Matters*

Timing is everything for NEPA analysis. An agency cannot initiate NEPA too late:

The thrust of § 102(2)(C) is thus that environmental concerns be integrated into the very process of agency decision-making. The “detailed statement” it requires is the outward sign that environmental values and consequences have been considered during the planning stage of agency actions. If environmental concerns are not interwoven into the fabric of agency planning, the “action-forcing” characteristics of § 102(2)(C) would be lost. “In the past, environmental factors have frequently been ignored and omitted from consideration in the early stages of planning .... As a result, unless the results of planning are radically revised at the policy level—and this often means the Congress—environmental enhancement opportunities may be foregone and unnecessary degradation incurred.”<sup>246</sup>

Nor can an agency initiate a final NEPA decision too early: “[A] site-specific project demands site-specific analysis. Agencies cannot rely on a general discussion” in a prior analysis “to satisfy its NEPA obligations for a site-specific action.”<sup>247</sup> In other words, site-specific impacts must be

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<sup>244</sup> *Id.* See also *WildEarth Guardians*, 790 F.3d at 921-25 (holding EIS inadequate for failure to disclose location of moose range); see also *Or. Nat. Desert Ass’n v. Rose*, 921 F.3d 1185, 1189, 1190-91 (9th Cir. 2019) (holding environmental analysis violated NEPA by failing to establish “the physical condition” of roads and trails and authorizing activity without assessing the actual baseline conditions).

<sup>245</sup> *Or. Nat. Res. Council Fund v. Goodman*, 505 F.3d 884, 892 (9th Cir. 2007) (holding EIS inadequate for failure to evaluate in detail impacts of ski area expansion to acknowledged biological corridor); *Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 995 (9th Cir. 2004) (holding numeration of logging acres and road miles insufficient to describe actual environmental effects).

<sup>246</sup> *Andrus v. Sierra Club*, 442 U.S. 347, 350-1 (1979) (quoting S. Rep. No. 91-296, 20 (1969)); see also *Weinberger v. Catholic Action of Haw./ Peace Educ. Project*, 454 U.S. 139, 143 (1981).

<sup>247</sup> *Protect Our Communities Found. V. LaCounte*, 939 F.3d 1029, 1039 (9<sup>th</sup> Cir. 2019).



evaluated “once the ‘critical decision has been made to act on site development’” unless those site-specific impacts have already been considered in a programmatic analysis.<sup>248</sup>

CEQ’s regulations appropriately require agencies to “commence preparation of an environmental impact statement as close as possible to the time the agency is developing or is presented with a proposal ... so that it can serve practically as an important contribution to the decisionmaking process and will not be used to rationalize or justify decisions already made.”<sup>249</sup> The same rationale applies with equal force to decisions analyzed using Environmental Assessments.

As courts have noted, “[t]here is no magic” as to when site-specific decisions must be made—whether at a “programmatic” stage or, later, in a project-level decision.<sup>250</sup> The right time, as the Forest Service’s own handbook notes, is up to the agency, because it depends simply on when the agency is proposing to make a decision, and the scope of that decision. Broad, general analysis for broad, programmatic decisions, and site-specific analysis for site-specific decisions.<sup>251</sup>

As noted above, site-specific impacts cannot be assessed at the programmatic level, and such impacts must therefore be evaluated “when the agency proposes to make an irreversible and irretrievable commitment of the availability of resources which usually occurs following a tiered site- or project-specific NEPA review.”<sup>252</sup> “Irreversible” means an activity that forecloses future options for a long period of time.<sup>253</sup> Irretrievable is a term that includes “harvest ... of natural resources.”<sup>254</sup> Accordingly, as the agency has acknowledged, timber harvest is an irreversible and irretrievable commitment of resources.<sup>255</sup> And, as the courts have explained, the location of timber harvest matters. Thus, a final project decision cannot be made until the Forest Service has a site-specific proposal on the table, with accompanying site-specific analysis.

That is not the case with the Foothills Project. With no site-specific proposal on the table for vegetation management, a final decision is premature.

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<sup>248</sup> *Id.*

<sup>249</sup> 40 C.F.R. § 1502.5.

<sup>250</sup> *Ilioulaokalani Coalition*, 464 F.3d at 1102.

<sup>251</sup> *California v. Block*, 690 F.2d 753, 761 (9th Cir. 1982) (explaining that “site-specific impacts should be evaluated in detail” not in the programmatic analysis, but rather when the agency proposes to “act on site development”).

<sup>252</sup> Memorandum from Michael Boots, CEQ, to Heads of Federal Departments and Agencies, “Effective Use of Programmatic NEPA Reviews” at 27 (Dec. 18, 2014) included as Attachment 7.

<sup>253</sup> FSH 1909.15 § 05.

<sup>254</sup> *Id.*

<sup>255</sup> *E.g.*, Prince of Wales Landscape Analysis Project FEIS at 83 (Oct. 2018) available at [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd601039.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd601039.pdf).

“The [Forest Service] can’t have it both ways.”<sup>256</sup> Either it must explain the impacts and decision to work at particular sites (as opposed to reasonable location alternatives) in the programmatic EA, or it must leave itself the space to make those site-specific decisions in future NEPA processes.<sup>257</sup> It cannot, however, begin work on any part of the project without first finishing its analysis with respect to the stands where it intends to begin working. This requires not only completing the site-specific investigations, but also remaining open to reasonable location alternatives.

The Foothills Project’s timing problems are worse than any of the decisions cited above, because we understand the Forest has already identified some stands where it intends to act under this decision. Districts have already spent time in the field and prescribed stands for treatment, which the Forest believes will be covered by this project “when” (not “if”) the decision is finalized.<sup>258</sup> Withholding this information from the public is unfortunate; it is also unlawful.<sup>259</sup>

The Forest here takes the position that “strong” public input will occur post-decision. NEPA, however, does not permit the agency to delay gathering data about site-specific impacts until after the environmental review is complete. Ascertaining baseline information during implementation is inconsistent with NEPA’s purposes because it prevents the agency from “carefully consider[ing] information about significant environmental impacts” and deprives the public of “their opportunity to play a role in the decision-making process.”<sup>260</sup> Indeed, proposing “to increase the risk of harm to the environment and then perform [] studies ... has the process exactly backwards.”<sup>261</sup>

##### 5. *The Foothills Project’s Process Does Not Fit the Mold of Other, Lawful “Condition-based” Projects*

“Condition-based” decisions are a new trend in Forest Service management. The approach appears to have originated with the Four Forests Restoration Initiative (“4FRI”).<sup>262</sup> In that project, the Forest Service identified treatments in specific stands in a single ecosystem

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<sup>256</sup> *Ilio’ulaokalani Coalition*, 464 F.3d at 1097.

<sup>257</sup> *Id.*

<sup>258</sup> See Attachment 1 (comments of deciding officer, indicating intention to finalize the DN/FONSI regardless of any concerns that might be presented during the comment period).

<sup>259</sup> *Colo. Envtl. Coal. v. Ofc. of Legacy Mgmt.*, 819 F. Supp. 2d 1193, 1209-12 (D. Colo. 2011) (requiring site-specific NEPA analysis in an environmental assessment even when future NEPA would occur because “environmental impacts were reasonably foreseeable”).

<sup>260</sup> *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1085 (9th Cir. 2011).

<sup>261</sup> *Nat’l Parks & Conservation Ass’n v. Babbitt*, 241 F.3d 722, 733 (9th Cir. 2001), *abrogated on other grounds by Monsanto Co. v. Geertson Seed Farms*, 561 U.S. 139 (2010). See also *Western Watersheds Project v. Abbey*, 719 F.3d 1035, 1953-54 (9th Cir. 2013) (where agency failed to disclose site-specific impacts and alternatives in a programmatic EIS, it must do so in a site-specific EA).

<sup>262</sup> See Forest Service 4FRI webpage at <https://www.fs.usda.gov/detail/4fri/planning/?cid=stelprdb5361003>.

(ponderosa pine) on a vast landscape, which they expected would take at least 10 years to complete. The proposal and analysis was based on a host of specific treatments in specific stands, which were mapped and provided to the public for comment. Although the treatments were site-specific, they were proposed and analyzed without full information about what conditions were actually present on the ground in those stands, because the Forest Service lacked the resources to actually visit and survey all the stands in such a large project. Consequently, the agency developed an “implementation checklist” to guide the application of the treatments on the ground.<sup>263</sup> The implementation plan was very detailed and prescriptive. For example, it identified objective criteria (species, basal area, tree size) for identifying potential habitat for rare wildlife, and it provided strict sideboards for treating such stands, if at all. For areas outside rare wildlife habitat, the implementation plan provided a flowchart for applying the prescription that was decided and disclosed through the NEPA process. Significantly, the flowchart did not leave room for line officer discretion in locating or designing specific treatments that were previously assigned to individual stands through NEPA. Sideboards were also strict: for example, old trees (>150 years) were to be retained with just a few, narrowly circumscribed exceptions.

The combination of site-specific prescription and “implementation checklist” allowed the agency to decide first and gather additional site information later. This approach has proven an attractive to the agency to solve a persistent problem, to wit: the Forest Service is facing pressure to increase the pace and scale of vegetative management, but it lacks the resources to gather information about site-specific impacts at a large scale. If the agency can make a decision without putting “boots on the ground” first, it believes it can get more done.

Notably, 4FRI was not a pure “condition-based” decision as the term has subsequently been used. It was a landscape-scale, site-specific decision. But the “treatments” were specific and prescribed adjustments based on conditions that might be found at particular sites during implementation. We are not suggesting that the agency should pursue this approach or that it was a good idea at 4FRI, but to the extent that agency views it as a model, there are critical differences. The less diverse ecosystems of the Southwest also made it far simpler to apply there than in the Southern Appalachians. Finally, the 4FRI project’s implementation problems prove the rule that the public needs to be involved at the site specific level. Recently, the Forest Service “accidentally” approved logging old growth forest under the 4FRI decision, much to the dismay of the partners who believed this was off the table for the project and went along with a novel process with that understanding. This “mistake” would not have happened had the public been involved at the site-specific level.

A second type of “condition-based” decision has long been available to the Forest Service, but has been attempted only once that we are aware of. That approach is known as

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<sup>263</sup> We understand the Forest Service also proposes use of implementation plans and checklists at part of the Foothills Project. Please do not understand the comments in this section to suggest that use of those tools can categorically achieve NEPA compliance. Our comments here are to explain differences between the Foothills approach and the 4FRI approach.

“programmatic” analysis. Programmatic analysis lends itself well to the condition-based framework, and it can enjoy the support of conservation stakeholders. The Forest Service enjoys considerable discretion in managing public lands, and the exercise of that discretion can be very consequential for conservation values. Traditionally, this discretion has not been meaningfully narrowed in forest planning, and it has been exercised almost invisibly—in the development of site-specific projects’ “purpose and need” statements and the choice of sites to meet that purpose within an analysis area. If the public is appropriately involved in identifying and prioritizing the conditions to be treated, projects can be simultaneously more responsive to public concerns and more efficient from the agency’s perspective. Programmatic analysis, however, requires *subsequent*, site-specific NEPA decisions to select stands that fall within the programmatic decision. An implementation checklist can help to confirm that stands identified for treatment will advance the programmatic objectives, streamlining future site-specific analyses.

Both of these approaches can help the Forest Service increase its efficiency, and to do so lawfully. Recently, however, the Forest Service has attempted a third type of condition-based approach. This new generation of projects identifies conditions that could be found anywhere on a given landscape and purports to allow the agency to pick and choose stands without any additional analysis of those conditions, with various levels of discretion. The Foothills Project is of this type.

The Foothills Project and its kin are designed to avoid public scrutiny and accountability as the agency applies discretion in the future. With less accountability, the Forest Service can skirt by with less information, getting more done at the expense of causing more (unnecessary) negative impacts. If the Forest Service expects to apply discretion, with consequences for environmental values, after a final decision, then it will be legally vulnerable. In contrast, a condition-based approach can pass muster if the analysis goes “all the way to the ground” (i.e., eliminates the need to apply discretion in the future) or if anticipates successive, site-specific decisions (i.e., programmatic or “tiered” analysis).

Projects using both of these approaches have utilized implementation checklists in order to streamline implementation and/or site-specific analysis. Although line officers have been eager to try new approaches using implementation checklists, the agency has not provided any guidance on when and how to use those approaches. Without any policy guidance, the differences between conceptual approaches have become more and more confused. In our experience, Forest Service personnel often conflate “landscape” (i.e., all-the-way-to-the-ground) and “programmatic” analyses (i.e., necessitating future tiered NEPA decisions).

As noted above, 4FRI was the former type. The decision and accompanying analysis went “all the way to the ground.” The 4FRI decision did not leave discretion to the line officer to pick and choose sites or treatments; the decision was prescriptive, with adjustments built in based on specified, objective conditions.

The Cherokee National Forest’s Dry Forests Restoration Project<sup>264</sup> is a good example of the latter type. The decision identified several common conditions on the South Zone for which there is broad consensus favoring active management. The decision chooses to treat those conditions where they are found and provides a general (but not fully prescriptive) flowchart for addressing them. The decision also provides protective sideboards<sup>265</sup> to protect against cumulative impacts to soil, water, and unroaded area values. The decision defers final decisions to the site-specific level. Future decisions will be supported by site-specific analysis and public participation, but the scope of the site-specific analysis will be narrow. Cumulative, repeating impacts (soil, water, and roadless values, among others) have already been analyzed at the programmatic stage. Sites identified in the future will meet the checklist for coverage under the programmatic decision, and they’ll be analyzed only for issues that are unique or explicitly deferred to the site-specific level, such as how best to protect rare plants.

Because the Forest Service has not provided guidance to its line officers for how to choose and use these different approaches, they have been conflated. Programmatic analysis especially can be confusing, in part because CEQ guidance explains that programmatic analyses can include site-specific decisions that do not require further analysis. Still, what makes programmatic analyses “programmatic” is their utility for future decisions, because future analyses can “tier” back to the big-picture consideration of cumulative or common impacts.

In projects like Foothills, the agency is attempting to support to-the-ground decisions with programmatic-type analyses. In other words, the Forest is attempting to get the advantages of both the programmatic approach (a big-picture analysis that doesn’t get bogged down in site-specific details) and the to-the-ground approach (more acres included in a final decision) without the disadvantages of either (i.e., having to make successive, tiered site-specific decisions, in the case of programmatic approaches, or having to prescribe treatment “all the way to the ground,” in the case of the other).

#### 6. “Bounding” the EA’s Analysis Does Not Fill the Forest’s NEPA Gap

Explaining the Foothills Project in a public forum, senior staff responded to concerns about the condition-based approach by stating, “we are bounding our effects analysis.”<sup>266</sup> In this context, we assume that the reference was to the agency’s use of a “worst case” analysis to conclude that the project’s effects will be non-significant, no matter where harvest actually occurs. The project documentation explains that effects were estimated based on the maximum level of treatment authorized under Alternative 2. The agency’s theory seems to be that it can

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<sup>264</sup> The NEPA documents for the Cherokee National Forest’s Dry Forests Restoration Project are available at <https://www.fs.usda.gov/project/?project=55303>.

<sup>265</sup> We must note that, to the extent there is confusion about this, compliance with other, independent laws is not a meaningful sideboard for NEPA effects analysis.

<sup>266</sup> See Attachment 1.

therefore dispense with comparison of alternatives because, no matter where it chooses to harvest on this landscape, the effects will not be “significant” enough to warrant preparation of an EIS.

Nothing in the Forest Service or CEQ regulations provides guidance for using “bounding” in this way. In fact, the applicable guidance uses the term “bounding” in a very different context. “Bounding” is the process by which the Forest Service sets the spatial and temporal boundaries of the analysis for purposes of assessing cumulative effects.<sup>267</sup>

Another sense—the sense used here—is the use of “simplified quantitative analyses that use conservative assumptions and analytical techniques to ensure that potential impacts are not underestimated. They are often used when an impact is expected to be minor or insignificant to avoid the effort required to predict precisely the magnitude of the impact.”<sup>268</sup> Saylor and McCold make the case that “[t]his common-sense use of bounding analysis ... allows analysts, the public, and decision makers to focus on the most significant impacts without having their attentions diluted by minor impacts.”

Agencies are not required to use such “conservative” or “worst case” assumptions. At one time, CEQ regulations did require worst-case analysis when information was unavailable or too costly to obtain.<sup>269</sup> Now, in the face of unobtainable information, agencies must prepare “a summary of existing credible scientific evidence which is relevant to evaluating the ... adverse impacts” and an “evaluation of such impacts based on theoretical approaches or research methods generally accepted in the scientific community.”<sup>270</sup> In eliminating the worst-case requirement, CEQ reasoned that the change would help focus decisionmaking and public input on the “consequences of greatest concern” rather than “overemphasizing highly speculative harms.”<sup>271</sup> In other words, CEQ expected agencies to focus to the greatest extent possible on reasonably foreseeable impacts, not distort the decisionmaking process behind analysis of effects that are unlikely ever to materialize.

While not required, agencies may disclose worst-case impacts to cope with unobtainable information. The issue here, however, is somewhat different: rather than asking whether agencies *must* use worst-case analyses to fill in the gaps for *unobtainable* information, the question is whether an agency *may* use worst-case analysis to substitute for *obtainable* information.

The sole agency with written guidance on the use of a worst-case “bounding” analysis is the Department of Energy (“DOE”). According to that guidance:

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<sup>267</sup> FSH 1909.15 § 15.2.

<sup>268</sup> Saylor, R.E., and McCold, L.N. Bounding analyses in NEPA documents: When are they appropriate. United States: N. p., 1994,

<sup>269</sup> See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 354 (1989).

<sup>270</sup> *Id.* (quoting 40 C.F.R. 1502.22(b) (1987)).

<sup>271</sup> *Id.* (citing Fed Reg).

DOE NEPA documents sometimes estimate impacts by means of a “bounding” analysis; i.e., an analysis that uses simplifying assumptions and analytical methods that are certain to overestimate actual environmental impacts. While bounding analysis can be efficient and is sometimes necessary, DOE should *take care to use that approach only in appropriate circumstances; i.e., where the differences among alternatives would not be obscured.*<sup>272</sup>

DOE cautions that “bounding analyses should not be used where more accurate and detailed assessment is possible and would better serve the purposes of NEPA.”<sup>273</sup> Specifically, DOE warns that bounding analyses cannot be used to “mask the distinctions among alternatives”:

Even where overall impacts are small, detailed analysis for each alternative may be needed where differences in impacts may help to decide among alternatives or address concerns the public has expressed, as sometimes applies [in the selection of] sites ... and methods for conducting [agency] operations.

...

*It is never appropriate* to “bound” the environmental impacts of potential future actions (not yet proposed) and argue later that additional NEPA analysis is unnecessary because the impacts have been bounded by the original analysis.<sup>274</sup>

As DOE’s guidance explains, therefore, bounded analysis is more likely to be appropriate at the programmatic stage of decisionmaking—“the potential impacts of a program or broad agency action”—but not at the expense of the specific information needed to illuminate the future choice between “sites ... or methods.”<sup>275</sup> This distinction is not only required by law; it also makes good sense as a matter of policy. If an agency could “bound” the impacts of potential future actions and thereby avoid considering the differences between future site-specific choices, it would not have any incentive to look for less harmful alternatives. This would lead to unnecessarily harmful impacts, which is the evil that NEPA was intended to prevent.

Court cases illustrate these limitations. For example, in *Sierra Club v. Watkins*, DOE prepared an EA using conservative population estimates, overestimating the population density in its analysis area to show that the overall risk to port city populations was insignificant no matter which port was chosen for the receipt of spent nuclear fuel rods. According to the court, “[w]hile such a value does overestimate the risk, approximations of population density do not permit the sort of comparisons between ports that NEPA requires.”<sup>276</sup> Nevertheless, the court

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<sup>272</sup> DOE, Office of NEPA Policy and Assistance Mini-Guidance, “Using Bounding Analyses in DOE NEPA Documents” (emphasis added) included as Attachment 8.

<sup>273</sup> *Id.*

<sup>274</sup> *Id.* (emphasis added).

<sup>275</sup> *Id.*

<sup>276</sup> 808 F. Supp. 852, 866 (D.D.C. 1991).

held that the challenge was moot because a subsequent EA “cure[d] this problem by using actual population density values for each port and the highway route to be traversed.”<sup>277</sup>

In *OREPA v. Perry*, the agency declined to supplement its analysis based on new, site-specific information about the likelihood of an accident that could cause the release of nuclear materials, arguing that its worst-case analysis subsumed the later, more specific data.<sup>278</sup> The court disagreed, holding that DOE had used the worst-case analysis to “obscure differences in impacts among alternatives.”<sup>279</sup> Because the more specific information was available, the agency could not lawfully ignore it while using a worst case analysis.<sup>280</sup> An “unbounded” analysis was necessary to “help the public fully comprehend the difference” between potential alternatives.<sup>281</sup>

Under these principles, the Forest Service’s use of bounding analysis here is unlawful. First, the information regarding site specific impacts is easily obtainable, at least when the agency identifies site(s) for treatment. The agency has been gathering such site-specific information on all its projects for decades now, so it cannot now claim that the information is unobtainable. Second, the use of a bounding analysis here would mask the differences between alternatives the Forest Service is required to consider under NEPA. Even where impacts are not “significant” enough to require an EIS, the Forest Service must develop and study the consequences of reasonable alternatives in its EAs.<sup>282</sup> And no matter what stands the Forest Service ultimately packages for future timber sales, there are sure to be reasonable location alternatives, which may well be less harmful to resources valued by the public.

Only two cases so far have addressed the Forest Service’s use of “bounded” analyses for vegetation management. In *Southeast Alaska Conservation Council (SEACC) v. Forest Service*, the plaintiff challenged the Prince of Wales Landscape Level Analysis Project. As relevant to the court’s opinion, the Forest Service analyzed the “maximum potential effects” of harvesting all the acres that “could potentially be harvested” but “did not identify the specific sites where the harvest or road construction would occur” and “expressly left site-specific determinations for the future.”<sup>283</sup> The court held, consistent with *Sierra Club v. Watkins* and *OREPA*, that the plaintiff had shown a sufficient likelihood of success on the merits to justify a preliminary injunction, reasoning that the “worst-case-scenario analysis” was likely insufficient to allow the agency and public to “compare the environmental impacts of different alternatives.”

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<sup>277</sup> *Id.*

<sup>278</sup> 2019 WL 4655904, at \*50.

<sup>279</sup> *Id.*

<sup>280</sup> *Id.* at \*50-51.

<sup>281</sup> *Id.* at \*52.

<sup>282</sup> 42 U.S.C. § 4332(2)(E); FSH 1909.15 §§ 41.21 to 41.23.

<sup>283</sup> *See* Preliminary Injunction Order included as Attachment 9.



*WildEarth Guardians v. Conner* is not to the contrary. In that case, the Forest Service proposed to conduct harvest activities in potential Canada lynx habitat.<sup>284</sup> In that EA, the Forest Service quantified the amount of harvest, but “did not specify the treatment locations.”<sup>285</sup> According to the Forest Service, flexibility was needed “to select treatment units based on changing on-the-ground conditions during implementation.”<sup>286</sup> Although the Forest Service did not say where treatment would occur, it did specify that treatment would *not* occur in prime lynx habitat—i.e., healthy spruce-fir stands and stands with greater than 35% dense horizontal cover. Rather than provide site-specific analysis of the impacts to lynx, the agency “accounted for the uncertainty about treatment locations by evaluating the Project’s effects on lynx in a worst-case scenario in which all the mapped lynx habitat in the Project area is treated.”<sup>287</sup> The plaintiff brought a narrow challenge focused solely on impacts to lynx, but the court approved the agency’s bounded analysis, emphasizing that the project excluded prime lynx habitat from harvest.<sup>288</sup> In light of these protective criteria, the court accepted the Forest Service’s conclusion that “whatever sites it ultimately chooses (within the constraints imposed by the Project), *there would not be a negative impact* on the lynx.”<sup>289</sup> In other words, this was not a case, like *SEACC* or *Sierra Club v. Watkins* or *OREPA*, in which site-specific comparison of alternatives was needed to illuminate different degrees of harm. Instead, because the project prescriptively excluded prime lynx habitat in any alternative, *none* of the alternatives would have caused harm and there was therefore nothing to compare.

The Forest should not assume that it can shelter under the holding of *WildEarth Guardians*. First, and most importantly, the plaintiff did not raise, nor did the court address, any of the other site-specific conditions that might have been harmed to differing degrees depending on the locations chosen for treatment. In the Foothills Project, as we have explained above, location matters for a number of reasons. Second, the Foothills Project’s design criteria are not sufficiently prescriptive to ensure that “there would not be a negative impact” on any of these resource values. Design criteria are important, but these cannot possibly reduce impacts to zero. They are not mandatory (“should” instead of “shall” or “must”); they are not comprehensive (do not address all the various resources that could be affected by project activities); they largely incorporate requirements from the Forest Plan which itself deferred analyses to site-specific projects; and they describe best management practices that require the use of judgment at the site specific level to reduce, but not eliminate impacts, such as locating skid trails in areas with “adequate drainage” or re-using existing road prisms and buffering rare plants “where

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<sup>284</sup> 920 F.3d 1245 (10<sup>th</sup> Cir. 2019).

<sup>285</sup> 920 F.3d 1245, 1255 (10<sup>th</sup> Cir. 2019).

<sup>286</sup> *Id.* at 1258.

<sup>287</sup> *Id.*

<sup>288</sup> *Id.*

<sup>289</sup> *Id.* (emphasis added).

possible.”<sup>290</sup> Finally, in *WildEarth Guardians*, the court appeared to agree with the agency that site-specific information about which units would actually be harvested was unobtainable because of changing conditions.<sup>291</sup> Here, the Forest has offered no plausible reason that it cannot provide site-specific information in successive NEPA projects, as it has for decades, and in fact is doing right now with other projects on the Forest.

The Foothills Draft EA cannot hide behind a worst-case analysis for a number of reasons. First, the Forest simply lacks the baseline information needed to predict the worst case effects for the whole range of resources that would be impacted. For example, the agency understands that it does not (and will not) know what cultural resources are present on the sites where it will work. With no baseline for what’s out there, the Forest cannot say what might be lost in the worst case, much less compare the effects of choosing some sites for harvest as opposed to others. Indeed, impacts to these resources will go unseen during implementation; without comprehensive monitoring the Forest will never know (or be accountable for) what has been lost. Similar considerations apply to the presence of rare species.

Second, the “worst case” version of this project would allow violations of the laws protecting water, soil, and wildlife. The agency’s assurances that future actions will comply with the Forest Plan and other legal requirements offer little comfort: these external legal requirements are not self-enforcing. They often require site-level development of mitigation strategies, for example, to avoid violation of a general prohibition. On forests throughout the region, EA predictions about the success of BMPs or other mitigation strategies have proven to be falsely optimistic.

Third, the “worst case” scenario for Foothills would almost certainly involve “significant” impacts.<sup>292</sup> And as explained above, public input has been responsible for myriad improvements to projects and has prevented significant harmful impacts. Without such input at the site-specific level, those harmful impacts would occur in the future.

Fourth, at this point in time, the Forest has not prepared a true “worst case” analysis; it has disclosed maximum acreages of treatments that will be implemented at unknown location on the landscape. Different impacts are associated with different treatments and where those actions are implemented on the ground makes a significant difference. As an example, the Forest is proposing up to 10,500 acres of early successional habitat creation. Simply disclosing that number is not “worst case;” application of that treatment in different areas will result in wildly varying impacts. A true worst case scenario analysis would apply the most harmful treatment across the entire area that could be manipulated, which may differ by the resource considered.

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<sup>290</sup> Draft EA, 74-79.

<sup>291</sup> 920 F.3d at 1258 (adapting to changing conditions).

<sup>292</sup> *See supra* Section I.

Fifth, and most importantly, the Foothills approach would use “worst case” assumptions in order to avoid the Forest’s obligations to make informed decisions, and for that reason alone the approach should be held unlawful. The agency is attempting to authorize a level of treatment that it knows is unrealistic, then exercise discretion in picking and choosing stands without the public being involved. The Forest cannot lawfully use such an approach to avoid the requirement to make informed decisions between location alternatives.

*7. Options for Correcting the Legal Errors in the Foothills Project’s Condition-based Approach*

Condition-based approaches can lawfully help the Forest Service meet its needs for greater efficiency while also doing a better job of protecting resources that matter to environmental stakeholders. Such approaches can also unlawfully exclude the public from decisions with important consequences for environmental values. But, in order to survive legal scrutiny, such approaches must either (a) prescribe treatment all the way to the ground, including an analysis of the resulting site-specific impacts, or (b) commit to future site-specific analyses. To fix the Foothills process, the Forest must choose one or the other.

Of the options, the agency as a whole has a longer track record with all-the-way-to-the-ground approaches. Those projects are most appropriate where the agency wants to treat a large area for a specific, narrow purpose or purposes, such as increasing resilience to wildfire, or treating for non-native invasive species. The Foothills Project’s comprehensive approach places it outside the parameters of when this is typically used which will make application of the approach more difficult. But theoretically, by identifying specific sites for treatment, then using conditions in the field to tailor the pre-chosen treatment to site-level differences, the Forest Service can reduce the up-front burden needed to reach a decision. This approach can bring conservation stakeholders’ energy to the process, because it provides an opportunity for the agency to grapple with the cumulative impacts of decisions that otherwise would be made in small bites, like how to mitigate impacts to rare plants or wildlife. In the usual, project-by-project approach, the Forest Service might, for example, buffer a rare species’ habitat and dismiss any impact as individually minor (and dismiss cumulative impacts as outside the scope of the decision). With the to-the-ground approach, the Forest Service might instead work with stakeholders to develop a blanket rule for how to address the issue which could lead to overall better outcomes.

The agency has a shorter track record with programmatic analysis, but the approach is promising. This approach is most appropriate where the agency wants to treat some portion, but less than the total, of the acres meeting a specific condition. Programmatic approaches are much less likely to violate NEPA because the agency will have a second chance (the site-specific decision) to correct omissions from the programmatic analysis. This approach also assures that new information can feed into future decisions in an adaptive management framework. As another advantage, the Forest could borrow ideas from the Cherokee National Forest’s Restoration of Dry Forest Communities Project, which overlaps with the stated purpose and need

for the Foothills Project. We note that we have repeatedly asked the Forest Service to pursue this approach with Foothills.

We have focused here on vegetation management, but the same fundamental problems also apply to other elements of the project. Decisions affecting recreation resources, for example, are not ministerial, even where a project “trigger” is found, but also require the application of site-specific discretion. The Forest must determine not only *which* tool in the toolbox to apply, but whether to apply any tool at all. This is a question of resource allocation, and it should be made in light of public input about the relative values of recreation areas competing for those resources.

To be clear, there are lawful options available to the agency to use condition-based approaches, but the project proposed here does not fall within them. At the risk of being repetitive, we will summarize the issue one more time, because this is a critical issue, and one which the Forest locally or the Forest Service nationally does not seem to understand. If we begin with a question: Does NEPA *always* require site specific analysis? No, but it does require site-specific analysis where the site-specific decision is consequential—that is, when there are location alternatives such that different uses of agency resources would have different environmental consequences,<sup>293</sup> or when the choice between locations makes the difference between significant and nonsignificant impacts.<sup>294</sup> There may be circumstances where, because of the type of action or the ecosystem context in which it will occur, the choice between locations is not consequential. Such was the case, in the court’s view, in *WildEarth Guardians v. Conner*, at least with respect to lynx habitat. But in the Southern Appalachians particularly, that is simply not the case for commercial vegetation management projects.

### **III. Georgia’s Mountain Treasures Deserve Special Management Considerations**

One advantage of working at a landscape scale is it allows prioritization. Forest Plan goals can be pursued in the areas where they will produce the greatest benefits, rather than shoehorning them into suboptimal areas simply because those are the areas available in a smaller project. A landscape approach also provides context that may be missed at the broader scale of the entire forest.

Large roadless areas provide unique habitat and recreation benefits and their values should be analyzed specifically in the context of the Foothills landscape. Georgia ForestWatch researched, analyzed, and described areas meeting Agency definitions of roadless areas,<sup>295</sup> and published the results in [\*Georgia’s Mountain Treasures\*](#). The Mountain Treasure areas in the Foothills Landscape are Big Shoals, Thrifts Ferry, Five Falls, Raven Cliff Wilderness Extensions (Turner Creek IRA), Blood Mountain Wilderness Extensions (Cedar Mountain and Miller Creek

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<sup>293</sup> See 42 U.S.C. § 4332(2)(E).

<sup>294</sup> See *id.* § 4332(c).

<sup>295</sup> See *infra* 162-163.

IRA), Black Mountain, Long Mountain, Etowah Headwaters, Springer Mountain (Lance Creek IRA), Cohutta Wilderness Extensions, and Grassy Mountain. However, many of these lie primarily in other landscapes, and the only ones that are mostly or entirely within the Foothills are Big Shoals, Thrifts Ferry, Five Falls, and Grassy Mountain.<sup>296</sup> Please note that *Mountain Treasures* is not a comprehensive list of areas that meet agency roadless criteria. Georgia ForestWatch deliberately excluded some areas, such as Boggs Creek and Worley Ridge, because we recognized unusual concentrations of highly departed stands.

These areas generally rank relatively high in biotic integrity, connectivity, resilience to disturbance, and soil and water productivity. Biotic integrity is enhanced by low levels of invasive species and, in some cases, the potential to let some wildfires burn.

These areas are by definition connected as they lack fragmenting features. Roads disrupt both terrestrial and aquatic movement, so these roadless areas are exceptionally connected in both dimensions. At broader scales, these roadless areas connect to other roadless areas and link habitats across landscapes. Grassy Mountain lies adjacent to the Cohutta Wilderness and Thrifts Ferry joins the Rock Gorge (Big Mountain IRA) area. Connection to higher landscapes is particularly important in the face of climate change and the need for species to migrate to higher elevations to stay in a suitable temperature range. This connectivity enhances resiliency by helping species recolonize after a disturbance and ensuring that well-adapted species are present to colonize disturbed areas as climate changes. These conclusions reflect core principles of conservation biology and island biogeography in particular, which firmly establish that larger areas of habitat have lower extinction rates. These ideas were also behind The Nature Conservancy's Core Forests analysis, which also focuses on unfragmented habitats as a key to long-term species survival.

The Draft EA notes that “[r]oads affect watershed condition because more sediment is contributed to streams from roads and road construction than any other land management activity (Elliot et al. 2009). Roads directly alter natural sediment and hydrologic regimes by changing streamflow patterns and amounts, sediment loading, transport, and deposition, channel morphology and stability, water quality, and riparian conditions within a watershed.”<sup>297</sup> Hence, roadless areas have the highest water quality and best aquatic health.

Ultimately, these areas are some of the best examples of high biologic integrity, resiliency, connectivity, and soil and water productivity on the forest. In other words, these areas already exhibit the features behind this project's purpose and need. The agency can more effectively, efficiently, and economically achieve those qualities at the landscape-scale by not focusing treatments in these areas.

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<sup>296</sup> We are providing a shapefile of these areas as by sharefile link along with these comments. We are happy to re-provide them at any time.

<sup>297</sup> Draft EA, 42.

Big Shoals, Thrifts Ferry, and Five Falls exhibit these desirable qualities in similar ways, as all border the Chattooga River. They lie adjacent to each other and combine with roadless areas in other landscapes to form one of the two best corridors for plant and animal migration in North Georgia (the other being along the Appalachian Trail). Wild and Scenic River designations along the Chattooga River protect parts of this corridor, but they fail to protect many kinds of habitats and have limited impact on water quality. The roadless areas allow northward migration and encompass a dissected landscape that harbors an abundance of white pine, much of it growing in its natural habitat.

Grassy Mountain, in contrast, features a promontory and rocky escarpment that facilitates upward migration. Indeed, Grassy Mountain's roughly 2800' elevation gradient is the greatest in the Foothills and comparable to the greatest anywhere on the Forest. Further enhancing the value of this gradient is the fact that Grassy Mountain lies adjacent to the Ridge and Valley province and provides a unique opportunity for species associated with that region to respond to climate change. These benefits are not hypothetical. Chalk maple and oak-leaf hydrangea, two species that are common in the Ridge and Valley but rare in the Blue Ridge, grow on Grassy's lower slopes. High and low elevation species already mix on Grassy Mountain; for instance, low elevation sweetgum and high elevation yellow birch grow side-by-side on Mill Creek. Nor is yellow birch the only species finding unusually low elevation refuge on Grassy Mountain, as mountain maple reaches its lowest elevation in Georgia on the mountain. This unique value of Grassy Mountain is threatened by the Rocky Flats Trail, which would best be decommissioned just past the first wildlife opening. Grassy Mountain's intact core of the Forest's largest old-growth stand also gives it exceptional biotic integrity.

Beyond these roadless areas' biological values, they provide unique opportunities for remote backcountry recreation. The Foothills has no Remote Backcountry Management Prescription and the only Wilderness is a snippet of Tray Mountain. Recreation that relies on remoteness and solitude should be supported in the Foothills. Commercial timber harvests and their associated roads would disrupt that recreation. Additionally, Wilderness in Georgia is skewed toward the higher elevations, and many forest types found in the roadless areas of the Foothills are underrepresented.

We are *not* suggesting that Foothills roadless areas be managed as *de facto* Wilderness. Active management should be an option in these areas, but that management should not include commercial timber harvests, herbicide application, temporary roads, or plowed fire lines. Non-commercial timber harvests and prescribed fire units bounded by natural fire breaks and hand lines are appropriate management techniques for these areas. Those tools are sufficient to accomplish all of the goals of the Foothills Project, though they may achieve them more slowly.

## IV. The Vegetation Management Proposals Can Be Improved

### A. Discussion of Alternative Ways to Meet Vegetation Objectives is Lacking

Management is fundamentally about making choices. Choices do not have an absolute value, but only a value relative to other alternatives. Hence, the evaluation of alternatives is a crucial part of any environmental assessment. That importance is why the unequal evaluation of Alternative 2 and the no-action alternative in the Draft EA is so disturbing. Omissions, inconsistencies, and questionable information create a distorted comparison of the alternatives.

Most fundamentally, the presentation of the no-action alternative in the Draft EA is misleading because many statements that are presumably supported by analysis in the specialist reports are in fact unsubstantiated. For instance, the Draft EA claims “under [no-action], not acting to improve forest health or to restore hardwoods and southern yellow pine ecological systems would likely result in lower carbon sequestration. Consequent results are an increase in carbon emissions in the future as the result of forest decline, wildfires and increased insects and disease activity in the project area.”<sup>298</sup> However, the Climate Change Report provides no ecosystem level analysis or references to substantiate the claim.

The mesic deciduous forest no-action alternative summary surmises “[T]he observed decline in songbird populations in the project area is likely to continue.” The specific songbirds being referred to are never defined, and the management indicator species for the habitat is stable in Foothills, not declining.<sup>299</sup> Also in presenting the no-action alternative, the Draft EA asserts areas remaining in fire condition class 3 “would result in an increased level of risk of an unwanted wildland fire” and “more intense wildland fires in both the short and long-term duration of the project.”<sup>300</sup> In contrast, the scientific literature expresses concern that a lack of burning in the deciduous forests of eastern North America may create a feedback loop that inhibits fire. This process has been given the name “mesophication.”<sup>301</sup>

Just as problematic, the evaluation of the no-action alternative ignores ongoing natural processes and management. The Vegetation Report concludes “no young forest habitat would be established as a result of restoration treatments,” but misses that young forest would be produced by southern pine beetle (among other sources), even though the same sentence says “future attacks of southern pine beetle would be likely.”<sup>302</sup> Early succession habitat from wildfires is also ignored, and the propensity of oaks to grow underneath pines means that some of the young forest produced by southern pine beetle would be oak forest. Indeed, the Climate Change Report

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<sup>298</sup> Draft EA, 92.

<sup>299</sup> Terrestrial Wildlife Report, 28.

<sup>300</sup> Draft EA, 94.

<sup>301</sup> Nowacki, G.J. and Abrams, M.D., 2008. The demise of fire and “mesophication” of forests in the eastern United States. *BioScience*, 58(2), pp.123-138.

<sup>302</sup> Vegetation Report, 40, 45.

contradicts the Vegetation Report by describing a world increasingly stressful for trees and implies that early successional habitat should be becoming more abundant. The no-action alternative's implications for habitats are correctly stated in that snags, dens, downed wood, black bear habitat and ovenbird habitat would increase, but the increase in those habitats necessarily contradicts the conclusion that gaps in mesic forests will decline, which appears on the same page.<sup>303</sup>

The Vegetation Report also states “[t]he observed decline of fire-adapted southern yellow pine in the project area is likely to continue, because no actions to restore or maintain these communities and their associated woodlands habitats would be undertaken.”<sup>304</sup> Here, “no actions to restore or maintain” ignores 18,185 acres of existing prescribed burn units in the Foothills.<sup>305</sup> Similarly, the evaluation of bogs in the no-action alternative omits the active bog restoration program coordinated by the Georgia Plant Conservation Alliance, which predates the Foothills Project and would continue without it. Because of those efforts, it is incorrect to conclude bog habitats would “maintain or decrease in distribution and abundance as a result of [no action].”<sup>306</sup>

The assessments of Alternative 2 underestimate negative impacts while assuming complete success of treatments and not acknowledging their limitations. According to the Draft EA, Alternative 2 would cause “minor, short-term decreases to hard mast availability, but a long-term increase due to maintenance activities.”<sup>307</sup> However, oaks are the primary source of hard mast, and they take several decades before they produce substantial mast. There would be additional losses in mast production due to forests being maintained in more open conditions and the creation of new permanent openings. These changes are not accounted for, and negative impacts on mast production would in fact be long term. The analysis of Alternative 2 on hydrology ignores the gradual reduction of the duff layer and exposure of mineral soil produced by repeated prescribed fires. This is particularly important as the prescribed burning contemplated in this project is may be planned to continue indefinitely. The EA states “Alternative 2 would result indirectly in lowered flame lengths, decrease in spotting distances, and a decrease in fireline intensities, thereby increasing success of fire suppression.”<sup>308</sup> As with the no-action alternative above, this conclusion does not consider science suggesting the *absence*

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<sup>303</sup> Draft EA, 100.

<sup>304</sup> Vegetation Report, 40.

<sup>305</sup> Vegetation Report, 50.

<sup>306</sup> Draft EA, 89.

<sup>307</sup> Draft EA, 101.

<sup>308</sup> Draft EA, 95.



of fire may actually produce those results and that fire could maintain a more flammable ecosystem<sup>309</sup>.

Assessments of Alternative 2 also assume complete success, but even if treatments were completely successful, they would not eliminate issues such as southern pine beetle because they generally treat less than half the landscape (e.g., Alternative 2 would maintain “41% of mid to late-successional fire-adapted yellow pine across the landscape”<sup>310</sup>). Alternative 2’s evaluation also assumes experimental treatments would be successful, such as when it states the untried practice of treating hemlock woolly adelgid by cutting surrounding trees would “reduce the vulnerability of hemlock-dominated forests to hemlock woolly [sic] adelgid.”<sup>311</sup>

In some instances, the description of the impacts of alternatives becomes perfunctory. Alternative 2 lists the goals of the treatments, and the no-action alternative is described as a list of goals that would not be achieved. The Vegetation Report goes so far as to describe the no-action alternative as “*preventing* the restoration of declining fire-adapted southern yellow pine and oak species” (emphasis added).<sup>312</sup> The no-action alternative is not merely the absence of Alternative 2. Forests inevitably develop and change as they age (i.e. succession), and the Foothills is a dynamic landscape exhibiting many ongoing trends and subject to broader changes, such as climate change. The no-action alternative cannot be fairly described without accounting for these processes. Overall, these shortcomings deny the public and the Agency itself a fair and sound basis for making decisions about which actions to pursue.

#### B. Concerns About the Order of Treatments

In response to the 2017 proposed action, we suggested that where fire would be used in conjunction with other vegetation treatments, fire should be applied first. The Scoping Summary report indicated that “fire will be used first in Alternative 2,” and elaborated “Condition-based planning allows the Forest to choose the right tool and the order of the use of tools to best meet the purpose and need of the project.”<sup>313</sup>

However, in discussing southern yellow pine maintenance, the EA states: “Following the thinning treatments, the areas would be evaluated on the ground to determine the degree and intensity of subsequent understory treatments in order to meet desired outcomes. For example, if shade tolerant, fire intolerant understory vegetation persists after the thinning, then it would be treated using a combination of herbicides and/or prescribed fire.”<sup>314</sup> Clearly, logging would be

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<sup>309</sup> Nowacki, G.J. and Abrams, M.D., 2008. The demise of fire and “mesophication” of forests in the eastern United States. *BioScience*, 58(2), pp.123-138.

<sup>310</sup> Vegetation Report, 42.

<sup>311</sup> Draft EA, 111.

<sup>312</sup> Vegetation Report, 53.

<sup>313</sup> Summary of Scoping Report, 17.

<sup>314</sup> Draft EA, 46.

used first. The oak and oak pine maintenance mirror the pine maintenance in that “areas would be evaluated for subsequent needs for midstory reduction treatments designed to reduce oak seedling competitors” only “following the commercial thinning.”<sup>315</sup> Again, this is a timber harvest first approach that opens the canopy before understory restoration is complete. The EA indicates Alternative 2 is a timber harvest first approach.

We identified three distinct reasons why burning first is advantageous, and since those benefits have not been addressed, we briefly summarize them here. First, sprouts from undesirable understory vegetation have less light and energy under a closed canopy, and thus would be expected to have lower survival if prescribed fire top-killed them before harvests opened the canopy. Second, where prescribed fire is essential to treatment success—as is the case in several planned treatments—burning first allows harvests to be planned with knowledge of what areas will actually burn, accounting for any necessary adjustments to burn unit boundaries. Third, the stands that currently dominate the landscape and are the goal of maintenance treatments resulted from burning followed by timber harvests.

Complications produced by burning slash lead to a fourth reason to burn before harvests. The slash produced by commercial harvests or understory slash down treatments can lead to prescribed fires burning hot and potentially killing desired retained trees. Burning first allows fuels from understory vegetation to be consumed prior to harvests and can help avoid hot fires. In the Upper Warwoman Project, completing slashing down small stems in a Table Mountain pine restoration treatment forced the modification of burn plans to avoid killing Table Mountain pines.

### C. The Proposal Calls for Excessive and Unnecessary Herbicide Application

In forest management, pesticides and herbicides are one of the greatest areas of public concern. The CONF has previously evaluated the use of pesticides and herbicides for NNIS purposes through a handful of Environmental Assessments. Those reviews permit the use of herbicides, but they do not address all public concerns nor justify all uses of herbicides and pesticides.

The most recent of the reviews was 2011. Since then, use of pesticides and herbicides has been an area of very active research, driven in part by a growing appreciation of the dangers posed by neonicotinoid insecticides. The same time period saw the discovery of massive declines of insects generally, with some indications that pesticides are one of the causes. The final EA should incorporate the most recent research.

Continued research has discovered dangers from pesticides and herbicides that were not realized for years. For instance, Atrazine, a widely used herbicide, has been found to harm frogs and fish and at real-world exposure levels increase the chance of birth defects. Herbicides and timber treatment will remove desirable species.

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<sup>315</sup> Draft EA, 49.

Research is also revealing how the greatest danger from herbicides may come not from the active ingredient but from secondary compounds. That threat may sound abstract without a specific example, but we cannot provide an example because secondary compounds are proprietary trade information. However, PFAS are an example of the kind of chemicals that *may* be in herbicide formulations. PFAS, also known as polyfluoroalkyl substances, have a wide variety of industrial applications, including as surfactants and dispersants, which could allow them to help keep herbicide nozzles from clogging. PFAS are persistent in the environment, have negative impacts on animal livers, and initial research suggests they may be linked to high cholesterol, thyroid disease, cancer, and other health issues in humans.

We do *not* bring up these issues to suggest pesticides and herbicides should be banned. Indeed, some management goals, such as controlling some invasive species, are difficult or impossible without pesticides and herbicides. At the same time, something has gone wrong when more herbicides are sprayed on native species than on invasive species, as the Foothills Project plans. Even if herbicides are used, that does not mean they should be used everywhere. The Agency allows skidders in the forest, but prohibits their use in some areas (steep slopes) and generally looks for ways their impacts can be reduced. In the same way, the Agency should reduce pesticide and herbicide use where possible.

Fortunately, simple changes to the Foothills Project can reduce their use. The greatest savings would come from applying prescribed fire before applying herbicides. Repeated prescribed fires have eliminated sourwood and mountain laurel from sites in the Foothills. Those species eliminated are plants that would not have to be sprayed with herbicide. Restoring understories before opening the canopy with timber harvests would also reduce herbicide application because sprouts of understory vegetation would be less vigorous due to receiving less light. Herbicides can also be eliminated from the young oaks treatment without any loss of effectiveness. The retained oaks will have such a great height advantage over the sprouts from the adjacent cut tree that they are certain to win in competition even if the sprouts do not immediately die. None of these changes would reduce the total acres treated or the effectiveness of treatments, but they would save money.

They would also save biodiversity, one of the goals of Foothills Project. Few herbicide applicators will be able to recognize blueberries, persimmons, azaleas, or dozens of other species that will grow in the understory and add diversity and wildlife value. The loss of these species in treated stands has been dismissed because they are not present across the entire landscape. By that logic, there is no reason to remove culverts because other streams are already connected, treat for southern pine beetle because southern pine beetle will not impact all pine stands on the landscape, or expand HCA because hemlocks are already protected in some areas. Treating and inadvertently killing desirable understory species on up to 74,500 acres will significantly reduce biodiversity and wildlife value on nearly half of the Foothills area. That loss is not trivial and could well eliminate some species from the landscape.

#### D. Concerns Regarding the Decision Matrices

The decision matrices clearly reflect a great deal of thought and effort. They capture well many key variables such as forest type, site index, and presence of fire. They also account for over two dozen different scenarios. There is a place for the use of these tools in forest management though not as a replacement for site-specific analysis. Like any system that seeks to cleanly divide situations that vary along a continuum, decisions in the real world will be more ambiguous than they appear on paper.

The Immature Pine Decision Matrix appears to assume that pines will be on dry/oak sites. That is certainly the most common scenario, but some Virginia and white pine stands are on more mesic sites. These sites would require more mixed restoration than simply SYP or oak. White pine may even be on its native sites in some cases.

The Mature Pine Decision Matrix would benefit from an early break to determine if undesirable understory species are large enough to survive repeated prescribed fires or not, and if prescribed fire is available. If the understory would survive fires, that path would feed into the existing matrix. If the understory would be outright killed by fires or scarred so that they would be killed by repeated fires, further treatment would only be needed in the case where a SYP seed source is absent. Otherwise, fire would restore the understory light environment and SYP would regenerate episodically as canopy gaps inevitably form.

The Mature Pine Decision Matrix contains an option only for off-site Virginia and white pine. Those two pines are native to the Foothills and will sometimes occupy appropriate sites. Virginia pine has been dated to the 1870s on dry ridges at multiple sites on the CONF. Old white pines have been almost entirely eliminated from the CONF, but the Cullasaja Gorge in NC and many sites in Great Smoky Mountains National Park support white pines that grow on dry slopes with oak and predate fire suppression by a century or more. White pines are especially common far up slopes in gorges associated with large streams, as occurs in association with the Chattooga and Conasauga Rivers and some of their larger tributaries. White pine also occupies many mesic sites in the Foothills, and should not be considered off-site there. The decision matrix should include a break to determine if these pines are onsite, and if so, include treatments that retain them. That judgment will be difficult to determine based solely on stand data, and shows one example of where decision matrices should yield to individual site evaluation.

We are encouraged to see that the Mesic Condition Decision Matrix specifically asks if structural diversity is lacking rather than assuming it is absent. Those treatments also need to ask if the stand is outside of prescribed burn units. Intuitively, mesic stands would not be burned, but we observed stands mapped as suitable for canopy gap treatments that had carried fire in the Rocky Flats prescribed burn unit. If the stands are in burn units, they are very unlikely to develop dense understories or midstories.

The Mesic Condition Decision Matrix also asks, "Is the ability for oak seedlings to reach the overstory being inhibited by shade-tolerant mid-story vegetation?" Mesic oak forests

naturally have substantial numbers of shade tolerant species in their understories, such as hickories, silverbell, sourwood, and white pine. Oak recruitment may be sporadic under these conditions, so further unacceptable understory conditions should be further narrowed. Mesic oak forests can also be quite mixed, so satisfactory regeneration may need to be reduced from 200-500 4'+ seedlings/acre. Grouse habitat is a poor deciding factor because climate change will likely render the Foothills unsuitable for grouse in the near future. Grouse is already restricted to narrow parts of the landscape, and the species that will actually be affected by treatments should decide them.

Similar to Mature Pine, the Non-Mesic Conditions Decision Matrix would benefit from a break on the mature side to determine whether repeated prescribed fire can take out undesired midstory vegetation. Where the understory is still sensitive to fire, prescribed fires could be used to restore understory conditions, and allow oaks to regenerate gradually in naturally forming canopy gaps. Otherwise, the decision point would feed back into the existing matrix.

#### E. Recommendations for Treatments for Southern Yellow Pine

Southern yellow pines (SYP) provide a unique evergreen element to uplands in the Foothills. Altered disturbance regimes have created well documented problems for them, and several species are undergoing region-wide declines. These issues make them an appropriate target for management. Many populations also exist on sites where they are not native, which creates restoration opportunities. We support the efforts to address that issue through pine plantation thinning and using 1,700 acres of pine plantations for oak and SYP restoration.

The Foothills Project proposes multiple tactics in SYP maintenance and restoration that are likely to improve odds of success and promote biotic integrity. Requiring pine plantations used for restoration to contain a significant component of the desired species helps ensure clearing the pine plantation does not simply promote another undesirable species. Using old pine stumps to identify potential restoration sites also helps ensure appropriate sites are chosen. We were pleased that the options of scarifying the ground to promote seedling recruitment and planting seedlings in clumped patterns were incorporated into the proposal.

While we generally favor growing season burning, we wonder about its effectiveness for oak and pine restoration. Growing season burning tends to favor grasses over woody plants, but in this case the goal is to perpetuate the existing woody understory. Personnel and smoke management issues limit growing season burning capacity, which brings up the question whether committing to burning these stands in the growing season would take that option away from other larger areas where the practice could produce greater benefits.

Some other tactics appear greatly counterproductive. For SYP restoration with adequate desired trees for natural regeneration, there should not be a follow up harvest. Residual trees should be left on site indefinitely to provide cavities, structural complexity, and age diversity, as we explain in more detail in our scoping comments.

Planting pure pine in restoration treatments also appears to be asking for trouble. Most of the pine management in the Foothills Project is aimed at preventing Southern Pine Beetle (SPB) infestations. Yet planting pure pine stands maximizes the risk of future southern pine beetle infestations. The Vegetation Report notes “Managing for mixed stands of hardwood and yellow pine has also been suggested because southern pine beetle prefers stands with a uniform and continuous composition of host susceptible species. Mixed stands break this continuity, which can limit spot spread”<sup>316</sup> Mixed planting provides that strategic value, and we outline additional benefits in our scoping comments. We understand that the Foothills Project plans future thinnings to reduce risk, but post-harvest non-commercial treatments have repeatedly proven difficult to implement on the CONF.

Conversely, the CONF has repeatedly succeeded in spurring natural SYP regeneration without the use of mechanical treatments. At the buffalo range, Johns Mountain/Keown Falls, and Jones Creek/Bull Mountain burn units, we have observed shortleaf pine regeneration in the vicinity of mature shortleaf pines. Even without opening the canopy, seedlings have grown well until being knocked back by the next fire, at which point they resprouted. Two of these three units are in the Foothills. They demonstrate the potential for using fire to accomplish many of the maintenance goals in the Foothills Project, as we elaborate in our scoping response.

While Southern Yellow Pines were historically the dominant pines on dry sites, they were not the only pine species in that landscape position. A minority of white pines naturally occur on upper slopes or dry aspects, as verified by the presence of white pines over two hundred years old in Southern Appalachian old-growth forests otherwise dominated by dry oaks. Across the landscape, white pine most consistently occurs in association with river gorges, and in these and similar settings often naturally occurs high on slopes. Similarly, Virginia pine has proliferated on dry sites in the absence of fire, but also occurred on dry sites even with frequently occurring fires. Rather than assuming all mature white pine and Virginia pine are off-site when they occur on ridges and upper slopes, each site should be carefully examined and mature individuals retained if the site appears suitable for them.

#### F. Recommendations for Treatments for Oaks

The Foothills Project proposes more treatment acres in oak forests than any other forest type. We support this focus on oaks. Oaks are important due to their abundance, social value, and wildlife value. Oaks also have well documented regeneration problems that warrant attention.

In our Foothills Project scoping comments, we pointed to several changes that would allow this important work to be accomplished more effectively while simultaneously minimizing adverse impacts. The Agency has incorporated one suggestion by planning 1,700 acres of oak and pine restoration in pine plantations. We recognize that pine plantations represent a

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<sup>316</sup> Vegetation Report, 27.

significant investment of planning, effort, and time, and that using them for oak and pine restoration represents a loss of timber production from those stands. At the same time, the plantations have low wildlife value, are pest prone, and many are already primed for oak restoration. We appreciate the Agency considering all relevant factors and choosing the option with the greatest overall forest health and social benefits.

We do not see how any of the other suggestions have been incorporated. Nor can we find where the specific points have been addressed in the EA, specialist reports, or Summary of Scoping Report. Targeting stands with an “adequate population of competitive oak seedlings” to establish young oak forests does nothing to “create a more balanced and resilient age-class distribution.”<sup>317</sup> The young oaks already exist, so the distribution of oak ages would not change. Age diversity should be created within stands, by enhancing regeneration, rather than by seeking to producing artificial even-aged stands. The least healthy rather than the healthiest stands should be harvested to produce young forest.

Clearcuts from decades past often dramatically decreased the proportion of oaks in the stand. We are pleased to see efforts to counteract that effect by selectively removing competition from oaks that have survived. While many of the competitors will be tuliptrees, white pines, and red maples, common species that have increased their abundance on many landscape positions, these stands will also include less common species, such as black cherry, cucumbertree, and sassafras. If these species are removed along with other competitors, there is a significant risk of greatly reducing the diversity and wildlife resources in these stands. Additionally, if the goal is to give oaks a competitive advantage, simply slashing down adjacent trees accomplishes that goal well. There is no need for herbicide.

Healthier stands should result from conducting initial prescribed burns in the dormant season followed by later prescribed burns in the growing season, as the Foothills Project commits to. Dormant season burns should place less stress on existing oaks and other fire tolerant species, while the growing season burns will better match natural fire seasons, thus promoting biotic integrity. One exception to these benefits may be in oak and pine restoration where the goal is to perpetuate existing desirable understory composition. Growing season burning tends to favor grasses over woody plants, so the results may be less favorable than dormant season burning.

The major rationale presented for the need to thin oak forests is perplexing. The case that oaks are actually experiencing elevated rates of decline is never clearly made. Instead, oak decline risk factors are discussed without ever quantifying or otherwise estimating how much decline would actually occur if the situation were left unchecked. The Forest Plan notes that “many of the older forests are already experiencing oak decline.”<sup>318</sup> How can “many” of our forests have experienced this ostensibly major threat for 15 years—which presumably would

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<sup>317</sup> Draft EA, 50.

<sup>318</sup> Forest Plan, 3-122.

have only gotten worse as the forests have aged and experienced an intense drought—and we still have canopies that are too dense and lacking canopy gaps? Where is the decline? Problems with oaks are confined to regeneration problems, and should be addressed by altering understory conditions and allowing natural processes to gradually open overstories.

If invasive pests like gypsy moth are a genuine concern in the Foothills, why does the project not address other invasive pests and diseases, including sudden oak death, thousand canker disease, Japanese lantern fly, and Asian long-horned beetle? Early detection and rapid response are the most effective ways to address invasive species. Why does the Foothills Project not propose any monitoring steps or outline how infestations would be responded to? The Agency could promote gypsy moth awareness similar to how it promotes fire safety, with signs in the forest, informational videos, and frequent social media postings. The focus on silvicultural solutions is a strategically poor choice.

Neither the EA nor the Vegetation Report cites any scientific literature to establish that gypsy moth is even a threat in the Foothills, or Georgia more generally. Gypsy moth is discussed in terms of “risk,” but that risk is never quantified. There are no estimates of how many trees would be lost, or how effective silviculture could be. The Foothills Project refers to the Forest Plan, a 15-year-old summary, to say that gypsy moth populations are increasing regionally, but provides no actual current data on populations.<sup>319</sup>

EDDMaps, which stores reports of invasive species, shows no gypsy moth infestations south of North Carolina, and the limited occurrences in North Carolina are largely confined to the northern part of the state. Scientific articles on gypsy moth’s range in North America focus on the potential for the pest to spread north, not south. Climate change will only make the Foothills less suitable for gypsy moth as the landscape warms. Of the five known introductions of gypsy moth in Georgia, none successfully established. All of them died out, either with control measures that fail farther north or with no control at all. Spring temperature cycles in Georgia are not suitable for gypsy moth development. Gypsy moth is not a threat in Georgia. Gypsy moth does not justify thinning oak forests in the foothills.

#### G. Concerns about the Experimental Expanding Gap Treatment

Improvement comes through new approaches, so we support the Agency’s continued exploration of different ways to restore forests. Partnering with the Southern Research Station on new treatments ensures high quality feedback and maximizes the chance of future success. In particular, regenerating oaks and pines without prescribed fire is a challenge, and we are pleased that the agency continues to prioritize that goal.

In our scoping response, we pointed to the expanding gaps as an example of this positive approach. At the same time, we highlighted the need for caution and identified some specific issues that could lead to the treatment not producing the desired outcomes. The response to

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<sup>319</sup> Vegetation Report, 28.



scoping says these concerns were addressed by “clarifying how fire will be used first throughout the landscape.”<sup>320</sup> That reply is perplexing since expanding gaps is proposed for areas where fire is not an available tool. The modification does nothing to address the experimental nature of the treatment, nor does it address the specific points we raised.

The inconsistency of regeneration from gap-based silviculture<sup>321</sup> and the potential to promote undesired species over SYP continue to create concerns. Research has found that factors not accounted for in silvicultural prescriptions, ranging from gap shape to herbivory, can lead to unintended results in gap-based treatments. Thinning around gaps will release species like white pine and red maple. Even if treated with herbicides, white pine and Virginia pine would likely recolonize and dominate regeneration, as they have following thinning in the East Nottley Project. The Foothills Project recognizes this risk in the productive oak forest treatment, and plans the treatment so that “large gaps in canopy are not created, preventing the rapid establishment of shade-intolerant species like yellow poplar from invading and dominating the understory.”<sup>322</sup>

The experimental nature of expanding gap treatments on this forest is emphasized by “being proposed in collaboration with the [Southern Research station].”<sup>323</sup> At 14,600 acres, the agency proposes to complete more of this treatment than it has treated in any project on the Chattahoochee in over a decade. That scale is not appropriate for an experimental treatment. This approach is also a missed opportunity, in that all the restoration eggs are put in one basket. Since the agency doesn’t have a proven way to regenerate oaks without fire, it should experiment with multiple approaches. The decisions matrix identifies the fundamental issue as “Mid-story competitors are suppressing oak seedling development (seedlings small & non-competitive),” which makes mastication a possibility for meeting restoration needs.<sup>324</sup> Expanding gaps should be attempted on a limited basis along with other treatments that have the potential to regenerate oak.

#### H. Recommendations for the Canopy Gap Treatments

We are always pleased to see management activities based on the natural disturbance regimes that our forests and streams are adapted to. For that reason, we are pleased to see that the sizes of the gaps in the canopy gap treatment have been changed to better match the size of gaps produced by wind disturbances in this ecosystem. In the long term, this approach should better support biodiversity and fits with the Foothills Project goal of restoring biotic integrity.

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<sup>320</sup> Scoping Summary Report, 3.

<sup>321</sup> Kern, C.C., Burton, J.I., Raymond, P., D'Amato, A.W., Keeton, W.S., Royo, A.A., Walters, M.B., Webster, C.R. and Willis, J.L., 2017. Challenges facing gap-based silviculture and possible solutions for mesic northern forests in North America. *Forestry: An International Journal of Forest Research*, 90(1), pp.4-17.

<sup>322</sup> Draft EA, 49

<sup>323</sup> Draft EA, 50

<sup>324</sup> Draft EA, AP55

It is difficult to understand how the thinning between the gaps would contribute to biotic integrity or other Foothills Project goals. Mesic forests are by their nature closed-canopied, and the Vegetation Report notes “[b]ecause of their sheltered sites, large scale disturbances are uncommon in cove stands.”<sup>325</sup> Hurricane Irma, the most intense gap-forming disturbance of recent years on the CONF, did not open stands to the extent proposed in the canopy gap treatment. What a gap would even mean in the context of surrounding thinning is unclear. A gap is an opening in a closed canopy. Without that closed canopy there is no gap; one opening simply merges with adjacent openings to produce a more open stand. Thinning is not compatible with canopy gaps in the same stand.

Thinning mesic forests, in addition to creating gaps, could have multiple negative consequences. Thinning to the extent proposed would allow tuliptree and white pine to dominate the regeneration. Limiting harvests to gaps would still regenerate those species, but the lower light levels would allow basswood, hickories, and other species to also regenerate. The productive oak forest treatment recognizes this risk and “large gaps in canopy are not created, preventing the rapid establishment of shade-intolerant species like yellow poplar from invading and dominating the understory.”<sup>326</sup> Gaps alone would promote biodiversity more than gaps with thinning.

Thinning would also dry the forest floor by increasing light penetration. Mesic forests are home to most of our amphibians, and the Draft EA notes “[a]mphibians may be most at risk [to climate change], due to dependencies on moisture and cool temperatures that could be altered.”<sup>327</sup> Wildlife should not be put at risk by thinning.

If the canopy gap treatment includes thinning, it would not contribute to Forest Plan goals. Objective 7.1 requires “canopy gaps within *closed-canopied* mid- and late-successional mesic deciduous forest,” but the Foothills Project proposes creating canopy gaps in open-canopied forest (emphasis added). The treatment could easily be altered so that it would contribute to plan goals by removing the thinning component and proceeding with only the canopy gaps.

Why so many acres of the canopy gap treatment are needed is also difficult to understand based on the information provided in the EA and specialist reports. Canopy gap formation increases as forests age, and emerald ash borer is currently creating canopy gaps in mesic deciduous forests throughout the Foothills. “Declining songbirds” are supposed to be the beneficiaries of the canopy gaps, but which songbirds those are is never specified. Grouse, not a songbird, appears in the decision matrix, and “populations are stable on the CONF including the Foothills Landscape (R8 bird database, accessed 6/24/18)”<sup>328</sup> for hooded warbler, the mesic

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<sup>325</sup> Vegetation Report, 22

<sup>326</sup> Draft EA, 49

<sup>327</sup> Draft EA, 44

<sup>328</sup> Terrestrial Wildlife Resources Report, 28

deciduous forest management indicator species. Theoretically the treatment would benefit the birds by “improving the structural complexity,” but most mesic forests in the Foothills already have well developed understories and midstories.<sup>329</sup> Finally, “Over the past 10 years, the Foothills Project area has not seen any of the proposed canopy gap treatments implemented,” and we are unaware of any earlier implementation of this treatment. As such, it should be considered experimental and limited in extent.<sup>330</sup>

The canopy gap goal for the entire Chattahoochee is 10,800 acres, so placing 8,100 acres in the Foothills is not at all proportional. If mesic deciduous forests were disproportionately abundant in the Foothills, the uneven distribution of treatment might be justifiable, but the opposite is in fact the case. The Foothills Project deliberately leaves out the higher, cooler, moister parts of the Chattahoochee where mesic forests are more abundant. Application of this treatment in the Foothills should be reduced.

#### I. Recommendations for the Hemlock Treatments

Hemlocks have some of the most severe problems of any tree species in the Foothills. Not only do they have problems with regeneration, but mature trees are also undergoing rapid decline. Hemlocks have no congeners in the landscape and fill a unique ecological role. Those issues justify the Foothills Project’s focus on hemlocks and ongoing efforts to find ways to protect them from hemlock woolly adelgid.

Even though hemlocks are a worthy cause, potential treatments still need to be critically examined. In our scoping comments, we pointed out that real world situations that approximate the effects of the proposed silvicultural treatments are not ultimately effective. Those issues were not addressed in the Summary of Scoping Report, Draft EA, or Vegetation Report.

Instead, the EA insists “SRS research that indicates a benefit to hemlocks using silvicultural practices” and the Vegetation Report claims silviculture treatments would “minimize mortality” of hemlocks.<sup>331,332</sup> The source of these statements seems to be an SRS study of hemlock woolly adelgid populations and hemlock energy availability under different light levels. While it is tempting to conclude from that study that intervention to increase light levels on hemlocks would help them in the field, this study is not sufficient to warrant that conclusion.

Even though silviculture would increase light levels as was done in the study, multiple factors are likely to prevent study results from transferring to the field. First, hemlocks in the field receive additional adelgids from surrounding trees while the seedlings in the study were infested only once. Second, the study used fertilized, regularly watered, potted seedlings, so they

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<sup>329</sup> Vegetation Report, 23

<sup>330</sup> Vegetation Report, 52.

<sup>331</sup> Draft EA, 54.

<sup>332</sup> Vegetation Report, 55.

did not have to contend with the below-ground competition or drought stress experienced by trees in the wild. Third, the study ran for only 14 months, so adelgid populations on high-light seedlings may simply have grown slower rather than having a lower maximum. The ultimate test is still what happens in the field under high-light conditions, and trees growing along the Chattooga River, the tops of overstory trees, and yard trees all indicate that hemlocks in high-light conditions eventually succumb to the adelgid.

These treatments are experimental, and should be tried on a limited basis, not on the 7,275 acres of Foothills hemlock forest identified in the Vegetation Report.<sup>333</sup> The treatments should only be used in conjunction with other factors that aid in hemlock survival, such as the presence of predator beetles, since high-light levels are not sufficient to save hemlocks under real world conditions. Thinning around hemlocks needs to be specifically described. Currently, the EA just lists “overstory and midstory thinning, expanding gap, or midstory treatments” and does not narrow the locations beyond forests with hemlocks.<sup>334</sup> Forests around hemlocks are generally healthy, and they should not be sacrificed for no reason. One reason hemlocks are valuable is they shade streams and keep stream temperatures cool. This treatment would raise stream temperatures even if hemlocks recover.

#### J. Concerns Regarding the Woodland Treatments

There is broad agreement on what woodlands are, how they are structured, and what disturbances maintain them. What has made woodland restoration difficult is the lack of reference conditions. Woodlands in the Blue Ridge are not declining; they have declined. Without extant woodlands, knowing when restoration has been achieved and knowing how to recognize sites in need of restoration are difficult.

The Foothills Project put some appropriate general parameters on where woodland restoration would occur: “In general, these would include upper slopes and ridge tops, south and west aspects, and often lower elevations.”<sup>335</sup> The Draft EA also contains a generally good list of woodland associates. The trouble comes in the decision matrix with the attempt to use these species to determine where to implement woodland restoration. While they are easily confused, there is a difference between species that are typical woodland species (woodland associates) and species that are effective indicators of woodland. The confusion comes from the fact that some species may be common in woodlands, but also common in other habitats. These species may be desirable in restored woodlands, but also function poorly as indicators of where to restore woodlands.

To see the distinction, suppose plants that occur in other habitats did not detract from their ability to indicate woodlands. If that were the case, then plants in general would be perfect

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<sup>333</sup> Vegetation Report, 55.

<sup>334</sup> Draft EA, 54.

<sup>335</sup> Draft EA, 25.

woodland indicators because plants occur in every single woodland. Of course, we cannot simply use plants as indicators of woodlands *because they also occur in other habitats*. We must identify plants that occur in woodlands but are otherwise scarce.

As indicated in the EA, some SYP are certainly woodland associates, but historical photographs that pre-date fire suppression show them growing in stands denser than what is described in the woodland restoration treatment. They may need more open conditions than are prevalent today, but that does not mean they need stands as open as woodlands. In contrast, post oak and blackjack oak have difficulty even persisting in forested conditions in the Foothills and are generally associated with permanent openings, such as roadsides. They appear to be rare outside of woodlands and are known woodland dominants in other regions, making them good woodland indicators.

The shrub woodland associates are a similar mix of good woodland indicators and more generalist species. Of particular note, mountain-laurel is noted as one of the primary species filling in oak and pine understories in the wake of fire suppression. It flowers and proliferates under closed canopies, so it is clearly not a woodland indicator. The shrub is not even a woodland associate, as repeated fires, the conditions that maintain woodlands, can eliminate mountain laurel. Bear huckleberry also fruits abundantly and readily dominates underneath closed canopies, and is thus not a good woodland indicator.

*Coreopsis major* is common in forest understories, but we have observed var. *major* only in more open settings at sites with other woodland indicators. Other herbaceous species that are not currently included in the list but that may prove good woodland indicators include arrowfeather (*Aristida purpurascens*), rattlesnake-master (*Eryngium yuccifolium*), eastern false-aloe (*Manfreda virginica*), wild quinine (*Parthenium integrifolium*), and *Tephrosia spicata*. Beyond individual species, diversity of certain groups may indicate past open conditions, notably blazing stars (*Liatris* spp.) and grasses. We would welcome a more thorough discussion of all the species being considered for use as woodland indicators.

#### K. Old-growth Concerns

Old-growth forests have great biological, scientific, and social value. The CONF has a good track record of protecting old-growth when the stands have been recognized. We are pleased to see that strong tradition continue by designating many known old-growth stands in the Foothills for old-growth management. These stands and ones like them are the best possible stands to designate because they by definition are in the desired condition. The Foothills Project is also well-designed in that it does not assume all old-growth is known pre-implementation, and any stand meeting age criteria “would be assessed prior to implementation of project activities within these areas to determine if they meet the other defining criteria for old growth conservation (FWS – 046). If so, these areas would be conserved for old growth.”<sup>336</sup> We do have concerns about whether the agency’s corporate stand layer properly captures old growth,

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<sup>336</sup> Vegetation Report, 12.

and whether that condition might exist outside areas the agency has identified, but generally this is a positive step.

To have a fully sound old-growth management plan for the Foothills, the agency should designate for old-growth management the old-growth stands identified in the Agency's old-growth survey of the Chattooga River Watershed.<sup>337</sup> These stands have the same significant attributes as the other stands being designated as part of this project, and their conditions were vetted by field research.

#### L. Concerns Related to Wildlife Openings

The Foothills Project proposes to expand the existing 275 acres of wildlife openings in the foothills area by 1,400 acres. The wildlife openings (food plots) that exist on the CONF both in the Foothills and elsewhere are nonproductive and provide very little if any benefit to wildlife. The agency did not acquire fertile farm land when the CONF was established but rather steep and rocky forest land ill-suited for cultivation. What areas had been farmed had been abandoned as a result of their unsuitability prior to Forest Service acquisition. The agency acknowledged problems with the food plots on agency land, mostly managed by the GA DNR, in 2000 when they proposed to apply herbicide to the existing vegetation and start over in an attempt to create a more nutritious clover mix rather than the fescue cover that existed. Twenty years later, the food plots, if tended at all, remain predominately low value fescue. A major problem with food plots is that when cleared initially the clearing was done with bulldozers and most of the topsoil was bladed off with the stumps. This can be seen when looking at the mounds of soil on the perimeter of the openings. Neither the agency nor the DNR has the manpower to properly maintain the many small scattered food plots. Given this record of failure, it makes no biologic or economic sense to expand the size or number of the openings.

Wildlife openings also cause a number of detrimental effects. They require heavy and repeated applications of herbicide to maintain because they are artificial systems not suited to the landscape. Due to the ephemeral and random nature of early successional habitat, species associated with that habitat are good dispersers capable of reaching isolated habitat, so wildlife openings do not meaningfully contribute to connectivity. Indeed, they also require maintenance of access roads to maintain them, which fragments the landscape and contributes to sedimentation problems. Food plots also focus management on a single species, white tailed deer, rather than entire ecosystems.<sup>338</sup> Autumn olive infests many existing openings and has spread into and degraded surrounding ecosystems. Success with past openings should be demonstrated before any new ones are created.

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<sup>337</sup> Carlson, P.J., 1995. An assessment of the old-growth forest resource on National Forest System lands in the Chattooga River watershed. *Report to the United States Department of Agriculture, Forest Service, Region, 8.*

<sup>338</sup> Draft EA, 102.



This food plot on Flat Top Mountain shows the poor condition of many existing wildlife openings. The opening provides only low-quality habitat and is an ongoing sediment source.

#### M. Recommendations for Young Forest Creation

Many species depend on early successional habitat (“ESH”) and some of those species have experienced severe population declines over the past few decades. Those species can best be helped by restoring the forces that historically would have disturbed forests and created ESH, most notably fire and beavers. Restoration of those forces ensures habitat that species are best adapted to is created in appropriate locations. We also recognize that some forest users desire additional ESH, and that the Forest Service will meet those desires with timber harvests. In those situations, the greatest value to wildlife comes from cutting stands that currently provide little benefit. The 1,700 acres of pine proposed for pine and oak restoration are good examples because they currently have low species and structure diversity and provide little in terms of wildlife resources. In general, value can be maximized by avoiding more diverse and older forests.

The plans for creating ESH in mesic hardwood stands include reserving oaks and hickories. Those generally are appropriate to reserve, although they are common across large parts of the landscape.

There are many mesic site species that occur only in mesic areas, and to maintain diversity in mesic stands their regeneration needs should be considered too. Some mesic site species, such as tuliptree, white pine, and black birch, will regenerate readily after an intense

harvest, and do not need additional accommodation. Others will not compete as effectively in large openings and should be targeted for retention, such as basswood, silverbell, yellow buckeye and less common species including persimmon and American elm.

Small diameter stems should also be retained after regeneration harvest in mesic stands. Fire suppression in uplands has increased understory density, but on mesic sites understories are naturally dense. Mesic systems work by having an abundance of stems in the understory that then accelerate growth after a disturbance to ascend to the canopy. Removing them would be disrupting natural process and run counter to the goals of biotic integrity.

These mesic site issues could largely be avoided by choosing old-field stands, which are typically low diversity, structurally simple, and dominated by tuliptree or white pine. In response to this suggestion in our scoping comments, the agency stated that that would not meet requirements to create a diversity of ESH.<sup>339</sup> However, targeting old fields would still produce ESH in mesic habitats, and the FLP does not consider ESH in all forests. Instead, “regeneration treatments would be limited to yellow poplar dominated stands or stands dominated by other non-oak cove hardwood associates.”<sup>340</sup> What we are suggesting would not reduce ESH diversity in any way that is not already planned. Instead, it would focus the treatments on areas where the biodiversity gain would be the greatest and losses of existing habitat quality would be minimized.

The particular goal for young forest creation in the Foothills, 10,500 acres, in part reflects the caps put on ESH by different management prescriptions. ESH created by timber harvests and existing ESH combined must not exceed what is permitted by the management prescriptions. However, the Foothills Project underestimates existing ESH because it focuses solely on ESH created by timber harvests and ignores ESH from prescribed fires and natural disturbances, most notably in the Hickory Ridge Burn Unit.

Plans for creating new ESH should also account for reasonably foreseeable future ESH. Prescribed fires are known to produce ESH, and the Project proposes more than doubling the acreage of prescribed burns in the Foothills. The Forest Service rightfully took this anticipated ESH into account in the Upper Warwoman Project. The Foothills Project also discusses at length the threats posed to a large portion of the Foothills by southern pine beetle, wildfire, oak decline, and gypsy moth. While we question whether some of these are really a threat to Foothills forests, if the agency is sincerely concerned about them, they should be included in ESH estimates, particularly since even if the Foothills Project is implemented on the maximum possible acres and 100% effective, the Project would not treat the entire landscape. The risks from these issues should be quantified and the anticipated ESH subtracted from the timber harvest ESH acres.

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<sup>339</sup> Scoping Summary Report, 13.

<sup>340</sup> Vegetation Report, 12.



## N. Recommendations on Approaches to Rare Communities

The attention paid to rare and unusual communities is heartening to see. Rare communities play a disproportionate role in maintaining landscape scale biodiversity. We also appreciate the effort put into once common species such as the proposed chestnut orchard. The location of the chestnut orchard still needs to be disclosed so that the public can assess important impacts, such as whether the orchard might introduce the pathogen *Phytophthora cinnamomi* into previously uninfected parts of the forest.

The focus on mountain bogs is well deserved, and we are particularly pleased to see discussed the potential of restoring altered hydrology. Physical conditions are one of the fundamental determinants of what ecosystem occupies a site, so restoring hydrology is essential to restoring bog ecosystems. This restoration also fits with the biotic integrity model of restoring natural processes.

We also support experimental thinning around Small whorled pogonia because the species has continued to decline and there is anecdotal evidence of increased light bolstering populations. As indicated in the Draft EA, monitoring the results of these experiments will be critical. However, it is not appropriate to experiment on all populations as the effects of these treatments are not confirmed, and they could still be detrimental. We suggest starting with small or non-flowering populations rather than relatively healthy populations. Using “prescribed fire to reduce the canopy and midstory” over small whorled pogonia raises concerns because opening the canopy implies an intense fire.<sup>341</sup> Small whorled pogonia typically occupies mesic sites where fires would naturally be rare and of low intensity. Additionally, while soil is effective at insulating against low-intensity fires, hot fires could still damage small whorled pogonia. Non-commercial mechanical treatments would be more appropriate and less risky for small whorled pogonia management.

Green salamander needs additional protections based on their habitat preferences and the way proposed activities would impact their habitat. Green salamanders are not restricted to the vicinity of cliffs, the habitat targeted by the Project Design Features. They can also occupy boulders as small as a car if appropriate crevices are available, which is where they were recently found in the South Side Project just over the state line in North Carolina. Edge effects, such as those produced by logging, can penetrate into adjacent forest well beyond the proposed buffer of 200 feet.<sup>342</sup> Without more, a buffering approach is likely not sufficient here but at a minimum, within the known range of green salamander, both cliffs and large boulders should receive a no-harvest buffer of at least three times the canopy height.

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<sup>341</sup> Draft EA, 55.

<sup>342</sup> Laurance, W.F., 1991. Edge effects in tropical forest fragments: application of a model for the design of nature reserves. *Biological conservation*, 57(2), pp.205-219.

## V. More Disclosure is Needed Before Making Changes to the Recreation System

Managing recreation in the Foothills is difficult. Demand for popular sites often exceeds the capacity of infrastructure, and is expected to grow further. Resources for addressing maintenance needs are inadequate. Design flaws in trails and facilities produce additional problems. These issues create a challenging situation to create a sustainable trail system while meeting user desires. We appreciate the agency's efforts to increase sustainability, minimize resource damage, and consider user desires.

Of the potential changes to the system specifically discussed in the Draft EA, several are positive and contribute to these goals. Additional parking is needed at Bear Creek for user safety and to meet demand at Stonewall/White twister. Severely eroding sections of trail at Oakey Mountain are beyond what can be addressed with maintenance, and rerouting the trail is the only viable option to protect soil water and quality while maintaining recreation opportunities. Collaborative work along the Chattooga River to provide sustainably located trails that meet user needs will help protect a unique resource.

Other planning suffers from a lack of consideration of specific sites. The scenic value of any specific landscape must be decided on a case-by-case basis in order to more fully evaluate all the factors that contribute to an area's perceived beauty or lack thereof. Views from within the designated area should be considered as should views of the area from other vantage points such as roadside overlooks or natural vistas. We feel strongly that this proposed simplistic approach to establishing scenic value cannot be applied to the entire project area and that public input for each proposed treatment area is essential.<sup>343</sup> The Scenic Integrity Objectives and Recreational Opportunity Spectrum are similarly general and not sufficient for evaluating local impacts.

It is not fair to Forest users to casually dismiss impacts as only lasting for "one to two growing seasons"<sup>344</sup> or base decisions on unfounded and unprovable claims, such as "the long-term benefits of managing a healthy forest far outweigh the short-term inconveniences of having to move to another location."<sup>345</sup> Sites on the CONF have had raw and eroding "temporary" roads five years post-harvest, and blackberries cover multiple sites seven years after implementation, which create more than just a visual problem. These impacts are deeply upsetting to some users, including some of those who have worked hard to help the agency maintain and improve trails. Impacts to users need to be evaluated with more realistic assumptions for both the timeline and how treatments will impact trail health.

The no-harvest zone between the regeneration harvest unit and any roads with scenic integrity objective of high is a good example of the kind of protections that visitor experience

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<sup>343</sup> Scenery and Recreation Resources Report, 3-9

<sup>344</sup> Draft EA, 106

<sup>345</sup> Draft EA, 107

should be given.<sup>346</sup> Surely trails should receive greater consideration since they exist primarily for scenery access. The 150' campground and 25' trail buffers are insufficient, and in most cases visitor experiences would be severely impacted by treatments so close to recreational facilities.

## **VI. Recommendations for Prescribed Fires**

### **A. Fire Frequency in the Southern Appalachians**

Fire chronology reconstructions from dated fire scars on trees form the bedrock of our understanding of fire frequency in the Southern Appalachians. They are the only annual records of fires prior to fire suppression, and they help guide prescribed fire frequency. Given the importance of these studies, understanding how they scale to the landscape is critical. To do that requires a brief detour into the theory of statistical sampling.

People use sampling when we can't measure or examine every single individual. Researchers select a sample to represent some larger group. In the case of fire chronologies, researchers don't have the resources to date the fire scars on every tree in every stand, so they choose particular stands to sample. The sample provides information only about the group it was drawn from. For instance, if a group of college students at an American university is randomly selected to be surveyed about their spending habits, the survey results will not describe the spending habits of Americans in general. Instead, the results will describe the spending habits of students at that college, because only students at that college had a chance of being surveyed.

What stands have a chance of being included in a fire history reconstruction? Not all stands. Some stands cannot be sampled, because they include few or no trees that predate fire suppression. Other stands are dominated by species that do not produce durable fire scars. All sites are also not dominated by old trees of species that produce rot-resistant fire scars potential sites for fire history studies. Stands with few or no fire scars are not suitable for fire research studies. Hence, fire history reconstructions sample from only sites with many old fire-scarred trees, and describe the frequency of fire only in sites with many old, fire-scarred trees. Statisticians refer to this as sampling bias and data must be interpreted accordingly, acknowledging these limitations.

Consequently, describing fire on only those sites with many fire-scarred trees may miss a large proportion of the landscape. We are not aware of any studies that estimate what proportion of the Southern Appalachians has abundant fire scars, so we refer to our own observations. Over the past year, we have visited four stands that were never logged and contain pitch pine or Table Mountain pine, species that readily form and retain fire scars. We examined the bases of up to twelve pines in each of these stands for the presence of fire scars. One pine snag appeared to have a sealed-over fire scar. All other trees examined had smooth bases on the uphill side with no indication of past scarring. In a younger forest that included plants with prairie affinities, we

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<sup>346</sup> Draft EA, 79.

encountered one old pine stump with fire scars. We also were told about a dendrochronologist researching in Great Smoky Mountains National Park who rejected the first and second sites he was shown, because they had zero and three fire scars, respectively. The third site had many fire scars and was used for the study. While these observations represent a small sample, they show that sites with few or no fire scars are common in the southern Appalachians, and sites with many fire scars do not represent the entire landscape.

Sites with many fire scars likely experienced more fire than sites with few fire scars. Hence, sites with relatively low fire frequency have little chance of being reported in scientific journals, but sites with relatively high fire frequency can easily be included. This situation biases the dendrochronology literature towards reports of higher fire frequency.

Dendrochronological studies cover the period of European settlement and some extend into the last stages of Native American occupancy, but say nothing about the period before human settlement when lightning strike fires controlled the fire regime. This earlier period is relevant, because most species in the region evolved in and are adapted to the disturbance regimes of this period. The Chattahoochee-Oconee National Forest recorded 142 lightning strike fires from 1970-1999.<sup>347</sup> Similarly, 39 lightning strike fires were reported from 1993 to 2009 on the Grandfather Ranger District of the Pisgah National Forest<sup>348</sup>, and 138 were reported from Great Smoky Mountains National Park from 1940 to 2006.<sup>349</sup> These figures range from one lightning strike per year per 83,692 acres to one lightning strike per year per 253,642 acres. Cohen and others also report that 10 fires that were not suppressed averaged 195 acres, though those fires did not overlap with any extreme drought. These figures suggest most Southern Appalachian species evolved with less frequent fire than what is currently being prescribed.

The bias towards frequent fire in the dendrochronology literature and the paucity of lightning strike fires lead us to question whether 3-7 year return intervals should be the default and whether they should be applied to most burn units.

#### B. Burning Too Frequently May Cause Damage

At the 2016 Southern Blue Ridge Fire Learning Network Meeting, students from Duke presented their preliminary findings from their review of hundreds of scientific articles that reported the effects of prescribed fire and timber harvests on various groups of wildlife. They found complex results with both positive and negative outcomes that varied with type of animal, forest type, and intensity of treatment. They also pointed out that an issue with the analysis was most of the fire studies only involved one or two treatments. We have often been told when

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<sup>347</sup> USDA Forest Service. 2004. Final environmental impact statement for the land and resource management plan revision. *Chattahoochee Oconee National Forest*, Gainesville, GA

<sup>348</sup> Denman, Michael. 2016. Broad-scale weather configurations and lightning-ignited fires on the Grandfather Ranger District. *Southern Blue Ridge Fire Learning Network Workshop 11*, May 19<sup>th</sup>, Johnson City, TN

<sup>349</sup> Cohen, Dena, Bob Dellinger, Rob Klein, and Beth Buchanan. 2007. Patterns in lightning-caused fires in Great Smoky Mountains National Park. *Fire Ecology* 3(2):68-82

reviewing a project involving prescribed burning that we should not expect immediate results and that success may only be achieved gradually with repeated burns. We agree that restoration will not be achieved with a single burn.

However, negative effects may be similarly slow to manifest. Indeed, we shouldn't expect to see them after one or two burns. Fire is a natural part of ecosystems in the Southern Appalachians, so species on sub-mesic to dry sites have evolved with fire. The first prescribed burn is nothing new to these species. If they could not tolerate a single burn they likely would not have survived in this landscape. As described above, though, subsequent burns may represent conditions these species have not adapted to.

Since very few studies have examined the effects of several applications of prescribed fire, we must look at the processes that may affect species with repeated burns. Monitoring across the Southern Appalachians indicates the first few burns reduce the duff layer. Prescribed burns also consume inputs to the duff layer, so this trend in duff layer reduction will likely continue with burns at frequent intervals. That change in habitat may impact the soil food web and cause the loss of site-level diversity. The duff layer enhances germination and seedling establishment of many plant species, and along with the upper A horizon, contains high microbial diversity and mycorrhizal networks that are critical for forest health. Additionally, many invertebrates and small vertebrates live in the litter/duff layers. These organisms play a critical role in forest ecosystems. Salamanders, for instance, have higher total mass than any other vertebrate group, and form a critical link in food webs.

Duff loss may also gradually expose mineral soil and lead to erosion and degradation of soil quality. That erosion threatens adjacent aquatic habitats. Organic matter greatly increases soil fertility by promoting retention and availability of both water and nutrients. The duff layer is a large repository of soil organic matter and an important source of organic matter for lower soil horizons. Thus, repeated, frequent fires are likely to reduce soil organic matter derived from leaf litter and woody sources, and gradual dry and impoverish soils leading to overall reductions in forest productivity.

Diversity may also be lost due to competitive exclusion. Conditions that are especially favorable for one or a few species may allow those species to thrive to such an extent that space and resources are not available to other species. Over time, those other species may be out-competed and eventually lost from the site. The most fire-adapted species, perhaps those that resprout the fastest or seed the most prolifically, gain a cumulative advantage after each fire. Over time these species may gradually displace other species through competition and ultimately reduce site diversity.

### C. A Greater Diversity of Fire Regimes May Promote Greater Diversity

Given the research on pre-settlement fire frequency and the potential harm from burning too often, we suggest a reallocation of prescribed fire resources. Instead of burning a few sites at or above the high-end pre-settlement fire frequency, use a wide variety of burn regimes on many

sites. Under this plan, most sites would be burned at low frequency, perhaps 20 to 50 year return interval. A few sites would still be burned very frequently (3-7 years). Remaining resources would be dedicated to burning sites at intermediate frequencies. This system would result in roughly the same acreage being burned each year, but a much larger proportion of the landscape being included in burn units. Critically, it would also produce the full natural range of variation of fire frequencies.

Please note, we are not suggesting that high frequency prescribed fire be eliminated. Having some areas burn frequently adds to landscape scale diversity and produces habitat for species that area dependent on frequent fire. Other considerations, such as managing the wildland-urban interface, may also dictate more frequent fire at particular sites. Rather, we are suggesting that high frequency fire should not be the default. We want to promote a landscape that can support all species, not only those that are adapted to no fire or frequent fire.

Burning a greater area may be essential to preserving future management options. Nowaki and Abrams<sup>350</sup> argue that a lack of fire promotes mesophytic species that suppress future fire. Further, they argue this feedback creates a ratcheting effect. The longer an area goes without fire the harder it becomes to burn and the more difficult any future restoration with fire becomes. Hence, focusing prescribed fire resources on a few areas may preclude future restoration on much larger swaths of the landscape.

#### D. Other Implementation Considerations

The lightning fire season in the Southern Appalachians is primarily April through September.<sup>351,352</sup> Hence, fires during these periods best match the natural range of variation and are most likely to have beneficial effects. We encourage the Forest to burn during this period possibly. We understand that later in the summer can be logistically difficult for burning, especially in terms of finding days when fire will actually carry and have good smoke dispersal. We would appreciate the Forest actively looking for chances to burn during this window and taking advantage of opportunities when they arise.

We know that fire managers across the Chattahoochee-Oconee National Forest recognize the value of producing a burn mosaic. However, many of the prescribed burns we have observed show generally continuous and often fairly uniform fire effects. We also note that modern prescribed fires use vastly more ignition points than lightning strike fires or Native American fires. We wonder if greater heterogeneity could be introduced into burns by strategically reducing the number of ignition points, especially for hand ignitions. The burns we have seen

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<sup>350</sup> Nowacki, Gregory J. and Marc D. Abrams. 2008. The demise of fire and the “mesophication” of forests in the eastern United States. *Bioscience*. 58(2):123-138

<sup>351</sup> Cohen, Dena, Bob Dellinger, Rob Klein, and Beth Buchanan. 2007. Patterns in lightning-caused fires in Great Smoky Mountains National Park. *Fire Ecology* 3(2):68-82

<sup>352</sup> Denman, Michael. 2016. Broad-scale weather configurations and lightning-ignited fires on the Grandfather Ranger District. *Southern Blue Ridge Fire Learning Network Workshop 11*, May 19<sup>th</sup>, Johnson City, TN

involved lighting nearly continuous parallel strips, dots of fire only a few feet apart, along both sides of ridges. Could interior ridges be lit by placing dots of fire further apart? Could interior ridges be lit on only the south or west upper slopes rather than the upper slopes on both sides? Are there other opportunities for using fewer ignitions? As far as we can tell, these ignition patterns would not make the burn take longer or produce significantly more smoke. They would allow more opportunities for fire shadows, such as downwind of a log, and more areas of locally intensification where two lines of fire meet. Overall, we believe this ignition pattern would increase heterogeneity of burn intensity, provide refuge habitat for ground-dwelling organisms during the burn, and produce a greater diversity of habitat for more species post-burn.

#### E. Conclusions

Species are not adapted just to fire or a lack of fire, but to specific fire regimes characterized by the frequency, intensity, size, and seasonality of fire. Examining the scientific literature indicates most of the Foothills is managed under fairly extreme fire regimes in terms of frequency, either high or low. We suggest that diversifying fire frequency would produce habitat for a wider range of species. Which areas receive which frequency would be determined by both ecological conditions and other considerations such as the need to protect adjacent property and structures. Habitat diversity could also be improved by taking advantage of growing season burning opportunities to the extent possible and limiting the number of ignitions in each burn unit.

### VII. **Concerns Regarding Impacts to Soils**

Impacts to soils are a primary cause of concern with the Foothills Project. Several of the issues we mention here are also mentioned in other contexts in this letter. Moreover, many issues appear repeatedly in the Soils Report. For simplicity's sake, we refer only to statements in the first 25 pages, but which also apply to later iterations of the same issues in the Soils Report. We request that the Soils Report be revised to include the minimum and maximum for numerical estimates.

The Soils Report states that “as this project is condition based and specific activity areas have not been identified the Foothills Project area will be used to ensure activities will not exceed the 15% threshold. Fifteen percent of the 157,625-acre Foothills Project area would be 23,644 acres.”<sup>353</sup> This approach is too broad and general, as under it an excessive amount of disturbance could occur in a concentrated area and greatly affect a watershed. We request that the SR be revised to specify that the 15% threshold for activities be set on a per watershed basis. We also request that the Foothills Project be constrained to not exceed the mechanical harvest extent, temporary road, skidding , and other assumptions shown on pages 22-23 of the Soils Report.

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<sup>353</sup> Soil Report, 2.

“[E]rosion tends to be concentrated on relatively small portions of the harvest area, making these locations critical in BMP implementation efforts to reduce overall erosion rates.”<sup>354</sup> We agree and appreciate all actions taken to carefully implement BMPs.

Soil indicators need to be considered in a quantitative fashion whenever possible. “To some degree, compaction would decrease with time as roots penetrate and break up the compacted area.”<sup>355</sup> For this statement to be meaningful, the Soils Report should be revised to quantify the natural decompaction process, including how long it takes to occur, the amount of decrease, which locations would experience natural release, and whether the soil returns to pre-activity compaction.

“T-Factor, which is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting soil quality and productivity over a sustained period,” is a useful tool for quantifying risk.<sup>356</sup> Assuming “[v]egetation typically recovers within 1-5 years re-establishing ground cover and begins to reduce erosion rates towards normal levels,”<sup>357</sup> and using the acres per T-Factor class shown in Table 5 of the Soils Report, if all disturbances occur in the same year, the maximum soil erosion from the Foothills Project would be 562,454 tons/yr for possibly more than 5 years. This worst case scenario shows that the Foothills Project has the potential to cause a great deal of erosion. We request that the Soils Report be revised to include calculations of the maximum soil mass that would be eroded per year, the percentage that would be delivered to aquatic resources, and the amount of time the erosion would take to return to a “Good” rating.

To protect soils and streams, this project should be revised to include erosion control measures for both severe and moderate erosion factor soils. Even “‘moderate’ indicates that some erosion is likely and that erosion control measures may be needed”; moderate soils comprise over half of the Foothills Project, and meaningfully protecting the landscape cannot be accomplished without properly accounting for them.

The Soils Report states that heavy equipment will not be used on slopes over 35%, so their tables only include soils on under-35% slopes to evaluate heavy equipment. Even with that limitation, 27,117 acres are shown as poor suitability in the Harvest Equipment Operability Rating (Soils Report, Table 7) and 14,700 acres are classified as “severe” rutting hazard (Soils Report, Table 8). We request that the Foothills Project be revised to exclude heavy equipment from soils with poor suitability for harvest equipment or soil with a severe rutting hazard.

The Soils Report addresses the potential for harvesting to deplete nutrients by noting that “[o]ver time, nutrient loss from stem removal is believed to be replaced by soil weathering and

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<sup>354</sup> Soil Report, 24.

<sup>355</sup> Soil Report, 5.

<sup>356</sup> Soil Report, 12.

<sup>357</sup> Soil Report, 13.



natural inputs” and “[m]aintaining the O and A horizons intact as much as possible would help to alleviate nutrient loss from timber harvesting (Hallett and Hornbeck, 1997).”<sup>358</sup> However, the reference cited was performed in the northeast to explore the effects of acid rain, and states:

The nutrient status of our sites indicates that they are susceptible to nutrient depletion and that mineral soils are not a major supply of plant-available nutrients. Most available nutrients are found in the O horizon and make up a high percentage of the total nutrient capital of the O horizon. Consequently, if O horizons were subjected to disturbance by logging or fire, it is likely that the available nutrients would be leached into mineral horizons or lost to volatilization or erosion.<sup>359</sup>

The cited Hallett and Hornbeck study also did not evaluate phosphorus, one of the most often limiting nutrients. We request that the soil report be revised to define the time period needed for soil weathering and the efficacy of natural inputs to provide pre-disturbance plant-available phosphorus, and to define the average and maximum short term and long term amount of O horizon soil that will be lost as a result of the Foothills Project. We also request that slash be distributed across stands after harvest since it represents a large nutrient pool and concentrating slash would effectively remove nutrients from most of the stand.

“Nitrogen is the most limiting nutrient to forest growth...”<sup>360</sup> We agree this is true for many undisturbed forests. However, as phosphorus is removed by repeated logging, phosphorus can become limiting. The Soils Report does not address phosphorus. We request that the Soils Report be revised to address phosphorus.

While climate change may have little impact on total annual precipitation in the Southern Appalachians, models predict rain events will become increasingly intense. Indeed, actual Forest Service data shows a trend of increasing rainfall intensity, and recent hurricane events in Texas and North Carolina show the potential extremes. This Forest has witnessed such events in the deluges experienced in December of 2015 that swept away parts of several roads on the Conasauga District, which took years to repair.

The lesson to be learned from these trends is “the less ground disturbance the better.” The project however proposes timber harvesting over tens of thousands of acres. Timber harvesting requires temporary roads, skid trails, log landings and heavy truck traffic. All of this ground disturbance leaves areas vulnerable to landslides and erosion in major rain events. As the exact areas to be harvested are not identified it is difficult to comment precisely as to the extent of this danger.

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<sup>358</sup> Soil Report, 24.

<sup>359</sup> Hallett, R.A. and Hornbeck, J.W. 1997. Foliar and soil nutrient relationships in red oak and white pine forests. *Canadian Journal of Forest Research*, 27(8):1233-1244.

<sup>360</sup> Soil Report, 28.

## VIII. The Project Threatens Aquatic Resources

Removing and/or replacing existing barriers to aquatic species passage represents a major improvement for aquatic habitats in the Foothills. We are pleased to see it considered across the Foothills.

To assess impacts on aquatic resources in a biologically meaningful way, we request that the Aquatic Resource Report be revised to evaluate impacts by the 6<sup>th</sup> level HUC. Confidence intervals should be provided for assumed parameters, so that the public can take into account the uncertainty in estimates.

The Aquatic Resource Report vaguely assumes that stream sediment as a result of the Foothills Project will quickly go away and therefore is not a concern. However, the sediment will settle somewhere downstream where velocities are reduced. The Swank, Vose, Elliott study cited in the Aquatic Resource Report found large increases in sediment yield at the Coweeta Hydrologic Station immediately after road construction due to two major storm events. “Subsequently, during logging, sediment yield from roads was greatly reduced and insignificant when logging activities were completed. In contrast, cumulative increases in sediment yield were observed downstream over the next 15 years which illustrate the lag between pulsed sediment inputs to a stream and the routing of sediments through a stream system.”<sup>361</sup> We request that the Aquatic Resource Report be revised with estimates of mass sediment release per year and the impact to response reaches.

The Aquatic Resource Report (pg 20) also assumes that timber removal would not be completed on steep slopes, but the Foothills Project does not commit to complete avoidance of steep slopes. Short segments of slopes exceeding 35% are permitted, and such slopes are abundant in the Foothills. It is also unclear to us if forms of logging other than ground-based logging are allowed on slopes exceeding 35%. We request that the Aquatic Resource Report be revised to include evaluation of steep slopes.

Understanding the impact of Foothills Project activities on aquatic resources requires understanding the impacts of roads because:

more sediment is contributed to streams from roads and road construction than any other land management activity. Roads directly alter natural sediment and hydrologic regimes by changing streamflow patterns and amounts, sediment loading, transport, deposition, channel morphology and stability, and water quality and riparian conditions within a watershed...Road-related mass soil

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<sup>361</sup> Swank, W.T., J.M. Vose, and K.J. Elliot. Long-term hydrologic and water quality responses following commercial clearcutting of mixed hardwoods on a southern Appalachian catchment. *Forest Ecology and Management* 143 (2001).

movements can continue for decades after roads have been constructed, and long-term slope failures frequently occur after road construction and timber harvest.<sup>362</sup>

The Aquatic Resource Report discounted sediment contribution to aquatic resources. We request that the report be revised to quantify the range of possible sediment delivery specifically by roads and stream crossings built as part of Foothills Project.

Standard FW-069 in the Forest Plan gives highest priority for watershed improvement to locations with known occurrence of federally-listed aquatic species on National Forest land or within three stream miles below the farthest downstream location of National Forest ownership. The Aquatic Resource Report only considered one stream mile below the National Forest. We request that the AR be revised to evaluate three miles downstream.

We appreciate the Aquatic Resource Report's focus on endangered species, but it does not address objective 26.2 in the Forest Plan: Biota (including nonnative species) and/or habitat improvement needs. We request that the report be revised to evaluate the Foothills Project's impact on all stream biota, including but not limited to benthic organisms, and that the effect of the Foothills Project on the aquatic biota condition indicator be predicted.

VanDusen, Huckins, Flaspohler reported: "[n]ine Michigan headwater streams where the adjacent forest had undergone selection logging in the previous 2 to 30 years were modeled. Brook trout density and biomass were substantially lower in streams bordering more recently logged forests. Streams in recently logged stands had substrates with higher fine sediment content and lower overall habitat quality as estimated by a multimetric habitat index."<sup>363</sup> We request that the Aquatic Resource Report be revised to thoroughly evaluate impact of the Foothills Project to trout (a stated USFS goal for the report due to public comments received).

The minimum riparian corridors in the Forest Plan for the CONF are 125' for 11-45% slopes, and 150' for >45%. The Aquatic Resource Report only addresses a 100' corridor, which is only for <10% slope. We request that all riparian corridor extents be increased to Forest Plan recommendations or more for slopes >10%. The Aquatic Resource Report also does not address ephemeral streams. We request that the Aquatic Resource Report be revised to include the 25 foot riparian corridor for ephemeral streams as noted in Appendix C of the Forest Plan, and to address impacts to ephemeral streams.

The Aquatic Resource Report assumed potential riparian corridor activity (pg 20) of canopy gap creation in mesic hardwoods on 2,250 acres and pine plantation maintenance on 1,060 acres. The report assumes that stream impacts from these two activities would be minimal but does not substantiate the assumption. Sediment release to, and heating of, the stream could be

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<sup>362</sup> Aquatic Resource Report, 27.

<sup>363</sup> Peter J. VanDusen, Casey J. F. Huckins & David J. Flaspohler (2005) Associations among Selection Logging History, Brook Trout, Macroinvertebrates, and Habitat in Northern Michigan Headwater Streams, Transactions of the American Fisheries Society, 134:3, 762-774, DOI: [10.1577/T03-228.1](https://doi.org/10.1577/T03-228.1)

significant and performing these actions in the riparian corridor violates the purpose for the riparian corridor. We request that no mesic hardwood gap be created in the riparian corridor.

The Aquatic Resource Report (pg 21) includes 55 acres of wildlife opening maintenance in the riparian corridor, which includes mowing, disking, prescribed burning, herbicide, mechanical planting, and application of fertilizer and lime. The report also admits that this opening maintenance would increase sediment and heat in the stream. We believe that permanent wildlife openings in the riparian corridor are a violation of the purpose of that designation, and request no new openings be made in the riparian corridor. This action would not significantly restrict the diversity of wildlife openings because they could be located in mesic habitats that extend outside of the riparian corridor.

The Aquatic Resource Report (pg 24) asserts that “most activities would occur in upland habitats that are not directly connected to riparian corridors and therefore would not pose a significant risk or effecting (sic) aquatic resources.” This assumption is not supported in the analysis, and our review of the provided references indicates that upland timber removal and roads, especially on steep slopes, can significantly increase sediment loading to streams. We request that the analysis be revised to address upland sediment delivery, especially during extreme rain events which are expected to be more severe and frequent due to climate change.

Many of Aquatic Resource Report references do not support its assumption that timbering in the upland and riparian corridor do not increase sediment and heat load to the stream.

The Clinton, Vose, Fowler study area had <20% slope. Unusually warm and dry weather existed for most of the logging period, which likely reduced runoff, erosion, and sediment.<sup>364</sup>

Dissmeyer reported: “The long-term sediment yield data illustrate a lag or delay between pulsed sediment inputs to a stream and the routing of sediments through the stream channels. In the absence of significant additional sources of sediment to streams on the watershed, annual sediment yield at the base of the watershed was still substantially above pre-disturbance levels at least 15 years later. Thus, there appears to be a continual release of sediment from upstream storage that was primarily deposited from road crossings of streams during exceptionally severe storms.”<sup>365</sup>

The road sampler design in the Riedel and Vose study was only sufficient for collecting the beginning runoff flow. Higher erosion rates generally occur later in a rain event after the ground is saturated. The study did not quantify the rain events sampled. No mention of

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<sup>364</sup> Clinton, Barton D.; Vose, James M.; Fowler, Dick L. 2010. Flat Branch monitoring project: stream water temperature and sediment responses to forest cutting in the riparian zone. Res. Pap. SRS-51. Asheville, NC: USFS Southern Research Station.

<sup>365</sup> Dissmeyer, George E., ed. 2000. Drinking water from forests and grasslands: a synthesis of the scientific literature. Gen. Tech. Rep. SRS-39. USDA Forest Service, Southern Research Station. Pg 122

sampling extreme storm events, which is when higher erosion occurs, was made.<sup>366</sup> The study likely underestimates peak erosion rates.

The Aquatic Resource Report references a paper by Edwards and Williard<sup>367</sup> as showing that BMPs adequately reduce sediment delivery to aquatic resources. That paper is only a review of three earlier studies, none of which was performed in the Southern Appalachians. The one study in a mountainous area that showed >90% reduction in sediment with BMPs reflected “precipitation ... [which for] several years was well below average.” The other reported major sediment reduction was in the coastal plain, which is not applicable to the Foothills Project due to extremely different topography and soils. Edwards and Willard also explicitly discuss why estimated BMP efficiencies may be too high:

Sediment and nutrient reductions were based on in-stream water-column loadings because, presently, there are no published studies/measurements that have measured and compared hillside delivery of sediment or nutrients from harvesting with and without BMPs...Some eroded sediment originating from management activities may be stored on the hillside or in the channel during at least the time in which monitoring was performed. If the area of storage was a riparian buffer and if storage is permanent, then the attribution of the reduction of the constituent delivery is fully appropriate in the calculation of the BMP efficiency. If storage was not by the riparian buffer or it was not permanent, attributing the entire efficiency value to the BMPs is not fully appropriate. Because substantial amounts of sediment delivered to a stream channel can be stored for decades and perhaps longer before being flushed from the watershed (Trimble 1981, Reid 1982), sediment efficiencies may be greatly overestimated in some situations...Sediment BMP efficiencies also may be overestimated or underestimated because of the types of flow conditions that occur during monitoring. Most suspended sediment exports occur during large or intense storm events (Beasley 1979, Edwards and Owens 1991), which occur infrequently and randomly... Road or culvert washouts are not uncommon because of a lack of maintenance and can lead to large and chronic loadings of sediment and nutrients to waterbodies. In this type of situation, water quality protection from high BMP effectiveness and efficiencies in the short term could be more than negated by the effects of BMP failure in the long-term.

The third study considered by Edwards and Williard was Arthur et al. 1998<sup>368</sup> (on the Cumberland Plateau, a different physiographic region). This study found that clearcutting on a 45% slope had BMP sediment removal effectiveness of 53% during harvest, 34% 17 months

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<sup>366</sup> Riedel, M.S. and J.M. Vose. 2002. Forest road erosion, sediment transport and model validation in the southern Appalachians. In Proc. Second Federal Interagency Hydrologic Modeling Conference, Las Vegas, Nevada.

<sup>367</sup> Edwards P, Williard K. “Efficiencies of Forestry Best Management Practices for Reducing Sediment and Nutrient Losses in the Eastern United States” *Journal of Forestry* • July/August 2010

<sup>368</sup> ARTHUR, M.A., G.B. COLTHARP, AND D.L. BROWN. 1998. Effects of best management practices on forest streamwater quality in eastern Kentucky. *J. Am. Water Resour. Assoc.* 34: 481–495.

later, and 2%, 53%, -94% (sediment increased with BMP over control), and 78% for each year subsequently. Arthur et al. found that streamflow increased by 123 percent on the BMP watershed during the first 17 months after cutting and by 138 percent on the non-BMP watershed. Water yields remained significantly elevated compared to the uncut watershed 8 years after harvesting. Suspended sediment flux was 14 and 30 times higher on the BMP and Non-BMP Watersheds, respectively, than on the uncut watershed during treatment, and 4 and 6.5 times higher in the 17 months after treatment was complete. Clearcutting resulted in increased concentrations of nitrate and other nutrients compared to the uncut watershed, and concentrations were highest on the non-BMP watershed. Overall, BMPs reduced impacts, but logging still produced dramatic impacts.

We request that the Aquatic Resource Report be revised to address all of the above information in the Edwards and Williard paper.

### **IX. The Foothills Project Does Not Comply With the National Forest Management Act**

The National Forest Management Act (“NFMA”) “sets forth substantive and procedural standards that govern the management of national forests.”<sup>369</sup> This happens in two phases. “First, the NFMA directs the Forest Service to ‘develop, maintain, and, as appropriate, revise’ Forest Plans” which must comply with NFMA.<sup>370</sup> “[S]econd, it directs the Forest Service to ensure that all activities on national forest lands . . . are consistent with the Forest Plans.”<sup>371</sup> “In summary, all management activities undertaken by the Forest Service must comply with the forest plan, which in turn must comply with [NFMA].”<sup>372</sup> This is generally referred to as the consistency requirement. Forest plans must be consistent with NFMA and individual projects on a forest must be consistent with both the forest plan and NFMA, though theoretically a project’s compliance with the forest plan should ensure compliance with NFMA.

When authorizing individual projects the Forest Service can run afoul of these requirements in two main ways. First, the agency can authorize a project that violates a provision of the forest plan on its face. Second, the Forest Service can authorize a project using an interpretation of its forest plan that violates NFMA’s substantive standards. Assertions that a forest plan is being applied in a way that is inconsistent with NFMA are evaluated when the Forest Service uses that interpretation to authorize a specific project, not when the forest plan itself is promulgated.<sup>373</sup> “In order to ensure compliance with the forest plan and [NFMA], the Forest Service must conduct an analysis of each ‘site specific’ action, such as a timber sale, to

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<sup>369</sup> *Cowpasture River Pres. Ass’n v. Forest Serv.*, 911 F.3d 150, 160 (4th Cir. 2018), *cert. granted sub nom. United States Forest Serv. v. Cowpasture River Pres. Ass’n*, 140 S. Ct. 36, 204 L. Ed. 2d 1193 (2019) (citing 16 U.S.C. § 1604).

<sup>370</sup> *Id.*

<sup>371</sup> *Id.*; see also *Am. Wild Horse Pres. Campaign v. Perdue*, 873 F.3d 914, 919 (D.C. Cir. 2017) (stating the same).

<sup>372</sup> *Idaho Sporting Cong., Inc. v. Rittenhouse*, 305 F.3d 957, 962 (9th Cir. 2002).

<sup>373</sup> See generally *Ohio Forestry Ass’n, Inc. v. Sierra Club*, 523 U.S. 726 (1998).

ensure that the action is consistent with the forest plan.”<sup>374</sup> The Chattahoochee-Oconee Forest Plan echoes this requirement: “Projects are evaluated to determine if they are consistent with the management direction in the Plan. This evaluation is recorded in the project-level environmental document with a finding of consistency incorporated into the decision document.”<sup>375</sup> The Forest Service has failed to do that here.

A. The Forest Plan Requires Site-Specific Analysis Which the Agency is Bypassing

To comply with both NFMA and NEPA, the current Forest Plan requires site-specific analysis to authorize projects. The Forest Plan Record of Decision is plain: “Forest Plans are permissive in that they allow, but do not mandate, the occurrence of certain activities. *Site-specific analysis* of proposed activities will determine what can be accomplished.”<sup>376</sup> The Record of Decision even restates the requirement: “Final decisions on proposed projects will be made on a *site-specific basis* using appropriate analysis and documentation.”<sup>377</sup> The agency restated it again in the Forest Plan itself: “Any decisions on projects to implement the Plan are based on *site-specific analysis*.”<sup>378</sup> And in responding to public comments on the forest plan, the agency repeatedly committed itself to site-specific, project-specific analyses to comply with NFMA and NEPA.<sup>379</sup> Even the precursor to the current Forest Plan incorporated this requirement.<sup>380</sup>

The agency’s proposal is purposefully not site-specific. The “location and timing of treatments” have not been selected but would be chosen after the agency completes analysis documenting compliance with NEPA and NFMA.<sup>381</sup> Stated another way, “specific geographic locations . . . for proposed activities . . . are not specified” in the agency’s proposal.<sup>382</sup> There are no proposals for specific actions in specific places. The recreation proposals in particular just establish a process for the agency to *consider* taking an action at some point in the future. The agency may substantially change the recreation system or it may do nothing, all without any site-

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<sup>374</sup> *Id.*; see also *Wildwest Inst. v. Bull*, 468 F. Supp. 2d 1234, 1242 (D. Mont. 2006), *aff’d*, 547 F.3d 1162 (9th Cir. 2008) (“NFMA requires individual site-specific projects to comply with both the Forest Plan and NFMA’s substantive requirements”); 36 C.F.R. § 219.15(d) (2012) (“A project or activity approval document must describe how the project or activity is consistent with applicable plan components”).

<sup>375</sup> Forest Plan, 2-2.

<sup>376</sup> Forest Plan Record of Decision, 27 (emphasis added).

<sup>377</sup> Forest Plan Record of Decision, 28 (emphasis added).

<sup>378</sup> Forest Plan, 2-2 (emphasis added).

<sup>379</sup> See, e.g., FEIS, App’x G, G-20, -44, -46, -87, -259.

<sup>380</sup> *Sierra Club v. Martin*, 168 F.3d 1, 2 (11th Cir. 1999) (“Before any sales of timber can occur within the Forest, the Plan requires the Forest Service to conduct a site-specific study”) (applying 1985 Forest Plan as amended in 1989).

<sup>381</sup> Draft EA, 11.

<sup>382</sup> Vegetation Report, 10.

specific documentation of compliance with the Forest Plan and NEPA. This is well outside the bounds of what is allowed by the Forest Plan.

Many parts of this proposal simply seek to implement objectives in the Forest Plan with no site-specific analysis. For instance, the agency plans to create early successional habitat but it does not know where. It acknowledges that its ability to do so is limited by standards in its Forest Plan. It has generally predicted how much early successional habitat it intends to create in specific prescriptions but “if fewer acres of young forest exist within a given management prescription” than predicted, it will “create additional acres of [early successional habitat]” so long as it stays “below the maximum acres allowed for individual [prescriptions].”<sup>383</sup> The only thing the agency believes it is bound by here is the limits in its Forest Plan. It is planning to go to undisclosed and undecided locations and create the maximum amount of early successional habitat allowed under its Forest Plan. That treats the Forest Plan as a self-implementing document which it plainly is not. If that is the agency’s plan, why has it prepared the Draft EA at all? Compliance with NEPA and NFMA is not just a check-the-box exercise.

To be clear, condition-based management does not prevent the agency from complying with this requirement. The agency can use its condition-based protocols to identify areas for site-specific actions, and then those actions can be implemented following “appropriate analysis and documentation.”<sup>384</sup> The agency’s effort to reach a decision it can implement on the ground is just premature at this point. To comply with NFMA and NEPA, it must conduct site-specific analysis.

## B. The Project Violates NFMA’s Prohibition on Timber Harvesting on Unsuitable Lands

### 1. *Timber Production and the Foothills Project*

National forests are managed, in part, for timber production purposes. Since the inception of the national forest system in the late 1800s, Congress has instructed that they be managed “to furnish a sustainable supply of timber.”<sup>385</sup> Still today, Congress requires national forests to be managed for timber purposes.<sup>386</sup> The Chattahoochee-Oconee National Forest tracks how much timber it is producing on a quarterly basis. By the fourth quarter of fiscal year 2019, the Chattahoochee-Oconee had sold approximately 10.5 million board feet of timber.<sup>387</sup> Since the very beginning, timber production has been an important part of national forest management.

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<sup>383</sup> Vegetation Report, 67-68.

<sup>384</sup> Forest Plan Record of Decision, 28.

<sup>385</sup> See 30 Stat. 34 (1897) codified at 16 U.S.C. § 475; see also *United States v. New Mexico*, 438 U.S. 696, 707 (1978) (stating Congress originally “intended national forests to be reserved for only two purposes-[t]o conserve the water flows, and to furnish a continuous supply of timber for the people”) (citations omitted).

<sup>386</sup> 16 U.S.C. § 1604(e)(1).

<sup>387</sup> See Forest Service Region 8, Periodic Timber Sale Accomplishment Report Quarters 1-4 (FY 19) available at [https://www.fs.fed.us/forestmanagement/documents/ptsar/2019/2019\\_Q1-Q4\\_PTSAR\\_R08.pdf](https://www.fs.fed.us/forestmanagement/documents/ptsar/2019/2019_Q1-Q4_PTSAR_R08.pdf).



Over the past two years there has been a concentrated push to produce more timber from the national forest. In May 2018, the Washington Office of the Forest Service wrote all Regional Foresters requesting a plan for completing more vegetation management across the national forest system.<sup>388</sup> Meeting that objective would be determined not by evaluating and quantifying acres of forest restored, or acres of hazardous fuels reduced; success would be determined based on fulfillment of timber targets.<sup>389</sup> The national timber target for fiscal year 2018 was 3.4 billion board feet increasing to an estimated target of 4.2 billion board feet by fiscal year 2022.<sup>390</sup>

The Southern Region responded to the Washington Office in June 2018 stating its objective of “increasing timber volume from 680 [million board feet] in FY 2018 to 780 [million board feet] by FY 2021, and then maintain[ing] that level.”<sup>391</sup> The Southern Region also noted a problem however. The Region had “depleted much of its shelf volume [of NEPA-approved timber projects] over the last two years of increasing timber outputs.”<sup>392</sup> In June 2018, the “majority of forests [only had] about 6-9 months of shelf volume remaining.”<sup>393</sup> Fiscal year 2020, in particular, would need “additional completed NEPA analysis and signed decisions” to meet the increased timber targets.<sup>394</sup> To facilitate that objective, the Region was encouraging forests to pursue NEPA efficiencies including the use of “templates,” “checklists,” and “EADM-centric” tools like condition-based management.<sup>395</sup>

The Forest Service is implementing this direction to increase timber production. In its Fiscal Year 2020 Budget Justification Request the Forest Service committed to “sell 3.7 billion board feet of timber to continue work towards the President’s goals” outlined in Executive Order 13855.<sup>396</sup> The Budget Justification requested more funding for “forest products” specifically to “promote increased timber sales.”<sup>397</sup> The agency requested separate funding for “vegetation and watershed management” though it noted a chief objective of those actions was “improving the growth and health of timber stands” for the benefit of “improved timber quality.”<sup>398</sup> The agency justified efforts to “treat existing timber stands to increase resilience to wildfires and insect” by

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<sup>388</sup> See Attachment 3.

<sup>389</sup> See Attachment 3.

<sup>390</sup> See Attachment 3. The President also issued Executive Order 13855 on December 21, 2018, calling on the Forest Service to sell “at least 3.8 billion board feet of timber from [Forest Service] lands” in fiscal year 2019. See 84 Fed. Reg. 45 (Jan. 7, 2019).

<sup>391</sup> See Attachment 3.

<sup>392</sup> *Id.*

<sup>393</sup> *Id.*

<sup>394</sup> *Id.*

<sup>395</sup> *Id.*

<sup>396</sup> See 2020 Budget Justification Request, 2 included as Attachment 10. For background on the President’s Executive Order see *supra* n. 391.

<sup>397</sup> 2020 Budget Justification, 61.

<sup>398</sup> 2020 Budget Justification, 62.

pointing out that it would “improve the quality of timber for future harvests.”<sup>399</sup> Timber is so heavily emphasized that the Forest Service even justified road system expenditures as:

essential for . . . meeting the Forest Service’s goal of producing 3.7 billion board feet of timber in FY 2020 . . . Given that timber is a priority, the agency is making careful choices within budget constraints; therefore, *all requested capital improvement funding directed towards the Roads program will support timber production and public safety.*<sup>400</sup>

The fact that the agency is devoting capital improvement road funding to timber production, in the face of a failing road system and growing maintenance backlog, underscores its commitment to producing timber above nearly all else. On December 19, 2019, while this comment period was pending, the Forest Service issued a press release specifically to celebrate that it had “sold more timber in this year than we have in any of the past 21 years.”<sup>401</sup>

The Forest Service cannot contend that the Foothills Project is connected to this effort to both: 1) increase timber production at the national level, and 2) have signed NEPA decisions “on the shelf” at the regional level to show compliance with increased timber targets. The agency’s five-year timber plan includes offering the first timber sale authorized as part of the Foothills Project in fiscal year 2020.<sup>402</sup> The agency has already internally named this the “Willis Knob” timber sale and intends to offer for sale 13,000 units of timber volume.<sup>403</sup> That will be followed by the “Upper Jigger Creek” timber sale in fiscal year 2021 which will offer 4,000 units of timber volume under the Foothills Project NEPA decision.<sup>404</sup> The agency plans to offer three timber sales authorized under Foothills – the “Lower Jigger,” “3 Sisters,” and “Earls Ford” sales – for a total of 13,000 units of volume in fiscal year 2022.<sup>405</sup> And at least one timber sale authorized under Foothills for 5,000 units of volume is planned for fiscal year 2023.<sup>406</sup> The agency’s five-year timber plan explains how these timber sales will be used to meet forest-wide timber targets for each fiscal year.

These timber plans are particularly striking in light of the fact that, according to the Foothills Project Draft EA, the agency does not currently know where on the ground it will harvest timber. The Foothills Project is a “condition-based restoration project where specific geographic locations (i.e., stands, in the case of vegetation management) for proposed activities”

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<sup>399</sup> 2020 Budget Justification, 62.

<sup>400</sup> 2020 Budget Justification, 83.

<sup>401</sup> See Forest Service Press Release available at <https://www.fs.fed.us/news/releases/usda-forest-service-surpasses-goals-and-breaks-records-2019>.

<sup>402</sup> See Attachment 4.

<sup>403</sup> *Id.* The unit of volume is unclear from the attachment.

<sup>404</sup> *Id.*

<sup>405</sup> *Id.*

<sup>406</sup> *Id.*

are unknown.<sup>407</sup> The agency does not even know “existing baseline conditions” that may indicate timber harvest is appropriate in an area.<sup>408</sup> Yet without knowing where it might harvest timber, the agency is planning multiple timber harvests for specific volumes. The conclusion here is unmistakable: these timber sales are being developed, in part or in full, to meet timber production goals. The Forest Service already has an objective for how much timber will be produced yet it does not know where it will harvest that timber on the ground. Site-specific conditions are not driving those harvests, timber goals are.

To be clear, we do not fault the agency for taking this approach. Congress requires the Chattahoochee-Oconee National Forests to be managed in part for timber production. It is reasonable to think the Forest Service would have timber objectives and plan its timber program years in advance. We also understand that sometimes timber harvests to meet timber production objectives can also serve other purposes like creating wildlife habitat. But the agency cannot pretend that timber production is not a driving factor for this project. Its failure to discuss timber production or suitability at all in its Draft EA renders its analysis deficient.

## *2. NFMA Prohibits Timber Harvests in Areas Designated Unsuitable for Timber Production in the Foothills Project Area*

NFMA requires the Forest Service to “identify lands . . . which are not suited for timber production” when developing Forest Plans.<sup>409</sup> The Chattahoochee-Oconee National Forest fulfilled that requirement when it last revised its Forest Plan in 2004. Each individual management prescription was designated as either suitable or unsuitable for timber production. Overall, the Forest Service designated 367,196 acres of the forest as suitable for timber production and 383,571 acres as unsuitable for timber production.<sup>410</sup> The Foothills Project covers 28 individual management prescriptions.<sup>411</sup> Though not disclosed in the Draft EA, the Forest Service has designated 20 of these prescriptions as unsuitable for timber production under NFMA. These 20 unsuitable prescriptions occupy approximately 34,500 acres (not counting acres in the embedded Riparian Prescription which is also designated unsuitable) of the 157,000-acre project area.<sup>412</sup>

On lands the Forest Service has designated as unsuitable for timber production, NFMA requires that “except for salvage sales or sales necessitated to protect other multiple-use values, no timber harvesting shall occur.” 16 U.S.C. § 1604(k). Restated, on lands designated as unsuitable for timber production, there shall be no timber harvesting except for salvage sales or

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<sup>407</sup> Vegetation Report, 10.

<sup>408</sup> Draft EA, 11.

<sup>409</sup> 16 U.S.C. § 1604(k).

<sup>410</sup> Forest Plan, App’x F, F-10.

<sup>411</sup> Vegetation Report, Table 18 (fails to account for MRx 0).

<sup>412</sup> Estimate taken from Table 18 of the Vegetation Report.

sales *necessitated* to protect other multiple uses. This prohibition is also incorporated into the Forest Plan. *See, e.g.*, Forest Plan Standard 4.F-012 (“These lands are classified under NFMA as unsuitable for timber production; not appropriate, however, salvage sales, sales necessary to protect other multiple-use values, or activities that meet other Plan goals and objectives are permitted.”).

The Forest Service appears to be completely ignoring this prohibition. Nowhere does the Forest Service disclose that it has designated as unsuitable for timber production many of the prescriptions affected by the project. The maps of potential timber harvest produced with the Draft EA reveal that the agency is contemplating substantial timber harvesting in prescriptions designated unsuitable for timber production.<sup>413</sup> The Forest Service is treating unsuitable areas identically with suitable areas, eviscerating any distinction between the two and ignoring Congress’ instruction that “except for salvage sales or sales necessitated to protect other multiple-use values, no timber harvesting shall occur” in unsuitable areas. 16 U.S.C. § 1604(k).

At the very least, this fails NFMA’s consistency requirement. The agency has not shown that its proposal is consistent with NFMA’s prohibition on harvesting timber from unsuitable land, nor the Forest Plan standards incorporating the same prohibition. The Forest Service acts arbitrarily and capriciously if it cannot explain how its project is consistent with NFMA and the Forest Plan.<sup>414</sup>

But more to the point, it seems unlikely that the Forest Service can show that its logging proposals meet either of the two exceptions to NFMA’s prohibition on timber harvesting on unsuitable lands. Only two types of timber harvests can occur on unsuitable lands: 1) “salvage sales” and 2) “sales necessitated to protect other multiple-use values.”<sup>415</sup>

It appears that the agency is seeking authority under the Foothills NEPA documents to “implement” “salvage harvests”<sup>416</sup> but the proposal is so undefined that it cannot be approved or evaluated under NFMA or any other statute. The only discussion of salvage harvest in the Draft EA is that in responding to “site and pest-specific” insect and disease outbreaks the agency may choose to use a salvage harvest.<sup>417</sup> Those harvests will “occur when needed.”<sup>418</sup> When indicating whether these would be commercial salvage harvests, the agency only stated “maybe.”<sup>419</sup> There is no specific proposal for a salvage harvest, no anticipated amount of harvest, no identification of dead or dying trees, no identified pest or insect problem that

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<sup>413</sup> *See* Draft EA, Maps 12-20.

<sup>414</sup> *See The Lands Council v. McNair*, 537 F.3d 981, 994 (9th Cir. 2008) *overruled on other grounds by Winter v. Nat. Res. Def. Council, Inc.*, 555 U.S. 7 (2008).

<sup>415</sup> 16 U.S.C. § 1604(k).

<sup>416</sup> Draft EA, 59.

<sup>417</sup> Draft EA, App’x B.

<sup>418</sup> Draft EA, App’x B.

<sup>419</sup> Draft EA, App’x B.

necessitates salvage, no estimate on when these salvage harvests may occur, and no indication about whether this would be accomplished commercially or not. This is a blank check. The agency is seeking authority to pursue salvage logging anywhere across a 157,000-acre area at any time over the next several decades without identifying a single acre that would justify a salvage harvest of any sort. That does not comply with NEPA or NFMA.<sup>420</sup> It also is insufficient to qualify for the salvage exception to NFMA’s prohibition on harvesting on unsuitable lands. At the very least, to meet the exception the agency must be able to show there is a salvage need.

The Project also does not fit within the exception for “sales necessitated to protect other multiple-use values.” The condition-based approach has simply not provided enough detail to evaluate whether a timber harvest would be *necessary* to protect another multiple-use value. Using the condition-based approach “the condition of forest stands, and sites will be assessed prior to implementation” but after the NEPA process is over.<sup>421</sup> Only at implementation would “[s]ite characteristics [ ] be assessed to determine existing baseline conditions and understand any underlying causes of ecologic degradation.”<sup>422</sup> If the agency does not have baseline data and does not currently have an understanding of underlying causes of degradation (if any) it cannot assert that its timber sale is *necessary* to another multiple-use value. Congress clearly understood that timber harvests do not always further other multiple uses, otherwise the prohibition on timber harvests in unsuitable areas – *except* for those harvests truly necessary to further multiple uses – would be meaningless.

Any assertion that the Foothills Project meets this exception to NFMA’s prohibition is simply premature. There may be actions theoretically contemplated as part of the Foothills Project that could meet this exception but without any site-specific proposal, it is impossible to know. Timber harvests are not categorically necessary to protect other multiple uses.

### 3. *The Agency Cannot Explain Its Way Out of NFMA’s Prohibitions*

As the agency is aware, this is not the first time we have voiced concerns over substantial timber harvesting in areas designated unsuitable for timber production. The agency is regularly pursuing commercial timber harvests in unsuitable areas.<sup>423</sup> It is also not the first time these concerns have been discussed as part of the Foothills Project. Nevertheless, the agency refuses to explain whether its proposed timber harvesting in unsuitable areas meet either exception provided under NFMA. Responding to our administrative objection on the Cooper Creek Project the agency admitted that its NEPA documents did not “disclose which activities are occurring on

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<sup>420</sup> See *infra* p. 177.

<sup>421</sup> Draft EA, 11.

<sup>422</sup> Draft EA, 11.

<sup>423</sup> See, e.g., Chattahoochee-Oconee National Forest, Brawley Mountain Project Final Environmental Assessment (2009), Chattahoochee-Oconee National Forest, Cooper Creek Project Final Environmental Assessment (2018); see also Attachment 11.

unsuited lands in a transparent manner,” nor “describe how those activities are consistent with the National Forest Management Act.”<sup>424</sup> The agency is making the same mistake here.

Past agency efforts to explain how its proposed activities fit into NFMA’s exceptions on harvesting timber on unsuitable lands make clear that the agency is arbitrarily applying this prohibition.

When we raised this issue as part of the Cooper Creek Project, the agency’s initial reaction was that the suitability prohibition was at least partially related to internal agency funding codes.<sup>425</sup> The agency could use “timber dollars [NFTM, etc.] to prep and administer the sales” in unsuitable areas “but not to plan the sales.”<sup>426</sup> It is unlikely that Congress was concerned with Forest Service funding codes when it enacted the prohibition on harvesting timber in unsuitable areas. Regardless, the agency appears to have abandoned this explanation.

Next, the agency suggested that NFMA’s prohibition on timber harvesting on unsuitable lands was only “temporary,” specifically that “NFMA envisioned that lands classified as unsuitable would return to active management after 10 years, and therefore ‘unsuitable’ is a temporary condition. The CONF forest plan is now 14 years old . . . well past the ten year limitation per NFMA.”<sup>427</sup> This is incorrect. The Forest Service is to review its “decision to classify these lands as not suited for timber production at least every 10 years and [ ] return these lands to timber production whenever [it] determines that conditions have changed so that they have become suitable for timber production.”<sup>428</sup> But until that happens, the lands remain unsuitable under NFMA. And any effort to remove the unsuitable designation would require a Forest Plan amendment. Neither of those events has occurred.

Another theory was that NFMA provides “a considerable amount of discretion regarding the interpretation of the word ‘necessary’” as used in the exception for actions *necessary* to protect other multiple uses.<sup>429</sup> The agency suggested a better interpretation would be determining necessity “within the context of defining the ‘purpose and need’ for an action.”<sup>430</sup> In other words, if the activity fell within the purpose and need for a project it was considered “necessary” for NFMA purposes.

This theory cannot be right either. Congress enacted the prohibition on timber harvesting on unsuitable lands because it was concerned about balancing multiple uses across the forest and

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<sup>424</sup> See Attachment 12.

<sup>425</sup> See Attachment 13.

<sup>426</sup> *Id.*

<sup>427</sup> See Attachment 14.

<sup>428</sup> 16 U.S.C. § 1604(k).

<sup>429</sup> See Attachment 15.

<sup>430</sup> *Id.*

it recognized that timber harvesting was not always compatible with all other multiple uses.<sup>431</sup> As a result, timber harvest would not be allowed on lands the Forest Service designated as unsuitable *unless* it was *necessary* to protect a multiple use in a way that other timber harvests were not. Congress did not enact the prohibition because it was concerned about the purpose and need statements developed as part of the agency’s NEPA obligations, nor could Congress have intended for the Forest Service to simply wordsmith around its prohibitions by artfully crafting purpose and need statements.

If the Forest Service is going to harvest timber in unsuitable prescriptions, it must show that harvest is a salvage harvest or is “*necessitated* to protect other multiple-use values.”<sup>432</sup> The agency has done neither here and, as a result, its proposed timber harvests violate NFMA. The agency must either abandon these proposals or demonstrate consistency with NFMA’s requirements.

C. The Agency is Implementing *De Facto* Forest Plan Amendments Without Following Proper Procedure in Violation of NFMA

As explained above, each national forest must have a governing Forest Plan.<sup>433</sup> Plan development requires “a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences.”<sup>434</sup> Plans must “provide for multiple use . . . includ[ing] coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness.”<sup>435</sup> They must “form one integrated plan . . . incorporating in one document or one set of documents . . . all of the features required by [NFMA].”<sup>436</sup> Ultimately, Forest Plans “guide management of NFS lands so that they are ecologically sustainable and contribute to social and economic sustainability; consist of ecosystems and watersheds with ecological integrity and diverse plant and animal communities; and have the capacity to provide people and communities with ecosystem services and multiple uses that provide a range of social, economic, and ecological benefits for the present and into the future.”<sup>437</sup> In other words, a forest plan “provides a framework for integrated resource management and for guiding project and activity decisionmaking on a national forest.”<sup>438</sup>

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<sup>431</sup> Other than timber, multiple uses and values include: outdoor recreation, streams and watersheds, wildlife, fish, the diversity of plant and animal communities, and soil productivity. See 16 U.S.C. § 528 (1960); § 1604(e), § 1604(g)(3).

<sup>432</sup> 16 U.S.C. § 1604(k) (emphasis added).

<sup>433</sup> 16 U.S.C. § 1604(a).

<sup>434</sup> 16 U.S.C. § 1604(b).

<sup>435</sup> *Id.* § 1604(e)(1).

<sup>436</sup> *Id.* § 1604(f)(1).

<sup>437</sup> 36 C.F.R. § 219.1(c).

<sup>438</sup> *Id.* § 219.2(b)(1).

Forest Plans “shall . . . be revised [ ] from time to time when the Secretary finds conditions in a unit have significantly changed, but at least every fifteen years.”<sup>439</sup> Forest Plans also may “be amended in any manner whatsoever after final adoption” but only “after public notice” and compliance with applicable public participation requirements.<sup>440</sup> Specifically, “a plan amendment is required to add, modify, or remove one or more plan components, or to change how or where one or more plan components apply to all or part of the plan area (including management areas or geographic areas).”<sup>441</sup> The Forest Service may not implement a plan amendment – *de facto* or formal – without following the procedures mandated by NFMA.<sup>442</sup> The Forest Service has violated this requirement on at least two fronts.

*1. Removal of the Unsuitable Designation Requires a Formal Forest Plan Amendment*

A “plan amendment is required to add, modify, or remove one or more plan components, or to change how or where one or more plan components apply to all or part of the plan area (including management areas or geographic areas).”<sup>443</sup> Twenty-one management prescriptions (including Riparian Prescription 11) include prescription-specific language stating that the prescription is unsuitable for timber production. As explained above, the Foothills Project does not distinguish at all between suitable areas and unsuitable areas; the Forest Service is reading that limitation out of the prescription-specific standards for unsuitable areas and focusing timber harvests in those areas equally with suitable areas. The Forest Service may remove this plan component but only through following the procedures for a plan amendment. Its effort to do so without following those procedures amounts to a *de facto* plan amendment in violation of NFMA.

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<sup>439</sup> 16 U.S.C. § 1604(f)(5). The Chattahoochee-Oconee Forest Plan is now out of date. The Plan was last revised in 2004, expiring in 2019. Failure to revise a Forest Plan within the required fifteen year timeframe is a violation of NFMA. *See Biodiversity Assocs. v. U.S. Forest Serv. Dep't of Agric.*, 226 F. Supp. 2d 1270, 1316 (D. Wyo. 2002). Congress routinely includes a provision in annual appropriations bills excusing forests that have not revised their Forest Plans within the requisite timeframe. This Congress is no different. The current appropriations bill includes language stating that the Forest Service “shall not be considered to be in violation of . . . 16 U.S.C. 1604(f)(5)(A) solely because more than 15 years have passed without revision of the plan for a unit of the National Forest System.” *See* H.R. 1865. However, if the Forest Service “is not acting expeditiously and in good faith, within the funding available, to revise a plan for a unit of the National Forest System, this section *shall be void* with respect to such plan and a court of proper jurisdiction may order completion of the plan on an accelerated basis.” *Id.* (emphasis added). It is unclear to us if the Forest Service is complying with this provision.

<sup>440</sup> 16 U.S.C. § 1604(f)(4); *see* 36 C.F.R. § 219.13(b)(2).

<sup>441</sup> 36 C.F.R. § 219.13(a).

<sup>442</sup> *See Oregon Nat. Res. Council Fund v. Forsgren*, 252 F. Supp. 2d 1088, 1101 (D. Or. 2003) (enjoining timber sales implementing *de facto* forest plan amendment until the Forest Service complies with NFMA’s public participation requirements for plan amendments); *House v. U.S. Forest Serv., U.S. Dep't of Agric.*, 974 F. Supp. 1022, 1034 (E.D. Ky. 1997) (enjoining timber sales implementing policies adopted without notice and comment “until the Forest Plan has been properly amended to include the same”).

<sup>443</sup> 36 C.F.R. § 219.13(a).



It is worth noting that removing this plan component has real consequences. The Forest Plan and underlying EIS assume that unsuitable areas will not be subject to regular timber harvests. That assumption is critical to how the agency, through its Forest Plan, balances multiple uses across the forest. The Forest Service can reassess that balance but only through plan amendment or revision.

2. *Designating Substantial Acreage Under Prescription 9.F also Requires a Formal Forest Plan Amendment*

Forest Plan Prescription 9.F protects rare communities and, unlike most Forest Plan prescriptions, is designated over time when rare community sites are identified. Sites are “added to [the] prescription without plan amendment, *unless such additions would result in large shifts in land allocation.*”<sup>444</sup> As part of the Foothills Project, the Forest Service anticipates adding to Prescription 9.F: 2,300 acres of “bogs, fens, seeps, and seasonal ponds,”<sup>445</sup> 3,225 acres of “basic mesic forests,”<sup>446</sup> 200 acres of “rock outcrops and cliffs,”<sup>447</sup> and 50 acres of canebrakes.<sup>448</sup> Presumably, these communities are currently managed under other prescriptions, so the Foothills Project will effect a nearly 6,000 acre shift in land allocation. Such an expansive reallocation necessitates a Forest Plan amendment.

3. *The Agency’s Approach to This Project Constitutes a De Facto Forest Plan Amendment*

Forest plans balance multiple uses to “provide[ ] a framework for integrated resource management and for guiding project and activity decisionmaking on a national forest.”<sup>449</sup> Development of the current Forest Plan took years, with intensive public involvement, feedback, and negotiation. The public expected (and indeed the law requires) the forest to be managed according to the management structure decided in the Forest Plan until it is revised and amended. The agency cannot revisit that framework without going through the forest plan amendment or revision process. But that is effectively what is happening with the Foothills project.

To be clear, we are not suggesting that use of landscape-scale, or condition-based, management techniques, necessitate forest plan amendments. Those techniques can be pursued under the current Forest Plan and we have repeatedly suggested ways the agency could use those concepts while staying within applicable legal boundaries. We are disappointed that those suggestions have fallen by the wayside.

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<sup>444</sup> Forest Plan, 3-158 (emphasis added).

<sup>445</sup> Botanical Resources and Rare Communities Report, 12

<sup>446</sup> Botanical Resources and Rare Communities Report, 20.

<sup>447</sup> Botanical Resources and Rare Communities Report, 22.

<sup>448</sup> Draft EA, App’x B.

<sup>449</sup> 36 C.F.R. § 219.2(b)(1).

According to the Draft EA, the Foothills Project is the product of a new “Integrated Landscape Restoration Strategy” (“Landscape Restoration Strategy”) developed by the Forest which culminated in a “Restoration Plan.”<sup>450</sup> Exactly how the Landscape Restoration Strategy was used is a little unclear. The Restoration Plan (presumably the output of that strategy) was circulated as early as March 2017 but the Landscape Restoration Strategy is dated October 2017. Regardless, the Landscape Restoration Strategy was “designed to complement the Chattahoochee-Oconee National Forests Land and Resource Management Plan while focusing maintenance and restoration efforts.”<sup>451</sup> The Forest Service recognized that the Landscape Restoration Strategy was not comprehensive however. Some Forest Plan goals “may be subordinate to the goals that more directly apply to the type, location, and methods of restoration that will be proposed by future landscape restoration projects.”<sup>452</sup> “[G]oals that are not restoration focused but . . . that meet other sociologic, cultural, economic, outreach or research needs” are explicitly not pursued using the approach.<sup>453</sup>

The concepts of a Landscape Restoration Strategy and Landscape Restoration Plan sound perfectly appropriate to us. The Forest Service can use the process to identify restoration opportunities and design specific projects to meet those objectives. This seems like a reasonable way to prioritize restoration work.

The trouble arises in the way the Forest Service is using it here. The agency can pursue landscape-scale restoration with individual projects identified to advance the goals of the Restoration Plan. With that approach the agency could also mix in projects that are not driven by the Restoration Plan but may meet other objectives. Here, the Forest Service’s approach turns the Restoration Plan *into the exclusive management direction* for this entire area.

Stated another way, instead of using the Restoration Plan to prioritize projects implementing the Forest Plan, the Restoration Plan is replacing the Forest Plan in the Foothills project area (except for Plan direction it incorporates). Or another way: it would be appropriate to use the Restoration Plan to design and prioritize site-specific restoration projects, because members of the public whose interests are not fully reflected in the Restoration Plan could advocate for additional actions along the way, but Alternative 2 would take away that right. There is nothing specific proposed in the Draft EA, only a new process (taken from the objectives of the Restoration Plan) for identifying site-specific work. Instead of implementing the process in the Forest Plan, the agency is now implementing the process articulated in its Foothills Restoration Plan and Draft EA. The Forest Service is applying that process across this entire landscape, and the Forest has indicated it will duplicate the process (and make similar shifts in priorities) for the seven remaining landscapes. Put simply, this is a plan revision in eight separate bites.

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<sup>450</sup> Draft EA, 10.

<sup>451</sup> Landscape Restoration Strategy, 1.

<sup>452</sup> Landscape Restoration Strategy, App’x A.

<sup>453</sup> Landscape Restoration Strategy, App’x A.

The desired conditions in specific prescriptions in the Forest Plan are replaced by decision matrices that apply regardless of plan prescription. The Draft EA includes virtually no consideration of the objectives of the 21 management prescriptions within the Foothills project area. This is all replaced by the objectives of the Restoration Plan which are incorporated into the Draft EA.

This upsets the balance of multiple uses struck in the Forest Plan, by refocusing the entire Foothills area on ecological restoration. The Restoration Plan specifically does not further “goals that are not restoration focused.” This is reflected in the Draft EA which purports to cover recreational activities and actions to improve water quality but has no specific proposals for those activities. The most specific information offered in the Draft EA is prediction of vegetation management acreage which is the output of the Restoration Plan. Restoration is a worthy objective but the Forest Service is required to manage for more than just ecological restoration.

A comparison between this proposal and how the Forest Service understands its Forest Plan is illustrative. According to the agency: “The forest plan provides forest-wide direction and sets the land management of the forests by describing overarching goals and objectives. These goals and objectives are more specifically applied in the use of management prescription allocations; each allocation provides the desired conditions and standards (prescriptions) specific to each forest type and the geographic location where those standards can be applied.”<sup>454</sup> Here, the Draft EA sets the project area-wide direction and overarching goals which are applied at geographic locations through project-specific decision matrices regardless of Forest Plan prescriptions. To be sure, the agency will compare site-specific actions authorized under Foothills project to Forest Plan standards and guidelines but the *management direction* for the area will be decided by the priorities in the Foothills Draft EA and decision matrices, not the Forest Plan.

We are not suggesting that the Restoration Plan is pursuing objectives *incompatible* with the Forest Plan, or that implementing the Restoration Plan automatically leads to Plan violations. But the way the Restoration Plan and Draft EA are being used here recalibrates management focuses in this area. Nor are we contesting that these (or similar) recalibrations may be ecologically appropriate and needed. After all, the current Forest Plan has already reached the 15 year mark, when NFMA requires the Forest to ask whether there is a need for change based on “new information and changing conditions.”<sup>455</sup> But if the Forest intends to make a fundamental shift in plan priorities, leaving some behind for good, it must comply with the requirements of the planning rule.<sup>456</sup> The Forest clearly has not even attempted to do so.

The planning rule’s requirements directly answer the Forest’s rationale for this project. The Forest states that a new framework is needed based on new scientific information and what we have learned through monitoring. Under the planning rule, if such information shows a need

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<sup>454</sup> Landscape Restoration Strategy, App’x A.

<sup>455</sup> 16 U.S.C. § 1604(f)(5); 36 C.F.R. 219.2(b).

<sup>456</sup> 36 C.F.R. Part 219.

to adjust priorities in a way that changes “the unit’s expected distinctive roles and contributions to the local area, region, and nation,” the plan must be changed.<sup>457</sup> Plan amendments and revisions are subject to the procedural requirements of the planning rule, which ensure that the public is appropriately involved. They also require the agency to meet the rule’s substantive requirements, including a duty to maintain and restore ecological integrity along the dimensions of structure, function, connectivity, and composition, at all relevant ecological scales, and to ensure that rare wildlife species’ habitats are also maintained or restored.<sup>458</sup>

The planning rule’s requirements are rigorous because they have long-lasting effects. If a site-specific project does not have the desired effect, the responsible official can make adjustments iteratively. But a plan amendment or revision will shift the Forest’s priorities for many years to come, and that is precisely what the Forest intends to do with this project. Instead of meeting the planning rule’s rigorous requirements, however, the Forest attempts to substitute a its Restoration Plan which obviously did not fulfill the analysis and substantive requirements applicable to forest planning.

The problem is, in part, one of timing. The agency could use its Restoration Plan to identify site-specific projects and then offer NEPA-compliant comment periods on those individual projects rather than turn its Restoration Plan into the overall project. Again, this would give other members of the public the ability to remind the Forest of other plan objectives that are being neglected, and it would allow for iterative adjustments if any of the Forest’s assumptions about ecological needs and the likely benefits of treatments prove incorrect. The need for such adjustments are likely because the new restoration framework is not supported by a robust plan revision analysis process.

This approach is also problematic because of NFMA’s requirement for “one integrated plan.”<sup>459</sup> The Forest Plan was designed so that the priorities of, for example, Prescriptions 7.E.1 would be pursued wherever Prescription 7.E.1 is found on the landscape and the position of Prescription 7.E.1 on the landscape with other prescriptions should balance multiples uses. Now, the objectives of Prescription 7.E.1 will be pursued in some areas but in the Foothills, actions in the prescription will be determined by the Draft EA and decision matrices.

This is the big picture: Forest plans “provide[] a framework for integrated resource management and for guiding project and activity decisionmaking on a national forest.”<sup>460</sup> That calls for tiering site-specific actions to the priorities in the Forest Plan. With Foothills, site-specific actions will effectively be tiered to the Draft EA and decision matrices. We understand those activities may not violate the Forest Plan but the agency is inserting a new layer of priorities in between site-specific actions and the Forest Plan which is effectively an amendment of the Plan in this area.

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<sup>457</sup> 36 C.F.R. § 219.2(b).

<sup>458</sup> 36 C.F.R. §§ 219.8; 219.9.

<sup>459</sup> 16 U.S.C. § 1604(f)(1).

<sup>460</sup> 36 C.F.R. § 219.2(b)(1).

#### D. The Agency Has Not Demonstrated Consistency With the Forest Plan

All projects or activities on national forests must be consistent with the applicable Forest Plan.<sup>461</sup> The Forest Service bears the burden of demonstrating that consistency.<sup>462</sup> Blanket assertions of consistency, like that found on page 11 of the Draft EA (“All actions taken would be consistent with the revised Chattahoochee-Oconee National Forests Land and Resource Management Plan”) are insufficient. The Forest Service:

must support its conclusions that a project meets the requirements of the NFMA and relevant Forest Plan with studies that the agency, in its expertise, deems reliable. The Forest Service must explain the conclusions it has drawn from its chosen methodology, and the reasons it considers the underlying evidence to be reliable.<sup>463</sup>

The consistency requirement would be relatively meaningless if it only required the agency to include a general statement in its NEPA documents that it did not plan to violate its Forest Plan. NFMA requires more. The agency must show that its proposals do not violate its Forest Plan. The Foothills Project either violates, or the agency has failed to demonstrate consistency with, the following forest-wide plan standards:

- Forest-wide Standard 029: “Site-specific analysis of proposed management actions will identify any protective measures needed in addition to Forest Plan standards, including increasing the width of protective buffers where needed.” To our knowledge, this “site-specific analysis” has not occurred. In fact, the Forest Plan assumes site-specific will support each project authorized under the Forest Plan: “Any decisions on projects to implement the Plan are based *on site-specific analysis* in compliance with the National Environmental Policy Act.”<sup>464</sup> Thus the structure of the Forest Plan bakes in the assumption that site-specific analyses will be completed to support project development and demonstrate compliance with the Forest Plan.
- Forest-wide Standard 041: “Culverts that are barriers to stream biota passage in waters of aquatic PETS species have priority for replacement over culverts in waters without PETS species.” Under Foothills, “[m]ost [aquatic organism passage] projects would occur in cold-water streams which are several miles from federally-listed species.”<sup>465</sup> It is unclear to us if there are culverts closer to federally-listed species that are in need of

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<sup>461</sup> 16 U.S.C. § 1604(i); *see, e.g., Sierra Club v. Martin*, 168 F.3d 1, 4-5 (11th Cir. 1999); *Cherokee Forest Voices v. U.S. Forest Serv.*, 182 F. App'x 488 (6th Cir. 2006).

<sup>462</sup> *See Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1377 (9th Cir. 1998) (“Forest Service must demonstrate that a site-specific project would be consistent with the land resource management plan”).

<sup>463</sup> *See Lands Council*, 537 F.3d at 994; *see also* Forest Plan, 2-2 (“Projects are evaluated to determine if they are consistent with the management direction in the Plan”).

<sup>464</sup> Forest Plan, 2-2 (emphasis added).

<sup>465</sup> Aquatic Resource Report, 22.

replacement and should be prioritized over others. We are unaware of any plan to replace specific culverts.

- Forest-wide Standard 059: “Mechanical site preparation is not done on sustained slopes over 20 percent with soil erosion hazard classified as moderate or higher.” The Foothills Project proposes “scarifying, disking, de-compacting, or re-contouring” on 39,781 acres.<sup>466</sup> Without site-specific analysis it is unclear to us if this is being proposed on slopes with soil erosion hazard ratings of moderate or higher but it seems likely given that only 6% of the project area has a soil erosion hazard classified below moderate.<sup>467</sup>
- Forest-wide Standard 065: “On all soils dedicated to maintaining forest cover, the organic layers, topsoil, and root mat will be left intact over at least 80 percent of an activity or project area.” The Forest Service has stated that it will comply with that standard but without any site-specific analysis or proposal, we are aware of no information to support that conclusion. We also were unable to find any specific monitoring plan or other mechanism that the Forest Service might use to evaluate compliance with that standard in the future.
- Forest-wide Standard 100: “In areas with very high scenic integrity objectives, management actions are limited to alterations that are low scenic impact.” Comparing Draft EA, Maps 12-20, to the Scenic Integrity Objective Map attached to the Scenery and Recreation Resources Report, it appears that substantial timber harvesting is contemplated in areas with a scenic integrity objective of very high. There are no techniques provided to achieve a scenic integrity objective of very high in Appendix B to the Scenery and Recreation Resources Report (which provides techniques for other scenic integrity objectives). We appreciate the commitment that “all projects located in areas of very high scenic integrity objectives should be developed with the advice of the Scenery Resource Specialist”<sup>468</sup> but this is effectively a commitment to figure out compliance with the Forest Plan later, after the agency issues a decision authorizing it to do work on the ground, which is insufficient under NFMA. The Union County Target Range Project demonstrates the need for this analysis before authorizing any site-specific action. There, the Draft EA concluded that the project would “not be consistent with the existing landscape [scenic integrity objective]” in the Forest Plan.<sup>469</sup>
- Forest-wide Standard 149: “The roadless character of inventoried roadless areas will be maintained so as to continue to meet Forest Service roadless area criteria.” We appreciate the forest’s stated intention of maintaining the roadless character of these areas but without any specific proposal in an inventoried roadless area (only an

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<sup>466</sup> Soil Report, 37.

<sup>467</sup> Soil Report, 12.

<sup>468</sup> Scenery and Recreation Resources Report, 10.

<sup>469</sup> Chattahoochee-Oconee National Forest, Union County Target Range Project Draft Environmental Assessment (May 2019), 35.

acknowledgment that some management will/may occur) we cannot evaluate compliance with this standard.

- Forest-wide Standard 154: “Identify and give priority for restoration to stands affected by oak decline.” We understand the project proposes actions meant to address oak decline but it is unclear to us if that will be in stands *affected* by oak decline.

The Project appears to violate the following prescription-specific standards:

- Prescriptions 0, 2.A.1, 2.A.2, 2.A.3, 2.B.1, 2.B.2, 2.B.3, 3.C, 3.D, 4.D, 4.F, 4.H, 6.B, 7.E.1, 9.F, and 11 all have prescription-specific standards designating the prescription as unsuitable for timber production. In some of those prescriptions, such as 2.A.1, 2.A.2, and 2.A.3, the prohibition on timber harvesting is strict, with no exceptions. The Forest Plan does not appear to allow timber harvesting in these areas. In other prescriptions, the NFMA exceptions to the prohibition are available. Because there are no site-specific activities proposed it is unclear to us if timber harvesting is planned for all of these prescriptions but Draft EA, Maps 12-20 suggest timber harvesting is being contemplated for all or many of them. The Vegetation Resources Report also indicates that commercial regeneration harvests are planned for some of these prescriptions.<sup>470</sup> As discussed above, there is no indication those activities meet the exceptions to timber harvesting in lands designated unsuitable for timber production under NFMA, or can be pursued in areas where the exceptions are not available.
- It is unclear to us how the application of Appendix B to the Scenery and Recreation Resources Report will ensure compliance with prescription-specific standards regarding scenic integrity.
- Because there are no site-specific proposals it is unclear if the action will exceed prescription-specific early successional habitat requirements. In the past, the Forest Service has had to reduce harvests to ensure it does not exceed applicable thresholds.
- Prescription Standard 0.B-004: “In general, investments in forest health will not be made.” Despite this limitation, Draft EA, Maps 12-20 suggest the Forest Service is considering timber harvesting activities in Prescription 0.
- Prescription Standard 0.B-009: “Prescribed fire will not be used as a management tool.” It is unclear if prescribed fire is being considered in this prescription.
- Prescription Standards 2.A.-019 and 2.B.-011: In these areas “insect and disease outbreaks may be controlled when necessary to protect the values for which the area was established, to reduce hazards to visitors, for safety or legal reasons, or to protect adjacent resources provided that pest management activities shall be as specific as possible against target organisms and induce minimal impact to other components of the ecosystem.” We are not aware of any specific insect or disease outbreaks in these prescriptions. But the Foothills Project appears to seek authority to address insect and disease outbreaks wherever they may occur. If those activities will

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<sup>470</sup> Vegetation Report, Table 39.

occur in these prescriptions, the Forest Service has not demonstrated how they comply with this standard.

- Prescription Standards 2.A.1-004, 2.A.2-004, and 6.B-013: “No new wildlife clearings will be developed, but existing ones may be maintained.” The Project proposes to create 1,400 acres of new wildlife openings.<sup>471</sup> It is unclear if any are planned for these prescriptions.
- Prescription Standards 2.B-008: “Management actions will not negatively affect the outstandingly remarkable values such that classification of a river segment is downgraded; that is, from wild to scenic or recreational or from scenic to recreational or from recreational to not eligible.” We do not know what the Forest Service is proposing in this prescription so it is unclear if it is complying with this standard. Draft EA, Maps 12-14 suggest timber harvest is being considered in the prescription.
- Prescription Standard 6.B-003 states that: “Native pests are generally conducive to providing the desired conditions of this management prescription, and will be controlled only” in very limited circumstances. If the agency is considering native pest control in this prescription, it has not shown that it meets one of the limited circumstances.
- Prescription Standard 6.B-010: “Up to one-half mile of temporary-use road per entry can be constructed for management purposes within any single contiguous block of this management prescription.” It is unclear if the Forest Service is complying with this standard because it has not disclosed the amount of harvest planned for prescription 6.B nor the amount of temporary road necessary for the any portion of the project.
- Prescription Standard 9.F-001: “Site-specific analysis of proposed management actions will identify any protective measures needed in addition to Forest Plan standards, including the width of protective buffers where needed. Management activities occur within rare communities only where maintenance or restoration of rare community composition, structure, or function is expected.” Because no site-specific analysis has occurred, we are unaware of the identification of any additional protective measures.
- Prescription Standard 9.F-005: “Nonnative invasive species are not intentionally introduced in or near rare communities, nor will management actions facilitate their inadvertent introduction.” Management activities may inadvertently introduce NNIS into rare communities in the Foothills project area, particularly those that are currently undocumented. Without knowing where timber harvests will occur and where rare communities are located, we do not know how to evaluate consistency with this requirement.
- Prescription Standard 9.F-007: “Except for approved studies or needed community maintenance, removal of vegetative material in rare communities is prohibited.” Because the Forest Service has not identified rare communities on the

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<sup>471</sup> Draft EA, 19.



landscape, it is impossible to gauge compliance with this requirement. Nevertheless, the agency plans thousands of acres of logging in mesic hardwood stands which may overlap with mesic rare communities.<sup>472</sup> The proposals to log in those areas do not appear intended to maintain rare communities, and without site-specific information indicating where this may occur, the agency cannot show that the treatment furthers *needed* maintenance.

- Prescription Standard 11-024 (emphasis added): “Tree removals may *only* take place if *needed* to enhance the recovery of the diversity and complexity of vegetation, rehabilitate both natural and human-caused disturbances, provide habitat improvements for TES or riparian-associated species, reduce fuel buildup, provide for visitor safety, or for approved facility construction/renovation.” Without a site-specific proposal, the agency cannot assert consistency with this requirement.

The lack of site-specific proposals, and decision to not offer future NEPA analyses for decisions under consideration in Foothills, makes it very difficult to determine if the Forest Service is complying with its Forest Plan. The Forest Service must explain if it is complying with these standards and support its explanation with a reasoned justification. If it is not complying with these standards, it must amend its proposal.

E. The Agency is Not Complying With NFMA’s Substantive Requirements Related to Soils and Watersheds, and Potentially Plant and Animal Diversity

Under NFMA, the Forest Service must “insure that timber will be harvested . . . only where . . . soil, slope, or other watershed conditions will not be irreversibly damaged.” 16 U.S.C. § 1604(g)(3)(E)(i). The agency is not complying with this requirement.

First, the agency concedes that the Foothills Project will irreversibly damage soils. “Long-term impacts [to soils] are considered to be effects occurring longer than 10 years following a treatment and are not recoverable by natural processes nor will they return to acceptable potential soil productivity.”<sup>473</sup> These soil impacts will occur across at least 7,432 acres.<sup>474</sup> However, “[w]ith all of the potential treatments identified in [the project], this number has the potential to increase,” impacting even more soils.<sup>475</sup> The agency does not know how much it is likely to increase because its analysis assumes that all impacts to soils are “occurring on separate pieces of ground.”<sup>476</sup> There is no basis for that assumption. The agency knows that “there are numerous combinations as to when treatments [that will affect soils] may overlap”

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<sup>472</sup> Botanical Resources and Rare Communities Report, 54.

<sup>473</sup> Soil Report, 18.

<sup>474</sup> Soil Report, 55.

<sup>475</sup> Soil Report, 52.

<sup>476</sup> Draft EA, 108.

causing more long-term impacts to more soils.<sup>477</sup> The “uncertain[ty] as to when treatments may overlap” only underscores the need for analysis now to determine if the project complies with NFMA’s standards.<sup>478</sup> Regardless, at least 7,432 acres of soils will experience long-term detrimental impacts.

The agency downplays this impact by arguing it is inconsequential because it is only 4.6% of the 157,000-acre project area. Its percentage of the project area is irrelevant, otherwise the agency could always expand its project area to escape NFMA’s prohibitions. Regardless, the agency believes most of these impacts will occur in only an 85,587-acre area.<sup>479</sup> Long-term impacts to soils across 7,432 acres in an 85,857-acre area equates to 8.7% of the area. Given the conservative assumptions discussed above, this could easily climb to 10% of the area. Long-term detrimental impacts to soils across 10% of the action area – over 8,500 acres – would violate NFMA’s soil protection standard.

Second, the agency uses a proxy of total impervious surface area to assess impacts to watersheds and assumes that there will be a “negative effect to beneficial uses at any temporal or spatial scale with [total impervious area] over 10% within a watershed.”<sup>480</sup> As explained elsewhere (*see infra* 148), the agency will exceed this limit in several watersheds, degrading streams below their assigned beneficial uses in violation of the Clean Water Act. The agency also proposes to conduct sediment-inducing activities in multiple watersheds that are not currently maintaining their beneficial use, further impairing those watersheds. This may irreversibly damage the watershed in violation of NFMA.

Finally, NFMA requires the agency to “provide for diversity of plant and animal communities.”<sup>481</sup> With no site-specific proposal, and the failure to take a hard look particularly at endangered, threatened, locally rare, and Regional Forester Sensitive species, we cannot tell if the proposed actions will comply with this requirement.

## **X. The Agency’s Purpose and Need Statement is Unworkable**

NEPA requires the Forest Service to provide with its project proposals a statement of purpose and need which “shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action.”<sup>482</sup> These statements are necessary to inform the public exactly what the agency intends to do. “NEPA forces agencies to explain what it is they seek to do, why they seek to do it, what the environmental impacts may be of their proposed action, and what alternatives might be available

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<sup>477</sup> Draft EA, 108.

<sup>478</sup> Soil Report, 52.

<sup>479</sup> Soil Report, 25 (defining project area for purposes of soil impacts as 85,587 acres).

<sup>480</sup> Hydrology Report, 4.

<sup>481</sup> 16 U.S.C. § 1604(g)(3)(B).

<sup>482</sup> 40 C.F.R. § 1502.13; *see* FSH 1909.15 § 11.21.

to the agency that might lessen environmental impact. Without a clear ‘what and why’ statement, the public is kept in the dark.”<sup>483</sup> Coherent purpose and needs statements are critical because “the available reasonable alternatives are dictated by the underlying purpose of the proposed action.”<sup>484</sup> “[A] purpose can [] be unreasonable if the agency draws it so broadly that an infinite number of alternatives would accomplish [it] and the project would collapse under the weight of the possibilities.”<sup>485</sup> The “what and why” statement for this project does not facilitate compliance with any of these requirements.

This was the purpose and need statement at the scoping stage for this project:

The proposed action for the Foothills Landscape project is organized to first describe the overall need of the project. A need is the overarching theme that was discovered while comparing the existing environmental conditions to the desired, achievable future conditions. In order to identify the underlying purpose of the project regarding the four primary needs, the interdisciplinary team incorporated the objectives from the Forest Plan, the US Forest Service Watershed Condition Framework, Georgia’s State Water Regional Plans, the Georgia State Wildlife Action Plan, Community Wildfire Protection Plans, Georgia’s Forest Action Plan, Shortleaf Pine Restoration Plan, Recovery Plans for Threatened and Endangered Species in the project area and information provided through the collaborative effort.<sup>486</sup>

As we explained in our scoping comments this “is so broad as to make the project purpose virtually anything.” When we submitted those comments it was unclear to us what the “four primary needs” referenced in the purpose and need statement were. It now appears that they encompass “biological integrity, resilience to disturbance, connectivity, and soil and water quality.”<sup>487</sup> That does not help further define the project purpose.

In its response to scoping comments, the Forest Service developed a “purpose and need” statement that is three full pages of bulleted points.<sup>488</sup>

The purpose and need section of the Draft EA is 29 pages<sup>489</sup> “organized into four categories [ ] required to maintain and improve watershed and ecological conditions: improving biologic integrity, increasing the ecosystem’s resilience to disturbance, maintaining or restoring

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<sup>483</sup> *Soda Mountain Wilderness Council v. Norton*, 424 F. Supp. 2d 1241, 1262 (E.D. Cal. 2006) (emphasis added).

<sup>484</sup> *Wilderness Soc. v. U.S. Forest Serv.*, 850 F. Supp. 2d 1144, 1163 (D. Idaho 2012).

<sup>485</sup> *Webster v. U.S. Dep’t of Agric.*, 685 F.3d 411, 422 (4th Cir. 2012)(citation omitted).

<sup>486</sup> Foothills Landscape Proposed Action (October 2017), 5.

<sup>487</sup> *Id.* at 1.

<sup>488</sup> Scoping Summary Report, 39-41.

<sup>489</sup> Draft EA, 13-42.

connectivity, and supporting high water quality and soil productivity.”<sup>490</sup> The Draft EA then includes a 2-page “Supporting Purpose and Need.”<sup>491</sup> Materials provided in public meetings in December 2019 also included a “Project Vision”:

To create, restore and maintain ecosystems that are more resilient to natural disturbances. Specifically, the Forest Service is seeking to enhance and provide quality habitat for rare and declining species, as well as desired game and non-game species; to reduce hazardous fuel loading across the landscape to diminish damaging wildfires; to improve soil and water quality; to provide sustainable recreation and access opportunities; and to awaken and strengthen a connection to these lands for all people.

The Draft EA provides that the project is “needed because active restoration on a landscape scale is critical to moving existing conditions within the project area towards meeting desired, achievable future conditions.”<sup>492</sup>

This is not a workable purpose and need articulation. Its simplest articulation seems to be that the agency plans to: improve biologic integrity, increase the ecosystem’s resilience to disturbance, maintain or restore connectivity, and support high water quality and soil productivity to move the project area towards meeting desired, achievable future conditions. That explanation is so vague that anything can fall into it. What is the agency specifically seeking to accomplish here? If there are no specific objectives, then perhaps there is no need for action at this point. If there are specific objectives, we remain willing to work with the agency on those goals. But all the agency has provided so far is a general statement that justifies almost any type of work on the forest.

This is not just a nit-picky concern. It has real consequences for this project. Practically, the agency’s amorphous purpose and need statement has resulted in an amorphous preferred alternative. The foundation of its analysis is an indeterminate purpose and need statement that does not require it to do or consider anything in particular - except “work” generally, somewhere on the forest – and that has produced a shapeless project proposal. There are no recommendations to do anything at certain places, just a commitment to do something on the ground in the future. There is no commitment to do a specific amount of work or do it in any particular timeframe. There appears to be no way to tell when or if the purpose and need for the project is achieved. The agency’s proposal is just as ungrounded as its purpose and need statement.

This lack of specificity is not without legal consequence. A project’s “reasonable alternatives are dictated by the underlying purpose of the proposed action.”<sup>493</sup> The purpose and

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<sup>490</sup> Draft EA, 13.

<sup>491</sup> Draft EA, 43-44.

<sup>492</sup> Draft EA, 13.

<sup>493</sup> *Wilderness Soc. v. U.S. Forest Serv.*, 850 F. Supp. 2d 1144, 1163 (D. Idaho 2012).

need statement here produces an immense number of reasonable alternatives. To the detriment of the public however, as discussed below, the agency uses the ambiguity of its purpose and need statement to wrongfully dismiss reasonable alternatives.

#### A. The Agency Does Not Disclose the Full Purpose of This Project

The agency's purpose and need statement is also flawed in a separate way – it does not disclose an underlying purpose of this project.

It is not news that the Forest Service is being asked to do more—to restore ecological systems degraded by historical logging and other land uses, to support local economies, to protect communities from wildfire, to maintain a sustainable network of roads and trails for access and recreation—but its budget has not kept pace with public or political demands.

By 2022, the Forest Service has set a national timber target of 4.2 billion board feet—a 45% increase over 2017 outputs, and the highest harvest level on the National Forest System in 25 years. Region 8 is expected to bear a disproportionate share of this burden: In 2017, Region 8 sold 0.56 billion board feet,<sup>494</sup> but its target for 2022 is .78 billion board feet.<sup>495</sup> This increase would account for 17% of the national total, despite the fact that Region 8 includes only 7% of the land in the National Forest System.

Outputs have already increased substantially, but as Region 8 recently explained to the Washington Office, the timber sale pipeline is drying up: “The Southern Region has depleted much of its shelf volume over the last 2 years of increasing timber outputs. As a result, the majority of forests have about 6-9 months of shelf volume remaining.”<sup>496</sup> Though they lack the capacity to scale up responsibly, the forests of Region 8 are expected to replenish and grow their shelf stock—i.e., to complete NEPA for enough acres to meet out-year targets.

This is undoubtedly an underlying “need” that the Foothills Project would serve. As the Forest explains, the type of work expected to occur under the Foothills Project is not different from the type of work that has been occurring in prior, site-specific projects: “The locations and timing of treatments would *continue* to be selected and prioritized using a systematic process that evaluates restoration needs, determines appropriate treatments to address those needs (through use of decision matrices) and balances implementation of those activities with operational feasibility, agency capacity, and social considerations, to the extent possible.”<sup>497</sup> The advantage of Alternative 2, according to the Forest, is that its future program of work can be authorized

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<sup>494</sup> Region 8 PTSAR for FY 2017, available at [https://www.fs.fed.us/forestmanagement/documents/ptsar/2017/2017\\_Q1-Q4\\_PTSAR\\_R08.pdf](https://www.fs.fed.us/forestmanagement/documents/ptsar/2017/2017_Q1-Q4_PTSAR_R08.pdf)

<sup>495</sup> Letter from Ken Arney to Deputy Chief, National Forest System, “Region 8 Implementation Strategy for Improving Forest Conditions” (June 8, 2018) included as Attachment 3.

<sup>496</sup> *Id.*

<sup>497</sup> Draft EA at 11 (emphasis added); *see also* Attachment 1.

now, under a single decision, rather than in a series of decisions.<sup>498</sup> More volume on the shelf now,<sup>499</sup> with the work of identifying stands and treatments deferred to the future.

Unfortunately, the Draft EA fails to acknowledge this need behind the project. This is unlawful. The reasons the agency gives to the public must be genuine: the agency cannot rely on a pretextual or contrived explanation in order to avoid legal or political accountability for its actions.<sup>500</sup> We are not suggesting that the proposed harvesting activities could not also further other objectives but pretending that timber targets are not involved in this calculation is simply a misrepresentation. And certainly those timber targets will drive project design as the agency selects areas to harvest based, in part, on their commercial value rather than solely the ecological benefits of harvesting certain areas. As we have stated numerous times, having timber objectives is not necessarily a problem on the forest, but the agency needs to be upfront about its motivations and not pretend like this is not a factor in its decisionmaking

## **XI. The Agency Arbitrarily Rejects Reasonable Alternatives**

Regardless, NEPA requires federal agencies to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.”<sup>501</sup> Agencies must “[u]se the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment.”<sup>502</sup> Accordingly, “[a]n agency must look at every reasonable alternative, with the range dictated by the nature and scope of the proposed action, and sufficient to permit a reasoned choice.”<sup>503</sup> The failure to consider a “viable but unexamined alternative” will render the analysis inadequate.<sup>504</sup> Dismissing alternatives without objective exploration also violates NEPA,<sup>505</sup> as does unreasoned

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<sup>498</sup> Scoping Summary Report, 8-12 (discussing rejection of Alternative D).

<sup>499</sup> Alternative 2 would authorize 10,500 acres of regeneration harvest. Vegetation Report, Table 38. Assuming that each of those acres yields 3,000 board feet (2.5 ccf), this project’s regeneration harvest alone would put 31.5 million board feet on the shelf, not counting commercial thinnings and woodland treatments.

<sup>500</sup> *Dep’t of Commerce v. New York*, 139 S. Ct. 2551, 2575–76 (2019) (“The reasoned explanation requirement of administrative law, after all, is meant to ensure that agencies offer genuine justifications for important decisions, reasons that can be scrutinized by courts and the interested public”).

<sup>501</sup> 42 U.S.C. § 4332(2)(E).

<sup>502</sup> 40 C.F.R. § 1500.2(e); *see also* 40 C.F.R. § 1508.9(b) (EAs must discuss alternatives); *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1229 (9th Cir. 1988) (federal action involving unresolved conflicts as to proper use of resources triggers NEPA’s alternatives requirement, whether or not an EIS is also required).

<sup>503</sup> *Idaho Conservation League v. Mumma*, 956 F.2d 1508, 1520 (9th Cir. 1992) (internal citations omitted); *see also Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810, 816 (9th Cir. 1988), *rev’d on other grounds*, 490 U.S. 332 (1989) (reasonable range of alternatives framed by purposes of project).

<sup>504</sup> *Dubois v USDA*, 102 F.3d 1273, 1289 (1st Cir. 1996), *cert. denied sub nom. Loon Mt. Rec. Corp. v. Dubois*, 521 U.S. 1119 (U.S. 1997) (*quoting Resources Ltd. v. Robertson*, 35 F.3d 1300, 1307 (9th Cir. 1994)).

<sup>505</sup> 40 C.F.R. § 1502.14.

and arbitrary rejection of reasonable alternatives. The agency's evaluation of project alternatives fails to meet these requirements.

We asked the agency to consider several project alternatives in our Scoping Comments on this project. First we asked the agency to “[d]evelop an alternative that discloses where site-specific activities will occur and assesses the impacts of those activities in its environmental analysis.”<sup>506</sup> That alternative received no consideration. The alternative did not ask the agency to substantively change any of its proposed activities so it plainly would have met the purpose and need for the project, only through a different process. The agency's failure to give this any consideration at all renders its Draft EA inadequate.

We also asked the agency to “[d]evelop an alternative using consensus-based treatments with widespread support (of which we think there are many) developed during collaborative discussions.”<sup>507</sup> The agency rejected that alternative because of restrictions in the Federal Advisory Committee Act (“FACA”).<sup>508</sup> We should have used a word other than “consensus” but we were not soliciting a violation of FACA; we were asking the agency to develop an alternative that focused on activities for which there was “widespread support.” We had hoped this might allow us to positively resolve “conflicts concerning alternative uses of available resources.”<sup>509</sup> We continue to believe the public would be better served if the agency developed an alternative along those lines rather than continue to move forward with its controversial preferred alternative. There is so much common ground to take advantage of.

The remaining rejections of alternatives all represent an abuse of the agency's indeterminate purpose and need statement. This approach is troubling. Crafting a vague purpose and need statement so the agency can interpret it to support all of its preferred activities but simultaneously use it to reject alternatives submitted by the public is a flagrant violation of NEPA.

The agency rejected an alternative that “focuses heavily on connecting people to the land through outdoor recreation opportunities”<sup>510</sup> on the grounds that it “does not address the purpose and need for maintenance and restoration of yellow pine, oak/oak-pine stands, woodland communities, aquatic habitat, wildlife habitat, and rare communities.”<sup>511</sup> The agency's purpose and need statement *does not say anything* about yellow pine, oak/oak-pine stands, woodland communities, aquatic habitat, wildlife habitat, or rare communities; it is about amorphous general concepts. The agency cannot read specific requirements into its vague purpose and need

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<sup>506</sup> Comments from Georgia ForestWatch, Sierra Club, and Southern Environmental Law Center (Dec. 22, 2017), 53.

<sup>507</sup> *Id.* at 53.

<sup>508</sup> Scoping Summary Report, 8.

<sup>509</sup> 42 U.S.C. § 4332(2)(E).

<sup>510</sup> Scoping Summary Report, 8.

<sup>511</sup> *Id.*

statement without rewriting it. If the purpose of this project is related to yellow pine, that needs to be disclosed to give the public a fair opportunity to recommend alternative actions.

Worse, the agency rejected an alternative that would have implemented the same activities but in a manner that was “in-line with current budgetary expectations and capacity constraints” because that alternative did not “*fully* meet the purpose and need.”<sup>512</sup> It cannot be true that an alternative developed to stay within the agency’s budget is unreasonable or does not meet the purpose and need for a project. Stated differently, the purpose and need statement is *per se* invalid if it requires the agency to implement an alternative outside of its budget. This is clearly an arbitrary rejection. The agency’s assertion that it would not “fully” meet the purpose and need is also further abuse of its exceedingly vague purpose and need statement which has no quantifiable objectives.

The agency rejected an alternative that would have avoided timber harvests in areas the Forest Service designated as unsuitable for timber production in its Forest Plan because “the project would not be able to modify the forest composition in the lands within Management Prescriptions that are not suitable for timber production.”<sup>513</sup> Again – nothing in the purpose and need statement mentions the need to “modify forest composition” in unsuitable areas. The 29-page articulation of the purpose and need for the project does not mention suitability, nor does the “supporting purpose and need statement.”<sup>514</sup> The agency cannot read this requirement into its unclear purpose and need statement now in an effort to avoid considering reasonable alternatives.

The agency rejected an alternative that would have focused early successional habitat creation in areas with low existing diversity by pointing to a Forest Plan goal.<sup>515</sup> First, it is unclear why the proposal does not comply with the Forest Plan goal. But more to the point, the goal is nowhere to be found in the purpose and need statement. The public has never been informed that all Foothills Project alternative proposals had to achieve a specific Forest Plan goal. The agency cannot read that into its purpose and need statement now to avoid considering viable alternatives.

Finally, the agency rejected an alternative that would have avoided activities in Inventoried Roadless Areas under the assertion that “[t]aking no action in the portions of the IRAs in the landscape would not meet the purpose and need of the project.”<sup>516</sup> Even the 29-page articulation of the purpose and need statement in the Draft EA says nothing about Inventoried Roadless Areas. Without question, the agency could meet its purpose and need if it avoided those areas. This is an unreasoned and arbitrary rejection of a viable alternative.

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<sup>512</sup> Scoping Summary Report, 11.

<sup>513</sup> Scoping Summary Report, 13.

<sup>514</sup> Draft EA, 13-45.

<sup>515</sup> Scoping Summary Report, 13.

<sup>516</sup> Scoping Summary Report, 14.



Overall this reflects an abuse of the NEPA process. The agency cannot use a vague purpose and need statement to give it maximum flexibility to find that actions are either within or outside the purpose and need for the project. This wrongfully and illegally hollows out the “heart” of NEPA: alternatives analysis.<sup>517</sup> Multiple avenues are available to the agency to reject proposed alternatives but constantly rearticulating its purpose and need statement is not one of them. The range of reasonable alternatives would shrink if the agency more narrowly defined the purpose of this project but as long as it continues to use an extremely expansive purpose and need statement, it will have to consider an extremely wide array of potential alternatives.

The lack of any site-specific proposals as part of this project also threatens to hollow out NEPA’s alternatives analysis mandate, and is further indication the agency’s overall approach does not comply with NEPA. For instance, what if we requested that the agency develop a proposal that used fewer “temporary” roads? The agency cannot evaluate that alternative because it does not know how many temporary roads it will use. Similarly, what if we asked the agency to focus activities in a particular watershed first? The agency has nothing to compare that to because the preferred alternative includes no site-specific actions and no timeframe. Or what if we asked the agency to develop an alternative that was more protective of scenery? Again, there is nothing to compare to because nothing specifically has been proposed.

Related, the agency’s use of the no-action alternative as a tool to compare the effects of its preferred alternative is only minimally useful because the agency does not have adequate baseline conditions for either alternative, and the lack of site-specific proposals in its preferred alternative frustrates any meaningful comparison.

Nevertheless, we ask the agency to give objective and meaningful consideration to alternatives B-G which it has unreasonably rejected<sup>518</sup> as well as the following alternatives:

- An alternative that provides site-specific NEPA compliance for each annual out-year meeting proposed in the Draft EA.
- The Council on Environmental Quality has explained that environmental analysis “more than 5 years old should be carefully reexamined.”<sup>519</sup> The agency should consider an alternative that commits to supplementing its NEPA analysis every five years.
- The agency should consider an alternative that uses the Draft EA as programmatic NEPA analysis and tiers concise, site-specific environmental analyses to the programmatic analysis.

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<sup>517</sup> 40 C.F.R. § 1502.14

<sup>518</sup> Scoping Summary Report, 8-14.

<sup>519</sup> Council on Environmental Quality, Forty Most Asked Questions Concerning NEPA available at <https://www.energy.gov/sites/prod/files/2018/06/f53/G-CEQ-40Questions.pdf>.

The agency's alternatives analysis is also flawed because it presents a skewed comparison of Alternative 2 and the no-action alternative. The Draft EA cannot support a DN/FONSI because it fails to forthrightly describe the consequences of the decision being made. The Draft EA presents two alternatives: No Action and Alternative 2. In describing the No Action Alternative, the Forest states that "[a]ll current actions and management ... would continue in its [sic] present state."<sup>520</sup> As for any future actions, however, the Forest pretends that *nothing* would occur under the No Action Alternative. According to the analysis, "no activities" would take place to restore biological integrity, period.<sup>521</sup> This is plainly false. In fact, the Forest Service explicitly decided that it would not follow a custodial management approach during plan revision in 2004.<sup>522</sup>

If Alternative 2 were not chosen, the Forest Service would not stop working; it would simply continue using the same project development process it has used in the past—namely, analysis of site-specific proposals through the NEPA process.<sup>523</sup> The Forest's mistake here is fundamental, and it pervades the Draft EA. The Forest purports to analyze Alternative 2 as a set of actions, but the agency is not proposing particular actions *now*; it is proposing a new framework and process to select actions in the *future*. The alternative to this new process is not to do nothing at all, but rather to continue using the existing process (site-specific NEPA) to propose and refine future actions, consistent with the forest plan.

The Forest also overstates the benefits of Alternative 2. In rejecting Alternative D, in which the agency's work would have continued at the current pace, the Forest Service explained that an alternative "in-line with current budgetary expectations and capacity constraints" would not be considered in detail "because it does not fully meet the purpose and need of the project"—which is to say that Alternative D does not include as many acres' work as Alternative 2.<sup>524</sup> But the Forest cannot dismiss one alternative because of fiscal constraints while ignoring those same constraints to promote the preferred alternative. By pretending that Alternative 2 would not be hobbled by the same fiscal constraints as Alternative D, the Forest wildly overstates the comparative benefits of Alternative 2. It is not "reasonably foreseeable" that these benefits would occur under Alternative 2, but not under Alternative D or the No Action Alternative.

Because nothing (save capacity) prevents the Forest Service from pursuing or achieving its stated purpose and need in successive, site-specific projects, then the differences between Alternative 2 and the No-Action Alternative (or Alternative D, for that matter) cannot be expressed simply in terms of *whether* physical benefits or harms will occur. Thus, for example, it

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<sup>520</sup> Draft EA at 45.

<sup>521</sup> Vegetation Report at 40 *et seq.*

<sup>522</sup> See FEIS at 2-8 to 2-10 (rejecting Alternative C).

<sup>523</sup> See FSH 1909.15 § 14.2 (explaining that when evaluating a programmatic change, the no-action alternative would be a continuation of the ongoing program of work).

<sup>524</sup> Scoping Summary Report, 25.

is simply false to assert that “no actions . . . would be undertaken” in the No-Action Alternative to restore degraded communities, address insect and disease risks, or manipulate successional stages.<sup>525</sup> Even if the Forest decides not to proceed with Alternative 2, it will continue to pursue these same goals with site-specific projects as it has historically done.

The Forest is not choosing in this decision whether or not to restore degraded terrestrial and aquatic ecosystems; it is choosing a *process* that it will use to select and vet the site-specific actions intended to further its restoration goals. Thus, even if the condition-based approach were lawful, the Draft EA would be required to compare the environmental consequences of those different *processes*. It does not.

This is a fundamental flaw in the analysis: the Draft EA does not offer any meaningful description of how Alternative 2 will more “fully” meet the project’s purpose and need.<sup>526</sup> If on-the-ground work will proceed more quickly under Alternative 2, where will the time and cost savings be found? Will they be found by spending less time in the field undertaking botanical or other surveys? Will they be found by cutting out public input? Will they be found by ignoring public complaints that, under ordinary project development processes, would have been addressed by refining and improving the project?

## **XII. The Forest Service Has Not Satisfied NEPA’s Hard Look Standard**

“Section 101 of NEPA declares a broad national commitment to protecting and promoting environmental quality.”<sup>527</sup> That commitment is “realized through a set of ‘action-forcing’ procedures that require that agencies take a ‘hard look’ at environmental consequences, and that provide for broad dissemination of relevant environmental information.”<sup>528</sup>

This “hard look” must include “some quantified or detailed information” supporting the conclusions of an EA.<sup>529</sup> An “agency has satisfied the ‘hard look’ requirement if it has examine[d] the relevant data and articulate[d] a satisfactory explanation for its action including a rational connection between the facts found and the choice made.”<sup>530</sup> The “hard look” requirement is violated when “the agency failed entirely to consider an important aspect of the problem.”<sup>531</sup> The agency has failed the hard look standard here on numerous fronts.

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<sup>525</sup> See Vegetation Report at 40, 45, 51, 53, 56, 58, 60, 62.

<sup>526</sup> See Scoping Summary Report, 11.

<sup>527</sup> *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989).

<sup>528</sup> *Id.* at 350 (citations omitted).

<sup>529</sup> *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 993 (9th Cir. 2004) (citations omitted).

<sup>530</sup> *Black Warrior Riverkeeper, Inc. v. U.S. Army Corps of Engineers*, 833 F.3d 1274, 1285 (11th Cir. 2016) (citation omitted).

<sup>531</sup> *Sierra Club v. U.S. Army Corps of Engineers*, 295 F.3d 1209, 1216 (11th Cir. 2002).

#### A. Consistent Problems Throughout the Agency's Hard Look Analysis

There are several overarching errors that plague the agency's hard look analysis.

First, the agency cannot take a hard look at the impacts of its action if it does not know where that action will take place. The most the Forest Service has disclosed is that it plans to complete tens of thousands of acres of commercial logging, masticating, prescribed burning, and herbicide application somewhere within a 157,000-acre area. The Southern Appalachians have some of the most diverse ecosystems in the world. The Foothills Project area is extremely diverse and includes a wide range of slopes, soil types, soil erodibility and stream types. Rainfall varies drastically across the area. Some streams in the project area are pristine, others are severely degraded. Past management practices have significantly altered some parts of the forest, while other areas remain intact. There is almost nothing uniform about the area as a whole. *Where* actions occur in this area is directly and inseparably related to the *effect* those actions will have. If the Forest Service does not know where its actions will take place, it cannot know what the effect of those actions will be. This problem is apparent throughout the agency's analysis as it tries to disclose the impact of unknown actions in undecided locations.

Related, because the agency has no site-specific proposals, it does not know when actions may overlap in space. Logging and burning the same piece of ground may cause more severe impacts than only logging it. Certainly two separate logging treatments on the same piece of ground will cause more intense impacts. The agency's proposal allows for this possibility but it cannot assess the impacts of multiple actions on the same piece of ground because it does not know: 1) if that will even occur and 2) if it were to occur, where it would happen.

Effectively, the Draft EA discloses impacts at a programmatic level. In fact, much of the analysis, particularly of the effects on vegetation communities, closely tracks analysis in the Forest Plan EIS. The agency knows that is not sufficient to authorize a site-specific activity. When the public raised concerns about the adequacy of the agency's analysis during Forest Plan revision, the agency reassured the public that the effects disclosed in the Forest Plan EIS were those at the "programmatic level"; "[s]ite-specific effects will be analyzed at the project level."<sup>532</sup> The agency clearly recognized a gap between the analysis required by NEPA for implementation of site-specific activities and the analysis that occurs at the programmatic level during forest plan revision. The lack of any site-specific proposal here prevents the agency from closing that gap.

Second, the deciding officer for this project has indicated that "the pace and scale" for the work contemplated in the Foothills Project "will be the same" as it is for other projects the agency is currently implementing.<sup>533</sup> If the Forest Service continues at its current pace and scale

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<sup>532</sup> FEIS, App'x G, G-20.

<sup>533</sup> See Attachment 1.

of work, it will take the agency more than four decades to accomplish all of the logging contemplated in the Foothills Project. How can the agency take a hard look *now* at the effects of commercially logging an area in *thirty or forty years*? Does the agency know what needs or values the different areas of the analysis area will be serving, ecologically and socially, thirty or forty years down the road? The answer to that question must be no. Again, the agency has not disclosed where it intends to log either in the immediate or distant future. The agency cannot take a hard look at impacts now for an action that will occur at an undecided location several decades in the future.

Third, a related problem is that because there is no time limit for this project,<sup>534</sup> and at its current pace of work it will take the agency decades to complete all that is proposed, the Forest Service's effort to temporally bind its analysis has unclear meaning. For instance, the "temporal bounds of effects" to aquatic species is "10 years following each treatment."<sup>535</sup> But we do not know when each treatment will be implemented. If a treatment is implemented in 2030, we understand the agency to be purportedly taking a hard look at impacts to aquatic species from 2030 to 2040. How can it accomplish that now in 2020? It does not know what the conditions will be in 2030. Confusingly, what if that same treatment is actually implemented in 2040 – does the agency believe its analysis is valid for either timeframe, 2030-2040 or 2040-2050? We are aware of no evidence that effects over these two time periods will be the same, yet the agency's analysis rests on this assumption. Particularly for rare, threatened, and endangered species, the baseline condition of the species may substantially change in the next several decades and the agency's proposed activities may have a significantly different impact in the future than they would now. We do not understand how the agency can temporally bind its analysis when it does not know when activities will occur.

Fourth, the agency makes two consistent errors in its cumulative impacts analysis. The first error is that the agency uniformly finds that activities occurring on private lands do not contribute to cumulative impact simply by virtue of the fact that the activities are occurring off of the national forest.<sup>536</sup> A cumulative impact "is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) *or person* undertakes such other actions."<sup>537</sup> The cumulative impact of actions on private lands must be considered under NEPA.

The second error the agency routinely makes in its cumulative impacts analysis is that its analysis consists of just providing a list of other past, present, and reasonably foreseeable future

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<sup>534</sup> Scoping Summary Report, 11.

<sup>535</sup> Draft EA, 86.

<sup>536</sup> See e.g., Aquatic Resource Report, App'x B (85-acre prescribed burn on public lands has a cumulative effect on aquatic resources but 95-acre prescribed burn on private lands in the same watershed does not).

<sup>537</sup> 40 C.F.R. § 1508.7 (emphasis added).

actions in the project.<sup>538</sup> There is no *analysis* of the combined effect of these actions, just a list of other actions that could potentially have an effect. Cumulative impacts analysis that does not “offer any substantive analysis of how the present impacts of . . . past actions would combine and interact with the added impacts of the [project under review] . . . [falls] far short of the NEPA mark.”<sup>539</sup>

Fifth, “[w]ithout establishing the baseline conditions which exist . . . there is simply no way to determine what effect the proposed [activity] will have on the environment and, consequently, no way to comply with NEPA.”<sup>540</sup> The agency does not plan to “determine existing baseline conditions” including “stand composition, structure, stand health, age, slope, hydrology or soil conditions”<sup>541</sup> until after NEPA concludes – a straightforward violation of its requirements.

Sixth, even if the agency had baseline data, NEPA requires agencies to use that data to “document the potential environmental impacts of significant decisions *before* they are made, thereby ensuring that environmental issues are considered by the agency and that important information is made available to the larger audience that may help to make the decision or will be affected by it.”<sup>542</sup> Here, the agency’s plan is to “assesses environmental conditions before implementation” but *after making a final NEPA decision*.<sup>543</sup> NEPA does not allow that approach. The agency cannot approve a final action now and then assess environmental conditions and impacts later. The whole point of NEPA is to assess and disclose environmental impacts before making a decision.

The agency’s “Implementation Process Guide” underscores all of these points. At the time NEPA concludes, the agency will not have “determine[d] [areas] proposed for activity,”

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<sup>538</sup> See, e.g., Aquatic Resource Report, App’x B.

<sup>539</sup> *Am. Rivers v. Fed. Energy Regulatory Comm’n*, 895 F.3d 32, 55 (D.C. Cir. 2018); see also *League of Wilderness Defs./Blue Mountains Biodiversity Project v. Connaughton*, No. 3:12-CV-02271-HZ, 2014 WL 6977611, at \*9 (D. Or. Dec. 9, 2014) (finding cumulative impacts analysis deficient under NEPA where it “lists ‘Potential Cumulative Activities’ but does not provide any analysis regarding the activities’ cumulative impacts”).

<sup>540</sup> *Half Moon Bay Fishermans’ Mktg. Ass’n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988); see also *Great Basin Res. Watch v. Bureau of Land Mgmt.*, 844 F.3d 1095, 1101 (9th Cir. 2016) (“Establishing appropriate baseline conditions is critical to any NEPA analysis.”).

<sup>541</sup> Draft EA, 11.

<sup>542</sup> *Wilderness Watch & Pub. Employees for Envtl. Responsibility v. Mainella*, 375 F.3d 1085, 1094 (11th Cir. 2004) (citing *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989)) (emphasis added); see also *Reed v. Salazar*, 744 F. Supp. 2d 98, 102 (D.D.C. 2010) (NEPA “requires federal agencies to take a ‘hard look’ at the environmental consequences of their projects *before* taking action”); *Sierra Club v. U.S. Forest Serv.*, 593 F. Supp. 2d 1306, 1327 (N.D. Ga. 2008) (“The harm sought to be prevented by the NEPA procedural requirements is ‘the added risk to the environment that takes place when governmental decisionmakers make up their minds without having before them an analysis (with prior public comment) of the likely effects of their decision upon the environment.’”) (citation omitted); 40 C.F.R. § 1500.1 (“NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken”).

<sup>543</sup> Draft EA, 11 (emphasis omitted).

“assess[ed] site(s) proposed for activity,” “determine[d] range of appropriate treatment options,” “plan[ned] and acquire[d] data from all necessary surveys and inventories,” or “determine[d] appropriate actions.”<sup>544</sup> The agency cannot take a hard look in the absence of all that basic information. It must compile that information and assess impacts *before* reaching a decision.

Seventh, as discussed throughout these comments, the agency cannot avoid its obligations to perform effects analysis under NEPA by pointing to separate legal requirements under NFMA and its Forest Plan, the Clean Water Act, Endangered Species Act, or any other statute. The existence of those other requirements does not prevent the agency from authorizing activities that may have avoidable or significant impacts on the environment. The agency must take a hard look at impacts to determine if they would be significant and, if so, prepare an EIS. It must also consider alternatives (such as location alternatives) that would cause less harm regardless of whether the effects of the proposal are significant. The existence of other legal requirements has no bearing on whether the agency has fulfilled its procedural duties to understand the impacts of its proposals and consider ways of avoiding them.

We cannot underscore this point enough. Using Forest Plan standards (as an example) to replace impacts analysis is akin to arguing that posted speed limits prevent violations of that limit, obviating the need for speedometers. Drivers do not know if they are exceeding the speed limit without speedometers; likewise, the Forest Service does not know if it will exceed plan standards without assessing the likely impact of its actions.

## B. The Forest Service Has Not Taken a Hard Look at Impacts to Soils

### 1. *The Agency’s Baseline Data is Incomplete and Does Not Appear to Have Been Used to Assess Impacts*

The agency rightfully recognizes that consideration of impacts to soils requires first assessing soil baseline conditions and then evaluating the impact of its project in light of those baseline conditions. But the agency’s attempt at disclosing baseline conditions offers little in the way of meaningful analysis.

Its disclosure of baseline conditions begins by revealing the soil series that compromise 69.4% of the Foothills project area.<sup>545</sup> The role this information plays in the rest of the agency’s analysis is unclear. More to the point, the agency only provides information for roughly 2/3 of the project area. If this information is important to disclose, the agency needs to disclose it for the remaining 1/3 of the area or commit to not affecting that area.

The agency then discloses the erosion rating hazards for the entire Foothills project area. That information reveals that over 50% of the soils in the project area have a “moderate” erosion

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<sup>544</sup> Draft EA, AP49.

<sup>545</sup> Soil Report, 9.

hazard indicating that erosion is likely,<sup>546</sup> and 40% of the project area has an erosion hazard rating of “severe” or “very severe” indicating that erosion or significant erosion is very likely.<sup>547</sup>

Assuming that ground-based logging will not occur on slopes over 35%, the agency then discloses the suitability of soils under that threshold for use of ground-based logging equipment. Nearly a third of those soils are “poorly suited” for operation of “harvest equipment,” while approximately another third are only “moderately suited” which indicates “soil properties are less than desirable” for use of mechanical equipment.<sup>548</sup> Over 98% of the soils on slopes under 35% have a rutting hazard rating of “moderate” or “severe” indicating respectively that rutting is “likely” or will “form readily.”<sup>549</sup> Over half of the soils have compaction ratings of “moderate” or “high.”<sup>550</sup> And a third have “moderate” or “high” potential for damage from prescribed fire.<sup>551</sup>

While this information generally underscores that soils in the project area are not well-suited for commercial logging and other mechanical activities, it offers little information from which to evaluate the effects of this project because where project activities will occur is unknown. For example, is the Forest Service planning mechanical logging on any of the 27,117 acres with a harvest equipment operability rating of “poorly suited”?<sup>552</sup> Or will most of the logging occur on the 25,936 acres with a harvest equipment operability rating of “well suited”? The ratings indicate there will be different impacts based on which soil types are affected. We do not know 1) where these soils are located or 2) if the agency is proposing to use mechanical equipment on these soils. Without that site-specific information, the relevance of the soil baseline conditions is unclear.

The biggest takeaway from these disclosures is that all soils in the project area are not equal. There are likely to be more severe impacts if the Forest Service logs on soils that are “poorly suited” for ground-based harvest equipment, have a “severe” rutting hazard rating, and a “medium” or “high” compaction rating. But those ratings play no role in the remainder of the agency’s analysis. When assessing the effects of its proposed action, the agency treats all soils as if they are equal, with no consideration factored in for these erosion hazard ratings. For example, when considering the effect of “ground-based harvest” on soil stability, the agency concludes that 9,278-12,102 acres will see a reduction in soil stability based on the amount of

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<sup>546</sup> Soil Report, 11-12.

<sup>547</sup> Soil Report, 12.

<sup>548</sup> Soil Report, 14.

<sup>549</sup> Soil Report, 14.

<sup>550</sup> Soil Report, 15.

<sup>551</sup> Soil Report, 17.

<sup>552</sup> Soil Report, 14.



work it is proposing.<sup>553</sup> The degree of that reduction must depend, in part, on soil type; a reduction in soil stability on soils with a “slight” erosion hazard rating may be acceptable while a reduction on soils with a “very severe” rating may not be. Disclosing that soils have different qualities and then completing its analysis as if all soils have uniform qualities is not a hard look.

Finally, the agency acknowledges that it needs more information to accurately assess baseline soil conditions. “The biggest assumption throughout this analysis is that the NRCS soil surveys and other existing data are correct.”<sup>554</sup> As a result, it is “necessary to judge risks to soil stability and productivity based on site topography rather than inclusion in a broad slope class or mapping unit.”<sup>555</sup> Yet the latter approach – which the agency concedes is inadequate – is the one it appears to adopt. Finally, the agency recognizes that “field reviews” are necessary to truly identify existing soil conditions, including “soils already in impaired conditions,” yet the agency has no plans to conduct those reviews until after the NEPA process concludes.<sup>556</sup> If the agency does not know actual baseline conditions in areas where it plans to work, it cannot accurately evaluate the effect of its actions either to determine whether they would be significant or to determine whether there are less harmful ways to meet project needs.

## 2. *Assessing Impacts as Good, Fair, or Poor is Not a Hard Look*

The Forest Service uses indicators and “measures” to “display the estimated effects on the soil resource resulting from each alternative.”<sup>557</sup> The soil indicators are “soil stability,” “soil structure,” “soil strength,” and “soil burn severity.” The analysis measures are “good,” “fair,” and “poor.”<sup>558</sup> These measures are subjective, vague, and inconsistently applied, and do not constitute a hard look.

The Draft EA does not adequately explain how the Forest Service developed these measures. They purport to be “based on current soil conditions” but beyond that conclusory statement, we do not see the connection.<sup>559</sup> The measures are vague and difficult to understand. A “good” measure indicates an activity “meets desired conditions” while a “fair” measure indicates an activity “partially meets desired conditions” and a “poor” measure indicates an activity “does not meet desired conditions.”<sup>560</sup> But the dividing line between a project that is not meeting desired conditions (poor) and partially meeting desired conditions (fair) is unclear. If a project is only partially meeting desired conditions, doesn’t that mean that it is *not* meeting

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<sup>553</sup> Soil Report, 27.

<sup>554</sup> Soil Report, 17.

<sup>555</sup> Soil Report, 3

<sup>556</sup> Soil Report, 3.

<sup>557</sup> Soil Report, 6.

<sup>558</sup> Soil Report, 8-9.

<sup>559</sup> Soil Report, 6.

<sup>560</sup> Soil Report, 8.

desired conditions? More specifically, “good” soil stability is defined as keeping soil cover across 85% of the activity area while “fair” soil stability is defined as loss of soil cover across no more than 15% of the activity area.<sup>561</sup> Those definitions appear to say the same thing; both turn on whether soil cover is maintained across 85% of the activity area, or stated in the inverse, whether soil cover is *not* maintained across 15% of the activity area.

Other aspects of the indicator “measures” appear impossible to evaluate prior to project activity and thus cannot constitute a hard look. For instance, soil stability is considered to be in a “good” condition if “signs of erosions are not visible” but a “fair” condition if “signs of erosion such as pedestals, sheet, rill, and/or gully erosion [are] visible.”<sup>562</sup> There is no analysis of the visibility of erosion features. Similarly, soil structure is considered to be in a “fair” condition if “[w]heel tracks or depressions are evident and moderately deep” but a “poor” condition if “[w]heel tracks and depression are evident and deep.”<sup>563</sup> At this point, we do not know how the Forest Service can evaluate whether wheel tracks are deep or *moderately* deep. Finally, soil burn severity is considered to be “fair” if the “color of the ash is generally blackened with possible gray patches” but “poor” if soil becomes “gray, orange, or reddish at the ground surface where large fuels were concentrated or consumed.”<sup>564</sup> How can the agency assess the color of ash before conducting site-specific activities? These “measures” seem like a reasonable way to evaluate the effect of an action *after* it occurs but they do not seem well-suited to assessing pre-project effects. During NEPA analysis, the Forest’s job is to *predict* impacts, and to gather the information and public input to do so with confidence. Effects monitoring in no way substitutes for this obligation.

### 3. *Compliance With Separate Legal Requirements is Not a Substitute for Taking a Hard Look, and Regardless, Analysis Indicates Effects Will be Significant*

The agency’s ability to accurately predict soil impacts is particularly important with respect to two standards from the Forest Plan and Region 8 regarding soil impacts. These standards are the driving factors in its assessment of “good,” “fair,” and “poor” conditions.<sup>565</sup> The first standard requires that “at least 85% of an activity area [be] left in a condition of acceptable soil productivity” and the second mandates that “soil loss should not exceed the allowable soil loss T-factor.”<sup>566</sup> Promised compliance with these standards is not a replacement for taking a hard look. Indeed, the hard look is a prerequisite to the agency’s ability to say it will

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<sup>561</sup> Soil Report, 8.

<sup>562</sup> Soil Report, 8.

<sup>563</sup> Soil Report, 8.

<sup>564</sup> Soil Report, 9.

<sup>565</sup> See Soil Report, Table 1

<sup>566</sup> Soil Report, 2.

comply with the standards. Regardless, the agency's own analysis shows both standards are likely to be violated.

As we point out throughout these comments, asserting that the agency will comply with requirements enacted pursuant to other laws does not replace NEPA's requirement. Impacts can be significant, necessitating preparation of an EIS, even if they do not exceed the 85% or T-factor thresholds the agency relies on. Two sets of actions (harvesting different stands) could have substantially different effects on soils, even if neither set of actions violated the soil standards or crossed the threshold of "significance." Regardless of those separate requirements, the agency must consider and disclose whether this project will have a significant impact on soils or if there are less harmful ways to choose sites for treatment. The agency has not sought to specifically answer those questions, but its analysis confirms the Foothills Project will have significant impacts.

i. The Agency's Assessment of Compliance With the 85% Threshold is Inconsistent and Circular

The standard the Forest Service relies on to evaluate soil impacts requires "at least 85% of an *activity area* [to be] left in a condition of acceptable potential soil productivity."<sup>567</sup> Yet right off the bat, the agency acknowledges that it cannot evaluate compliance with this standard because it does not know where activities will occur. Instead, because "this project is condition based and specific activity areas have not been identified the [*project*] area will be used to ensure activities will not exceed the 15% threshold."<sup>568</sup> In other words, the agency immediately substitutes the "project area" for the "activity area" – yet that is not what the standard requires. Inconsistently, when assessing impacts to soils under other factors, the agency uses an *activity area* of 85,847 acres, instead of the full 157,000-acre project area.<sup>569</sup> The activity area cannot be *both* of those acreages. And it is unlikely to be either since "activity areas have not been identified."<sup>570</sup> It seems the agency cannot assess compliance with this standard at all, much less use it as a substitute for taking a hard look, if it does not know where it will pursue certain activities.

Moreover, the agency's assessment of compliance with this standard is invalid. On one hand, it asserts that the 85% standard will prevent it from disrupting soil stability across more than 15% of a 85,847-acre activity area, and on the other hand, it find this impact insignificant because it will not result in an exceedance of the 15% standard across the 157,000-acre project area.<sup>571</sup> The agency has designed its analysis so it is impossible to violate the standard and

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<sup>567</sup> Soil Report, 2 (emphasis added).

<sup>568</sup> Soil Report, 2.

<sup>569</sup> See, e.g., Soil Report, Table 7.

<sup>570</sup> Soil Report, 2.

<sup>571</sup> Soil Report, Table 16.

thereby show significant impacts. Its analysis assumes that 15% of an 85,847-acre activity area will see a detrimental decrease in soil stability but then asserts it complies with the 85% standard by converting that activity area to 157,000 acres.<sup>572</sup> The use of two different acreages for the “activity area” is unreasonable, arbitrary, and provides little in the way of useful information; 15% of 85,847 acres will never exceed 15% of 157,000, acres ensuring the Forest Service always complies with its standard.

Just as problematically, the agency inconsistently applies this 85% threshold. When evaluating the impact to soil stability from ground-based harvesting *only*, the Forest Service concludes that 15% of an 85,847-acre activity area (approximately 12,102 acres) would experience detrimental soil stability impacts, but then uses the sleight of hand discussed above to find those impacts “[n]ot significant because 15% or more soil cover should remain in place” across the 157,000-acre project area.<sup>573</sup> But when evaluating the impact to soil stability from *all* project activities (not only ground-based harvesting) the Forest Service concludes that 84,086 acres would experience detrimental soil stability impacts.<sup>574</sup> That acreage is equivalent to approximately 53% of the entire Foothills 157,000-acre project area (or activity area depending on which frame the agency is using). If an impact to 12,102 acres was “not significant” because 12,102 acres is less than 15% of the activity area, then an impact to 84,086 acres – 53% of the activity area – clearly is significant even under the agency’s flawed analysis.

Potentially aware of this contradiction, the agency pivots in its assessment of the significance of impacting 84,086 acres, arguing not that it complies with the 15% threshold but that it is “[n]ot significant because the effects are short term.”<sup>575</sup> That statement is inadequately supported and just because an effect may be relatively “short term” does not mean it cannot rise to a significance level for NEPA or NFMA purposes, and on steep slopes a hard rain is all it takes to turn a short-term loss of stability into a long-term loss of soil cover. More to the point, the agency’s application of a double standard here – using the 15% threshold sometimes and the “short term impacts” threshold elsewhere – is arbitrary.

ii. There is No Assessment of T-Factor Compliance

The second standard the agency attempts to use to escape its hard look obligation states that “soil loss should not exceed the allowable soil loss T-factor.”<sup>576</sup> There is no assessment of compliance with this standard. The agency points to three studies to conclude that timber

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<sup>572</sup> Soil Report, Table 16.

<sup>573</sup> Soil Report, Table 16.

<sup>574</sup> Soil Report, Table 26

<sup>575</sup> Soil Report, Table 26.

<sup>576</sup> Soil Report, 2.

harvesting on the Chattahoochee National Forest never threatens exceedances of soil loss T-factors.<sup>577</sup> That conclusion is unsupported both by the cited studies and agency experience.

The Barrett et al., 2016 study examined timber harvesting and soil loss at twenty sites in the Piedmont of Virginia. Specific inputs to that analysis included rainfall amount, soil erodibility factors, slope length, and slope steepness. Those factors all likely varied significantly in comparison to the Foothills area. The study does not appear to be particularly relevant to the Foothills project and certainly does not indicate T-factors will not be exceeded. To the contrary, even in the Piedmont of Virginia, several activities associated with logging including construction and use of roads, decks, and skid trails were predicted to cause exceedance of T-factors applicable in the Foothills area.

The Aust and Blinn, 2004, study reviewed assessments of best management practice (BMP) implementation across the eastern United States over a twenty-year period. The Forest Service asserts that this study shows that “erosion can be reduced 3-6 times less within two to three years after harvest is complete,” but that statement refers to analysis of timber harvesting specifically in New England, not Georgia. Aust and Blinn only summarized three studies from the Southern Appalachians, only two of which are relevant for the Foothills Project and neither of which supports the conclusion that T-factors will not be exceeded. The first study found that “intense rain, coupled with newly installed roads, resulted in a significant increase in stream sediment” which had effects “of long duration.” The second found that timber harvests with the use of BMPs resulted in a fourteen-fold increase of in-stream suspended sediment over control conditions. If anything, the studies highlight why the proposed activities threaten water quality.

The Patric, 1976 study is nearly fifty years old and effectively concludes that timber harvest has little effect on soil productivity under nearly any circumstance. We question that conclusion as it is contradicted by the majority of the agency’s analysis.

The agency recently completed an analysis of soil loss and compliance with T factors for its Union County Target Range Project. There the agency found that simply operating a shooting range was likely to result in soil loss of 3.9 tons/acre/year.<sup>578</sup> To be clear, this only involved operation of a shooting range on mild slopes and did not take into account any clearing, construction, or grading necessary to construct the shooting range. Soil loss of that magnitude would exceed the T-factor for over half of the soils in the Foothills Project area.<sup>579</sup> If the mere operation of shooting range on relatively gentle slopes will result in that much soil loss then it seems inescapable that the tens of thousands of acres of mechanical harvesting on steep slopes and erosive soils will cause soil loss in excess of T-factors as part of the Foothills Project. At the very least, the agency has not completed an analysis indicating that will not occur.

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<sup>577</sup> Soil Report, 24-25.

<sup>578</sup> Forest Service, Union County Target Range Final Environmental Assessment (August 2019), 16.

<sup>579</sup> Soil Report, 12.

If the agency is going to rely on T-factor analysis to dismiss impacts, then it must actually *complete* the analysis. The agency knows how, as it recently demonstrated with the Union County Target Range Project. But an accurate assessment of T-factor compliance will require the agency to consider and disclose where it plans to pursue site-specific activities.

#### 4. *Soil Compaction Appears to Be More Severe Than Disclosed*

Soil compaction is a key factor in the agency's consideration of soil strength and soil structure but the agency's analysis appears to downplay impacts to soil compaction.

First, many of the assumptions regarding soil compaction appear to have been drawn from data collected on the Conasauga District.<sup>580</sup> We are not familiar with this data and ask that the agency disclose it. Its relevance to the rest of the forest is unclear to us. For instance, the data conclude that skid trails typically occupy 3.5% of an activity area but on other projects the agency has indicated skid trails can occupy up to 10% of an activity area.<sup>581</sup>

Second, the agency discloses that the "potential for compaction increases anytime equipment is used on the forest" and that "[m]ost compaction of soil occurs during the first pass of equipment,"<sup>582</sup> but then assumes that skid trails will not result in compaction unless there are "3+ passes"<sup>583</sup> over a certain area. As a result, "secondary skid trails," those with less than 3 passes, are not considered in the agency's assessment of compaction.<sup>584</sup> If "most compaction of soil occurs during the first pass of equipment," then those secondary skid trails should also be considered for compaction purposes.

Third, when assessing soil strength and structure the agency does not consider the impacts from "old temporary roads."<sup>585</sup> Yet the agency also asserts that these "old temporary roads" were likely "either naturally closed with vegetation or were physically closed after the last entry."<sup>586</sup> If that means that the compaction impacts have recovered, then renewed use of these roads is likely to result in new compaction that must be considered in the agency's analysis. If not, then the continuing compaction is a cumulative impact that must be considered. As drafted, compaction on these "old temporary roads" is not considered anywhere in the analysis – whether as a project effect, cumulative effect from a past action, or baseline condition. As a result, the amount of compaction in the project area is underrepresented.

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<sup>580</sup> Soil Report, 22 ("The average level of soil disturbance was calculated from sales occurring mostly on the Conasauga District from 2015 to present.").

<sup>581</sup> Forest Service, Cooper Creek Final Environmental Assessment (Aug. 2018), 43.

<sup>582</sup> Soil Report, 25.

<sup>583</sup> Soil Report, 23.

<sup>584</sup> Soil Report, 24.

<sup>585</sup> Soil Report, Table 16.

<sup>586</sup> Soil Report, 26.

Moreover, assessing the impacts of “new temporary roads” and “old temporary roads” differently reveals that “temporary road” is a misnomer. If reuse of “old temporary roads” has less *additional* impact than “new temporary roads,” as they do under the agency’s compaction analysis, then the “old temporary roads” are not temporary at all but instead have long-term, lasting impacts on the environment even if they are not open to vehicle use.

Fourth, the agency also discounts compaction impacts from mastication. We are confused by the agency’s assertion that “[u]se of heavy equipment for mastication work would expose minimal amounts of soil to erosion and compaction since the equipment would be riding on top of the soil surface.”<sup>587</sup> The fact that it is riding on top of the soil surface is why it compacts the soil. This is also inconsistent with its findings that “[m]ost compaction of soil occurs during the first pass of equipment.”<sup>588</sup> If the Forest intends to use this analytical shortcut, it must show why it is appropriate: how much do masticators weigh as compared to other kinds of equipment? What are the comparative widths and operating pressures of their tires, or the pounds per square inch compacting the soil? The Forest’s NEPA analysis simply does not provide the information a decisionmaker would need to understand the significance of soil compaction issues.

The agency’s Hydrology Report also indicates that compaction will be more severe than disclosed. That analysis indicates that up to 23,140 acres<sup>589</sup> could become “impervious area” defined as “surfaces that prohibit the movement of water from the land surface into the underlying soil,”<sup>590</sup> i.e., compacted soils. In that instance, compacted soils would cover as much as 27% of an 85,847-acre activity area. We recognize that this is not an apples-to-apples comparison, but these wildly varying assumptions and conclusions are indicative of a lack of a hard look.

The biggest difficulty with its assessment of soil compaction is that the agency does not know where activities will occur in the project area. The agency recognizes as much, stating that soil compaction has the “potential to increase if more than anticipated treatments or activities overlapped causing more than three passes of mechanical equipment over the same surface.”<sup>591</sup> The lack of site-specific data also means that the agency does not know if these passes will occur on highly erodible and/or compactable soils, or relatively stable soils. Without that critical information, the agency’s analysis is just a wild guess, insufficient to meet the hard look standard.

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<sup>587</sup> Soil Report, 28

<sup>588</sup> Soil Report, 25.

<sup>589</sup> This number was calculated using the “sum impervious area” column but excluding roads from Table 7 of the Hydrology Report.

<sup>590</sup> Hydrology Report, 2.

<sup>591</sup> Soil Report, 52.

### 5. *The Agency Cannot Dismiss Impacts to “Essential Infrastructure”*

The agency dismisses the impact of its actions to trails, permanent roads, and parking lots because it asserts these facilities are “considered essential infrastructure and are not considered a part of the productive land base.”<sup>592</sup> But that does not mean those actions escape hard look review under NEPA. Changes to “essential infrastructure” can still have significant impacts for NEPA purposes necessitating preparation of an EIS. Differently aligned road and trail networks can have different impacts on soils. Realignment of roads and trails can help protect waters but double the linear impact on soil compaction.

### 6. *The Agency’s Assessment of Cumulative Impacts Appears Incorrect*

The agency discloses cumulative impacts in Table 13 of the Soils Report. That reveals that cumulative impacts to soil stability include 15,463 acres of past activities, 12,650 acres of current activities, and 13,262 acres of future activities.<sup>593</sup> Direct effects to soil stability will occur on 84,086 acres.<sup>594</sup> The agency then concludes that the overall cumulative effect will be a decrease in soil stability across 84,715 acres. It is unclear how this accounts for cumulative effects. If soil stability is currently being affected across 12,650 acres, at a minimum it seems that number should be added to the 84,086 acres of direct impacts from this project for a total of 96,736, or approximately 61% of the entire project area. The agency appears to have made this same error with its assessment of cumulative effects on soil strength, soil structure, and soil burn severity. At the very least, it is unclear what role past, present, and reasonably foreseeable future actions play in this analysis.

### 7. *The Lack of Site-Specific Information Renders the Analysis Insufficient but it is Clear There Will Be Significant Impacts*

Ultimately, the agency is not able to overcome the lack of a site-specific proposal to meet the hard look standard. Its promises to “minimize” rutting and compaction are hollow because the risk of those impacts, which varies site by site, is not accounted for in the analysis. Where activities occur in space is critical for assessing impacts to soils. The agency’s analysis confirms that some soils are poorly suited for mechanical logging while others are better suited. Those differences should drive the agency’s analysis but they cannot because the agency does not know where it will pursue certain activities.

For the same reason, the agency does not currently know “which activities may overlap in space.”<sup>595</sup> The agency admits that whether activities overlap in space affects soil impacts. For instance, “[s]oil disturbance caused by skidding during harvest will increase the probability of

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<sup>592</sup> See, e.g., Soil Report, Table 24.

<sup>593</sup> Soil Report, Table 13.

<sup>594</sup> Soil Report, 53.

<sup>595</sup> Soil Report, 52.



soil erosion after burning.”<sup>596</sup> Thus to gauge soil impacts the agency needs to know if lands will be burned only, or potentially burned and harvested.

Related, the agency appears to be attempting to reserve for itself the ability to make multiple entries in one stand of trees over the life of the Foothills Project. A stand could be commercially thinned one year, burned thereafter, and then commercially harvested to create early successional habitat thereafter. The agency’s assessment of impacts to soils cannot take any of this into account because the agency has not yet made those decisions. The bottom line is that the agency cannot take a hard look at the impacts of actions it has not yet decided to take.

Nevertheless, the analysis here is sufficient to demonstrate that there will be significant impacts to soils necessitating preparation of an EIS. The agency concludes that soil stability will be impacted across 84,086 acres and soil strength and structure will have long-term detrimental impacts across 7,462 acres.<sup>597</sup> Regardless of whether this complies with other legal requirements, it is a straightforward indication that this project may have a significant effect on the environment, necessitating an EIS. The agency may be tempted to say that actual effects will be somewhat less, and that these represent some sort of worst-case scenario. But that argument is unavailing, because the Forest cannot use a worst-case analysis to avoid doing the hard work of accurately estimating impacts, then claim that the real impacts will be lower when it doesn’t get the answer it wanted.

### C. The Forest Service Has Not Taken a Hard Look at Impacts to Water Quality

Without an accurate assessment of impacts to soils the agency cannot accurately assess impacts to water quality but, unmistakably, this project will adversely impact water quality. “Sediment is the primary pollutant resulting from land disturbing activities on National Forest lands.”<sup>598</sup> On the Chattahoochee National Forest specifically, “roads, trails, recreation uses, and logging operations have some of the greatest potential to impact water quality.”<sup>599</sup> This Project contemplates tens of thousands of acres of those activities.

We note that the Forest Service appears to candidly admit that its analysis of impacts to water quality is not meant to satisfy NEPA’s requirements. We agree that it does not. The Hydrology Report is intended to address “compliance with the Clean Water Act and the National Forest Management Act,” not NEPA.<sup>600</sup> Nevertheless, for purposes of commenting we point out why that analysis fails the agency’s hard look obligations, since there is nothing else to hang our comments on.

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<sup>596</sup> Soil Report, 34.

<sup>597</sup> Soil Report, Table 28.

<sup>598</sup> Hydrology Report, 1

<sup>599</sup> Hydrology Report, 1.

<sup>600</sup> Hydrology Report, 2.

1. *The Forest Service Incorrectly Points to Separate Legal Requirements in an Attempt to Satisfy the Hard Look Standard*

The agency's assessment of impacts to water quality suffers from the same fatal flaw as its assessments of other impacts: the agency cannot satisfy the hard look standard by pointing to compliance with other, separate legal requirements. The agency commits that error twice in its consideration of water quality impacts. First, the agency assesses impacts through the lens of Georgia's antidegradation rule required under the Clean Water Act. Nested within that error is a separate error: the Forest Service assesses compliance with Georgia's antidegradation rule by asserting that it will not violate Forest Plan standards. This approach does not meet NEPA's requirements.

The Forest Service assesses impacts to water quality using a single "indicator": "risk to water beneficial uses."<sup>601</sup> As explained in the Draft EA, these "beneficial uses" are designated by the Georgia Environmental Protection Division ("EPD").<sup>602</sup> EPD assigns these uses to meet its obligations under the Clean Water Act (*see infra* 206-208). Activities cannot degrade water quality below the standards associated with the beneficial use assigned by EPD without risking violations of Georgia's antidegradation rule. The Forest Service dismisses impacts to water quality based on its finding that there is a "low risk of sediment affecting water resource beneficial use."<sup>603</sup> The agency's own analysis proves that finding incorrect, but even if it was accurate, it would not meet NEPA's hard look standard.

As we have explained throughout these comments, the agency cannot satisfy its hard look obligations by pointing to compliance with other legal obligations. Here the agency effectively concludes that impacts to water quality will not be significant so long as beneficial uses assigned by EPD are maintained. But the requirement to maintain beneficial uses is related to legal obligations under the Clean Water Act, not NEPA. Impacts to water quality can be significant even if they do not impair existing uses of waterbodies or violate the Clean Water Act. To state this another way, the Forest Service is conflating two questions with different legal significance. NEPA asks: "What is the effect of this project on water quality and may that effect be significant?" and "What alternatives might meet project purposes with less harm to water quality?" The CWA's antidegradation requirement asks: "Will this project degrade water quality below the standards set by the state of Georgia?" The second question does not subsume the first. In fact, as pointed out elsewhere, the agency must conduct the analysis to answer the first question *before* it can answer the second. Here, the agency has failed to consider the degree to which water quality will be impacted by the project, instead simply asserting (incorrectly) that existing uses will be maintained.

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<sup>601</sup> Hydrology Report, 2.

<sup>602</sup> Hydrology Report, 2.

<sup>603</sup> Hydrology Report, 27.

The agency compounds this error by nesting a second legal error in its analysis. The Forest Service assumes that impacts to soils will not occur on more than 15% of the activity area because of the 85% threshold and that therefore it will not violate the “maintain beneficial use” standard.<sup>604</sup> As discussed above, the agency has not shown compliance with this standard and regardless, it is not a replacement for hard look analysis or an adequate way to assess compliance with the antidegradation rule. Whether the Forest Service abides by the 85% threshold or not, it must independently assess the impact of its actions. Further, the threshold was developed for soil resource protection, not water. The Forest Service is using a broad analysis area to gauge compliance with the 85% threshold. Even if it could show compliance, therefore, it would not thereby demonstrate that localized impacts to water quality.

More to the point, complying with Forest Plan standards and Georgia’s antidegradation requirement does not mean that impacts will not be significant. Impacts can occur below those thresholds and still require preparation of an EIS. All the Forest Service concludes is that impacts to water quality will “result in a ‘low risk’ to beneficial uses.”<sup>605</sup> But significance for NEPA purposes is not determined based on maintaining beneficial uses.

The Forest Service knows how to take a hard look at these impacts. As part of its analysis for the Upper Warwoman Project, the Forest Service estimated the amount of sediment in tons per decade that was likely to be discharged to streams as a result of project activities; then the agency calculated the resulting change to in-stream suspended sediment (in light of baseline conditions) for individual streams.<sup>606</sup> The agency concluded that under Alternative Two for that project an “estimated 3,600 tons of sediment may be added to streams over the decade from the proposed vegetation management, burning and road management activities.”<sup>607</sup> In other recent projects in this region the Forest Service has held up the revised universal soil loss equation model (RUSLE) as the “best available data” for assessing impacts of sedimentation.<sup>608</sup> And the Chattahoochee National Forest recently put that model to use to estimate sediment yield as part of Union County Target Range Project.<sup>609</sup> The agency has failed to provide anything remotely close to that level of analysis as part of this project.

The Forest Service was even able to more generally estimate sediment yield to streams when comparing alternatives in the programmatic EIS for the Forest Plan.<sup>610</sup> If the agency can

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<sup>604</sup> Hydrology Report, 22.

<sup>605</sup> Draft EA, 97.

<sup>606</sup> See Forest Service, Upper Warwoman Landscape Management Project Final Environmental Assessment (November 2015), 84-88.

<sup>607</sup> *Id.* at 87.

<sup>608</sup> See Forest Service, Atlantic Coast Pipeline Final Record of Decision (November 2017), 26, available at [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd564397.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd564397.pdf).

<sup>609</sup> See Forest Service, Union County Target Range Final Environmental Assessment (August 2019), 15.

<sup>610</sup> See, e.g., FEIS, 3-58-62.

estimate sediment discharge across the entire forest for different alternatives considered during forest plan revision, it should be able to estimate the amount of sediment that will be discharged because of the Foothills Project.

To be sure, analysis of impacts to water quality would be easier if the agency knew where it planned to build roads (“temporary” or otherwise), ignite prescribed burns, harvest commercial timber, chip vegetation with masticators, and make changes to recreation opportunities. Where those actions occur matters for water quality purposes. But the fact that the agency has chosen to forego any site-specific disclosures or considerations does not lessen its NEPA burden. It must credibly assess and disclose impacts to water quality from its proposed project. If the Forest Service wants to use a “bounded” analysis to avoid saying where it will build roads (which, we should point out, violates NEPA for other reasons), then it must assume that it will build the maximum mileage authorized, in the worst locations authorized, in order to seed the impacts analysis.

In summary, determining compliance with Georgia’s antidegradation rule is not a substitute for taking a hard look at impacts as required by NEPA. Nor can the Forest Service point to standards in its Forest Plan as a replacement for taking a hard look or determining compliance with the antidegradation rule. The Forest Service knows how to take a hard look at water quality impacts; it must go back and complete that analysis.

## 2. *The Agency’s Assessment of Baseline Conditions is Inadequate*

Taking a hard look at water quality impacts involves answering at least two questions: 1) what is the current condition of water quality in the area?; and 2) what effect will the project have on water quality? To answer the first question the agency relies on information from its Watershed Condition Framework and road density data. This information fails to disclose the baseline condition of water quality in the project area.

### i. *The Agency is Misusing its Watershed Condition Framework*

The agency’s Watershed Condition Framework is clear that it cannot be used to accurately assess baseline conditions for site-specific projects and, in any event, is misapplied by the agency, obscuring impacts.

The Watershed Condition Framework is a “reconnaissance-level assessment” of water quality.<sup>611</sup> It is not meant to provide a baseline for site-specific actions but to provide a rough sense of water quality to prioritize watersheds for restoration work.<sup>612</sup> The framework does “not

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<sup>611</sup> Hydrology Report, 4.

<sup>612</sup> See Forest Service, Watershed Condition Framework (2011), 6, available at [https://www.fs.fed.us/biology/resources/pubs/watershed/maps/Watershed\\_Condition\\_Framework2011FS977.pdf](https://www.fs.fed.us/biology/resources/pubs/watershed/maps/Watershed_Condition_Framework2011FS977.pdf).

provide the level of detail expected from site-specific watershed analysis or assessments.”<sup>613</sup> It specifically calls for “additional detailed assessments to validate conclusions, to identify specific watershed problems, and to arrive at treatment solutions.”<sup>614</sup> And it assumes projects in priority watersheds will be subject to “NEPA requirements to assess the potential environmental consequences of the watershed improvement project, evaluation of alternatives, and opportunity for public review and comment.”<sup>615</sup>

With the Foothills Project, the Forest Service throws that approach out the door and attempts to use the Framework as an assessment of baseline water quality conditions in the project area despite the Framework’s explicit warning that it should not be used for that purpose. The Framework is a tool for prioritizing watersheds for restoration work. It is not a replacement for the hard look required by NEPA and indeed assumes the hard look will occur for site-specific activities *after* watersheds are prioritized according to the Framework.

The agency also ignores the Watershed Condition Framework Technical Guidance’s warning that use of the Framework requires forests to “update watershed condition classifications each year to track changes in watershed condition class for performance accountability.”<sup>616</sup> The data the Chattahoochee is relying on is ten years old<sup>617</sup> and may not represent actual conditions even at the “reconnaissance” level. Why does the agency believe it is appropriate to use this data when the guidance accompanying the framework specifically cautions against using outdated information?

Perhaps more problematically, the agency selectively applies the Watershed Condition Framework which skews its consideration of water quality impacts. The Watershed Condition Framework relies on twelve indicators to determine watershed conditions at the reconnaissance level.<sup>618</sup> Using that twelve-indicator analysis, numerous watersheds in the project area are identified as functioning “at risk.”<sup>619</sup> The analysis in the Draft EA looks at only *one* of the twelve indicators. Focus on the single indicator converts fourteen watersheds which the twelve-indicator analysis reveals are functioning “at risk” to functioning “properly.”<sup>620</sup> This is an inaccurate portrayal of the true condition of the watersheds and a false baseline from which to consider the impacts of the project.

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<sup>613</sup> Forest Service, Watershed Condition Classification Technical Guide, 8, available at [https://www.fs.fed.us/biology/resources/pubs/watershed/maps/watershed\\_classification\\_guide2011FS978.pdf](https://www.fs.fed.us/biology/resources/pubs/watershed/maps/watershed_classification_guide2011FS978.pdf).

<sup>614</sup> *Id.*

<sup>615</sup> Watershed Condition Framework, 17.

<sup>616</sup> Watershed Condition Framework Technical Guide, 12.

<sup>617</sup> Hydrology Report, 4.

<sup>618</sup> Hydrology Report, 4.

<sup>619</sup> Hydrology Report, Table 2.

<sup>620</sup> Hydrology Report, Table 2.

The agency's application of the single indicator also obscures impacts. The indicator is derived by looking at two attributes of watersheds: the number of impaired waters (303(d) listed) in the watershed and a vague attribute titled "water quality" which considers whether the watershed "has water quality problems" beyond those listed on the 303(d) list.<sup>621</sup> "If either attribute . . . has a score of less than 'good' it is likely the watersheds are experiencing a higher level of sedimentation. Further increases to this sediment loading would likely result in continued reduction to water quality and could have an effect on the designated use of the stream." The Forest Service obscures the fact that a score of less than good for *either* attribute indicates excess sedimentation by purporting to "average" the two attributes.<sup>622</sup> This averaging exercise only makes water quality in the watershed appear better than it actually is. For instance, Chickamauga Creek received a "good" rating for the "impaired waters" attribute but a "fair" rating for the "water quality" attribute.<sup>623</sup> When the Forest Service "averaged" these "good" and "fair" ratings the overall water quality condition for the watershed was determined to be "good." The "fair" rating disappears in this exercise even though the agency acknowledges that "[i]f either attribute . . . has a score of less than 'good' it is likely the watersheds are experiencing a higher level of sedimentation."<sup>624</sup> This again provides an inaccurate baseline from which to consider project impacts.

Finally, the agency cannot use its Watershed Condition Framework to avoid assessing impacts to individual streams. An action may have a significant effect on the environment, triggering the need for an EIS, even if it does not have a significant effect on an entire watershed. And it can have localized effects that could be avoided by choosing a different, less harmful alternative even if those impacts do not cross the threshold of significance. For instance, the agency could cause impacts meeting the "significance" threshold to numerous streams in different watersheds that appear insignificant when only assessing impacts at the watershed scale. Relying solely on watershed-level analysis obscures impacts to individual streams.

Consideration of impacts to individual streams is particularly important for streams that are not meeting designated uses. Twenty-two watersheds within the project area contain streams that are not meeting designated beneficial uses.<sup>625</sup> There is no analysis of the impact of this project on those streams. Despite the presence of impaired streams, the averaging exercise discussed above leads the Forest Service to designate several of these watersheds as having "good" water quality, sweeping the existence of the impaired streams under the rug. Even if an overall watershed may be functioning normally, the agency must still consider the impact of its

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<sup>621</sup> Hydrology Report, 5-6.

<sup>622</sup> Hydrology Report, 4.

<sup>623</sup> Hydrology Report, 10 Table 2.

<sup>624</sup> Hydrology Report, 4.

<sup>625</sup> Hydrology Report, Table 2.

actions on individual streams, including streams on the 303(d) and 305(b) lists. Its failure to do so here is further indication that it has not taken a hard look.

ii. Road Density Data is Not a Substitute for Baseline Water Quality Information

The second category of information the agency relies on to disclose baseline water quality conditions is road density data.<sup>626</sup> Without other information – such as the proximity of roads to streams, the conditions of roads, the number of roads directly discharging to streams, how the roads are used, or what slopes and soils the roads are built on – this information is only minimally useful. We generally agree that risks to water quality increase as road density increases in a watershed, but *when* exactly those risks exceed certain thresholds depends on site-specific conditions and cannot be reduced to a ratio of road acreage per square mile.

The agency has reached this same conclusion elsewhere:

For example, increasing road density has been correlated with increasing sediment yield in many studies nationwide. *However, the true set of environmental conditions that produce sedimentation are complex, unmeasured, or unknown. Numerous other factors including soils, geology, slope, and road condition also influence sediment yield. The result is that road density is not a perfect predictor of the effects on sediment yield.*<sup>627</sup>

The agency's decades-long effort to conduct rational transportation planning teaches the same lesson: each road's risk depends on a number of factors including hydrological connection, soil types, local rainfall levels, frequency of BMP maintenance, etc. Analysis of the road network's impacts must be summed from the impacts of its constituent parts, not generalized based on density.

The same is true of the disclosure of road stream crossings per watershed.<sup>628</sup> A dozen bridges will cause less impact than a few culverts will cause less impact than a single ford. The fifteen crossings in the Dicks Creek watershed may be causing no impact to water quality while the single crossing in the Cochran's Creek watershed may be cause extreme impacts. Enough information is not provided to describe existing water quality in the project area.<sup>629</sup>

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<sup>626</sup> Hydrology Report, 16.

<sup>627</sup> Watershed Condition Framework Technical Guidance, 8.

<sup>628</sup> Hydrology Report, 20.

<sup>629</sup> To the extent it is relevant, Table 5 of the Hydrology Report miscalculates the road density on Forest Service lands by dividing Forest Service road mileage by the total acreage of the watershed regardless of the percentage of the watershed owned by the Forest Service. It understates road density on Forest Service lands.

### 3. *The Agency Fails to Meaningfully Evaluate Effects on Water Quality*

As discussed above, taking a hard look at water quality impacts involves answering at least two questions: 1) what is the current condition of water quality in the area?; and 2) what effect will the project have on water quality? To answer the second question the agency largely looks to the amount of impervious surface cover in each watershed. This approach falls short on several fronts but even so indicates there will be significant impacts to water quality.

#### i. Schueler's Impervious Surface Model is Misapplied

The approach of assessing impacts to water quality based on impervious surface cover is taken from Schueler (1994). We question the application of that model here as Schueler's assessment was targeted largely to urban watersheds, not forests. The Forest Service also recognizes that "stream responsiveness to imperviousness can vary due to local slope, soils, geology, land and storm water management practices, and other factors"<sup>630</sup> and the import of Schueler's model to the steep slopes and highly erosive soils of the Foothills project area is unexplained and unclear. Regardless, the model is being misapplied.

First, the agency interprets the model to stand for the proposition that measurable effects to watersheds will not occur as long as impervious surface area remains under 10% of the watershed.<sup>631</sup> That is not what the model stands for. The 1994 model suggested watersheds with under 10% impervious surface area would retain their function but not that there would be no measurable effects or significant effects for NEPA purposes.

Second, in 2009 it appears Schueler reconsidered his 1994 approach; this revision has important takeaways for the Foothills Project. The Forest Service's assessment relies on the assumption that keeping total impervious area below 10% per watershed will only cause "moderate risk" to beneficial uses, which the agency adopts as a satisfactory level of risk. This 10% threshold was taken from Schueler's 1994 model. But Schueler's 2009 model<sup>632</sup> questions this assumption, correcting the "misperception that streams with low subwatershed [impervious cover] will automatically possess good or excellent quality."<sup>633</sup> It cautions that "[impervious cover] should not be the sole metric used to predict stream quality when subwatershed [impervious cover] is very low."<sup>634</sup> The 2009 approach concludes that watersheds with impervious cover below 5% can range from fair to excellent stream quality.

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<sup>630</sup> Hydrology Report, 3.

<sup>631</sup> Hydrology Report, 20.

<sup>632</sup> See Attachment 16.

<sup>633</sup> *Id.*

<sup>634</sup> *Id.*



Relying on the 1994 model, the Draft EA also assumes that streams are not “impacted” until imperviousness exceeds 10% of the watershed<sup>635</sup> but the 2009 study also calls that assumption into question, explaining that streams can become impacted at between 5-10% impervious cover.<sup>636</sup> The Foothills Project would cause many watersheds within the project area to exceed this new threshold which, using the agency’s approach, would indicate a likelihood of significant impacts.<sup>637</sup>

ii. The Agency Never Considers Impacts on Water Quality From Prescribed Fire

The effect of prescribed fire on water quality is an afterthought in the Draft EA. With no analysis to back its conclusions, the agency simply states that prescribed fire “may increase the risk of sediment loading” but that this risk is “expected to be low.”<sup>638</sup> This is not a hard look and contradicts past agency findings. For instance, as part of the Upper Warwoman Project, the Forest Service predicted that an “estimated 3,600 tons of sediment may be added to streams over the decade from the proposed vegetation management, burning and road management activities.”<sup>639</sup> Of that amount, “an estimated 2,600 tons of sediment would result from burning . . . and another 300 tons from fire lines.”<sup>640</sup> Prescribed burning can impact water quality. The agency is not free to ignore that impact.

iii. The Agency Cannot Rely On Changes to Recreation Sites, Roads, and Aquatic Organism Passage When Assessing Water Quality Because There is No Commitment Those Activities Will Actually Occur

The agency assumes that improvements to the road system, recreation sites, and aquatic organism passage will help mitigate detrimental impacts to water quality from other activities but there is no commitment that these potentially mitigating activities will actually occur.<sup>641</sup> For instance, at most the agency can say that it “may undertake a few [aquatic organism passage] or other instream restoration projects in a given year.”<sup>642</sup> Without more assurance that these activities will actually occur, they cannot be used to downplay or mitigate other impacts to water quality.

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<sup>635</sup> Hydrology Report, 3.

<sup>636</sup> See Attachment 16.

<sup>637</sup> Hydrology Report, Table 7.

<sup>638</sup> Hydrology Report, 25.

<sup>639</sup> Upper Warwoman Project Final EA, 87.

<sup>640</sup> Upper Warwoman Project Final EA, 88.

<sup>641</sup> Hydrology Report ,26.

<sup>642</sup> Hydrology Report, 26.

iv. The Agency's Impervious Surface Analysis is Not an Accurate Portrayal of Impacts

The thrust of the agency's assessment of the impact of the Foothills Project on water quality is Table 7 of the Hydrology Report. That approach fails the hard look standard for numerous reasons.

First, as explained above, the approach assumes soil disturbance will be limited to 15% of the treated acreage due to a Forest Plan standard but the existence of that standard on its own does not prevent the agency from exceeding it. Rather, impacts analysis is necessary to determine if the proposed activities will exceed the standard. There also appears to be no plan for measuring and enforcing this limitation during project implementation.

Second, the relationship between the significance of impacts and impervious surface area is unclear. Keeping impervious surface area below a certain threshold may suggest that watersheds will continue to function normally but it does not indicate that there will be no significant impact from a proposed activity. A project can have a significant impact even if it does not completely disrupt watershed function. Regardless, the Forest Service appears to assume that impacts will be significant if impervious surface area exceeds 10% of a watershed. The agency's analysis confirms that the project will cause impervious surface area to exceed that threshold in several watersheds indicating significant impacts necessitating clear disclosure in an EIS.<sup>643</sup>

Third, the location of soil disturbance matters for assessing impacts to water quality but is completely unaccounted for in the agency's analysis. For instance, 8,060 acres of the 13,433-acre Bridge Creek watershed may see some mechanical treatment.<sup>644</sup> That indicates there may be some impact to water quality but the degree of impact depends on other factors such as:

- How close will these activities occur to streams?
- Will they be concentrated in subwatersheds that may see particularly acute impacts?
- Will the activities occur on highly erosive soils?
- What is the slope of areas where activities will occur?
- Will multiple activities (burning, logging, etc.) occur on the same piece of ground?

The agency's analysis does not consider any of these factors, instead focusing solely on impervious surface area. Unfortunately, impervious area is only a small part of a much more complicated picture.

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<sup>643</sup> See Hydrology Report, Table 7.

<sup>644</sup> Hydrology Report, Table 7.

Fourth, the agency skews its analysis so it is not capturing the total impervious area in each watershed. Assuming *arguendo* that impervious surface area is an appropriate tool to assess impacts to water quality, the agency can approach the analysis in two ways. It can: 1) focus its analysis on that portion of a watershed owned by the Forest Service or 2) assess impervious surface area across the entire watershed regardless of ownership. The Forest Service employs a hybrid approach that misrepresents impacts by including only impervious surface area on national forest lands in the numerator while using the entire watershed, with both national forest and other ownership, in the denominator (except for roads).

This problem is most easily explained with an example. The Bridge Creek watershed is 13,433 acres. For purposes of impacts analysis, the Forest Service assumes that 1,328 acres will become impervious if the project is implemented, which equates to approximately 9.9% of the watershed. But the 1,328-acre number was derived by looking almost solely at the impacts of the action on Forest Service-owned land, ignoring impervious surface area on private lands within the watershed. It assumes that there are no impervious surfaces off of the national forest except for roads. That is inaccurate. Homes, industrial facilities, parking lots, other land management practices may result in impervious surface area on private lands but are unaccounted for in the analysis. If the agency's analysis is going to turn on the amount of impervious surface area in each watershed, the Forest Service must accurately calculate that area by also including impervious surface on private lands. Remote sensing data is readily available to help answer this question.

Alternatively, the Forest Service could assess impervious area on just the portions of the watershed it owns. The Forest Service owns 8,060 acres of the Bridge Creek watershed, and excluding roads as impervious surfaces, assumes the Foothills project will convert 1,209 acres to impervious surface area, or 15% of the watershed that is owned by the Forest Service. That percentage exceeds the trigger the agency uses in the rest of its analysis to indicate significant impacts to water quality. Either way, the methodology used to choose the numerator must match the methodology used to choose the denominator.

Finally, the threshold of significant impacts using this impervious surface analysis is unclear. As discussed above, it appears that the Forest Service is using a threshold of 10% impervious surface area to indicate significant impacts. The project would authorize activities to exceed that threshold in multiple watersheds.<sup>645</sup> Elsewhere the agency downplays this finding, suggesting impacts are not significant because the 10% threshold will not be exceeded in a "majority of the watersheds."<sup>646</sup> Is the agency's position that impervious surface area can exceed 10% in some watersheds in the project but not rise to a level of significance so long as it does not occur in all watersheds? That position may be convenient, but there is no support for it.

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<sup>645</sup> See Hydrology Report, Table 7.

<sup>646</sup> Hydrology report, 27.

#### 4. *The Agency Never Applies the Outcome of Its Effects Analysis to Its Baseline Data*

Even assuming that the agency has reasonably quantified baseline water quality conditions and assessed the likely impact of its actions, it never puts the two together to explain the effect of its proposal. “Baseline conditions” and “project impacts” remain in separate silos that are never considered in combination.

For example, the agency’s analysis of baseline conditions finds that Millcreek/Rockflat Branch watershed is entirely owned by the Forest Service and is in a “fair” condition indicating that it is functioning at risk.<sup>647</sup> The Foothills project contemplates 6,987 acres of mechanical treatment activity in the 7,027-acre watershed.<sup>648</sup> This will increase impervious area to 15.4% of the watershed.<sup>649</sup> But the agency never discloses the impact of converting 15.4% of a “functioning at risk” watershed to impervious surface area. Based on the approach the agency takes to assessing water quality impacts, this would appear to significantly adversely affect the watershed. NEPA requires the agency to go the final step of disclosing that finding.

#### 5. *The Agency Did Not Take a Hard Look at Cumulative Impacts to Water Quality*

The agency’s assessment of cumulative impacts to water quality is three sentences concluding essentially that there will be no cumulative impact to water quality. The agency discloses other activities that could affect water quality but then dismisses them with no analysis. Simply listing other activities that may affect water quality, with no indication of whether or how they are impacting water quality is insufficient to meet the hard look standard.

The agency wrongfully dismisses the cumulative impact of many activities because they occur on private land. For instance, an 85-acre prescribed burn in the Boggs Creek watershed in 2013 is considered to potentially have a cumulative effect on water quality but a 95-acre prescribed burn in the same watershed in the same year is determined to have no cumulative effect on water quality because it occurred on private land. We are aware of no basis to exclude this impact simply because it occurred on private land. Activities on public and private land can affect water quality and must be considered in cumulative impacts analysis.

More to the point, the agency’s conclusory dismissal of cumulative impact concerns is unjustified. Again, this is best explained with an example. Sumac Creek is listed on Georgia’s 303(d) list as impaired likely due to excess sedimentation.<sup>650</sup> The Foothills Project contemplates 6,654 acres of mechanical treatments in this 8,177-acre watershed which will increase

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<sup>647</sup> Hydrology Report, Table 2.

<sup>648</sup> Hydrology Report, Table 7.

<sup>649</sup> *Id.*

<sup>650</sup> Hydrology Report, 15.

impervious area in the watershed to 12.6%.<sup>651</sup> There are 26 other past, present, or reasonably foreseeable future actions covering thousands of acres in the watershed that the agency discloses will affect water quality.<sup>652</sup> Some of these actions have already occurred. Does the agency have monitoring data indicating these activities had *no effect* on water quality? What basis does the agency have to conclude that there will be no cumulative effect on water quality in this watershed despite the enormous amount of mechanical treatments it will receive? We are aware of no data or analysis suggesting that there will not be a cumulative impact on water quality in this watershed. The agency's conclusory dismissal of this concern is unjustified and arbitrary.

#### 6. *The Agency's Summary of Effects to Water Quality is Unsupported*

The lack of a hard look is underscored by the agency's conclusion that impacts to water quality from the "no action" alternative and its preferred alternative are the same. Both will result in only a "low risk of sediment affecting water resource beneficial uses." Restated, according to the agency's analysis, doing *nothing* in the Foothills Project Area will have the same general effect on water quality as:

- Commercially harvesting 60,000 acres or more of timber;
- Conducting prescribed burns on 50,000 acres;
- Constructing hundreds of miles of fire line with bulldozers;
- Building an untold mileage of temporary roads; and
- Making various undisclosed changes to recreational facilities.

That cannot be right. Clearly, the agency's preferred alternative will have more of an impact on water quality than doing nothing. The fact that the agency's assessment led it to conclude that the impacts will be more-or-less equivalent is further evidence of the lack of a hard look. When other Forests have tried to use "bounded" analysis, they have at least admitted the negative impacts of the worst-case version of the project.

#### D. The Forest Service Has Not Taken a Hard Look at Impacts to Aquatic Species

Stemming from its failure to take a hard look at impacts to water quality, the agency has also failed to take a hard look at impacts to aquatic species.

As an initial matter, the agency should expand the boundaries of its analysis. The Forest Service limits its consideration of impacts to aquatic species to those found on Forest Service lands or one mile downstream<sup>653</sup> but the Forest Plan requires the agency to prioritize watershed improvement actions in areas with "known occurrence of federally-listed aquatic species on National Forest land or within *three stream miles* below the farthest downstream location of

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<sup>651</sup> Hydrology Report, Table 7.

<sup>652</sup> Hydrology Report, AP9.

<sup>653</sup> Aquatic Resource Report, 8.

National Forest ownership.”<sup>654</sup> To give effect to this provision the Forest Service should consider impacts to aquatic species as much as three miles downstream of the Forest Service boundary.

Much like the agency’s assessment of water quality impacts, there appears to be a disconnect between the agency’s disclosure of baseline conditions and its consideration of project impacts. While baseline conditions are generally disclosed, they appear to play no role in the agency’s disclosure of project impacts.

The agency’s general disclosure of baseline conditions reveals that habitat for many aquatic species is degraded. Pool habitat is lacking on the Chattahoochee and most streams have high percentages of streambed covered with fine sediments “which is not desirable for species.”<sup>655</sup> Multiple streams within the Foothills project area are not meeting Georgia water quality standards.<sup>656</sup> Many of the watersheds in the project area are not functioning “properly,” but are instead functioning “at risk.”<sup>657</sup>

While this information is generally helpful, it fails to provide a platform from which to assess impacts to species because “[s]ediment loads are highly variable across project area streams.”<sup>658</sup> That is another way of saying “location matters.” But since the Forest does not disclose which locations will be impacted, it cannot assume that aquatic species will be protected. What if activities are concentrated in the areas of highest risk? The Forest doesn’t admit the possible impacts of the actions it is authorizing under Alternative 2. Some streams may be so impacted that the agency should avoid sediment-inducing activities in the watershed to protect aquatic habitat. Other streams may be capable of withstanding a higher degree of impact without affecting species. The agency apparently has not sought to understand these differences, but they are important to accurately assessing the impact of its actions on aquatic species.

Regardless, baseline conditions appear to play little role in the agency’s assessment of project impacts. For example, the agency discloses that logging “could result in an increase of sediment” to streams but then never considers that finding in the context of determining whether streams can support additional sediment loading. It is very likely that some streams cannot support additional sediment loading, particularly 3030(d) and 305(b) listed streams, without adversely affecting aquatic species. To meet its hard look obligation, the agency must consider which specific streams will be impacted by its actions and disclose, given their existing conditions, the impact of additional sediment discharge to those streams.

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<sup>654</sup> FW-069, Forest Plan, 2-22 (emphasis added).

<sup>655</sup> Aquatic Resource Report, 10.

<sup>656</sup> Hydrology Report, 14-15.

<sup>657</sup> Hydrology Report, Table 2.

<sup>658</sup> Aquatic Resource Report, 10.

The agency's assessment of project effects also has several flaws. The most significant is that the agency assumes sediment-inducing activities outside of the riparian corridor will have no effect on aquatic species. The agency considers only "effects in riparian corridors."<sup>659</sup> This is unsupported and contradicted by the rest of the agency's analysis. The Aquatic Resource Reports itself finds that "[s]tream channel sediment may originate from *upslope* sources."<sup>660</sup> The Report also adopts the conclusion from the Hydrology Report that "10% and greater impervious watershed area typically adversely affects aquatic habitats" regardless of whether that impervious area is in the riparian corridor.<sup>661</sup> As discussed above, the 10% threshold may be too lenient. Nevertheless, the agency's analysis indicates the Foothills Project will cause multiple watersheds to exceed this threshold causing adverse impacts to aquatic habitats.<sup>662</sup>

Second, the agency never clearly discloses the conclusions of its analysis. To assess impacts it uses four "measures" as proxies.<sup>663</sup> For the no-action alternative, the agency discloses the results of its analysis in Table 3 of the Aquatic Resource Report.<sup>664</sup> We were unable to find a conclusion, similar to Table 3 or otherwise, that revealed the effects of the agency's preferred alternative according to the four measures it has chosen as proxies. However, application of those measures reveals the project will have a significant impact on aquatic resources, necessitating an EIS.

The first proxy measure is the "change in percent canopy cover within the riparian corridor."<sup>665</sup> The agency estimates the project "would affect vegetation within the riparian corridor [ ] on an estimated 4,700 acres or 16% of the total riparian acreage."<sup>666</sup> This unmistakably will have an impact on water quality and aquatic species. The agency distances itself from that conclusion by suggesting only 1.6% of the riparian corridor would be affected annually; however, nothing in the project requires activities to be distributed in that manner, and in fact the Forest Service admits that it does not know when or where it will pursue specific activities, or whether some (potentially more sensitive) streams would be affected by a greater concentration of project activities than other streams.<sup>667</sup> The Forest generalizes possible impacts on the riparian corridor across the entire 157,000-acre project area, ignoring the impact in specific watersheds. Undoubtedly, impacts in riparian areas will not be distributed throughout

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<sup>659</sup> Aquatic Resource Report, 19.

<sup>660</sup> Aquatic Resource Report, 10 (emphasis added).

<sup>661</sup> Aquatic Resource Report, 10.

<sup>662</sup> See Hydrology Report, Table 7.

<sup>663</sup> Aquatic Resource Report, 8.

<sup>664</sup> Aquatic Resource Report, 18.

<sup>665</sup> Aquatic Resource Report, 8.

<sup>666</sup> Aquatic Resource Report, 24.

<sup>667</sup> Aquatic Resource Report, 24.

the entire project area annually; rather, logging will occur in specific watersheds that will shoulder the bulk of this impact. The impact to aquatic species in a particular watershed(s) can still be significant even if the activity only affects a smaller percentage of riparian habitat at the project-wide scale.

The agency also does not appear to consider in its direct effects analysis the impact prescribed fire can have on forest canopy in the riparian corridor. Its disclosure of cumulative impacts finds that prescribed fire can at least have a “limited impact” on the riparian canopy.<sup>668</sup> If prescribed fire can have an impact for cumulative effects’ purposes, it should also be considered in the agency’s direct effects analysis.

The second proxy is the “change in the amount of impervious surface in each 6<sup>th</sup> level watershed.”<sup>669</sup> Since the effects analysis in the Aquatic Resource Report focuses solely on impacts in the riparian corridor, this proxy appears to have been missed. However, the Hydrology Report underscores that the project will result in hundreds to thousands more acres of impervious surface area in each 6<sup>th</sup> level watershed.<sup>670</sup>

The third proxy is the “change in aquatic habitat connectivity.”<sup>671</sup> This proxy cannot be evaluated because there are no specific proposals for actions that affect aquatic habitat connectivity or any specific commitment that the agency will pursue these activities in the future. Yet the activities authorized under Alternative 2 could undoubtedly affect connectivity, for example by culverting temporary road crossings.

The fourth proxy is the “acres of potential ground disturbing activities in riparian corridors” in the project area.<sup>672</sup> As explained above, this should not be limited to only ground disturbing activities in the riparian corridor; activities on upland slopes can and will affect water quality and aquatic habitats. The analysis should also be stream specific because, as explained above, significant harvesting in the riparian corridor on one stream could significantly impact that stream even if it is a small percentage of riparian habitat in the overall project area. Regardless, the 3,385 acres of timber harvesting at undisclosed locations in the riparian corridor represents a significant impact. Review of the agency’s Fiscal Year 2013-2016 Monitoring and Evaluation Annual Report indicates this is more logging than has been proposed for the riparian corridor in years.<sup>673</sup>

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<sup>668</sup> Aquatic Resource Report, 18.

<sup>669</sup> Aquatic Resource Report, 8.

<sup>670</sup> Hydrology Report, Table 7.

<sup>671</sup> Aquatic Resource Report, 8.

<sup>672</sup> Aquatic Resource Report, 8.

<sup>673</sup> Chattahoochee-Oconee National Forest, Fiscal Year 2013-2016 Monitoring and Evaluation Annual Report, Table 4.3.1, available at [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd587101.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd587101.pdf).



Moreover, the agency may be underestimating impacts within the riparian corridor. Its disclosure of activities occurring in the riparian corridor assumes the corridor extends for 100 feet on each side of a stream<sup>674</sup> but the Forest Plan identifies riparian corridors based on slope class and some corridors are likely to be larger than 100 feet.<sup>675</sup> As a result, activities that are planned for the riparian corridor may be missed in the agency's analysis.

The agency appears to assume that BMPs will mitigate many of these impacts.<sup>676</sup> But the agency cannot assume that BMPs will mitigate impacts because it does not know where it will pursue logging and other activities and thus cannot judge BMP effectiveness. BMPs are not equally effective in all areas. The Forest Service cannot know if they will be effective if it does not even know where it will build roads, log, etc.<sup>677</sup> Additionally, BMPs are often not installed until after logging units close and skid trails and temporary roads are no longer in use.<sup>678</sup> Thus BMPs do not mitigate adverse impacts incurred while timber units are open, which can last for months at a time. The simple fact is that BMPs, used correctly, help to reduce impacts but they do not prevent them.

The overall conclusion of the agency's analysis is that the project "may affect, [but is] not likely to adversely affect" various protected species.<sup>679</sup> As explained elsewhere, the agency has not provided enough information to support that finding, but regardless, while the finding has legal significance for the Endangered Species Act, it does not answer the question as to whether this project may significantly impact aquatic species under NEPA. The agency's application of its four proxy measures is flawed but is at least sufficient to demonstrate that an EIS is necessary.

#### E. The Agency Has Not Taken a Hard Look at Impacts to Rare Botanical Species and Communities

The agency's assessment of impacts to rare botanical species and communities suffers from many of the same shortfalls as its assessment of impacts to aquatic species. To put a point on the overall problem: The agency does not know where rare botanical species occur on the ground because it has not looked for them. The agency also does not know where it will pursue logging and other activities that may impact these species. How can it take a hard look at impacts to these species if it: 1) does not know where the species are, and 2) does not know if its proposed actions overlap with species' locations? There could be no impact to these species;

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<sup>674</sup> Aquatic Resource Report, 19.

<sup>675</sup> Forest Plan, 3-176.

<sup>676</sup> Aquatic Resource Report, 21.

<sup>677</sup> See *infra* Section XII(S).

<sup>678</sup> See Project Design Features, Draft EA 74-79.

<sup>679</sup> Aquatic Resource Report, 29.

there could be substantial adverse impacts. The agency does not know because it does not have the information before it to answer the question. This is not a hard look.

This problem permeates the agency's entire analysis. For instance, it dismisses impacts to the federally endangered smooth coneflower by stating that "site-specific, project-level planning . . . would be used to ensure there would be no adverse effects to individuals."<sup>680</sup> A promise of future, unspecified mitigation cannot substitute for NEPA analysis. This is the agency's chance: the Draft EA *is the final decision* document but the agency is plainly referring to some future analysis. The agency cannot comply with NEPA by stating it will take a hard look at project impacts *later*. The agency must take the hard look now or commit to additional NEPA in the future, because the public must be involved in any "future" site-specific analysis. The agency often misses rare species in its own surveys, and interested members of the public deserve the opportunity to provide better information before the skidders are turned loose.

Faced with this problem, the agency tries a two-pronged approach to analyzing impacts to species without site-specific information. First, the agency "estimate[s] the effects" to protected species by measuring project-wide changes to habitat where species are expected to be found.<sup>681</sup> This is effectively a management indicator species-style analysis for non-management indicator species. This may indicate change in the amount of habitat available to the species across the entire project area but cannot measure impacts to rare specimens without more information about whether the specimens are in fact located in habitat that is impacted by logging or other activities contemplated in the project. In other words, improving habitat where the species could be but is *not* located does not mitigate impacts to habitat where the species *is* located. And even if overall habitat is improved, impacts to individual specimens or populations can still be detrimental to species overall. This approach fails to take that into account. Some species disperse and colonize well, but others do not, and other suitable streams may be isolated from occupied habitat by factors (like impoundments) that are outside the Forest's control. The Forest's analysis does not account for these differences at all.

This is paired with the assertion that specific locations of protected species "would be protected in the Foothills Landscape under the revised Forest Plan." As we have pointed out elsewhere, the agency cannot point to Forest Plan requirements as a replacement for taking a hard look. The mere existence of the Forest Plan does not protect rare, threatened, or endangered species; the Forest Plan is not self-implementing. The agency must determine the location of species and conduct impact analysis to determine if it is complying with its Forest Plan. The Forest Plan recognizes the same: "Site-specific analysis of proposed management actions will identify any protective measures needed in addition to Forest Plan standards" specifically for protected species.<sup>682</sup> Similarly, the EIS supporting the Forest Plan depends on "[p]roject-level

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<sup>680</sup> Botanical Resources and Rare Communities Report, 75.

<sup>681</sup> Botanical Resources and Rare Communities Report, Table 2.

<sup>682</sup> 9.F.-001, Forest Plan, 3-163.

surveys . . . to ensure that management activities do not adversely affect” protected species, including several at issue here.<sup>683</sup> Site-specific analysis is necessary to assess impacts to these species; the agency cannot just point to its Forest Plan.

This combined approach presents an overly rosy picture of impacts to rare species. The agency uses changes to habitat to assert that the project overall will be beneficial for species and then uses the Forest Plan to imply there will be no adverse effects to individuals. This is not a hard look but a look designed to downplay adverse effects. At the end of the day, the agency cannot take a hard look at impacts to these species if it does not know where they are or where its proposed activities will take place.

#### F. The Forest Service Has Not Taken a Hard Look at Impacts to Terrestrial Species

The agency’s assessment of impacts to terrestrial species suffers from the same overall defect that permeates the rest of the analysis: the lack of any site-specific information or analysis. This is effectively a Forest Plan revision scale of analysis which, as recognized by the Forest Plan, does not provide sufficient detail to consider the impacts of site-specific activities. Moreover, *how* the agency implements the hundred thousand acres or more of vegetation management it is proposing will affect wildlife, yet there is no plan for how that will occur. To be clear, we are not talking about process but how substantively the work will progress on the ground. Wildlife will be affected differently if, for example, the agency pursues thinning harvests for the next decade but does not create early successional habitat. The lack of any site-specific proposal or plan hampers the ability to assess impacts to wildlife. There are as many possible impacts to wildlife as there are permutations of site-specific action under Alternative 2. Each of them would entail benefits for some species and harms for others. And some of them are undoubtedly more efficient (i.e., a better benefit to harm ratio) than others. Yet the Forest’s abstract analysis precludes any comparison between them.

However, some shortcomings are clear. First, the agency excludes federal actions from its consideration of cumulative impacts to species listed under the Endangered Species Act (“ESA”) by pointing to the definition of cumulative impact from the ESA.<sup>684</sup> That may be sufficient for ESA purposes but it is not sufficient for NEPA purposes. Under NEPA, the agency must consider and disclose cumulative impacts to these species from federal actions, including other Forest Service actions.

Second, the agency’s conclusion regarding impacts to eastern small-footed bat is unsupported. The agency concludes that use of a buffer around cliffs and rock outcrops will prevent impacts to roosting or hibernating bats.<sup>685</sup> Activities outside the buffer however, such as

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<sup>683</sup> See, e.g., FEIS, 3-268.

<sup>684</sup> Terrestrial Wildlife Report, 9.

<sup>685</sup> Terrestrial Wildlife Report, 46.

logging or road building, could affect bats through noise, vibration, and changes to the surrounding habitat. It is also not clear that the species exclusively hibernates and roosts in these areas. The buffer will not prevent all adverse impacts. In other words, actions that would be authorized under Alternative 2 *would* cause adverse impacts. It may not be the Forest’s intention to carry out such impacts, but the decision allows them, and so the analysis supporting the decision must disclose them.

Third, assessment of impacts to small-footed bat and tri-colored bat fall short because they assume logging in riparian areas (which will affect the bats) will be spread evenly over the life and area of the project even though that is certainly not the case.<sup>686</sup> There will be times of more intensive logging in specific watersheds, and when that overlaps with bat habitat there will be more acute impacts than what is revealed by calculating the average amount of work that will occur in riparian areas forest-wide over the life of the project. The agency needs to consider and disclose this more direct impact.

Fourth, the agency states that tri-colored bat hibernaculum will not be affected by the project because a Project Design Feature requires the agency to identify and avoid logging within 0.25 mile of these areas.<sup>687</sup> That project design feature applies to northern long-eared bats, not tri-colored bats, so its application appears in doubt.<sup>688</sup>

Fifth, the agency assumes that buffers around rock outcrops and cliffs will avoid all impacts to green salamanders.<sup>689</sup> The agency’s analysis fails NEPA’s hard look standard in multiple ways. First, the size of the buffers is determined by the Forest Plan which does not appear to have been designed to protect green salamanders. The agency has provided no evidence to support its assertion that these buffers would be effective. This failure is particularly troublesome given a recent shift in scientific understanding of green salamander habitat. Whereas “[p]reviously, arboreal habitat was deemed secondary to rock outcrops as preferred habitat...recent studies indicate that woody and arboreal habitats play a much larger role in the life history than generally thought.”<sup>690</sup> Second, there are “significant gaps in survey data” for the Foothills region indicating the agency also lacks support on that front to conclude that the buffers will be effective.<sup>691</sup> Even if the agency did provide sufficient information to support the assertion that the proposed buffer zones would be effective at protecting green salamanders, this would not cure the agency’s deficient analysis. Assuming that buffers around cliffs and rock

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<sup>686</sup> Terrestrial Wildlife Report, 47.

<sup>687</sup> Terrestrial Wildlife Report, 47.

<sup>688</sup> Terrestrial Wildlife Report, 21.

<sup>689</sup> Terrestrial Wildlife Report, 51.

<sup>690</sup> U.S. Fish and Wildlife Service Green Salamander Fact Sheet (2019), available at <https://www.fws.gov/southeast/pdf/fact-sheet/green-salamander.pdf> .

<sup>691</sup> Terrestrial Wildlife Report, 27.

outcrops would prevent direct harm to most green salamanders, the agency has provided no information to support its assumption that cumulative fragmentation of green salamander habitat will not negatively impact populations in the Foothills area. What are the long-term effects of genetically isolating small pockets of salamanders that otherwise would range further from their nesting outcrops? The Draft EA provides no information supporting the agency's position that creation of an isolated pocket of trees around a rock outcropping or cliff is protective of the species and would therefore not be likely to lead toward federal listing or a decrease in viability across the forest.

A final and related point is that the project generally fails to take a hard look at impacts to salamanders and other species that cannot quickly escape prescribed fires, masticators, and logging equipment. The Southern Appalachians are a global hotspot of salamander diversity; these species deserve consideration in the agency's effects analysis. There is no management indicator species that serves as a proxy for effects to these species and the Forest Service does not seem to monitor them. Nevertheless they are experiencing significant habitat reduction and face numerous climate change related challenges. To comply with NEPA, the agency needs to take a hard look at impacts to these species.

G. The Forest Service Has Not Taken a Hard Look at Impacts to Locally Rare Aquatic, Botanical, or Terrestrial Species

When the Forest Plan was last revised, the public asked the agency to make specific commitments about how it would treat locally rare species. Commenters requested "more specificity regarding inventory and monitoring of species of viability concern, including those of local viability concern ('locally rare' species)." <sup>692</sup> The agency "agree[d] that inventory and monitoring are critical" <sup>693</sup> but refrained from providing that specificity during plan revision because "locally rare species receive further consideration in project proposals." <sup>694</sup>

Yet under this "project proposal" the Forest Service asserts that "[n]either the [Forest Plan] nor any other law or regulation specifically identifies the need for an effect analysis for [locally rare] species." <sup>695</sup> To the contrary, NEPA requires the agency to consider the effects of its actions on locally rare species. The agency recognized that during plan revision but explicitly chose to defer that analysis until it developed "project proposals." Now that it has a project proposal, it must complete the analysis it deferred. Moreover, the Forest Plan calls on the

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<sup>692</sup> FEIS, App'x G, G-88.

<sup>693</sup> FEIS, App'x G, G-88.

<sup>694</sup> FEIS, App'x G, G-99.

<sup>695</sup> Botanical Resources and Rare Communities Report, 4.

agency to “[c]ontribute to the conservation of State-identified locally rare species,”<sup>696</sup> which it cannot do if it does not know how its projects affect the species.

The most the agency does is list locally rare species in Appendix B of the Botanical and Rare Communities Report and then categorically dismiss impacts to them as insignificant. That does not constitute a hard look. First, Appendix B seems to have multiple errors so it is unclear if this is a full and accurate list. But more to the point, taking a hard look requires more than just listing species and then concluding impacts to the species are insignificant with no supporting information or analysis. It is unclear if the agency is even aware of the locations of these species and we do not understand how the agency can evaluate impacts to the species if it does not know where the many proposals under the Foothills Project will be implemented on the ground. Enough information is not provided to evaluate impacts to these locally rare species even at a very general level.

#### H. The Forest Service Has Not Taken a Hard Look at Impacts From Prescribed Fire

The Forest Service proposes to conduct prescribed burns across 50,000 acres of the Foothills project area but acknowledges that “geographic location[s] for proposed prescribed burn activities have not been determined.”<sup>697</sup> Prescribed burning does not have uniform impacts across the landscape. Some areas may burn hotter and produce different effects; fire may have different effects on different ecosystems within burn units; fire may respond differently to different fuels in different places in the forest; prescribed fire poses different risks to communities and wildlife based on where it occurs on the forest. All the Forest Service has disclosed is that somewhere within the 157,000-acre project area, it is going to conduct 50,000 acres of burning. The agency cannot take a hard look at the impacts of prescribed fire if it does not know where that fire will burn.

The agency also lacks baseline data from which to assess the effects of prescribed fire or determine the need for fire. The entire analysis rests on the assumption that unless an area has been burned twice, or burned once accompanied by additional “vegetation manipulation,” it is at high “risk of losing key ecosystem components from unwanted wildfire fire.”<sup>698</sup> The agency does not have a reasonable basis for that assumption. Its assessment of the need for prescribed fire must be informed at least by *some* in-field review, not simply calculating acres that have not been subject to the agency’s prescribed burning in the past. This analysis assumes that every acre of the forest has the same general need for prescribed fire, and if the agency has not burned it in the past, it needs burning now. There is no information in the Draft EA supporting such an expansive conclusion.

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<sup>696</sup> Forest Plan, 2-13.

<sup>697</sup> Fire and Fuels Report, 7.

<sup>698</sup> Fire and Fuels Report, 4.

The agency admits that it does not know the long-term effect prescribed burning will have on the landscape. “[L]ong-term effects can last as long as treatment are being maintained” but there is no indication of how long the agency will maintain treatments nor how frequently it plans to burn.<sup>699</sup> It is important that the agency has some long-term plan here. In the short term, fire may cause “fuels [to] build up or even exceed the dangerous fuel loading of pre-burn levels within 3 to 5 years.”<sup>700</sup> Depending on burn frequency, this proposal runs the risk of making fuels conditions *worse* than if the agency did not act. Elsewhere, the agency states that prescribed fire needs to be applied “over the course of many years, perhaps upwards to 50 years” to have a meaningful impact.<sup>701</sup> Is that the agency’s plan? Its impacts analysis does not reflect a commitment to that level of management.

To be clear, we agree that some parts of the project area could benefit from prescribed burning. But the agency has thrown out any site-specific considerations and concluded that 90% of the Foothills area has the same general need for prescribed fire and that burning across that acreage will have the same general effect.<sup>702</sup> That is not a hard look.

#### I. The Forest Service Has Not Taken a Hard Look at Impacts to Roadless Areas

To meet its “hard look” obligations the Forest Service must consider the effects of logging and road building on: 1) areas that have been formally designated as “inventoried roadless areas” and 2) areas that have not been formally designated as “inventoried roadless areas” but which meet criteria for inclusion in the next potential wilderness inventory under the 2012 Forest Planning Rule.<sup>703</sup> The Forest Service recognizes its obligation to take a hard look at the former, though as explained below, it has not fulfilled that obligation. As for the latter, the agency has made no attempt to fulfill its obligation. This violates NEPA.

##### 1. *The Forest Service Has Not Taken a Hard Look at Impacts to Inventoried Roadless Areas*

The Foothills Project stands to impact five inventoried roadless areas (“IRA”).<sup>704</sup> The agency’s assessment of that impact is deficient for multiple reasons.

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<sup>699</sup> Fire and Fuels Report, 8.

<sup>700</sup> Fire and Fuels Report, 15.

<sup>701</sup> Vegetation Report, 64.

<sup>702</sup> Fire and Fuels Report, 12.

<sup>703</sup> See *Sierra Club, Inc. v. Austin*, 82 F. App’x 570, 572 (9th Cir. 2003)(finding Forest Service EIS did not take sufficient hard look at effects of logging on uninventoried roadless area); *Smith v. U.S. Forest Serv.*, 33 F.3d 1072 (9th Cir. 1994)(requiring analysis of impacts on roadless area); *Oregon Wild v. United States*, 107 F. Supp. 3d 1102 (D. Or. 2015)(acknowledging requirement to consider impacts on roadless areas); *Ctr. for Biological Diversity v. Gould*, 150 F. Supp. 3d 1170 (E.D. Cal. 2015)(the same).

<sup>704</sup> Inventoried Roadless Areas Report, 1.

First, the agency completes its analysis on the assumption that the “effects on IRAs within the project area are bound by the limitations set forth in overarching law, policy, and regulation.”<sup>705</sup> As discussed elsewhere, this concept is not accurate for limiting effects analysis under NEPA. It is true that law and policy prohibit certain activities in IRAs but practically, the Forest Service is capable of exceeding those limitations whether intentionally or unintentionally. The mere existence of law and policy does not prevent it from being violated. The agency must assess the impact of its actions to determine *if* it is complying with law and policy. Here again, the roadless rule is the speed limit and NEPA is the speedometer. The approach articulated in the Draft EA turns that solid reality on its head by assuming that the mere existence of these laws prevents any impact that may violate them. Laws do not prevent their own violation. Agency decisions either violate or refrain from violating. And NEPA is the tool agencies use to determine the effects of their decisions. We do not question whether the Forest Service is *trying* to comply with the Roadless Rule; we *do* question whether this project will in fact violate the Rule. The Forest Service has to complete effects analysis to make that determination.

The agency can attempt to “bind” its effects analysis by agreeing not to pursue certain activities or pursuing them in only certain places. If the agency is clear that those actions will not occur, it does not need to assess the impact of these (non)actions. But it cannot bind its NEPA effects analysis by pointing to the existence of other laws.

Second, the “measures” the agency uses to assess impacts to roadless characteristics are too vague to be meaningful. The agency only considers whether actions will cause roadless characteristics to “trend” upwards, downwards, or remain stable. That is not a hard look. What are the differences between these categories? They seem to only be a subjective prediction of what will happen. The agency confusingly concludes that some characteristics will experience a “downward/stable” trend.<sup>706</sup> It is unclear to us what that means.

Regardless, the agency cannot assess impacts to roadless characteristics because there are no specific proposals in these areas. The agency states that it may conduct treatments for hemlock conservation in IRAs but it does not disclose where or how. The Draft EA indicates that these treatments may be commercial, which means they have the potential for profound impacts on roadless characteristics.<sup>707</sup> The agency has not decided if it will pursue actions in IRAs affecting unspecified trails, recreation sites, or roads, only indicating that they “could be warranted” at some point over the lifespan of the project.<sup>708</sup> This is not a proposal from which effects can be assessed, just an indication that the agency might do something at some location at some time in the future. Finally, the agency proposes untold work to respond “to insect and

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<sup>705</sup> Inventoried Roadless Areas Report, 1.

<sup>706</sup> Inventoried Roadless Areas Report, 8.

<sup>707</sup> Draft EA, App’x B.

<sup>708</sup> Inventoried Roadless Areas Report, 6.



disease outbreaks.”<sup>709</sup> No information is provided indicating there is a current insect or disease problem in IRAs that necessitates a response or any information about what a “response” may look like. The agency even seems to concede that it cannot assess this activity now: it will be “assessed on a case-by-case basis” *later*.<sup>710</sup> The lack of any specific proposals for these areas prevents the agency from taking a hard look or demonstrating compliance with the 2001 Roadless Rule.

2. *The Forest Service Has Not Taken a Hard Look at Impacts to Uninventoried Roadless Areas*<sup>711</sup>

In its analysis of effects to IRAs the Forest Service recognizes that roadless areas provide certain qualities that are unmatched on national forests.<sup>712</sup> IRAs are designated to protect those qualities but the act of designation is not what brought those qualities into existence. Other significant, unroaded areas on the forest that are not formally designated can also provide those characteristics. The Forest Plan recognizes as much, obligating the agency to “[m]anage wilderness, roadless, and other un-roaded areas *to provide the social and ecological benefits that only they can offer.*”<sup>713</sup>

NEPA requires the agency to assess impacts to the special characteristics of roadless areas – inventoried or uninventoried – and practically, the agency must take that step to evaluate compliance with the obligation under its Forest Plan to manage these areas to provide the “benefits that only they can offer.” Whether an area is formally inventoried does “not provide a meaningful legal distinction” for purposes of NEPA analysis.<sup>714</sup>

“[T]here are at least two separate reasons why logging in roadless areas is environmentally significant, so that its environmental consequences must be considered. First, roadless areas have certain attributes that must be analyzed. Those attributes, such as water resources, soils, wildlife habitat, and recreation opportunities, possess independent environmental significance. Second, roadless areas are significant because of their potential for designation as wilderness areas under the Wilderness Act of 1964.”<sup>715</sup> “The possibility of future wilderness classification triggers, at the very least, an obligation on the part of the agency to

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<sup>709</sup> Inventoried Roadless Areas Report, 6.

<sup>710</sup> Inventoried Roadless Areas Report, 6.

<sup>711</sup> The term “uninventoried roadless area” as used in these comments refers to an area that has not been officially designated as an IRA but meets requirements under the 2012 Forest Planning Rule for inclusion in the next potential wilderness inventory.

<sup>712</sup> See Inventoried Roadless Areas Report, 2 (recognizing “roadless characteristics as identified by the 2001 Roadless Rule”).

<sup>713</sup> Forest Plan, 2-37 (emphasis added).

<sup>714</sup> *Lands Council v. Martin*, 529 F.3d 1219, 1230-1231 (9th Cir. 2008).

<sup>715</sup> *Id.* at 1230 (citations omitted).

disclose the fact that development will affect a 5,000 acre roadless area or will affect an area of sufficient size as to make practicable its preservation and use in an unimpaired condition.”<sup>716</sup> This requirement applies to both inventoried and uninventoried roadless areas.<sup>717</sup>

There are four primary areas within the Foothills landscape that qualify for inclusion in the potential wilderness inventory to be completed using the 2012 Forest Planning Rule during the next Forest Plan revision. Those areas are the Big Shoals, Thrifts Ferry, Five Falls, and Grassy Mountain Mountain Treasure areas.<sup>718</sup> Each area is “at least five thousand acres . . . or of sufficient size as to make practicable its preservation and use in an unimpaired condition.”<sup>719</sup> The areas do not include maintenance level 3, 4, or 5 roads.<sup>720</sup> And the areas do not include “other improvements.”<sup>721</sup> The qualities of these areas are discussed in the “Georgia’s Mountain Treasures” publication of which the Forest Service has a copy.<sup>722</sup>

The Forest Service has not assessed whether these areas should be considered for wilderness recommendation or other protective management under the 2012 Forest Planning Rule. The last Forest Plan revision utilized directives under the 1982 Forest Planning Rule. We maintain that many of these areas were wrongly excluded from consideration under previous inventories, and the 2001 Roadless Rule, but they clearly qualify for inclusion in the potential wilderness inventory under the 2012 Forest Planning Rule. As a result, the Forest Service must disclose impacts to the roadless characteristics of these areas.

Courts have reached this same conclusion. In *Smith v. U.S. Forest Service*, the Forest Service was reversed because it “never, in its NEPA documents, [took] into account the fact that the [timber] sale will affect a 5,000 acre roadless area.”<sup>723</sup> The Forest Service argued that the fact that the roadless area was not formally designated in previous roadless or wilderness inventories excused any obligation to consider impacts on the undesignated roadless area. The court disagreed, noting specifically that the area’s designation “may be revisited in second-generation Forest Plans.”<sup>724</sup>

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<sup>716</sup> *Id.* at 1231 (emphasis added).

<sup>717</sup> *Id.* at 1230-1231.

<sup>718</sup> *See supra* Section III.

<sup>719</sup> FSH 1909.12, Ch. 70.21.

<sup>720</sup> *Id.* at Ch. 71.22a.

<sup>721</sup> *Id.* at Ch. 71.22b.

<sup>722</sup> It is also linked in Section III.

<sup>723</sup> *Smith v. U.S. Forest Serv.*, 33 F.3d 1072, 1079 (9th Cir. 1994).

<sup>724</sup> *Id.* at 1078.

Disclosure of impacts to these areas is particularly important because “[t]he choice to commence logging . . . implicates and constrains future decisions regarding the [area].”<sup>725</sup> In other words, actions the Forest Service takes now may affect an area’s eligibility for inclusion in the agency’s potential wilderness inventory later, and the public should be made aware of that decision as it is made, rather than after an area’s values have been degraded and its inclusion in the inventory potentially compromised.

In the past, the Forest Service has explained that it does not need to disclose these impacts because “the potential impacts of . . . silvicultural treatments and . . . temporary road segments would not be an irreversible and irretrievable commitment of resources.”<sup>726</sup> But the agency’s own analysis discounts existing IRAs because of “past management apparent throughout” and “evidence of management, such as past timber harvest . . . [and] access roads.”<sup>727</sup> If the agency recognizes the impact those conditions have on the characteristics of IRAs it must also recognize and disclose that pursuing similar activities in uninventoried roadless areas may affect their character and eligibility for inclusion in the next potential wilderness inventory.

The gist of the agency’s argument seems to be that harvesting trees and building roads does not affect the eligibility of an area for inclusion in a potential wilderness inventory because trees grow back including, sometimes, in road beds. But if that is the agency’s standard then practically *nothing* prevents an area from being included in the next potential wilderness inventory because over time the forest will grow back. Every part of the forest would have to be considered for inclusion in the potential wilderness inventory because trees regenerate and roads can be removed. If that is the Forest’s position, then it should say so clearly now, so that we can remind you of it when the time comes for the next plan revision.

Furthermore, the Forest’s position is arbitrary and capricious because the Forest Service has elsewhere recognized that timber harvests and road building constitute irreversible and irretrievable commitments of resources. On other forests, the agency has specifically disclosed that “[r]oad construction is an irreversible action because of the time it takes for a constructed road to revert to natural conditions.”<sup>728</sup> “Soils . . . displaced by road construction activities are irreversible commitments of project resources, due to the long-term loss of soil productivity”<sup>729</sup> – indeed, the agency recognizes that construction of roads and skid trails will cause long-term detrimental impacts to soil in the project area.<sup>730</sup> A “reduction in the visual quality of an area due

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<sup>725</sup> *Sierra Club, Inc. v. Austin*, 82 F. App’x 570, 573 (9th Cir. 2003).

<sup>726</sup> Forest Service, Cooper Creek Final Environmental Assessment, 8.

<sup>727</sup> Inventoried Roadless Areas Report, 2-3.

<sup>728</sup> Forest Service, Prince of Wales Landscape Level Analysis Project Final Environmental Impact Statement (Oct. 2018), 61.

<sup>729</sup> *Id.*

<sup>730</sup> Soil Report, 53.

to timber harvesting would be an irretrievable commitment of resources.”<sup>731</sup> Even “[f]oregoing timber harvest opportunities in certain areas . . . due to resource concerns or economics, may represent an irretrievable commitment of resources.”<sup>732</sup> If foregoing timber harvest is an irretrievable commitment of resources, then actively harvesting timber certainly is.

The agency must consider and disclose the effect of its activities on the roadless characteristics of inventoried and uninventoried roadless areas. It has not done that here, nor can it meet that obligation if it does not know where logging, road building, and other activities will take place on the ground.

#### J. The Agency Has Not Taken a Hard Look at Impacts to Cultural Resources

We are confused by the statement in the Draft EA that “cultural resources were reviewed for sufficiency and for supporting resource information in [a] corresponding specialist report[] that can be found in the project record, but [was] not carried forward in this EA.”<sup>733</sup> We assume that the agency’s intention was to incorporate by reference its analysis in the Cultural Resources Report. It must assess impacts to these resources under NEPA. Unfortunately the Report’s analysis of cultural resources falls well short of a hard look, for multiple reasons.

##### 1. *The Forest Service Improperly Conflates Its NEPA and NHPA Obligations*

Like other portions of its analysis, the Cultural Resources Report misstates the agency’s obligation to consider impacts to cultural resources under NEPA. While the report begins by accurately describing cultural resources as “the tangible remains of past human activity” including “archaeological sites . . . historic buildings, structures, objects, and districts,” as well as “historic landscapes and the locations of Traditional Cultural Properties,” it then *erroneously* asserts that “[u]ltimately, what determines whether or not the [Foothills Landscape Project] adversely affects cultural resources is whether or not sites eligible or unevaluated for the NRHP are disturbed.”<sup>734</sup> Elsewhere, citing the National Historic Preservation Act’s (NHPA) implementing regulations, the agency asserts that “an adverse effect is considered to have occurred to a cultural resource site when the characteristics that may make that site eligible for inclusion on the National Register of Historic Places have been altered.”<sup>735</sup> In other words, the agency seems to think that the *only* relevant impacts to cultural resources are those which affect the resources’ eligibility to be listed on the National Register. This is a misstatement of the law—it describes relevant impacts under the NHPA, not NEPA—and this error undermines the agency’s analysis.

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<sup>731</sup> Prince of Wales Final Environmental Impact Statement, 62.

<sup>732</sup> Prince of Wales Final Environmental Impact Statement, 61.

<sup>733</sup> Draft EA, 85.

<sup>734</sup> Cultural Resources Report, 3.

<sup>735</sup> Cultural Resources Report, 28.

NEPA requires a broader scope of analysis than NHPA. Under NEPA, an agency must consider impacts to cultural resources which are listed or eligible to be listed on the National Register, but it must also consider impacts to any other “significant” cultural or historical resources.<sup>736</sup> Furthermore, relevant impacts to cultural resources include but are not limited to those impacts which affect listing eligibility.<sup>737</sup> The Forest Service recently acknowledged this distinction in its Final Environmental Impact Statement for the Prince of Wales Landscape Level Analysis Project, noting that while NHPA is concerned only with “historic properties” and their eligibility status, “the NEPA definition of ‘cultural resources,’ by contrast, encompasses both eligible and non-eligible cultural resources, including districts, sites, buildings, structures, and objects.”<sup>738</sup> In the Prince of Wales project, the Forest Service correctly determined that it was required to consider impacts to “all culturally significant features and items, regardless of NRHP-eligibility.”<sup>739</sup>

Although agencies may use the NEPA process as a framework for complying with NHPA, compliance with NHPA is not sufficient to satisfy NEPA.<sup>740</sup> Here, as a result of the agency’s confusion about which cultural resources and effects it must consider under NEPA, it has failed to take the requisite hard look.

2. *The Lack of Site-Specific Information Renders the Analysis Insufficient, but it is Clear There May Be Significant Impacts to Cultural Resources*

Continuing the pattern of the agency’s analysis of other aspects of the human environment, its evaluation of impacts to cultural resources cannot meet the hard look standard due to the EA’s lack of site-specific proposals. Without knowing where it will propose certain project activities, the agency cannot satisfactorily evaluate whether cultural resources will be impacted. As the agency’s Cultural Resources Report acknowledges, *known* cultural resources are not evenly distributed across the Foothills landscape.<sup>741</sup> Likewise, undiscovered resources are unlikely to be evenly distributed across the landscape. While the agency has developed a model for predicting the relative probability that a certain area of the Foothills landscape will contain archaeological sites, this model is of limited use in a NEPA effects analysis because the agency has not decided where particular activities will be implemented. How many acres of timber treatments will take place in “high probability” areas? How many acres of prescribed burning will take place in “low probability” areas? This information is relevant to any analysis of impacts to cultural resources, but it is absent from the Cultural Resources Report.

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<sup>736</sup> 40 C.F.R. §1508.27

<sup>737</sup> *Id.*

<sup>738</sup> Prince of Wales Final Environmental Impact Statement, 243.

<sup>739</sup> *Id.* at 246.

<sup>740</sup> *See Lemon v. McHugh*, 668 F.Supp.2d 133, 144 (D.D.C. 2009).

<sup>741</sup> Cultural Resources Report, 9.

Even ignoring the Report’s shortcomings due to the lack of site-specific project proposals, it is clear that implementation of the Foothills project may have significant impacts on cultural resources. As discussed in the agency’s *Cultural Resources Overview* and in the section of these comments relating to NHPA, the Foothills area has a rich but poorly understood cultural past. A number of peoples have called the Foothills area home over the centuries, and the Forest Service estimates that there are *thousands* of unidentified archaeological sites scattered throughout the different project implementation areas. The location of these sites and their potential significance is not known because only a small percentage of the Foothills area has been surveyed. Based on the Forest Service’s predictive model for cultural resources, approximately 85% of these unidentified sites are likely to be found in “high probability” areas, which make up around 44% of the land area in the Piedmont region and 28% of the land area in the Blue Ridge region.<sup>742</sup> Approximately 15% of the unknown sites are likely to be found in the remaining “low probability” areas.<sup>743</sup>

Meanwhile, the Forest Service has acknowledged that many of the activities it is proposing to carry out across the Foothills landscape will adversely affect cultural resources if such resources are present and not protected. Timber treatments, prescribed burning, road construction and decommissioning, trail construction and decommissioning, and the creation of wildlife openings all have the potential to affect cultural resources.<sup>744</sup> Specific to ground-disturbing activities, the Forest Service has observed that archaeological deposits on the CONF are typically near the soil surface and “[a]s a result of sites being so shallow, archaeological sites on the Chattahoochee NF can be severely impacted by activities that disturb the ground surface.”<sup>745</sup> With respect to prescribed burning, the agency has observed that cultural resources may be directly affected by flames and heat or by subsequent erosion or damage due to increased public access.<sup>746</sup>

The Forest Service does not acknowledge other types of effects. For example, as noted by the agency in its FEIS for the Prince of Wales Landscape Level Analysis Project, “large-scale changes to the landscape affect the integrity of a cultural resource, including its historic setting

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<sup>742</sup> Draft NHPA Programmatic Agreement, Appendix E, 67.

<sup>743</sup> *Id.*

<sup>744</sup> Cultural Resources Report, 26-27

<sup>745</sup> Cultural Resources Report, 27

<sup>746</sup> Cultural Resources Report, 28. As discussed in the NHPA section of these comments, the Forest Service generally dismisses the possibility that heat or flames from prescribed burning will adversely affect historic properties and other cultural resources. For the reasons discussed in that section, this conclusion is arbitrary and not supported by quantifiable and detailed information. To the contrary, USFS reports on the impact of fire on cultural resources suggest that fire intensity—and its effects on cultural resources—will necessarily vary based on site-specific and environmental factors. Therefore it is inappropriate for the Forest Service to broadly conclude that prescribed fires in the Foothills area will be low intensity and that consequently they will not impact subsurface cultural resources.

and feeling of association.”<sup>747</sup> By contrast, to the extent that the Foothills Cultural Resource Report discusses effects to cultural resources, it focuses entirely on *physical* effects to artifacts; it completely ignores the *contextual* adverse effects that would result from the large-scale changes to the landscape that the Foothills project would bring.

The agency’s analysis makes clear that there is *likely* to be a large number of unidentified cultural resources in the Foothills area and that the activities the agency is proposing for the Foothills project may damage or destroy them. But the agency’s analysis goes no further than this, because it cannot. Without knowing where it will implement various activities and where most cultural resources are located, the agency cannot adequately evaluate impacts to them.

The Forest Service attempts to bridge this chasm in its analysis by suggesting that any potential adverse effects to cultural resources will be avoided or mitigated by “a series of mitigation measures” that have been agreed to by the agency and various parties the agency consulted with in developing its NHPA programmatic agreement.<sup>748</sup> These measures consist of “standard protection measures” and “alternative mitigation measures.”<sup>749</sup> As discussed below, the agency merely *lists* its proposed mitigation measures; it does not evaluate their effectiveness. This mere listing of mitigation measures does not save the agency’s analysis or show that the potential impacts to cultural resources will not be significant.

### 3. *The Forest Service’s Analysis Fails to Discuss the Effectiveness of the Agency’s Proposed Mitigation Measures*

As discussed in the section of these comments addressing the agency’s NHPA obligations, that statute requires the Forest Service to develop and consider measures that could mitigate adverse effects to historic properties. In its draft programmatic agreement, the agency presents a series of “standard protection” and “mitigation” measures that were developed in coordination with Section 106 consulting parties.

In its NEPA analysis, the agency relies on these protection and mitigation measures en route to its conclusion that implementation of the Foothills project would not adversely affect cultural resources. This reliance is misplaced because the agency fails to adequately assess the effectiveness of the proposed mitigation measures. “Without analytical data to support . . . proposed mitigation measures,” they do not “amount to anything more than a ‘mere listing’ of good management practices” that is insufficient for NEPA purposes.<sup>750</sup>

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<sup>747</sup> Prince of Wales Final Environmental Impact Statement, 246.

<sup>748</sup> Cultural Resources Report, 5

<sup>749</sup> *Id.*

<sup>750</sup> *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1151 (9th Cir. 1998), *overruled on other grounds by Lands Council v. McNair*, 537 F.3d 981 (9th Cir. 2008)

The three “standard protection” measures listed by the agency are “exclusion,” “avoidance,” and “limited use of existing transportation routes.”<sup>751</sup> It’s not entirely clear what the difference is between exclusion and avoidance. Under both scenarios, the agency asserts that it would simply conduct its proposed activities *around* known cultural resources so as to avoid impacting them. As for “limited use of existing transportation routes,” the agency’s “protection measure” is simply a statement that “[I]inear sites may be crossed or bounded in areas where their features or characteristics clearly lack integrity, that is, where those portions do not contribute to a site’s eligibility [for listing on the National Register].”<sup>752</sup>

Each of these three protection measures is only applicable where the location of cultural resources is *known*. As discussed above, the agency predicts that there are *thousands* of unidentified archaeological sites across the Foothills area, some of which could be significant. While the agency is planning to conduct sample surveying within “high probability” project areas in order to comply with NHPA, the Cultural Resources Report appears to assume, without supporting data, that these sample surveys will necessarily uncover all significant cultural resources within a coverage area. There is no discussion of the possibility that resources—particularly those located in the soil—will be missed, and consequently destroyed. Moreover, the “limited use of existing routes” protection measure appears applicable only to effects which impact eligibility for the National Register. Once again, analysis under NEPA must consider and disclose a broader range of effects to cultural resources.

Even to the extent that they are effective, the “standard protection measures” would not mitigate adverse effects to unidentified cultural resources in areas that are *not* surveyed. The Forest Service predicts that approximately 15% of the unidentified archaeological sites in the Foothills project area are located on portions of the Forest designated “low probability.” To its credit, the agency has acknowledged that by deciding not to survey any “low probability areas,” significant cultural resources in these areas may be adversely affected. Under the process currently proposed by the Forest, cultural resources will be destroyed without the agency or the public ever knowing what has been lost.

However, the Forest Service asserts that any such adverse effects will be mitigated by a series of “alternative mitigation measures.”<sup>753</sup> Some of these mitigation measures are referred to as “thematic overview/context projects” while some are “watershed specific.” As described in the agency’s draft programmatic agreement, the thematic/context projects involve historical research into various aspects of the cultural heritage of the Foothills. Some of the projects also call for conducting “test excavations” at unspecified sample sites throughout the Foothills area, as well as “identify[ing] interpretive opportunities.”<sup>754</sup> The “watershed specific” mitigation

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<sup>751</sup> Cultural Resources Report, 6-7.

<sup>752</sup> *Id.* at 7.

<sup>753</sup> Cultural Resources Report, 7

<sup>754</sup> Draft NHPA Programmatic Agreement, 46



projects consist almost entirely of plans to survey high probability areas that are *not* proposed for activities that may adversely affect cultural resources.

As discussed elsewhere in these comments, “mitigation” considered under NHPA must have some nexus with specific adverse effects to historic properties. Here, it is not clear that the requisite nexus exists between the research and surveying the agency has proposed as “alternative mitigation” and any specific adverse effects to historic properties or other cultural resources. Related to but distinct from this issue of a “nexus,” NEPA requires the Forest Service to evaluate the *effectiveness* of the mitigation measures it relies on in reaching a conclusion about effects to cultural resources.<sup>755</sup>

The Cultural Resources Report contains no such analysis. The agency presents no quantified or detailed information to support its conclusion that the listed alternative measures will be effective in mitigating potential adverse impacts to cultural resources. It offers only repeated statements that it developed the alternative mitigation measures *because* it anticipates adverse effects to some cultural resources. This does not satisfy NEPA’s hard look standard.

#### 4. *The Agency’s Conclusion That There Will Not Be a Significant Impact to Cultural Resources is Arbitrary*

Ultimately, the Cultural Resources Report concludes that the Foothills project, as proposed, “would not affect cultural resource sites, therefore, there would be no cumulative effects to cultural resources as a result.”<sup>756</sup> This conclusory analysis does not meet NEPA’s hard look standard.<sup>757</sup>

As discussed above, the agency’s analysis acknowledges that its proposed activities have the potential to negatively affect cultural resources; it acknowledges the possibility that there are significant unidentified cultural resources in the Foothills area; and it fails to adequately assess the effectiveness of the proposed “protection” and “mitigation” measures. Without presenting any quantified or detailed information in support, the agency simply assumes its proposed mitigation measures will be effective. Consequently, it’s conclusion that “[s]electing Alternative 2 would not affect cultural resource sites” is arbitrary and capricious, and it fails the hard look standard.

Based on this arbitrary conclusion, the agency likewise concludes that there would be no *cumulative* effects to cultural resources. Because the specific impacts to cultural resources in the

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<sup>755</sup> *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1151 (9th Cir. 1998), *overruled on other grounds by Lands Council v. McNair*, 537 F.3d 981 (9th Cir. 2008)

<sup>756</sup> Cultural Resources Report, 28-29.

<sup>757</sup> *See Te-Moak Tribe of Western Shoshone of Nevada v. U.S. Dept. of Interior*, 608 F.3d 592, 604 (9th Cir. 2010) (agency failed to take the requisite hard look at cumulative impacts where it utilized “conclusory analysis” in reasoning that there would be no cumulative impacts because all impacts from proposed activities would be mitigated).

Foothills area are not adequately analyzed, the agency's cumulative impacts analysis is likewise deficient.<sup>758</sup>

K. The Forest Service Has Not Taken a Hard Look at Any Impact from Changing the Recreation System Because Currently Nothing Specific is Being Proposed

The Draft EA and accompanying Scenery and Recreation Resources Report include *no* specific proposals for making changes to the recreation system. The public cannot realistically be expected to offer meaningful comments on this as a site-specific proposal. In any event, without a specific action to consider, the agency has not taken a hard look at any impact that may stem from that action.

The agency's analysis lays out a process for determining whether it should make changes to the recreation system at some point in the future. For developed and dispersed recreation sites, at some point in the future it will "independently assess[] . . . the current condition [of areas] . . . with existing tools" such as the Natural Resource Management corporate database, PACEIt! program, and matrices attached to the EA.<sup>759</sup> The outcome of those assessments would "be measured against the desired condition" and then the agency would "*consider* three options: construct a new site, maintain/enhance existing site, or decommission."<sup>760</sup> For trails it will apply the "CONF trails matrix . . . to determine *potential* actions . . . including enhancements/repairs, new additions and decommissioning."<sup>761</sup>

To put a point on this, not only does the Draft EA not reveal a concrete proposal, but at most it reveals a process that concludes with the agency *considering* if it *potentially* might take an action at some undisclosed point in the future. This process for identifying recreation sites that need improvement may be very reasonable but it cannot satisfy any obligation under NEPA, particularly not the hard look standard, because *nothing is being proposed*.

Changes to the recreation system necessitate NEPA analysis to consider the effect on the natural and social environment that result from the change. For instance, work on trails or recreation sites may introduce sediment to streams which needs to be disclosed under NEPA. As another example, changing, rerouting, and certainly decommissioning trails could have profound social effects that also must be disclosed under NEPA. The agency cannot consider those effects without some type of specific proposal before it. The distribution of recreation resources and the management activities affecting recreation settings will have profound indirect effects, because the volume of visitation (and all the effects it brings) will follow those resources.

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<sup>758</sup> See *Center for Biological Diversity v. BLM*, 746 F.Supp.2d 1055, 1098 (N.D. Ca. 2009)

<sup>759</sup> Scenery and Recreation Report, 7.

<sup>760</sup> Scenery and Recreation Report, 7 (emphasis added).

<sup>761</sup> Scenery and Recreation Report, 15 (emphasis added).

While not directly a “hard look” concern, we have to note that the process being employed here is profoundly unfair to the public. NEPA is what guarantees the public a voice when the agency proposes to make changes to trails and recreation sites. The agency is seeking to conclude that process with nothing more than a commitment that it will think about making changes to the recreation system across 157,000 acres at some future point. That may result in no action being taken at all. It also may result in someone’s favorite trail being decommissioned. NEPA gives that person an opportunity to voice concerns to the agency about that decision—an opportunity the agency is making hollow by attempting to satisfy its legal obligation under NEPA to “involve” that person before anything has even been proposed.

Finally, the concerns above reflect problems with evaluating the effects *from changing* the recreation system, but the agency also cannot evaluate effects from the other proposed actions (logging, herbicide application, etc.) *on* the recreation system for the same reason: there are no site-specific proposals. For instance, maps provided by the agency indicate it is considering substantial logging near the Pinhoti Trail.<sup>762</sup> The Project Design Features call for locating “temporary roads . . . on previous existing routes” such as “system trails,” so presumably there is the potential that portions of the Pinhoti Trail will be converted into a temporary logging road for some period of time.<sup>763</sup> If that were to happen, the agency would be required to disclose the effect of that action. It has not done that here because there are no site-specific proposals and thus no way to judge how logging etc. would affect recreational facilities. The agency has not taken a hard look.

#### L. The Agency Has Not Taken a Hard Look at Effects to Scenery

For the same reason – the lack of site-specific proposals – the agency has not taken a hard look at impacts to scenery. Appendix C to the Scenery and Recreation Resources Report confirms that nearly every activity considered under the Foothills Project has the potential to affect scenery but we were unable to find any analysis of how, or to what degree, those activities may affect scenery. The Forest Service asserts that it will abide by the Scenic Integrity Objectives of its Forest Plan but there is nothing supporting that conclusion. If at this stage the Forest knows where various management activities will be compatible with its SIOs, it must refine the project accordingly and disclose any limitations to the public. As proposed, however, Alternative 2 would allow actions in locations, densities, and frequencies that will degrade scenic values, and the degree of the effect (and the number of residents, businesses, and visitors affected) will depend on the locations actually chosen for treatment. Regardless, complying with the Forest Plan is not a replacement for assessing impacts to scenery; the Forest Service must perform that analysis even if it will meet scenic integrity objectives.

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<sup>762</sup> Draft EA, Maps 12-14.

<sup>763</sup> Draft EA, 75.

Recent projects on this forest illustrate why this is an important consideration. Analysis of effects from the Union County Shooting Range concluded that constructing the range as designed was “inconsistent” with the Forest Plan’s scenic integrity objectives for the area.<sup>764</sup> Undoubtedly the agency did not intend to compromise scenic integrity, but it is just as clear that the agency failed to achieve the scenic integrity objectives in its Forest Plan even when acting with good intentions. The agency must take a hard look at impacts to scenery.

M. The Agency Has Not Taken a Hard Look at the Impacts of Maintaining or Building Roads for Timber Harvests

The Forest Service is aware that road construction and reconstruction have significant impacts on forests. “Roads are the highest contributor to sedimentation within forested systems.”<sup>765</sup> “Roads directly alter natural sediment and hydrologic regimes by changing streamflow patterns and amounts, sediment loading, transport, and deposition, channel morphology and stability, water quality, and riparian conditions within a watershed.”<sup>766</sup> Roads can also fragment habitats. Yet the agency has not disclosed where it plans to complete road-related work intended to facilitate timber harvests.

Approximately “260 total miles of system road exist in the project area.”<sup>767</sup> The Forest Service estimates that up to “213 miles of [road] reconstruction” may be necessary to meet “needs associated w/ timber harvest.”<sup>768</sup> Restated, the agency may reconstruct 82% of its road system in the project area to facilitate timber harvests. This will undoubtedly have an environmental impact but we were unable to find any consideration of that impact in the Draft EA. Road reconstruction often changes the character of the road (and the setting of the area it traverses) significantly. Reconstruction is utilized to allow larger equipment access, so it involves widening roadbeds and smoothing out curves (which requires more cut and fill, especially where roads wrap around finger ridges. Older roads may be much narrower and less noticeable, especially from distant vantage points, making this relevant to scenic impacts too.

The agency also does not assess impacts from building temporary roads to facilitate timber harvests beyond assuming that they will occupy approximately 6% of the project activity area.<sup>769</sup> The agency well knows that *where* roads are built makes a significant difference. For instance, it discloses that “[m]uch of the sedimentation [in the project area] is occurring from the

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<sup>764</sup> Nutter and Associates, Resource Report for the Human Environment Proposed Union County Shooting Range (Aug. 2019), 17.

<sup>765</sup> Soil Report, 60.

<sup>766</sup> Draft EA, 42.

<sup>767</sup> Draft EA, 80.

<sup>768</sup> Draft EA, 80.

<sup>769</sup> Soil Report, 23.

high percentage of poorly maintained roads located in riparian areas.”<sup>770</sup> Similarly, it acknowledges that “[p]replanning of . . . temporary roads . . . is the key to limiting soil disturbance and the amount of area impacted.”<sup>771</sup> If the agency realizes that preplanning road locations is key to limiting impacts, then it must be able to appreciate that it cannot take a hard look at the impact of building temporary roads without some idea of where they will be built.

We are not suggesting that the agency needs to have the route of every temporary road planned to meet NEPA’s hard look standard but generally disclosing that an estimated percentage of a massive and highly varied area will be converted to temporary roads is not taking a hard look at impacts from building those roads. The total mileage of temporary road construction (and associated compaction, erosion, landslide risk, aquatic passage, and recreation setting impacts) will depend on which areas are ultimately selected for harvest, because some units are easier to get to than others. The public asked the agency to more rigorously examine the impacts of building roads on the forest during the last forest plan revision and the agency refused, deferring that analysis to projects like this one: “Specific roads and their impacts on forest resources are considered in a subsequent watershed or project level roads analysis.”<sup>772</sup> Now is the time to complete that analysis.

Finally, the agency needs to forthrightly disclose the impacts of building so-called temporary roads. Forest Service policy defines a “temporary road” as a road “necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road.”<sup>773</sup> Temporary roads are “decommissioned at the conclusion of the project or activity.”<sup>774</sup> And indeed the Draft EA states that “temporary roads would be rehabilitated to restore to original condition once all connected actions where road access is needed are completed.”<sup>775</sup> But this is plainly not happening. The road prism remains on the ground, along with its compaction issues and erosion/landslide risks. The agency distinguishes between “new” and “old” temporary roads, finding that the impacts of using “old temporary” roads are less severe than “new temporary” roads.<sup>776</sup> The only way use of “old temporary roads” does not have the same impact as “new temporary roads” is if old temporary roads are not being decommissioned and “rehabilitated to original condition.” The agency cannot have it both ways here. It cannot assume that the bulk of the impact from “old temporary” roads has already occurred but then downplay impacts from “new temporary” roads based on their supposed

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<sup>770</sup> Draft EA, 4.

<sup>771</sup> Soils Report, 52.

<sup>772</sup> FEIS, App’x G, G-263.

<sup>773</sup> 36 C.F.R. § 212.1.

<sup>774</sup> FSM 7711.2.

<sup>775</sup> Draft EA, 80.

<sup>776</sup> Soil Report, 22-23.

“temporary” nature. These roads may see “temporary” use but their construction is having long-term impacts on the environment which is what must be considered and disclosed under NEPA.

As discussed elsewhere in these comments, the agency is using temporary roads as “roads in storage between intermittent uses.”<sup>777</sup> This has implications for the Forest’s travel management program. The Draft EA needs to address the cognitive dissonance and planning implications of the fact that a “temporary road” that was built in a previous logging project and still exists on the forest, and will likely be used again in future entries, is functionally not temporary.

#### N. The Agency Has Not Taken a Hard Look at the Economic Impact of Its Proposal

NEPA requires agencies to take a “hard look” at the effect of their actions on the “human environment.”<sup>778</sup> “Human environment shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment.”<sup>779</sup> This includes “economic or social effects.”<sup>780</sup> “Effects” for NEPA purposes is specifically defined to include “economic” effects.<sup>781</sup>

Disclosure of the economic impact of this project is particularly important because the agency appears to concede that its proposal is not “in-line with current budgetary expectations and capacity constraints.”<sup>782</sup> This directly relates to the reasonableness of the agency’s proposal. Is the agency proposing a project that it does not have the budget to implement? That is arbitrary decision-making. Moreover, the Forest Service Manual underscores that economic impact analysis is required when “there is an important interaction between anticipated environmental effects and economic effects.”<sup>783</sup> Here there is an important interaction because the agency’s economic capacity to pursue the myriad activities it is considering directly relates to the impact the project will have on the environment. For instance, the agency assumes that improvements to the trail and road system will mitigate detrimental impacts to water quality from logging but there is no indication the agency has the funding to make those trail and road improvements. If the agency cannot afford them, it cannot use them to discount impacts from logging.

The Forest Service Handbook also requires disclosure of economic information. As described in the Handbook, the timber sale preparation process “pass[es] through specific stages,

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<sup>777</sup> FSH 7709, Sec. 62.32

<sup>778</sup> 42 U.S.C. § 4332.

<sup>779</sup> 40 C.F.R. § 1508.14.

<sup>780</sup> *Id.*

<sup>781</sup> 40 C.F.R. § 1508.8.

<sup>782</sup> Scoping Summary Report, 8.

<sup>783</sup> FSM 1972.

called ‘gates,’ each of which requires specific outputs before proceeding to the next gate.”<sup>784</sup> Gate Two is the “environmental analysis[] phase,” where the agency “develop[s] alternative designs and analyze[s] them for environmental effects.”<sup>785</sup> Presumably we are in Gate Two for the Foothills Project. At that point, the agency is to prepare “an analysis of financial and, if needed, economic efficiency” to support “a NEPA decision.”<sup>786</sup> The Handbook even restates the requirement: “Complete a financial analysis of each timber sale project alternative at Gate 2.”<sup>787</sup> “The financial and, if needed, economic efficiency analyses should be formulated early in the [NEPA] process.”<sup>788</sup> “In every case, conduct the environmental analysis so that the sale is based on *field reconnaissance*,” in part, to ensure the project is economically viable.<sup>789</sup> To our knowledge, the agency has not complied with any of these requirements and it appears the agency cannot comply with them because it has not conducted field reconnaissance.

Disclosure of economic impacts is also necessary because it relates to the agency’s ability to conduct other work across the forest. If the agency is expending its entire budget in the Foothills, then it needs to disclose to the public that its ability to do work in the remaining 80% of the forest will be impaired.

Economic analysis should also help explain the viability of achieving certain outcomes with this project. We assume most of the vegetation work will not occur if it cannot be completed commercially. In order to inform its ability to accomplish the work proposed, the agency needs to assess and disclose if it is planning work in areas where commercial sales are viable. We note that several of the recent timber sales on the Chattahoochee seem to have received no bids.

As part of this consideration, the agency needs to disclose how economic considerations are shaping its analysis. For instance, the agency concludes that “habitat diversity is at its lowest during the sapling/pole successional stage.”<sup>790</sup> Logically, if the agency’s objective is improving habitat, it will get the most benefit from targeting sapling/pole stands. But the agency is proposing very little treatment in those stands.<sup>791</sup> We assume this is because those trees have questionable commercial value. If the monetary value of trees affects where the agency chooses to create habitat and pursue other activities, then it is shaping the agency’s approach to meetings its objectives. Restated, if the above example is accurate, the agency is not only seeking to

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<sup>784</sup> FSH 2409.18 Ch. 12.

<sup>785</sup> FSH 2409.18 Ch. 12.

<sup>786</sup> FSH 2409.18 Ch. 12.

<sup>787</sup> FSH 2409.18 Ch. 32.

<sup>788</sup> FSH 2409.18 Ch. 32.

<sup>789</sup> FSH 2409.18 Ch. 34 (emphasis added).

<sup>790</sup> Vegetation Report, 32.

<sup>791</sup> See, e.g., Vegetation Report, 48 (no harvest of sapling/pole oaks).

create habitat but specifically seeking to do that in areas with commercially valuable trees. That needs to be disclosed under NEPA.

The agency also needs to consider the impact of its action on the timber market, particularly timber coming off of private lands. The agency is proposing almost twice as much commercial logging as was completed on Southern Appalachian national forests from 2009-2019 in Georgia, Tennessee, North Carolina, and Virginia *combined*.<sup>792</sup> That has the potential to flood the timber market, affecting prices and production from private lands – a project impact the agency needs to consider and disclose.

Finally, we note that when concerns about the economics of timber sales were raised during Forest Plan revision, the agency disclosed that “[i]ndividual timber sales are analyzed before a project is undertaken . . . [and d]iscounted costs and benefits are considered to see if the project will be economically efficient.”<sup>793</sup> “If a proposed sale alternative does show a negative return, the decision maker will justify the reason for commencing with the project.”<sup>794</sup> The agency has not complied with this commitment because it has not assessed the economic viability of its project.

#### O. The Agency Has Not Taken a Hard Look at Impacts From Salvage Harvests

The Draft EA suggests the agency anticipates salvage logging as part of the Foothills Project. Specifically, some areas “could be treated through cut-and-remove salvage harvests. These treatments would be implemented in a manner consistent with the Forest Plan.”<sup>795</sup> The treatments would occur “when needed” and “may be” commercial.<sup>796</sup> No specific areas or infestations are identified though the agency hints that there is potential for this work across approximately 44,000 acres.<sup>797</sup> These salvage harvests are explicitly not a part of the other timber harvests the agency is proposing and list in its Draft EA.

This is not a hard look. The agency has provided no information about when or where these activities may occur or any information indicating they are necessary at all. There is no analysis or justification for this activity in the Draft EA, just a statement that it may occur. That does not comply with NEPA.

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<sup>792</sup> See Attachment 2.

<sup>793</sup> FEIS, App’x G, G-215.

<sup>794</sup> FEIS, App’x G, G-215.

<sup>795</sup> Draft EA, 59.

<sup>796</sup> Draft EA, App’x B.

<sup>797</sup> Draft EA, App’x B.



P. The Agency Has Not Justified Its Vegetation Management or Taken a Hard Look at Its Impacts

Like many other aspects of this proposal, the agency's assessment of impacts to various vegetation communities comes down to this: "We would adhere to Forest Plan standards, applicable design criteria, and best management practice, and therefore [ ] impacts would not . . . rise to a level of significance."<sup>798</sup> As we have explained at length, stating that the agency intends to comply with its Forest Plan is not a substitute for NEPA effects analysis nor does it mean impacts will not be significant. This fundamental error prevents the agency from taking a hard look.

There is another overarching reason the agency's assessment of impacts to vegetation communities does not constitute a hard look: it is built entirely on data that the agency acknowledges is inaccurate. The analysis is run on "the CONF's corporate stand layer."<sup>799</sup> But the agency knows that has limited value. For example, elsewhere it admits that the "Foothills mapping data shows an abundance of young shortleaf pine stands in the Foothills Landscape, [and] many of those stands are *void . . . of shortleaf pine*."<sup>800</sup> The most site-specific information provided with the Foothills analysis are the maps attached to the Draft EA which the agency disclaims: "Data shown on this map are for reference only. The Forest Service strives to obtain accurate and precise data; however, there are likely some errors in these data."<sup>801</sup> Even with this data, the agency explicitly acknowledges that it lacks adequate information on "underlying causes of ecological degradation" and "site characteristics" such as "stand composition, structure, stand health, [and] age."<sup>802</sup> Those are the very conditions the agency proposes to manipulate with its treatments. It cannot take a hard look at that impact if it does not know what the conditions are.

To be clear, we do not fault the agency for having imperfect data and appreciate that the agency has complied with NEPA by disclosing its limitations. But this is insufficient to meet the hard look standard. At the very least, the Forest Service must verify the information through some type of in-field analysis.

This Forest has been down this road before. In 2011 it proposed a project to "thin 6,375 acres of over-stocked pine stands" it identified using data similar to that used in the Foothills analysis.<sup>803</sup> Two years later it had to re-scope that project because through "on-the-

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<sup>798</sup> Vegetation Report, 45.

<sup>799</sup> Vegetation Report, 10.

<sup>800</sup> Vegetation Report, 17.

<sup>801</sup> Draft EA, Maps 12-20.

<sup>802</sup> Draft EA, 11.

<sup>803</sup> See Scoping Notice, Forest Health Stewardship Project (July 20, 2011) included as Attachment 5.

ground examination, [it] found that many of the stands” were not over-stocked pine stands at all.<sup>804</sup> Field review revealed that the project actually only contained 713 acres of over-stocked pine stands. The agency took a hard look in that instance by going out and field-checking its data. Its refusal to do so prevents it from taking a hard look here.

Making the Foothills analysis even less reflective of actual conditions, it is not built just on admittedly imperfect data but a series of “proportional-based assumptions” derived from the data.<sup>805</sup> This is how the agency purports to “divide potential effects” amongst vegetation communities.<sup>806</sup> We understand that applying assumptions to some degree is appropriate in environmental analysis but layering assumptions on top of already flawed data moves the assessment further away from a hard look.

The agency’s position is apparently that “[m]oving forward with limited or incomplete data is necessary to plan for landscape-scale projects.”<sup>807</sup> Moving forward with incomplete data may be necessary to plan landscape-scale projects *on the timeline the agency desires* but it is not accurate that landscape-scale projects categorically necessitate use of incomplete data. Regardless, NEPA does not apply differently based on the geographic scale of a project. In other words, the agency cannot diminish its obligations under NEPA by designing larger projects. Any other interpretation would turn NEPA on its head because the statute specifically reserves the most rigorous analysis for the largest, most complex projects that may have a significant impact on the environment. The Forest Service must take a hard look using the same general quality of information whether its project area is 157,000 acres or 1,000 acres.

Finally, it appears the agency is using its incomplete data to reach unsupported conclusions. For instance, it justifies some activities by stating that there are “55,534 acres of oak-dominated forest . . . [with] closed canopies and overstocked conditions.”<sup>808</sup> We understand that its data may indicate the acreage of oak-dominated forest but how does the agency know all of that acreage has closed canopies and is overstocked? Similar assumptions drive much of the analysis but appear to be wholly unverified. Perhaps the agency is planning to confirm these assumptions through in-field inspection later. If so, the problem here is that its effort to meet NEPA’s obligations is mistimed; taking a hard look post-decision does not comply with NEPA.

Examining current data to estimate opportunities for vegetation management on the landscape seems like a very reasonable approach. But the agency cannot stop there. If the Forest intends to make a final decision now, it has to take the additional step of looking at conditions in the field to verify the accuracy of its data and estimate effects under NEPA.

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<sup>804</sup> See Scoping Notice Reissuance, Forest Health Stewardship Project (July 11, 2013) included as Attachment 6.

<sup>805</sup> Vegetation Report, 11.

<sup>806</sup> Vegetation Report, 11.

<sup>807</sup> Foothills Project Restoration Plan, 18.

<sup>808</sup> Vegetation Report, 49.

1. *The Agency Has Not Justified or Taken A Hard Look at Treatments for Gypsy Moth or Oak Decline*

The agency justifies approximately 54,500 acres of timber harvest by pointing to a “continuous threat from both oak decline and gypsy moth.”<sup>809</sup> According to the agency, much of the oak population is “extremely likely to be overtaken by oak decline and gypsy moth.”<sup>810</sup> This is significantly overstated.

First, even if there was a gypsy moth threat, the agency’s analysis suggests harvesting timber may not mitigate the problem. “Mortality following gypsy moth outbreaks tends to occur in stands stressed for resources and *suffering from severe spring droughts.*”<sup>811</sup> “Stands with frequent outbreaks and severe damage include areas where *average rainfall is lowest.*”<sup>812</sup> Nothing the agency does is going to directly affect rainfall patterns in the Foothills.

More to the point, last year *not a single gypsy moth* was detected on the Chattahoochee.<sup>813</sup> Thankfully, for now gypsy moth does not appear to be an imminent threat to the forest.

As far as we can tell, this appears to be a proposal to cut down oak trees before they might become infested by gypsy moth regardless of the degree of threat. The worst case scenario, where some trees become infested by gypsy moth and die, seems to further some of the agency’s other objectives. For instance, the agency indicates that oak stands are overstocked. If gypsy moth infests some of those trees, effectively accomplishing a natural thinning, then the agency’s desired condition would be achieved. Or if gypsy moth killed an entire stand of trees, they would be replaced with the early-successional habitat the agency seeks to achieve with other harvest techniques. If part of this proposal is driven by a need to commercially harvest oak trees before they become less valuable due to potential gypsy moth infestation, the agency needs to disclose that reasoning as part of its NEPA analysis. Because the agency’s analysis is built on the assumption that gypsy moth poses an imminent threat, when data indicates otherwise, it does not reflect actual conditions and is not a hard look.

The agency has also not provided justification or assessed accurately the impact of action to address oak decline. According to the agency, oak forests appear to be in relatively good shape. “Oak forests are the dominant forest type in the Southern Appalachian region.”<sup>814</sup> They

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<sup>809</sup> Vegetation Report, 60.

<sup>810</sup> Vegetation Report, 60.

<sup>811</sup> Vegetation Report, 28 (emphasis added).

<sup>812</sup> Vegetation Report, 28 (emphasis added).

<sup>813</sup> See Forest Service, Southern Region Gypsy Moth Report (Oct. 1, 2019) available at [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd600534.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd600534.pdf).

<sup>814</sup> Vegetation Report, 18.

currently account for more than 1/3 of the acreage within the landscape.<sup>815</sup> This has all occurred with minimal timber management over the last 50 years.<sup>816</sup> If there is a problem, it appears to be in the understory where oak seedlings are being outcompeted potentially due to the exclusion of fire.<sup>817</sup> We do not see how cutting mature oaks solves that problem.

The justification for harvesting those trees appears to be oak decline which is a “complex that involves the interaction of environmental stresses such as drought, root disease, insect pests of opportunity, and physiologically mature trees.”<sup>818</sup> Like gypsy moth, drought appears to be a driving factor here. Nevertheless, the Forest Service identifies oak decline as a “serious forest health concern”<sup>819</sup> and believes “over-mature oak forests” are particularly at risk.<sup>820</sup> To mitigate this risk, the agency proposes to cut down mature oaks.

This justification appears to be overwhelmingly built on the age of the forests. If the agency is going to take action to address oak decline threats, it needs at least some site-specific information indicating that oak decline is a legitimate threat in an area. Age alone does not indicate this is a threat and does not provide a platform for taking a hard look at the effect of the proposal.

Moreover, it is unclear if the agency’s proposal will achieve its stated objective. “[R]egeneration of oak stands has proven problematic.”<sup>821</sup> “[T]imber harvests,” specifically, “of the overstory of oak-dominated stands have often released established shade-tolerant species (red maple or white pine) or escalated the establishment of aggressive post-disturbance invaders, such as yellow pine.”<sup>822</sup> Stated differently, harvesting oaks appears to be transitioning the composition of stands. Instead of harvesting oaks to create younger oaks which are less susceptible to oak decline, the agency appears to be harvesting oaks and diminishing that community on the landscape.

Finally, we do not see the long-term objective here. According to the agency, “[s]prout regeneration is normally the primary and most reliable means of regenerating oaks.”<sup>823</sup> That suggests the agency is on a treadmill of harvesting an older oak, for a younger oak to grow in its place which, according to this explanation, will have to be harvested when it gets old due to

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<sup>815</sup> Vegetation Report, 18.

<sup>816</sup> Vegetation Report, 19.

<sup>817</sup> Vegetation Report, 19-20.

<sup>818</sup> Vegetation Report, 28.

<sup>819</sup> Vegetation Report, 28.

<sup>820</sup> Vegetation Report, 20.

<sup>821</sup> Vegetation Report, 21.

<sup>822</sup> Vegetation Report, 21.

<sup>823</sup> Vegetation Report, 30.

threats from oak decline and the cycle will restart. That approach seems to ensure the community will not become self-sustaining. The Forest Service defines ecological restoration as restoring forest *function*, including the disturbance processes that drive the other elements of ecological integrity (structure and composition). In our forests, those processes are primarily gap phase regeneration in mesic forests and fire in more xeric forests. If forest health is the goal, the agency should consider making changes to the understory and midstory to facilitate a system of natural, self-sustaining oak reproduction rather than repeated harvests of mature oaks.

## 2. *The Agency Has Not Taken a Hard Look at Impacts to Old Growth*

Failing to properly assess old growth and account for impacts is a NEPA violation.<sup>824</sup> The Forest Service has not met its obligation here for at least three reasons.

First, the agency cannot assess impacts to old growth because it has not looked for old growth and thus does not know when, or where, or how, it may be affected by any activity proposed in the Foothills Project. The agency also cannot evaluate any potential effects within the context of the overall distribution of old growth on the landscape. To be sure, it has identified “areas of possible old growth,” based on its corporate stand layer, and agreed to examine these areas to determine if they meet old growth criteria.<sup>825</sup> But that approach is inadequate because it is entirely possible that old growth may exist outside these areas, and be impacted by timber harvesting with no assessment at all. As discussed above, the agency acknowledges that its corporate stand layer is imperfect. Simply reviewing the stand layer data is not an adequate survey of potential old growth in the project area. The approach is also insufficient because there is no proposal or plan for how this would work. Conclusory statements are insufficient for hard look purposes.

Second, the agency admits that it plans to harvest Type 22 and Type 24 old growth.<sup>826</sup> Regardless of whether this is allowed under the Forest Plan, NEPA still requires the agency to consider the effect of harvesting existing old growth – a highly rare resource on the Chattahoochee.<sup>827</sup> As the Region 8 Guidance explains, “[i]f the stand is existing old growth, then the effects of a proposed project on the stand’s old growth characteristics will be fully disclosed and considered through the [NEPA] process.”<sup>828</sup> Here, all the agency has stated is that

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<sup>824</sup> See *Cuddy Mountain*, 137 F.3d at 1378 (holding cumulative impact analysis of combined effect on depleting existing old growth habitat inadequate); *Bair v. Cal. Dep’t. of Transp.*, No. C 10-04360 WHA, 2011 WL 2650896 (N.D. Cal. July 6, 2011) (issuing injunction for road widening through old-growth redwood area for issuing a FONSI instead of producing an EIS); *Alliance for the Wild Rockies v. Wood*, CIV 07-452-EJL, 2008 WL 2152237 (D. Idaho May 21, 2008) (enjoining timber sale where method of calculating old growth scientifically flawed).

<sup>825</sup> Vegetation Report, 69.

<sup>826</sup> Vegetation Report, 69.

<sup>827</sup> Vegetation Report, 69.

<sup>828</sup> See Guidance for Conserving and Restoring Old-Growth Forest Communities on National Forests in the Southern Region, Report of the Region 8 Old Growth Team (June 1997), *available at* <https://www.fs.fed.us/outernet/r8/planning/R8%20Old%20Growth%20Report.pdf>.

harvesting these old growth types is allowed by the Forest Plan; that does not carry its NEPA burden.

Third, even when the agency avoids old growth, but harvests near it, NEPA analysis must consider indirect effects of logging in and near old growth including impacts related to fragmentation or edge effects that will be caused by logging and by the building of temporary roads and skid trails. Old growth forest communities are sensitive to edge effects, habitat fragmentation, and gradual creep of disturbance from logged areas into the boundaries of neighboring old growth areas. This is an indirect effect that also must be disclosed under NEPA.

Q. The Agency Has Not Taken a Hard Look at Effects to Climate Change

Trees are a major carbon store in any forested ecosystem. We believe that the extensive tree harvest proposed in the Foothills Project would deplete the total carbon sink in the short and long term. Claims to the contrary in the Climate Change Report are not adequately supported, either by analysis or other documents. The report presents benefits of tree harvest using words such as “may” and “likely.” Due to the large uncertainty in the current science of carbon sequestration by temperate forests, and the Climate Change Report completely ignoring carbon sequestration in forest soil, the agency has not taken a hard look and we request that the Climate Change Report be revised to consider the sequestration of soil, and quantitatively analyze total ecosystem carbon impacts of proposed treatments in the short and long term.

We also request that the Climate Change Report be revised to include scientific research on the importance of older forests and soil in carbon sequestration. A review by Luyssaert et al.<sup>829</sup> points out:

...it is generally thought that ageing forests cease to accumulate carbon. Here we report a search of literature and databases for forest carbon-flux estimates. We find that in forests between 15 and 800 years of age, net ecosystem productivity (the net carbon balance of the forest including soils) is usually positive. Our results demonstrate that old-growth forests can continue to accumulate carbon, contrary to the long-standing view that they are carbon neutral...Old-growth forests accumulate carbon for centuries and contain large quantities of it. We expect, however, that much of this carbon, even soil carbon, will move back to the atmosphere if these forests are disturbed.<sup>830</sup>

Referring to the United States, they note, critically, that "most greenhouse gas mitigation policies and programs have focused on managing [US forests and forest products as] natural climate

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<sup>829</sup> Luyssaert, Sebastiaan & Ernst Detlef, Schulze & Börner, Annett & Knohl, Alexander & Hessenmöller, Dominik & Law, Beverly & Ciais, Philippe & Grace, John. (2008). Old-growth forests as global carbon sinks. *Nature*. 455. 213-5. 10.1038/nature07276.

<sup>830</sup> Luyssaert, Sebastiaan & Ernst Detlef, Schulze & Börner, Annett & Knohl, Alexander & Hessenmöller, Dominik & Law, Beverly & Ciais, Philippe & Grace, John. (2008). Old-growth forests as global carbon sinks. *Nature*. 455. 213-5. 10.1038/nature07276.

protection by managing aboveground biomass alone, and little consideration is given to the large and critical pool of soil carbon.”<sup>831</sup>

The Climate Change Report also fails to reference USFS guidance on managing carbon: Considering Forest and Grassland Carbon in Land Management. Gen. Tech. Rep. WO-95.<sup>832</sup> That report notes that “Ultimately, the carbon stored in wood products is returned to the atmosphere through decomposition or combustion, although the time needed for this return can vary widely based on the use and longevity of materials made from harvested wood.” We request that the Climate Change Report be revised to address the carbon release from harvested timber.

The WO-95 report repeatedly identifies less harvest as increasing carbon retention:

Decreasing the intensity of forest harvest is one way to decrease carbon losses to the atmosphere... the “no harvest” option commonly produces the highest forest carbon stocks...Managed stands typically have lower levels of forest biomass than unmanaged stands, even though the annual rate of sequestration may be higher in a younger forest...found that less-frequent harvests and greater levels of structural retention (e.g., residual trees) resulted in increased forest carbon stocks...Forest harvest can cause disturbance to the ground, releasing carbon from soils and the forest floor.<sup>833</sup>

These carbon losses are easily visualized as tops, laps and branches left on the forest floor decompose and the regenerating forest does not sequester the same amount of carbon as the mature trees removed. Masticating the debris left over from timber harvest will only hasten decomposition and increase the rate of carbon release. We request that the Climate Change Report be revised to address the total forest biomass and carbon release from soil disturbance instead of focusing solely on tree age.

In addition to the effects of timber harvest, the plan to regularly burn tens of thousands of acres in perpetuity will upon burning release vast amounts of carbon into the atmosphere that otherwise would have been released slowly over decades. The WO-95 report also speaks to this issue, and calls into question specific conclusions in the Climate Change Report:

Fuel-reduction treatments lower the density of the forest stand, and, therefore, reduce forest carbon. Some studies suggest that fuel-reduction treatments create carbon benefits over time by increasing the growth of the residual stand and reducing risk of catastrophic fire...The results of studies to date, however, are divided as to whether this benefit can be realized. Prescribed fires also result in the release of greenhouse gas emissions, which

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<sup>831</sup> American Forests available at <https://www.americanforests.org/priorities/climate/forest-soil-carbon-initiative/>

<sup>832</sup> Janowiak, M.; Connelly, W.J.;Dante-Wood, K.; Domke, G.M.; Giardina, C.; Kayler, Z.; Marcinkowski, K.; Ontl, T.; Rodriguez-Franco, C.; Swanston, C.; Woodall, C.W.; Buford, M. 2017. Considering Forest and Grassland Carbon in Land Management. Gen. Tech. Rep. WO-95 <https://www.fs.usda.gov/treearch/pubs/54316>

<sup>833</sup> *Id.* at 25.

need to be accounted for when considering the relationship between fire and carbon... Additionally, carbon emissions from prescribed fire, the machinery used to conduct treatments, or the production of wood for bioenergy may reduce or negate the carbon benefit associated with fuel treatments, especially when treatments are repeated... Further, there are uncertainties in predicting the actual occurrence of wildfire and its impacts on forests due to an incomplete scientific understanding of ecological response to fire, of fire behavior response to treatments, and inability to predict fire occurrence at the stand level...<sup>834</sup>

We request that the Climate Change Report be revised to address carbon emissions from prescribed fires and the uncertainty associated with wildfire occurrence and response to proposed Foothills Project activities.

WO-95 references a Scharlemann report,<sup>835</sup> which states that “most climate change mitigation policies have focused on carbon stored in phytomass... However, in addition to phytomass carbon, soil carbon is likely to be of major importance, as soils and surface litter store two- to three-times as much carbon in organic form as there is carbon in the atmosphere globally, as referred to in the Kyoto Protocol.”<sup>836</sup> “Uncertainty in modeled estimates of soil carbon is very large.”<sup>837</sup>

Timber harvesting with bulldozers, skidders and truck traffic directly adds carbon to the atmosphere as all these machines consume large amounts of diesel fuel. The Climate Change Report does not address carbon emissions from fuel for equipment use or transportation. We request that the report be revised to include a carbon life-cycle assessment by factoring in all inputs and outputs as a result of the Foothills Project.

#### R. The Agency Has Not Taken a Hard Look at the Use of Herbicide for Silvicultural Purposes

The agency’s analysis of herbicide and pesticide treatments is found entirely in Appendix B of the Vegetation Specialist Report. This section of analysis likewise tiers to a separate programmatic NEPA document—the Final Environmental Impact Statement for Vegetation Management in the Appalachian Mountains (VMEIS), which was published in 1989. The Vegetation Special Report also references risk analysis worksheets for individual pesticides and herbicides; these worksheets were developed on behalf of the Forest Service by Syracuse Environmental Research Associates (SERA) in 2011.<sup>838</sup> Last, the Vegetation Specialist Report

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<sup>834</sup> Considering Forest and Grassland Carbon in Land Management. Gen. Tech. Rep. WO-95, 96.

<sup>835</sup> Jörn PW Scharlemann, Edmund VJ Tanner, Roland Hiederer & Valerie Kapos(2014) Global soil carbon: understanding and managing the largest terrestrial carbon pool, CarbonManagement, 5:1, 81-91, DOI: 10.4155/cmt.13.77.

<sup>836</sup> *Id.*

<sup>837</sup> *Id.*

<sup>838</sup> Vegetation Report, Appendix B, AP8.



references several “project design features” and a “spill plan” that the agency proposes would be implemented under Alternative 2.

The Forest Service’s references to previous NEPA documents and the SERA reports cannot take the place of a hard look at site-specific impacts from the use of pesticides and herbicides in the Foothills area. Yet this is precisely how the agency has approached its analysis.

The VMEIS on which the agency relies is a programmatic analysis that assesses in a generalized way the impacts of various vegetation treatment methods, including the use of herbicides. The VMEIS expressly states that it is not a site-specific analysis; rather, the agency’s intention in 1989 was for subsequent analyses to tier to the VMEIS—but only if additional site-specific analysis is prepared.<sup>839</sup>

For example, the VMEIS notes that “[t]his EIS is used to make decisions about how the vegetation management program on national forests in the Appalachians is conducted. Major decision are: (1) what methods and tools are allowed; (2) what intensity and frequency of treatments are used; and (3) what management requirements and mitigation measures are applied.”<sup>840</sup> Forest Plans and the VMEIS thus “define the limits within which [such site-specific vegetation management] projects may operate.”<sup>841</sup> Unmistakably, the VMEIS is not a site specific analysis of impacts. The VMEIS itself describes what the Forest Service must do in subsequent decisions:

Vegetation management projects must receive site-specific environmental analysis....Data on sites eligible for treatment are gathered and evaluated....A detailed analysis of site conditions and environmental effects of alternative treatments is done....The analysis must evaluate direct, indirect, and cumulative environmental effects...considering the unique physical and biological characteristics of the site.<sup>842</sup>

The VMEIS makes clear why site specific analysis of herbicide use is required: the analysis is “used to choose the herbicide, rate, and application method for the site conditions and species to be controlled. They are also used to select measures to protect human and wildlife health, non-target vegetation, water, soil, and threatened, endangered, proposed and sensitive species.”<sup>843</sup>

Yet the Forest Service’s draft EA contains no such site-specific analysis of environmental impacts. Without knowing exactly when, how, or where pesticides and herbicides will be

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<sup>839</sup> If the VMEIS had been amended to close this gap, we were not able to find it and ask that the agency produce a copy.

<sup>840</sup> VMEIS-AM, I-8

<sup>841</sup> *Id.* at I-9.

<sup>842</sup> *Id.*

<sup>843</sup> *Id.* at II-61.

applied, the Forest Service can only point to generalized data from SERA reports—some of which suggests that the Forest Service’s proposed treatments *may harm* non-target species of plants, animals, and insects—and offer conclusory statements that its “project design features” will effectively “discount” these negative impacts by making them less likely to occur. Nowhere does the agency explain *how* its project design features can be expected to eliminate harm to non-target species; nor does the agency attempt to disclose the degree of impacts to non-target species that, for one reason or another, are not protected by the agency’s project design features. The Forest Service attempts to minimize the extent of these impacts by asserting that where the SERA reports suggest that wildlife will be harmed by application of herbicides and pesticides, “one must remember that these effects are constructed for individuals and not populations.”<sup>844</sup>

The agency has developed its project design features in reverse, contrary to the process outlined by the VMEIS. Instead of collecting data on eligible sites and then developing measures to protect human and wildlife health, the agency instead points to its “project design features” and concludes that, no matter where herbicide treatments are applied, they will not impact the environment. Undermining the agency’s analysis are the facts that, first, the agency presents no detailed or quantified information to support its conclusion that potential harms to plant, animal and insect species identified by the SERA reports can reasonably be “discounted” by the project design features; and second, the agency has simply borrowed mitigation measures from the VMEIS and renamed them “project design features.”<sup>845</sup> This creates a logical loop: the VMEIS instructs the agency to prepare subsequent site-specific analysis of impacts, but the agency has simply incorporated the VMEIS’s minimum mitigation requirements and concluded that as a result, there will be no impacts. This does not suffice.

We are also aware of no monitoring data indicating past applications of herbicide on the Chattahoochee have not had unintended consequences.

For the above reasons, the agency has failed to take a hard look at the environmental impacts of pesticide and herbicide treatments.

#### S. The Agency Has Not Sufficiently Justified Its Proposed Mitigation Measures

If the agency is going to rely on mitigation measures it must assess the effectiveness of those measures to meet NEPA’s hard look standard. “A mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA.”<sup>846</sup> Only “when the adequacy of proposed mitigation measures is supported by substantial evidence” are they sufficient.<sup>847</sup> This Forest has been advised of this requirement before by other Forest Service

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<sup>844</sup> Vegetation Report, Appendix B, AP9.

<sup>845</sup> VMEIS-AM, II-61.

<sup>846</sup> *Nw. Indian Cemetery Protective Ass'n v. Peterson*, 795 F.2d 688, 697 (9th Cir. 1986), *rev'd sub nom. Lyng v. Nw. Indian Cemetery Protective Ass'n*, 485 U.S. 439, 108 S. Ct. 1319, 99 L. Ed. 2d 534 (1988).

<sup>847</sup> *Sierra Club v. U.S. Army Corps of Engineers*, 464 F. Supp. 2d 1171, 1224–25 (M.D. Fla. 2006), *aff'd*, 508 F.3d 1332 (11th Cir. 2007).

staff: “[The Forett] should avoid general statements that BMPs are adequate as justification. [It] should consider identifying specific BMPs, unit design and past monitoring on similar units to support any actions on these soils.”<sup>848</sup> But the agency’s analysis again falls short in this regard.

The most basic problem is that the agency cannot mitigate impacts if it does not know where an action will take place. To mitigate the effects of an action, the agency must know where the action will occur. With no site-specific proposals, and no baseline data from which to evaluate those proposals, it is providing nothing more than a “mere list” of mitigation measures. This is effectively a promise to try to mitigate future impacts; not a hard look.

Even if it had disclosed specific locations for its actions, the agency has presented no information indicating it has successfully mitigated impacts, particularly to soil, water, and aquatic species, from past timber sales in similar environments. It only states that it will apply best management practices without disclosing their effectiveness. The agency point to Georgia Forestry Commission BMP surveys to imply that the Forest Service correctly applies BMPs 96% of the time, but that is not what that data says.<sup>849</sup> That percentage reflects BMP compliance surveys on federal, state, county or city owned lands, not just Forest Service land. We were unable to determine how many Forest Service sites were surveyed or how well they performed. The Forest’s Fiscal Year 2013-2016 Monitoring and Evaluation Report similarly contains no assessment of BMP compliance or effectiveness. If the agency is going to rely on mitigation techniques we ask that it disclose relevant monitoring data from this forest indicating how effective its BMPs have been at mitigating impacts to soil and water resources. Where mitigation has failed in the past, the Forest must explain why, or at least explain why it is confident that future attempts to mitigate impacts will fare better.

Many of the Project Design Features simply rearticulate requirements from other documents such as the Forest Plan. The Forest Plan explicitly contemplated that more rigorous standards than those included in the Plan may be required for some projects: “Site-specific analysis will be conducted at the project level and further protection [for soils] provided as needed.”<sup>850</sup> The agency cannot just point to its Forest Plan (or Georgia State BMPs which are incorporated into its Forest Plan) to demonstrate adequate mitigation.

Many other project design features are aspirational, stating only that timber operators “should” do something.<sup>851</sup> There appear to be no consequences if these instructions are not followed as well as no plan for measuring compliance with something someone “should” do. Even the 10% watershed total impervious area and T-factor exceedance triggers that underpin much of the agency’s assessment of the significance of impacts to soils are aspirational

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<sup>848</sup> See Attachment 13.

<sup>849</sup> Soil Report, 26.

<sup>850</sup> FEIS, App’x G, G-46.

<sup>851</sup> See, e.g., Draft EA, 74.

requirements the agency “should” try to achieve.<sup>852</sup> We agree with many of these recommendations but they do not appear to be enforceable mitigation measures. An exhortation that operators “should” avoid rutting, for example, doesn’t mean much where the Forest has authorized logging on soils that are particularly susceptible to rutting.

Other Project Design Features are contradictory, making it impossible for them to be fully implemented. For instance, one Project Design Feature is to build temporary logging roads on “system trails[ ] where possible”<sup>853</sup> while another states that “[u]sing segments of designated forest trails as skid trails/haul roads should be avoided.”<sup>854</sup> The fact that these both cannot be achieved indicates this is a “mere list.”

Finally, we understand that many of the mitigation measures will not be implemented until after a timber unit is closed. For instance, “[d]rainage structures, such as outsloping and waterbars, would be installed along temporary roads *when the use of the road is no longer needed.*”<sup>855</sup> Obviously, this is ineffective to mitigate impacts from storms and other events while the timber unit is open, which could be for months at a time.

#### T. The Forest Service Must Complete Transportation Analysis to the Build Functional Equivalent of Maintenance Level 1 Roads

Forest Service regulations at 36 CFR 212.5(b)(1) require that the Forest Service identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System (NFS) lands. Whenever the Forest Service proposes to add to a forest’s road system, it must prepare or otherwise point to a supporting transportation analysis report.

Here, the Forest Service is proposing to add an unspecified number of temporary roads to the road prism in the Foothills area. Some of these will be “new” temporary roads and others will be reconstructed “old” temporary roads. The Forest Service asserts that “[t]he majority of temporary roads that will be used *are already existing and the road prism is still intact,*” suggesting that on the CONF, previously-constructed “temporary” roads are often kept in storage for future entry as opposed to being decommissioned in fact.<sup>856</sup>

The Draft EA confirms the same. Temporary roads the agency will construct or reconstruct in the Foothills area, “will be assessed for continued use to meet other resource needs”<sup>857</sup> and “[o]nce the temporary roads . . . are no longer needed, they would be closed to

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<sup>852</sup> Draft EA, 74.

<sup>853</sup> Draft EA, 75.

<sup>854</sup> Scenery and Recreation Report, AP15.

<sup>855</sup> Draft EA, 75.

<sup>856</sup> Soil Report, 22 (emphasis added).

<sup>857</sup> Draft EA, 79.

normal vehicle traffic so that illegal use is discouraged.”<sup>858</sup> Because the Foothills project, as proposed, could last for decades, it is not at all clear how long such “temporary” roads would remain in use. Indeed, if the Forest had fulfilled its duty to explain where and when it plans to harvest, it would be obvious that many of these road prisms will be used repeatedly *during this project*, and they are likely to be reused again in future projects too. The Forest Service cannot use these roads over the course of a multi-decade project without adding them to the road system.

Moreover, the Draft EA is straightforward that the temporary nature of these roads is their use, not their impact. Temporary roads will be “closed to normal vehicle traffic” after use. This may include actions such as “installation of an earthen barrier, . . . placement of logging debris along the road surface, [or] seeding or placement of boulders”<sup>859</sup> which will prevent access but leave the road prism intact. These are not temporary roads but Maintenance Level 1 roads the Forest Service is constructing and then keeping in storage. Regardless of the label the Forest Service assigns to the roads (“temporary” or not), the agency cannot build the functional equivalent of Maintenance Level 1 roads without completing transportation analysis and considering the environmental and economic implications of adding more roads to its road system. The Forest Service already has hundreds of miles of Maintenance Level 1 roads on its transportation network which it does not have the budget to maintain, some of which are causing adverse environmental impacts.<sup>860</sup>

### **XIII. The Forest Service is Not Complying with the National Historic Preservation Act**

Section 106 of the National Historic Preservation Act (“NHPA”) requires federal agencies to take into account the effect of their “undertakings” on any “historic property.”<sup>861</sup> An “undertaking” is a “project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency.”<sup>862</sup> A “historic property” is “any prehistoric or historic district, site, building, structure, or object included on, or eligible for inclusion on, the National Register [of Historic Places], including artifacts, records, and material remains relating to the district, site, building, structure, or object.”<sup>863</sup> As recognized by the Forest Service, the Foothills Landscape Project, as proposed, would involve a number of separate undertakings that will trigger the agency’s obligations under Section 106.

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<sup>858</sup> Draft EA, 74.

<sup>859</sup> *Id.*

<sup>860</sup> See Chattahoochee-Oconee National Forests, Travel Analysis Report (Oct. 2016) available at [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd539037.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd539037.pdf).

<sup>861</sup> *United Keetoowah Band of Cherokee Indians in Oklahoma v. Federal Communications Commission*, 933 F.3d 728, 733 (D.C. Circuit 2019); 54 U.S.C. §306108.

<sup>862</sup> 54 U.S.C. § 300320.

<sup>863</sup> 54 U.S.C. § 300308.

Regulations published by the Advisory Council for Historic Preservation at 36 C.F.R. Part 800 set out a detailed process that federal agencies must follow in order to comply with Section 106. In general, this process has four steps: first, the agency must define the “area of potential effects” (“APE”) for an undertaking; second, the agency must make reasonable and good-faith efforts to identify historic properties within the APE; third, if historic properties are present within the APE, the agency must determine whether the proposed undertaking will adversely affect the historic properties; and fourth, if the agency determines that the undertaking may cause an adverse effect to historic properties within the APE, it must develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize, or mitigate the adverse effects.<sup>864</sup> In navigating these steps, agencies are required to consult with interested parties about the identification of historic properties and the resolution of any adverse effects, including state historic preservation officers (SHPO) and tribes.<sup>865</sup> In addition, the regulations require that the agency “seek and consider the views of the public.”<sup>866</sup>

The ACHP regulations expressly authorize agencies to negotiate “programmatic agreements” with the ACHP and other consulting parties to govern “complex projects” involving “multiple undertakings.”<sup>867</sup> Specifically, agencies may use programmatic agreements to comply with Section 106 “[w]hen effects on historic properties cannot be fully determined prior to approval of an undertaking”<sup>868</sup>; in such circumstances, agreements may allow for a “phased” process to conduct identification of historic properties and evaluation of effects.<sup>869</sup>

When a validly-executed programmatic agreement is in place, “compliance with the procedures in that agreement satisfies the agency’s NHPA Section 106 responsibilities for all covered undertakings.”<sup>870</sup> While the ACHP regulations provide agencies with significant flexibility in negotiating the terms of a programmatic agreement, this flexibility is not limitless. The regulations impose both substantive and procedural requirements for developing an agreement.

To satisfy its Section 106 responsibilities for the Foothills project, the Forest Service has proposed to enter into a programmatic agreement that sets out, among other things, a phased identification and evaluation process. This approach is understandable; after all, under its proposed “toolbox” approach, the agency would not know where specific undertakings would

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<sup>864</sup> *Dine Citizens Against Ruining Our Environment v. Bernhardt*, 923 F.3d 831, 846 (10th Cir. 2019).

<sup>865</sup> 36 C.F.R. § 800.2.

<sup>866</sup> *Id.*

<sup>867</sup> 36 C.F.R. § 800.14.

<sup>868</sup> *Id.*

<sup>869</sup> 36 C.F.R. § 800.4(b)(2).

<sup>870</sup> *Dine Citizens Against Ruining Our Environment*, 923 F.3d at 846.

take place—and consequently, where the APEs would be—until after the NEPA process is complete.

However, just as the Forest Service’s proposed toolbox approach pushes past the legal bounds of NEPA, it likewise exceeds the limits of NHPA, for similar reasons: in its effort to conform the terms of the programmatic agreement to a flawed condition-based management approach, the Forest Service runs afoul of NHPA’s non-discretionary requirements for thorough and timely analysis, public disclosure, and public participation. As we have noted elsewhere in these comments, a condition-based management approach is not *inherently* problematic under NEPA. Nor is it impossible for the Forest Service to negotiate a valid programmatic agreement that both complies with Section 106 and comports with a condition-based approach. Unfortunately, the draft programmatic agreement does not achieve this feat.

In short, the programmatic agreement contains fatal flaws. Specifically, it provides no opportunities for the public to receive notice or offer comments to the Forest Service during the lifetime of the project, and it arbitrarily exempts from the programmatic agreement—and thereby, from NHPA’s protections—an assortment of undertakings which clearly have the potential to adversely impact historic properties.

In addition, we are concerned by language in the Cultural Resources Report suggesting that the agency intends to rely on its proposed “alternative mitigation measures” to “mitigate *any* adverse effects resulting from implementation of the Foothills Landscape Management Project.”<sup>871</sup> While the research and surveying projects the Forest Service has proposed in Appendix D are admirable in their own right, it is not clear that NHPA allows an agency to commit *in advance* to archaeological research that is not directly related to the adverse effects of an undertaking as a way of pre-emptively complying with the mitigation-related requirements of Section 106. While NHPA provides agencies with flexibility in developing mitigation measures through consultation, joint guidance from ACHP and CEQ makes clear that there must be a *nexus* between adverse effects and mitigation measures.<sup>872</sup> It is difficult to see how an appropriate nexus could be identified in advance where, as here, the location and nature of historic properties and any adverse effects to them will not come into focus for months, years, or even decades.

A detailed discussion of these problems follows below. But first, we would be remiss not to say that the agency’s efforts to identify *gaps* in our collective institutional knowledge about the cultural heritage of the CONF are laudable. As described in the Forest Service’s *Cultural Resources Overview*, the CONF has a rich and layered cultural heritage, but our understanding of

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<sup>871</sup> Draft Programmatic Agreement, 8.

<sup>872</sup> NEPA and NHPA: A Handbook for Integrating NEPA and Section 106 (2013), 40, available at <https://www.achp.gov/digital-library-section-106-landing/nepa-and-nhpa-handbook-integrating-nepa-and-section-106>.

how and where this heritage is evidenced across the Foothills landscape is sorely lacking. Given the relatively small percentage of the Foothills area that has been surveyed and the vastness of the Forest Service’s proposed actions, developing a programmatic agreement that will comply with NHPA is a significant challenge. The CONF archaeologist has clearly worked hard to meet this challenge, which we appreciate.

A. The Draft Programmatic Agreement Provides No Opportunities for Public Notice or Participation During the Lifetime of the Agreement

Congress enacted the NHPA to “foster conditions under which our modern society and our historic property can exist in productive harmony.”<sup>873</sup> Input from the public is crucial to the achievement of this productive harmony. The ACHP regulations make this clear, providing that

[t]he views of the public are *essential* to informed Federal decisionmaking in the section 106 process. The agency official *shall seek and consider the views of the public in a manner that reflects the nature and complexity of the undertaking* and its effects on historic properties, the likely interest of the public in the effects on historic properties, confidentiality concerns of private individuals and businesses, and the relationship of the Federal involvement to the undertaking.<sup>874</sup>

The regulations further provide that the agency official responsible for compliance with the Section 106 process “*must*, except where appropriate to protect confidentiality concerns of affected parties, provide the public with information about an undertaking and its effects on historic properties and seek public comment and input.”<sup>875</sup> An agency may choose to use its procedures for public involvement under NEPA to satisfy this requirement, but only “if they provide adequate opportunities for public involvement” consistent with the requirements of Subpart A of the ACHP regulations at 36 C.F.R. Part 800—in other words, *only if* the NEPA procedures provide opportunities for public involvement that are consistent with the purposes of NHPA and “the nature and complexity of the undertaking.”<sup>876</sup>

As noted above, the ACHP regulations allow an agency to use a programmatic agreement for compliance with Section 106.<sup>877</sup> While an agency has considerable flexibility in negotiating the terms of such an agreement, this flexibility is limited. The regulations impose both procedural and substantive requirements that apply to programmatic agreements. If an agreement does not comply with these requirements, it is invalid.

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<sup>873</sup> *United Keetoowah Band*, 933 F.3d at 733 (citing 54 U.S.C. § 300101(1)).

<sup>874</sup> 36 C.F.R. § 800.2(d)(1) (emphasis added).

<sup>875</sup> 36 C.F.R. § 800.2(d)(2).

<sup>876</sup> 36 C.F.R. § 800.2(d)(3) (emphasis added).

<sup>877</sup> 36 C.F.R. § 800.14(b).



One such requirement relates to public involvement. For programmatic agreements developed for “complex or multiple undertakings,” the regulations require that the agency engage in consultation which “shall follow [36 C.F.R.] § 800.6,”<sup>878</sup> which states in relevant part:

The agency official shall make information available to the public ... [and] shall provide an opportunity for members of the public to express their views on resolving adverse effects of the undertaking. The agency official should use appropriate mechanisms, taking into account the magnitude of the undertaking and the nature of its effects on historic properties, the likely effects on historic properties, and the relationship of the Federal involvement to the undertaking to ensure that the public’s views are considered in the consultation. The agency official should also consider the extent of notice and information concerning historic preservation issues afforded the public at earlier steps in the section 106 process to determine the appropriate level of public involvement when resolving adverse effects *so that the standards of §800.2(d) are met.*<sup>879</sup>

Guidance published by the ACHP to assist federal agencies in developing programmatic agreements provides further clarification about the requirements of §800.2. The ACHP’s website titled *Guidance on Agreement Documents: Before You Draft* notes that

[t]he regulations implementing Section 106 call for the federal agency official to actively seek and consider the views of the public as the Section 106 review process moves forward. ... [Programmatic agreements] are public documents that in some cases are provided to the public for review and comment prior to execution. In other cases, the ... [programmatic agreement] may call for the agency to provide for public review and comment on specific items or plans. The regulations (36 CFR § 800.2(d)) ask that the agency consider several factors in determining the level of public involvement: the nature and complexity of the undertaking and its effects on historic properties, the likely interest of the public in the undertaking, and the presence of any confidentiality concerns.<sup>880</sup>

Thus, whether or not a programmatic agreement itself “call[s] for the agency to provide for public review and comment on specific items or plans” should be based on the factors at listed at §800.2(d)—among them, the nature and complexity of the undertaking.

Elsewhere, an agreement-drafting “checklist” published by the ACHP indicates that agreements should include “procedures for public involvement for any ongoing reviews carried

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<sup>878</sup> *Id.*

<sup>879</sup> § 800.6(a)(4) (emphasis added).

<sup>880</sup> ACHP Guidance on Agreement Documents: Before You Draft, available at [https://www.achp.gov/before\\_you\\_draft](https://www.achp.gov/before_you_draft).

out according to the agreement’s terms.”<sup>881</sup> Notably, this guidance directs agencies to “use this checklist to ensure that the ... project Programmatic Agreement (project PA) includes the administrative stipulations and other clauses and information that *should be found in every Section 106 agreement document.*”<sup>882</sup>

Finally, ACHP guidance on drafting programmatic agreements provides that

[t]he public should be informed about the progress of agreement implementation, commensurate with the public interest in its implementation. As appropriate, they may be given the opportunity to provide views to the federal agency regarding subsequent reviews stipulated in a Section 106 agreement, particularly those in which evaluations of historic properties, assessment of effects to historic properties, or the development of treatment measures will occur. *These provisions are especially important in a [programmatic agreement] that sets forth an ongoing process for the implementation of a program or multiple undertakings.*<sup>883</sup>

Without question, ACHP has interpreted its own regulations as requiring that programmatic agreements developed for complex or multiple undertakings include provisions allowing for ongoing public notice and comment opportunities.

Yet nowhere in the terms of the draft programmatic agreement is there any requirement—or even any *allowance*—for the Forest Service to provide opportunities for public notice and comment throughout the lifetime of the Foothills Landscape Project. Likewise, in the flow chart outlining the Forest Service’s proposed process for implementing the programmatic agreement, found in Appendix C, opportunities for public notice and comment are conspicuously absent. This simply does not accord with NHPA and the ACHP implementing regulations.

For a “conditioned-based” project that is expected to impact more than 150,000 acres of National Forest land over a number of years, providing no additional opportunities for public involvement during implementation of a Section 106 programmatic agreement violates the requirement at 36 C.F.R. §800.2(d) that the agency “seek and consider views of the public in a manner that reflects the nature and complexity of the undertaking.” The Forest Service’s approach is moreover in direct contradiction with the clear guidance provided by ACHP that in situations involving complex or multiple undertakings, it is essential that a programmatic agreement contain provisions for ongoing public involvement.

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<sup>881</sup> ACHP Section 106 Agreement Checklist: Content, available at <https://www.achp.gov/sites/default/files/2018-06/Section%20106%20GAD%20Checklist%20-%20Content.pdf> (accessed January 1, 2019) ((citing the regulations at §800.2(d) and §800.6(a)(4))).

<sup>882</sup> *Id.*

<sup>883</sup> ACHP Guidance on Agreement Documents: Drafting, available at [https://www.achp.gov/drafting\\_section\\_106\\_agreements](https://www.achp.gov/drafting_section_106_agreements) (emphasis added).

Multiple aspects of the proposed Foothills Landscape Project point to the conclusion that under § 800.2(d), rather than providing the public with *zero* opportunities for participation, the programmatic agreement should instead provide the public with the *maximum* amount of notice and opportunity to participate that is feasible.

First, the scale of the project demands additional opportunities for the public to be involved. As proposed, the Foothills Landscape Project would impact over 150,000 acres of national forest lands and would include, among other things, 80,00 acres of commercial and non-commercial timber harvest, 50,000 acres of prescribed burning, 360 miles of new bulldozed fire lines, and construction of new temporary roads. By the agency's own admission, the project is enormous, and it is complex.

Second, the agency's proposal to use a condition-based "toolbox" approach for the Foothills project demands additional opportunities for public involvement throughout the project's lifetime. Under this approach, the Forest Service will not know what individual undertakings it is proposing, where the APEs for these undertakings will be, what the effects to historic properties would be, and what specific mitigation measures are appropriate until after the NEPA process is complete. In other words, the public will not have most of the information it needs in order to provide the Forest Service with the input that is so "essential to informed Federal decisionmaking in the section 106 process."<sup>884</sup> While the ACHP regulations clearly authorize programmatic agreements that employ a phased identification and evaluation process, they do *not* authorize cutting the public out of this process.

Third, additional public participation is required by the ACHP regulations because the Forest Service is not planning to utilize any additional NEPA processes throughout the implementation of the Foothills project. As noted elsewhere in these comments, the agency's proposal to rely on a single EA—with no plans to prepare subsequent, tiered, site-specific NEPA analysis—does not comply with NEPA. But it also means that the agency has no plans to use subsequent NEPA procedures to satisfy its Section 106 obligations to seek and consider public input. Because the agency is not presently able to provide the public with the information it needs to provide meaningful feedback under NHPA, the present NEPA procedures do not satisfy the agency's Section 106 obligations.

Nor is this fact altered by the Forest Service's statement in the preamble of the draft programmatic agreement that "the CONF has provided the public opportunities to comment on the Undertaking and participate in the NHPA Section 106 process" through public scoping, legal notices, public notification letters, "community meetings," workshops, and field trips. The Forest Service's October 2017 scoping notice does not mention NHPA, Section 106, the agency's intent to use a programmatic agreement, or any of the terms of the draft programmatic agreement. Rather, it mentions only that during project implementation "heritage

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<sup>884</sup> 36 C.F.R. § 800.2(d)(1).

resources... would be avoided and protected... where possible,” that “[t]he appropriate measures ... would be taken if an indirect effect is needed to meet the purpose and need,” and that heritage resource sites would have protective buffers. Many of the other “opportunities to ... participate in the NHPA Section 106 process” listed by the Forest Service had nothing to do with historic properties (e.g. the field trips and the science symposium). Simply offering the public an opportunity to learn about or comment on some aspects of a project is not sufficient to comply with Section 106 of the NHPA. The NHPA requires *agencies*, not the public, to start the conversation about impacts to historic properties, just as NEPA puts “the onus . . . on the [agency] to inform the public of impacts ... on cultural resources.”<sup>885</sup>

Fourth, the Forest Service’s NEPA analysis makes clear that there are likely *hundreds* of archaeological sites across the Foothills area that require protection under NHPA—some because they are eligible for listing on the National Register, others because they might be and therefore must be evaluated.<sup>886</sup> The CONF Forest Archaeologist’s excellent research in developing the *Cultural Resources Overview* shows why: the Foothills area has a rich and layered cultural heritage that stretches back many hundreds of years. But this heritage is imperfectly understood. The report notes that “no significant archaeological investigations have previously occurred within the Foothills Landscape Project area” and that, regarding American Indian cultural history, “[o]ne thing that became very clear during the development of this document is that the current understanding of the . . . history of northeast Georgia is woefully out of date. Due to the limited scope of the present document in many ways it can only highlight how we do not know what we think we know about the region.”<sup>887</sup>

Table 1 in Appendix A of the draft programmatic agreement provides a quantitative description of our relative ignorance: in approximately half of the Foothills project’s designated “implementation areas,” less than 10% of the lands have been surveyed for archaeological sites. Some of these lightly surveyed implementation areas—such as Sarah’s Creek and Warwoman-Chattooga—are among those predicted to have higher densities of unknown archaeological sites; hundreds of sites are thought to exist in these two implementation areas alone.

Our collective failure to adequately fund and support research and preservation of the cultural heritage of the Foothills area and other areas on the Chattahoochee National Forest does not justify eliminating meaningful opportunities for the public to participate in the Section 106 process for a project that will impact 150,000 acres of public land that has been home to many cultures over the centuries. It justifies the exact opposite.

And last, the Forest Service’s Cultural Resources Report acknowledges that the type and scale of undertakings that are proposed under the Foothills project have the potential to destroy

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<sup>885</sup> *Center for Biological Diversity v. Bureau of Land Management*, 746 F.Supp.2d 1055, 1096 (N.D. Ca. 2009).

<sup>886</sup> Cultural Resources Report, 13.

<sup>887</sup> Cultural Resources Overview, 74.

historic properties and other cultural resources. Compounding this threat to as-yet-unknown properties is the agency's plan to abstain from surveying areas it has concluded as "low probability" and its plan to exempt most prescribed burning and some timber activities from consulting and survey requirements.<sup>888</sup> While utilizing a probability model to tailor surveying intensity is appropriate under NHPA, in this case, the Forest Service's model predicts that 15-17% of unknown archaeological sites will be located in "low probability" areas.<sup>889</sup> The upshot is that implementation of the Foothills project, as proposed, would very likely damage archaeological sites that require protection under NHPA—despite the agency's confusing conclusion to the contrary.<sup>890</sup>

Each of these five characteristics of the Foothills project's "nature and complexity" would, by itself, demand that any programmatic agreement include provisions for continued public notice and comment, in accordance with 36 C.F.R. § 800.2(d). Because the proposed programmatic agreement does not include such provisions, it would not comply with the ACHP regulations and would be invalid if executed.

**B. The Draft Programmatic Agreement Arbitrarily Exempts From Section 106 Review Undertakings Which Have the Potential to Adversely Affect Historic Properties**

The draft programmatic agreement notes that "[i]mplementation of the Foothills Project will involve a number of routine and recurrent Undertakings whose potential effects on historic properties and unevaluated cultural resources are foreseeable and likely to be absent or negligible. These activities may generally be exempt [from Section 106 review], but ... require a review by a CONF Heritage Professional to confirm whether the activity qualifies as an exemption ...."<sup>891</sup> These exempted undertakings are listed in Appendix D of the programmatic agreement.

Appendix D states that "[t]he following Undertakings have little or no potential to affect historic properties and unevaluated cultural resources. As a result ... these Undertakings are exempt from survey and no further consultation with the SHPO, Tribes, other consulting parties, or the public is required."<sup>892</sup> In other words, they are exempt from the Section 106 process.

The ACHP regulations discuss "categories" of undertakings which the ACHP or an agency may propose to be exempted from the Section 106 process. Such exemptions are allowed only if "the potential effects of the undertakings within the ... category upon historic properties

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<sup>888</sup> Draft Programmatic Agreement, Appendix D.

<sup>889</sup> Draft Programmatic Agreement, Appendix E, 67.

<sup>890</sup> Cultural Resources Report, 28 ("Selecting Alternative 2 would not affect cultural resource sites, therefore, there would be no cumulative effects to cultural resources as a result of the Foothills Project").

<sup>891</sup> Draft Programmatic Agreement, 4.

<sup>892</sup> Draft Programmatic Agreement, Appendix D, 55.

are foreseeable and likely to be minimal or not adverse....”<sup>893</sup> Yet among the categories listed as “exempt” in Appendix D are some undertakings which, contrary to the ACHP regulations, do have the potential to adversely affect historic properties and other cultural resources. Specifically, these undertakings are: 15. *Prescribed burns ... in areas which have been previously burned*; 20. *Midstory removal with minimal impact equipment*; 30. *Very small areas ... having low site potential*; and 34. *Thinning of timber stands less than 20 years of age regardless of the methods used ... [including] any roads that have to be constructed to access these areas*.

These categories of actions cannot be described as “routine and recurrent.” Nor can it be said that their effects on historic properties are foreseeable and likely to be minimal.

1. *15. Prescribed burns ... in areas which have been previously burned*

The Forest Service’s own NEPA analysis acknowledges that prescribed burning can cause adverse effects to cultural resources.<sup>894</sup> The proposal to exempt prescribed burning from the Section 106 process is based on the agency’s assertions that burning would involve only “low intensity fires” and that surveying for historic properties could only be skipped “where it is documented that an area has previously been burned.” Although the Forest Service does not disclose the particulars of its reasoning, presumably the agency has concluded that where an area of the forest was previously burned, any artifacts or cultural resources present at that time have either already been destroyed or they were not harmed due to possessing qualities that make them impervious to the effects of fires. The Forest Service’s conclusion is arbitrary and inconsistent with the ACHP regulations, for multiple reasons.

First, the agency broadly asserts that all of its prescribed fires will be “low intensity.” Yet in a Forest Service technical report published in 2012, agency experts observed that “prescribed fire severity varies depending on the prescription (such as, whether the fire is intended to be non-lethal, mixed severity, or stand-replacing).”<sup>895</sup> For the Foothills project, the Forest Service has proposed using prescribed fire for a variety of purposes: “to remove slash/ground litter[,]. . . maintenance of open stand conditions, site preparation for planting, and hazardous fuel reduction.”<sup>896</sup> Moreover, “[f]ire intensity is determined by the mass of fine fuels (FF) in the surface and canopy strata and how rapidly they are ignited. The rate of ignition is primarily determined by FF moisture content and wind velocity. Thus, fire’s potential impacts on above-

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<sup>893</sup> 36 C.F.R. 800.14(c).

<sup>894</sup> Cultural Resources Report, 26-28.

<sup>895</sup> USFS General Technical Report, *Wildland Fire in Ecosystems: Effects of Fire on Cultural Resources and Archaeology* (2012) 182-83, available at [https://www.fs.fed.us/rm/pubs/rmrs\\_gtr042\\_3.pdf](https://www.fs.fed.us/rm/pubs/rmrs_gtr042_3.pdf).

<sup>896</sup> Draft Programmatic Agreement, Appendix D, 56.

ground artifacts and structures is a function of the mass of fine fuels, short term weather (humidity and wind) and how the fuels are ignited....”<sup>897</sup>

By contrast, *subsurface* cultural resources are primarily impacted by the conduction of heat through the soil, “which is a function of the soil type, its moisture content, and the duration of burning....Coarse woody debris (CWD) and duff/leaf mold (fermentation and humus layers) are capable of sustained burning at low moisture contents which only occur after extended drying.”<sup>898</sup> Further, “[i]n most forests either duff or peat covers a much greater proportion of the surface than [fine woody debris] and [coarse woody debris] combined. The burnout of these organic soil horizons by smoldering combustion is the primary source of mineral soil heating.”<sup>899</sup> Thus, the Forest Service’s own experts have concluded that even “low intensity” fires can damage subsurface cultural resources, provided there is sufficient duff, peat, or leaf mold present.

The bottom line is that the Forest Service has proposed to use prescribed burning in a variety of ways, and the potential for these fires to adversely affect historic properties will vary based on a number of site-specific and weather-related factors. Thus, it is not appropriate for the Forest Service to exempt prescribed fires from Section 106 process based on a vague assertion that they will be “low intensity.”

Second, the Forest Service’s proposed exemption rests on an unsupported assumption that historic properties in areas that were previously burned have either been destroyed or are inherently protected from the effects of subsequent fires. This assumption dismisses the fact that direct damage (from flames or heat) to historic properties and other cultural resources can be cumulative. Furthermore, it entirely ignores the impacts of “second-order” and “third-order” effects from fire.<sup>900</sup> The agency’s analysis acknowledges that “[f]or both ground disturbing activities and prescribed fires, the most likely indirect effects to cultural resources include erosion of the cultural deposits and the increase of public accessibility to the sites.”<sup>901</sup> Given that the susceptibility of a historic artifact to heat-related damage is a function of, among other things, the artifact’s depth in the soil, it stands to reason that repeated fires (and the erosion that follows) may have made some deposits *more likely* to be harmed by subsequent fires due to the loss of soil cover.

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<sup>897</sup> Ryan, Kevin (USFS Rocky Mountain Research Station). “Effects of Fire on Cultural Resources.” International Conference on Forest Fire Research (2010), available at [https://www.fs.fed.us/rm/pubs\\_other/rmrs\\_2010\\_ryan\\_k004.pdf](https://www.fs.fed.us/rm/pubs_other/rmrs_2010_ryan_k004.pdf).

<sup>898</sup> *Id.* (internal quotes and citations omitted).

<sup>899</sup> *Id.*

<sup>900</sup> *See* Ryan, *supra* n. 898, 3.

<sup>901</sup> Cultural Resources Report, 28.

Moreover, the proposed exemption seems to entirely ignore the possibility that an artifact might survive a prescribed fire but then be harmed by subsequent erosion or “increased access.” “Accelerated post-fire erosion can either wash-away, bury or redistribute archaeological materials. The physical redistribution of [cultural resources] in space along with thermal impacts on dating techniques confounds archaeological interpretation. To assess the potential for second-order effects requires multidisciplinary integration of the archaeology, geology, climatology, and fire severity.”<sup>902</sup> Here, an adequate “multidisciplinary” analysis would lead to the conclusion that the effects of prescribed burning on cultural resources, even in areas that have previously burned, are not foreseeable and are not likely to be minimal.

## 2. 20. *Midstory removal with minimal impact equipment*

As with prescribed burning, the Forest Service’s NEPA analysis concludes that both commercial and non-commercial timber activities have the potential to adversely impact historic properties.<sup>903</sup> Yet the agency’s draft programmatic agreement purports to exempt midstory timber treatments from Section 106 review—even when those treatments involve the use of heavy equipment.

The exemption asserts that certain heavy equipment, “when properly used,” results in “minimal ground disturbance.” Among the equipment types listed is Hydro-Axe; though a specific model is not named, these machines typically weigh in excess of 10 tons.<sup>904</sup> The Forest Service’s proffered caveat—that use of these 10-ton machines “under dry conditions” ensures “minimal ground disturbance”—is itself an admission that this activity has the potential to adversely affect historic properties. Will the Forest Service survey an area to ensure uniformly “dry conditions” before implementing such an undertaking? How dry is dry enough? How will ensuring “minimal ground disturbance” protect archaeological resources that lie on or just beneath the surface?

The appropriate approach is to honor the text and intent of the ACHP regulations. Where the agency is proposing to engage in an activity that has the potential to cause adverse effects to historic properties, the agency must make an effort to identify these properties and consider mitigation measures. Without question, proposing to exempt the use of 10-ton logging equipment in high probability areas is unsupported by the agency’s analysis and appears on its face to be an arbitrary decision.

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<sup>902</sup> Ryan, *supra* n. 898, 3.

<sup>903</sup> Cultural Resources Report, 38.

<sup>904</sup> See, e.g. <https://www.fs.fed.us/t-d/pubs/pdfpubs/pdf99242820/pdf99242820pt02.pdf>.



3. 30. *Very small areas having low site potential*

In the Forest Service’s own words, Appendix D lists undertakings which “have little or no potential to affect historic properties and unevaluated cultural resources.”<sup>905</sup> Elsewhere the Forest Service refers to these undertakings as “routine and recurrent” with “potential effects ... [which] are foreseeable and likely to be absent or negligible.”<sup>906</sup> The ACHP regulations likewise suggest that “exemptions” are limited to undertakings with “potential effects” which are “foreseeable” and “likely to be minimal or not adverse.”<sup>907</sup>

Here, the Forest Service has proposed to exempt from Section 106 review *any* undertaking it has authority to implement, in *any* location, so long as the impacted area has been identified as “low probability” and is either less than 1 acre in size or less than ½ mile in length. This exemption is clearly inconsistent with the Forest Service’s stated purpose for developing exemptions, and it is inconsistent with the ACHP regulations. An exemption that allows for *any* type of undertaking in *any* location cannot possibly have “foreseeable” effects on historic properties.

Moreover, the agency’s determination that the exemption may be applied for undertakings up to 1-acre in size or ½ mile in length is arbitrary. Within low probability areas that the Forest Service has no plans to survey—despite the agency’s conclusion that they are likely to contain 15-17% of the unknown archaeological sites on the CONF—one acre is just as likely to contain historic properties as the next. Consequently, a series of twenty 1-acre undertakings is just as likely to adversely affect historic resources as a single 20-acre undertaking.

4. 34. *Thinning of timber stands less than 20 years of age regardless of the methods used ... [including] any roads that have to be constructed to access these areas.*

As with the exemption for “very small areas,” the Forest Service’s proposal to exempt thinning on stands less than 20 years of age, including road construction needed to access these areas, cannot possibly comply with the ACHP regulation allowing exemptions only when the potential effects are “foreseeable and likely to be minimal or not adverse.” Exempting an undertaking from Section 106 review and consultation *solely* because it is located in a low probability area is contrary to the purpose and text of the ACHP regulations. If this were allowable, the Forest Service might as well propose an exemption that reads “No undertakings in

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<sup>905</sup> Draft Programmatic Agreement, Appendix D, 55.

<sup>906</sup> Draft Programmatic Agreement, 4.

<sup>907</sup> 36 C.F.R. § 800.14(c)(ii).

low probability areas are subject to the NHPA.” Needless to say, this would be contrary to law.<sup>908</sup>

Likewise, it is not appropriate to exempt undertakings from Section 106 review and consultation requirements simply because “surveys [in such stands] are hard to complete”—particularly when, in the very next sentence, the Forest Service asserts that “[h]igh probability areas will be surveyed.”<sup>909</sup> Evidently, surveying these stands is not so difficult that it cannot be done.

C. The Draft Programmatic Agreement’s Suggestion That the Listed “alternative mitigation measures” Will “mitigate any adverse effects resulting from implementation” is Inconsistent With NHPA and the ACHP Regulations

Under the Forest Service’s draft programmatic agreement, the agency would generally limit its surveying efforts to high probability areas.<sup>910</sup> Only where a consulting party requests a “full coverage survey” would the agency survey low probability areas—and even then, the survey would consist only of “visual examination” rather than any subsurface sampling.<sup>911</sup>

The ACHP regulations allow for agencies to use probability models to focus their more intensive surveying efforts. There is no requirement that intensive surveys be conducted across every APE. Nor is there a requirement that the agency identify every historic property or other cultural resource within an APE. Rather, the agency must make a reasonable and good faith effort.<sup>912</sup>

To its credit, the Forest Service has acknowledged that as a result of surveying only in “high probability” areas, implementation of the Foothills project may adversely impact historic properties.

Section VII of the draft agreement (“Measures to Mitigate Possible Adverse Effects”) states that:

[u]ndertakings associated with the Foothills Landscape Project may have adverse effects on historic properties because low probability areas within the APE will not be surveyed. As a result, the CONF has developed a series of alternative mitigation measures....These

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<sup>908</sup> See 36 C.F.R. §800.14(c)(iii).

<sup>909</sup> Draft Programmatic Agreement, Appendix D, 58.

<sup>910</sup> Draft Programmatic Agreement, 2.

<sup>911</sup> Draft Programmatic Agreement, Appendix E, 100.

<sup>912</sup> 36 C.F.R. §800.4(b)(1).

measures were developed to address potential effects resulting from not completing inventory on the entire APE.<sup>913</sup>

These “alternative mitigation measures” are mentioned at various points throughout the draft programmatic agreement. Problematically, it’s not clear how exactly the Forest Service considers these alternative measures to relate to its obligations under the ACHP regulations or the terms of the proposed agreement.

In some places (as in the language quoted immediately above) the programmatic agreement suggests that the alternative mitigation measures were specifically developed to address adverse impacts to historic properties located in “low probability” areas, where the agency will not conduct surveys.<sup>914</sup> Thus adverse impacts to cultural resources in low probability areas seem to be taken as a given and the “alternative” measures are presented as mitigation for these unknown future impacts.

Elsewhere, however, the programmatic agreement seems to suggest that the Forest Service may rely on the alternative mitigation measures to mitigate *any* adverse impacts to historic properties that result from implementation of the project. For example, in Section I (“Scope and Framework”), the programmatic agreement reads:

The CONF recognizes that Undertakings associated with the Foothills Landscape Management Project may have adverse effects on historic properties. *To mitigate those potential adverse effects from the overall project* the CONF has developed a series of mitigation measures agreed to by the consulting parties. These activities are listed in Appendix B.<sup>915</sup>

Likewise, in Section XII (“Reporting”), the agreement states that “Appendix B identifies a series of projects that the CONF is committed to completing to mitigate *any adverse effects* resulting from the implementation of the Foothills Landscape Project.” This language suggests that the Forest Service believes that implementing the alternative measures listed in Appendix B will have the effect of mitigating adverse effects to historic properties across the entire project area—whether in low or high probability areas.

While the ACHP regulations do not require than an agency implement any mitigation measures, they do require than an agency develop and evaluate measures which could avoid, minimize, or mitigate adverse effects.<sup>916</sup> For multiple reasons, it is critical that the Forest

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<sup>913</sup> Draft Programmatic Agreement, 6.

<sup>914</sup> *See, e.g.*, Draft Programmatic Agreement, 2.

<sup>915</sup> Draft Programmatic Agreement, 3 (emphasis added).

<sup>916</sup> 36 C.F.R. §800.6(a).

Service clarify what role its proposed alternative mitigation measures would play in meeting its Section 106 obligations.

First, guidance from the ACHP makes clear that mitigation measures must correspond to *particular* adverse effects.<sup>917</sup> “Mitigation” for purposes of NHPA is “[a] measure to resolve specific adverse effects to identified historic property or properties by offsetting such effects. A *nexus is required between the mitigation measure(s) and the adverse effects to historic properties.*”<sup>918</sup>

Thus, measures which might mitigate adverse effects to one type of property would not mitigate adverse effects to a different type of property. In its Cultural Resources Report, the Forest Service seems to agree with this general point, observing that “[a]n adverse effect is considered to have occurred to a cultural resource site when the characteristics that may make that site eligible for inclusion on the National Register ... have been altered ... [and] *therefore*, cumulative effects to cultural resources are considered to be the incremental effects of past, present, and reasonably foreseeable future actions on each specific heritage site.”<sup>919</sup> In the Forest Service’s view, adverse effects must attach to a particular historic property. It follows that mitigation must do the same.

Yet the programmatic agreement describes “alternative mitigation measures” which do not appear to have any sort of nexus with particularized adverse effects to historic properties. Part of the problem is that, under the agency’s condition-based management approach, adverse effects to particular properties will not come into focus until APEs are surveyed or archaeological sites are discovered during implementation.

As mentioned above, another problem is that in some places the programmatic agreement suggests that the alternative mitigation measures are intended to mitigate adverse impacts from not surveying “low probability” areas, whereas elsewhere the agreement suggests that “any” adverse effects will be addressed by the alternative measures. The question of whether there is a nexus with mitigation measures hinges on the nature of adverse effects being contemplated.

Yet another problem is that the alternative mitigation measures themselves consist almost entirely of conducting background research into various aspects of the area’s cultural past and surveying separate tracts of land—i.e., areas that do not fall within any APEs. While such work

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<sup>917</sup> NEPA and NHPA: A Handbook for Integrating NEPA and Section 106 (2013), 40, available at <https://www.achp.gov/digital-library-section-106-landing/nepa-and-nhpa-handbook-integrating-nepa-and-section-106>.

<sup>918</sup> *Id.* (emphasis added).

<sup>919</sup> The Forest Service seems to be conflating impacts to “cultural resources” under NEPA and “historic properties” under NHPA. Under NEPA, an agency must consider more than just the impacts to a cultural resource’s eligibility for listing on the National Register.

is important, it does not seem to address particularized adverse effects to specific historic properties—even after such effects come into focus.

Ultimately, it is simply unclear whether NHPA and the ACHP regulations authorize the kind of inverted Section 106 process that the Forest Service has proposed in its draft programmatic agreement. The purpose of Section 106 is for agencies to take into account the effects of their proposed undertakings on historic properties, and to develop and consider possible means of mitigating any adverse effects. Here the agency is proposing a complicated, condition-based project that will impact more than 150,000 acres and will take decades to complete. The vast majority of these acres have been categorized as “low probability,” and the agency has no intention of conducting even sample surveys on them. And as of right now, the agency does not know which projects it will implement in which locations. Yet the Forest Service’s draft programmatic agreement asserts that any adverse impacts to historic properties in low probability areas will be mitigated by a combination of generalized research projects and surveys in other locations. This would seem to put the cart before the horse.

#### **XIV. The Agency is Running Afoul of the Clean Water Act**

The Clean Water Act (“CWA”) was enacted to “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”<sup>920</sup> To that end, the CWA charges states with establishing water quality standards.<sup>921</sup> “A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria that protect the designated uses.”<sup>922</sup> In the Hydrology Report, the Forest Service generally refers to these as “beneficial uses.” Federal agencies including the Forest Service must comply with water quality standards set by each state.<sup>923</sup> A “project that does not comply with a designated use of the water does not comply with the applicable water quality standards.”<sup>924</sup> And Forest Service “[a]pproval of [a project] despite the violation of [a state’s] water quality standards is arbitrary and capricious.”<sup>925</sup>

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<sup>920</sup> 33 U.S.C. § 1251(a).

<sup>921</sup> See 33 U.S.C. § 1313.

<sup>922</sup> 40 C.F.R. § 131.2.

<sup>923</sup> See 33 U.S.C. § 1323.

<sup>924</sup> *PUD No. 1 of Jefferson Cty. v. Washington Dep’t of Ecology*, 511 U.S. 700, 715 (1994); see *City of Guyton v. Barrow*, 305 Ga. 799, 807, 828 S.E.2d 366, 372 (2019) (recognizing that “a water quality standard must be maintained”).

<sup>925</sup> *Save Our Cabinets v. United States Dep’t of Agric.*, 254 F. Supp. 3d 1241, 1255 (D. Mont. 2017), judgment entered, No. CV 16-53-M-DWM, 2017 WL 2829681 (D. Mont. June 29, 2017), dismissed *sub nom.* *Save Our Cabinets v. United States Fish & Wildlife Serv.*, No. 17-35694, 2018 WL 1091533 (9th Cir. Feb. 23, 2018).

Georgia law requires “[e]xisting instream water uses and the level of water quality necessary to protect the existing uses [to] be maintained and protected.”<sup>926</sup> Where the quality of waters exceeds applicable standards, some degradation of that quality may occur but only in very specific circumstances.<sup>927</sup> Even then though, the degradation cannot reduce water quality below the level necessary to protect existing uses.<sup>928</sup> This is generally referred to as the antidegradation requirement. The agency’s analysis indicates it is well aware of this requirement.<sup>929</sup>

Additionally, “each state is required to identify all of the waters within its borders not meeting water quality standards and establish ‘total maximum daily loads’ [“TMDL”] for those waters.”<sup>930</sup> By definition, and borrowing the terminology from the Forest Service’s Hydrology Report, these waterbodies are not maintaining their “beneficial use.” “A TMDL defines the specified maximum amount of a pollutant which can be discharged into a body of water from all sources combined.”<sup>931</sup> Discharges in excess of that amount contribute to failure to meet “beneficial uses.”

As explained elsewhere, the Forest Service’s analysis of effects on water quality is inadequate on multiple counts but it confirms that the Forest Service is threatening violations of these requirements.

An initial error in the agency’s assessment of compliance with the CWA is that it treats all waterbodies in the Foothills project area as if they have the same “beneficial use.” Georgia has six “beneficial uses.”<sup>932</sup> The agency cannot evaluate compliance with one as compliance with all. The agency must differentiate between the different assigned uses for each waterbody.

Regardless, the agency’s analysis confirms that it will not maintain beneficial uses. To assess maintenance of beneficial uses, the agency uses a watershed total impervious area proxy. There is likely to be a “negative effect to beneficial uses at any temporal or spatial scale with [total impervious area] over 10% within a watershed.”<sup>933</sup> The agency’s analysis confirms this threshold will be exceeded in at least three watersheds, and as discussed elsewhere, this appears to be an underestimate.<sup>934</sup> Using the agency’s proxy analysis, this demonstrates beneficial uses will not be maintained and violates the CWA.

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<sup>926</sup> Ga. Comp. R. & Regs. 391-3-6-.03(2)(b)(i); see also 40 C.F.R. § 131.12.

<sup>927</sup> See Ga. Comp. R. & Regs. 391-3-6-.03(2)(b)(ii).

<sup>928</sup> *Id.*

<sup>929</sup> See generally, Hydrology Report.

<sup>930</sup> *Am. Wildlands v. Browner*, 260 F.3d 1192, 1194 (10th Cir. 2001) (citing 33 U.S.C. § 1313(d)).

<sup>931</sup> *Id.* (citation omitted).

<sup>932</sup> Ga. Comp. R. & Regs. 391-3-6-.03

<sup>933</sup> Hydrology Report, 4.

<sup>934</sup> Hydrology Report, Table 7.

The agency also acknowledges that the project area “has 13 streams for a total of 31 miles that are not currently supporting their designated beneficial use.”<sup>935</sup> These are 303(d) or 305(b) listed streams. These streams are not supporting designated uses likely due to excess sediment.<sup>936</sup> Yet, as far as we can tell, the Forest Service is proposing significant sediment-inducing activities in these watersheds, further degrading them and impacting beneficial uses. This also threatens violations of the CWA.

The agency brushes this aside stating that total impervious area “is not anticipated to rise above 10% for the majority of the watersheds” but compliance with the CWA is not evaluated on the project-wide scale. The agency has developed a proxy to assess compliance with the CWA which indicates it will be violated. “Approval of [a project] despite the violation of [a state’s] water quality standards is arbitrary and capricious.”<sup>937</sup>

In addition to beneficial uses, Georgia has promulgated additional water quality standards that “are deemed to be necessary and applicable to all waters of the State.”<sup>938</sup> One of those requirements is that all “waters shall be free from turbidity which results in a substantial visual contrast in a water body due to a man-made activity.”<sup>939</sup> The Forest Service is proposing myriad activities as part of this project in locations it has not disclosed. As a result, it is difficult to assess compliance with this standard which the agency has not attempted to do in its Hydrology Report. Nevertheless, there appears to be a significant risk the agency may also violate this requirement.

Georgia law also requires that “[i]n streams designated as primary trout or smallmouth bass waters . . . there shall be no elevation of natural stream temperatures.”<sup>940</sup> Without site-specific information it is also difficult to assess compliance with this requirement, but the agency’s analysis establishes that an “increase in water temperature may occur” due to its proposed activities.<sup>941</sup> The agency then asserts that “maximum temperatures *should* remain below published maximum thresholds for common cold-water and cool-water species in this region”<sup>942</sup> but Georgia law prohibits *any* elevation of stream temperature in primary trout or smallmouth bass waters.

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<sup>935</sup> Hydrology Report, 13.

<sup>936</sup> Hydrology Report, 15.

<sup>937</sup> *See supra* n. 926.

<sup>938</sup> Ga. Comp. R. & Regs. 391-3-6-.03(5).

<sup>939</sup> Ga. Comp. R. & Regs. 391-3-6-.03(5)(d).

<sup>940</sup> Ga. Comp. R. & Regs. 391-3-6-.03(15)(a)(ii).

<sup>941</sup> Aquatic Resource Report, 20.

<sup>942</sup> Aquatic Resource Report, 20.

Finally, Georgia law also prohibits any “alteration of natural water quality from any source” on rivers designated “wild” or “scenic.”<sup>943</sup> This project could alter water quality in the Wild and Scenic Chattooga River corridor also threatening a violation of this requirement.

## **XV. The Agency Must Formally Consult With the Fish and Wildlife Service Under the Endangered Species Act**

The Endangered Species Act (“ESA”) mandates that the Forest Service give the conservation of threatened and endangered species the highest priority, “above any of the agency's competing interests.”<sup>944</sup> Section 7 of the ESA requires the agency to “insure” that its activities are “not likely to jeopardize the continued existence” of any threatened or endangered species in the Foothills area or “result in the destruction or adverse modification” of designated critical habitat.<sup>945</sup> This happens through the Section 7 formal consultation process with the Fish and Wildlife Service (“FWS”). Formal consultation is required when “any action may affect listed species or critical habitat.”<sup>946</sup> That requirement is easily triggered here.

The Forest Service has determined that its project “May Affect, Is Likely To Adversely affect the Indiana bat.”<sup>947</sup> That alone requires formal consultation. Instead, the agency claims that “the programmatic biological opinion satisfies the Forest Service’s responsibilities under ESA Section 7(a)(2) relative to the Indiana bat for this project.”<sup>948</sup> That is incorrect. The programmatic biological opinion prepared during plan revision does not authorize site-specific activity. If an individual project, such as the Foothills Project, may affect Indiana bats, that agency must enter formal consultation with FWS regardless of the existence of the Forest Plan programmatic biological opinion. The Terrestrial Wildlife Resources Report explains repeatedly that this project will affect Indiana bats.

The Forest Service has also found that its project “may affect” the gray bat.<sup>949</sup> Regarding botanical species listed under the ESA, the project “may affect”: swamp pink,<sup>950</sup> white fringeless orchid,<sup>951</sup> smooth coneflower,<sup>952</sup> and small whorled pogonia.<sup>953</sup> Because formal consultation is

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<sup>943</sup> Ga. Comp. R. & Regs. 391-3-6-.03(6)(d)-(e).

<sup>944</sup> *House v. U.S. Forest Service, U.S. Dept. of Agriculture*, 974 F. Supp. 1022, 1027 (E.D. Ky. 1997); *see Tennessee Valley Auth. v. Hill*, 437 U.S. 153, 175, 98 S. Ct. 2279, 57 L.Ed.2d 117 (1978) (The ESA's language “indicates beyond doubt that Congress intended endangered species to be afforded the highest priorities.”)

<sup>945</sup> 16 U.S.C. § 1536(a)(2).

<sup>946</sup> 50 C.F.R. § 402.14.

<sup>947</sup> Terrestrial Wildlife Resources Report, 43.

<sup>948</sup> Terrestrial Wildlife Resources Report, 43.

<sup>949</sup> Terrestrial Wildlife Resources Report, 40.

<sup>950</sup> Botanical and Rare Communities Resource Report, 68.

<sup>951</sup> Botanical and Rare Communities Resource Report, 69.

<sup>952</sup> Botanical and Rare Communities Resource Report, 65-76.



required whenever any agency action “may affect listed species,” it is required for all of these species; it is not optional.<sup>954</sup> The Forest Service seems to understand this: “Because the [species] is protected under the ESA, no activities with potential to affect the [species] either adversely or beneficially can take place in the sites without . . . *consultation with[] USFWS.*”<sup>955</sup> Yet the agency does not appear to be moving in that direction. The Forest Service has determined that a final decision on this project would authorize activities that “may affect” listed species; consequently it must formally consult with FWS under Section 7.

With circular reasoning, the agency downplays adverse impacts to many of these species by pointing to consultation with FWS “as appropriate.”<sup>956</sup> The agency cannot assert effects will be below a level requiring Section 7 consultation by pointing to the possibility of consultation. This is the equivalent of stating that the agency does not need to consult with FWS because effects will be minimized through potential consultation with FWS; it is circular reasoning. Regardless of what the agency was trying to convey with these statements, it is clear that these species may be affected which necessitates formal Section 7 consultation.

Finally, the agency has concluded that it “may affect” eight mussels protected under the ESA, three fish, and two areas of designated critical habitat.<sup>957</sup> As explained elsewhere, the agency’s assessment of impacts to these species is insufficient to determine that the effects will be minimal but the agency has clearly found that these species and critical habitat units may be affected by the project which is all that is required to trigger formal consultation under the ESA.

The agency appears to be under the impression that its obligations under the ESA have concluded because the Forest Service has determined that “no anticipated effects under either alternative that would jeopardize the continued existence of any [threatened and endangered] species” and that its project is “compliant with the ESA requirement that the Forest Service manage for the recovery of [threatened and endangered] species.”<sup>958</sup> Regardless of whether that is right or wrong, it is simply the wrong standard. In case it is not clear: “*Formal* consultation is *mandatory* for all agency programs or activities that may affect a listed species or critical habitat.”<sup>959</sup>

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<sup>953</sup> Botanical and Rare Communities Resource Report, 72.

<sup>954</sup> 50 C.F.R. § 402.14.

<sup>955</sup> Botanical and Rare Communities Resource Report, 73.

<sup>956</sup> *See, e.g.*, Botanical and Rare Communities Resource Report, 31.

<sup>957</sup> Aquatic Resource Report, 29.

<sup>958</sup> Aquatic Resource Report, 30.

<sup>959</sup> FSM 2671.45c (emphasis added).

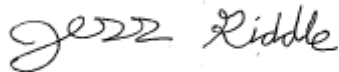
**XVI. The Lack of Site-Specific Information Prevents Assessing Compliance With Other Relevant Laws**

Because the agency has not disclosed where it intends to pursue certain actions the public and the agency cannot assess compliance with a host of other laws including the Wilderness Act,<sup>960</sup> 2001 Roadless Rule, Wild and Scenic Rivers Act, the Migratory Bird Treaty Act, and Executive Order 13112. The fact that the agency is unable to assess compliance with these laws is further evidence that it has not taken a hard look and that the way it is implementing condition-based management does not comply with NEPA.

**XVII. Conclusion**

We earnestly appreciate all the effort the agency has put into assessing social, infrastructure, and ecological issues in the Foothills and identifying potential solutions for those issues. We fully support many of the types of work proposed in this Project. Some actions need to be modified to avoid harmful impacts and achieve the desired outcomes. Many other actions cannot be meaningfully assessed without more site-specific information. We also remain deeply concerned that the agency appears intent on carrying out this project in ways that would violate NFMA, NEPA, and other laws while also denying the public meaningful opportunities for participation in implementation of this project over decades. We have been asking the agency to reconsider this approach for years but we will repeat our plea here. A first and necessary step in rectifying these issues is the preparation of an EIS. We remain optimistic that these issues can be addressed and willing to work with the agency to achieve a positive outcome for the Foothills.

Sincerely,



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<sup>960</sup> We recognize that the agency is not proposing activities in Wilderness Areas but “an agency’s duty to preserve . . . wilderness character under . . . the Wilderness Act may apply to agency activity that occurs outside of the boundaries of the wilderness area.” *Izaak Walton League of Am., Inc. v. Kimbell*, 516 F. Supp. 2d 982, 989 (D. Minn. 2007), judgment entered, No. CIV. 06-3357 JRT/RLE, 2008 WL 141728 (D. Minn. Jan. 11, 2008), amended, No. CV 06-3357 (JRT/RLE), 2008 WL 11383666 (D. Minn. May 21, 2008), and *aff’d*, 558 F.3d 751 (8th Cir. 2009).

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# Exhibit 3

Chattooga Conservancy • Defenders of Wildlife • Georgia ForestWatch •  
Sierra Club • Southern Environmental Law Center • The Wilderness  
Society

August 13, 2021

**VIA Electronic Mail**

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RE: Comments on Draft Programmatic Environmental Assessment for Foothills  
Landscape Project

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Dear Mr. Hunter:

We commend the Forest Service for its willingness to reconsider its approach to the Foothills Project and reset its engagement with stakeholders. In particular, the decision to adopt a programmatic review under the National Environmental Policy Act (“NEPA”) will better position the Forest Service to pursue the broad suite of actions contemplated in the Foothills Project. The development of an alternative with an important sideboard (unsuitable lands) is another welcome addition, and we believe this alternative can be further developed, with collaborative input, to focus the project on high priority work. As noted in the past, we share many of the same goals for the Foothills landscape and hope to work with the Forest Service to implement those actions successfully.

Having selected the right tool, the Forest Service must now use it to its best advantage. A programmatic NEPA review can afford agencies more flexibility and efficiency by evaluating impacts in phases, reducing redundancy, avoiding problematic actions, and focusing subsequent decisions on the most important issues. But, like any other tool, programmatic NEPA reviews will not realize these benefits if unless correctly crafted and deployed. A programmatic review does not alter NEPA’s underlying obligations to take a “hard look” at the effects of agency actions and consider those effects based on site-specific conditions. Thus, decisions regarding the scope and level of detail made in the programmatic review will dictate whether it actually achieves the desired flexibility and efficiencies at the implementation stage. Deferring hard questions and associated analytical responsibilities will only result in having to duplicate those efforts for each implementing project.

Therefore, a consistent theme running throughout these comments is the need to focus the project, adopt sideboards to preclude potentially difficult issues, and conduct a more detailed

review of potential impacts where possible *now* to avoid having to consider those effects *later*. The programmatic approach is intended to replace the *status quo* of project-by-project NEPA review with a more flexible and efficient phased review. In a programmatic approach, flexibility comes from deferral of options to future decisions. Efficiency, on the other hand, comes from narrowing the range of options and considering recurring issues at the outset, before making the site-specific choices and analyses. This tradeoff is the key - efficiency (narrowing down) is in tension with flexibility (deferring choices). We hope that our comments are useful in helping pinpoint the choices that should be deferred to the future versus the ones that can and should be resolved now.

A more focused scope and more detailed review at the programmatic stage is necessary for the agency to realize benefits at the implementation stage. The programmatic review should provide an intermediate level of review linking the broad goals of the Forest Plan with the site-specific decisions and analysis required by NEPA. But unless the programmatic review actually narrows the range of decisions and provides supporting analysis, it does little work to bridge the gap between these two levels of review. As currently written, the Draft Programmatic Environmental Assessment (“DPEA”) does not sufficiently limit the scope of potential actions or conduct the necessary analysis to bridge this gap.

The nascent Foothills Collaborative Group adds yet another layer of complexity to this project. The Forest Service has convened a series of meetings with stakeholders in the Foothills Landscape Project in an effort to restart this collaborative. As made clear in these meetings and the DPEA itself, the Forest Service hopes to “share the decision space” with this group and that the group will play a role in guiding the agency’s efforts with the Foothills Project. As discussed in more detail below, other stakeholder collaborative groups have played a crucial role in defining the scope of projects they will implement by defining the goals, activities, and locations where the activities will occur (or in some cases, will not occur).

But, unlike most such collaborative groups, the Foothills Collaborative Group is being created concurrently with the project it will be charged with implementing. Thus, the scope of activities in the DPEA does not reflect input from the Foothills Collaborative Group because that group does not yet exist. The Collaborative must be given a voice both in *where* the project is implemented, but what the project *is*.

The tension over project scope and what actions to exclude at the programmatic stage is present here as well. The Forest Service wants to leave all potential opportunities on the table for site-specific project, in that it hopes the Collaborative Group will help it accomplish goals it could not accomplish otherwise. As we understand it, the goal for the Collaborative Group is to help Forest Service not only do the easy things, but also the hard things. We want the Collaborative Group to tackle the hard questions too.

But for the reasons explained throughout, the time to tackle those questions is *now*, so that they do not have to be wrestled with again and again in each phase of implementation. Furthermore, collaborative discussions alone, no matter how well intentioned or facilitated, do

not guarantee a successful outcome for every single issue. There are “third rail” issues that are simply too divisive to tackle at the site-specific stage. Including these issues within the scope of the Foothills Project risks derailing the work of the Collaborative. These tough issues evade satisfactory resolution in site-specific projects because they create the potential for *cumulative* harms that are not prohibited or limited by broader-scale decisions like the forest plan. The Collaborative Group should be afforded the opportunity to identify these third rail issues, and the Forest Service should strongly consider limiting the project at the programmatic stage to exclude these issues. We understand that the Forest Service is reluctant to take any action off the table, but including third-rail actions risks allowing the limited number of highly divisive issues from distracting the Collaborative Group from the many issues where common ground can be found. The Forest Service must not let a bad apple spoil the bunch.

Further, it is important to recognize that adopting a particular sideboard or limit on the Foothills Project does not prevent the Forest Service from pursuing that particular action. Instead, it simply means that the Forest Service would pursue that action as an independent project with an independent NEPA review rather than as a tiered project as part of the Foothills Project’s programmatic review. Prioritizing the Foothills projects to exclude certain challenging issues or actions could actually expedite the Forest Service’s overall work plan. The majority of treatments would benefit from the expedited review, and harder questions would get extra attention. This is far preferable to a process where all treatments, even the “easy” ones, get bogged down by hard questions.

We would be pleased to discuss any of the issues or examples in these comments with you further. We are committed to helping you make this project a success, and we will continue offering our input directly and through the Collaborative Group. This is an exciting opportunity to do things differently, with better outcomes for a landscape beloved by so many, and we encourage you to bring additional focus to the Foothills Project to ensure the success of the programmatic review and the project itself.

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## **I. Programmatic Review Under NEPA**

The DPEA adopts a programmatic approach under 40 C.F.R. §§ 1502.20 and 1508.28.<sup>1</sup> DPEA at n. 3. Accordingly, the document should also be guided by the Council on Environmental Quality's ("CEQ") guidance on programmatic NEPA reviews. At its core, the programmatic approach is a decision framework and does not alter the Forest Service's underlying obligations to consider potential impacts under NEPA or other applicable statutes. Agencies are still required to consider both broad-scale and site-specific analyses – the programmatic approach simply changes the timing and sequence of these reviews.

When used correctly, the programmatic approach can improve the flexibility and efficiency of environmental review by considering potential impacts at a general level to identify and limit actions with the potential to trigger significant or controversial environmental effects. The agency can then decide to either avoid actions with the potential for those impacts or consider them in more detail at the project implementation stage. As explained in CEQ's *Memorandum on Effective Use of Programmatic NEPA Reviews* (the "CEQ Programmatic Guidance")<sup>2</sup>:

By identifying potential adverse impacts early during the broad programmatic planning, programmatic NEPA reviews provide a unique opportunity to modify aspects of the proposal and subsequent tiered proposals to avoid or otherwise mitigate those impacts.

CEQ Programmatic Guidance at 35. Modifying the proposal at the programmatic stage "can expedite the preparation of subsequent project- or site-specific proposals by establishing siting, design, operational, or other relevant implementation criteria, requirements, and protocols." *Id.* "The subsequent tiered NEPA review would then include those measures to address potentially significant impacts and focus on the impacts and mitigation alternatives available at the project- or site-specific level that were not considered in the [programmatic EA or programmatic EIS]." *Id.*

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<sup>1</sup> The Council on Environmental Quality is currently in the process of reevaluating the 2020 revisions to its NEPA regulations, citing serious concerns with the legality of those regulations. Further, the 2020 CEQ NEPA Regulations are the subject of ongoing legal challenges. Therefore, all citations to the CEQ NEPA regulations in this comment letter will refer to the 1978 version of these regulations unless stated otherwise.

<https://www.govinfo.gov/content/pkg/CFR-2019-title40-vol37/pdf/CFR-2019-title40-vol37.pdf#page=474>

<sup>2</sup> *Memorandum on Effective Use of Programmatic NEPA Reviews*, Council on Environmental Quality (December 18, 2014)

[https://www.energy.gov/sites/default/files/2014/12/f19/effective\\_use\\_of\\_programmatic\\_nepa\\_reviews\\_18dec2014.pdf](https://www.energy.gov/sites/default/files/2014/12/f19/effective_use_of_programmatic_nepa_reviews_18dec2014.pdf)

In this way, the potential benefits of the programmatic approach are a direct result of the degree to which the agency identifies potentially problematic issues at the outset and narrows the proposal to limit or avoid them. Where the agency cannot (or chooses not to) avoid these issues, they must be evaluated in site-specific detail at the project implementation stage. But, to limit the universe of issues and impacts that must be considered for each site-specific action and to justify a Finding of No Significant Impact (“FONSI”), the Forest Service should focus on actions with well-understood and generally beneficial impacts, and adopt project sideboards to exclude actions with unknown or avoidable environmental impacts.

a. Implementing Programmatic Actions Requires Site-Specific Review

NEPA requires federal agencies to provide the public with “notice and an opportunity to be heard” in the analysis of “specific area[s] in which logging will take place and the harvesting methods to be used.” *Ohio Forestry Ass’n v. Sierra Club*, 523 U.S. 726, 729–30 (1998).<sup>3</sup> The site-specific information and analysis required under NEPA serve two purposes: (i) to ensure agencies are making informed decisions before acting; and (ii) to ensure the public is given a meaningful opportunity to participate in those decision-making processes. *WildEarth Guardians v. Mont. Snowmobile Ass’n*, 790 F.3d 920, 922-25 (9th Cir. 2015). Merely disclosing the existence of particular geographic or biological features is inadequate—agencies must discuss their importance and substantiate their findings as to the impacts. *Or. Nat. Res. Council Fund v. Goodman*, 505 F.3d 884, 892 (9th Cir. 2007).<sup>4</sup> “[G]eneral statements about possible effects and some risk do not constitute a hard look, absent a justification regarding why more definitive information could not be provided.” *Or. Natural Res. Council Fund v. Brong*, 492 F.3d 1120, 1134 (9th Cir.2007).<sup>5</sup>

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<sup>3</sup> Project implementation requires a site-specific decision, and site-specific decisions require site-specific analysis. *Ilio’ulaokalani Coalition v. Rumsfeld*, 464 F.3d 1083, 1095-97 (9th Cir. 2006). The actual “location of development greatly influences the likelihood and extent of habitat preservation. Disturbances on the same total surface area may produce wildly different impacts on plants and wildlife depending on the amount of contiguous habitat between them.” *New Mexico ex rel Richardson*, 565 F.3d at 706. *Stein v. Barton*, 740 F. Supp. 743, 749 (D. Ak. 1990) (NEPA requires site-specificity to ensure that agencies are making informed decisions prior to acting and that the public is given a meaningful opportunity to participate in those decision-making processes); *City of Tenakee Springs v. Block*, 778 F.2d at 1407 (reasoning that an EIS must give decisionmakers sufficient data); *New Mexico ex rel Richardson v. Bureau of Land Management*, 565 F.3d 683, 718-19 (10th Cir. 2009) (requiring site-specific NEPA analysis when agency did not propose to undertake a future NEPA process).

<sup>4</sup> *Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 995 (9th Cir. 2004) (holding numeration of logging acres and road miles insufficient to describe actual environmental effects).

<sup>5</sup> *Or. Natural Res. Council Fund v. Goodman*, 505 F.3d 884, 892 (9th Cir. 2007) (holding the Forest Service’s failure to discuss the importance of maintaining a biological corridor violated NEPA, explaining that “[m]erely disclosing the existence of a biological corridor is inadequate” and that the agency must “meaningfully substantiate [its] finding”).

As both regulations and caselaw make clear, an agency's use of a programmatic approach does not alter its obligation to consider site-specific effects but instead allows that analysis to be deferred until the implementation phase of review. *Fund For Animals v. Mainella*, 283 F. Supp. 2d 418, 433-34 (D. Mass.2003)(Where a programmatic document fails to evaluate site-specific impacts, the deferred analysis must be conducted as part of the subsequent review at the implementation stage); *Western Watersheds Project v. Abbey*, 719 F.3d 1035, 1953-54 (9th Cir. 2013) (Where agency failed to disclose site-specific impacts and alternatives in a programmatic EIS, it must do so in a site-specific EA).

b. CEQ Regulations for Programmatic Review

The programmatic approach allows agencies to change the timing of its environmental review and conduct it in phases to “eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review.” 40 C.F.R. § 1502.20. This approach allows the agency to “summarize the issues discussed in the broader statement and incorporate discussions from the broader statement by reference and [] concentrate on the issues specific to the subsequent action.” *Id.*

Programmatic reviews can be as broad as the agency desires. 40 C.F.R. § 1508.28. However, the breadth of a programmatic review directly relates to its future utility and an overly broad programmatic review will not streamline the future NEPA review in any meaningful way. CEQ Programmatic Guidance at 15 (“A programmatic NEPA review may not be a cost effective effort for an agency if the effort required to perform the review is substantially greater than the time and effort saved in analyzing subsequent proposals.”). In this context, the DPEA should provide a bridge between the broad, open-ended goals in the Forest Plan and the granular, site-specific review required to implement projects under NEPA.

Thus, the DPEA is only useful to the extent it helps the agency narrow its focus and avoid problematic issues that would delay projects at the implementation stage. But, as currently written, the DPEA does not contain sufficiently detailed analysis to satisfy the need for site-specific analysis and does not contain adequate sideboards to preclude actions and impacts that will require substantial analysis at the implementation stage. To realize the potential gains in flexibility and efficiency, the Forest Service must focus the project on a more finite list of activities, include sideboards to preclude actions and areas that will necessitate more detailed review, and explain how these sideboards accomplish this purpose. Focusing the project in this fashion will allow the DPEA to bridge the gap between the Forest Plan goals and site-specific review.

c. Consideration of Cumulative Effects in a Programmatic Review

By definition, a programmatic NEPA review is designed to cover multiple related agency actions. Here, the Foothills Project seeks to authorize an undetermined number of future activities within the same geographic region and thus presents the clear potential for cumulative

impacts under 40 C.F.R. § 1508.7. In particular, the requirement to consider the cumulative impact of “individually minor but collectively significant actions taking place over a period of time” is squarely applicable to the project. *Id.* If a programmatic proposal is not sufficiently limited to allow for cumulative impact analysis at that stage, then such analysis can be deferred. *Salmon River Concerned Citizens v. Robertson*, 798 F. Supp. 1434, 1440 (E.D. Cal. 1992), *aff’d*, 32 F.3d 1346 (9th Cir. 1994); *Northern Alaska Environmental Center v. Lujan*, 961 F.2d 886 (9th Cir.1992) (holding that an EIS's deferral of consideration of certain potential cumulative and synergistic effects is proper tiering and does not foreclose later analysis of these factors in a future EA). But, once again, the ability to defer consideration of cumulative effects does not diminish the requirement and simply delays this work until later.

However, the Forest Service can adopt sideboards at the programmatic phase to limit the potential for cumulative effects and reduce the amount of analysis required at the implementation stage. Setting priorities can assist the Forest Service in avoiding cumulative effects. For example, it is much easier to discuss the cumulative effects of removing off-site pine than it is to discuss the cumulative effects of creating early successional habitat in mature, characteristic hardwood forests. If the programmatic decision allows the Forest Service to do either (or both) of those actions in any particular site-specific project, then the potential cumulative effects of the program are too slippery to grasp.

The decision whether to address cumulative effects at the programmatic stage is particularly relevant if the Forest Service seeks to use categorical exclusions during implementation of the Foothills Project. *See*, DPEA at B63 (referencing potential use of decision memos). CEs cannot be “tiered” to a programmatic decision. CEQ Programmatic Guidance at 29 (EAs are “tiered,” whereas CEs are “applied” during implementation of a program of work). CEs are stand-alone categories of action that do not have significant impacts, individually or cumulatively, by definition. 40 C.F.R. § 1508.4 (defining CEs as actions “which do not individually or cumulatively have a significant effect on the human environment.”). They are simply not available where the proposed action may have cumulatively significant impacts, and if the agency attempts to use them for such actions, the category itself is vulnerable to being invalidated as overbroad. As a result, programmatic analysis cannot be used to explain away cumulative impacts of CEs that are being used to segment a larger program of work.

Here, the potential for significant cumulative effects has not been adequately addressed in the DPEA, and as a result there is no basis for the conclusion that the implementing activities do not have the potential for cumulatively significant effects. To be sure, the Forest Service could avoid actions that might implicate cumulative significant impacts in implementing Foothills Projects, but that would only excuse the Forest Service from needing to prepare a supplemental EIS for those projects; it would not support the use of a CE. Unless the scope of reasonably foreseeable actions and potential environmental effects are limited and considered in

the DPEA, every potential action will require a full cumulative effects analysis, making use of a CE inappropriate.

d. Clarity on the Decisions Deferred to the Implementation Phase

CEQ also instructs agencies to be clear with respect to the “anticipated timing and sequence of decisions,” including “which decisions are supported by the programmatic NEPA document and which decisions are deferred for some later time, and the time-frame or triggers for a tiered NEPA review.” CEQ Programmatic Guidance at 10. “Agencies should clearly and concisely articulate their intentions to defer particular environmental review and consultation requirements for consideration until a subsequent project-or site-specific proposal is developed.” *Id.* The deferred analysis “should be identified and the intended use of tiering made clear at the outset of scoping, and articulated in the programmatic review.” *Id.* at 34. Here, the DPEA does not articulate the issues it believes are adequately addressed in the programmatic document and the issues it intends to defer until the project implementation phase.<sup>6</sup>

e. Endangered Species Act Consultation in a Programmatic Review

Under section 7(a)(2) of the Endangered Species Act (“ESA”), an agency must consult with (as relevant here) the Fish and Wildlife Service whenever a proposed action “may affect” listed species or destroy or adversely modify its critical habitat to ensure that the action is “not likely to jeopardize” these species. 16 U.S.C. § 1536(a)(2). This process is generally referred to as Section 7 consultation. The scope of the Foothills Project and the lack of sideboards to exclude potential impacts to threatened and endangered species will complicate this analysis at both the programmatic and project implementation stages.

Section 7 consultation shall occur “at the earliest possible time to determine whether any action may affect listed species or critical habitat.” 50 C.F.R. § 402.14(a). As a result, ESA regulations allow for Section 7 consultation over “framework programmatic action,” defined as “a framework for the development of future action(s) that are authorized, funded, or carried out at a later time,” where “any take of a listed species would not occur unless and until those future action(s) are authorized, funded, or carried out and subject to further section 7 consultation.” *Id.* at § 402.02. ESA Section 7 consultation for these programmatic actions occurs in two steps. First, the programmatic action is addressed through programmatic consultation, which “allow[s] the Services to consult on the effects of programmatic actions.” *Id.* The result of a formal programmatic consultation is a biological opinion that determines where the project overall is likely to jeopardize species or result in adverse modification of critical habitat. 50 C.F.R. §§ 402.14(h).

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<sup>6</sup> For comparison, see Decision Notice for the Cherokee National Forest’s Goal 17 project at 2-3. [https://www.fs.usda.gov/nfs/11558/www/nepa/110674\\_FSPLT3\\_4840187.pdf](https://www.fs.usda.gov/nfs/11558/www/nepa/110674_FSPLT3_4840187.pdf)

In the course of a programmatic consultation, the agency can adopt sideboards on the programmatic action to avoid or mitigate impacts to listed species or designated habitat. In the second step, site-specific actions implementing the programmatic decision are addressed through stepped-down, site-specific Section 7 consultations, ensuring adherence to any sideboards included in the programmatic biological opinion, with site-specific biological opinions accompanied by incidental take statements.

Further, the agencies are prohibited from segmenting their review under the ESA. *Conner v. Burford*, 848 F.2d 1441, 1457 (9th Cir. 1988). Thus, whether at the programmatic or the project implementation stage, the potential impacts on threatened and endangered species must be fully considered including the cumulative effects of multiple actions authorized under the umbrella of the Foothills Project.

Finally, we note that the Forest Service must also consider the requirement to reinstate consultation. Agencies are required to reinstate consultation under the ESA if any of the following circumstances are met:

- (1) the amount or extent of taking in the incidental take statement is exceeded;
- (2) new information reveals effects not previously considered;
- (3) the action is modified in a manner that causes an effect not previously considered; or
- (4) if a new species is listed or critical habitat designated.

50 C.F.R. § 402.16(a). Given the Foothills Project's potential scope, the lack of site-specific analysis, and its unlimited duration, all of these factors will likely be triggered at some point during the course of the project. Adopting appropriate sideboards would reduce the risk of triggering these factors and would ease the burden of site-specific consultation when it is needed, allowing the Forest Service to better realize the potential efficiencies of the programmatic approach.

## **II. The Role Of The Foothills Collaborative Group**

Beyond the programmatic NEPA review, we also appreciate the Forest Service's willingness to revisit the Collaborative Group planned for the Foothills Project. It is evident that CONF leadership and staff have invested a great deal of effort in listening to stakeholders, finding common ground with those individuals and organizations, and considering how to best engage the planned Collaborative Group. We understand the Forest Service's goal is to "share the decision space" with this group, and its hope that a successful collaborative will allow it to navigate issues and activities that would be challenging otherwise. We share the belief that successful collaboration can deliver a better Foothills Project and better outcomes for the CONF.

But the status of the Collaborative Group is out of step with that of the programmatic NEPA document. The DPEA states that the collaborative group "will be formed, prior to a final

decision, to work with public land managers to further influence the scope, scale, and exact locations of specific treatments within the project area.” DPEA at B63. Further, decisions made by the Collaborative Group “may result in modifications to the timing, methods, and monitoring requirements within the [Foothills Landscape Project].” *Id.* As of the date of this letter, the Foothills Collaborative Group does not yet exist and it seems unlikely that the group will be able to make any meaningful decisions before late 2021 or early 2022. Instead of proceeding in tandem, the Collaborative Group’s progress is well behind that of the NEPA review.

The Collaborative Group can play an important role in helping the Forest Service achieve a more successful Foothills Project, but the Collaborative Group must be afforded the opportunity to fully participate in shaping the project *including decisions made at the programmatic phase*. In particular, the Collaborative Group is uniquely suited to develop and recommend project sideboards that could refine the scope of actions considered in the Final Programmatic EA. Unless the Forest Service shares the decision space throughout the project, including both the programmatic and project implementation phases, it risks charging the Collaborative Group with a task it may be unable or unwilling to perform.

At the scoping phase, the Forest Service was asked to consider a project alternative that would focus on “consensus-based treatments with widespread support (of which we think there are many) developed during collaborative discussions.” Foothills Landscape Project Scoping Report at 8.<sup>7</sup> As explained in more detail below, we encourage the Forest Service to reevaluate this recommendation. If afforded the opportunity, we believe that a Collaborative Group can help the Forest Service define a programmatic project that achieves most of the goals identified in the DPEA on a more efficient basis and with broad support. But to do so, the Collaborative Group must be allowed to identify and resolve potential “third rail” issues that may otherwise jeopardize the group’s potential success.

### **III. Other Collaborative Groups Implementing Condition-Based Projects Have Helped Define The Project’s Scope, Including At The Programmatic Stage**

Collaborative groups can provide input on decisions at all scales. At the broadest scale, for example, a collaborative group organized under the Federal Advisory Committee Act helped the Forest Service develop the 2012 Planning Rule and associated directives.<sup>8</sup> This collaborative group addressed issues at a national scale— substituting ecological integrity for economic efficiency as the cornerstone of forest planning, developing a coarse- and fine-filter approach to protecting rare species, and ensuring that forest plans are grounded in fiscal realities. The composition, charter, and decision space for this collaborative group were well defined and its recommendations were reflected in the final product.

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<sup>7</sup> [https://www.fs.usda.gov/nfs/11558/www/nepa/107667\\_FSPLT3\\_5112645.pdf](https://www.fs.usda.gov/nfs/11558/www/nepa/107667_FSPLT3_5112645.pdf)

<sup>8</sup> <https://www.fs.usda.gov/main/planningrule/committee>



Collaborative groups have also been used to support forest plan revisions, with good examples in Region 8. For example, both the George Washington National Forest Stakeholders' Group<sup>9</sup> and the Nantahala-Pisgah Forest Partnership<sup>10</sup> have provided consensus input from diverse interests on the toughest issues for planning: management area allocations, timber harvest and other vegetation management objectives, and roadmaps to generate broad support for wilderness or other Congressional designations. Further afield, the Clearwater Basin Collaborative's Forest Plan Subcommittee is working on similar issues.<sup>11</sup>

These broader-scale collaborative groups can reveal much about the prerequisites for building trust and finding consensus, but they are less useful analogs for a collaborative group supporting a programmatic, landscape-scale project. Instead, the best model for the Foothills Project is the Cherokee National Forest's Goal 17 project, also known as the Dry Forest Communities Restoration project. The Goal 17 project was shaped by input from the South Zone Collaborative Group,<sup>12</sup> and we believe that the Foothills Project can follow a similar and equally successful track.

Specifically, the Forest Service entrusted the Goal 17 Collaborative Group to develop a strategy that would increase the pace and scale of restoration work and decrease conflict over recurring issues. With information about current conditions provided by the Forest Service and stakeholders, the group recommended focusing on treatments to restore characteristic dry site communities on sites currently dominated by or encroached upon by off-site pine. In order to head off potential issues that would potentially require burdensome site-specific analysis or conflict resolution, the group recommended sideboards to limit slopes where ground-disturbing harvest could occur and limit road construction in unroaded (Mountain Treasure) areas. Future site-specific decisions will look for opportunities to implement these programmatic priorities, and they will be made in concise EAs that are tiered to the programmatic document.<sup>13</sup> The Goal 17 project analyzed cumulative, repeating impacts at the programmatic stage, allowing the site-specific EAs to only analyze issues unique to those sites. The project is working well: because there is so much broadly-supported work ready to move through the pipeline, the state forestry department is pitching in to help prepare sales.

On the North Zone of the Cherokee National Forest, a collaborative group found a different solution to a familiar problem. After several years of conflict, a lawsuit, and cancelled timber sales, the Forest Service asked collaborative stakeholders to help find a new way forward. The CNF Landscape Restoration Initiative worked for several years on a science-based

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<sup>9</sup> <https://www.fs.usda.gov/detail/gwj/news-events/?cid=FSEPRD488746>

<sup>10</sup> <https://npforestpartnership.org/>

<sup>11</sup> <https://clearwaterbasincollaborative.org/subcommittees/forest-plan-revision/>

<sup>12</sup> [https://www.fs.usda.gov/nfs/11558/www/nepa/110674\\_FSPLT3\\_4660332.pdf](https://www.fs.usda.gov/nfs/11558/www/nepa/110674_FSPLT3_4660332.pdf)

<sup>13</sup> E.g., [https://www.fs.usda.gov/nfs/11558/www/nepa/113680\\_FSPLT3\\_5359354.pdf](https://www.fs.usda.gov/nfs/11558/www/nepa/113680_FSPLT3_5359354.pdf);  
<https://www.fs.usda.gov/project/?project=59945>

process to provide programmatic recommendations for future projects.<sup>14</sup> The group found that treating sites dominated by consensus-identified uncharacteristic vegetation would maximize progress toward restoration goals and facilitate more high-consensus work getting done. That group helped the Forest Service apply the recommendations in a pilot project and provided input on subsequent site-specific projects. Although the Forest Service did not formally adopt the collaborative group's recommendations in a programmatic decision, it has adhered to the collaboratively supported priorities and pursued them in site-specific projects, reducing social conflict.

In the course of recent stakeholder meetings, the Forest Service has highlighted other collaboratives around the county and there are many more that have not been discussed. In addition to the Goal 17 project, other collaboratives that seem applicable here are the Clearwater Basin and Southwestern Crown Collaboratives, which are part of the Montana Forest Collaborative Network, and 4FRI. Like the Pisgah National Forest's Grandfather District Collaborative, these are all funded as part of the Collaborative Forest Landscape Restoration Program (CFLR). While CFLR projects do not necessarily use the programmatic decisionmaking model proposed here, there are clear similarities. The CFLR program is tiered to a collaborative "proposal," and the forests receive funding to implement it. By law, these proposals are required to narrowly describe the kinds of treatments that are most needed to accomplish ecological restoration and fuels reduction objectives.<sup>15</sup> CFLR projects, moreover, are subject to mandatory sideboards, such as the retention of large and old trees and limitations on roadbuilding.<sup>16</sup> Accordingly, CFLR requires projects to pursue a narrowed focus and avoid tricky issues, just as we recommend the Forest Service should do here. The focus required by law is a major reason why these collaborative groups have been successful. If they had been asked to find consensus on contentious issues instead of commonly supported priorities, the task would have been much more difficult, if not impossible.

Throughout the recent round of stakeholder meetings for the planned Foothills Collaborative Group, recurring questions have been how and when input from the Collaborative will be incorporated into the Foothills Project. Will the Collaborative be given a role in defining the scope of the project, or will its role be limited to reviewing particular implementation proposals? Looking to the success of the Goal 17 Project and the CNF Landscape Restoration Initiative, we believe strongly that the Forest Service should use the programmatic review as an opportunity to task the Collaborative Group with helping identify priorities (and sideboards) for treatments that have broad support, are ecologically beneficial, maximize benefits for the greatest number of resources, and can be accomplished within the agency's fiscal constraints.

Identifying these priorities and sideboards may not be easy, but it is the kind of task well-suited for the collaborative setting. One common feature shared among all of the

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<sup>14</sup> <http://www.communityplan.net/cherokee/>

<sup>15</sup> PL 111-11 § 4003(c) (2009).

<sup>16</sup> *Id.*

successful collaboratives described above is the need to find a consensus strategy that can meet each participants' needs better than the *status quo*. Another common feature is the fact that certain issues will not be resolved through collaborative discussions alone, no matter how well facilitated or intentioned. The risk of third rail issues creating unresolvable problems for a collaborative seems greatest when the group is charged with implementing a project it did not have a role in shaping. Therefore, we believe that the Foothills Collaborative Group should be afforded the opportunity to develop a collaborative proposal that can be compared against other alternatives in the Final PEA to support a "reasoned choice between programmatic directions."<sup>17</sup>

#### **IV. Without Additional Limits, The Potential Impacts Of Activities Authorized In The Foothills Landscape Project Are Potentially Significant**

As outlined in the prior letter and below, the scope of work proposed for the Foothills Landscape Project has the potential for significant environmental impacts. Unless the Forest Service adopts limits on the project to ensure that the potential environmental impacts are not significant, it must either prepare an Environmental Impact Statement ("EIS") or perform sufficient analysis at the implementation stage to ensure that each and every implementation action does not itself require an EIS.

CEQ regulations suggest that a programmatic document will normally be an EIS, not an EA. 40 C.F.R. § 1508.28. ("Tiering refers to the coverage of general matters in broader *environmental impact statements ...*") and § 1502.20 ("Agencies are encouraged to tier their *environmental impact statements ...*")(emphasis added to both). A programmatic EA may be used to determine whether "a broad proposed action requires an EIS." FSH 1909.15 at §42.1. If a programmatic EA finds that the actions authorized in the programmatic proposal are potentially significant, individually or cumulatively, then an EIS must be prepared. There is no question that the Foothills Project's unbounded scope has the potential for significant impacts. Therefore, the Forest Service has three choices: (i) it can adopt sufficient sideboards now to ensure against significant effects in future projects; (ii) it can prepare a programmatic EIS now; or (iii) it can prepare a programmatic EA now and potentially be required to prepare an EIS for various implementation actions.

##### **a. Significant Impacts Under NEPA**

Based on its scope, scale, duration, and lack of limits, the Foothills Project has clear potential for significant impacts on the human environment. NEPA requires federal agencies to prepare an EIS for any "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(C).<sup>18</sup> "Human environment" is a "comprehensive[]" term that

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<sup>17</sup> CEQ Programmatic Guidance at 31.

<sup>18</sup> The adjective "major" for purposes of NEPA "does not have a meaning independent of significantly." 40 C.F.R. § 1508.18.

includes “the natural and physical environment and the relationship of people with that environment.” 40 C.F.R. § 1508.14. Nearly all actions on national forests affect the “human environment” to some degree.

Significance is determined based on two factors: context and intensity. 40 C.F.R. § 1508.27. To evaluate context, “the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality.” 40 C.F.R. § 1508.27. “Both short- and long-term effects are relevant.” 40 C.F.R. § 1508.27. “Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole.” 40 C.F.R. § 1508.27 and *Am. Rivers v. Fed. Energy Regulatory Comm’n*, 895 F.3d 32, 49 (D.C. Cir. 2018). “Intensity” “refers to the severity of impact.” 40 C.F.R. § 1508.27(b). CEQ provided ten factors to consider when analyzing the “intensity” of an action. 40 C.F.R. § 1508.27(b). “Implicating any one of the factors may be sufficient to require development of an EIS.” *Nat’l Parks Conservation Ass’n v. Semonite*, 916 F.3d 1075, 1082 (D.C. Cir.), *amended in part*, 925 F.3d 500 (D.C. Cir. 2019).

b. The Foothills Project’s Unbounded Scope has the Potential for Significant Impacts

Given its sweeping scope and lack of limits, it is difficult to imagine how the Forest Service could justify a conclusion that the Foothills Project will not have significant effects. This is precisely why forest plan revisions require an EIS,<sup>19</sup> and to the extent that the Foothills Project leaves those same broad options on the table, it will require the same. As detailed in the comments we submitted on the 2019 Draft EA, the massive scale of proposed actions could include tens of thousands of acres of commercial timber harvest, noncommercial mechanized timber harvest, prescribed burning, herbicide application, and use of industrial masticators for vegetation grinding. January 10, 2020 Letter from P. Hunter to B. Jewett re *Comments on Draft EA* at 12.

CEQ regulations evaluate significance based on context and intensity, and the Foothills Project has the potential for significant impacts under both. The project’s goal of “landscape-scale restoration,” DPEA at 29, suggests that project is designed to have significant effects (albeit beneficial ones). 40 C.F.R. § 1508.27(b)(1) (“Impacts that may be both beneficial and adverse.”) The changes made in the DPEA focus primarily on the process, rather than the scope of actions and potential effects. The new proposed alternative, Alternative 3, would reduce the number acres potentially subject to commercial activities by approximately 1/3, from 157,625 acres to 104,545 acres. DPEA at 55. But the areas potentially subject to noncommercial activities would remain unchanged and the areas potentially subject to commercial activities still exceeds 100,000 acres. *Id.*

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<sup>19</sup> 36 C.F.R. § 219.16(a)(2).

CEQ regulations identify ten intensity factors to be considered in evaluating the project's intensity, and implicating any one of the factors "may be sufficient to require development of an EIS." *Nat'l Parks Conservation Ass'n v. Semonite*, 916 F.3d 1075, 1082 (D.C. Cir.). Without the benefit of site-specific analysis in the DPEA or limits to preclude them, all of these intensity factors are potentially triggered. The Foothills Project would impact nearly every "interest" on the national forest - recreational, logging, road building, wildlife, conservation, and restoration. Thus, all of the intensity factors are triggered for the project. The DPEA must be evaluated on its face and cannot be assumed to be limited where no restrictions are imposed.

c. The Foothills Project Includes Activities That Trigger an EIS Under Forest Service Regulations

The scope of the Foothills Project also includes actions that would require an EIS under the Forest Service's own regulations. Forest Service regulations direct that an EIS is normally required for proposals "that would substantially alter the undeveloped character of an inventoried roadless area or a potential wilderness area." 36 C.F.R. § 220.5(a)(2). Among other actions, regulations state that this requirement is triggered by "[c]onstructing roads and harvesting timber in an inventoried roadless area where the proposed road and harvest units impact a substantial part of the inventoried roadless area." *Id.*

The project includes six inventoried roadless areas, constituting 2% of the total project area. DPEA at Table 51 and 4. The project area includes 99% of the Boggs Creek Inventoried Roadless Area and 100% of the Miller Creek Inventoried Roadless Area. *Id.* Over the course of scoping this project, activities planned within Inventoried Roadless Areas have expanded and now include "treatment opportunities, which would meet project objectives and maintain or enhance the characteristics of those Inventoried Roadless Areas, could occur if conditions warrant action." *Id.* at 4.

The DPEA contemplates both road construction and timber harvesting activities, and the DPEA includes no safeguards to ensure that these activities do not "impact a substantial part of the inventoried roadless area." Accordingly, the DPEA cannot support a conclusion that an EIS is not required. The assurance that these activities would be carried out in compliance with "overarching law, policy, and regulation that guide management activities permissible in roadless areas," DPEA at D4, does nothing to avoid a significance finding as these requirements apply to all agency actions in Inventoried Roadless Areas, including the actions that trigger an EIS under 36 C.F.R. § 220.5(a)(2).

d. The Programmatic EA Should Adopt Sideboards to Help Avoid “Significance Triggers”

Limiting the amount of road construction and timber harvest in Inventoried Roadless Areas is one example of how the Forest Service can limit the project’s scope to avoid “significance triggers” – actions that have the potential for significant effects unless they are expressly limited or prohibited. Caselaw clarifies the issues and circumstances frequently found to trigger a finding of significance in Forest Service decisions:

- Type/intensity of harvest;<sup>20</sup>
- Economic cost of harvest;<sup>21</sup>
- Old-growth characteristics;<sup>22</sup>
- Presence within an area potentially suitable for future protection as wilderness;<sup>23</sup>
- Proximity to a unique area such as designated wilderness;<sup>24</sup>
- Risk factors for soil impacts and erosion;<sup>25</sup>
- Sensitivity of receiving waters and fisheries;<sup>26</sup>
- Impacts to wetlands;<sup>27</sup>
- Efficacy of site-specific BMPs;<sup>28</sup>
- Recreational values and uses;<sup>29</sup>

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<sup>20</sup> *Curry v. Forest Service*, 988 F. Supp. 541 (W.D. Pa. 1997); *House v. Forest Service*, 974 F. Supp. 1022 (E.D. Ky. 1997).

<sup>21</sup> *Kettle Range Cons. Group v. Forest Service*, 148 F. Supp. 2d 1107 (E.D. Wash. 2001).

<sup>22</sup> *Curry v. Forest Service*, 988 F. Supp. 541 (W.D. Pa. 1997); *Lands Council v. Cottrell*, 731 F. Supp. 2d 1028 (D. Idaho) (R&R adopted 731 F. Supp. 2d 1074); *Neighbors of Cuddy Mountain v. Forest Service*, 137 F.3d 1372 (9th Cir. 1998); *Idaho Sporting Cong. v. Alexander*, 222 F.3d 562 (9th Cir. 2000) (overruled on other grounds); *Wildwest Inst. v. Austin*, 2006 WL 8435846, at \*1 (D. Mont. 2006).

<sup>23</sup> *Lands Council v. Martin*, 529 F.3d 1219 (9th Cir. 2008); *Mountaineers v. Forest Service*, 445 F. Supp. 2d 1235 (W.D. Wash. 2006).

<sup>24</sup> *Sierra Club v. Bosworth*, 352 F. Supp. 2d 909 (D. Minn. 2005).

<sup>25</sup> *Cowpasture River Pres. Ass’n*, 911 F.3d 150, 177 (4th Cir. 2018); *Sierra Club v. Forest Service*, 843 F.2d 1190 (9th Cir. 1988); *Kettle Range Cons. Group v. Forest Service*, 148 F. Supp. 2d 1107 (E.D. Wash. 2001); *Blue Mountain Biodiversity Project v. Blackwood*, 161 F.3d 1208 (9th Cir. 1998); *Wildwest Inst. v. Austin*, 2006 WL 8435846, at \*1 (D. Mont. 2006).

<sup>26</sup> *Sierra Club v. Forest Service*, 843 F.2d 1190 (9th Cir. 1988); *League of Wilderness Defenders v. Forest Service*, 2005 WL 3307087, at \*1 (D. Or. 2005).

<sup>27</sup> *Helena Hunters & Anglers v. Tidwell*, 841 F. Supp. 2d 1129 (D. Mont. 2009).

<sup>28</sup> *Colorado Env’tl Coalition v. Dombeck*, 185 F.3d 1162, 1173 (10th Cir. 1999); *Ohio Valley Env’tl. Coalition v. Hurst*, 604 F. Supp. 2d 860, 889 (S.D.W.Va. 2009); *Hells Canyon Pres. Council v. Connaughton*, 2012 WL 13047991 (D. Or. 2012) (R&R adopted 2013 WL 665134 (2013)).

<sup>29</sup> *Sierra Club v. Forest Service*, 843 F.2d 1190 (9th Cir. 1988); *Sierra Club v. Bosworth*, 352 F. Supp. 2d 909 (D. Minn. 2005).

- Scenic and aesthetic qualities of the site;<sup>30</sup>
- Geology of the particular area;<sup>31</sup>
- The presence of rare species (e.g., sensitive, forest concern, regional forest concern, species of conservation concern);<sup>32</sup>
- Impacts to quality of wildlife habitat;<sup>33</sup>
- Impacts to connectivity of wildlife habitat;<sup>34</sup>
- Condition and location of access roads;<sup>35</sup>
- The likelihood that the action will cause an increase of use on a particular road associated with the project;<sup>36</sup>
- The history of similar activities at the particular site;<sup>37</sup>
- Foreseeable future activities at the particular site;<sup>38</sup>
- The degree of scientific certainty that activities or mitigation measures will have the predicted effect given a site's unique characteristics;<sup>39</sup>
- Absence of data about the ecological importance of the site;<sup>40</sup> and
- Recency of data that are subject to change over time (e.g., wildlife population data).<sup>41</sup>

Imposing sideboards on the Foothills Project to minimize these significance triggers will help the Forest Service justify FONSI's, both at the programmatic and project implementation phases. This would also track the recommendation in CEQ's Programmatic Guidance: "identifying potential adverse impacts early during the broad programmatic planning, programmatic NEPA reviews provide a unique opportunity to modify aspects of the proposal and subsequent tiered proposals to avoid or otherwise mitigate those impacts." CEQ Programmatic Guidance at 34.

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<sup>30</sup> *Sierra Club v. Forest Service*, 843 F.2d 1190 (9th Cir. 1988); *Curry v. Forest Service*, 988 F. Supp. 541 (W.D. Pa. 1997).

<sup>31</sup> *House v. Forest Service*, 974 F. Supp. 1022 (E.D. Ky. 1997).

<sup>32</sup> *Lands Council v. Cottrell*, 731 F. Supp. 2d 1028 (D. Idaho)(species viability).

<sup>33</sup> *Found. for N. Am. Wild Sheep v. Dep't of Ag.*, 681 F.2d 1172 (9th Cir. 1982).

<sup>34</sup> *Helena Hunters & Anglers v. Tidwell*, 841 F. Supp. 2d 1129 (D. Mont. 2009).

<sup>35</sup> *Or. Nat. Desert Ass'n v. Rose*, 921 F.3d 1185, 1189 (9th Cir. 2019); *Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989 (9th Cir. 2004).

<sup>36</sup> *Found. for N. Am. Wild Sheep v. Dep't of Ag.*, 681 F.2d 1172 (9th Cir. 1982).

<sup>37</sup> *Sierra Club v. Forest Service*, 843 F.2d 1190 (9th Cir. 1988); *Curry v. Forest Service*, 988 F. Supp. 541 (W.D. Pa. 1997); *Conservation Congress v. Forest Service*, 2013 WL 4829320, at \*1 (E.D. Cal. 2013).

<sup>38</sup> *Sierra Club v. Forest Service*, 843 F.2d 1190 (9th Cir. 1988).

<sup>39</sup> *Blue Mountain Biodiversity Project v. Blackwood*, 161 F.3d 1208 (9th Cir. 1998); *Cascadia Wildlands v. Forest Service*, 937 F. Supp. 2d 1271 (D. Or. 2013).

<sup>40</sup> *Helena Hunters & Anglers v. Tidwell*, 841 F. Supp. 2d 1129 (D. Mont. 2009).

<sup>41</sup> *Klamath-Siskiyou Wildlands Ctr. v. Forest Service*, 373 F. Supp. 2d 1069 (E.D. Cal. 2004).

e. Proceeding With a Programmatic EA Risks Deferring Substantial Environmental Review Until the Implementation Phase

As discussed previously, a programmatic approach alters the timing but not the rigor of analysis required for NEPA review. But limits adopted on the scope of the project in the programmatic review can reduce the amount of subsequent review required, including by limiting the potential for significant impacts. If the Forest Service's programmatic review is limited to an EA and does not adopt limits to preclude significant effects in the future, it will defer a substantial portion of the required NEPA analysis until the implementation phase. This may leave the Forest Service in the strange position of preparing a programmatic EA but being required to prepare an EIS for individual projects at the implementation phase.

EISs and EAs serve two different purposes. An EA is intended to "provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement." 40 C.F.R. § 1508.9(a). An EA also allows an agency to consider alternatives whenever there are unresolved conflicts in the use of its resources—meaning that different choices (such as choices of locations) will have different environmental consequences. 42 U.S.C. § 102(2)(E). An EIS, in contrast, provides a more rigorous look at the impacts of a project known to have potentially significant impacts. An EIS must "provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. § 1502.1. An EIS requires more detailed review and investigation of environmental risks and alternatives. *N. Idaho Cmty. Action Network v. U.S. Dep't of Transp.*, 545 F.3d 1147, 1153 (9th Cir. 2008).

There are two ways the Forest Service can avoid deferring the bulk of NEPA review until the project implementation phase. Without substantially narrowing the focus of the project, the agency could prepare a programmatic EIS, evaluating the full range of environmental impacts that could result from the activities potentially authorized as part of the project. Having fully evaluated the range of impacts at the programmatic stage, the agency would only need to refer back to the programmatic document and apply that analysis to the site-specific conditions. But, for a project as broad and unbounded as the Foothills Project, the amount of analysis required to reach this level of detail would be enormous and would likely require an investment of resources similar to the preparation of a forest plan.

Alternatively, the Forest Service could expressly limit the activities, locations, and context of proposed actions to avoid circumstances with the potential to trigger significant effects. Excluding "significance triggers" – actions, locations, and potential impacts that are likely to result in significant environmental impacts - would substantially reduce the likelihood that future actions would require in-depth environmental review. Further, capping the total number of activities that could be undertaken as part of the project (i.e., a limit on the number of acres commercially harvested) and distributing those caps by type of harvest, timing of harvest, watershed, and/or implementation area would further reduced potential for significant impacts.



**V. The Forest Service Should Revise The Statement Of Purpose And Need To Narrow The Scope, Avoid Problematic Issues, And Focus The Project**

The sweeping and unbounded scope of the Foothills Project risks losing the potential efficiencies of the programmatic NEPA review and will complicate the implementation of future projects. But adopting a more focused statement of purpose and need in the programmatic document will limit the amount of environmental review required at the implementation phase.

NEPA requires a statement of purpose and need to “briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action.” 40 C.F.R. § 1502.13; FSH 1909.15 § 11.21. This statement is necessary to inform the public of exactly what the agency intends to do. “NEPA forces agencies to explain what it is they seek to do, why they seek to do it, what the environmental impacts may be of their proposed action, and what alternatives might be available to the agency that might lessen environmental impact. Without a clear ‘what and why’ statement, the public is kept in the dark.” *Soda Mountain Wilderness Council v. Norton*, 424 F. Supp. 2d 1241, 1262 (E.D. Cal. 2006). Coherent purpose and need statements are critical because “the available reasonable alternatives are dictated by the underlying purpose of the proposed action.” *Wilderness Soc. v. U.S. Forest Serv.*, 850 F. Supp. 2d 1144, 1163 (D. Idaho 2012). “[A] purpose can [] be unreasonable if the agency draws it so broadly that an infinite number of alternatives would accomplish [it] and the project would collapse under the weight of the possibilities.” *Webster v. U.S. Dep’t of Agric.*, 685 F.3d 411, 422 (4th Cir. 2012).

The need for a cogent statement of purpose and need applies the same in a programmatic document. “The purpose and need sets the tone for the scoping process and the course for conducting the NEPA review.” CEQ Programmatic Guidance at 19. A statement of purpose and need must be “focused enough for the agency to conduct a rational analysis of the impacts and allow for the public to provide meaningful comment on the programmatic proposal.” *Id.* If the statement of need is too vague and over-broad, the programmatic review risks spinning into abstraction with too many potential alternatives or alternatives so broad as to be meaningless.

The DPEA certainly toes that line. The Foothills Project’s purpose is to “create, restore, and maintain resilient ecosystems through active management.” DPEA at 35. But as the Forest Service knows, “restoration” and “resilience” are not self-applying concepts. Restoration for what dimensions of ecological integrity? And at what scales? The project’s goal is further explained through eleven bullet points, such as “Improve forest composition and structure;” “Reduce risks to forest health;” and “Enhance and provide sustainable recreation opportunities.” *Id.* These eleven bullets are expanded further into twenty-seven sets of “Existing and Desired Conditions.” *Id.* at Table 16. The project’s “Implementation Framework” goes on to describe “more than 30 management actions (or ‘tools’) are proposed to meet the restoration needs throughout the landscape.” *Id.* at B56.

This shifting and ever-expanding statement of purpose and need has consequences for the quality of the NEPA review. A project's "reasonable alternatives are dictated by the underlying purpose of the proposed action." *Wilderness Soc. v. U.S. Forest Serv.*, 850 F. Supp. 2d 1144, 1163 (D. Idaho 2012). Each of the DPEA's eleven bullets could stand alone as a statement of purpose and need. By seeking to accomplish them all, at the same time and across the entire Foothills Project area, the project's underlying purpose becomes so broad as to be nearly meaningless. There are an infinite number of reasonable alternatives that could satisfy this purpose, because it includes so many different objectives that can be combined in so many different ways. CEQ encourages the opposite approach – the statement of purpose and need should be "focused enough for the agency to conduct a rational analysis of the impacts and allow for the public to provide meaningful comment on the programmatic proposal." CEQ Programmatic Guidance at 19.

Once again, the solution to this problem remains the same. The Forest Service should focus on a narrower or more constrained list of activities. Doing so will improve the quality of the NEPA analysis, allow the public to better understand the actions contemplated by the agency, and will ultimately result in a more successful project. The Forest Service adopted this approach with respect to the Goal 17 Project, and we strongly encourage the same to be done here.

## **VI. The Forest Service Should Consider Additional Alternatives To Focus The Project And Limit Its Potential Environmental Effects**

The alternatives analysis is the "heart" of the NEPA review. 40 C.F.R. § 1502.14. NEPA requires federal agencies to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. § 4332(2)(E). Agencies must "[u]se the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment." 40 C.F.R. § 1500.2(e); *see also* 40 C.F.R. § 1508.9(b) (EAs must discuss alternatives); *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1229 (9th Cir. 1988) (federal action involving unresolved conflicts as to proper use of resources triggers NEPA's alternatives requirement, whether or not an EIS is also required).

Accordingly, "[a]n agency must look at every reasonable alternative, with the range dictated by the nature and scope of the proposed action, and sufficient to permit a reasoned choice." *Idaho Conservation League v. Mumma*, 956 F.2d 1508, 1520 (9th Cir. 1992) (internal citations omitted); *see also Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810, 816 (9th Cir. 1988), *rev'd on other grounds*, 490 U.S. 332 (1989) (reasonable range of alternatives framed by purposes of project). The failure to consider a "viable but unexamined alternative" will render the analysis inadequate. *Dubois v USDA*, 102 F.3d 1273, 1289 (1st Cir. 1996); and 40 C.F.R. § 1502.14.

CEQ's guidance advises that programmatic alternatives be focused enough to permit comparison of different programmatic directions. CEQ Programmatic Guidance at 31. Agencies should use a meaningful comparison of alternatives "at the programmatic level to support focusing future decisions and eliminating certain alternatives from detailed study in subsequent NEPA reviews." *Id.* Only by "articulating the reasoned choice between alternatives, with a discussion of why considered alternatives were not chosen, [can] the range of alternatives in tiered NEPA reviews can be appropriately narrowed." *Id.*

Here, the DPEA considers two action alternatives and one no-action alternative. DPEA at 55. The two action alternatives differ only in geographic scope. Alternative 2 would authorize the full range of proposed management activities within the entire 157,625-acre project area. Alternative 3 is identical to Alternative 2, except that commercial activities would be prohibited in 53,000 acres designated unsuitable for timber production. *Id.* The two action alternatives demonstrate both the problem with the Forest Service's current approach, and the solution.

First, the problem: Foothills Landscape Project seeks to authorize "more than 30 management actions" across over 150,000 acres. DPEA at B56. These thirty actions could be combined in a virtually infinite number of potential alternatives, and any attempt to compare the environmental impacts of so many different alternatives would quickly become impossible. Courts have cautioned against this exact situation, where a project's purpose is so broadly defined that an "infinite number of alternatives would accomplish [it] and the project would collapse under the weight of the possibilities." *Webster v. U.S. Dep't of Agric.*, 685 F.3d 411, 422 (4th Cir. 2012) (citation omitted). Currently, the agency has a programmatic analysis, but it is not proposing to make a programmatic *decision*. Instead, it is explicitly leaving all its options on the table. As a result, the DPEA does not make a detailed comparison of different programmatic directions that might be pursued.

But the Forest Service knows how to fix this problem: the difference between Alternatives 2 and 3 is a limitation on where commercial harvesting activities can be conducted. The additional limit imposed in Alternative 3 is an example of the sideboards that have been discussed throughout these comments and can help narrow the universe of potential effects. By excluding commercial activities in unsuitable areas, Alternative 3 allows the Forest Service to better quantify the potential impacts of its actions and avoid an issue that could be problematic at the implementation phase (conducting commercial harvests in areas designated unsuitable). Implementing limits like this one would serve multiple purposes by avoiding "significance triggers" and reducing the amount of site-specific review required by precluding certain categories of potential impacts.

Other useful sideboards have been proposed previously but were dismissed without adequate consideration. *See, Foothills Landscape Project Scoping Summary Report* (May 2018) at 8-13. For example, Alternative D (limiting time frame of project) and Alternative G (exclude treatments in Inventoried Roadless Area) would all be useful sideboards for this project. A more complete list of potential sideboards is set forth below in Section XIII.

Developing potential sideboards is a task uniquely well-suited for the planned Foothills Collaborative Group. Therefore, we encourage the Forest Service to afford the Collaborative Group the opportunity to develop an additional alternative with more robust sideboards and consider this new alternative in the Final Programmatic EA. Doing so will allow for the Forest Service to make a more meaningful comparison of alternatives “at the programmatic level to support focusing future decisions and eliminating certain alternatives from detailed study in subsequent NEPA reviews.” CEQ Programmatic Guidance at 22.

a. The No-Action Alternative Must Assume That Forest Service Activities Will Continue at the Current Rate

The Forest Service should also clarify the extent to which the No Action Alternative reflects the agency’s current ability to undertake projects within the Foothills Project region. “[In] situations where there is an existing program, plan, or policy, CEQ expects that the no-action alternative in an EIS would typically be the continuation of the present course of action until a new program, plan, or policy is developed and decided upon.” CEQ Programmatic Guidance at 22. Both in the statement of alternatives and in its comparison of environmental effects, it is unclear the extent to which the No Action Alternative reflects the Forest Service’s current number and frequency of actions within the Foothills Project area. For example, the discussion of alternatives states that the No Action Alternative reflects “ongoing management in which individual NEPA analysis is completed for actions tiered to the Forest Plan.” DPEA at 55. But it also states that the No Action Alternative “forecasts potential effects should the responsible official choose not to proceed with *any* management activities proposed for the Foothills Landscape” and that “*each resource would continue in its present state.*” *Id.* (emphasis added). At a minimum, the DPEA’s “Assumptions for Analysis” Appendix D should include an assumption regarding the type, frequency, and impacts of actions assumed as part of the No Action Alternative.

As currently drafted, the DPEA seemingly includes two different versions of “no action.” The current “no action” alternative assumes no action whatsoever, which, as noted above, is not what CEQ guidance requires. Alternative 2 may actually be closer to what CEQ defines as the “no action” alternative for a programmatic analysis. Alternative 2 doesn’t narrow the decision space from the forest plan; it instead provides a landscape assessment of all options but not a proposed *decision* to choose one direction for future management from among all the options. *See* CEQ Programmatic Guidance at 9 (differentiating NEPA decisions from non-NEPA assessments). In effect, Alternative 2 proposes to continue implementing all the options from the forest plan, just as the Forest Service currently can do and is doing. To properly contrast with this open-ended alternative, the Forest Service should further develop Alternative 3 (and perhaps other action alternatives) to explore the pros and cons of different directions for future management.

## VII. NEPA Requires That The Proposed Action’s Environmental Impacts Be Given A “Hard Look”

NEPA declares a broad national commitment to protecting and promoting environmental quality. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989). That commitment is “realized through a set of ‘action-forcing’ procedures that require that agencies take a ‘hard look’ at environmental consequences, and that provide for broad dissemination of relevant environmental information.” *Id.* at 350 (citations omitted). This “hard look” must include “some quantified or detailed information” supporting the conclusions of an EA. *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 993 (9th Cir. 2004). An “agency has satisfied the ‘hard look’ requirement if it has examine[d] the relevant data and articulate[d] a satisfactory explanation for its action including a rational connection between the facts found and the choice made.” *Black Warrior Riverkeeper, Inc. v. U.S. Army Corps of Engineers*, 833 F.3d 1274, 1285 (11th Cir. 2016) (citation omitted). The “hard look” requirement is violated when “the agency failed entirely to consider an important aspect of the problem.” *Sierra Club v. U.S. Army Corps of Engineers*, 295 F.3d 1209, 1216 (11th Cir. 2002).

### a. The Hard Look Standard and Programmatic Review

The Forest Service must decide whether it intends to conduct this “hard look” now or later. The DPEA, as currently written, does not contain sufficient site-specific analysis to satisfy NEPA’s hard look standard without additional site-specific review at the implementation phase. Although additional information has been provided compared to the prior Draft EA, much of this information is high level data regarding general conditions throughout the geographic range of the Foothills Project and does not allow for site-specific impacts of future actions to be evaluated. *Or. Nat. Res. Council Fund v. Goodman*, 505 F.3d 884, 892 (9th Cir. 2007)(Merely disclosing the existence of particular geographic or biological features is inadequate—agencies must discuss their importance and substantiate their findings as to the impacts.) The comments we previously submitted regarding the Draft EA illustrated in detail the type of site-specific analysis required to satisfy NEPA’s hard look standard. *See*, January 10, 2020 Letter from P. Hunter to B. Jewett re *Foothills Landscape Project Draft EA Comments* at 124-190.

In those prior comments, we noted that all forest stands are not created equal. They vary by too many factors to capture with a few “design elements,” including the different habitat values, different spatial relationships to other habitats, different proximity to communities, different elevations, different slopes and aspects, different hydrology, different soil types, different past management, and different use by people. In short, each patch of forest is unique. *Hoffman on behalf of NLRB v. Cement Masons Union Local 337*, 468 F.2d 1187, 1192 (9th Cir. 1972) (holding that “each parcel of real property is unique,” and that each parcel “serves a unique public interest because of its location and other intangible factors”).

Therefore, the Forest Service has three options with respect to its evaluation of the Foothills project's potential impacts: (i) it can add an enormous amount of new analysis to the programmatic document; (ii) it proceeds based on the expectation that the bulk of this analysis will be deferred until the project implementation stage; or (iii) it can adopt project sideboards at the programmatic stage to reduce the number of issues and analysis required at the implementation stage. Currently, the Forest Service appears to be pursuing the second option, deferring the bulk of analysis to the future, but we are concerned it may not realize how inefficient that will be in practice. As we stated before, we believe the third option is clearly the best one.

b. Analysis of Site-Specific Impacts is Required Under the Hard Look Standard

The unique characteristics of each site proposed for treatment, as well as the particular treatment itself, determines the issues that NEPA analysis must address before the agency may act. The broader the set of issues (including issues for which the impacts may be cumulative), the more complex the analysis. At this stage, where particular sites have not been identified *and* priorities have not been narrowed or sideboards adopted, there is a clear limit to the analysis that the Forest Service is able to do. This leaves most of the "hard look" to the future.

The DPEA proposes to use a series of "indicators" and "measures" to evaluate the potential impacts to different resources. DPEA at 58-105. These metrics seek to quantify the impact of proposed actions on specific environmental impacts. But they accomplish this goal to varying degrees and ultimately provide no site-specific information. The Forest Service can rely on this level of analysis in a programmatic document, but only if it intends to conduct additional site-specific analysis at implementation. But the Forest Service cannot rely on this information alone to satisfy NEPA's hard look requirement. Further, the Forest Service must anticipate that particular actions and sites may present environmental impacts that do not fall squarely within the framework of Indicators and Measures contained in the DPEA. The DPEA only provides a minimum framework for considering potential impacts and will necessitate site-specific analysis at the implementation phase.

c. Implementation Area Versus Stand-Level Review

At this point in Foothills Project development, the agency's plans for the scale of future site-specific analysis remain unclear but we note, out of an abundance of caution, that consideration of site-specific impacts at the implementation phase must be more granular and at a smaller scale than the Implementation Areas described in the DPEA. The DPEA identifies sixteen "Implementation Areas" ("IA") that were "were identified for logical and operational functionality in order to strategically plan the sequence of work across the landscape." DPEA at 5. The DPEA suggests that concentrating "implementation efforts at these smaller scales within

the greater context of the Foothills Landscape logistically allows for efficient planning and distribution of time and resources driven by need and operational feasibility.” *Id.* at 6.

NEPA’s hard look requirement necessitates more detailed, granular information than the IA-level data contained in the DPEA. Yet at several locations, the document suggests that the IA-level analysis is sufficient to satisfy NEPA’s site-specific analysis requirement. For example, the DPEA asserts that its maps have been modified to show “*site specific conditions per IA* for all resources or issues.” DPEA at Table 15 (emphasis in original). Appendix F is titled “Site Specific Conditions” and contains IA-level data, and DPEA elsewhere refers back to Appendix F for “[s]ite-specific conditions [that] are shown per resource.” *Id.* at 57.

If anything, the information in Appendix F demonstrates the need for further site-specific analysis. The maps in Appendix F demonstrate the great diversity and heterogeneity in conditions found across different IAs, and within the same IAs. Compliance with NFMA and NEPA turns on taking these differences into account. Moreover, Appendix F includes no commitments regarding what specific activities will take place in a specific area. Regeneration logging on highly erosive soils with low T-factors has different effects than prescribed burning on those same soils. Designation of implementation areas does not help resolve these differences; site-specific analysis considering specific activities in specific locations does.

That is why the site-specific evaluation required under NEPA requires more detailed review than IA-level information. It is perfectly appropriate for the Forest Service to use this IA-level data for planning purposes and to help identify areas potentially eligible for action based on existing and desired conditions. DPEA at 29. Further, IAs may be helpful to cap the cumulative activities within a geographic sub-region of the project and avoid concentrating actions in a way that would lead to significant impacts. But most of the Indicators and Measures identified in the DPEA cannot, and should not, be evaluated at the IA level and instead must be analyzed using more granular, stand-level data.

d. The Programmatic Document’s Failure to Meaningfully Compare Alternatives is a Missed Opportunity

The DPEA’s comparison of Alternatives 2 and 3 is an example of a missed opportunity to use the programmatic document to expedite future site-specific reviews. The DPEA’s two action alternatives are different in one key respect – whether they authorize commercial activities in areas deemed unsuitable for timber production under NMFA. DPEA at 55. CEQ regulations direct that the alternatives analysis should be presented in “comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public.” 40 C.F.R. § 1502.14. But instead of meaningfully comparing the environmental effects of the two action alternatives, the DPEA repeatedly describes the effects of the two alternatives as similar, with Alternative 3’s having effects on a “lesser scale” or to a “lesser degree.” DPEA at 61-62; 68; 70; 75; 77; and 88-89.

Setting aside whether this analysis is sufficient to satisfy the regulation (it is not), this cursory comparison is a critical missed opportunity for the Forest Service to get more mileage out of its programmatic review. The exclusion of commercial harvest from unsuitable areas is a perfect example of how sideboards can be used at the programmatic stage to avoid potential impacts or difficult issues at the implementation stage. But it is not enough for the agency to include this limit; it must explain how the sideboard serves to curtail the project's potential future environmental impacts. By doing this work at the programmatic phase, the Forest Service can leverage it later to expedite the environmental review at the implementation stage and incorporate the programmatic analysis by reference. Relating back to prior analysis is one of the key potential efficiencies afforded by the programmatic approach, but is only available if that comparative analysis is actually performed at the outset.<sup>42</sup>

This type of explanation would be relatively easy regarding the removal of unsuitable areas from consideration for commercial timber harvest in Alternative 3. Areas are set aside as unsuitable for specific reasons and the Forest Plan assumes that commercial logging will not be focused in these areas. By excluding them in project proposals, the agency avoids having to assess under NEPA the tradeoffs between logging in these areas and protecting their other values, as well as the need to explain how proposed activities meet the limited exceptions under NFMA for timber production in unsuitable areas.

Unfortunately, the DPEA's explanation that Alternative 3's effects will be "the same but less" provides little meaningful analysis to leverage in the future. The Forest Service should not only add an additional alternative with more robust sideboards, but it must also explain how those sideboards serve to curtail the potential for environmental effects of the action.

e. The DPEA's Discussion of Cumulative and Connected Actions Defers Much of Necessary Review to the Project Implementation Stage

If a programmatic proposal is not limited enough to allow for cumulative impact analysis, then such analysis can be deferred. *Salmon River Concerned Citizens v. Robertson*, 798 F. Supp. 1434, 1440 (E.D. Cal. 1992), *aff'd*, 32 F.3d 1346 (9th Cir. 1994); *Northern Alaska Environmental Center v. Lujan*, 961 F.2d 886 (9th Cir.1992) (holding that an EIS's deferral of consideration of certain potential cumulative and synergistic effects is proper tiering and does not foreclose later analysis of these factors in a future EA).

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<sup>42</sup> "For example, in the absence of certainty regarding the environmental consequences of future proposed actions, agencies may be able to make broad program decisions and establish parameters for subsequent analyses based on a programmatic review that adequately examines the reasonably foreseeable consequences of a proposed program, policy, plan, or suite of projects." CEQ Programmatic Guidance at 11.



The DPEA’s discussion of environmental impacts includes a section for cumulative impacts, but once again this analysis is insufficiently detailed to satisfy NEPA without substantial additional analysis. The DPEA’s cumulative effects analysis is organized based on the same Indicators and Measures outlined above, but includes a brief statement regarding the potential for the cumulative impact under these measures. DPEA at 57-105. Despite the Foothills Project’s lack of limits on the number, location, and types of activities involved, the DPEA largely concludes that projects authorized under the DPEA have little potential for cumulative effects. *Id.*

For example, the DPEA’s discussion of cumulative effects on aquatic resources illustrates how this approach falls short. First, the DPEA’s Indicators and Measures identify what will be measured but do not quantify or limit how much of that effect may occur. Further, NEPA requires conclusions to be supported by necessary analysis and there is no analysis to support the conclusion that aquatic effects would be “short term and small scale.” The DPEA states that disturbance “is not expected to exceed 10% of any watershed,” but this limit appears to be aspirational and nonbinding. Further, the conclusion that disturbances “would not appreciably increase the level of effects on aquatic resources” is also unsupported.

Again, the programmatic review is most useful when it links project sideboards with potential for environmental impacts. With the benefit of this analysis, the agency can refer back to this discussion and expedite its review at the implementation stage. But when the programmatic document contains little analysis of how sideboards impact the potential for environmental impacts – and particularly the potential for cumulative impacts – this analysis does little work to streamline the review at the implementation stage.

Although not a perfect example,<sup>43</sup> the 10% disturbance limit at least illustrates, at a conceptual level, how sideboards can be used to facilitate the consideration of cumulative effects. If the programmatic document adopted this limit as an binding parameter of the project and explained how the disturbance limit would prevent cumulative impacts on aquatic resources, then the sideboard and discussion would provide a basis for narrower review at the implementation stage.

<b>Cumulative Impacts</b>
<p>Any effects would be short term and small scale. Disturbance is not expected to exceed 10% of any watershed and would not appreciably increase the level of effects on aquatic resources. Alternative 2 would have the potential to provide the largest benefit for aquatic resources with improved aquatic connectivity and enhancement of the riparian corridors.</p>

**Cumulative Impacts of Alternative 2 on Aquatic Resources DPEA at 61**

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<sup>43</sup> A 10% limit on a disturbance across an entire watershed could still allow appreciable cumulative effects if all of the disturbances are concentrated in a specific location, in a limited timeframe, and depending on intensity. Once again, more explanation is necessary to ensure that this limit achieves the intended results.

## VIII. Technical Recommendations To Improve The Foothills Project

In the comments submitted on the prior Draft EA, we identified a variety of measures that the Forest Service should adopt to improve the Foothills Landscape Project. *See*, January 10, 2020 Letter from P. Hunter to B. Jewett re *Foothills Landscape Project Draft EA Comments* at 61-91. These include recommendations to: improve vegetation management actions; better disclose impacts to the recreation system; improve the use of prescribed fire; minimize impact to soils; and minimize impacts to aquatic resources. These comments remain largely applicable here, and are incorporated by reference.

Further, these recommendations illustrate the type of technical discussion that should be considered through the Collaborative Group to define the scope of the project, prioritize actions, identify appropriate locations, and mitigate the effects of actions. As previously discussed, these considerations are intertwined with the Forest Service's NEPA review and should be considered at both the programmatic phase and the implementation phase.

To stimulate further discussion and lay the foundation for future action by the Collaborative Group, we submit additional comments on the broader concepts underlying actions proposed for the Foothills Project. We also clarify our previous comments by highlighting where additional information is still needed to address previous comments.

### a. Aquatic Resources

The July 2021 revision to the Foothills Project Aquatic Resources Report has some minor wording shifts, and rearrangement of paragraphs and tables. However, none of our January 10, 2020 comments to the September 2019 Foothills Project Aquatic Resources Report have been resolved. In summary, our comments requested (including but not limited to):

- Modeling of mass erosion and sedimentation per year and per decade, including activities throughout the watershed, not just the riparian corridor;
- Inclusion of larger riparian corridors to accommodate activities in steeper slopes;
- Consideration of impacts a minimum of 3 miles downstream of the CNF;
- Addressing all stream biota, including benthic;
- Site specific evaluation of trout impacts;
- Inclusion of ephemeral stream impacts;
- Commitment for no mesic hardwood gap creation or new wildlife openings in the riparian corridor;
- Realistic BMP effectiveness, including long term failures;
- Disclose baseline conditions;
- Do not average stream ratings;
- Address two watershed that are not currently meeting designated uses;
- Evaluate stream impact from prescribed fire;

- Commit to specific changes in recreation and fish passage structures or do not include them as mitigation strategies;
- Correctly calculate impervious percentage of watershed;
- Use all twelve stream indicators instead of only one; and
- Evaluate stream impacts locally instead of only watershed wide.

b. Fire and Fuels

The DPEA does not contain sufficient information to assess the impacts of the proposed use of prescribed fire. The issue is that the impacts of prescribed fire come not only from the logistics of its implementation (e.g., fire lines and connected actions) but also from the fire regime itself. As fire managers know, fire behavior can change dramatically depending on conditions. Fire is not like a light-switch, “on” or “off”. The DPEA explains there will be an implementation plan for each burn unit, but does not describe the frequency, intensity, seasonality, location or size of burn units. Some of that information is scattered in descriptions of other treatments, but there is no complete description. DPEA at B19.

While the fire and fuels analysis uses several valid assumptions, it also relies on the hidden assumption that dry forests that do not burn become more flammable. A corollary of that assumption is: prescribed fires will reduce the intensity and extent of wildfires. A study in Mississippi pine-hardwood forests calls that assumption into question because researchers found that prescribed fire did not reduce the incidence, size, or intensity of wildfires.<sup>44</sup> Other researchers have found that prescribed fire can reduce wildfire hazard, but those results come from low productivity ecosystems where fuels accumulate slowly and fuel continuity is easily disrupted by prescribed fire.

The Mississippi researchers explain their findings by postulating that fire suppression had converted the landscape from more flammable forests types to less flammable. Indeed, Nowacki and Abrams, who have been leaders in pointing out the importance of fire in Appalachian forests, argue that a lack of fire can inhibit future fires by allowing less flammable species to dominate.<sup>45</sup> For instance, an increase in understory maples may reduce litter flammability and raise humidity levels in the understory.

In the DPEA, multiple proposed treatments aim to increase grass cover, which is easier to ignite than much of the existing groundcover. Thinning has also been used in the region to facilitate prescribed fires, and multiple thinning treatments in the DPEA would likely dry fuels, making them more likely to carry fire.

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<sup>44</sup> Brewer, Stephen, and Corey Rogers. "Relationships between prescribed burning and wildfire occurrence and intensity in pine-hardwood forests in north Mississippi, USA." *International Journal of Wildland Fire* 15, no. 2 (2006): 203-211.

<sup>45</sup> Nowacki, G.J. and Abrams, M.D., 2008. The demise of fire and “mesophication” of forests in the eastern United States. *BioScience*, 58(2), pp.123-138.

For these reasons, prescribed fire may not reduce wildfire risk in the Foothills, and other treatments may actively raise wildfire risk. This is not to say that prescribed fire cannot be used to reduce wildfire risk, only that it will not necessary do so. Additional analysis is needed to determine under what circumstances actions proposed in the DPEA would reduce wildfire risk.

c. Soils

The July 2021 revision to the Foothills Project Soil Resources Report was expanded by 92 (electronic version) pages (from 91 pages in the 9/19 version to 183 pages in the 7/21). The changes and additions seem to consist completely of organizational changes: minor wording shifts, quoting USFS guidance and NRCS soil classification, and rearrangement of paragraphs and tables. However, none of our comments to the September 2019 Foothills Project Soil Resources Report have been resolved. In summary, our comments requested (including but not limited to):

- Calculate site specific T-Factors for soil loss, and remove good, fair, and poor subjective and vague ratings;
- Site specific timelines showing cumulative effects;
- Define acreage to be impacted per watershed;
- Commit to not exceed assumptions used to estimate soil loss and compaction;
- Include erosion control measures for moderate risk soils;
- Exclude heavy equipment on unsuitable or severe rut hazard soils;
- Show timeline for nutrient availability from soil weathering;
- Define natural inputs for plant available phosphorus;
- Commit to distribute slash;
- Provide baseline soil conditions for each specific location based on current field review;
- Consider impacts from old temporary roads that will be reused; and
- Include compaction from mastication.

d. Recreation and Transportation

We are pleased to read in the DPEA plans to permanently close some of the many failing roads on the CONF and to restrict others to administrative use only. Additional funding through programs such as Legacy Roads and Trails may help to make these aspirations a reality, and we share your hope that such funds will be available soon. The Forest Service certainly has an obligation to take these steps, as they created many of these roads to begin with. It is sobering to read of the many roads currently being used illegally, but the report is consistent with our own observations.

It is imperative that the Foothills Project include sideboards on any *new* roads, including temporary roads, to ensure that they are returned to resource production quickly after use, and to ensure that they do not become additional vectors for illegal use.

e. Vegetation

An implicit assumption in the DPEA appears to be that the landscape consists of patches of even-aged forest of different age classes, which remain in a stable proportion over time even as the location of different ages shifts across the landscape. For instance, one treatment seeks to “establish areas of young oak forests to create a more balanced and resilient age-class distribution.” DPEA at B8. The idea of a “balanced” age class distribution assumes even-aged stands and a relatively stable age distribution across the landscape.

Those traits accurately describe some forested landscapes, but not the Foothills. This model better describes the forests of the Upper Midwest at the edge of the boreal forest<sup>46</sup>. The age structure of Foothills forests differ from those of Upper Midwest because the disturbance regimes differ. Disturbance in the para-boreal forests of the Upper Midwest is dominated by large fire and straight-line wind (derecho) events, which can individually flatten over 100,00 acres of forest.<sup>47</sup>

Forests of the Southern and Central Appalachians are typically uneven-aged with trees of many different ages occupying any given stand simultaneously.<sup>48</sup> This finding applies to oak forests<sup>49</sup>, southern yellow pine forests, and mesic deciduous forests<sup>50</sup>. Even trees with specific adaptations to high-intensity disturbance such as Table Mountain pine often form uneven-aged stands.<sup>51</sup> Uneven-age stands are the norm in the Southern and Central Appalachians because fine scale disturbances predominate over large, intense disturbances.<sup>52</sup> For southern yellow pine regeneration, these findings do not support the plan that “[a] follow up harvest to remove the

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<sup>46</sup> Heinselman, M.L., 1973. Fire in the virgin forests of the Boundary Waters Canoe Area, Minnesota. *Quaternary research*, 3(3), pp.329-382.

<sup>47</sup> Frelich, L.E., 2002. *Forest dynamics and disturbance regimes: studies from temperate evergreen-deciduous forests*. Cambridge University Press.

<sup>48</sup> Abrams, M.D., Orwig, D.A. and Demeo, T.E., 1995. Dendroecological analysis of successional dynamics for a presettlement-origin white-pine-mixed-oak forest in the southern Appalachians, USA. *Journal of Ecology*, pp.123-133.

<sup>49</sup> McEwan, R.W., Hutchinson, T.F., Ford, R.D. and McCarthy, B.C., 2007. An experimental evaluation of fire history reconstruction using dendrochronology in white oak (*Quercus alba*). *Canadian Journal of Forest Research*, 37(4), pp.806-816.

<sup>50</sup> Lorimer, C.G., 1980. Age structure and disturbance history of a southern Appalachian virgin forest. *Ecology*, 61(5), pp.1169-1184.

<sup>51</sup> Brose, P.H. and Waldrop, T.A., 2006. Fire and the origin of Table Mountain pine pitch pine communities in the southern Appalachian Mountains, USA. *Canadian Journal of Forest Research*, 36(3), pp.710-718.

<sup>52</sup> Runkle, J.R., 1982. Patterns of disturbance in some old-growth mesic forests of eastern North America. *Ecology*, 63(5), pp.1533-1546.

residual sheltering trees would occur once the site has been adequately regenerated to the target species and adequately stocked.” DPEA at B5.

Dominant trees in these uneven-aged forests reach much greater ages than currently common in the Foothills Landscape. Our research in old-growth forests of the Chattahoochee National forest produced a median age of 189 for chestnut oaks and 213.5 years for white oak, the two most common species. That longevity means that in 80 years, the threshold for “late successional” stands, is equivalent to a person being in their 30s. These ages are likely underestimates of the typical longevity of these species because core samples from still living trees missed the pith and were taken at roughly 4.5’ above ground, so the first several years did not appear in the core samples. These ages are also consistent with ages found by other species for trees common in the region.<sup>53,54</sup>

These general traits of Foothills forests have many implications for management and specific treatments. For instance, efforts to regenerate southern yellow pines often assume that they require fully open canopies and that at any one-time conditions are favorable for their regeneration throughout most of the stand. The dominance of fine-scale disturbances raises the possibility that they may require favorable seedbed conditions, but not ascend to the canopy until a fine-scale disturbance increases light levels above those typical of the stand. In fact, researchers studying an old-growth stand in the Georgia Ridge and Valley found that “[o]f the 32 pines, 31 experienced release events, with 166 release events occurring overall. Per tree, an average of 5.18 release events occurred.”<sup>55</sup> McEwan and others studying another Appalachian old-growth forest “posit that [fire and gap dynamics] may have a synergistic effect on long-term dynamics, wherein fire ‘filters’ the seedling pool and gap openings provide canopy accession opportunities.”<sup>56</sup>

In mesic deciduous forests, studies consistently find diverse and complex forests. Runkle found that canopy gaps cover 3.2% to 24.2% of old-growth stands.<sup>57</sup> While the research supports canopy gaps as a natural part of mesic forests, it also suggests that plans for “intermediate thinning between gaps, retaining 70-80 ft<sup>2</sup>/ac basal area in the thinned portion of

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<sup>53</sup> Johnson, K.E., Smith, L.G. and Brosi, S.L., 2017. How old is the old-growth? Dendrochronological Assessments to Protect Unique Appalachian Forest.

<sup>54</sup> Speer, J.H., Grissino-Mayer, H.D., Orvis, K.H. and Greenberg, C.H., 2009. Climate response of five oak species in the eastern deciduous forest of the southern Appalachian Mountains, USA. *Canadian Journal of Forest Research*, 39(3), pp.507-518.

<sup>55</sup> Petrucci, C.A., Sakulich, J., Harley, G.L. and Grissino-Mayer, H.D., 2014. Structure and dynamics of an old-growth pine-oak community in the southern Appalachian mountains, Georgia, USA. *southeastern geographer*, 54(2), pp.161-182.

<sup>56</sup> McEwan, R.W., Pederson, N., Cooper, A., Taylor, J., Watts, R. and Hruska, A., 2014. Fire and gap dynamics over 300 years in an old-growth temperate forest. *Applied Vegetation Science*, 17(2), pp.312-322.

<sup>57</sup> Runkle, J.R., 1982. Patterns of disturbance in some old-growth mesic forests of eastern North America. *Ecology*, 63(5), pp.1533-1546.

the stand” would exceed natural levels of canopy openness. DPEA at B15. The research suggests the canopy is closed between gaps, and retaining 70-80 ft<sup>2</sup>/ac basal area would remove a third to a half of the canopy, more opening than even the most open reference site. Potential connected actions for the treatment include “[h]erbicide use for release and/or mid-story reduction.” DPEA at 49. Understory saplings play a critical role in responding to canopy gaps in mesic deciduous forests.<sup>58</sup> The best available science does not appear to support either the thinning outside of gaps or herbicide use to remove understory or midstory vegetation.

## **IX. The Foothills Project’s Climate Change Impacts Must Be Properly Considered**

“It is essential that agencies capture the full costs of greenhouse gas emissions as accurately as possible.” Executive Order 13,990 (Jan. 20, 2021).<sup>59</sup> To meet the hard look requirement under NEPA, the Forest Service must revise its analysis to more accurately disclose the effect of the Foothills Project on climate change. Recently, CEQ instructed federal agencies to “consider all available tools and resources in assessing [greenhouse gas] emissions and climate change effects of their proposed actions, including, as appropriate and relevant, [CEQ’s 2016 Greenhouse Gas Guidance].” 86 Fed. Reg. 10252 (Feb. 19, 2021). That guidance cautions that “a statement that emissions from a proposed Federal action represent only a small fraction of global emissions is essentially a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether or to what extent to consider climate change impacts under NEPA.” 2016 CEQ Greenhouse Gas Guidance at 11. Instead, agencies should “quantify a proposed agency action’s projected direct and indirect [greenhouse gas] emissions, taking into account available data and [greenhouse gas] quantification tools that are suitable for the proposed agency action.” *Id.* at 4. The guidance specifically notes the advantages of considering climate change effects in programmatic NEPA documents like the DPEA. *Id.* at 31-32.

### **a. The Forest Service Must Reevaluate the Assumptions Underlying Its Climate Change Analysis**

While no assumptions are listed for climate change in Appendix D, the assessment of climate change impacts appears to rest on a few major assumptions. DPEA at D3. As discussed more below, the analysis is flawed because it focuses overwhelmingly on carbon sequestration rate but largely ignores carbon storage and the release of carbon through the Foothills Project activities. Regarding sequestration rates, the conclusion that the Foothills Project will positively influence carbon sequestration appears to rely heavily on the assumptions that climate change

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<sup>58</sup> Lorimer, C.G., 1980. Age structure and disturbance history of a southern Appalachian virgin forest. *Ecology*, 61(5), pp.1169-1184.

<sup>59</sup> <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-protecting-public-health-and-environment-and-restoring-science-to-tackle-climate-crisis/>

will drive broad scale tree mortality and wildfire in the Foothills, and that a combination of logging and prescribed fire is able to prevent that mortality. While climate change will produce novel conditions that stress ecosystems, species may replace each other gradually rather than in large die-off events. If replacement is gradual, the broad scale die-off assumption may not hold. While climate change is expected to generally increase the risk of wildfire, mesophication—succession to less flammable vegetation types—may also be occurring in the region.<sup>60</sup> Indeed, our region is predicted to become wetter overall due to climate change.<sup>61</sup> For that reason, the assumption about future wildfires may not hold. On the other side, climate change could produce such dramatic ecosystem stress that silvicultural and prescribed fire interventions will be overwhelmed, so the assumption of mitigation may not be valid.

The analysis also appears to assume that fuels that would accumulate in the absence of the Foothills Project, and would be converted to atmospheric CO<sub>2</sub> in the coming decades via wildfire. However, wildfires only consume a small percentage of available fuels. Tree boles do not burn well and, even under extreme wildfire conditions, a large amount of surface fuel remains after fires. Fuels remaining after wildfire need to be included in the analysis.

Finally, the analysis appears to assume that fire will have a dominant influence on greenhouse gas emissions in the Foothills Project area. While fire has the potential to both release CO<sub>2</sub> and strongly influence sequestration, it is not the only influence process. For example, vegetation growth and decay processes also have strong impacts and will also be influenced by the Foothills Project. Analyses is needed to determine the relative strengths of these different influences.

Beyond these assumptions, the relationship between fuels and carbon storage needs to be clarified or reanalyzed. Greenhouse gas emissions under Alternative 1 are described as “[f]uel-loading and lower carbon sequestration, with a higher carbon release over the long-term as fuel loading increases within forests.” DPEA at 70. Fuel is, by definition, made out of carbon compounds. The fire triangle that is basic to wildland fire training includes oxygen, heat, and fuel because heat triggers a chemical reaction between the fuel and the oxygen that produces CO<sub>2</sub> and H<sub>2</sub>O. Fire is literally a process of converting stored carbon into greenhouse gases.

Taking this basic understanding that fuel-loading is literally carbon sequestration and applying it to the Alternative 1 greenhouse gas emissions, we get “[carbon sequestration] and lower carbon sequestration, with a higher carbon release over the long-term as [carbon sequestration] increases within forests.” DPEA at 70. That conclusion does not make sense. Considering fuel accumulation now and carbon release in a wildfire later does not resolve the conundrum because, as discussed above, wildfires would release only part of the accumulated

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<sup>60</sup> Nowacki, G.J. and Abrams, M.D., 2008. The demise of fire and “mesophication” of forests in the eastern United States. *BioScience*, 58(2), pp.123-138.

<sup>61</sup> See 6<sup>th</sup> IPCC Report (2021) (available at [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_Chapter\\_12.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter_12.pdf)).



fuel. Alternatives 2 and 3 have similarly contradictory impact statements, only with the direction of changes reversed.

Similarly, the conclusion that “[t]he long-term effects would last as long as treatments are being maintained to reduce the fuel loading” does not make sense. DPEA at 71. The presumed effect in this case is carbon sequestration, which is in fact accomplished by fuel loading. Reducing fuel loading would reduce carbon storage. Using prescribed fire to consume fuels now will prevent a future wildfire from releasing those same fuels as CO<sub>2</sub> in the future, but only because the current prescribed fire would release those fuels as CO<sub>2</sub> now.

The influence of prescribed fire on carbon sequestration is an area of active research. Studies using different scales and assumptions in different ecosystems have produced a variety of results. However, a recent full ecosystem carbon modeling that accounts for the potential of prescribed fires to prevent wildfires found that whether prescribed fires increase or decrease net emissions depends on their frequency and how much they can reduce the risk of severe wildfires.<sup>62</sup>

b. The Forest Service Must Evaluate Carbon Storage, Not Just Carbon Sequestration

Critically, the DPEA falls short of the mark by ignoring the project’s largest single contribution to climate change effects: harvesting thousands of acres of trees. According to a 2015 Forest Service analysis, the CONF stores approximately 65 megatons of carbon.<sup>63</sup> The disturbance leading to the greatest reduction in carbon storage—by far—is timber harvest which, between 1990 and 2011, accounted for 83% of the disturbances affecting carbon storage on the forest.<sup>64</sup> The second highest disturbance was wind events, which accounted for 11% of disturbances affecting carbon storage, followed by fire and insects at 3% each.<sup>65</sup> Nationally, carbon losses from timber harvests are five times higher than those from all other disturbances *combined*, including wildfire.<sup>66</sup> Simply put, the greatest source of greenhouse gas emissions on the CONF and forests nationwide is timber harvest.

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<sup>62</sup> Volkova, L., Roxburgh, S.H. and Weston, C.J., 2021. Effects of prescribed fire frequency on wildfire emissions and carbon sequestration in a fire adapted ecosystem using a comprehensive carbon model. *Journal of Environmental Management*, 290, p.112673.

<sup>63</sup> <https://www.fs.fed.us/climatechange/documents/SouthernRegionCarbonAssessment.pdf>

<sup>64</sup> <https://www.fs.usda.gov/sites/default/files/Appendix-4-NFS-Disturbance-Carbon-Assessment-Southern-Region.pdf>

<sup>65</sup> *Id.*

<sup>66</sup> N.L. Harris et al., *Attribution of net carbon change by disturbance type across forest lands of the conterminous United States*, 11 *Carbon Balance Mgmt.* 24 (2016), <https://cbmjournals.biomedcentral.com/articles/10.1186/s13021-016-0066-5>.

Harvesting trees immediately releases significant amounts of accumulated carbon back into the atmosphere with only a fraction of live-tree carbon stored in wood products long-term.<sup>67</sup> One study estimates that harvesting, primary processing, and secondary processing may leave as little as 18% of live-tree volume to be converted into harvested wood products.<sup>68</sup> Another estimates that of the wood delivered to mills—which excludes significant amounts of wood discarded at the harvesting site—only 67.5% of softwoods are converted to harvested wood products, and 56.8% of hardwoods, “with the balance of carbon assumed to be immediately emitted to the atmosphere.”<sup>69</sup> These and other studies indicate that conservatively at least 50% of the carbon stored in a live tree is emitted to the atmosphere at the time of harvest.

The DPEA sidesteps this impact by focusing on carbon *sequestration* instead of *storage*. But these concepts are not interchangeable. Carbon sequestration refers to the rate at which carbon is removed from the atmosphere and sequestered in trees. For example, Forest Service data indicate that an oak/pine stand on the CONF increases its rate of carbon sequestration from harvest until approximately thirty years of age, peaking at a net annual primary productivity of 8.5 tons of carbon per hectare.<sup>70</sup> The rate of sequestration subsequently decreases slightly through approximately age 100 but then maintains a primary productivity of 5 tons per hectare.<sup>71</sup> We agree with the agency that these older trees likely sequester carbon at a lower overall rate. *See* Foothills 2021 Climate Change Specialist Report at 4.

But that is only a piece of the puzzle. Carbon *storage* is the amount of carbon stored in a living tree. Using the sequestration rates provided by the Forest Service, an 80-year old pine/oak stand is predicted to store over 450 tons of carbon.<sup>72</sup> Harvesting that stand will release at least 225 tons of carbon into the atmosphere almost immediately. A new stand will not re-sequester that lost carbon for nearly 40 years—and that does not take into account the carbon that would have continually been sequestered in the 80-year old stand had it not been harvested which would extend the amount of time to re-sequester the carbon emitted at harvest by decades. This is the point: while younger trees may sequester carbon at higher rates, harvesting

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<sup>67</sup> James E. Smith et al., *Methods for Calculating Forest Ecosystem and Harvested Carbon with Standard Estimates for Forest Types of the United States*, Gen. Tech. Rep. NE-343, Northern Research Station: U.S. Department of Agriculture, Forest Service, [https://www.nrs.fs.fed.us/pubs/gtr/ne\\_gtr343.pdf](https://www.nrs.fs.fed.us/pubs/gtr/ne_gtr343.pdf).

<sup>68</sup> Ingerson, Ann, “Wood Products and Carbon Storage: Can Increased Production Help Solve the Climate Crisis?,” The Wilderness Society (2009).

<sup>69</sup> Stockman et al., *Estimates of carbon stored in harvested wood products from the United States forest service northern region, 1906-2010*, Carbon Balance and Management 7:1 (2012).

<sup>70</sup> <https://www.fs.usda.gov/sites/default/files/Appendix-4-NFS-Disturbance-Carbon-Assessment-Southern-Region.pdf>

<sup>71</sup> *Id.*

<sup>72</sup> <https://www.fs.usda.gov/sites/default/files/Appendix-4-NFS-Disturbance-Carbon-Assessment-Southern-Region.pdf>

older trees emits carbon to the atmosphere that, in the best case scenario, will not be recoverable for decades to centuries.

Net emissions matter in the short term, while we still have a rapidly-closing opportunity to limit catastrophic climate change. The agency should not approach this issue with blinders on. The agency's suggestions that "effects occurring within 10 to 15 years following each treatment are considered short-term and are considered recoverable by natural processes" is therefore misplaced. Foothills 2021 Climate Change Specialist Report at 2. The carbon emission effects associated with timber harvests proposed under the Foothills Project are *irrecoverable* on any timescale relevant to avoiding the worst impacts of climate change. This is not disclosed anywhere in the DPEA.

The agency has tools available to help it "quantify [the Foothills Project's] direct and indirect [greenhouse gas] emissions." The agency has already estimated baseline carbon stocks on the CONF. Based on the ecotypes and stand ages targeted by specific activities in the Foothills Project, the agency can make basic predictions about the amount of carbon released via harvesting. With additional information about harvested timber end uses, the agency can make additional estimates regarding carbon emissions over the life of the harvested wood product. Some of this information and the tools necessary to complete this analysis are available on the agency's website where it has compiled "a toolbox of calculation tools to help quantify forest carbon for planning and reporting."<sup>73</sup>

Assessing carbon storage also requires accounting for belowground carbon because soils can be a major carbon pool in temperate forests. Timber harvests typically decrease soil carbon, and soil carbon characteristically takes several decades to return to pre-harvest levels.<sup>74</sup> In temperate forests, timber harvests reduce soil carbon by an average of 8%.<sup>75</sup> These effects may vary by the intensity of harvest.<sup>76</sup>

c. The Forest Service Should Evaluate the Social Cost of Carbon Emissions

One specific tool the agency should use is the social cost of carbon protocol. That tool is designed to "allow agencies to incorporate the social benefits of reducing emissions of . . . greenhouse gases, or the social costs of increasing such emissions, in decision making." Interagency Working Group on Social Cost of Greenhouse Gases, United States Government,

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<sup>73</sup> <https://www.fs.usda.gov/managing-land/sc/carbon>

<sup>74</sup> James, J. and Harrison, R., 2016. The effect of harvest on forest soil carbon: A meta-analysis. *Forests* 7: 308.

<sup>75</sup> Nave, L.E., Vance, E.D., Swanston, C.W. and Curtis, P.S., 2010. Harvest impacts on soil carbon storage in temperate forests. *Forest Ecology and Management*, 259(5), pp.857-866.

<sup>76</sup> Zhang, X., Guan, D., Li, W., Sun, D., Jin, C., Yuan, F., Wang, A. and Wu, J., 2018. The effects of forest thinning on soil carbon stocks and dynamics: A meta-analysis. *Forest Ecology and Management*, 429, pp.36-43.

*Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990*, 9 (Feb. 2021). The federal government recently announced new dollar estimates of the social cost of carbon per metric ton of CO<sub>2</sub> to “enable Federal agencies to immediately and more appropriately account for climate impacts in their decision-making.”<sup>77</sup> With the tool available, the Forest Service must use it or explain why its application is inappropriate here. *Vecinos para el Bienestar de la Comunidad Costera, et al., v. FERC*, No. 20-1045, 2021 WL 3354747, at \*4 (D.C. Cir. Aug. 3, 2021) (remanding agency decision for failure to apply social cost of carbon protocol or explain why its application was unnecessary).

We agree with the agency that the end product of harvested wood can affect a timber sale’s carbon impact and the social cost associated with emitting carbon into the atmosphere. In that regard, the Forest Service points to the possibility that “[w]ood products can be used in place of other, more emission intensive materials, like steel or concrete, and wood-based energy can displace fossil fuel energy.” Foothills 2021 Climate Change Specialist Report at 3. The agency uses the statement to downplay the overall climate effects of the Foothills Project but it falls flat for two reasons.

First, we are aware of no information suggesting that wood harvested as part of the Foothills Project will be used to replace steel, concrete, or fossil fuel energy. Without supporting information, the agency cannot suggest that the climate effects of its timber harvest will be mitigated based on potential, unconfirmed end uses of the wood product. Second, burning wood instead of fossil fuels to generate energy is not beneficial from a climate standpoint. Combustion of forest biomass emits more CO<sub>2</sub> per unit of energy generated than fossil fuels like coal or natural gas.<sup>78</sup> And as discussed above, new forests grown to replace those harvested for bioenergy will not re-sequester the carbon emitted at harvest for decades to centuries—a timescale inapplicable to addressing climate change’s most serious and immediate threats.

In summary, to properly consider the Foothills Project’s impacts on climate change and meet NEPA’s hard look standard, the agency must analyze and disclose the amount of carbon emitted through timber harvesting. These emissions should be placed into context by using the

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<sup>77</sup> <https://www.whitehouse.gov/cea/blog/2021/02/26/a-return-to-science-evidence-based-estimates-of-the-benefits-of-reducing-climate-pollution/>

<sup>78</sup> U.S. Env’tl. Protection Agency, Repeal of the Clean Power Plan; Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guidelines Implementing Regulations, 84 Fed. Reg. 32,520 (July 8, 2019), <https://www.govinfo.gov/content/pkg/FR-2019-07-08/pdf/2019-13507.pdf>. Specifically, burning wood-based biomass emits 65% and 285% more CO<sub>2</sub> per unit of energy generated than coal and natural gas, respectively. Rachel Carson Council, *Wood Pellet Production, the Destruction of Forests, and the Case for Environmental Justice* at 5 (2019), <https://rachelcarsoncouncil.org/clear-cut/>.

social cost of carbon protocol. Proper accounting of the project's carbon effects is not just a paper exercise; the severity of the climate crisis could lead the agency to develop a new action alternative with fewer climate change effects or forego the harvesting of older trees that are currently storing the highest amounts of carbon.

**X. Precluding Activities and Locations Likely To Trigger Significant Environmental Effects Is The Logical Extension Of The Draft Programmatic EA's Decision Framework**

In Appendix B, the DPEA describes a Decision Framework" that would guide implementation of the Foothills Project. This decision framework is structured around a series of proposed actions, followed by "Existing Condition (need)," "Desired Conditions;" "Known Conditions That Trigger Restoration Actions;" and "How to Implement Change." DPEA at B2 - B38. This Decision Framework is the perfect location for the Forest Service to implement sideboards, and is the obvious and logical extension of the decision process that the agency already proposes.

Just as the Decision Framework explains the conditions that would trigger certain actions, it should also use sideboards to limit or preclude the activity in certain areas. In other words, context can be used to define both *when an action would* be taken and *when it would not* be taken. Without expressly defining such limits, the DPEA must assume that the action can and would be used in all circumstances that otherwise meet the "Existing Conditions" and "Known Conditions that Trigger Restoration Actions" in the Decision Framework.

The use of sideboards also fits neatly into the decision trees for the project. DPEA at B59 - B62. These decision trees guide the Forest Service's treatment activities in the four identified conditions (Immature Pine, Mature Pine, Mesic, Non-Mesic) through a series of yes/no questions. But beyond identifying the suitable activity, the same decision tree of yes/no questions could be used to apply project sideboards and identify areas where the actions would be inappropriate.

**XI. Evaluating The Effectiveness Of The Project Design Features Will Reduce The Amount Of Mitigation Analysis Required At The Implementation Phase**

CEQ regulations require the alternatives analysis to consider "appropriate mitigation measures not already included in the proposed action or alternatives." 40 C.F.R. § 1502.14(f) and 40 C.F.R. § § 1508.20. The DPEA's discussion of mitigation appears to be through the requirements listed in the "Project Design Features, Best Management Practices, and Standards." DPEA at B50-B55. These Project Design Features "must be implemented, depending on the triggering activities of the treatment, for all proposed actions." *Id.* at 45. These requirements are derived from sources including "Georgia's Best Management Practices for Forestry Practices, USFS Southern Regional guidance or Foothills Landscape-specific design features and are in addition to Forest Plan standards and BMPs." *Id.*

Mitigation is an inherently site-specific inquiry, so courts have sanctioned the use of an “adaptive mitigation” approach in programmatic documents. *Wilderness Soc’y v. U.S. Bureau of Land Mgmt.*, 822 F. Supp. 2d 933, 941 (D. Ariz. 2011), *aff’d sub nom. Wilderness Soc. v. Bureau of Land Mgmt.*, 526 F. App’x 790 (9th Cir. 2013). This approach allows the agency to tailor the mitigation measures based on site-specific analysis, monitoring, and other factors. But, an adaptive mitigation approach that lacks “at least *some* evaluation of effectiveness is useless in making that determination.” *Id.* at 941 (emphasis in original). “Without analytical data to support . . . proposed mitigation measures,” they do not “amount to anything more than a ‘mere listing’ of good management practices” that is insufficient for NEPA purposes. *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1151 (9th Cir. 1998), *overruled on other grounds by Lands Council v. McNair*, 537 F.3d 981 (9th Cir. 2008).

Thus, the Forest Service is not required to identify with specificity the mitigation measures that will be used in each future project at this point. However, the review of mitigation in a programmatic document must discuss existing conditions, potential environmental impacts, and the effectiveness of potential mitigation measures in addressing these impacts. *Wilderness Soc’y v. U.S. Bureau of Land Mgmt.*, 822 F. Supp. 2d at 943-4 (Noting that programmatic FEIS discussed the “effectiveness” of mitigation measures applicable to travel, livestock grazing, environmental justice, and special status species.) And, as in any “mitigated FONSI,” the Forest Service must ensure that the mitigation measures needed to avoid significant impacts are binding commitments, not just possible options. This is where the DPEA’s discussion of Project Design Features falls short.

The Project Design Features are identified only by broad categories (e.g., “Soil and Water”, “Non-Native Invasive Species” and “Vegetation Management”) and include no discussion linking a specific Project Design Feature to the specific environmental impact that would be mitigated. And there is no information regarding the measure’s potential effectiveness. Without some information regarding a Project Design Feature’s effectiveness, it is impossible to understand the extent to which they could be effective in mitigating the environmental effects of a proposed action. This discussion of effectiveness can – and should – be addressed at the programmatic level.

Even if the list of Project Design Features was sufficient to pass muster at the programmatic stage, its lack of detail will be a problem at the project implementation stage. Without information regarding the effectiveness of a specific Project Design Feature in mitigating an environmental effect, this analysis will do little work in addressing the mitigation analysis required at a specific site. Conducting this additional level of review at the programmatic stage will allow the Forest Service to refer back to the analysis and expedite its review at the implementation stage.

Further, the DPEA relies on this same discussion to dismiss the potential cumulative effects to Biological Resources and Terrestrial Wildlife. DPEA at 68 and 88. It is not possible to validate this statement (or any other assumptions regarding the impact of design features and

mitigation measures) without analysis discussing the measure's effectiveness. Past monitoring data, to the extent it is available, could help the Forest Service overcome this hurdle. For this same reason, the Foothills Project should include a robust monitoring program to evaluate the success and effects of covered actions over time.

Once again, the use of sideboards can assist the agency here. Under CEQ regulations, mitigation includes “[a]voiding the impact altogether by not taking a certain action or parts of an action.” 40 C.F.R. § § 1508.20(a). Precluding certain actions at the programmatic phase allows the agency to incorporate mitigation into the project's design by excluding potential impacts from the outset. Avoiding environmental impacts altogether is not only environmentally preferable, but is also the most efficient approach for the agency because it avoids the need for site-specific application of mitigation to impacts at the implementation phase.

## **XII. Future Tiered Actions Must Demonstrate Compliance With The National Forest Management Act**

In our January 10, 2020 comments on the Draft EA, we raised several concerns related to compliance with the National Forest Management Act. *See* 2020 Letter from P. Hunter to B. Jewett re *Foothills Landscape Project Draft EA Comments* at 95-115. The DPEA does not resolve several of those concerns so we reincorporate those earlier comments here. However, we understand that the agency plans to tier future site-specific environmental reviews to the current programmatic EA, and many of our concerns could potentially be resolved through that future tiering process. As a result, we reiterate our concerns only briefly.

First, the CONF Forest Plan requires site-specific activities, such as timber sales, to be supported by site-specific analysis. The Forest Plan Record of Decision commits that “[f]inal decisions on proposed projects will be made on a site-specific basis using appropriate analysis and documentation.” Forest Service, *Record of Decision for the Final Environmental Impact Statement of the Land and Resource Management Plan Revision for the Chattahoochee-Oconee National Forests* (Jan. 2004) at 28. The Forest Plan also includes the requirement: “Any decisions on projects to implement the Plan are based on site-specific analysis.” Forest Service, *Land and Resource Management Plan: Chattahoochee-Oconee National Forests* (2004) at 2-2. The analysis prepared to date in the DPEA does not meet this site-specificity requirement. Instead, “treatments . . . will be determined based on the conditions on the ground and the desired conditions for the landscape” *later*. DPEA at 29. To be clear, we support a tiered approach. But we want to underscore that the agency cannot implement most of the proposed actions with no further analysis without running afoul of its Forest Plan and NFMA. Future site-specific analysis is additionally necessary to show that on-the-ground actions are consistent with the various requirements of the Forest Plan. *See* 2020 Letter from P. Hunter to B. Jewett re *Foothills Landscape Project Draft EA Comments* at 110-114.

Second, we support the sideboard adopted in Alternative 3, which removes management prescriptions designated as unsuitable for timber production from consideration for commercial

logging activities. Timber production activities are generally prohibited on unsuitable lands with some minor exceptions. 16 U.S.C. § 1604(i). Removing unsuitable management prescriptions from consideration for commercial timber harvest is a logical step to streamline future tiered analyses, avoid conflict over whether certain activities meet the limited exceptions to timber production in those areas under NFMA, and allow the agency to implement on-the-ground activities more efficiently. Further, we anticipate that avoiding commercial activities in unsuitable prescriptions will not meaningfully detract from the agency’s ability to pursue its objectives in the Foothills landscape as it still leaves over 104,000 “suitable” acres available for commercial timbering activities. DPEA at 55.

Third, the DPEA continues to fail to demonstrate “that timber will be harvested . . . only where . . . soil, slope, or other watershed conditions will not be irreversibly damaged.” 16 U.S.C. § 1604(g)(3)(E)(i). Again, this concern can be resolved through future, site-specific analysis.

We commend the Forest Service for providing additional information in the DPEA and for presenting the information more clearly. But the Implementation Area-level information is still insufficient to show compliance with NFMA’s substantive standards related to soils, slopes, and watershed conditions. That analysis can only be completed when the agency is considering specific actions in specific places; now, the agency’s proposal remains too high-level. For example, to demonstrate a lack of significance under NEPA, and consistency with NFMA’s substantive requirements, the agency relies on keeping soil loss below certain thresholds for specific soils. *See, e.g.*, Foothills 2021 Soil Report at 80-84. This threshold is referred to as the T-factor. *Id.* at 16-17 (providing T-factors for various soil types). These T-factors can vary significantly across implementation areas. For instance, approximately 1/3 of the Tiger Implementation Area cannot withstand soil loss of greater than 2 tons/acre/year, while 2/3 can withstand losses of up to 5 tons/acre/year. *Id.* at 17. This is a significant difference that must be considered as the agency plans site-specific actions in this Implementation Area. If regeneration logging may cause the loss of 2 or more tons of soil per acre annually, it cannot be allowed in 1/3 of this Implementation Area without potentially running afoul of NEPA and NFMA. Because there are no site-specific (i.e., activity-specific and location-specific) proposals before the agency right now, it cannot meaningfully gauge compliance with this requirement.

The best the agency offers is that literature reviews suggest erosion rates can be kept “below what NRCS has rated the T-Factor for more than 99% of the soils.” *Id.* at 40. This is insufficient. We do not have access to the cited studies but we doubt they stand for the proposition that site-specific considerations are not necessary because past actors have successfully limited soil loss. If anything, we suspect these past actors kept soil loss below various threshold *specifically by taking site-specific considerations into account*—something the agency is deferring in the DPEA.



More to the point, past analyses by the CONF demonstrate why this site-specific analysis is necessary. The agency completed site-specific T-factor analysis as part of its Union County Target Range Project. That analysis showed the project would cause a loss of 3.9 tons/acre/year which was just below the applicable threshold of 4 tons/acre/year. *See* Soil and Water Resources Report For the Proposed Union County Target Range Project at 8 (Aug. 2019). That level of soil loss would exceed the T-factor for nearly half of the acreage open to logging under Alternative 3 of the Foothills Project. *See* Foothills 2021 Soil Report at 17. The potential to exceed the T-factor is real and must be taken into account in site-specific analysis and design to ensure compliance with NEPA and NFMA.

While our comments focus on T-factor analysis as an example to explain why future, site-specific analysis is necessary to demonstrate compliance with NFMA's requirements, our concerns are not limited to T-factor considerations only. Similar points could be made regarding the need for site-specific planning and analysis on soils with "very severe" erosion hazard ratings. The point is the information currently before the agency is insufficient to demonstrate NFMA compliance. We support the agency's proposal to tier site-specific reviews to the current DPEA and look forward to engaging with the agency in that process.

### **XIII. Example Sideboards For The Foothills Project's Programmatic Review**

The recurring theme throughout these comments is the need to focus and limit the potential scope of the Foothills Project. The tension here is obvious. On one hand, the Forest Service seeks to avoid limiting its ability to undertake future actions that it may seek to pursue as part of this project. On the other hand, proceeding with the project's current unlimited menu of options risks losing the potential efficiencies of the programmatic approach and may limit the usefulness of the Foothills Collaborative Group.

But, as the Goal 17 Project illustrates, there is a better way forward. The Forest Service can find a middle ground by crafting a programmatic project that allows it to achieve most of its objectives, implement a more flexible and efficient NEPA review, and improve project support through the Collaborative Group. This result can be achieved through the use of carefully crafted project sideboards.

To that end, below is a list of potential sideboard topics that the Forest Service could use to focus and streamline the Foothills Project. These would allow the Forest Service to pursue many (or even most) of the actions currently contemplated as part of the Foothills Project. But, by better defining the project's outer bounds and addressing third rail issues, the Forest Service can avoid entangling the vast majority of uncontroversial projects with the few controversial ones. And, as stated previously, excluding a project now does not prevent the Forest Service from pursuing it later.

Therefore, we suggest that the Collaborative Group should be afforded the opportunity to develop sideboards regarding topics including the following:

- Habitat of threatened and endangered species;
- Areas containing Section 106 resources;
- Commercial timber harvest in Georgia Mountain Treasure Areas;
- Commercial timber harvest in existing old growth stands;
- Actions in Inventoried Roadless Areas;
- The duration of the project;
- Activities within a half mile from an existing road;
- Ecological integrity, including species composition and fine scale structure.
- Soil types and erosion hazard areas;
- Total acres of commercial timber harvest;
- Total acres of noncommercial timber harvest;
- Total number of miles of new roads; and
- Tree thinning activities in mesic areas.

*These are intended for illustrative purposes only*, and we believe that the Collaborative Group should discuss and formally recommend specific sideboards for the project. These collaborative recommendations, in turn, should be incorporated as part of a new alternative in the Final Programmatic EA.

#### **XIV. Conclusion**

We appreciate the Forest Service’s willingness to revisit its approach to the Foothills Landscape Project, the Foothills Collaborative Group, and the NEPA review of this project. If properly employed, the combination of the programmatic NEPA review and the Collaborative Group have the potential to help the Forest Service implement the project with greater flexibility, efficiency, and stakeholder support. But doing so will require focusing the scope of the project, adopting sideboards to avoid potentially divisive issues, and sharing decision space with the Collaborative Group throughout the decision-making process. We look forward to working with the Forest Service to develop these sideboards, develop a more focused alternative, and put the Foothills Project on a course for success.

We are happy to discuss any of these matters further and look forward to continued participation in the Foothills Collaborative stakeholder group.

Sincerely,

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CC:

Stephanie Israel (CONF)

# Exhibit 4



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*Via E-mail*

October 30, 2019

Ms. Stephanie Israel  
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stephanie.israel@usda.gov

**Re: Condition-based management and the Foothills Project**

Dear Ms. Israel:

We look forward to future Foothills public meetings and discussing the project with you, other staff, and other members of the public. We understand that staff specialists have spent considerable time over the past few months preparing sections of the environmental analysis and supplemental reports. We look forward to seeing the fruits of their hard work.

While that work was being done, there were three developments that closely relate to the Chattahoochee National Forest's proposed Foothills Project. Specifically, they relate to the proposal to use a "condition-based management" approach by delaying site-specific analysis of project impacts until after the NEPA process has concluded. We remain concerned about the use of this approach on the Chattahoochee and continue to urge the Forest Service to reconsider it.

First, as you know, the Forest Service has proposed revising its regulations implementing the National Environmental Policy Act. *See* National Environmental Policy Act Compliance Proposed Rule, 84 Fed. Reg. 27,544 (June 13, 2019). One change under consideration is codifying that the Forest Service can engage in "condition-based management." As we explained in our comments on the proposed rule, condition-based management cannot be used to authorize site-specific decisions. For the same reasons that the Forest Service cannot codify the condition-based approach, it cannot utilize it as part of the Foothills Project. Our concerns related to codifying the condition-based approach are on pages 186-194 of our comments on the proposed NEPA rule which are attached to this letter. *See* Attachment 1.

Second, the Forest Service has proposed using this condition-based approach in several projects across the country. One of the projects furthest along in development and implementation is the Prince of Wales Landscape Level Analysis Project in Alaska. That project is being litigated and, for many of the same reasons we have been bringing to the agency's

attention related to the Foothills Project, was recently preliminarily enjoined. *See* Attachment 2. Like the plan for the Foothills Project, the NEPA document for the Prince of Wales Project provided that “site-specific locations and methods will be determined during implementation based on defined conditions in the alternative selected.” The court found this approach problematic for multiple reasons including that “by only identifying broad areas within which harvest may occur, [the analysis] does not fully explain to the public how or where actual timber activities will affect localized habitats.” The condition-based approach created “at least serious questions going to the merits of [plaintiffs’] NEPA claim.” As a result, the court enjoined all project activity until it could decide the full case on the merits.

Third, the Cherokee National Forest recently signed a Decision Notice for its “Restoration of Dry Forest Communities on the South Zone” project which we have referred to in the past as the Goal 17 Project. *See* Attachment 3. There, addressing the same fundamental issues in a similar landscape, the Cherokee National Forest conducted landscape-scale analysis at the programmatic level and committed to conducting further site-specific analysis under NEPA before authorizing any site-specific activities. We continue to urge the agency to consider this approach as part of the Foothills Project. The approach fulfills the agency’s objective of increasing flexibility for future vegetation management options while also meeting the Forest Service’s mandate under NEPA.

As always, we remain available to discuss these concerns at the agency’s convenience.

Sincerely,



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*Via Electronic Mail*

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March 23, 2020

RE: Prince of Wales Project court decision and implications for the Foothills Project

Dear Ms. Israel:

On October 20, 2019, we wrote to make sure you were aware that the Forest Service's Prince of Wales Landscape Project on the Tongass National Forest – which uses the same condition-based management approach being used for the Chattahoochee-Oconee National Forest's ("CONF's") Foothills Landscape Project – had been preliminarily enjoined by the federal court for the District of Alaska. Recently the court issued its full opinion (attached), confirming that the condition-based approach violates requirements of the National Environmental Policy Act ("NEPA"). We bring this to your attention because the Foothills Project suffers from some of these same legal shortcomings.

The approaches used for the Foothills and Prince of Wales projects are fundamentally the same. Like Foothills, the Prince of Wales Project "does not specify when and where individual activities will occur within the Project Area. Rather, the Project is designed to be a flexible planning framework intended to allow the Forest Service to tailor resource management to changing conditions on the ground over the course of the Project's 15-year term." Opinion p. 5. The "'site-specific locations and methods' for activities such as timber harvest 'will be determined during implementation' over the 15-year lifespan of the Project . . . pursuant to an Implementation Plan." *Id.* at 9 (citation omitted). "[T]hese subsequent, site-specific decisions will not be subject to additional NEPA review." *Id.* The "Forest Service terms this approach 'condition-based analysis.'" *Id.*

As explained by the Alaska court, this approach is problematic because "it reserves actual siting decisions [of timber harvests and road building] for the future, as individual timber sales are offered," but after NEPA has concluded. *Id.* at 21. Without that information, the agency cannot fulfill its obligations under NEPA to take a hard look at environmental effects or consider

project alternatives. This is a fatal flaw in the condition-based approach as pursued in the Prince of Wales and Foothills projects: “NEPA requires that environmental analysis be specific enough to ensure informed decision-making and meaningful public participation[;] . . . [the] omission of the actual location of proposed timber harvest and road construction within the Project Area falls short of that mandate.” *Id.* at 22.

With the Prince of Wales Project, the Forest Service employed some of the same defenses of the condition-based approach it has used for the Foothills Project. For instance, the Forest Service argued the Prince of Wales Project satisfies NEPA because it uses a bounded or worst-case analysis—in other words, “because it analyzes the Project's maximum potential impacts.” *Id.* at 25.

The Alaska court rejected the agency’s attempt at a worst-case analysis. As it explained, the worst-case framework “overestimates the Project's impacts and is unlikely to reflect the actual extent and nature of activities under each of the proposed alternatives within the Project Area. By focusing on the Project's maximum potential impacts for all alternatives rather than its actual or foreseeable impacts for each alternative, the [analysis] falls short of NEPA's directive to contain[ ] a reasonably thorough discussion of the significant aspects of the *probable* environmental consequences for each alternative.” Opinion p. 30. The worst-case approach combined with the lack of site-specific analysis “detracts from a decisionmaker's or public participant's ability to conduct a meaningful comparison of the probable environmental impacts among the various alternatives.” *Id.* at 30.

Distinguishing *WildEarth Guardians v. Conner*, 920 F.3d 1245 (10th Cir. 2019), the Alaska court held that the condition-based approach violated the “detailed statement” requirement applicable to EIS-level analyses which the Foothills Project requires. The court also held, however, that the approach violated the agency’s obligation to consider alternatives—a requirement that applies to both EIS- and EA-level processes. 42 U.S.C. §§ 4332(C), (E). We therefore caution the Forest Service against taking the court’s statement that “an agency's analysis of a proposed action's maximum potential impacts *may* be appropriate for an EA” – an issue that was not before the court – beyond its logical and legal bounds. Opinion at 29 (emphasis added). Nor did the court in *Conner* approve the use of a worst-case analysis to obscure the different environmental consequences of feasible location alternatives. Indeed, the *Conner* court held precisely the opposite: no matter what locations were chosen, there would be no adverse effects to the lynx (the only issue raised by the plaintiff). *Conner*, 920 F.3d at 1261 (“lynx would not be adversely affected by the Project”). And even the *Conner* court recognized that had plaintiff focused on other non-lynx issues, the outcome may well have been different. *Id.* at 1263 (upholding the Forest Service’s no-significance conclusion while pointing out that plaintiff “has not challenged any of the reasoning of the [Forest] Service supporting its rejection of any of the non-lynx factors as significant”).

The Foothills Project differs from the narrow challenge in *Conner* in at least two important ways: First, the *Conner* court held, unexceptionally, that the absence of *any* effects to lynx meant that there were no *significant* effects to lynx. *Id.* at 1262. Second, the court held that because there were no effects to lynx under any conceivable alternative, then the choice of



alternatives was immaterial to the project's environmental impacts to lynx. *Id.* at 1259 (location of timber harvests "was not material to determining whether the Project would adversely affect the lynx."). In the Foothills Project, neither of these conditions is true. As in the Prince of Wales Project, the Foothills Project will have different impacts depending on which locations are chosen. The Foothills Project's purpose is so broad and vague that there are untold alternatives that could be considered to fulfill the project's objectives, each having different impacts on "available resources" such as wildlife generally (not only a single species like lynx), forest structure and composition, water quality, soil quality, impacts to the recreation system, the agency's fiscal ability to maintain its road system, etc. *See* 42 U.S.C. § 4332(E) (stating requirement to consider alternatives when there are "unresolved conflicts concerning alternative uses of available resources"). As a result, it is incumbent on the Forest Service to assess those differences by proposing a concrete action, comparing it to reasonable location alternatives (including those suggested by the public during the NEPA process), and to determine whether those alternatives' impacts would be significant based on site-specific information.

If the Forest Service moves forward with the Foothills Project as proposed, it will be vulnerable to legal challenge. The Alaska court's reasoning applies, nearly verbatim, to Foothills. First, the court explained why the condition-based approach did not allow consideration of alternatives as required by NEPA:

The Project EIS identified a total acreage of potential timber harvest, but not the distribution of the specific acreage authorized by each alternative within these areas. This omission is meaningful given the duration and scale of the project. Despite "additional parameters that limit the ultimate selection of units and activities," such as mitigation measures . . . the Project EIS's structure creates ambiguity about the actual location, concentration, and timing of timber harvest and road construction on Prince of Wales Island. By doing so, the Project EIS fails to provide a meaningful comparison of alternatives.

Opinion p. 31.

Second, the Alaska court also explained why the condition-based approach did not facilitate the "hard look" at environmental effects required by NEPA:

By authorizing an integrated resource management plan but deferring siting decisions to the future with no additional NEPA review, the Project EIS violates NEPA. The Forest Service has not yet taken the requisite hard look at the environmental impact of site-specific timber sales on Prince of Wales over the next 15 years. The Forest Service's plan for condition-based analysis may very well streamline management of the Tongass . . . however, it does not comply with the procedural requirements of NEPA, which are binding on the agency.

*Id.* at 32.

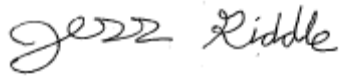
The court reached the straightforward conclusion that the agency cannot take a hard look at the impact of its actions if it does not know when, where, how, and at what

pace those actions will be implemented. The condition-based approach being used for the Foothills Project does not comply with NEPA for these same reasons.

We reiterate our request for the Forest Service to abandon its attempt to use the condition-based approach to comply with NEPA once and for all with the Foothills Project before any decisions are made about where activities will actually occur on the ground. The approach is unlawful and agency resources would be better spent preparing a project that meets legal mandates. As always, if we can discuss these concerns further please let us know.

Sincerely,


*[SIGNATURES ON FOLLOWING PAGE]*



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# Exhibit 5

**Methodology and Assumptions Used to Calculate Aboveground and Belowground Carbon  
Lost from ROW Clearing, Trench Excavation, and Cut Sites along the ACP  
Proposed ROW in the Monongahela National Forest**

USDA Forest Service

May 8, 2017

This document describes the methodology and calculations used to calculate aboveground and belowground carbon that will be lost from ROW clearing, trench excavation, and cut sites along the ACP proposed ROW in the Monongahela National Forest.

**Aboveground Carbon – Summary of Calculations**

Aboveground calculations apply to bole wood expected to be removed from the ROW, temporary roads, other access corridors, and similar areas that will experience removal of trees. Because tops and roots typically will be left on site, they are not included in the carbon loss calculations. We acknowledge that some carbon from those sources will be lost to the atmosphere during microbial decomposition processes, but estimates are not available in the literature to separate the percentages of carbon lost to the atmosphere from percentages returned to the soil from decomposition of tree tops and roots. Consequently, the aboveground losses probably underestimate the actual C losses from tree removal.

Data for estimating aboveground carbon losses were obtained from the Forest Inventory and Analysis (FIA) branch of the US Forest Service. These are summaries by state and land owner from Miles (2016), so only the data pertaining to National Forest land in WV were employed. The values in the FIA estimates include all aboveground carbon, including tops for stems > 1 inch diameter at breast height (DBH). Consequently, those values were adjusted using a value of 70% to determine the portion of carbon associated with only bole wood. The 70% adjustment value was obtained from Jenkins et al. (2003), Freedman et al. (1982), and Ker (1980), as the estimate of the bole wood volume from total above-ground volume for hardwood species.

The total area that applies to the National Forest ownership and carbon estimate also was obtained from Miles (2016).

The acreage of disturbed lands related to the proposed ACP pipeline on the Monongahela National Forest (MNF) was calculated to be 82 acres (see Methods for Calculating Area of Disturbance on MNF Lands, below).

**Aboveground Carbon – Calculations**

Total above-ground carbon for live trees >1 in DBH in National Forest ownership in WV = 45,456,512 short tons (or US tons)

Acres of National Forest ownership in WV to which the carbon total applies = 1,041,443 ac

Total area that would be disturbed by proposed pipeline = 82 acres

45,456,512 US tons x 1/1,041,443 ac = 43.65 tons above-ground C per ac on WV National Forest lands

43.65 total tons x 0.7 = 30.55 tons C in bole wood per acre on WV National Forest Lands

30.55 tons C/ac x 82 ac of disturbance on MNF = **2505.4 tons** of carbon in bole wood removed from areas proposed for disturbance on MNF by ACP

### **Aboveground Carbon – Methods for Calculating Area of Disturbance on MNF Lands**

Tools Utilized:

- ArcMap
- Revised ACP Route Shapefiles
  - “ACP\_Rev11b\_Construction Footprint”
  - “Rev11b\_Centerline\_Mileposts\_20170331”
- Most Recent MNF Surface Ownership layer
- Excel

Methods:

To calculate the acres disturbed within the MNF from the proposed ACP pipeline, a shapefile was created that encompassed the disturbance area and disturbance types clipped to the MNF surface ownership layer. This new shapefile included the area of disturbance within the MNF surface ownership. Another shapefile that included only the Permanent ROW disturbance, Temp ATWS, Temp CPY, and Temp ROW was created from the aforementioned shapefile. A field in the attribute table used to calculate disturbance dimensions in feet, and exported to an excel file to calculate areal disturbance in acres. See Table 1 below.

Table 1: Type and acres disturbed within the MNF from the ACP.

<b>Type of Disturbance</b>	<b>Acres Disturbed in MNF</b>
Permanent ROW	33
Temporary Additional Temporary Workspace	2
Temporary Contractor Project Yard	2
Temporary ROW	45
<b>Grand Total</b>	<b>82</b>

Note: Temporary and permanent access roads were not used in this analysis due to the fact that no new roads are to be constructed within the MNF. However, additional disturbance due to road improvements (e.g., widening) are factored into this total disturbance value for soil carbon calculations.

## **Belowground Carbon – Calculations**

All data and calculations used to estimate soil carbon lost due to trench excavation and other soil excavation areas for the proposed ACP pipeline within the Monongahela National Forest are presented in the Microsoft Excel spreadsheet entitled “FS\_ACPSoilCarbCalculation\_2017.” The contents of each specific Excel sheet are described below.

Sheet 1, “Sheet 1-Soil C Lab Data,” contains field and laboratory data collected during the Order 1 Soil Survey along with the soil carbon stock calculations. The description of each column is listed below.

- Column A provides a numbering of the rows for ease when discussing specific rows of data. These numbers are not used in the calculation.
- Column B provides the lab identification name given to each sample sent for lab testing.
- Column C provides the field identification name assigned to the pit and each horizon in the pit during the Order 1 Soil Survey.
- Column D provides the soil polygon identification which correlates to the designated soil map units generated from data collected during the Order 1 Soil Survey. Labeling comes from the ACP soil mapping key which was provided to the FS by ACP with the Order 1 Soil Survey information.
- Column E provides a numbering of the rows associated with Column F. These numbers are not used in the calculation.
- Column F provides the soil horizon designation within each soil pit from Column C.
- Column G provides the top depth of each soil horizon, in inches below the surface.
- Column H provides the bottom depth of each soil horizon, in inches below the surface.
- Column I provides Column G in meters.
- Column J provides Column H in meters.
- Column K provides the abbreviated coarse fragment modifier identified in the field during the Order 1 Soil Survey and taken from the NRCS 232 description sheets used during the Order 1 Soil Survey.
- Column L provides the abbreviated field texture class assigned to each horizon during the Order 1 Soil Survey and taken from the NRCS 232 description sheets used during the Order 1 Soil Survey.
- Column M provides the percent organic matter value taken from lab data as determined by the loss on ignition test.
- Column N provides the total organic carbon in mg/kg taken from lab data results from the Order 1 Soil Survey.
- Column O provides the percent total organic carbon taken from lab data results from the Order 1 Soil Survey.
- Column P provides organic carbon in g/100 g taken from lab data results from the Order 1 Soil Survey.
- Column Q provides organic carbon in g/Mg soil (calculated by multiplying the values in Column P by 10,000).
- Column R provides bulk density for each soil horizon. This value was not taken from Order 1 Soil Survey data because no data for bulk density existed or if it did exist, it was not provided to the FS. The bulk density value for each horizon was based on the field

texture assigned to each horizon during the Order 1 Soil Survey. For horizons from which no texture was provided, the texture for the horizon located below was used for the bulk density, and the bulk density was determined from the NRCS, General guide for Estimating Moist Bulk Density

([https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/office/ssr10/tr/?cid=nrcs144p2\\_074844](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/office/ssr10/tr/?cid=nrcs144p2_074844)).

For organic horizons, bulk density values from Nottingham et al., (2015) “*Seasonal Dynamics of Surface Soil Bulk Density in a Forested Catchment*” were used. For organic horizons that were not included in this publication, for example Oa horizons, values for the Oe horizon were used.

- Column S provides the length of each soil polygon (from Column D) which is crossed by the proposed ACP trenchline. This length was calculated in ArcGIS using the most current ACP centerline shapefile clipped to the MNF surface boundary layer shapefile. The “identify” tool in ArcGIS then was used to identify the length of the proposed ACP trenchline in each soil polygon.
- Column T provides the horizon thickness for each horizon within each pit. This was calculated by subtracting Column J from Column I.
- Column U provides the weighted average width of each horizon in the trench. The trench dimensions came from dimensions provided in the most recent version of the ACP Construction, Operation, and Maintenance Plan (Draft 2, January 2017). See schematic below (Figure 1).
  - The average width of each horizon that has its bottom depth within the trapezoidal area of the trench (i.e., shallower than 0.914 meter) was determined by:

$$\text{Width} = 2(\tan\Theta)(0.914 - ((\text{bottom depth} + \text{top depth})/2)) + 1.6764$$

$$\text{Since } \tan\Theta = (0.609/0.914)$$

$$\text{Width} = 2((1.45/0.914)(0.914 - ((\text{bottom depth} + \text{top depth})/2))) + 1.6764$$

- If the bottom and top depth of a horizon are both greater than (i.e., deeper) than 0.914 m, the width of the horizon is 1.6764 m, based on the schematic trench dimensions (Figure 1).
- If the bottom of the horizon is greater (deeper) than 0.914 and the top of the horizon is less (shallower) than 0.914 m, the average width is weighted by the amount of the horizon (i.e., depth) present in the trapezoidal and rectangular parts of the trench:

$$\text{Width} = ((2(\tan\Theta)(0.914 - ((\text{bottom depth} + \text{top depth})/2))) + 1.6764) \times (((0.914 - \text{top depth}) / \text{total horizon thickness}) + (1.6764((\text{bottom depth} - 0.914) / \text{total horizon thickness}))) / 2$$



Again, since  $\tan\Theta = (1.45/0.914)$

Width =  $((2((1.45/0.914) \times (0.914 - ((\text{bottom depth} + \text{top depth})/2))) + 1.6764) \times ((0.914 - \text{top depth})/\text{total horizon thickness}) + (1.6764((\text{bottom depth} - 0.914)/\text{total horizon thickness}))) / 2$

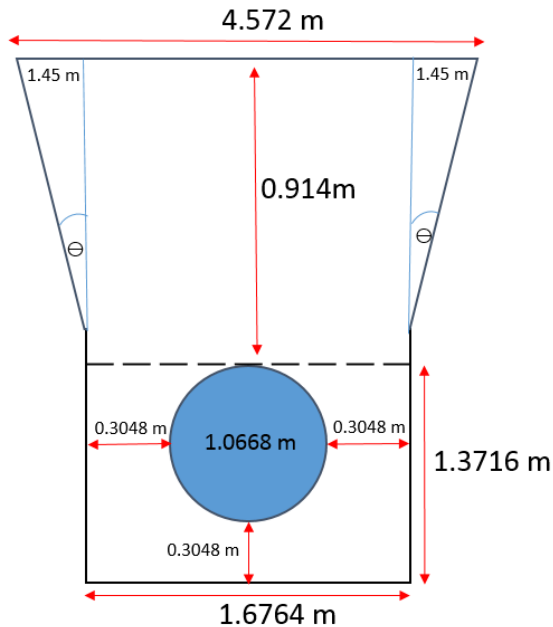


Figure 1. Assumed dimensions of the ACP Trench for carbon calculations. Dimensions were derived from ACP Construction, Operation, and Maintenance Plan (Draft 2, January 2017)

- Column V provides the coarse fragment percent identified in the field during the Order 1 Soil Survey.
- Column W provides the coarse fragments as a correction factor for each soil horizon (i.e., percent in column v divided by 100).
- Column X provides the amount of carbon in each horizon in grams. This value was calculated by:

$$C \text{ in each horizon} = \text{Column Q} \times \text{Column R} \times \text{Column S} \times \text{Column T} \times \text{Column U} \times \text{Column W}$$

- Column Y provides grams from Column X converted to Megagrams.

Note: If a soil polygon generated from the Order 1 Soil Survey did not cross the ACP proposed trench area, the soil pit information was not used in this calculation and was eliminated from the Excel sheet.

Sheet 2, "Sheet 2-Soil Pits No Lab Data," contains the remaining soil pits dug during the Order 1 Soil Survey that do not have associated lab data. A description of each column is listed below.

- Column A provides a numbering of the rows for ease when discussing specific rows of data. These numbers are not used in the calculation.
- Column B provides the field identification name assigned to the pit and each horizon in the pit during the Order 1 Soil Survey.
- Column C provides the soil polygon identification that correlates to the designated soil map units generated from data collected during the Order 1 Soil Survey. Labeling comes from the ACP soil mapping key which was provided to the FS by ACP with the Order 1 Soil Survey information.
- Column D provides the length of each soil polygon (from Column C) which is crossed by the proposed ACP trenchline. This length was calculated in ArcGIS using the most current ACP centerline shapefile clipped to the MNF surface boundary layer shapefile. The "identify" tool in ArcGIS then was used to identify the length of the proposed ACP trenchline in each soil polygon.
- Column E provides a numbering of the rows associated with Column F. These numbers are not used in the calculation.
- Column F provides the soil horizon designation within each soil pit from Column B.
- Column G provides the top depth of each soil horizon, in inches below the surface.
- Column H provides the bottom of each soil horizon, in inches below the surface.
- Column I provides Column G in meters.
- Column J provides Column H in meters.
- Column K provides the abbreviated coarse fragment modifier identified in the field during the Order 1 Soil Survey and taken from the NRCS 232 description sheets used during the Order 1 Soil Survey.
- Column L provides the abbreviated field texture class assigned to each horizon during the Order 1 Soil Survey and taken from the NRCS 232 description sheets used during the Order 1 Soil Survey.
- Column M provides the horizon thickness for each horizon within each pit. This was calculated by subtracting Column J from Column I.
- Column N provides bulk density for each soil horizon. The values used in this column were taken from the same horizons selected for the highest C value as described below in Column O.
- Column O provides organic carbon in g/Mg soil. The values in this column were taken from known carbon values from Sheet 1. Laboratory data associated with the highest C value were substituted for missing data; the data were always obtained from the same soil series.
- Column P provides the weighted average width of each horizon in the trench. See calculations from above Sheet 1, Column U.
- Column Q provides the coarse fragment percent identified in the field during the Order 1 Soil Survey.
- Column R provides the coarse fragments as a correction factor for each soil horizon (i.e., percent in Column Q divided by 100).
- Column S provides the amount of carbon in each horizon in grams. This value was calculated by:

C in each horizon = Column D x Column M x Column N x Column O x Column P x Column R

- Column T provides the soil series identified on the 232 descriptions sheets by the soil scientist during the Order 1 Soil Survey.

Note: If a soil polygon generated from the Order 1 Soil Survey did not cross the ACP proposed trench area, the soil pit information was not used in this calculation and was eliminated from the Excel sheet.

Sheet 3, “Sheet 3-TOTAL Trench Carbon,” provides the results of the total C from sheet 1, sheet 2, and then Total C summed from Sheets 1 and 2. Sheet 3 also calculates the estimated percent of C for cut/fill sites. To calculate for cut/fill sites the FS performed the following:

- The FS does not have specific information related to locations or volumes for cut or excavation sites on the MNF. Consequently, the FS used topographic maps to estimate where ACP would need to perform the most intensive excavations on ridge tops. This length was estimated to be approximately 1 mile long, which is approximately one-quarter of the ROW length on the MNF. Therefore, to account for these areas of soil disturbance an additional 25% of the total C calculated from trench construction (i.e., from Sheet 3) was added to the total from trench construction (again, the Sheet 3 total) to obtain the total mass of carbon associated with disturbed soils on the MNF within the ACP ROW.
- Not all of the 1,974 megagrams of carbon would be lost from soil pools due to disturbance. Approximately 8% of the available carbon is considered to be active, and therefore, potentially lost due to increased oxidation and microbial activity/respiration. Consequently, the total soil carbon pool estimated to be lost from the proposed ACP pipeline was calculated as 8% of the total C presented in Sheet 3 (i.e., 0.08 x total in Sheet 3).

Sheet 4, “Sheet 4-Above G. Plus Below G.,” provides the results of the total aboveground C lost added to the total belowground C lost.

Sheet 5, “Sheet 4-Polygon Lengths,” lists all the soil polygons created from the Order 1 Soil Survey and the length of the trenchline within each soil polygon, calculated using ArcGIS as described for Sheets 1 and 2.

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## Methodology and Assumptions Used to Calculate Carbon to be Added to ACP ROW in the Monongahela National Forest Through Application of Soil Amendments

USDA Forest Service

May 5, 2017

This document describes the methodology used to calculate the amount of carbon (C) that will be added to the ACP proposed ROW on Monongahela National Forest Lands during restoration. Carbon will be added through the use of organic soil amendments ProGanics™ Biotic Soil Media™ (ProGanics) and Flexterra® High Performance-Flexible Growth Medium™ (Flexterra).

### Methods

The mass of ProGanics and Flexterra that will be applied per acre was calculated as a multiple of the minimum recommended application rate of 3,500 pounds/acre (for each product). The final amount of carbon, and therefore each product, to be added was that which approximately equaled or exceeded the total carbon calculated to be lost from below ground (trench and other soil disturbances) and above ground sources (tree bole removal). Those calculations and total values are given in the “FSCarbCalcMethodology\_2017” attachment.

### Calculations

Calculations are presented below and also in the attached Excel spreadsheet, “FS\_ACPCarbCalculaton\_2017,” on Sheet 6, “Sheet 6-Addition of soil amend.” Calculations are based on the manufacturer’s minimum recommended rates of 3,500 pounds (dry weight) per acre per product (ProGanics and Flexterra).

<b>ProGanics</b>	<b>Flexterra</b>
49.69% C on a dry weight basis	40.00% C on a dry weight basis
$(3,500 \text{ pounds}/1 \text{ acre}) \times (1 \text{ kilogram}/2.2 \text{ pounds}) \times (0.001 \text{ Megagrams}/1 \text{ kilogram}) =$ <b>1.59 Megagrams/1 acre</b>	$(3,500 \text{ pounds}/1 \text{ acre}) \times (1 \text{ kilogram}/2.2 \text{ pounds}) \times (0.001 \text{ Megagrams}/1 \text{ kilogram}) =$ <b>1.59 Megagrams/1 acre</b>
$0.4969 \times 1.59$ <b>= 0.790 Megagrams of C/acre</b>	$0.40 \times 1.59$ <b>= 0.636 Megagrams of C/acre</b>
ProGanics and Flexterra C additions combined: $0.790 + 0.636 =$ <b>1.426 Megagrams of C/acre</b>	
Combined C additions x ACP Disturbance Area on MNF:	
$1.42 \text{ Megagrams of C/acre} \times 82 \text{ acres} =$ <b>116.44 Megagrams C or 116 Mg C</b>	

The minimum application rates of 3,500 pounds/acre equates to 116 Mg C for the entire 82 acres of disturbance on MNF lands. Total aboveground and belowground C losses (described in aforementioned spreadsheet) were estimated to be 2,430 Mg for the entire 82 acres of

disturbance. Consequently, difference between the estimated total carbon losses and carbon inputs, based on the minimum recommended applications for ProGanics and Flexterra is:

$$116 \text{ Mg} - 2,430 \text{ Mg} = -2,314 \text{ Mg}$$

Thus, the minimum recommended combined application rates will result in a net loss of more than 2000 megagrams. Taking the 116 Mg of added C from ProGanics and Flexterra and applying it to the belowground C only (157 Mg), the project would result in a net loss of 41 Mg of C. Due to this net loss of belowground C, it is recommended that ACP double the application rate to account for belowground soil carbon loss.

$$116 \text{ Mg} - 157 \text{ Mg} = -41 \text{ Mg}$$

Doubling the application rate of both ProGanics and Flexterra would result in 233.7 Mg of added C. Applying this to the belowground C only would result in a net gain of 76.7 Mg of C.

<b>ProGanics</b>	<b>Flexterra</b>
49.69% C on a dry weight basis	40.00% C on a dry weight basis
(7,000 pounds/1 acre) x (1 kilogram/2.2 pounds) x (0.001 Megagrams/1 kilogram) = <b>3.18 Megagrams/1 acre</b>	(7,000 pounds/1 acre) x (1 kilogram/2.2 pounds) x (0.001 Megagrams/1 kilogram) = <b>3.18 Megagrams/1 acre</b>
0.4969 x 3.18 <b>= 1.58 Megagrams of C/acre</b>	0.40 x 3.18 <b>= 1.27 Megagrams of C/acre</b>
ProGanics and Flexterra C additions combined: <b>1.58 + 1.27 = 2.85 Megagrams of C/acre</b>	
Combined C additions x ACP Disturbance Area on MNF:	
<b>2.85 Megagrams of C/acre x 82 acres = 233.7 Megagrams C or 233.7 Mg C</b>	

$$233.7 \text{ Mg} - 157 \text{ Mg} = 76.7 \text{ Mg of C}$$

However, doubling the application rate would still result in a net loss of 2,196.3 Mg C for aboveground C.

$$233.7 \text{ Mg} - 2,430 \text{ Mg} = -2,196.3 \text{ Mg}$$

Sort	Lab ID	Field Name	Soil Polygon	Profile Sort	Horizon Designation	Top (in)	Bottom (in)	Top (m)	Bottom (m)	Coarse Fragment Modifier	Field texture	OM (%)	TOC (mg/kg)	TOC (%)	Organic Carbon (g/100g)	Organic Carbon (g/Mg soil)	Bulk Density (Mg/m3)	Length (m)	Horizon			C in each horizon (g)	C in each horizon (Mg)																				
																			Thickness (m)	Width (m)	CF (%)																						
1	NA	P-003-160620-1025-rll-S1A	1F5A-05D	1	Oa	0	2	0	0.0508	0	NA	53.6	374000	37.4	37.4	374000	1.5	67.36	0.0508	4.491567	0	1	8622384	8.622384																			
2	S16-32385	P-003-160620-1025-rll-S2A	1F5A-05D	2	A	2	6	0.05	0.1524	0	CL	15.8	100000	10	10	100000	1.5	67.36	0.1016	4.250266	0	1	4363189	4.363189																			
3	S16-32386	P-003-160620-1025-rll-S3A	1F5A-05D	3	Bw	6	17	0.15	0.4318	ST	SiC	5	8780	0.878	0.878	8780	1.5	67.36	0.279401	3.647015	10	0.1	90396.72	0.903997																			
4	S16-32387	P-003-160620-1025-rll-S4A	1F5A-05D	4	Bt	17	32	0.43	0.8128	ST	CL	3.4	2270	0.227	0.227	2270	1.5	67.36	0.381001	2.601379	25	0.25	56831.45	0.568314																			
5	NA	P-010-160620-1315-mgw-S1A	1AB4A-04D	1	Oe	0	1	0	0.0254	0	NA	86.3	476000	47.6	47.6	476000	0.351	17.9832	0.0254	4.531783	0	1	345847.6	0.345848																			
6	S16-32751	P-010-160620-1315-mgw-S2A	1AB4A-04D	2	A	1	4	0.03	0.1016	GR	SL	41.4	185000	18.5	18.5	185000	1.6	17.9832	0.0762	4.370916	20	0.2	354582.3	0.354582																			
7	S16-32752	P-010-160620-1315-mgw-S3A	1AB4A-04D	3	AE	4	8	0.1	0.2032	GR	SCL	14.8	67200	6.72	6.72	67200	1.55	17.9832	0.1016	4.089399	15	0.15	116738.3	0.116738																			
8	S16-32753	P-010-160620-1315-mgw-S4A	1AB4A-04D	4	Bt1	8	13	0.2	0.3302	GR	CL	8.1	30500	3.05	3.05	30500	1.5	17.9832	0.127	3.727448	8	0.08	31157.62	0.031158																			
9	S16-32754	P-010-160620-1315-mgw-S5A	1AB4A-04D	5	Bt2	13	23	0.33	0.5842	GR	CL	5.1	7200	0.72	0.72	7200	1.5	17.9832	0.254001	3.124197	8	0.08	12329.73	0.01233																			
10	S16-32755	P-010-160620-1315-mgw-S6A	1AB4A-04D	6	Bt3	23	31	0.58	0.7874	GR	CL	4.3	3280	0.328	0.328	3280	1.5	17.9832	0.2032	2.400296	8	0.08	3452.323	0.003452																			
11	S16-32756	P-010-160620-1315-mgw-S7A	1AB4A-04D	7	Bt4	31	37	0.79	0.9398	GR	Cl	5.9	2360	0.236	0.236	2360	1.5	17.9832	0.1524	1.023829	10	0.1	993.3072	0.000993																			
12	S16-32758	P-010-160620-1315-mgw-S8A	1AB4A-04D	8	Bt3	37	44	0.94	1.1176	GR	C	5	2810	0.281	0.281	2810	1.45	17.9832	0.1778	1.6764	10	0.1	2183.995	0.002184																			
13	NA	P-012-160620-1115-mgw-S1A	4AB5D-13I	1	Oe	0	2	0	0.0508	0	NA	96.9	484000	48.4	48.4	484000	0.351	135.33	0.0508	4.491567	0	1	5245767	5.245767																			
14	S16-32389	P-012-160620-1115-mgw-S2A	4AB5D-13I	2	A	2	7	0.05	0.1778	GR	SL	18.1	147000	14.7	14.7	147000	1.6	135.33	0.127	4.210049	60	0.6	1021114.4	10.211144																			
15	S16-32390	P-012-160620-1115-mgw-S3A	4AB5D-13I	3	Bhs	7	10	0.18	0.254	GR	Sl	16.4	92400	9.24	9.24	92400	1.6	135.33	0.0762	3.888315	60	0.6	3556760	3.556760																			
16	S16-32391	P-012-160620-1115-mgw-S4A	4AB5D-13I	4	Bs	10	17	0.25	0.4318	GR	SL	8.7	49800	4.98	4.98	49800	1.6	135.33	0.1778	3.486148	50	0.5	3341888	3.341888																			
17	S16-32392	P-012-160620-1115-mgw-S5A	4AB5D-13I	5	BC	17	24	0.43	0.6096	GR	SCL	6.4	21600	2.16	2.16	21600	1.55	135.33	0.1778	2.923113	50	0.5	1177410	1.177410																			
18	NA	P-022-160614-1050-jsw-S1A	4E5D/A-15C/B	1	Oe	0	3	0	0.0762	0	NA	64.6	473000	47.3	47.3	473000	0.351	59.44	0.0762	4.45135	0	1	3347300	3.3473																			
19	S16-32394	P-022-160614-1050-jsw-S2A	4E5D/A-15C/B	2	Oa	3	5	0.08	0.127	0	SCL	33.3	238000	23.8	23.8	238000	1.55	59.44	0.0508	4.250266	0	1	4734435	4.734435																			
20	S16-32395	P-022-160614-1050-jsw-S3A	4E5D/A-15C/B	3	E	5	8	0.13	0.2032	GR	LS	1.3	5540	0.554	0.554	5540	1.65	59.44	0.0762	4.049182	15	0.15	25147.04	0.025147																			
21	S16-32396	P-022-160614-1050-jsw-S4A	4E5D/A-15C/B	4	Bs	8	14	0.2	0.3556	GR	SCL	4.1	13000	1.3	1.3	13000	1.55	59.44	0.1524	3.687232	5	0.05	33651.94	0.033652																			
22	S16-32397	P-022-160614-1050-jsw-S5A	4E5D/A-15C/B	5	Bt1	14	21	0.36	0.5334	CH	SiC	3.2	2230	0.223	0.223	2230	1.5	59.44	0.1778	3.164414	25	0.25	27966.67	0.027967																			
23	S16-32398	P-022-160614-1050-jsw-S6A	4E5D/A-15C/B	6	2Bt2	21	34	0.53	0.8636	NA	C	4.3	710	0.071	0.071	710	1.45	59.44	0.330201	2.360079	0	1	47688.06	0.047688																			
24	S16-32399	P-022-160614-1050-jsw-S7A	4E5D/A-15C/B	7	2BC	34	55	0.86	1.397	NA	C	6	1110	0.111	0.111	1110	1.45	59.44	0.533401	0.871275	0	1	44460.98	0.044661																			
25	NA	P-040-160615-1119-jcr-S1A	4E5C-05C	1	Oe	0	1	0	0.0254	GR	NA	38.8	411000	41.1	41.1	411000	0.351	91.44	0.0254	4.531783	10	0.1	151840.9	0.151841																			
26	S16-32401	P-040-160615-1119-jcr-S2A	4E5C-05C	2	A	1	3	0.03	0.0762	GR	L	10.1	75700	7.57	7.57	75700	1.55	91.44	0.0508	4.411133	10	0.1	240424.4	0.240424																			
27	S16-32402	P-040-160615-1119-jcr-S3A	4E5C-05C	3	Bw1	3	10	0.08	0.254	GR	SiCL	3.7	7880	0.788	0.788	7880	1.55	91.44	0.1778	4.049182	10	0.1	80407.04	0.080407																			
28	S16-32403	P-040-160615-1119-jcr-S4A	4E5C-05C	4	Bw2	10	17	0.25	0.4318	GR	CL	3.7	1790	0.179	0.179	1790	1.5	91.44	0.1778	3.486148	15	0.15	22827.07	0.022827																			
29	S16-32404	P-040-160615-1119-jcr-S5A	4E5C-05C	5	Bw3	17	25	0.43	0.635	GR	SiCL	2.5	1400	0.14	0.14	1400	1.55	91.44	0.2032	2.882897	35	0.35	40683.44	0.040683																			
30	NA	P-045-160614-1019-jcr-S1A	4D6C-05I	1	Oe	0	1	0	0.0254	CH	NA	49.4	273000	27.3	27.3	273000	0.351	257.25	0.0254	4.531783	15	0.15	425618.1	0.425618																			
31	S16-32760	P-045-160614-1019-jcr-S2A	4D6C-05I	2	A	1	2.5	0.03	0.0635	CH	L	9.6	53700	5.37	5.37	53700	1.55	257.25	0.0381	4.431241	15	0.15	542255.4	0.542255																			
32	S16-32761	P-045-160614-1019-jcr-S3A	4D6C-05I	3	BA	2.5	6	0.06	0.1524	VCH	SiL	3.2	4230	0.423	0.423	4230	1.55	257.25	0.0889	4.230158	45	0.45	285429.7	0.28543																			
33	S16-32762	P-045-160614-1019-jcr-S4A	4D6C-05I	4	Bw	6	10	0.15	0.254	VCH	CL	3.8	3480	0.348	0.348	3480	1.5	257.25	0.1016	3.928532	45	0.45	241192.2	0.241192																			
34	S16-32405	P-063-160614-0950-rll-S1A	9B3A-05D	1	Ap	0	6	0	0.1524	0	L	11.1	49800	4.98	4.98	49800	1.55	44.8	0.1524	4.3307	0	1	2282354	2.282354																			
35	S16-32406	P-063-160614-0950-rll-S2A	9B3A-05D	2	Bt	6	16	0.15	0.4064	0	C	3.5	2470	0.247	0.247	2470	1.45	44.8	0.254001	3.687232	0	1	150272	0.150272																			
36	S16-32407	P-063-160614-0950-rll-S3A	9B3A-05D	3	Btg	16	50	0.41	1.27	0	SiC	2.7	1100	0.11	0.11	1100	1.5	44.8	0.863602	1.226205	0	1	78277.79	0.078278																			
37	NA	P-068-160614-1338-sdd-S1A	4AB5C-13I	1	Oe	0	2	0	0.0508	CH	NA	60.3	270000	27	27	270000	0.351	39.6	0.0508	4.491567	25	0.25	214076.3	0.214076																			
38	S16-32409	P-068-160614-1338-sdd-S2A	4AB5C-13I	2	A	2	4	0.05	0.1016	CH	SL	8.8	62900	6.29	6.29	62900	1.6	39.6	0.0508	4.3307	25	0.25	219193.9	0.219194																			
39	S16-32411	P-068-160614-1338-sdd-S3A	4AB5C-13I	3	Bw	4	18	0.1	0.4572	CH	SCL	1.9	2280	0.228	0.228	2280	1.55	39.6	0.355601	3.687232	40	0.4	73398.09	0.073398																			
46	NA	P-077-160617-1035-sdd-S1A	4D5C-14I	1	Oe	0	2	0	0.0508	CH	NA	87.2	194000	19.4	19.4	194000	0.351	334.366	0.0508	4.491567	60	0.6	3117056	3.117056																			
47	S16-32764	P-077-160617-1035-sdd-S2A	4D5C-14I	2	A	2	8	0.05	0.2032	CH	L	8.7	68700	6.87	6.87	68700	1.55	334.366	0.1524	4.169833	60	0.6	1357582.5	13.57583																			
48	S16-32765	P-077-160617-1035-sdd-S3A	4D5C-14I	3	Bt1	8	21	0.2	0.5334	CH	CL	3.6	6160	0.616	0.616	6160	1.5	334.366	0.330201	3.405714	30	0.3	1042321	1.042321																			
49	S16-32766	P-077-160617-1035-sdd-S4A	4D5C-14I	4	Bt2	21	28	0.53	0.7112	CH	L	3.7	5130	0.513	0.513	5130	1.55	334.366	0.1778	2.601379	20	0.2	245944.7	0.245945																			
50	S16-32767	P-077-160617-1035-sdd-S5A	4D5C-14I	5	Bt3	28	50	0.71	1.27	CH	CL	3.7	1300	0.13	0.13	1300	1.5	334.366	0.558801	1.026754	15	0.15	56114.06	0.056114																			
																						<b>Total:</b>																				<b>68879216</b>	<b>68.87922</b>

Sort	Field Name	Soil Polygon	Polygon Crossing		Horizon Designation	Top (in)	Bottom (in)	Top (m)	Bottom (m)	Coarse Fragment Modifier	Field texture	Horizon Thickness (m)	Bulk Density (Mg/m3)	Organic C (g/Mg soil)	Width (m)	CF (%)	CF	C (g)	Series or Pit similar to with data
			Length (m)	Profile Sort															
1	P-001-160620-1005-rl1	1E4A-15D	89.0016	1	Oa	0	3	0	0.0762	NA	NA	0.0762	0.351	484000	4.451		1	5128578.493	Cateache (3-12)
2	P-001-160620-1005-rl1	1E4A-15D	89.0016	2	Bw	3	10	0.076	0.254	ST	SiL	0.1778	1.6	185000	4.049	5	0.05	948328.3345	Cateache (3-12)
3	P-001-160620-1005-rl1	1E4A-15D	89.0016	3	Bt	10	24	0.254	0.6096	CN	SiL	0.3556	1.6	185000	3.205	25	0.25	7505327.226	Cateache (3-12)
4	P-002-160620-1020-rl1	1CD5A-14D	69.7992	1	Oa	0	3	0	0.0762	NA	NA	0.0762	0.351	484000	4.451		1	4022070.12	Cateache (3-12)
5	P-002-160620-1020-rl1	1CD5A-14D	69.7992	2	Bt1	3	15	0.076	0.381	ST	SiCL	0.3048	1.6	185000	3.848	5	0.05	1211639.638	Cateache (3-12)
6	P-002-160620-1020-rl1	1CD5A-14D	69.7992	3	Bt2	15	24	0.381	0.6096	ST	SiL	0.2286	1.6	185000	3.004	5	0.05	709289.0455	Cateache (3-12)
7	P-005-160620-1425-rl1	1E5A-05D	108.204	1	Oa	0	3	0	0.0762	NA	NA	0.0762	0.351	484000	4.451		1	6235086.867	Cateache (3-12)
8	P-005-160620-1425-rl1	1E5A-05D	108.204	2	Bw	3	22	0.076	0.5588	ST	SiL	0.4826	1.6	185000	3.567	20	0.2	11025663.04	Cateache (3-12)
9	P-005-160620-1425-rl1	1E5A-05D	108.204	3	Bt	22	50	0.559	1.27	ST	SiL	0.7112	1.6	185000	1.122	40	0.4	10223012.53	Cateache (3-12)
10	P-006-160620-1509-dat	4E4A-05D	90.2208	1	Oe	0	1	0	0.0254	FL	NA	0.0254	0.351	484000	4.532	85	0.85	1499618.992	Cateache (3-12)
11	P-006-160620-1509-dat	4E4A-05D	90.2208	2	Oa	1	2	0.025	0.0508	FL	NA	0.0254	0.351	484000	4.451	70	0.7	1213061.032	Cateache (3-12)
12	P-006-160620-1509-dat	4E4A-05D	90.2208	3	AB	2	8	0.051	0.2032	CH	SiL	0.1524	1.6	185000	4.17	25	0.25	4242697.393	Cateache (3-12)
13	P-006-160620-1509-dat	4E4A-05D	90.2208	4	2Bt1	8	16	0.203	0.4064	GR	SiL	0.2032	1.6	185000	3.607	15	0.15	2935860.45	Cateache (3-12)
14	P-006-160620-1509-dat	4E4A-05D	90.2208	5	2Bt2	16	25	0.406	0.635	GR	SiCL	0.2286	1.6	185000	2.923	5	0.05	892258.6447	Cateache (3-12)
15	P-006-160620-1509-dat	4E4A-05D	90.2208	6	2Bt3	25	34	0.635	0.8636	GR	SiCL	0.2286	1.6	185000	2.199	5	0.05	671293.7957	Cateache (3-12)
16	P-007-160620-1245-dat	4C3AB-23F	90.8304	1	A	0	3	0	0.0762	CH	SiL	0.0762	1.6	185000	4.451	60	0.6	5471682.673	Cateache (3-12)
17	P-007-160620-1245-dat	4C3AB-23F	90.8304	2	Bt1	3	9	0.076	0.2286	CH	SiCL	0.1524	1.6	185000	4.089	20	0.2	3351177.976	Cateache (3-12)
18	P-007-160620-1245-dat	4C3AB-23F	90.8304	3	Bt2	9	17	0.229	0.4318	CH	SiCL	0.2032	1.6	185000	3.526	5	0.05	963261.3022	Cateache (3-12)
19	P-007-160620-1245-dat	4C3AB-23F	90.8304	4	2Bt3	17	28	0.432	0.7112	GR	SiC	0.2794	1.6	185000	2.762	5	0.05	1037486.194	Cateache (3-12)
20	P-007-160620-1245-dat	4C3AB-23F	90.8304	5	2Btx	28	44	0.711	1.1176	GR	SiC	0.4064	1.6	185000	0.943	10	0.1	1030332.817	Cateache (3-12)
21	P-007-160620-1245-dat	4C3AB-23F	90.8304	6	3Bct	44	50	1.118	1.27	CH	SiCL	0.1524	1.6	185000	1.676	85	0.85	5838542.995	Cateache (3-12)
22	P-008-160620-1057-dat	4B5C-13I	180.7464	1	A	0	3	0	0.0762	GR	SiL	0.0762	1.6	185000	4.451	40	0.4	7258854.195	Cateache (3-12)
23	P-008-160620-1057-dat	4B5C-13I	180.7464	2	Bw1	3	12	0.076	0.3048	GR	SiL	0.2286	1.6	185000	3.969	50	0.5	24269528.56	Cateache (3-12)
24	P-008-160620-1057-dat	4B5C-13I	180.7464	3	Bw2	12	20	0.305	0.508	CH	L	0.2032	1.6	185000	3.285	65	0.65	23213606.31	Cateache (3-12)
25	P-009-160620-1415-mgw	1AB5C-13I	106.9848	1	Oe	0	1	0	0.0254	NA	NA	0.0254	0.351	484000	4.532		1	2092075.78	Cateache (3-12)
26	P-009-160620-1415-mgw	1AB5C-13I	106.9848	2	A	1	6	0.025	0.1524	GR	SiL	0.127	1.6	185000	4.29	30	0.3	5176604.495	Cateache (3-12)
27	P-009-160620-1415-mgw	1AB5C-13I	106.9848	3	AB	6	13	0.152	0.3302	GR	SiL	0.1778	1.6	185000	3.808	35	0.35	7504076.021	Cateache (3-12)
28	P-009-160620-1415-mgw	1AB5C-13I	106.9848	4	Bw1	13	25	0.33	0.635	GR	SiL	0.3048	1.6	185000	3.044	40	0.4	11751683.89	Cateache (3-12)
29	P-009-160620-1415-mgw	1AB5C-13I	106.9848	5	Bw2	25	32	0.635	0.8128	GR	SiL	0.1778	1.6	185000	2.28	45	0.45	5775987.364	Cateache (3-12)
30	P-011-160620-1140-mgw	1A5C-13I	647.0904	1	Oe	0	1	0	0.0254	NA	NA	0.0254	0.351	484000	4.532		1	12653780.29	Cateache (3-12)
31	P-011-160620-1140-mgw	1A5C-13I	647.0904	2	A	1	3	0.025	0.0762	GR	SiL	0.0508	1.6	185000	4.411	30	0.3	12876321.75	Cateache (3-12)
32	P-011-160620-1140-mgw	1A5C-13I	647.0904	3	Bw1	3	10	0.076	0.254	GR	SiL	0.1778	1.6	185000	4.049	30	0.3	41369199.74	Cateache (3-12)
33	P-011-160620-1140-mgw	1A5C-13I	647.0904	4	Bw2	10	24	0.254	0.6096	GR	SiL	0.3556	1.6	185000	3.205	55	0.55	120049251.2	Cateache (3-12)
34	P-023-160614-1150-jsw	4E5A-15D	79.248	1	Oe	0	1	0	0.0254	NA	NA	0.0254	0.351	473000	4.532		1	1514465.632	Calvin-Dekalb-Berks (22)
35	P-023-160614-1150-jsw	4E5A-15D	79.248	2	BE	1	5	0.025	0.127	GR	L	0.1016	1.55	238000	4.331	15	0.15	1929478.896	Calvin-Dekalb-Berks (22)
36	P-023-160614-1150-jsw	4E5A-15D	79.248	3	Bt1	5	13	0.127	0.3302	CH	SiCL	0.2032	1.55	238000	3.848	20	0.2	4571903.074	Calvin-Dekalb-Berks (22)
37	P-023-160614-1150-jsw	4E5A-15D	79.248	4	Bt2	13	29	0.33	0.7366	CH	SiCL	0.4064	1.55	238000	2.883	25	0.25	8562887.77	Calvin-Dekalb-Berks (22)
38	P-024-160614-1440-jsw	1AB5A-05F	74.676	1	Oe	0	2	0	0.0508	NA	NA	0.0508	0.351	473000	4.492		1	2828856.169	Calvin-Dekalb-Berks (22)
39	P-024-160614-1440-jsw	1AB5A-05F	74.676	2	A	2	3	0.051	0.0762	CH	SiL	0.0254	1.55	238000	4.371	5	0.05	152920.5847	Calvin-Dekalb-Berks (22)
40	P-024-160614-1440-jsw	1AB5A-05F	74.676	3	Bt1	3	11	0.076	0.2794	GR	SiCL	0.2032	1.55	238000	4.009	1	0.01	224411.8837	Calvin-Dekalb-Berks (22)
41	P-024-160614-1440-jsw	1AB5A-05F	74.676	4	Bt2	11	18	0.279	0.4572	GR	SiC	0.1778	1.55	238000	3.406	5	0.05	834065.155	Calvin-Dekalb-Berks (22)
42	P-024-160614-1440-jsw	1AB5A-05F	74.676	5	BC	18	36	0.457	0.9144	CH	SiC	0.4572	1.55	238000	2.4	2	0.02	604632.4405	Calvin-Dekalb-Berks (22)



Sort	Field Name	Soil Polygon	Polygon Crossing		Horizon Designation	Top (in)	Bottom (in)	Top (m)	Bottom (m)	Coarse Fragment Modifier	Field texture	Horizon Thickness (m)	Bulk Density (Mg/m3)	Organic C (g/Mg soil)	Width (m)	CF (%)	CF	C (g)	Series or Pit similar to with data
			Length (m)	Profile Sort															
43	P-027-160617-0942-jcr	4ABC5C-13C	40.5384	1	Oe	0	0.5	0	0.0127	GR	NA	0.0127	0.351	473000	4.552	5	0.05	19453.62337	Dekalb- Hazelton
44	P-027-160617-0942-jcr	4ABC5C-13C	40.5384	2	A	0.5	3	0.013	0.0762	GR	SiL	0.0635	1.55	238000	4.431	10	0.1	420798.7296	Dekalb- Hazelton
45	P-027-160617-0942-jcr	4ABC5C-13C	40.5384	3	E	3	7	0.076	0.1778	GR	SiL	0.1016	1.55	238000	4.17	10	0.1	633559.8737	Dekalb- Hazelton
46	P-027-160617-0942-jcr	4ABC5C-13C	40.5384	4	Bw1	7	15	0.178	0.381	GR	SiL	0.2032	1.55	238000	3.687	10	0.1	1120468.325	Dekalb- Hazelton
47	P-027-160617-0942-jcr	4ABC5C-13C	40.5384	5	Bw2	15	19	0.381	0.4826	GR	SiL	0.1016	1.55	238000	3.205	20	0.2	973816.9023	Dekalb- Hazelton
48	P-028-160617-1100-jcr	4D5C-14I	334.3656	1	Oe	0	3	0	0.0762	NA	NA	0.0762	0.351	473000	4.451		1	18829403.5	Dekalb- Hazelton
49	P-028-160617-1100-jcr	4D5C-14I	334.3656	2	A	3	5	0.076	0.127	GR	L	0.0508	1.55	238000	4.25	10	0.1	2663238.969	Dekalb- Hazelton
50	P-028-160617-1100-jcr	4D5C-14I	334.3656	3	E	5	10	0.127	0.254	GR	L	0.127	1.55	238000	3.969	10	0.1	6217097.941	Dekalb- Hazelton
51	P-028-160617-1100-jcr	4D5C-14I	334.3656	4	Bw1	10	20	0.254	0.508	GR	L	0.254	1.55	238000	3.366	40	0.4	42176792.43	Dekalb- Hazelton
52	P-028-160617-1100-jcr	4D5C-14I	334.3656	5	Bw2	20	32	0.508	0.8128	GR	L	0.3048	1.55	238000	2.481	50	0.5	46633208.23	Dekalb- Hazelton
53	P-031-160615-1222-jsw	4F5C-13I	252.0696	1	Oe	0	2	0	0.0508	NA	NA	0.0508	0.351	411000	4.492		1	8297188.81	Weikert (same as 40)
54	P-031-160615-1222-jsw	4F5C-13I	252.0696	2	A	2	2.5	0.051	0.0635	GR	SiL	0.0127	1.55	75700	4.391	5	0.05	82468.42206	Weikert (same as 40)
55	P-031-160615-1222-jsw	4F5C-13I	252.0696	3	BA	2.5	5	0.064	0.127	CH	SiL	0.0635	1.55	75700	4.27	10	0.1	802024.7843	Weikert (same as 40)
56	P-031-160615-1222-jsw	4F5C-13I	252.0696	4	Bw	5	16	0.127	0.4064	CH	SiL	0.2794	1.55	75700	3.727	40	0.4	12321008.85	Weikert (same as 40)
57	P-031-160615-1222-jsw	4F5C-13I	252.0696	5	BC	16	24	0.406	0.6096	CH	SiL	0.2032	1.55	75700	2.963	70	0.7	12466665.3	Weikert (same as 40)
58	P-034-160615-1019-jsw	4D5A-14I	104.5464	1	Oe	0	3	0	0.0762	NA	NA	0.0762	0.351	411000	4.451		1	5115696.083	Weikert (same as 40)
59	P-034-160615-1019-jsw	4D5A-14I	104.5464	2	A	3	5	0.076	0.127	CH	SiL	0.0508	1.55	75700	4.25	12	0.12	317832.1295	Weikert (same as 40)
60	P-034-160615-1019-jsw	4D5A-14I	104.5464	3	BE	5	15	0.127	0.381	CH	SiL	0.254	1.55	75700	3.768	17	0.17	1995683.981	Weikert (same as 40)
61	P-034-160615-1019-jsw	4D5A-14I	104.5464	4	2Bt	15	31	0.381	0.7874	GR	SiL	0.4064	1.55	75700	2.722	25	0.25	3392530.865	Weikert (same as 40)
62	P-035-160615-1011-jsw	1AB6C-12C	53.6448	1	O	0	1	0	0.0254	NA	NA	0.0254	0.351	411000	4.532		1	890798.3897	Weikert (same as 40)
63	P-035-160615-1011-jsw	1AB6C-12C	53.6448	2	A	1	1.5	0.025	0.0381	GR	SiL	0.0127	1.55	75700	4.471	5	0.05	17872.20436	Weikert (same as 40)
64	P-035-160615-1011-jsw	1AB6C-12C	53.6448	3	Bw	1.5	10	0.038	0.254	CH	SiL	0.2159	1.55	75700	4.11	20	0.2	1116934.515	Weikert (same as 40)
65	P-036-160615-1557-jcr	4D5C-12I	261.8232	1	Oe	0	1	0	0.0254	CH	NA	0.0254	0.351	411000	4.532	10	0.1	434770.3505	Weikert (same as 40)
66	P-036-160615-1557-jcr	4D5C-12I	261.8232	2	A	1	2	0.025	0.0508	CH	SiL	0.0254	1.55	75700	4.451	20	0.2	694690.1798	Weikert (same as 40)
67	P-036-160615-1557-jcr	4D5C-12I	261.8232	3	Bw1	2	12	0.051	0.3048	CH	SiL	0.254	1.55	75700	4.009	30	0.3	9384758.92	Weikert (same as 40)
68	P-036-160615-1557-jcr	4D5C-12I	261.8232	4	Bw2	12	23	0.305	0.5842	CH	SiL	0.2794	1.55	75700	3.164	65	0.65	17655057.07	Weikert (same as 40)
69	P-037-160615-1532-jcr	1BC5C-11I	36.576	1	Oe	0	1	0	0.0254	CH	NA	0.0254	0.351	411000	4.532	10	0.1	60736.25385	Weikert (same as 40)
70	P-037-160615-1532-jcr	1BC5C-11I	36.576	2	A	1	2	0.025	0.0508	CH	SiL	0.0254	1.55	75700	4.451	10	0.1	48523.17903	Weikert (same as 40)
71	P-037-160615-1532-jcr	1BC5C-11I	36.576	3	Bw	2	11	0.051	0.2794	CH	SiL	0.2286	1.55	75700	4.049	40	0.4	1589012.978	Weikert (same as 40)
72	P-038-160615-1455-jcr	4E5C-13I	137.4648	1	Oe	0	2	0	0.0508	CH	NA	0.0508	0.351	411000	4.492	15	0.15	678724.0907	Weikert (same as 40)
73	P-038-160615-1455-jcr	4E5C-13I	137.4648	2	A	2	4	0.051	0.1016	CH	SiL	0.0508	1.55	75700	4.331	15	0.15	532270.2016	Weikert (same as 40)
74	P-038-160615-1455-jcr	4E5C-13I	137.4648	3	Bw1	4	12	0.102	0.3048	CH	SiL	0.2032	1.55	75700	3.929	60	0.6	7725462.32	Weikert (same as 40)
75	P-038-160615-1455-jcr	4E5C-13I	137.4648	4	Bw2	12	16	0.305	0.4064	CH	SiL	0.1016	1.55	75700	3.446	65	0.65	3670565.835	Weikert (same as 40)
76	P-039-160615-1344-jcr	4DE5C-14I	25.908	1	Oe	0	1	0	0.0254	GR	NA	0.0254	0.351	411000	4.532	10	0.1	43021.51314	Weikert (same as 40)
77	P-039-160615-1344-jcr	4DE5C-14I	25.908	2	A	1	3	0.025	0.0762	CH	SiL	0.0508	1.55	75700	4.411	15	0.15	102180.1704	Weikert (same as 40)
78	P-039-160615-1344-jcr	4DE5C-14I	25.908	3	Bw1	3	11	0.076	0.2794	CH	SiL	0.2032	1.55	75700	4.009	25	0.25	619095.4662	Weikert (same as 40)
79	P-039-160615-1344-jcr	4DE5C-14I	25.908	4	Bw2	11	19	0.279	0.4826	CH	SiL	0.2032	1.55	75700	3.366	50	0.5	1039452.789	Weikert (same as 40)
80	P-041-160614-1453-jcr	1D5A-12D	303.5808	1	Oe	0	0.5	0	0.0127	GR	NA	0.0127	0.351	411000	4.552	10	0.1	253173.8686	Weikert (same as 40)
81	P-041-160614-1453-jcr	1D5A-12D	303.5808	2	A	0.5	1	0.013	0.0254	GR	SiL	0.0127	1.55	75700	4.512	10	0.1	204100.1892	Weikert (same as 40)
82	P-041-160614-1453-jcr	1D5A-12D	303.5808	3	Bw	1	7	0.025	0.1778	GR	SiL	0.1524	1.55	75700	4.25	20	0.2	4614588.936	Weikert (same as 40)
83	P-041-160614-1453-jcr	1D5A-12D	303.5808	4	Bt	7	14	0.178	0.3556	CH	SiL	0.1778	1.55	75700	3.727	40	0.4	9442901.364	Weikert (same as 40)
84	P-046-160614-1050-def	1CD5C-13I	57.912	1	Oe	0	1	0	0.0254	NA	NA	0.0254	0.351	411000	4.532		1	961657.3526	Weikert

Sort	Field Name	Soil Polygon	Polygon Crossing		Horizon Designation	Top (in)	Bottom (in)	Top (m)	Bottom (m)	Coarse Fragment Modifier	Field texture	Horizon Thickness (m)	Bulk Density (Mg/m3)	Organic C (g/Mg soil)	Width (m)	CF (%)	CF	C (g)	Series or Pit similar to with data
			Length (m)	Profile Sort															
85	P-046-160614-1050-def	1CD5C-13I	57.912	2	A	1	1.25	0.025	0.03175	CH	SiL	0.00635	1.55	75700	4.482	20	0.2	38674.47922	Weikert
86	P-046-160614-1050-def	1CD5C-13I	57.912	3	AB	1.25	6	0.032	0.1524	GR	SiL	0.12065	1.55	75700	4.28	20	0.2	701844.3011	Weikert
87	P-046-160614-1050-def	1CD5C-13I	57.912	4	Bw1	6	13	0.152	0.3302	CH	SiL	0.1778	1.55	75700	3.808	40	0.4	1840227.529	Weikert
88	P-046-160614-1050-def	1CD5C-13I	57.912	5	Bw2	13	19	0.33	0.4826	CH	SiL	0.1524	1.55	75700	3.285	75	0.75	2551447.046	Weikert
89	P-047-160614-1045-def	3E5C-05I	53.0352	1	Oe	0	1	0	0.0254	NA	NA	0.0254	0.351	473000	4.532		1	1013527	Berks
90	P-047-160614-1045-def	3E5C-05I	53.0352	2	A	1	5.5	0.025	0.1397	GR	SiL	0.1143	1.55	238000	4.311	40	0.4	3855813.086	Berks
91	P-047-160614-1045-def	3E5C-05I	53.0352	3	Bw1	5.5	17	0.14	0.4318	CH	SiL	0.2921	1.55	238000	3.667	40	0.4	8382819.758	Berks
92	P-047-160614-1045-def	3E5C-05I	53.0352	4	Bw2	17	25	0.432	0.635	GR	SiL	0.2032	1.55	238000	2.883	38	0.38	4355216.457	Berks
93	P-047-160614-1045-def	3E5C-05I	53.0352	5	2Bw3	25	44	0.635	1.1176	GR	SiL	0.4826	1.55	238000	1.155	40	0.4	4361896.273	Berks
94	P-047-160614-1045-def	3E5C-05I	53.0352	6	3Bw4	44	50	1.118	1.27	GR	SiL	0.1524	1.55	238000	1.676	15	0.15	749767.7299	Berks
95	P-048-160614-1035-def	4E5C-12I	133.5024	1	Oe	0	2	0	0.0508	NA	NA	0.0508	0.351	473000	4.492		1	5057302.049	Berks
96	P-048-160614-1035-def	4E5C-12I	133.5024	2	A	2	4.25	0.051	0.10795	CH	SiL	0.05715	1.55	238000	4.321	20	0.2	2432162.719	Berks
97	P-048-160614-1035-def	4E5C-12I	133.5024	3	AB	4.25	10.5	0.108	0.2667	GR	SiL	0.15875	1.55	238000	3.979	40	0.4	12442968.96	Berks
98	P-048-160614-1035-def	4E5C-12I	133.5024	4	Bw	10.5	18	0.267	0.4572	GR	SiL	0.1905	1.55	238000	3.426	40	0.4	12856355.53	Berks
99	P-048-160614-1035-def	4E5C-12I	133.5024	5	2BC	18	21	0.457	0.5334	CH	SiL	0.0762	1.55	238000	3.004	38	0.38	4283227.699	Berks
145	P-049-160614-1025-def	4F5C-13I	252.0696	1	Oe	0	2	0	0.0508	NA	NA	0.0508	0.351	473000	4.492		1	9548832.864	Berks
146	P-049-160614-1025-def	4F5C-13I	252.0696	2	A	2	6	0.051	0.1524	GR	SiL	0.1016	1.55	238000	4.25	25	0.25	10038735.77	Berks
147	P-049-160614-1025-def	4F5C-13I	252.0696	3	Bw1	6	20	0.152	0.508	GR	SiL	0.3556	1.55	238000	3.526	50	0.5	58302657.62	Berks
148	P-049-160614-1025-def	4F5C-13I	252.0696	4	Bw2	20	32	0.508	0.8128	GR	SiL	0.3048	1.55	238000	2.481	43	0.43	30233792.49	Berks
150	P-050-160614-1015-def	4F5C-13I	252.0696	1	Oe	0	1.25	0	0.03175	NA	NA	0.03175	0.351	473000	4.522		1	6008097.964	Berks
151	P-050-160614-1015-def	4F5C-13I	252.0696	2	A	1.25	2.5	0.032	0.0635	CH	L	0.03175	1.55	238000	4.421		1	13053043.66	Berks
152	P-050-160614-1015-def	4F5C-13I	252.0696	3	Bw	2.5	10	0.064	0.254	GR	SiL	0.1905	1.55	238000	4.069	38	0.38	27392175.35	Berks
153	P-050-160614-1015-def	4F5C-13I	252.0696	4	Bw2	10	22	0.254	0.5588	GR	SiL	0.3048	1.55	238000	3.285	45	0.45	41898723.46	Berks
154	P-050-160614-1015-def	4F5C-13I	252.0696	5	2BC	22	31	0.559	0.7874	CH	SiL	0.2286	1.55	238000	2.441	85	0.85	44096696.66	Berks
155	P-050-160614-1015-def	4F5C-13I	252.0696	6	3CB	31	35	0.787	0.889	CH	SiL	0.1016	1.55	238000	1.918	58	0.58	10508276.63	Berks
156	P-053-160613-1105-rll	1E5A-13C	17.6784	1	A	0	3	0	0.0762	CN	SiL	0.0762	0.351	473000	4.451	5	0.05	49776.90988	Berks
157	P-053-160613-1105-rll	1E5A-13C	17.6784	2	Bt1	3	15	0.076	0.381	CN	SiL	0.3048	1.55	238000	3.848	25	0.25	1912286.382	Berks
158	P-053-160613-1105-rll	1E5A-13C	17.6784	3	Bt2	15	24	0.381	0.6096	CN	SiL	0.2286	1.55	238000	3.004	40	0.4	1791111.799	Berks
167	P-055-160613-1110-rll	1CD5C-12I	352.9584	1	Oa	0	3	0	0.0762	NA	NA	0.0762	0.351	473000	4.451		1	19876435.05	Berks
168	P-055-160613-1110-rll	1CD5C-12I	352.9584	2	Bw1	3	9	0.076	0.2286	CN	SiL	0.1524	1.55	238000	4.089	10	0.1	8114779.753	Berks
169	P-055-160613-1110-rll	1CD5C-12I	352.9584	3	Bw2	9	16	0.229	0.4064	CN	SiL	0.1778	1.55	238000	3.567	40	0.4	33027545.61	Berks
170	P-056-160613-1117-rll	1C5C-12I	291.084	1	Oa	0	1	0	0.0254	NA	NA	0.0254	0.351	473000	4.532		1	5562748.764	Berks
171	P-056-160613-1117-rll	1C5C-12I	291.084	2	A	1	4	0.025	0.1016	NA	SiL	0.0762	1.55	238000	4.371		1	35764691.84	Berks
172	P-056-160613-1117-rll	1C5C-12I	291.084	3	Bw1	4	10	0.102	0.254	NA	SiL	0.1524	1.55	238000	4.009	10	0.1	6560612.721	Berks
173	P-056-160613-1117-rll	1C5C-12I	291.084	4	Bw2	10	16	0.254	0.4064	CN	SiL	0.1524	1.55	238000	3.526	40	0.4	23083380.77	Berks
174	P-056-160613-1117-rll	1C5C-12I	291.084	5	Cr	16	21	0.406	0.5334	CN	SiL	0.127	1.55	238000	3.084	50	0.5	21028715.1	Berks
175	P-057-160613-1041-jdf	4E5C-13I	137.4648	1	Oe	0	2	0	0.0508	SI	NA	0.0508	0.351	473000	4.492	8	0.08	416592.3697	Berks
176	P-057-160613-1041-jdf	4E5C-13I	137.4648	2	Bw1	2	12	0.051	0.3048	CN	SiL	0.254	1.55	238000	4.009	35	0.35	18073171.34	Berks
177	P-057-160613-1041-jdf	4E5C-13I	137.4648	3	2Bw2	12	20	0.305	0.508	GR	SiL	0.2032	1.55	238000	3.285	45	0.45	15232828.92	Berks
178	P-057-160613-1041-jdf	4E5C-13I	137.4648	4	2C	20	32	0.508	0.8128	GR	SiL	0.3048	1.55	238000	2.481	75	0.75	28757853.57	Berks
179	P-058-160613-1057-jdf	1C5A-13D	116.1288	1	Oe	0	1	0	0.0254	NA	NA	0.0254	0.351	473000	4.532		1	2219274.638	Berks
180	P-058-160613-1057-jdf	1C5A-13D	116.1288	2	A	1	2	0.025	0.0508	GR	SiL	0.0254	1.55	238000	4.451	10	0.1	484366.4496	Berks
181	P-058-160613-1057-jdf	1C5A-13D	116.1288	3	Bt1	2	12	0.051	0.3048	CN	SiL	0.254	1.55	238000	4.009	35	0.35	15268022.8	Berks

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Sort	Field Name	Soil Polygon	Polygon Crossing Length (m)	Profile Sort	Horizon Designation	Top (in)	Bottom (in)	Top (m)	Bottom (m)	Coarse Fragment Modifier	Field texture	Horizon Thickness (m)	Bulk Density (Mg/m <sup>3</sup> )	Organic C (g/Mg soil)	Width (m)	CF (%)	CF	C (g)	Series or Pit similar to with data
182	P-058-160613-1057-jdf	1C5A-13D	116.1288	4	Bt2	12	20	0.305	0.508	CN	Sil	0.2032	1.55	238000	3.285	25	0.35	10008858.03	Berks
183	P-059-160613-1107-jdf	1B5C-12I	74.3712	1	Oe	0	2	0	0.0508	GR	NA	0.0508	0.351	473000	4.492	5	0.05	140865.4909	Berks
184	P-059-160613-1107-jdf	1B5C-12I	74.3712	2	A	2	6	0.051	0.1524	GR	Sil	0.1016	1.55	238000	4.25	20	0.2	2369481.525	Berks
185	P-059-160613-1107-jdf	1B5C-12I	74.3712	3	Bw1	6	12	0.152	0.3048	GR	Sil	0.1524	1.55	238000	3.848	20	0.2	3217916.394	Berks
186	P-059-160613-1107-jdf	1B5C-12I	74.3712	4	Bw2	12	18	0.305	0.4572	GR	Sil	0.1524	1.55	238000	3.366	45	0.45	6332285.974	Berks
187	P-060-160613-1555-rll	1E5C-11C	44.8056	1	A	0	4	0	0.1016	NA	Sil	0.1016	1.55	238000	4.411		1	7407724.903	Berks
188	P-060-160613-1555-rll	1E5C-11C	44.8056	2	Bw	4	12	0.102	0.3048	ST	Sil	0.2032	1.55	238000	3.929	10	0.1	1319456.566	Berks
189	P-064-160614-1020-rll	4D3C-13C	27.1272	1	Oa	0	1	0	0.0254	NA	NA	0.0254	0.351	270000	4.532		1	295922.9886	Paddyknob-Madsheep
190	P-064-160614-1020-rll	4D3C-13C	27.1272	2	A	1	4	0.025	0.1016	ST	Sil	0.0762	1.55	68700	4.371	10	0.1	96210.15237	Paddyknob-Madsheep
191	P-064-160614-1020-rll	4D3C-13C	27.1272	3	Bw1	4	19	0.102	0.4826	GR	Sil	0.381	1.55	68700	3.647	25	0.25	1003450.923	Paddyknob-Madsheep
192	P-064-160614-1020-rll	4D3C-13C	27.1272	4	Bw2	19	30	0.483	0.762	ST	Sil	0.2794	1.55	68700	2.601	20	0.2	419908.0064	Paddyknob-Madsheep
193	P-067-160614-1441-sdd	4D5A-05D	71.0184	1	Oe	0	3	0	0.0762	CH	NA	0.0762	0.351	270000	4.451	20	0.2	456581.6725	Paddyknob-Madsheep
194	P-067-160614-1441-sdd	4D5A-05D	71.0184	2	A	3	7	0.076	0.1778	CH	Sil	0.1016	1.55	68700	4.17	20	0.2	640769.3343	Paddyknob-Madsheep
195	P-067-160614-1441-sdd	4D5A-05D	71.0184	3	BA	7	10	0.178	0.254	CH	Sil	0.0762	1.55	68700	3.888	25	0.25	560164.9431	Paddyknob-Madsheep
196	P-067-160614-1441-sdd	4D5A-05D	71.0184	4	Bt	10	30	0.254	0.762	CH	Sil	0.508	1.55	68700	2.963	30	0.3	3415268.025	Paddyknob-Madsheep
197	P-067-160614-1441-sdd	4D5A-05D	71.0184	5	2BC	30	50	0.762	1.27	CH	Sil	0.508	1.55	68700	0.998	65	0.65	2493101.914	Paddyknob-Madsheep
198	P-070-160614-1102-sdd	1A5C-13I	647.0904	1	Oe	0	3	0	0.0762	CH	NA	0.0762	0.351	270000	4.451	40	0.4	8320368.16	Paddyknob-Madsheep
199	P-070-160614-1102-sdd	1A5C-13I	647.0904	2	A	3	8	0.076	0.2032	CH	L	0.127	1.55	68700	4.13	40	0.4	14455291.18	Paddyknob-Madsheep
200	P-070-160614-1102-sdd	1A5C-13I	647.0904	3	Bw	8	18	0.203	0.4572	CH	L	0.254	1.55	68700	3.526	55	0.55	33945113.55	Paddyknob-Madsheep
201	P-071-160614-1001-sdd	4C5C-13I	64.6176	1	Oe	0	4	0	0.1016	CH	NA	0.1016	0.351	270000	4.411	40	0.4	1097805.971	Paddyknob-Madsheep
202	P-071-160614-1001-sdd	4C5C-13I	64.6176	2	A	4	9	0.102	0.2286	CH	Sil	0.127	1.55	68700	4.049	40	0.4	1415371.387	Paddyknob-Madsheep
203	P-071-160614-1001-sdd	4C5C-13I	64.6176	3	Bw	9	18	0.229	0.4572	CH	Sil	0.2286	1.55	68700	3.486	60	0.6	3290128.082	Paddyknob-Madsheep
204	P-072-160616-1447-sdd	4B5C-13I	180.7464	1	Oa	0	2	0	0.0508	GR	NA	0.0508	0.351	270000	4.492	55	0.55	2149635.317	Paddyknob-Madsheep
205	P-072-160616-1447-sdd	4B5C-13I	180.7464	2	A	2	4	0.051	0.1016	GR	L	0.0508	1.55	68700	4.331	55	0.55	2328855.771	Paddyknob-Madsheep
206	P-072-160616-1447-sdd	4B5C-13I	180.7464	3	Bw1	4	18	0.102	0.4572	CH	SL	0.3556	1.55	68700	3.687	40	0.4	10094398.75	Paddyknob-Madsheep
207	P-072-160616-1447-sdd	4B5C-13I	180.7464	4	Bw2	18	30	0.457	0.762	CH	SL	0.3048	1.55	68700	2.642	60	0.6	9298038.931	Paddyknob-Madsheep
208	P-074-160616-1238-sdd	1A5C-12I	135.3312	1	Oe	0	2	0	0.0508	CH	NA	0.0508	0.351	270000	4.492	40	0.4	1170551.072	Paddyknob-Madsheep
209	P-074-160616-1238-sdd	1A5C-12I	135.3312	2	A	2	4	0.051	0.1016	CH	Sil	0.0508	1.55	68700	4.331	40	0.4	1268142.833	Paddyknob-Madsheep
210	P-074-160616-1238-sdd	1A5C-12I	135.3312	3	Bw	4	24	0.102	0.6096	FL	Sil	0.508	1.55	68700	3.446	60	0.6	15135898.33	Paddyknob-Madsheep
211	P-075-160616-1140-sdd	4D5C-12I	261.8232	1	Oe	0	3	0	0.0762	GR	NA	0.0762	0.351	270000	4.451	40	0.4	3366554.993	Paddyknob-Madsheep
212	P-075-160616-1140-sdd	4D5C-12I	261.8232	2	A	3	5	0.076	0.127	GR	L	0.0508	1.55	68700	4.25	40	0.4	2407888.898	Paddyknob-Madsheep
213	P-075-160616-1140-sdd	4D5C-12I	261.8232	3	Bw	5	14	0.127	0.3556	CH	L	0.2286	1.55	68700	3.808	45	0.45	10921164.17	Paddyknob-Madsheep
214	P-076-160616-1055-sdd	4D5C-14I	334.3656	1	Oa	0	2	0	0.0508	GR	NA	0.0508	0.351	270000	4.492	30	0.3	2169078.592	Paddyknob-Madsheep
215	P-076-160616-1055-sdd	4D5C-14I	334.3656	2	A	2	4	0.051	0.1016	GR	Sil	0.0508	1.55	68700	4.331	30	0.3	2349920.081	Paddyknob-Madsheep
216	P-076-160616-1055-sdd	4D5C-14I	334.3656	3	BA	4	10	0.102	0.254	GR	L	0.1524	1.55	68700	4.009	35	0.35	7613695.119	Paddyknob-Madsheep
217	P-076-160616-1055-sdd	4D5C-14I	334.3656	4	2Bw	10	20	0.254	0.508	CH	L	0.254	1.55	68700	3.366	40	0.4	12174561.51	Paddyknob-Madsheep
218	P-078-160617-1201-sdd	3C4A-05D	19.812	1	Oe	0	2	0	0.0508	CH	NA	0.0508	0.351	270000	4.492	50	0.5	214205.5735	Paddyknob-Madsheep
219	P-078-160617-1201-sdd	3C4A-05D	19.812	2	A	2	6	0.051	0.1524	CH	Sil	0.1016	1.55	68700	4.25	50	0.5	455508.6682	Paddyknob-Madsheep
220	P-078-160617-1201-sdd	3C4A-05D	19.812	3	AB	6	12	0.152	0.3048	CH	Sil	0.1524	1.55	68700	3.848	40	0.4	494889.2981	Paddyknob-Madsheep
221	P-078-160617-1201-sdd	3C4A-05D	19.812	4	2Bt	12	26	0.305	0.6604	CH	Sil	0.3556	1.55	68700	3.044	30	0.3	685032.4085	Paddyknob-Madsheep
222	P-078-160617-1201-sdd	3C4A-05D	19.812	5	3BC	26	44	0.66	1.1176	CH	Sil	0.4572	1.55	68700	1.143	70	0.7	771738.7553	Paddyknob-Madsheep

Sort	Field Name	Soil Polygon	Polygon Crossing Length (m)	Profile Sort	Horizon Designation	Top (in)	Bottom (in)	Top (m)	Bottom (m)	Coarse Fragment Modifier	Field texture	Horizon Thickness (m)	Bulk Density (Mg/m3)	Organic C (g/Mg soil)	Width (m)	CF (%)	CF	C (g)	Series or Pit similar to with data
223	P-079-160617-1251-sdd	1AB5A-13D	173.1264	1	Oe	0	2	0	0.0508	CH	NA	0.0508	0.351	270000	4.492	20	0.2	748730.8661	Paddyknob-Madsheep
224	P-079-160617-1251-sdd	1AB5A-13D	173.1264	2	A	2	4	0.051	0.1016	CH	SiL	0.0508	1.55	68700	4.331		1	4055772.123	Paddyknob-Madsheep
225	P-079-160617-1251-sdd	1AB5A-13D	173.1264	3	BA	4	6	0.102	0.1524	CH	SiL	0.0508	1.55	68700	4.17		1	3905117.831	Paddyknob-Madsheep
226	P-079-160617-1251-sdd	1AB5A-13D	173.1264	4	Bt	6	24	0.152	0.6096	CH	SiCL	0.4572	1.55	68700	3.366	30	0.3	8509985.203	Paddyknob-Madsheep
227	P-080-160617-1000-def	4D5C-14C	124.0536	1	Oi	0	0.5	0	0.0127	NA	NA	0.0127	0.351	270000	4.552		1	679635.2422	Paddyknob-Madsheep
228	P-080-160617-1000-def	4D5C-14C	124.0536	2	Oa	0.5	2	0.013	0.0508	GR	SL	0.0381	1.55	68700	4.471		1	2250463.487	Paddyknob-Madsheep
229	P-080-160617-1000-def	4D5C-14C	124.0536	3	A	2	6.5	0.051	0.1651	GR	SL	0.1143	1.55	68700	4.23	45	0.45	2874174.781	Paddyknob-Madsheep
230	P-080-160617-1000-def	4D5C-14C	124.0536	4	BA	6.5	14	0.165	0.3556	GR	SL	0.1905	1.55	68700	3.748	35	0.35	3300724.168	Paddyknob-Madsheep
231	P-080-160617-1000-def	4D5C-14C	124.0536	5	2Bw	14	34	0.356	0.8636	GR	SL	0.508	1.55	68700	2.642	30	0.3	5318018.332	Paddyknob-Madsheep
232	P-081-160617-1010-def	4C5C-13I	64.6176	1	Oi	0	1.5	0	0.0381	NA	NA	0.0381	0.351	270000	4.512		1	1052651.194	Paddyknob-Madsheep
233	P-081-160617-1010-def	4C5C-13I	64.6176	2	A	1.5	5	0.038	0.127	CB	SL	0.0889	1.55	68700	4.311	40	0.4	1054721.736	Paddyknob-Madsheep
234	P-081-160617-1010-def	4C5C-13I	64.6176	3	AB	5	8.5	0.127	0.2159	CB	SL	0.0889	1.55	68700	4.029	40	0.4	985839.8351	Paddyknob-Madsheep
235	P-081-160617-1010-def	4C5C-13I	64.6176	4	2Bw	8.5	20	0.216	0.508	GR	SL	0.2921	1.55	68700	3.426	20	0.2	1377101.609	Paddyknob-Madsheep
236	P-081-160617-1010-def	4C5C-13I	64.6176	5	2BC	20	36	0.508	0.9144	ST	SL	0.4064	1.55	68700	2.32	60	0.6	3892308.308	Paddyknob-Madsheep
237	P-082-160617-1020-jsw	1AB5C-13I	106.9848	1	Oe	0	1	0	0.0254	CH	NA	0.0254	0.351	270000	4.532		1	1167067.068	Paddyknob-Madsheep
238	P-082-160617-1020-jsw	1AB5C-13I	106.9848	2	A	1	4	0.025	0.1016	CH	SL	0.0762	1.55	68700	4.371	10	0.1	379435.5447	Paddyknob-Madsheep
239	P-082-160617-1020-jsw	1AB5C-13I	106.9848	3	BA	4	5	0.102	0.127	CH	SL	0.0254	1.55	68700	4.21	10	0.1	121823.6156	Paddyknob-Madsheep
240	P-082-160617-1020-jsw	1AB5C-13I	106.9848	4	Bw1	5	12	0.127	0.3048	CH	SL	0.1778	1.55	68700	3.888	12	0.12	945116.0619	Paddyknob-Madsheep
241	P-082-160617-1020-jsw	1AB5C-13I	106.9848	5	Bw2	12	24	0.305	0.6096	CH	SL	0.3048	1.55	68700	3.124	55	0.55	5966600.973	Paddyknob-Madsheep
242	P-083-160617-1011-jsw	4E5A-13C	37.4904	1	Oe	0	2	0	0.0508	NA	NA	0.0508	0.351	270000	4.492		1	810685.7089	Paddyknob-Madsheep
243	P-083-160617-1011-jsw	4E5A-13C	37.4904	2	A	2	5	0.051	0.127	CH	SL	0.0762	1.55	68700	4.29	10	0.1	130517.7865	Paddyknob-Madsheep
244	P-083-160617-1011-jsw	4E5A-13C	37.4904	3	BA	5	9	0.127	0.2286	CH	SL	0.1016	1.55	68700	4.009	12	0.12	195126.3445	Paddyknob-Madsheep
245	P-083-160617-1011-jsw	4E5A-13C	37.4904	4	Bt	9	21	0.229	0.5334	CH	SL	0.3048	1.55	68700	3.366	20	0.2	819036.1346	Paddyknob-Madsheep
246	P-084-160617-1005-jsw	4B5A-13D	119.1768	1	Oe	0	2	0	0.0508	NA	NA	0.0508	0.351	270000	4.492		1	2577057.823	Paddyknob-Madsheep
247	P-084-160617-1005-jsw	4B5A-13D	119.1768	2	A	2	5	0.051	0.127	GR	SiL	0.0762	1.55	68700	4.29	5	0.05	207449.0022	Paddyknob-Madsheep
248	P-084-160617-1005-jsw	4B5A-13D	119.1768	3	Bt1	5	11	0.127	0.2794	CH	SiL	0.1524	1.55	68700	3.929	12	0.12	911752.1809	Paddyknob-Madsheep
249	P-084-160617-1005-jsw	4B5A-13D	119.1768	4	Bt2	11	21	0.279	0.5334	CH	SiL	0.254	1.55	68700	3.285	10	0.1	1058907.586	Paddyknob-Madsheep
250	P-085-160616-1039-jcr	4C5C/A-14I	192.6336	1	Oe	0	1.5	0	0.0381	GR	NA	0.0381	0.351	270000	4.512	5	0.05	156904.612	Paddyknob-Madsheep
251	P-085-160616-1039-jcr	4C5C/A-14I	192.6336	2	A	1.5	4	0.038	0.1016	GR	SiL	0.0635	1.55	68700	4.351	35	0.35	1983499.967	Paddyknob-Madsheep
252	P-085-160616-1039-jcr	4C5C/A-14I	192.6336	3	BA	4	9	0.102	0.2286	GR	SiL	0.127	1.55	68700	4.049	40	0.4	4219409.041	Paddyknob-Madsheep
253	P-085-160616-1039-jcr	4C5C/A-14I	192.6336	4	Bw1	9	24	0.229	0.6096	GR	SiL	0.381	1.55	68700	3.245	50	0.5	12679732.21	Paddyknob-Madsheep
254	P-085-160616-1039-jcr	4C5C/A-14I	192.6336	5	2Bt	24	37	0.61	0.9398	CH	SiL	0.3302	1.55	68700	1.115	65	0.65	4910593.878	Paddyknob-Madsheep
255	P-087-160616-1316-jcr	3C5C-05I	57.6072	1	Oe	0	1	0	0.0254	GR	NA	0.0254	0.351	270000	4.532	10	0.1	62842.07287	Paddyknob-Madsheep
256	P-087-160616-1316-jcr	3C5C-05I	57.6072	2	A	1	3	0.025	0.0762	GR	L	0.0508	1.55	68700	4.411	10	0.1	137460.8736	Paddyknob-Madsheep
257	P-087-160616-1316-jcr	3C5C-05I	57.6072	3	Bw1	3	17	0.076	0.4318	GR	SL	0.3556	1.55	68700	3.768	25	0.25	2054657.491	Paddyknob-Madsheep
258	P-087-160616-1316-jcr	3C5C-05I	57.6072	4	Bw2	17	32	0.432	0.8128	GR	SL	0.381	1.55	68700	2.601	40	0.4	2431949.332	Paddyknob-Madsheep
259	P-088-160616-1506-jcr	4D5C-14I	334.3656	1	Oe	0	1	0	0.0254	GR	NA	0.0254	0.351	270000	4.532	10	0.1	364750.0208	Paddyknob-Madsheep
260	P-088-160616-1506-jcr	4D5C-14I	334.3656	2	A	1	2	0.025	0.0508	GR	SiL	0.0254	1.55	68700	4.451	15	0.15	603846.7656	Paddyknob-Madsheep
261	P-088-160616-1506-jcr	4D5C-14I	334.3656	3	AB	2	4	0.051	0.1016	GR	L	0.0508	1.55	68700	4.331	30	0.3	2349920.081	Paddyknob-Madsheep
262	P-088-160616-1506-jcr	4D5C-14I	334.3656	4	Bw1	4	14	0.102	0.3556	GR	L	0.254	1.55	68700	3.848	65	0.65	22620565	Paddyknob-Madsheep
263	P-088-160616-1506-jcr	4D5C-14I	334.3656	5	Bw2	14	28	0.356	0.7112	GR	L	0.3556	1.55	68700	2.883	65	0.65	23725463.88	Paddyknob-Madsheep
264	P-089-160616-1550-jcr	1C5C-12I	291.084	1	Oe	0	1.5	0	0.0381	GR	NA	0.0381	0.351	270000	4.512	40	0.4	1896758.284	Paddyknob-Madsheep

Sort	Field Name	Soil Polygon	Polygon Crossing		Horizon Designation	Top (in)	Bottom (in)	Top (m)	Bottom (m)	Coarse Fragment Modifier	Field texture	Horizon Thickness (m)	Bulk Density (Mg/m3)	Organic C (g/Mg soil)	Width (m)	CF (%)	CF	C (g)	Series or Pit similar to with data
			Length (m)	Profile Sort															
265	P-089-160616-1550-jcr	1C5C-12I	291.084	2	A	1.5	2.5	0.038	0.0635	GR	SL	0.0254	1.55	68700	4.411		1	3472887.15	Paddyknob-Madsheep
266	P-089-160616-1550-jcr	1C5C-12I	291.084	3	AB	2.5	5	0.064	0.127	GR	SL	0.0635	1.55	68700	4.27	60	0.6	5043102.081	Paddyknob-Madsheep
267	P-089-160616-1550-jcr	1C5C-12I	291.084	4	Bw	5	20	0.127	0.508	GR	SL	0.381	1.55	68700	3.567	65	0.65	27377732.61	Paddyknob-Madsheep
																	<b>Total C (g):</b>	<b>1510018325</b>	
																	<b>Total C (Mg):</b>	<b>1510.02</b>	

Sheet 3-TOTAL Trench Carbon

Total C from Sheet 1			Total C from Sheet 2			Total C (sum of sheet 1 and sheet)			25% of Total C for cut/fill sites			Total with additional 25% for cut/fill sites			8% taken for loss of the entire active C pool due to decomposition		
grams	Megagrams	US tons	grams	Megagrams	US tons	grams	Megagrams	US tons	grams	Megagrams	US tons	grams	Megagrams	US tons	grams	Megagrams	US tons
68879216	68.8792162	75.9263174	1510018325	1510.02	1664.512	1578897541	1578.899216	1740.438	394724385	394.7248041	435.1095	1973621926	1973.62402	2175.5475	157889754	157.8899216	174.0438

Total Aboveground C for live trees >1 DBH in NFS ownership in WV = 45,456,512 short tons (or US tons)

Acres of National Forest ownership in WV to which the carbon total applies = 1,041,443 ac

Total area that would be disturbed by proposed pipeline = 82 acres

45,456,512 US tons x 1/1,041,443 ac = 43.65 tons above-ground C per ac on WV NFs

43.65 total tons x 0.7 = 30.55 tons C in bole wood per acre on WV NFs

30.55 tons C/ac x 82 ac of disturbance on MNF = 2505.4 tons of carbon in bole wood removed from areas proposed for disturbance on MNF by ACP

<b>Tons of C in bole wood removed</b>	<b>Belowground C loss due to decomposition (US tons)</b>	<b>Total aboveground and belowground C loss (US tons)</b>	<b>Total aboveground and belowground C loss (Mg)</b>
2505.4	174.0437966	2679.443797	2430.753415

Sheet 5-Polygon Lengths

<b>Map Unit Name</b>	<b>Crossing Length (feet)</b>	<b>Crossing Length (meters)</b>
1A5C-12I	444	135.3312
1A5C-13I	2123	647.0904
1A6C-12C	592	180.4416
1AB4A-04D	59	17.9832
1AB5A-05F	245	74.676
1AB5A-13D	568	173.1264
1AB5C-13I	351	106.9848
1AB6C-12C	176	53.6448
1B5C-12I	244	74.3712
1BC5C-11I	120	36.576
1C5A-12D	271	82.6008
1C5A-13D	381	116.1288
1C5C-12I	955	291.084
1C5C-13I	79	24.0792
1CD5A-14D	229	69.7992
1CD5C-12I	1158	352.9584
1CD5C-13I	190	57.912
1D5A-05D	432	131.6736
1D5A-12D	996	303.5808
1D5A-13D	92	28.0416
1D5A-13I	225	68.58
1D5C-12I	534	162.7632
1D5C-13I	535	163.068
1E4A-15D	292	89.0016
1E5A-05D	355	108.204
1E5A-13C	58	17.6784
1E5C-11C	147	44.8056
1E5C-13I	625	190.5
1F5A-05D	221	67.3608
2B4C-02I	24	7.3152
3AB5C-05I	110	33.528
3C4A-05D	65	19.812
3C5C-05I	189	57.6072
3E5C-05I	174	53.0352
3F5C-05I	326	99.3648
4AB5C-13I	444	135.3312
4AB5C-14C	246	74.9808
4AB5D-13I	130	39.624
4ABC5C-13C	133	40.5384
4B3C-13C	202	61.5696
4B5A-13D	391	119.1768
4B5C-13I	593	180.7464
4BC5A-13C	157	47.8536
4C3A-13B	214	65.2272



Sheet 5-Polygon Lengths

<b>Map Unit Name</b>	<b>Crossing Length (feet)</b>	<b>Crossing Length (meters)</b>
4C3AB-23F	298	90.8304
4C5A-05D	141	42.9768
4C5A-14D	19	5.7912
4C5C/A-14I	632	192.6336
4C5C-13I	212	64.6176
4C5C-14I	115	35.052
4D3C-13C	136	41.4528
4D3C-13C☐	89	27.1272
4D5A-05D	233	71.0184
4D5A-13D	89	27.1272
4D5A-14I	343	104.5464
4D5C/A-05D	577	175.8696
4D5C-05E/D/K	195	59.436
4D5C-12I	859	261.8232
4D5C-14C	407	124.0536
4D5C-14I	1097	334.3656
4D6C-05I	844	257.2512
4DE5C-14I	85	25.908
4E4A-05D	296	90.2208
4E5A-13C	123	37.4904
4E5A-15D	260	79.248
4E5C-05C	300	91.44
4E5C-12I	438	133.5024
4E5C-13I	451	137.4648
4E5C-14I	228	69.4944
4E5D/A-15C/B	195	59.436
4EF5C-13I	437	133.1976
4F5A-05D	2	0.6096
4F5C-12I	89	27.1272
4F5C-13I	827	252.0696
9B3A-05D	147	44.8056
<b>Grand Total</b>	<b>26259</b>	<b>8003.7432</b>

**ProGanics**

$(3,500 \text{ pounds/1 acre}) \times (1 \text{ kilogram/2.2 pounds}) \times (1,000 \text{ grams/1 kilogram}) = 1,590,909.09 \text{ grams 1 acre of ProGanics}$   
 Since ProGanics is 49.69 percent carbon, this equals 790,522.73 grams of carbon per acre.

**Flexterra**

$(3,500 \text{ pounds/1 acre}) \times (1 \text{ kilogram/2.2 pounds}) \times (1,000 \text{ grams/1 kilogram}) = 1,590,909.09 \text{ grams 1 acre of Flexterra}$   
 Since Flexterra is 40.00 percent carbon, this equals 636,363.64 grams of carbon per acre.

ProGanics (g C/ac)	Flexterra (g C/ac)	ProGanics/Flexterra Total (g C/ac)	ACP disturbance on MNF (acres)	Total addition of C (g)	Total addition of C (Mg)	Total loss of C from aboveground/belowground (Mg)	Total Net Loss of C (Mg)
790522.73	636363.64	1426886.37	82	117004682.3	117.0046823	2430.753415	-2313.748732

Lab Data-Raw Data

Sort	Pit ID	Serial Number		Horizon	Rock Frag. Type	Rock Frag. (%)	Bulk Density	Sand %	Silt %	Clay %	Soil Textural Class	Soil pH	TOC (mg/kg)	TOC (%)
		Lab ID	Profile Sort											
	1	P-003-160620-1025-rll-S1A	NA	1	Oa	0	0	NA	NA	NA	NA	4	374000	37.4
	2	P-003-160620-1025-rll-S2A	S16-32385	2	A	0	0	33	38.8	28.2	Clay Loam	3.7	100000	10
	3	P-003-160620-1025-rll-S3A	S16-32386	3	Bw	ST	10	16.9	42.6	40.5	Silty Clay	4.6	8780	0.878
	4	P-003-160620-1025-rll-S4A	S16-32387	4	Bt	ST	25	22.8	47.2	29.9	Clay Loam	4.5	2270	0.227
	5	P-010-160620-1315-mgw-S1A	NA	1	Oe	0	0	NA	NA	NA	NA	4.8	476000	47.6
	6	P-010-160620-1315-mgw-S2A	S16-32751	2	A	GR	20	64.3	17.2	18.5	Sandy Loam	3.6	185000	18.5
	7	P-010-160620-1315-mgw-S3A	S16-32752	3	AE	GR	15	45.4	25.1	29.5	Sandy Clay Loam	4.1	67200	6.72
	8	P-010-160620-1315-mgw-S4A	S16-32753	4	Bt1	GR	8	42.6	25	32.4	Clay Loam	4.7	30500	3.05
	9	P-010-160620-1315-mgw-S5A	S16-32754	5	Bt2	GR	8	43.3	22.9	33.8	Clay Loam	4.7	7200	0.72
	10	P-010-160620-1315-mgw-S6A	S16-32755	6	Bt3	GR	8	43.3	21	35.7	Clay Loam	4.7	3280	0.328
	11	P-010-160620-1315-mgw-S7A	S16-32756	7	Bt4	GR	10	41.4	20.7	37.9	Clay Loam	4.6	2360	0.236
	12	P-010-160620-1315-mgw-S8A	S16-32758	8	Bt3	GR	10	23.5	19.8	56.7	Clay	4.6	2810	0.281
	13	P-012-160620-1115-mgw-S1A	NA	1	Oe	0	0	NA	NA	NA	NA	5.1	484000	48.4
	14	P-012-160620-1115-mgw-S2A	S16-32389	2	A	GR	60	54.9	27.3	17.8	Sandy Loam	3.9	147000	14.7
	15	P-012-160620-1115-mgw-S3A	S16-32390	3	Bhs	GR	60	55.9	25.5	18.6	Sandy Loam	4.3	92400	9.24
	16	P-012-160620-1115-mgw-S4A	S16-32391	4	Bs	GR	50	53.7	31	15.3	Sandy Loam	4.9	49800	4.98
	17	P-012-160620-1115-mgw-S5A	S16-32392	5	BC	GR	50	49.2	24.6	26.2	Sandy Clay Loam	4.9	21600	2.16
	18	P-022-160614-1050-jsw-S1A	NA	1	Oe	0	0	NA	NA	NA	NA	3.3	473000	47.3
	19	P-022-160614-1050-jsw-S2A	S16-32394	2	Oa	0	0	57.5	19.4	23.1	Sandy Clay Loam	3.5	238000	23.8
	20	P-022-160614-1050-jsw-S3A	S16-32395	3	E	GR	15	79.6	12.2	8.2	Loamy Sand	4.2	5540	0.554
	21	P-022-160614-1050-jsw-S4A	S16-32396	4	Bs	GR	5	66.8	11.4	21.8	Sandy Clay Loam	4.3	13000	1.3
	22	P-022-160614-1050-jsw-S5A	S16-32397	5	Bt1	CH	25	13.6	59.6	26.8	Silt Loam	4.4	2230	0.223
	23	P-022-160614-1050-jsw-S6A	S16-32398	6	2Bt2	NA	NA	22.9	31.1	45.9	Clay	4.5	710	0.071
	24	P-022-160614-1050-jsw-S7A	S16-32399	7	2BC	NA	NA	8.8	37.2	54	Clay	4.4	1110	0.111
	25	P-040-160615-1119-jcr-S1A	NA	1	Oe	GR	10	NA	NA	NA	NA	4.5	411000	41.1
	26	P-040-160615-1119-jcr-S2A	S16-32401	2	A	GR	10	35.9	46	18.1	Loam	4	75700	7.57
	27	P-040-160615-1119-jcr-S3A	S16-32402	3	Bw1	GR	10	18.4	51.4	30.2	Silty Clay Loam	4.8	7880	0.788
	28	P-040-160615-1119-jcr-S4A	S16-32403	4	Bw2	GR	15	29.2	39	31.8	Clay Loam	4.6	1790	0.179
	29	P-040-160615-1119-jcr-S5A	S16-32404	5	Bw3	GR	35	19.6	44	36.4	Silty Clay Loam	4.7	1400	0.14
	30	P-045-160614-1019-jcr-S1A	NA	1	Oe	CH	15	NA	NA	NA	NA	4.4	273000	27.3
	31	P-045-160614-1019-jcr-S2A	S16-32760	2	A	CH	15	32.1	42.7	25.2	Loam	4.5	53700	5.37
	32	P-045-160614-1019-jcr-S3A	S16-32761	3	BA	VCH	45	24.3	51.2	24.5	Silt Loam	4.9	4230	0.423
	33	P-045-160614-1019-jcr-S4A	S16-32762	4	Bw	VCH	45	27	45.4	27.6	Clay Loam	5.3	3480	0.348
	34	P-063-160614-0950-rll-S1A	S16-32405	1	Ap	0	0	34.8	41	24.2	Loam	6.5	49800	4.98
	35	P-063-160614-0950-rll-S2A	S16-32406	2	Bt	0	0	21.7	37.6	40.7	Clay	5.8	2470	0.247
	36	P-063-160614-0950-rll-S3A	S16-32407	3	Btg	0	0	8.8	48.7	42.4	Silty Clay	4.8	1100	0.11
	37	P-068-160614-1338-sdd-S1A	NA	1	Oe	CH	25	NA	NA	NA	NA	6.1	270000	27
	38	P-068-160614-1338-sdd-S2A	S16-32409	2	A	CH	25	74.1	16.6	9.3	Sandy Loam	5.3	62900	6.29
	39	P-068-160614-1338-sdd-S3A	S16-32411	3	Bw	CH	40	53.5	25.1	21.4	Sandy Clay Loam	4.8	2280	0.228
	40	P-068-160614-1338-sdd-S4A	S16-32412	4	2C	FL	70	37.3	32.7	30	Clay Loam	5.2	4200	0.42

Lab Data-Raw Data

Sort	Pit ID	Serial Number		Horizon	Rock Frag. Type	Rock Frag. (%)	Bulk Density	Sand %	Silt %	Clay %	Soil Textural Class	Soil pH	TOC (mg/kg)	TOC (%)
		Lab ID	Profile Sort											
41	P-069-160614-1158-sdd-S1A	NA	1	Oe	CH	30		NA	NA	NA	NA	4.9	123000	12.3
42	P-069-160614-1158-sdd-S2A	NA	2	A	CH	30		NA	NA	NA	NA	4.2	72000	7.2
43	P-069-160614-1158-sdd-S3A	S16-32413	3	AB	CH	25		40.9	39	20.1	Loam	4.6	37600	3.76
44	P-069-160614-1158-sdd-S4A	S16-32414	4	Bt	CH	25		50.3	31.1	18.6	Loam	4.6	1630	0.163
45	P-069-160614-1158-sdd-S5A	S16-32415	5	2BC	CH	40		64.3	22.4	13.2	Sandy Loam	4.7	1530	0.153
46	P-077-160617-1035-sdd-S1A	NA	1	Oe	CH	60		NA	NA	NA	NA	5.1	194000	19.4
47	P-077-160617-1035-sdd-S2A	S16-32764	2	A	CH	60		50.3	32.5	17.1	Loam	4.9	68700	6.87
48	P-077-160617-1035-sdd-S3A	S16-32765	3	Bt1	CH	30		32.9	37	30.2	Clay Loam	5.1	6160	0.616
49	P-077-160617-1035-sdd-S4A	S16-32766	4	Bt2	CH	20		44.7	33.5	21.9	Loam	5.1	5130	0.513
50	P-077-160617-1035-sdd-S5A	S16-32767	5	Bt3	CH	15		32.8	34.5	32.7	Clay Loam	4.9	1300	0.13

# Exhibit 6



United States  
Department of  
Agriculture

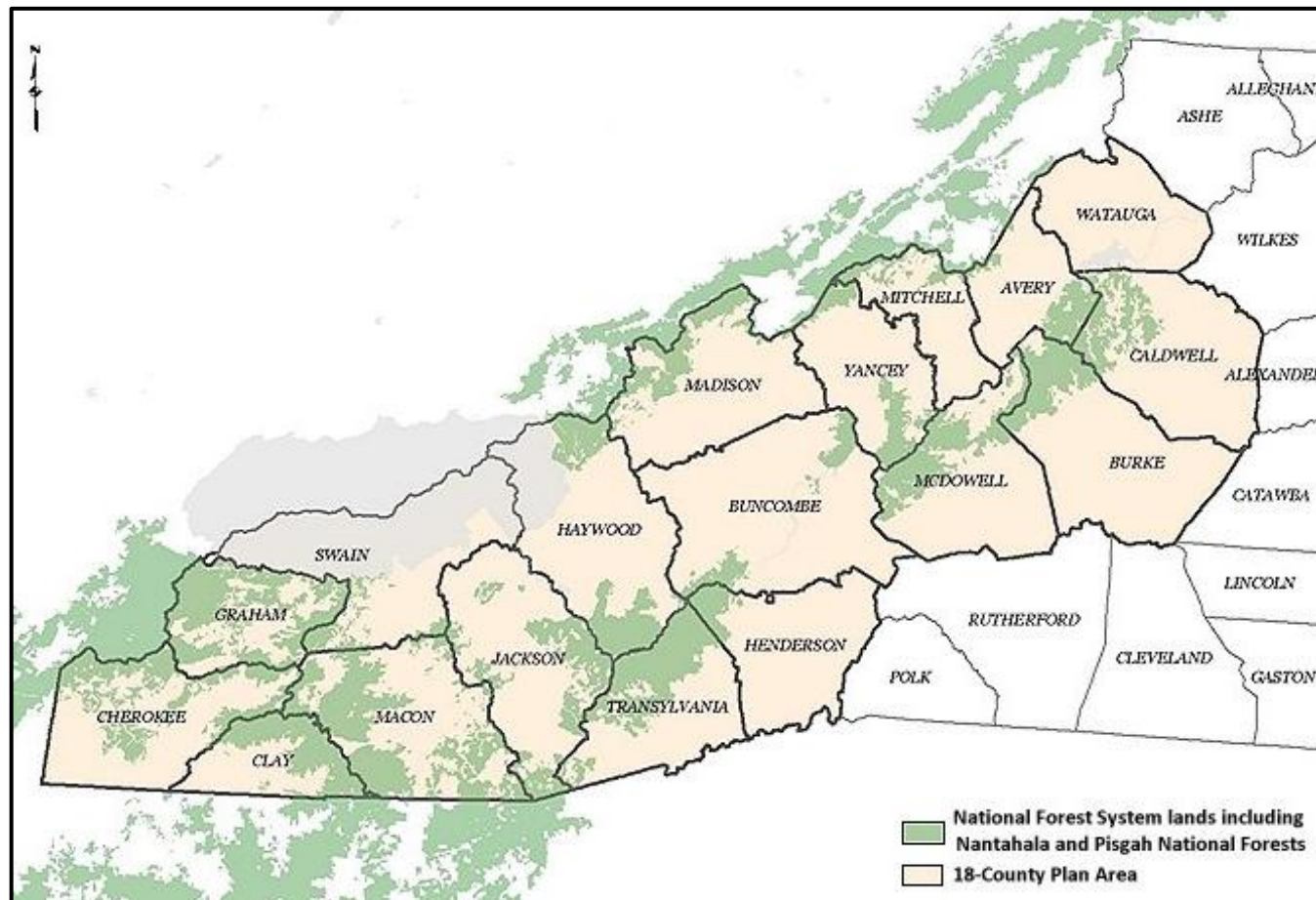
Forest  
Service

**Southern  
Region**

March 12, 2014



# Nantahala and Pisgah National Forests Assessment



# Carbon Stocks

## Key questions addressed in this Section:

- What is the relationship between carbon sequestration and storage and climate change?
- What activities and processes may increase or decrease carbon stored by forests?
- What are the current carbon stocks of the Nantahala and Pisgah NFs?
- What effects do tree harvest and prescribed burning on the Nantahala and Pisgah NFs have on carbon stocks?
- What are the carbon stock trends over time for the Nantahala and Pisgah NFs?

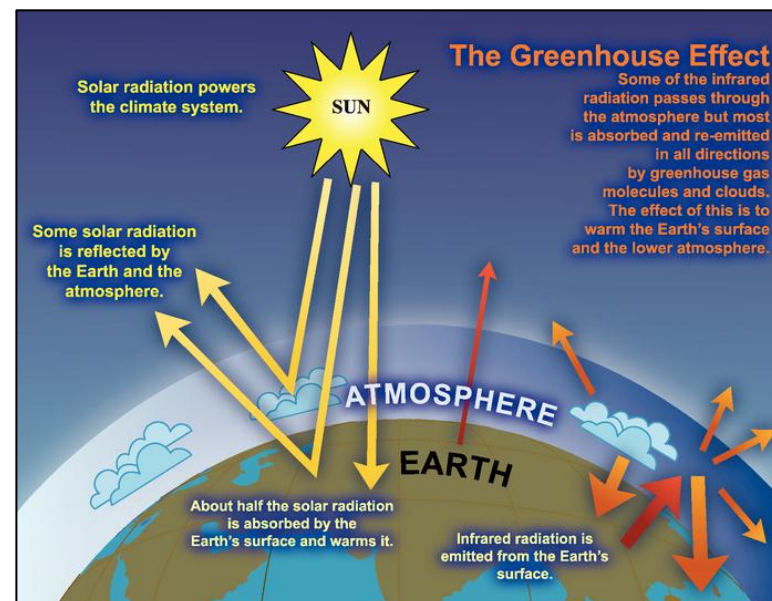
## What is the relationship between carbon sequestration and storage and climate change?

The Forest Service, in its Strategic Framework for Responding to Climate Change, has reported that “climate change is one of the greatest challenges to sustainable management of forests and grasslands and to human well-being that we have ever faced, because rates of change will likely exceed many ecosystems’ capabilities to naturally adapt (USDA Forest Service 2008).

Excess greenhouse gases (GHGs) in the atmosphere are a measureable and significant contributor to a changing climate. Their concentrations have steadily increased over the past century (IPCC 2007). Carbon in the atmosphere (carbon dioxide or CO<sub>2</sub>) has the largest effect of GHGs on the climate. Growth rates of

atmospheric CO<sub>2</sub> are relatively high, with 2010 experiencing one of the largest annual growth rates of the past decade (Global

**Figure 26. A simplified model of the greenhouse effect. Source: IPCC 2007a Ch.1.**

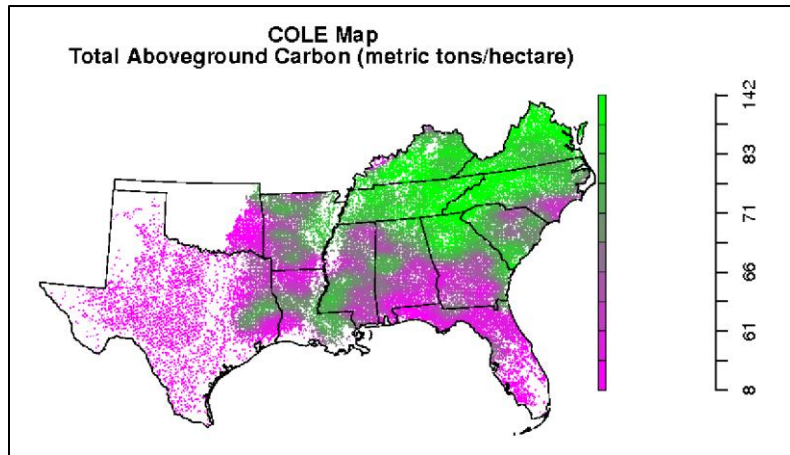


Carbon Project 2011). CO<sub>2</sub> concentration in late 2011 was at 391 parts per million, a level that is higher than at any point during the past 800,000 years (Global Carbon Project 2011; Figure 26). For further information see the Climate Primer: <http://www.fs.fed.us/ccrc/climate-basics/climate-primer.shtml>.

Human activities have led directly to increases in GHG concentrations and therefore an enhanced greenhouse effect. Predicted GHG emission scenarios, based on different assumptions about population growth, energy use, etc., are used by climate scientists to predict future trends of GHG atmospheric

concentrations that are the climate-driving forces used for climate change projections. (Daniels et al. 2012)

Carbon sequestration is the process by which atmospheric CO<sub>2</sub> is taken up by trees, grasses, and other plants through photosynthesis and stored as carbon in biomass (trunks, branches, foliage, and roots) and soils. Forests help to mitigate the climate effects of increasing atmospheric CO<sub>2</sub> concentrations by removing carbon from the atmosphere through the process of vegetative growth and storing carbon as biomass. Worldwide, forests offset up to 60% of global CO<sub>2</sub> emissions from fossil fuel combustion (Pan et al. 2011). However, loss of forest land cover is responsible for about 20% of global human-caused carbon emissions (IPCC 2007). In the U.S., forests and carbon stored in wood products are a net carbon sink and offset about 13% of total U.S GHG emissions (EPA 2012). Forest management activities will play a critical role in ensuring that forests remain a net carbon sink.”



**Figure 27. Forest carbon distribution in the Southeastern US (Carbon On-Line Estimator, Van Deusen and Heath 2013)**

**What activities and processes may increase or decrease carbon stored by forests?**

The Intergovernmental Panel on Climate Change (IPCC) defines mitigation as an intervention to reduce the emissions or enhance the storage of greenhouse gases (IPCC 2007a, IPCC 2007b).

Forests and other ecosystems as carbon sinks provide for mitigation by their very existence as they absorb CO<sub>2</sub>, removing it from the atmosphere. Forest management activities will play a critical role in ensuring that forests remain net carbon sinks (USDA Forest Service 2010c).

The Nation’s forests and grasslands provide clean water, scenic beauty, biodiversity, outdoor recreation, natural resource-based jobs, forest products, renewable energy and carbon sequestration. Sustainable forestry practices can increase the ability of forests to sequester atmospheric carbon and help to mitigate the effects of changing climate while enhancing other beneficial services. For further information see the following link: <http://www.fs.fed.us/ecosystemservices/carbon.shtml>. Effective climate change mitigation requires balancing carbon sequestration with other beneficial services (USDA Forest Service 2008a).

Mitigation is predicated on adaptation: the long-term capacity of ecosystems to capture and store carbon depends in large part on their ability to adapt to a rapidly changing climate. Adaptation and mitigation strategies must complement each other. Carbon accrues in trees, soil, and wood products and the use of wood-based substitutes for fossil fuel-based products decreases the amount of greenhouse gas emissions. However, slow growth and the loss of vegetation to storms, insects, disease, and wildfire results in reduced or direct loss of carbon to the atmosphere. Forest management is important for protecting, maintaining, and improving the amount of carbon stored in forests (USDA Forest Service 2008a).



“Harvested biomass converted into solid wood products, biofuels, or other fossil fuel substitutes may add to the stocks of sequestered carbon which help to mitigate climate change” (USDA Forest Service 2008a, p. 10).

“Most opportunities for increased sequestration of greenhouse gases on forests and grasslands are on private lands” (USDA Forest Service 2008a, p. 10).

“Management practices, such as thinning, revegetation and prescribed fire, designed to maintain or restore forests may, at least over the short- or mid-term, reduce total carbon stocks. However, not taking action to improve ecological health will likely result in substantially lower carbon stocks and substantially increased carbon emissions in the future as the result of forest decline, severe wildfire, and losses from storms, insects, and disease” (USDA Forest Service 2008a, p. 10). USDA Forest Service 2008a)

The Forest Service was established to help stem the Nation’s dramatic forest losses in the 19th century. Within a single generation, net forest loss almost entirely ceased. America’s forests have stabilized at about 750 million acres, one-third of the Nation’s land area. A century of forest conservation and restoration has turned America’s forests from a net carbon source into a net carbon sink (USDA Forest Service 2010c) America’s forests, including the carbon stored in wood products and landfills, offset about 12% to 16% of the carbon dioxide that Americans emitted (EPA 2012).

Forest regrowth in the United States and the attendant high rates of carbon sequestration, however, have limits, linked as they are to recovery from past deforestation and logging practices. Greenhouse gas accumulations in the atmosphere will have uncertain effects on carbon sequestration. On the one hand,

increasing carbon dioxide might accelerate forest growth and carbon uptake; on the other, climate change will exacerbate drought, wildfire, insects, disease, and other disturbances. (USDA Forest Service 2010c)

The National Roadmap for Responding to Climate Change states, “Managing America’s forests and grasslands to adapt to changing climates will help ensure that they continue to produce the benefits that Americans need, while helping to mitigate the effects of a changing climate and to compensate for fossil fuel emissions through carbon storage in healthy forests” (USDA Forest Service 2010c, p. 2)

**What are the current carbon stocks of the Nantahala and Pisgah NFs?**

Existing carbon stocks and changes over time are estimated using Forest Inventory and Analysis (FIA) data, which provides estimates for five pools of carbon within the forest ecosystem. The 2011 estimates for the Nantahala and Pisgah NFs total 72.0 teragrams (Tg or million metric tonnes) +/- 5.0 Tg of carbon. This represents about 0.16% of the total of approximately 45,278 Tg of carbon in forests of the coterminous United States (EPA 2012). The average density of forest carbon is about 68.9 metric tonnes per acre (Mt/ac).

**Table 16. 2011 Nantahala and Pisgah NFs Carbon Stocks (Metric tonnes or Mt)**

Total Carbon	By Carbon Pool				
	Above Ground Live Carbon	Below Ground Live Carbon	Dead Wood Carbon	Litter Carbon	Soil Carbon
72,010,405	35,637,818	6,904,064	4,778,916	3,496,699	21,192,908

**Table 17. Metric Tonnes of 2011 Carbon Stocks by Forest Type and Dominant Tree Size Class**

Forest type field call	Total	Large diameter(sfwd 9 to 19.9;hdwd 11 to 19.9 inches)	Medium diameter(sfwd 5 to 8.9;hdwd 5 to 10.9 inches)	Small diameter(0.1 to 4.9 inches)
Total	72,010,405	55,866,699	14,919,782	1,223,924
Eastern white pine	1,153,498	768,998	384,500	-
Eastern white pine / eastern hemlock	544,009	544,009	-	-
Red spruce / balsam fir	685,075	685,075	-	-
Table Mountain pine	128,233	128,233	-	-
Eastern white pine / northern red oak / white ash	752,972	752,972	-	-
Shortleaf pine / oak	439,480	439,480	-	-
Virginia pine / southern red oak	326,774	99,732	227,042	-
Other pine / hardwood	2,966,790	1,458,405	1,508,385	-
Post oak / blackjack oak	312,667	312,667	-	-
Chestnut oak	12,507,572	10,742,086	1,398,159	367,327
White oak / red oak / hickory	8,906,424	6,362,810	2,352,346	191,268
Northern red oak	3,488,013	2,473,643	517,926	496,445
Yellow-poplar / white oak / northern red oak	13,889,880	12,749,678	1,140,202	-
Scarlet oak	1,795,803	679,210	1,116,593	-
Yellow-poplar	5,044,214	4,401,474	642,740	-
Chestnut oak / black oak / scarlet oak	3,231,630	2,635,043	596,587	-
Cherry / white ash / yellow-poplar	427,689	-	427,689	-
Red maple / oak	101,336	-	101,336	-
Mixed upland hardwoods	7,302,535	5,258,311	2,044,224	-
Sugar maple / beech / yellow birch	5,310,633	3,157,876	2,152,757	-
Black cherry	168,884	-	-	168,884
Hard maple / basswood	2,526,295	2,216,998	309,298	-

**What effects do tree harvest and prescribed burning on the Nantahala and Pisgah NFs have on carbon stocks?**

Trees harvested from the Nantahala and Pisgah NFs are converted to a variety of primary wood products. Sawtimber may be converted partially into lumber that remains in structures for many years. Bark, chips and sawdust may be used for other products or uses, such as paper or to generate electricity, which given off as emissions over different periods. Landfilled residues and waste are often sequestered for extended periods of time. Forest Service

Research has developed methods to estimate the uses of harvested wood and the rates at which the carbon in various products are sequestered or emitted to the atmosphere.(Smith, et al 2006).

Annual harvests from the Nantahala and Pisgah NFs average 65,940 ccf (USDA Forest Service 2014). On average 0.06% of the standing total stocks of carbon are harvested each year. Of this annual harvest it is estimated that more than 30% will remain in a sequestered state (wood products in use or in landfills) after 50 years (See table 19).

**Table 18. Nantahala and Pisgah NFs Fate of Carbon from Annual Average Forest Harvests**

<b>Year After Harvest</b>	<b>Total C in Allowable Sales Quantities (metric tons)</b>	<b>C Remaining in Primary Wood Products (metric tons)</b>	<b>Wood Product C Accumulating in Landfills (metric tons)</b>	<b>Total Carbon Emissions (metric tons)</b>	<b>Emitted with Energy Use (metric tons)</b>	<b>Emitted without Energy Use (metric tons)</b>
0	44,489					
10		13,640	5,543	25,306	15,520	9,786
20		9,463	7,040	27,986	16,414	11,572
30		7,607	7,576	29,306	16,722	12,584
40		6,365	7,900	30,223	16,875	13,348
50		5,460	8,141	30,887	16,936	13,952

Table 20 displays the total GHG emissions from Nantahala and Pisgah NFs as a total of all US emissions. The Nantahala and Pisgah NFs have a relatively small prescribed burning program, with an average of 8,116 acres burned annually. Emissions from these activities represent a small fraction of the total carbon stocks of the forest as well as the carbon estimates in available fuels.

Annual prescribed burning emits carbon at the rate of only about 0.4% of the carbon in down wood and litter, but only 0.05% of the total standing carbon stocks. Prescribed burning generates GHG emissions other than carbon as methane and nitrogen oxides. Estimates of these emissions and comparisons of their effects as CO<sub>2</sub> Equivalents are presented in Table 21.

**Table 19. Total GHG Emissions 2009 (includes land use change)**

	Million Mt CO <sub>2</sub> e	% of US Total
United States	5,209.70	100.00%
Region 8 State Totals	2003.1	38.45%
North Carolina	123.9	2.38%
Nantahala-Pisgah NF	1.32	0.03%

**Table 20. Nantahala and Pisgah NFs Emissions from Annual Average Prescribed Burning**

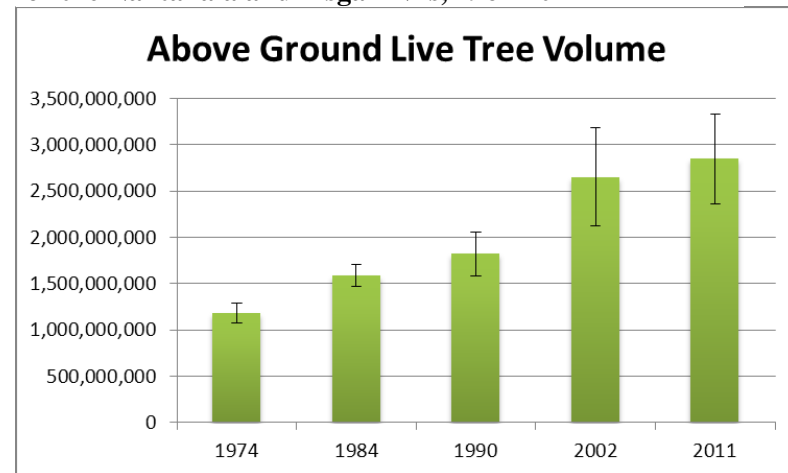
GHG GAS	EMISSION FACTOR (lb/metric ton)	EMISSION FACTOR (lbs/U.S. ton)	FUEL CONSUMPTION (tons/acre)*	ACRES BLACKENED (acres)**	TOTAL EMISSIONS (lbs)	TOTAL EMISSIONS (metric tons)	CO <sub>2</sub> Equiv. (metric tons)
CARBON DIOXIDE - CO <sub>2</sub>	3,457.00	3,137.00	3.00	8,116.00	76,379,676.00	34,645.82	34,645.82
METHANE -CH <sub>4</sub>	11.90	10.80	3.00	8,116.00	262,958.40	119.28	2,504.84
NITROGEN DIOXIDE -N <sub>2</sub> O	0.46	0.42	3.00	8,116.00	10,226.16	4.64	1,437.96

**What are the carbon stock trends over time for the Nantahala and Pisgah NFs?**

Forest carbon stocks fluctuate over time as the forest grows and goes through varying levels of impact from disturbance. When the Nantahala and Pisgah NFs were established, the land had been heavily cut over. Some of the land had been rained and cultivated for agriculture. Reforestation, fire protection, and limited harvests provided for regrowth of the forest and large accumulations of carbon stocks. Forest Inventory and Analysis (FIA) inventories reflect the impacts from the original condition of these forests and the continued growth and recovery that continues today.

Based on trends in tree volume estimates from FIA, the Nantahala and Pisgah NFs have been a steady carbon sink for a number of decades. The most recent inventories indicate that the Nantahala and Pisgah NFs is a carbon sink, with most recent 9-year accumulations at the rate of about 7.3%. Although this increase is well within the sampling error for the inventory, the trends reflect that a continued increase over time without interruption. These estimates include the growth, mortality, and harvests. Even considering the current harvest and burning levels the forest maintains large carbon stocks that continue to grow, although the growth rates may be slowing and close to reaching their upper limits.

**Figure 28. Total above ground live tree volume estimates for the Nantahala and Pisgah NFs, 1964-2011**



# Exhibit 7

## Projecting wildfire area burned in the south-eastern United States, 2011–60

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**Abstract.** Future changes in society and climate are expected to affect wildfire activity in the south-eastern United States. The objective of this research was to understand how changes in both climate and society may affect wildfire in the coming decades. We estimated a three-stage statistical model of wildfire area burned by ecoregion province for lightning and human causes (1992–2010) based on precipitation, temperature, potential evapotranspiration, forest land use, human population and personal income. Estimated parameters from the statistical models were used to project wildfire area burned from 2011 to 2060 under nine climate realisations, using a combination of three Intergovernmental Panel on Climate Change-based emissions scenarios (A1B, A2, B2) and three general circulation models. Monte Carlo simulation quantifies ranges in projected area burned by county by year, and in total for higher-level spatial aggregations. Projections indicated, overall in the Southeast, that median annual area burned by lightning-ignited wildfire increases by 34%, human-ignited wildfire decreases by 6%, and total wildfire increases by 4% by 2056–60 compared with 2016–20. Total wildfire changes vary widely by state (–47 to +30%) and ecoregion province (–73 to +79%). Our analyses could be used to generate projections of wildfire-generated air pollutant exposures, relevant to meeting the National Ambient Air Quality Standards.

**Additional keywords:** climate change, human-caused wildfire, land use, lightning-caused wildfire.

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### Introduction

Wildfire activity in the south-eastern USA is determined by two major factors: climate and society. Climate change is expected to alter patterns of precipitation, temperature and the severity of droughts, which will impact on the accumulation of fuels and the occurrence of favourable wildfire conditions in the region (e.g. Liu *et al.* 2013). Simultaneously, it has long been recognised (e.g. Prestemon *et al.* 2002; Mercer and Prestemon 2005; Prestemon and Butry 2005; Mercer *et al.* 2007; Prestemon *et al.* 2013) that humans are a dominant factor affecting ignition rates and the arrangement of fuels on the landscape. Although humans start most wildfires in the region, they also devote substantial resources to suppressing wildfires to limit their areal extent and associated damages (e.g. Butry *et al.* 2001), and they manage fuels, in part, to limit wildfire severity and intensity. Therefore, to

gain insight into how climate change is likely to affect wildfire (e.g. Liu *et al.* 2013), the role of humans must be considered.

In addition to uncertainty regarding capturing the direct roles of humans in influencing ignition sources and fuels distributions and, thereby, the overall expected extent of wildfires, there is uncertainty about how society and climate will jointly evolve over time. The Intergovernmental Panel on Climate Change (IPCC) has published several assessments describing how climate will change under different greenhouse gas (GHG) emission scenarios. Nakicenovic and Steward (2000) elaborate how these emissions scenarios emerge under varying assumptions regarding energy policies, economic output trends and human population growth. These varying assumptions, along with the projected changes in climate, define scenario-storylines that were the data inputs into descriptions of various possible

land-use futures in the south-eastern US (e.g. Wear 2013), including those of forestland, a critical variable affecting wildfire activity. The scenario-storylines were also the inputs into projections of possible futures regarding population and income growth in the region (and worldwide). Nobody knows precisely how emissions or society will change, but capturing the variety of potential changes in all of these variables (as inferred by the approach used by Littell *et al.* (2009), for example) would be an important step towards understanding how they combine to produce a picture of a wildfire future for the Southeast.

The primary objective of the present research was to project area burned in 13 south-eastern states of the United States during the period 2011–60, while accounting for projected changes in climate and society, including land use. To do this, we built statistical models of wildfire annual area burned, estimated by county within ecoregion provinces (Bailey 1995) for the historical period 1992–2010. Models were specified as functions of temperature, precipitation, potential evapotranspiration, personal income, population and land use. The estimated statistical models were then used in projection mode, using exogenous projections to 2060 of the same variables used in the model-building phase of the analysis. Three different emission scenarios were used in each of three general circulation models to generate nine realisations of future climate. The three emissions scenarios were A1B and A2 from the IPCC's Third Assessment Report, and B2, from a somewhat earlier model (see Joyce *et al.* 2014). Projections of land use, population and personal income, provided by the 2010 Resources Planning Act (RPA) Assessment (USDA Forest Service 2014a, 2014b) for each of these three scenarios, were combined to enable modelling to generate envelopes of possible futures of wildfire area burned, annually to 2060, by county, which can then be reported by state and by ecoregion province. Because of our attention to land-use and societal changes, motivated by theory regarding wildfire management (e.g. Donovan and Rideout 2003) and empirical evidence (Prestemon *et al.* 2002; Mercer and Prestemon 2005; Mercer *et al.* 2007; Butry *et al.* 2010), the present effort differs from studies that focus only on wildfire changes, and due only to climate change. The wildfire projections resulting from this effort therefore provide a more comprehensive picture of the range of possible futures of wildfire in the region by capturing projected changes in human factors.

The modelling and projection effort we describe differs significantly from other efforts to project changes in area burned, and their consequences, in a changing climate. A comprehensive review of past efforts is in Flannigan *et al.* (2009), who enumerate and classify modelling studies that project future wildfire. Our study extends these earlier efforts in three ways. First, this is the first study we are aware of to project future area burned in the south-eastern US. Second, we estimate not only the effects of climate change, but also land-use changes and shifts in the societal factors that affect area burned. Third, we address issues of data quality that are commonly found in wildfire activity databases (Short 2015), using a technique (Heckman 1979) common in the econometrics literature but not, as far as we are aware, applied in models for projecting wildfire area burned.

## Methods

### *Theoretical structure*

Wildfire area burned ( $W$ ) by either lightning or human causes is posited to be dependent on the availability of ignition sources, fuels, weather favourable for ignition and spread, and intentional and unintentional contributions by humans ('Society'):

$$W = f(\textit{Weather}, \textit{Fuels}, \textit{Society}) \quad (1)$$

Mercer and Prestemon (2005) documented how wildfire is affected by these sets of variables, while Mercer *et al.* (2007) described the theoretical underpinning for managerial interventions in wildfire processes. Consistent with descriptions by Donovan and Rideout (2003) and Mercer *et al.* (2007), among others, we also describe a Cost plus Net Value Change (CNVC) model, whose objective function minimises expected CNVC with respect to wildfire management input quantities. Abstracting from Mercer *et al.* (2007) by ignoring terms associated with long-run discounting, we have:

$$\min_{\mathbf{x}} E[\textit{CNVC}] = \mathbf{w}'\mathbf{x} + VE[W(\mathbf{x})] \quad (2)$$

where  $\mathbf{x}$  is a vector of wildfire management inputs;  $\mathbf{w}$  is a conformable vector describing the costs of those inputs;  $V$  quantifies the value at risk per unit of wildfire area burned;  $W$  is area burned; and  $E$  is the expectations operator (because area burned is a stochastic variable). In solving Eqn 2, at the optimum, the last unit of wildfire management input deployed is valued equally to the cost of the last unit of loss averted owing to the unit of input applied. In other words, wildfire managers (or society, more broadly) act to deploy costly and scarce resources (labour, capital, materials) to wildfire management in order to avert even greater losses of social welfare (values at risk) due to wildfire. One implication of the wildfire manager's actions is that, as values at risk increase owing to increased prevalence of weather and fuel favourable to fire ignition and spread, the optimal amount of resources devoted to wildfire management will also increase. Generally, on private lands, particularly in the south-east US, where private lands dominate, changes in these values at risk are beyond the direct control of wildfire managers; they instead derive from the broader economy and society.<sup>1</sup> In empirical modelling, values at risk can be represented by the number of people living in fire-prone landscapes, the value of their structures, and the value of vulnerable natural resources such as timber (e.g. Butry *et al.* 2001). Therefore, as the density (number of structures per unit of fire-prone landscape) rises along with human population and wealth, so will  $V$  in Eqn 2. Similarly, as wealth increases, the (market) value of each additional structure is also expected to rise (e.g. Mankiw and Weil 1989), further increasing  $V$ . Because timber and most other natural resources have market values that are far less than those of structures, development that reduces the quantity of natural resources on the landscape would only slow the rate of increase with rising wealth for a  $V$  that is calculated solely using market values.

<sup>1</sup>Landowners and public land managers, however, can alter the quantity of values at risk by managing fuels, reducing unwanted human-caused wildfire ignitions through fire prevention efforts, and making structures more fire-resistant.



The quantity of the values at risk can change not only owing to the weather, but also because of the availability of fuels. Because fuels are more contiguous and abundant in forests compared with other land uses in the south-eastern US, greater forest area can be linked to greater wildfire area burned, holding physical variables affecting wildfire (e.g. slope, weather conditions) constant. Increased population, requiring more structures, is associated with increased road densities and other interruptions of fuel contiguity on landscapes, which can slow wildfire spread, and provide easier access for firefighting, leading to less area burned (e.g. Mercer and Prestemon 2005; Narayanaraj and Wimberly 2012; Syphard *et al.* 2012). So the forest loss associated with increased population and economic activity can decrease values at risk by limiting how much wildfire burns on the landscape – although the link between area burned and values at risk is not necessarily linear or constant across space, or even across wildfires, owing to variations in fuels, wildfire intensities and severities, and the valuable resources, structures, and humans that each fire encounters. Likewise, humans intentionally or unintentionally ignite most wildfires in the United States at large, and in the Southeast in particular (Prestemon *et al.* 2013). These ignitions can be reduced by wildfire prevention (Butry *et al.* 2010) and law enforcement efforts (Prestemon and Butry 2005). A greater number of humans, holding other variables constant, would imply a greater number of fire ignitions due to accidental and intentional actions, but greater values at risk and larger human populations imply greater wildfire prevention and law enforcement efforts. Therefore, the net effect of increases in population and values at risk on wildfire ignitions is ambiguous, owing to the competing influences of greater prevention efforts and law enforcement, and greater human contact with fuels.

In modelling annual area burned, analysts need to acknowledge the possibility that the wildfire area burned data may be incomplete (e.g. Malamud *et al.* 2005; Short 2015) and also that wildfire occurrence is highly variable when viewed across broad landscapes. In the statistical modelling for the present study, we accounted for both of these phenomena partly owing to suggestions by K. C. Short (unpubl. data) regarding data adequacy for every county and year in our historical dataset. Another reason was our conception that the processes involved in determining whether a wildfire occurs at all in a spatial and temporal unit of inference is different from that determining total area burned in the spatial-temporal unit (Mercer and Prestemon 2005). Not accounting for either data quality or the truncated distribution of wildfire area burned in estimating statistical models (e.g. simply regressing area burned in a spatial-temporal unit on a set of predictors) could lead to biased and inconsistent estimates of the area burned production process (e.g. Heckman 1979; Greene 1992; Short 2014; Short 2015). To account for variable data quality and area burned distribution truncation, we specify an empirical model structure that accounts for sample selection (Heckman 1979) at two stages in advance of estimating a final-stage equation of wildfire area burned by cause category. Stage 1 is on the existence of a ‘valid’ observation, where ‘valid’ has been determined by K. C. Short (unpubl. data) based on whether the observation on reported wildfire area burned (a valid observation could be 0 ha burned, for example) is likely to reflect actual wildfire area burned accurately for each spatial and temporal unit. This stage involves estimating a statistical model that predicts

whether each spatial-temporal unit of observation is valid. A summary statistic of this equation estimate, the Inverse Mills Ratio (IMR), measures the likelihood of each observation’s validity. Stages 2 and 3 are estimated using a two-step estimator. Stage 2 controls for the truncation of the dependent variable at zero, and quantifies the probability that a valid observation has zero reported wildfire, given the IMR from the first stage, as well as a set of additional exogenous predictor variables. Finally, Stage 3 is an ordinary least-squares equation relating the area burned, if non-zero, to a set of exogenous predictors and the IMRs from Stages 1 and 2.

More specifically, in the statistical modelling, we estimated equations at each stage sequentially: we estimated the first stage and calculated the first-stage IMR; estimated the second stage that included the first stage IMR as an additional predictor, and, with that equation, calculated the second-stage IMR; and estimated the third stage that included both IMRs as predictors. The first stage of the three-stage wildfire model controls for the selection effect of inadequate data. All observations for all counties and all years in our dataset were coded as 1 if not valid, and 0 otherwise. Although the value of the IMR varies from one observation to another, for all observations included in an equation with the IMR from an earlier stage, the coefficient measures the direction of the biasing effect of sample selection.

This first-stage equation, a probit model, controls for the potential biasing effects of non-randomness in the sample of observations making it into the next stage of estimation. Heckman’s (1979) insight is that the sample selection (dropping of particular observations) is a form of omitted variables bias, which can lead to incorrect inference and lead to poor out-of-sample performance of the resulting estimated equation. In the Heckman (1979) approach, the probit model explaining the selection bias is based on a theory explaining the selection process. When the resulting IMR is included in the subsequent equation estimated on the remaining data, parameter estimates are, in the limit, unbiased. The first-stage probit model is (Greene 1992, p. 663):

$$\text{Prob}[Y_i = 1] = \Phi(\beta_1' \mathbf{x}_{1,i}) \quad (3)$$

where  $Y_i = [0,1]$  is a discrete variable identifying whether the observation on wildfire area burned (in our case) is valid (0) or not valid (1);  $\Phi(\cdot)$  is the Standard Normal probability distribution function;  $\mathbf{x}_{1,i}$  is a vector of variables for observation  $i$  that are hypothesised to be related to the validity of the observation; and  $\beta_1$  is a vector of estimation parameters conformable to  $\mathbf{x}_1$ . From an estimate of Eqn 1, the IMR for the  $i$ th observation ( $\lambda_{1,i}$ ) can be calculated (Heckman 1979):

$$\lambda_{1,i} = \frac{\phi(Z_{1,i})}{\Phi(-Z_{1,i})}, \quad (4)$$

$$Z_{1,i} = -\beta_1' \mathbf{x}_{1,i} / \sigma_1$$

where  $\phi(\cdot)$  is the Standard Normal probability density and  $\sigma_1$  is the standard error of the estimate of the residuals in Eqn 3. Variables in the set of predictors ( $\mathbf{x}_1$ ) for observation validity could include indicators of the state from which the observation derives, because state and federal agencies in charge of data

**Table 1.** Groups of ecoregion provinces and the selection model stages in the final versions of statistical models

Ecoregion provinces included in the model	Lightning wildfire selection model stages	Human wildfire selection model stages
Eastern Broadleaf Forest (Oceanic) (221)	2	3
Eastern Broadleaf Forest (Continental) (222)	3	3
South-eastern Mixed Forest (231)	3	3
Coastal Plain mixed Forest (232), Lower Mississippi Riverine Forest (234), Everglades (411)	3	3
Prairie Parkland (Temperate) (251), Prairie Parkland (Subtropical) (255), Great Plains Steppe and Shrub (311), South-west Plateau and Plains Dry Steppe and Shrub (315), Chihuahuan Semidesert (321), Great Plains–Palouse Dry Steppe (331), Great Plains Steppe (332)	2	2

reporting may have variable success across space and time in reporting wildfires completely and in a statistically unbiased way (Short 2014; Short 2015). Variables in  $\mathbf{x}_1$  could also include measures of weather, fuels and human factors that are themselves hypothesised to be related to wildfire processes.

The second stage evaluates whether an observation that is valid has recorded wildfire area burned that is greater than zero.<sup>2</sup> For the present study, this second stage seeks to explain why the area burned by a human- or lightning-ignited wildfire is greater than zero in a particular county in a particular year. This stage includes the IMR from Stage 1 as an additional explanatory variable:

$$\text{Prob}[A_i = 1|Y_i = 0] = \Phi(\beta'_2 \mathbf{x}_{2,i} + \gamma_1 \lambda_{1,i}) \quad (5)$$

where  $A_i = [0,1]$  indicates if the area burned for observation  $i$  is zero ( $A_i = 0$ ) or positive ( $A_i = 1$ );  $\mathbf{x}_{2,i}$  is a vector of variables for observation  $i$  that are hypothesised to be related to whether wildfire area burned was greater than zero for observation  $i$ ;  $\beta_2$  is a vector of estimation parameters conformable to  $\mathbf{x}_2$ ; and  $\gamma_1$  is a parameter measuring the effect of sample selection in the first stage on the probability of non-zero wildfire area burned, which controls for the potentially biasing effects (on the estimate of  $\beta_2$ ) of observation validity. Examples of variables in  $\mathbf{x}_2$  affecting wildfire area burned could include summary measures of weather, fuels and societal factors. As in the first stage, the IMR for the  $i$ th observation of the second stage ( $\lambda_{2,i}$ ) can also be calculated for each observation where  $Y_i = 0$ :

$$\lambda_{2,i} = \frac{\phi(Z_{2,i})}{\Phi(-Z_{2,i})}, \quad (6)$$

$$Z_{2,i} = -\frac{\beta'_2 \mathbf{x}_{2,i} + \gamma_1 \lambda_{1,i}}{\sigma_2}$$

where  $\sigma_2$  is the standard error of the estimate of the residuals in Eqn 5.

The third and final stage of modelling of wildfire area burned is a least-squares equation relating non-zero area burned to a set

of predictors  $\lambda_{1,i}$ , and  $\lambda_{2,i}$  into the equation specification to control for both the validity of the observation and the likelihood of zero area burned:

$$E[W_i|Y_i = 0, A_i = 1] = \beta'_3 \mathbf{x}_{3,i} + \alpha_1 \lambda_{1,i} + \alpha_2 \lambda_{2,i} \quad (7)$$

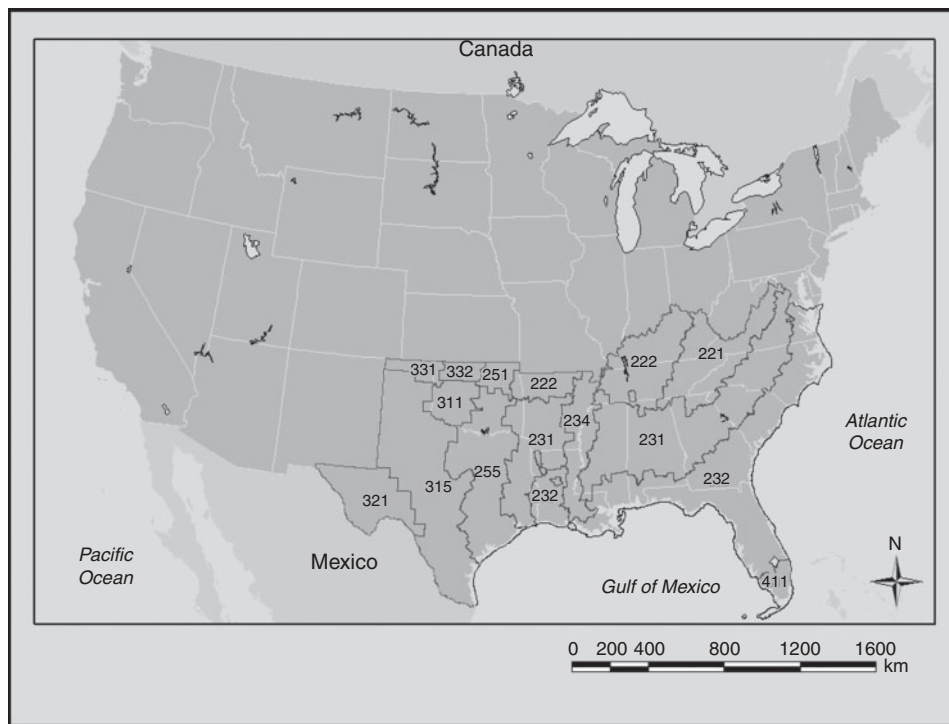
where  $W_i > 0$  is area burned;  $\mathbf{x}_{3,i}$  is a vector of variables for observation  $i$  that are hypothesised to be related to area burned, given that an observation was both valid and greater than zero;  $\beta_3$  is a vector of estimation parameters conformable to  $\mathbf{x}_3$ ; and  $\alpha_1$  and  $\alpha_2$  control for the potentially biasing effects (on the estimate of  $\beta_3$ ) of the probability that the observation is valid, and the probability that it is non-zero respectively. Variables contained in  $\mathbf{x}_3$  could be the same variables (in  $\mathbf{x}_2$ ) used to predict whether a unit of observation had zero wildfire.

## Data and model development

### Historical data

Historical wildfire data on annual area burned by lightning and annual area burned by human causes (which we call ‘human-ignited’) in acres by county for the years 1992–2010 were obtained from K. C. Short (unpubl. data) for estimating Eqns 1–5. Data were aggregated (i.e. the area burned was added up across all wildfires of (i) lightning cause, and (ii) all wildfires of other causes, including unknown cause, which we label ‘human’) to the county spatial unit and annually, based on the county of origin and the date of wildfire ignition. As recommended by K. C. Short (unpubl. data), observations of wildfire area burned by lightning and humans were flagged as not valid, but the indicator of observation validity and a set of predictor variables associated with each observation were used in the first of the three stages of the wildfire statistical model estimation process. Each model of lightning wildfire and of human-ignited wildfire was separately estimated for five spatial domains based on ecoregion provinces found in the south-eastern US (Bailey 1995), shown in Table 1. Counties were assigned to whole ecoregion provinces based on Butry (2003). Fig. 1 is a map of the ecoregion provinces for the Southeast.

<sup>2</sup>An alternative functional form at this stage would be the Tobit model rather than a Heckman sample selection model. Preliminary tests showed that the Tobit performed significantly worse in out-of-sample predictions compared with the Heckman sample selection model.



**Fig. 1.** Bailey's ecoregion provinces in the south-eastern US, with delineations drawn at county lines (source: Butry 2003).

The form of weather observations included as predictors in the three-stage statistical models of wildfire annual area burned was based on what was available from temporal and spatial downscaling emerging from general circulation model (GCM) projections. Weather data for the historical time series (1992–2010) were obtained from the historical data assembled for the Parameter-elevation Regressions on Independent Slopes Model (PRISM) developed by [Daly et al. \(2002\)](#). Potential evapotranspiration (PET) was calculated using a modified [Linacre \(1977\)](#) method described by [Joyce et al. \(2014\)](#). Daily data on these four measures for each county were summarised as monthly values (average maximum and minimum temperature, total precipitation, average PET) for each county. In equation specifications for [Eqns 3–7](#), only the aggregated observations for January, March, May, July and September were used. The January–September range corresponded best with fire seasons across the south-eastern US. Initial data exploration indicated that intertemporal correlations of monthly meteorological variables fall with temporal distance; including all months runs the risk of multicollinearity. Hence, we omitted meteorological observations from the intervening months in the equation estimation.

Data on county land area and historical forest land use by county were obtained from the [USDA Forest Service \(2014a\)](#), with methods on land use described in [Wear \(2013\)](#). Data for the historical time series were reported only for 1997 and for 2010. Data for intervening years were obtained by linear interpolation (1998–2009) and extrapolation (1992–96).

Data on population by county in the historical time series were obtained from the [US Census Bureau \(2012\)](#). Data on annual personal income by county ([US Bureau of Economic](#)

[Analysis 2013a](#)), 1992–2010, were converted to real values (in constant 2005 US dollars) with the US gross domestic product deflator ([US Bureau of Economic Analysis 2013b](#)).

#### *Projected data*

Climate inputs for the statistical models for the projection period, 2011–60, were statistically downscaled from three GCMs ([Daly et al. 2002](#)), namely the MIROC32, the CSIRO-MK35 and the CGCM31, for each of three IPCC emission scenarios (A1B, A2, B2), producing nine climate projections for the region. The statistically downscaled data for each of these nine projections were obtained from [Joyce et al. \(2014\)](#), who produced them for the 2010 RPA assessment using data from the IPCC, at 5-arcmin resolution in latitude–longitude coordinates. They were remapped to a Lambert Conformal Conic map projection grid at 12-km resolution for an air-quality modelling domain that includes 13 states from eastern Texas to the Carolinas east to west, and Kentucky to Florida north to south, for eventual use in regional air quality assessments. To generate county-level meteorological data for area burned projections, county-level averages of daily maximum and minimum temperature, total precipitation and PET were averaged across all of the model grid cells whose majority area was in the county.

Land area and land-use data by county and by year for each emissions scenario (A1B, A2, B2) in the projection years were obtained from [Wear \(2013\)](#). Projections of land use were by 10-year increments (2010, 2020, 2030, 2040, 2050, 2060) for each of the three scenarios. Intervening-year values for each county were calculated using linear interpolation. Data on

**Table 2.** Variables used in the initial empirical specification for each stage of the empirical modelling

	Stage 1 (data validity flag, probit)		Stage 2 (non-zero wildfire, probit)		Stage 3 (least-squares)	
	Lightning	Human	Lightning	Human	Lightning	Human
Monthly average daily maximum temperature (°C)	X	X	X	X	X	X
Monthly average daily PET	X	X	X	X	X	X
Monthly total precipitation (mm)	X	X	X	X	X	X
Land area (km <sup>2</sup> )	X	X	X		X	X
Forest land-use area (km <sup>2</sup> )	X	X		X	X	X
Population	X	X	X	X	X	X
Population density (population per land area)	X	X	X	X	X	X
Personal income per capita (real personal income, US\$ per population)	X	X	X	X	X	X
State dummy variables	X	X	X	X	X	X

population and personal income (real, in constant 2005 US dollars) were obtained from [USDA Forest Service \(2014b\)](#) projections made at 5-year increments for each scenario. Inter-vening-year values were calculated using linear interpolation. Land areas by county were held at the initial totals for 1997 reported in [Wear \(2013\)](#).

We chose the older climate projection models that supported the IPCC Third Assessment Report, The Coupled Model Inter-comparison Project Phase 3 (or CMIP3), rather than the analogous supporting models of the Fifth Assessment Report (CMIP5) for two main reasons. First, unlike the CMIP5 scenarios, the CMIP3 scenarios are directly, mechanistically linked to internally consistent projections of human population and economic growth that are tied to the emissions scenarios – that is, they form an internally consistent picture of societal development under alternative emissions pathways. Second, projections of county-level income, population and land use were produced in the 2010 RPA Assessment, providing a ready dataset of not just the evolution of climate at fine spatial scales in the United States, but also variables that we assert are connected to wildfire. Updating the projections based on CMIP5, including more recently available alternative representative concentration pathways (RCPs), would require identifying population and economic projections for the United States Southeast, and hence the region's land-use futures, that are consistent with the CMIP5 RCPs. The extra effort required is beyond the scope of this analysis. We note that the CMIP5 RCPs, if we were able to use them, could conceivably alter our conclusions, but [Knutti and Sedláček \(2013\)](#) showed that the CMIP5 projections *per se* are not significantly different from the CMIP3 (and fourth phase, CMIP4), and their uncertainty remains almost the same, even though climate projection methods themselves have been refined in later iterations. Additional evidence of their similarity is available from [IPCC Working Group I Technical Support Unit \(2015, p. 811\)](#).

#### Model development

Given the large number of potential predictor variables, we employed a model selection approach to final model identification in all three stages of the statistical modelling. The list of predictor variables used in the initial (full) equation specifications for each of the three stages differed slightly across stages, across lightning- vs human-caused wildfires, and across ecoregion provinces. Differences across ecoregion provinces involved dummy

variable intercept shifters measuring the effects of individual states and constituent ecoregion provinces for cases where the data for counties in multiple ecoregion provinces were included together in a single ecological domain model (e.g. the models for aggregated ecoregion provinces 232, 234 and 411).

In model estimation, we began with the full list of variables shown in the first column of [Table 2](#) and estimated models using a subset of the data – i.e. only covering 1992–2003, which we call the ‘in-sample’ data. We reduced the numbers of predictor variables to arrive at final specifications for each stage in every lightning- and human-caused wildfire in each ecological domain by dropping statistically insignificant variables until all included variables were at *P* values smaller than 0.10. Once these final specifications were found, we examined their out-of-sample forecast performances for the held-out sample (2004–10), i.e. the out-of-sample data. Fit statistics for the out-of-sample forecasts were recorded, and then the final specifications based on the in-sample data were re-estimated using the entire dataset (1992–2010). It was these whole-sample model estimates that were used in the projection modelling (2011–60). Statistics of wildfire area burned by lightning and by human causes are summarised for all of the valid observations of annual area burned in the counties within the ecoregion provinces included in model estimation ([Table 3](#)).

As [Heckman \(1979\)](#) explained, bias can be eliminated (in large samples) or reduced (in smaller samples) in the presence of sample selection as long as the first stage of the selection model accurately explains the selection process. We hypothesised that the validity of the observation of wildfire area burned in a county in a year (i.e. that  $Y_i = 0$ ) was related in unknown ways to the efforts by the government fire-occurrence reporting agencies to record wildfire occurrences consistently, which were in turn related to factors affecting the overall extent of wildfire (e.g. large fires are more likely to be observed and recorded). For this reason, we included the same variables in the specification of Eqn 3 as we did in subsequent stages in the modelling. Model selection (the process of dropping insignificant variables to arrive at a specification) naturally led to a specification of Stage 1 equations that differed from those of subsequent stages.

One concern in employing the model selection approach was the introduction of biases in statistical models that could have led to poor out-of-sample forecasts of area burned. A comparison of the area burned predictions made in-sample (i.e. using models

**Table 3. Summary statistics for wildfire area burned for annual area burned by county, in hectares, 1992–2010**

		Ecoregion province number				
		221	222	231	232, 234, 411	251, 255, 311, 315, 321, 331, 332
Lightning wildfire	Valid observations	1601	1423	4687	4504	1132
	Mean area burned observed (ha)	12	5	15	127	24
	Standard deviation area burned observed (ha)	95	110	143	1599	182
	Minimum area burned observed (ha)	0	0	0	0	0
	Maximum area burned observed (ha)	2361	4047	5564	50226	3844
Human-caused wildfire	Valid observations	1601	1423	4687	4504	1132
	Mean area burned observed (ha)	244	113	154	271	403
	Standard deviation area burned observed (ha)	701	348	396	928	1804
	Minimum area burned observed (ha)	0	0	0	0	0
	Maximum area burned observed (ha)	10884	5404	10035	29278	32786

estimated with data for 1992–2003) with the area burned predicted out-of-sample (i.e. 2004–10) allowed us to evaluate whether the model selection procedure resulted in reduced forecast performance. Goodness-of-fit measures included bias (average prediction error in area burned), percentage bias, root mean-squared error, maximum absolute error and mean absolute error. Bias was a primary criterion used to evaluate forecast performance, whereas the other fitness measures were used secondarily. If bias was detected in out-of-sample performance, we returned to the full model specifications and did not drop some ‘borderline’ variables (i.e. those with *P* values in the 0.10 to 0.20 range). This process was continued until a final specification for each stage was identified.<sup>3</sup>

The final empirical specification of the three-stage selection models depended in part on whether the coefficient estimate for the IMR from the first stage was statistically significant in the second-stage model estimate. If not, the first stage was dropped for the final version of the second- and third-stage model estimates (Table 1), resulting in the standard two-stage selection model (i.e. Stages 2 and 3 in our framework) described by Heckman (1979).

Not included among the list of potential predictor variables (Table 2) were direct measures of wildfire suppression, prescribed fire, the fuel treatment effects of wildfire, or fire prevention. Firefighting organisations in the United States seek to comply with standards advanced by the National Fire Protection Association, which recommend that capacity levels adjust to changing densities of structures and other landscape features at risk of fire to maintain minimum staffing and average response times (e.g. National Fire Protection Association 2015). We therefore assume that firefighting agencies adjust their staffing and response times in step with changes in values at risk that were measured by the land-use and other socioeconomic variables included in the statistical equations. Omission of variables that would account for the fuel treatment effects of wildfire (e.g. Mercer *et al.* 2007), which tend to reduce area burned in subsequent periods, implies

that such treatment effects are accounted for generally by the intercepts and variables accounting for states and ecoregions, which capture historical wildfire activity. A shortcoming of this assumption is that in places with large positive changes in projected wildfire, these projections would be positively biased, and the reverse would be true for locations with large negative changes in projected wildfire. Another underlying assumption is that the relationship of wildfire to the included variables takes into account the effects of prescribed fire on annual area burned. Prescribed fire currently is, and has been historically, an important part of public and private management of southern pine forests, especially in ecoregion provinces 231 and 232. The implication of explicitly omitting them in these two provinces in particular is that prescribed fire activity, including operational windows for burning, is assumed to be explained by the societal and climatic variables already appearing in the estimated statistical models. Finally, studies show that wildfire prevention efforts are effective in reducing occurrences of wildfire (e.g. Prestemon *et al.* 2010). An assumption of our modelling was therefore that the other included variables in the statistical models adequately accounted for the spatial and temporal variations in wildfire prevention efforts.

#### Monte Carlo simulations

Future states of nature are inherently uncertain; this applies to both climate and societal factors affecting wildfire. In our analyses, annual area burned for each county was predicted using three-stage statistical models using climate variables extracted from each of the nine climate model realisations.<sup>4</sup> All such models have uncertainties regarding their predictions, and this uncertainty can be used, in conjunction with the model uncertainty in the nine-member ensemble of GCM–emission scenario realisations, to describe the range of potential futures. Median annual area burned projections (where the median is the middle projected value in a Monte Carlo simulation) and probability bounds around the median can provide the analyst

<sup>3</sup>Goodness-of-fit measures were also used to compare the three-stage approach with a simple Tobit model, which predicted area burned as a truncated variable (continuous from zero), and ignored model selection. We found that the Tobit generally had larger bias than the three-stage selection model.

<sup>4</sup>The models estimated in the first-stage equations using historical data (Appendix S1, Tables S1 through S4) provided the probit model parameter estimates needed to generate IMRs for projection years for all counties.

with a sense of the range of future possible wildfire outcomes for any desired location or area of inference (down to the smallest modelling unit).

To describe the range of potential outcomes in our projections, we conducted Monte Carlo simulations of equation estimates. These simulations randomly selected samples, with replacement, from among the observations in the historical time series, and then used the resulting equation estimates in each iteration to project wildfire in each county in each of the years 2011–60; 2006 and 2010 wildfire burned areas were also predicted using historical data. Across all scenario–GCM combinations, these produced a total of 2250 iterations of projections for each county for each year. From these iterations, we summarised quantile distribution bounds of expected wildfire for every county, for both lightning- and human-ignited wildfire, and their sum. We also did these summaries for other higher-level spatial units of inference, including by state, and by ecosystem province-based ecological domain of counties in the south-eastern US.

### Equation estimation results

The first-stage equations (*Stata/MP 13.1*, StataCorp LP, College Station, TX) were used in all statistical modelling; probit models predicting whether a county's observation of wildfire area burned for the calendar year was valid ( $Y_i = 0$ ) or considered to be not valid ( $Y_i = 1$ ) were the same for both lightning- and human-ignited wildfires, because K. C. Short (unpubl. data) judged validity for the entire county and year in question for all wildfires recorded, regardless of cause. Equation estimates (summarised in [Tables 4 and 5](#), with detailed statistical results shown in Appendix S1, Tables S1–S4, available as online supplementary material) showed that non-valid data were often related to the state where the county was located, as well as to factors that affected the number of wildfire occurrences. The direction of the effect of many weather-related variables indicated that the probability of a non-valid observation was related in a complex way to weather and climate, with some months showing positive relationships, and others negative, for each of maximum temperature, PET and precipitation. For ecoregion province 221, there was a negative relationship of non-valid data with personal income per capita and a positive relationship with population density. For 222, a negative relationship to personal income per capita was also found, whereas population was positively related. Forest area in this equation was negatively related, which might be linked to the idea that wildfires occurring in heavily wooded areas often go unreported, or could be connected to other problems with reporting accuracy. For counties in 231, land area was negatively related, whereas forest area was positively related to data validity, a result that is difficult to explain. It should be noted that the first-stage probit model for counties in ecoregion provinces 251, 255, 311, 315, 321, 331 and 332 (whose counties were grouped together in a single ecological domain for modelling) had broad insignificance, including the intercept. Thus, for both lightning- and human-ignited wildfire models,

the three-stage approach collapsed to a two-stage model in this ecological domain.

The results of second- and third-stage statistical models are summarised in [Tables 4 and 5](#) (with detailed results available in Appendix S1, Tables S5–S14). For the lightning wildfires ([Table 4](#)), the IMR produced by the first-stage equation was found to be positively related to the probability that wildfire in the county was zero for the counties grouped together for the ecological domain defined by ecoregion provinces 232, 234 and 411, and in ecoregion province 222. For counties in ecoregion province 231, the relationship was negative. For the counties in the other ecological domain consisting of ecoregion provinces 251, 255, 311, 315, 321, 331 and 332, the first-stage probit model was not significant, so that no IMR was included; for 221, the IMR from the first stage was not statistically significant in initial second-stage model estimates and was therefore dropped from the final specification. For lightning wildfires, land area of the county, included in four out of five lightning model second-stage specifications, had a positive effect on the likelihood that a county had non-zero lightning wildfire; that is, larger counties were more likely to have had at least one lightning fire occurrence. Forest area was included in only two models: counties for the ecological domain consisting of ecoregion provinces 251, 255, 311, 315, 321, 331 and 332, where it was positively related, and counties in ecoregion province 231, where it was negative but not significant (but where land area was positive).<sup>5</sup> Personal income per capita was positively related to non-zero lightning fire in counties of the ecological domain containing ecoregion provinces 232, 234 and 411, and counties in ecoregion province 221, but negatively for those in 222. When population density entered the second-stage model, its effect was negative. Weather variables had effects that were generally expected based on theory: precipitation was negatively related to non-zero lightning fires in most cases, whereas temperature and PET were both positively related. In most cases, these models were substantially simpler than the second-stage (and first-stage) selection equations, limited to a few climate and societal variables, and land use. In one case, namely the model of lightning wildfire area burned in counties of ecoregion province 222, the area burned was a function of just a constant and a statistically insignificant IMR from the second-stage equation. Land area, when it appeared, was positively related. In ecoregion province 231, the positive sign on land area was accompanied by a negative sign on forest area, a result that was not necessarily expected. The only societal variable affecting area burned other than forest area, a land-use measure, was population density, which appeared in the final-stage model for counties in the ecological domain containing ecoregion provinces 251, 255, 311, 315, 321, 331 and 332. Here, its effect was negative. This appears reasonable because more densely populated counties would have more breaks in the landscape that slow wildfire spread, so that wildfire sizes should be smaller, all other things being equal. For area burned in the final stage of lightning wildfire, weather variables were also related as expected from theory – precipitation, negatively, and temperature and PET, positively.

<sup>5</sup>In model development using in-sample data, 1992–2003, forest area was statistically significant. But when the final model was estimated using all data (1992–2010), its significance disappeared. We included it in this specification based on its in-sample model significance.

**Table 4. Lightning-ignited wildfire summary statistical results (first-, second-, third-stage models), by ecoregion province**

For each variable in each column, the three indicators refer to the first, second and third stages of the selection models. '+' implies a positive and '-' a negative parameter estimate that was significantly different from zero at 10% or stronger; '0' implies no statistically significant effect (or not included in the model). T is temperature in degrees Celsius, PET is potential evapotranspiration

Predictor variable	221	222	231	232, 234, 411	251, 255, 311, 315, 321, 331, 332
<b>Weather variables</b>					
January average max. T	-, 0, 0	0, 0, 0	-, 0, 0	-, 0, 0	0, 0, 0
March average max. T	+, 0, 0	0, 0, 0	+,-, 0	+, 0, 0	0, 0, 0
May average max. T	+, 0, 0	0, 0, 0	-, 0, 0	-, 0, 0	0, +, 0
July average max. T	0, 0, 0	0, 0, 0	+, 0, 0	+, 0, 0	0, 0, 0
September average max. T	-, 0, 0	-, 0, 0	-, 0, 0	+, -, 0	0, +, 0
January average PET	+, +, 0	-, 0, 0	+, +, +	+, +, +	0, 0, 0
March average PET	-, 0, 0	0, 0, 0	-, 0, +	-, 0, 0	0, 0, 0
May average PET	+, 0, 0	-, 0, 0	+, 0, 0	+, +, 0	0, 0, 0
July average PET	+, 0, 0	+, +, 0	-, 0, 0	-, 0, 0	0, 0, 0
September average PET	+, 0, 0	+, 0, 0	-, 0, 0	-, 0, 0	0, 0, 0
January average precipitation	-, 0, 0	0, 0, 0	+, 0, 0	+, 0, -	0, 0, 0
March average precipitation	+, 0, -	0, 0, 0	0, -, 0	+, 0, 0	0, 0, 0
May average precipitation	+, -, 0	0, 0, 0	-, -, 0	+, 0, -	0, 0, 0
July average precipitation	0, 0, 0	0, 0, 0	+, -, 0	+, 0, 0	0, 0, 0
September average precipitation	+, -, 0	+, 0, 0	0, +, 0	0, 0, 0	0, 0, 0
<b>Biophysical variables</b>					
Land area	+, +, 0	0, +, 0	-, +, +	0, +, +	0, 0, +
Forest area	0, 0, 0	-, 0, 0	+, -, -	0, 0, 0	0, +, 0
<b>Socioeconomic variables</b>					
Population	0, 0, 0	+, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Population density	+, -, 0	0, 0, 0	0, -, 0	0, 0, 0	0, -, -
Personal income per capita	-, +, 0	-, -, 0	0, 0, 0	0, +, 0	0, 0, 0
<b>Categorical variables</b>					
Alabama	0, 0, 0	-, 0, 0	+, -, 0	0, 0, 0	0, 0, 0
Arkansas	0, 0, 0	-, 0, 0	+, +, 0	0, 0, 0	0, 0, 0
Florida	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Georgia	+, 0, 0	0, 0, 0	+, 0, 0	+, 0, 0	0, 0, 0
Kentucky	+, 0, 0	-, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Louisiana	0, 0, 0	0, 0, 0	+, -, 0	+, 0, 0	0, 0, 0
Mississippi	0, 0, 0	0, 0, 0	+, 0, 0	-, 0, 0	0, 0, 0
North Carolina	-, 0, 0	0, 0, 0	0, 0, 0	-, 0, 0	0, 0, 0
Oklahoma	0, 0, 0	-, 0, 0	+, 0, 0	0, 0, 0	0, 0, 0
South Carolina	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Tennessee	+, -, 0	0, 0, 0	+, 0, 0	0, 0, 0	0, 0, 0
Texas	0, 0, 0	0, 0, 0	+, 0, 0	-, 0, 0	0, 0, 0
Virginia	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Province 234	0, 0, 0	0, 0, 0	0, 0, 0	-, -, 0	0, 0, 0
Province 411	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Province 255	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0	0, -, 0
<b>Inverse Mills ratios</b>					
Second stage	0	+	-	+	0
Third stage	-	0	0	+	-

For human-ignited wildfires (Table 5), only one second-stage model included land area, consisting of the counties of the ecological domain containing ecoregion provinces 232, 234 and 411, and its effect was positive. Forest area was included in the other second-stage models, and its effect was positive. Personal income per capita had varying effects, including a positive effect for ecoregion provinces 232, 234 and 411, and a negative effect for counties in 221 and 231. Population density had a positive effect on the probability of non-zero human-ignited wildfire for

counties in 251, 255, 311, 315, 321, 331 and 332. Population itself, however, had a generally positive effect for counties whose models included it: ecoregion provinces 222 and 231. This makes sense because higher population density would mean that there are fewer people in close proximity to wildlands, while higher populations should be connected to more chances for wildfires to be accidentally ignited through any number of specific causes (e.g. debris-burning, children, campfires, equipment). In nearly all cases, weather variables had the expected

**Table 5. Human-ignited wildfire summary statistical results province (first-, second-, third-stage models), by ecoregion province**

For each variable in each column, the three indicators refer to the first, second and third stages of the selection models. '+' implies a positive and '-' a negative parameter estimate that was significantly different from zero at 10% or stronger; '0' implies no statistically significant effect (or not included in the model). T is temperature in degrees Celsius, PET is potential evapotranspiration

Predictor variable	221	222	231	232, 234, 411	251, 255, 311, 315, 321, 331, 332
<b>Weather variables</b>					
January average max. T	-, 0, 0	0, 0, 0	-, 0, 0	-, 0, 0	0, 0, 0
March average max. T	+, 0, 0	0, 0, 0	+, 0, 0	+, 0, 0	0, 0, 0
May average max. T	+, 0, 0	0, 0, 0	-, 0, 0	-, 0, 0	0, 0, 0
July average max. T	0, 0, 0	0, 0, +	+, 0, 0	+, 0, 0	0, 0, 0
September average max. T	-, 0, 0	-, 0, 0	-, 0, 0	+, 0, -	0, +, 0
January average PET	+, 0, 0	-, +, 0	+, 0, +	+, 0, +	0, 0, 0
March average PET	-, 0, 0	0, 0, +	-, 0, 0	-, 0, 0	0, 0, 0
May average PET	+, 0, 0	-, 0, 0	+, 0, 0	+, 0, 0	0, 0, 0
July average PET	+, 0, 0	+, 0, 0	-, 0, 0	-, 0, 0	0, 0, 0
September average PET	+, 0, 0	+, 0, 0	-, 0, 0	-, 0, 0	0, 0, 0
January average precipitation	-, 0, 0	0, 0, 0	+, 0, 0	+, 0, 0	0, 0, 0
March average precipitation	+, 0, 0	0, 0, -	0, -, -	+, 0, 0	0, 0, -
May average precipitation	+, -, 0	0, 0, 0	-, 0, 0	+, 0, 0	0, 0, 0
July average precipitation	0, 0, 0	0, 0, 0	+, 0, 0	+, 0, 0	0, 0, 0
September average precipitation	+, 0, 0	+, -, 0	0, 0, 0	0, -, 0	0, 0, 0
<b>Biophysical variables</b>					
Land area	+, 0, 0	0, 0, 0	-, 0, 0	0, 0, 0	0, 0, 0
Forest area	0, +, +	-, +, +	+, +, 0	0, +, 0	0, +, +
<b>Socioeconomic variables</b>					
Population	0, 0, 0	+, -, 0	0, +, +	0, +, +	0, +, 0
Population density	+, 0, 0	0, 0, 0	0, 0, -	0, 0, -	0, -, 0
Personal income per capita	-, -, 0	-, 0, -	0, -, -	0, 0, 0	0, 0, 0
<b>Categorical variables</b>					
Alabama	0, 0, 0	-, 0, 0	+, +, +	0, 0, 0	0, 0, 0
Arkansas	0, 0, 0	-, 0, 0	+, 0, 0	0, 0, 0	0, 0, 0
Florida	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Georgia	+, 0, 0	0, 0, 0	+, 0, 0	+, 0, 0	0, 0, 0
Kentucky	+, 0, +	-, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Louisiana	0, 0, 0	0, 0, 0	+, 0, 0	+, 0, 0	0, 0, 0
Mississippi	0, 0, 0	0, 0, 0	+, 0, +	-, 0, 0	0, 0, 0
North Carolina	-, 0, 0	0, 0, 0	0, 0, 0	-, 0, 0	0, 0, 0
Oklahoma	0, 0, 0	-, 0, 0	+, 0, +	0, 0, 0	0, -, 0
South Carolina	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Tennessee	+, 0, 0	0, 0, 0	+, 0, 0	0, 0, 0	0, 0, 0
Texas	0, 0, 0	0, 0, 0	+, 0, +	-, 0, 0	0, 0, 0
Virginia	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Province 234	0, 0, 0	0, 0, 0	0, 0, 0	-, -, 0	0, 0, 0
Province 411	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, +	0, 0, 0
Province 255	0, 0, 0	0, 0, 0	0, 0, 0	0, 0,	0, 0, 0
<b>Inverse Mills ratios</b>					
Second stage	+	-	+	+	0
Third stage	-	+	+	0	+

signs in these second-stage model estimates. Final-stage area burned models for human-ignited wildfires, like lightning wildfires, also demonstrated a tendency (except for ecoregion province 231) to be simpler, including fewer predictor variables.

Land area and forest area were both positively related to area burned. This indicates that a prediction of forest area loss would be connected to a decline in the area burned by human-ignited wildfires. In these final-stage equations, population density had a negative effect on the area burned by human-caused wildfires

in counties of the ecological domain containing ecoregion provinces 251, 255, 311, 315, 321, 331 and 332, and those of ecoregion province 231. The finding on population density is consistent with the idea that a greater density of humans is linked to more fuel breaks in the landscape and greater opportunities for wildfire suppression resources to access and extinguish active fires. In contrast, higher overall populations in counties of ecoregion province 222 were linked to more area burned by human-caused wildfires. This is logical because more people are

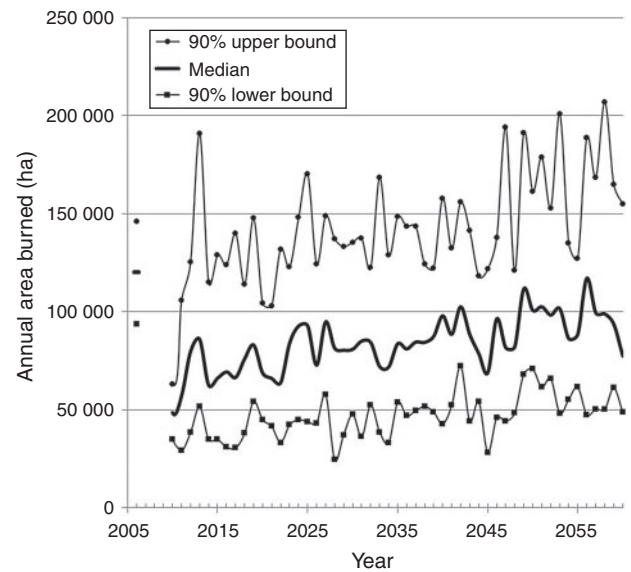


in contact with the wildland, creating more opportunities to ignite wildfires, but also have them recorded by fire management agencies. Personal income per capita was found to be negatively related to area burned for counties of ecoregion province 222 and 231. The negative relationship makes sense from an economics perspective: locations with higher wealth generally have greater financial resources available for fire suppression and prevention, leading to smaller overall wildfires. Such locations also typically have greater values at risk, which would compel greater investments in suppression and prevention. Finally, the IMRs from the first and second stage were usually statistically significant and positively related to area burned, indicating that places with more likely non-zero wildfire tend to also have larger wildfires, all other things being equal, which, in turn, indicates the importance of accounting for this tendency.

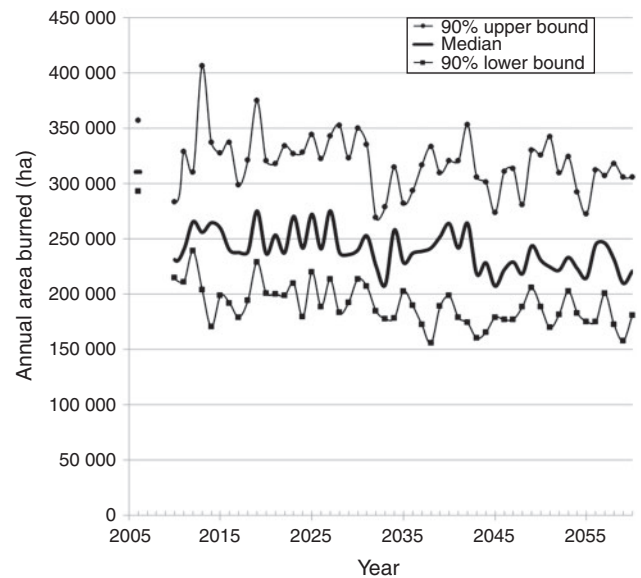
### Monte Carlo simulation of projected wildfire futures

While individual iteration data for each county and each of the 2250 iterations performed in this projection of the annual area burned future of wildfire in the Southeast are available from the authors on request,<sup>6</sup> Appendix S2, available as online supplementary material, describes these graphically. In Appendix S2, charts show projected annual area burned over the projection period for each state and each ecosystem province-based ecological domain. For a concise description, Figs 2–4 display the Southeast-wide summary for lightning and human causes and for total wildfire respectively.

The results of Monte Carlo simulations are probability distributions of projected wildfire in the Southeast, given our modelling and projection assumptions, and it is from these that we extract median and quantile information in our discussion of the projection results. Our results show that, for the projection period after 2010, there is a wide range in potential outcomes consistent with the historical data and our chosen scenarios of projected climate and societal futures. This is apparent for the extent of both lightning- and human-ignited wildfire area burned in the south-eastern US. However, from 2011 on, it is apparent that the expected annual area burned by lightning rises over time.<sup>7</sup> This increase is projected in percentage terms for every state and ecosystem province (Table 6). The average of the Monte Carlo median area burned by lightning rises by an average of ~616 ha per year across the entire region from the 2016–20 average of the Monte Carlo median to the 2056–60 average of the Monte Carlo median, a 34% rise.<sup>8</sup> For human-ignited wildfires, the picture is different. The average of the Monte Carlo median area burned declines 373 ha per year across the entire region, a 6% fall. Human-ignited wildfires represent the majority of annual area burned in the region. Projections indicate that their human share will drop from 76% of all area burned in the 2016–20 period to ~69% by 2056–60. The net effect of these changes across the Southeast in total is that expected annual area burned by wildfires



**Fig. 2.** Projections of lightning-ignited wildfires, 2006 and 2010–60, for the south-eastern US, in aggregate (i.e. the sum of wildfire for all counties in the region), including upper and lower 90% bounds of 2250 Monte Carlo iterations of models under all scenario and general circulation model (GCM) realisations. (Note: No projections were made for 2005, 2007, 2008 or 2009.)

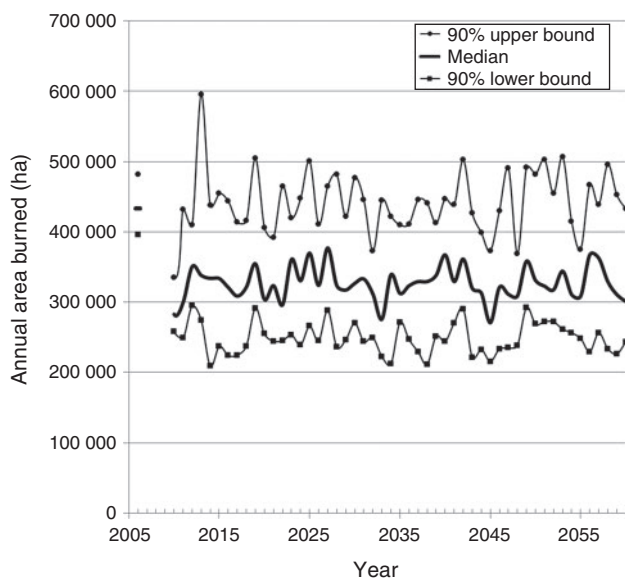


**Fig. 3.** Projections of human-ignited wildfires, 2006 and 2010–60, for the south-eastern US, in aggregate (i.e. the sum of area burned for all counties in the region), including upper and lower 90% bounds of 2250 Monte Carlo iterations of models under all scenario and general circulation model (GCM) realisations. (Note: No projections were made for 2005, 2007, 2008 or 2009.)

<sup>6</sup>That is, data can be summarised at the county level for any of the nine emission scenario–GCM combinations. Results generally indicate substantial ranges in potential futures, with the A2 scenario combinations generating higher levels of wildfire and the B2 the lowest amounts, although these trends vary across space.

<sup>7</sup>The higher level of predicted area burned for 2006 in these figures is due to the unusually fire-prone conditions found in many parts of the Southeast that year, especially from lightning and in states along the Atlantic coast and much of the Gulf of Mexico coast, compared with 2011–15 projections.

<sup>8</sup>We compared the average of the Monte Carlo median area burned for 2056–60 with the average of the Monte Carlo median area burned projected for 2016–20 rather than with a historical (pre-2011) period because of missing data in the pre-2011 period.

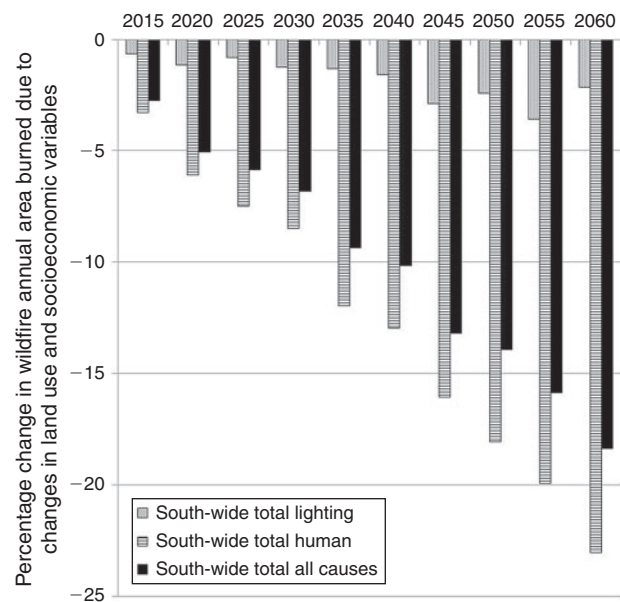


**Fig. 4.** Projections of all wildfires combined, 2006 and 2010–60, for the south-eastern US, in aggregate (i.e. the sum of area burned for all counties in the region), including upper and lower 90% bounds of 2250 Monte Carlo iterations of models under all scenario and general circulation model (GCM) realisations. (Note: No projections were made for 2005, 2007, 2008 or 2009.)

of all causes is projected to rise by  $\sim 4\%$  by 2056–60 compared with 2016–20.

Such changes at the regional level mask more substantial, and sometimes contrasting projected changes for geographical subsets of the region. For example, Florida and Louisiana are projected to see median wildfire area burned rise by 15 and 30% respectively. Other states with smaller expected rises include Georgia, Mississippi, North Carolina, Oklahoma, South Carolina and Texas. States with projected double-digit percentage declines include Arkansas, Kentucky, Tennessee and Virginia. Ecoregion provinces 221, 222 and 231 are each projected to have double-digit percentage declines in median annual area burned, but double-digit percentage increases in expected annual area burned are projected for ecoregion provinces 232, 234 and 411. It should be emphasised that great uncertainties exist in the likelihood of projected changes, even in the context of our modelling assumptions. The 90% upper and lower bounds, documented in Figs 2–4, and those for individual states and ecoregion provinces available in Appendix S2, are indicators that definitive conclusions cannot be made about the ultimate changes in wildfire in any state or ecoregion province.

The results suggest that changes in society have a large impact on human-ignited wildfires and a smaller impact on lightning-ignited wildfires. We summarise the net effects of the projected net reductions in forestland, and increases in income and human population across the region in Fig. 5. This figure was constructed by: (1) projecting wildfire allowing only changes in the climate variables from all nine climate realisations while holding land use, income and population constant at levels observed in 2006; and (2) subtracting the mean projection from the mean projections reported in Figs 2–4 that do allow land use, income and population to change. Fig. 5 therefore demonstrates the net effects of the land-use, income and population variables on our



**Fig. 5.** Projected effects of changes, in percentage, in wildfire annual area burned in the Southeast owing to changes in land use and other socioeconomic variables, mean effect across all scenario–GCM combinations, in 5-year increments, in aggregate (i.e. the sum of area burned for all counties in the region), 2015–60.

projections. The figure shows that land-use and socioeconomic variables have a minimal effect on projected lightning-ignited fire areas; changes in these variables reduce projected lightning wildfire area burned by only  $\sim 2\%$  by 2060 compared with the simulation with no change in land-use and socioeconomic variables. For human-ignited wildfire, the effects are substantially greater: annual area burned by human-ignited wildfires is projected to be 23% lower in 2060 when land-use and socioeconomic variables are allowed to change, compared with holding those variables constant; conversely, ignoring land-use and socioeconomic variable changes results in a projected median that is 30% higher than our median projection. In total, the effect of land use, income and population changes is to reduce wildfire by all causes by  $\sim 18\%$  in 2060 compared with what it would be if land-use and socioeconomic changes did not occur. In summary, climate change, on average, is projected to push up annual area burned in the Southeast, but changes in the distribution of fuels and other factors that are related to income and population growth serve to counteract most of the effects of climate change on area burned, largely through reductions in the annual area burned by human-ignited wildfires.

## Discussion

Modelling of wildfire in the south-eastern US, to be broadly useful, requires information on whether historical data are valid. Selection models can help compensate for (a lack of) valid data. Such projections should also account for the uncertainties in both the statistical models as well as future states of nature. Finally, wildfire, particularly in the south-eastern US, is dominated by humans, who ignite the majority of wildfires and suppress nearly all of them. Humans break up landscapes, thus limiting fire spread, and, with their roads and other infrastructure, facilitate the

**Table 6. Summary of projected expected percentage changes in annual areas burned by wildfire by lightning and human causes and in total, 2056–60 compared with 2016–20**

Provinces 315, 321, 331 and 332 were represented by very few counties in the spatial domain of inference, and so their wildfire changes were not separately tracked in the modelling

Geographic unit	Lightning wildfire annual area burn change (% change, 2056–60 average compared with 2016–20 average)	Human wildfire annual area burn change	Total wildfire annual area burn change
Alabama	39	–12	–3
Arkansas	60	–59	–31
Florida	11	16	16
Georgia	33	–7	6
Kentucky	189	–28	–22
Louisiana	57	8	30
Mississippi	85	–2	8
North Carolina	74	–10	4
Oklahoma	43	–1	3
South Carolina	34	–7	5
Tennessee	173	–62	–52
Texas	26	–5	4
Virginia	164	–50	–26
Ecoregion province 221	218	–41	–29
Ecoregion province 222	8	–88	–78
Ecoregion province 231	55	–20	–10
Ecoregion province 232	22	10	20
Ecoregion province 234	151	34	82
Ecoregion province 251	37	3	4
Ecoregion province 255	31	–5	–1
Ecoregion province 311	52	2	6
Ecoregion province 411	5	22	17
Ecoregion provinces 315, 321, 331, 332	27	–3	3
Southeast	34	–6	4

suppression of wildfires. Our modelling results found that counties in the Southeast tend to have less area burned in places with higher personal income per capita. Furthermore, dense populations and lower areas of forest are related to less overall wildfire area burned. However, larger populations may be connected to more fires ignited, and therefore the net effect of rising population density and rising overall population numbers is an empirical question.

The scenarios defined in the 2010 RPA Assessment projected rising populations, rising population densities, rising incomes and falling forest area for the region. These effects would tend to favour less wildfire in the region, at least for fires ignited by humans. However, based on our model estimation results (Table 4 and Table 5), warming temperatures tend to favour more wildfire. Additionally, precipitation patterns could also change. The net effect of these climate variables, our results show, is therefore especially to force up lightning-caused wildfire. In our simulations, we would expect more lightning-caused wildfires in locations with already plentiful lightning-ignited wildfires – especially along the Gulf of Mexico and Atlantic coasts. Human-ignited wildfires, especially in interior portions of the Southeast, are projected to decline in most states owing to loss of forest, and in relation to rising incomes. Overall, the median of our wildfire area projections indicates that the Southeast would not experience a large net increase in annual area burned. However,

considerable uncertainty remains in how both society and nature and, therefore, wildfire will evolve in the coming decades. Our results show that there is ample scope for either increases or decreases in annual wildfire area burned when viewed Southeast-wide. Hence, wildland fire managers and environmental policy-makers concerned with how wildfire may affect the costs and losses accruing from wildfire and its management, as well as the air quality implications of such changes, would do well to plan for either eventuality. Our simulations provide context for the possible ranges of these changes.

Although state-level policies regarding landowner liability have shifted to favour increased use of prescribed fire (Yoder *et al.* 2004), concerns about air quality and other factors (e.g. Liu *et al.* 2009; Quinn-Davidson and Varner 2012) have led to the possibility of growing restrictions on its use. It is enlightening to consider how the net effect of such changes, not modelled in our study, may affect wildfire in the Southeast. Mercer *et al.* (2007) found that a 1% increase in prescribed fire led to ~0.23% long-run decrease in the annual area burned by wildfire in Florida, which lies primarily in ecoregion province 232, a state with large amounts of prescribed fire. The median annual area burned for ecoregion province 232 is projected in our models to rise from ~99 000 ha in 2016–20 to 120 000 ha in 2056–60, or by ~21.6% (Table 6). If prescribed fire in all of ecoregion province 232 were to decline by 25%, over and above any changes forced by a

changing climate, an application of the estimate of Mercer *et al.* (2007) would project the ecoregion province annual area burned to rise by an additional 6900 ha above our median projection for the ecoregion province, to  $\sim 126\,900$  ha. This represents a rise of an additional 7 percentage points (to  $\sim 28.6\%$ ) compared to the 2016–20 average.

A sensitivity analysis that examined the impacts of changes in land use and other socioeconomic factors on wildfire showed that these trends in the south-eastern US should not be ignored when seeking to understand how wildfire could change into the future. Economic and population growth in the Southeast leads directly to forest loss because humans require land to build houses (Wear 2013), requiring new investments in fire suppression resources by states and municipalities, and involving the construction of new roads, which create breaks in fuels and allow easier fire suppression access. For example, from 2006 to 2060, under scenario A1B, population is projected to increase by 54% and forestland use to decrease by 10% in the counties covered in the current study. Similarly, increasing personal income, projected to rise by 252% under the A1B scenario, and rising population imply greater densities of values at risk on the landscape, which are a focus of fire suppression. In summary, we find that ignoring changes in land-use and socioeconomic factors that have a statistically significant effect on wildfire would overestimate area burned by nearly one-fifth, and the effect is particularly acute for human-ignited wildfires.

In contrast, rising population in the face of nearly stable wildfire area burned implies rising human exposure to wildfire when viewed in total across the region. These changes in the exposure are projected to vary widely across the counties of the region, in step with widely varying changes in wildfire and population. Nevertheless, the consequences of greater exposure to emissions of ozone and particulate species from wildfire include an expected rise in their human morbidity and mortality impacts (Rappold *et al.* 2011; Fann *et al.* 2013). This result implies that there could be significant social and economic benefits to management approaches that are shown to reduce the occurrence of wildfires in the region, including wildfire prevention and fuels management (e.g. Mercer *et al.* 2007; Butry *et al.* 2010).

Finally, these annual burned area projections could be a valuable dataset for informing broader assessments, from air quality to exposure to health burden, over the next few decades in the Southeast. There could be significant consequences for the region's future air quality and the human morbidity and mortality associated with wildfire activity changes (e.g. Viswanathan *et al.* 2006; Johnston *et al.* 2011). With projections of both climate and wildfire activity, models for studying the air quality impacts of anthropogenic and natural emissions that can include those from wildfire (e.g. the Community Multiscale Air Quality model (Byun and Schere 2006)) can provide additional insights into how a changing climate and society may in turn have health consequences for humans.

## Conclusions

Flannigan *et al.* (2009) described the need for new studies that account for the complex, non-linear interactions between climate, fuels and humans if we hope to understand the implications

of climate on future wildfire. These authors also highlighted the importance of improved data on wildfire occurrence so that prospective analyses can be done for many parts of the world. Our study addresses the first need, bringing in variables that are surrogates for the many roles that humans have in igniting, suppressing and preventing wildfire, managing fuels and changing aggregate fuels through land-use shifts; in the process, it also addresses the second need by compensating for the obvious data-quality problems that face analysts focussed on the US.

This study has also directly addressed some of the uncertainties that arise when considering the future of wildfire. By combining nine alternative views of both climate and society, generating probability distributions of area burned, we can begin to appreciate the extent of wildfire uncertainty facing society in the south-eastern US. Such uncertainty implies that wildfire managers and other decision-makers need to prepare for a possibly wide-ranging direction of change in wildfire processes in the region. Although some of this uncertainty is connected to bounded confidence of statistical models of wildfire production, much is due to uncertainty about how driving climate and societal variables will change over the coming decades in this region. In future studies, uncertainties could be reduced first by the development of more accurate wildfire production models than the ones we estimated. As newer climate projections are produced with improved GCMs and RCPs for greenhouse gas climate forcing, and as scientists and policymakers gain a better picture of our emissions, economic, population and policy futures, greater prediction accuracy as well as precision could be achieved. This enhanced projection environment will enable land managers and policymakers to take more concrete actions to minimise some of the negative effects of altered wildfire patterns.

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