

**BEFORE THE FOREST SUPERVISOR
OF THE DANIEL BOONE NATIONAL FOREST
UNITED STATES FOREST SERVICE**

In Re:

Predecisional Objection of the Environmental Assessment, Draft Decision Notice, and FONSI for the Greenwood Vegetation Management Project, Stearns Ranger District, Daniel Boone National Forest

NOTICE OF OBJECTION

Pursuant to 36 CFR § 218, Kentucky Heartwood is seeking predecisional administrative review by Forest Supervisor Dan Olsen of the Environmental Assessment, Draft Decision Notice, and Finding of No Significant Impact for the Greenwood Vegetation Management Project on the Stearns District of the Daniel Boone National Forest.

The Objectors are:

Kentucky Heartwood, Inc., a forest advocacy group dedicated to the health and well-being of the public forests in the Commonwealth of Kentucky. Kentucky Heartwood submitted comments during Scoping and on the Environmental Assessment.

Michael and Elizabeth Loiacono, residents of Pulaski County bordering the Daniel Boone National Forest within the Greenwood project area. They are members of Kentucky Heartwood.

The Center for Biological Diversity, a national non-profit conservation organization dedicated to the protection of endangered species and the habitat and climate they need to survive. The Center has more than 1.5 million members and supporters nationwide including members and supporters in Kentucky. The wellbeing of the wild flora and fauna in Kentucky and the quality of the human environment are of concern to our members, supporters, and staff.

Respectfully submitted by:

Kentucky Heartwood (Lead Objector)

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I. Introduction

The Greenwood Vegetation Management Project (“Greenwood project”) proposes to address management issues on 32,149 acres of national forest system lands in the northern portion of the Stearns Ranger District of the Daniel Boone National Forest in northern McCreary and southern Pulaski counties. The project includes 16 management actions directed “towards meeting the goals, objectives, and desired future conditions established in the Forest Plan for the key prescription areas in the Greenwood Project Area” (Scoping at 4). Several of the proposed management actions are designed to establish or restore a range of fire-adapted community types, primarily oak and oak-pine wooded grassland communities, and to restore shortleaf pine on the landscape.

The Greenwood project was first proposed in July, 2014 with the release of the scoping document and associated 30-day comment period. Scoping comments were jointly submitted by objectors on August 18, 2014. Kentucky Heartwood subsequently provided input to the Forest Service during meetings and field trips on October 8, 2015, November 15, 2015, November 30, 2015, December 1, 2015, and February 23, 2016. Kentucky Heartwood also worked cooperatively with the Daniel Boone National Forest to organize and lead the two-day Cumberland River Fire Learning Network (CRFLN) Shared Learning Event in June, 2016, where sites in and around the Greenwood project area were visited and discussed. An Environmental Assessment (EA) for the project was released for comment in January, 2017. Kentucky Heartwood submitted detailed comments on the EA on March 6, 2017. Michael and Elizabeth Loiacono are members of Kentucky Heartwood and separately submitted individual comments on the EA. Legal notice for the objection period was published along with the Draft Decision Notice (DN) and Finding of No Significant Impact (FONSI) on July 27, 2017.

Objectors believe that properly designed and implemented active management to restore fire-adapted natural communities in the Greenwood project area is important, and will help meet Forest Plan Goal 1 to “Maintain a variety of life and recover native and desirable non-native populations that are rare or declining” and “Protect and/or enhance current and potential habitat for Proposed, Endangered, Threatened (PET) species, or Sensitive (S) species and Conservation species” (Forest Plan 2-5). As Objectors and the Kentucky State Nature Preserves Commission have repeatedly pointed out to the Forest Service throughout this process, national forest lands in the Greenwood project area include notable and unique rare species and natural communities that are in decline, including a wide range of federally- and state-listed species. Some of these species rely on having an open (or semi-open) fire-adapted community structure, and Objectors have worked in earnest to get the Forest Service to design the Greenwood project in a site-specific manner around these species’ needs and habitats.

The Forest Service has acknowledged in other project planning that fire-adapted woodland communities (one of the main management targets for the Greenwood project) are a diverse natural community supporting a wide range of species, and not just a distribution of burned timber. The Forest Plan describes Woodland and Wooded Grassland/Shrubland communities as open forest types as having “grasses/forbs which are promoted by a regular cycle of burning” and a “well developed shrub/grass/forb layer,” respectively (Forest Plan 3-33). The scoping document for the Freeman Fork Oak Woodland Restoration¹ Project provides a more detailed description, stating:

¹ The Freeman Fork Oak Woodland Restoration Project was approved in January, 2014. The project area overlaps the Greenwood project area and was designed to restore oak woodland and oak grassland community structure to meet Forest Plan goals much like the Greenwood project.

Oak woodlands and wooded grasslands contain a greater diversity of plants than both prairie and forest communities (Leach and Givnish, 1999; Kirkman et al. 2001; Peterson and Reich, 2001; Nelson, 2005; Grundel and Pavlovic, 2007). These observations make them important targets of conservation and restoration (Belsky et al., 1989; Leach and Givnish 1999). Light reductions accompanying successional advance in the absence of fire have contributed to widespread plant diversity losses within these communities (Price and Morgan, 2008; Breshears, 2006; Walker and Silletti, 2006). **Many species within this once robust diversity of grasses, forbs, and legumes are listed as endangered or threatened at some level (Anderson and Bowles, 1999), and numerous native woodland and wooded grassland forbs have been locally extirpated as a result of fire suppression** (Vogl, 1964; Nielsen et al., 2003; Packard, 1993). (Freeman Fork scoping document at 2, emphasis added)

This objection will focus on substantive and procedural deficiencies in the EA and Draft DN and FONSI with regard to forest and timber management, rare species, and wildlife openings. All issues herein were raised in our previous comments submitted to the Forest Service during official comment periods. Broadly, our concerns relate to the “where and how” of restoring fire-adapted community structure, and not “if.” We make suggestions at the end of each section regarding how the Forest Service can correct legal and regulatory deficiencies that exist in the record and project design and work more effectively toward meeting Forest Plan goals of restoring rare and declining biodiversity in the Greenwood project area.

We incorporate by reference all documents and all evidence and assertions pertinent to the points of objection discussed herein that were “previously provided to the Forest Service by the objector during public involvement opportunities for the proposed project where written comments were requested by the responsible official,” as allowed at 36 C.F.R. § 218.8(b)(4). We also incorporate by reference various Federal laws and regulations, Forest Service directives and land management plans, and documents referenced by the Forest Service in the proposed project EA (36 C.F.R. § 218.8(b)(1-3).

Additionally, we are attaching the following referenced documents:

1. Scoping comments submitted by the Kentucky State Nature Preserves Commission (KSNPC) dated August 22, 2014
2. Comments on the Environmental Assessment submitted by KSNPC dated March 6, 2017
3. Field data relating to surveys conducted of SPB-impacted stands in April 2017

In succeeding sections of this document, Objectors provide the following for each of the issues that provide the bases for this Objection:

- 1) “A description of . . . specific issues related to the proposed project” for which “the environmental analysis or draft decision specifically violates law, regulation, or policy.” 36 C.F.R. 218.8(d)(5),
- 2) “suggested remedies that would resolve the objection,” Id., and
- 3) descriptions of the connections “between prior specific written comments on the particular proposed project or activity and the content of the objection.” 36 C.F.R. 218.8(d)(6).

II. Rare species

This section addresses differing but related deficiencies with regards to consideration of federally proposed, endangered, threatened (PET) and sensitive species (S) and their habitats, as well as a wide range of state-listed and other rare species and their respective habitats. We address these issues in section 7. **Species Surveys** in our comments on the EA and section 12. **Proposed, Endangered, Threatened, and Sensitive (PETS) Species** in our scoping comments. We believe that that Forest Service has made several substantive and procedural errors with regard to rare species. The Forest Service has failed in its consistency requirements with regard to NFMA and the Forest Plan by failing to adequately survey for and consider rare and listed species and their habitats, violated the ESA by failing to consider effects of the proposed action on several PETS that could be in the project area, and violated NEPA by ignoring significant information and failing to adequately analyze both the beneficial and detrimental environmental effects that could result from the proposed action.

The restoration of rare species and rare communities is not incidental to Forest Service management broadly or the Greenwood project specifically. The EA states:

The purpose of this proposed project is to bring the project area closer to the desired condition by working towards accomplishing the following goals and objectives:

- Goal 1. Maintain a variety of life and recover native and desirable non-native populations that are rare and declining – Actions 2, 7, 9, 10, 13
- Goal 1.1. Protect and/or enhance current and potential habitat for Proposed, Endangered, Threatened (PET) species, or Sensitive (S) species and Conservation species. Evaluate habitats to determine those capable of supporting re-introduction of [Protected, Endangered, Threatened and Sensitive] (PETS) species – Actions 1-13, 17. (EA-2)

Additionally, the Forest Service Manual at 2020.3 states:

1. The Forest Service will emphasize ecosystem restoration across the National Forest System and within its multiple use mandate.
2. The Forest Service land and resource management plans, project plans, and other Forest Service activities may include goals or objectives for restoration. The goals or objectives for ecosystem restoration must be consistent to all applicable laws and regulations. **In development of restoration goals or objectives, the Forest Service should consider:**
 - a. Factors such as the following:
 - (1) Public values and desires;
 - (2) the natural range of variation (NRV);
 - (3) ecological integrity;
 - (4) current and likely future ecological capabilities;
 - (5) a range of climate and other environmental change projections;
 - (6) **the best available scientific information;** and,
 - (7) detrimental human uses.
 - b. technical and economic feasibility to achieve desired future conditions.
 - c. ecological, social, and economic sustainability.
 - d. the recovery, maintenance, and enhancement of carbon stocks.

e. **opportunities to incorporate restoration objectives into resource management projects to achieve complementary or synergistic results.**

f. the concept that an ecological system is dynamic and follows an ecological trajectory

g. the social, economic and ecological influences of restoration activities at multiple scales. (emphases added)

The Greenwood project area is known to harbor a wide range of rare federally- and state-listed species. In addition to the PETS species referenced in the analysis, KSNPC provided in their scoping comments a large list of state-listed species and communities known to occur in the project area:

We are also concerned about possible impacts of the proposed activities on the numerous other rare species and communities within the project area. KSNPC listed species and communities, known to occur within the project area include:

Animals

eastern small-footed myotis (*Myotis leibii*, KSNPC listed threatened)

evening bat (*Nycticeius humeralis*, KSNPC listed special special concern)

Rafinesque's big-eared bat (*Chorynorhinus rafinesquii*),

sharp-shinned hawk (*Accipiter striatus*, KSNPC listed special concern)

southern cavefish (*Typhlichthys subterraneus*, KSNPC listed special concern)
(caves)

a limnephilid caddisfly (*Manophylax butleri*, KSNPC listed special concern)(wet
cliffs in mesophytic forest)

cave crayfish (*Orconectes packardi*, KSNPC listed threatened) (cave)

southeastern five-lined skink (*Eumeces inexpectatus*, KSNPC listed special concern)
(open woodland, glade)

Plants

eastern silvery aster (*Symphotrichum concolor*, KSNPC listed threatened) (open
woodland)

wood lily (*Lilium philadelphicum* , KSNPC listed threatened) (open woodland)

Ssouthern clubmoss (*Lycopodiella appressa*, KSNPC listed endangered) (seep,
woodland)

Lucy Braun's white snakeroot (*Ageratina luciae-brauniae*, KSNPC listed special
concern) (cliff in mesophytic
and hemlock forest)

roundleaf fameflower (*Talinum teretifolium*, KSNPC listed endangered) (glade)

mock orange (*Philadelphus inodorus*) (mesophytic forest)

bearded-skeleton-grass (*Gymnopogon ambiguus*, KSNPC listed special concern)
(glade, open woodland)

Appalachian cypress-swamp sedge (*Carex jorii* , KSNPC listed endangered) (seep)

globe beaked-rush (*Rhynchospora recognita*, KSNPC listed special concern) (open
woodland, seep)

Appalachian sandwort (*Minuartia glabra*, KSNPC listed threatened) (glade)

nettle-leaf sage (*Salvia urticifolia*, KSNPC listed endangered) (mesophytic forest)

common silverbell (*Halesia carolina*, KSNPC listed endangered) (mesophytic forest)
spreading false foxglove (*Aureolaria patula*, KSNPC listed special concern) (open cliff, glade)
northern witchgrass (*Dicanthelium boreale*, KSNPC listed special concern) (open woodland)
wild honeysuckle (*Lonicera dioica* var. *borealis*, KSNPC listed endangered) (open woodland)
white walnut (*Juglans cinerea*, KSNPC listed special concern) (mesic bottomland)
Saint Peter's-wort (*Hypericum crux-andreae*, KSNPC listed threatened) (wet meadows, open woodland)

Communities

High ranking occurrences of Appalachian mesophytic forest, hemlock mixed forest, Cumberland Plateau sandstone glade (globally rare), and Appalachian seep/bog (globally rare) are located within the project area.

Little or no consideration was given to these species in the project analysis.

II.1. Consideration of rare communities and species

The Wildlife Resources Report states:

Some of the project sites are located in or affected by the following DBNF Prescription Areas: the Cliffline Community, Significant Bat Caves, Riparian Corridor, Rare Communities, Habitat Diversity Emphasis, and Beaver Creek Wilderness. Below are the Forest Plan goals and objectives that are specific to these prescription areas. (Report at 53)

The following Forest Plan Goal for Rare Communities is also given:

Rare Communities

- 1.G-Goal 1. Maintain rare communities in a condition capable of sustaining the species associated with them (USDA-FS 2004a, p. 3-23). (Report at 54)

No site specific information or description of Forest Plan 1.G Rare Communities are provided in the analysis or supporting documents. The EA does not discuss Rare Communities, nor effects of the proposed action on Rare Communities. The GIS database for the DBNF in our possession includes a layer for 1.G Rare Communities, but does not show any areas managed under this Forest Plan prescription in the project area. The Forest Plan calls for a proactive management approach for Rare Communities:

Emphasis of Condition: These areas are managed to promote the habitat conditions that support the diverse and locally unique assemblage of plant and animal species occurring within them. While not devoid of human influence, natural conditions are allowed to regulate the communities when possible. Rare communities may continue to be protected as classified, or may be recommended for designation as a botanical or zoological area.

Desired Ecosystem Conditions: These systems are dynamic and subject to a variety of weather and other disturbances. Some, such as streamhead wetlands, appear to be somewhat mobile within a stream channel over time, so they are never truly stable. However, as habitat for numerous rare species, stability of the community within the capability of the system is desired; i.e., the desire is to sustain the communities in a condition to support the species associated with them. These areas are characterized by conditions particular to the community in question. (Forest Plan 3-20)

Rare community types listed in the Forest Plan (Forest Plan 3-18) that are known to occur in the project area include Streamhead Seeps/Bogs, Sandstone Glades, Natural Ponds, and Native Warm-season Grasslands. Slope Seeps and Limestone Glade occurrences are possible, even probable. In section **IV.1. Southern pine beetle and existing forest** structure, below, we note a sandstone glade community that we located in the project area while conducting surveys that we requested of the Forest Service. KSNPC has specifically discussed concerns regarding seeps. Objectors have raised site-specific concerns regarding management for rare plant species, with an emphasis on Warm-season Grasslands species. The Forest Plan provides the following community description for Native Warm-season Grasslands:

Native Warm-season Grasslands: Naturally occurring grasslands (such areas created by human action also are present on the Forest) that are dominated by warm-season grasses. Many of these areas are edaphically controlled, but most are maintained by fire. Historically, they were associated with burned yellow pine, upland oak and mixed oak-yellow pine woodlands, occurring as open areas between clusters of trees. They were likely more common in the past. In the grassland areas, trees are usually absent, although small shrubs and saplings may occur in sites of poorer condition. These areas are generally small, often less than one-quarter acre, but may occur as areas as large as 20 to 30 acres. Native warm-season grasslands provide habitat for many rare or uncommon species such as royal catchfly and yucca-leaved rattlesnake master. In conjunction with woodland, they provide habitat for uncommon species such as eastern slender glass lizard and Diana fritillary. These communities are threatened by fire exclusion, loss of large ungulate herbivory (grazing by large, hoofed mammals) and land use change (see Owen 2002). (Forest Plan 3-19)

It's worth noting here that the only recorded populations of royal catchfly (listed as Endangered in Kentucky) and yucca-leaved rattlesnake master in the Daniel Boone National Forest are in or near the project area. The 1988 Cooperative Inventory of Endangered, Threatened, Sensitive, and Rare Species (cited in our comments and the Wildlife Resources Report) describes the "Route 751 roadsides" stating:

This 175 acre area contains several rare species that are typical of pine-savanna or other southern grasslands: *Helianthus atrorubens*, *Agalinis decemloba*, *Aster concolor* and *Gymnopogon ambiguous*. Also, *Lilium philadelphicum* occurs on the roadside. It seems likely that these roadsides, mostly covered with native species, are relictual from some type of open grassy pine woods or "barrens" maintained by fire in the past. Also, there is a natural pond with *Carex jorii* on the adjacent Curt Pond Ridge. The Forest Service might consider establishing this area as an experimental demonstration project where a burning regime is implemented to create and maintain a pine savanna habitat. Such an effort it appears would be justifiable since these fire associated species now are clustered along the road right of way where artificial openings are maintained. (Cooperative Inventory at 76)

Agalinis decemloba (tenlobe false foxglove) is listed as Endangered in Kentucky with a distribution limited to the Stearns District of the DBNF and one county in western Kentucky. Aster concolor (Symphyotrichum concolor) is listed as Threatened in Kentucky and is known to be in the project area. Gymnopogon ambiguous is listed as a species of Special Concern in Kentucky, with its only known occurrences in eastern Kentucky in Pulaski county. Lilium philadelphicum is listed as Threatened in Kentucky, with some of the best historic occurrences in the state have been previously recorded in and around the Greenwood project area. Carex jorii is listed as Endangered in Kentucky, with occurrences limited to Pulaski and McCreary Counties, and possibly limited to the project area.

The Route 751 roadsides and Curt Pond Ridge areas are locations that we have cited regularly and visited with the Forest Service throughout the planning process. This section also includes some of the best and only specimens of Rattlesnake master (*Eryngium yuccifolium*) in the Cumberland Plateau of eastern Kentucky, which, as noted above, is considered an indicator for the Native Warm-season Grasslands Rare Community type in the Forest Plan. We located and provided data to the Forest Service of another single specimen of *Eryngium yuccifolium* in the project area on Liz Worley Drive that likely represents a new recorded occurrence (this plant is now intergrown with invasive miscanthus grass with Johnson grass spreading throughout the stand). Other historical references suggest similar barrens or prairie remnants along Bauer Rd., and last year we identified a new population of *Lilium philadelphicum* along Hwy 90 on the south end of the project area.

The EA states:

The purpose of this proposed project is to bring the project area closer to the desired condition by working towards accomplishing the following goals and objectives:

- **Goal 1.5** Provide for grassland habitat – Actions 10, 11, 13, 17.
- **Objective 1.5.A.** Provide for 2,200 acres of grassland habitat in various Prescription Areas. Promote native warm season grasses and associated forbs in upland grassy openings – Actions 10, 11, 13, 17. (EA-3)

Management for Native Warm-season grasslands is clearly within the scope of the project.

Grassy Gap Ridge is another area in the Greenwood project area that was identified in the Cooperative Inventory.

Located adjacent to the Beaver Creek Wilderness Area is this 180 acre area composed of cliffs and ravines. On narrow promontories here, there are two relatively undisturbed areas of rocky openings with *Talinum teretifolium* and *Minuartia glabra*. *Liatris microcephala* is a frequent on clifftops. Several rare *Dichanthelium* [Panicum] species occur in these openings or in adjacent pine woods (*D. sabulorum* [P. columbianum], *D. boreale* [P. bicknellii], *D. aciculare* and *D. Dichotomum* var. *tenuis* [P. albomarginatum]). Also, *Malus angustifolia* is relatively frequent in thickets, and there are patches of *Gaylussacia brachycera*. Along streams, there are *Rhynchospora globularis* and *Calamagrostis canadensis*, and there is a natural seasonal pond with *Carex jorii*. (Cooperative Inventory at 75)

Talinum teretifolium is listed as Endangered in Kentucky and known only from Pulaski and McCreary counties, in or near the project area. *Minuartia glabra* is state listed as Threatened, and with records limited to Pulaski, McCreary, and Harlan counties. *Dichanthelium boreale* is listed as a species of Special Concern in Kentucky, limited to McCreary, Estill, and Rowan counties. *Carex jorii*

is listed as Endangered in Kentucky, with occurrences limited to Pulaski and McCreary Counties, and possibly limited to the project area.

The Forest Plan and associated FEIS recognized limitations with regard to the information used to delineate rare communities in the Forest Plan, and anticipated identifying more rare communities and species records to facilitate proactive management through implementation of the Forest Plan, and specifically through surveys associated with the development of land management projects. The FEIS states:

The Rare Communities section of Chapter 3 addresses rare communities as defined here. Rare communities are difficult to pinpoint and evaluate with complete knowledge of their extent and condition because of their dispersion across the landscape. (FEIS 2-17)

In the discussion on Setting for 1.G Rare Community, the Forest Plan recognizes that the extent of Rare Communities in the DBNF is only estimated, stating:

This Prescription Area, found in all management Areas, **is currently estimated at** approximately 1,200 acres across the Forest. (Forest Plan 3-20, emphasis added)

The FEIS further states that:

Most of these were located during project surveys or indirectly through the Forest's cooperative inventories (USDA Forest Service et al. 1988-1994). **Additional rare community sites likely exist on the DBNF.** Finding them, however, is often a matter of serendipity. Because it calls for the lowest level of management activity, the discovery of new site would be less likely under Alternative B, but such estimates are problematic. (FEIS 2-18, emphasis added)

Alternative B is the "no-logging" or "less management" alternative that was analyzed in the Forest Plan FEIS. The Forest Plan FEIS is fairly clear here in stating that rare communities will continue to be identified through project-specific surveys. In the discussion of environmental effects for Alternative C-1 (which was the Selected Alternative chosen in the Record of Decision) the FEIS states:

This alternative would include the Rare Community Prescription Area and expressly identify rare communities by type for specific management. From a programmatic view, Alternative C-1 should support the continued existence and health of these communities. Favorable conditions within all or most rare communities would be enhanced, not just maintained. **Given the emphasis of this alternative, the actual number of existing sites is more likely to be discovered. Identification determines the number of acres to be managed for rare community values.** Relative acres of communities, rare due to distribution, may decrease or remain stable depending on the community. As conditions within rare communities improve, the number of those rare due to condition can be expected to decrease. **The relative level of management for rare communities can be expected to increase beyond the current condition primarily through recognition of specific community types and appropriate management action to enhance these communities.** Inadvertent damage, such as trampling and alteration of hydrology, from dispersed recreation would be expected to increase as dispersed recreation levels rise. (FEIS 3-110, emphasis added)

In the Record of Decision (ROD) for the Forest Plan, the Regional Forester states that one of the reasons for choosing Alternative C-1 over Alternative B (or other alternatives with more limited management) is the assertion that Alternative C-1 best supports “the restoration of rare and missing ecosystems.”

I chose Alternative C-1 because it encompasses an ecological approach to forest management and provides a logical and sound evolution from the management direction in the 1985 Forest Plan (Alternative A); **it provides for more than the minimum habitat requirements for keeping viable populations of native and desirable non-native species, and goes further by setting objectives for the restoration of rare and missing ecosystems.** (ROD at 5, emphasis added)

The presence of rare and declining plant species and natural communities as a significant issue in the Greenwood project area was raised early and often. This includes both documented occurrences and statements (see below) regarding data gaps and the need for surveys. The Forest Plan recognizes the importance of managing proactively for these areas, stating that:

Many (rare communities) are likely to disappear over time without direct manipulation of vegetation. (Forest Plan 3-17)

The Forest Service has violated the Forest Plan in the EA and Draft DN/FONSI both in failing to adequately analyze the effects *to* rare communities, and by failing to consider (or tailor) actions consistent with the purpose and need of the project to manage *for* these rare communities.

36 CFR 219.15 - Project and activity consistency with the plan states:

(d)Determining consistency. Every project and activity must be consistent with the applicable plan components. A project or activity approval document must describe how the project or activity is consistent with applicable plan components developed or revised in conformance with this part by meeting the following criteria:

(1)Goals, desired conditions, and objectives. The project or activity contributes to the maintenance or attainment of one or more goals, desired conditions, or objectives, or **does not foreclose the opportunity to maintain or achieve any goals, desired conditions, or objectives, over the long term.** (emphasis added)

By not following Forest Plan direction to survey and delineate Rare Communities in the Greenwood project area, the Forest Service cannot reasonably state that implementation of the project will not “foreclose the opportunity to maintain or achieve any goals, desired conditions, or objectives, over the long term” with regard to Rare Communities. The Forest Services has made it clear on multiple occasions that the once the IRMS process moves on to another portion of the district, it is unlikely that a new land management project will be proposed in the same area in the foreseeable future. It has been conveyed that the Stearns District will next be moving to the Jellico portion of the district for project planning and analysis, leaving any proactive management described in the Forest Plan that would otherwise be called for in the Greenwood Project area off the table. Because these Rare Communities are likely to “disappear over time” without appropriate management, the Forest Service is essentially foreclosing on management that could help these communities persist into the future.

II.2. Rare plant and community surveys

The Forest Service has failed to conduct adequate surveys for PETS and state-listed and rare species in the project area as called for in the Forest Plan (see above). The inadequacy of existing data has been made explicit in comments from Objectors and the Kentucky State Nature Preserves Commission (KSNPC), which is responsible for monitoring and cataloguing rare species throughout the state. The failure to conduct adequate surveys, particularly for rare and listed plant species, has created problems relating to NEPA, NFMA, and the ESA. We address this issue in section 7. **Species Surveys** in our comments on the EA and section 12. **Proposed, Endangered, Threatened, and Sensitive (PETS) Species** in our scoping comments.

In their scoping letter to the Forest Service (quoted in Objector's comments on the EA), KSNPC stated:

Not every section of the proposed project locations has been thoroughly surveyed, and additional rare species populations could occur. We recommend that a thorough survey be conducted by a team of qualified biologists for rare species and communities of all stands proposed to be managed as part of this project, so that impacts on rare species and communities can be avoided.

KSNPC further commented in their comments on the EA:

The proposal did not address occurrences and possible impacts on state listed rare plants and rare plant communities within the project area. The Forest Service has obtained rare species data from our natural heritage database for the whole Forest and we are surprised that they were not addressed in this proposal. We would be glad to resubmit a report and map for your area, if you are interested, but I would recommend that you first contact the Winchester office for this data.

As I mentioned before, the project area has not been systematically surveyed for rare state listed species and before any management decisions are made on the ground, we recommend that every stand be surveyed by a qualified biologist to determine, which management activities might be the most appropriate. While some stands might be best managed for old-growth to benefit the unique species diversity associated with it, (in this area i.e. snails and other inverts), other stands might be chosen for a more intense fire regime to encourage fire dependent species associated with more open conditions.

The Consideration of Comments responds:

"All rare flora were addressed as described in Appendix M of the EA on pages 8 – 10. The requirements for addressing rare plants on federally managed lands have been met. The National Forest Management Act and the Forest Plan do not require all state listed species to be analyzed." (Consideration of Comments at 27)

Appendix M, the updated Wildlife Resources Report, states that the following process was used to identify possible effects to rare species:

Step 1: Pre-field Assessment - Once preliminary treatment areas were identified by the DBNF, information was collected to identify the present condition or affected environment for the wildlife species under analysis. This information included aerial photos, Geographic Information System (GIS) data, Forest, District, and partner databases related to wildlife occurrence, stream monitoring data and Forest-wide direction (USDA-FS 2004a). These

sources include the Kentucky Department of Fish and Wildlife Resources (KDFWR 2015), Kentucky State Nature Preserve Commission (KSNPC 2015), U.S. Fish & Wildlife Service (USFWS 2015), and NatureServe (2015). Collectively this information was used to complete a preliminary assessment of available habitat, and to identify potential concerns related to wildlife, fish and plants.

Step 2: Field Assessment – Site conditions could change over time and some species may move into or out of an area. Areas that involve ground disturbing activities were checked on the ground as well as unique areas on the map such as sinkholes, caves or areas that are potentially boggy.

While the Forest Service used KSNPC species data for the area, KSNPC also made very clear that their data for the area are not comprehensive and that field examinations need to be surveyed by a “qualified biologist.” While Mr. Metzmeier (preparer of the Wildlife Resources Report) is a qualified biologist with regard to wildlife issues, he is not a trained botanist. As far as we can tell, no qualified botanist conducted any surveys of the project area. Many of the state- and federally-listed and other rare botanical species of concern are difficult to identify.

The KSNPC comments further state:

“We appreciate that the Forest Service has excluded an occurrence of Appalachian acid seep from the proposed management activities. However, the area has not been surveyed systematically, and more seeps are likely occurring. We recommend that the area be carefully surveyed by a qualified botanist to identify these rare and sensitive communities. We are especially concerned, as some proposed activities, such as the installation of additional vernal pool could easily coincide with seep locations and/or impact their hydrology. Seep hydrology could also be impacted by the installation of logging roads and logging stations, as well as timber management activities within a seep’s watershed. Early successional regrowth appears to have reduced the amount of water reaching the seep in a similar setting in Pulaski County.”

The Consideration of Comments document responds to these latter concerns stating:

“Impacts to rare and sensitive plants are disclosed in the EA on pages 52 – 53 and 65. Impacts to soil and water are disclosed in the EA on pages 41 – 43 and 61 – 62.”
(Consideration of Comments at 29)

But such impacts have not been addressed, and the District has therefore failed “to consider an important aspect of the problem.” See *Motor Vehicles Manufacturers Ass’n v. State Farm*, 463 U.S. 29 (1983). Rare or sensitive species or habitats are not addressed in any way whatsoever in the EA on pages 52-53. Pages 52-53 of the PDF (EA 49-50) address environmental impacts with respect to “Terrestrial species **excluding bats and plants**” (emphasis added). We presume this is the section being referred to. Note here that the Consideration of Comments responds to concerns relating to rare plant species by citing a section of the EA that discloses effects to “terrestrial species excluding... plants.” This does not constitute a response to concerns regarding rare or listed plant species. Generally, this section addresses PETS and the determination that the proposed action will not threaten the viability of any species or move species closer to federal listing under the Endangered Species Act (ESA). This section does not address any of the state-listed or other sensitive plant species of concern. The only text on page 65 of the EA relates to the National Historic Preservation Act. The PDF at 65 (EA-62) does have brief language regarding compliance with the ESA. However, the comment above does not refer to federally-listed species, but to the significant

issue of the wide range of rare plants species and natural communities in the project area. The Consideration of Comments fails to address this. Proceeding with a decision intended to maintain and restore rare communities without considering impacts to the rare and sensitive plants for which those communities are important is arbitrary and capricious.

As we (and KSNPC) have pointed out repeatedly in our comments, the Greenwood project area is known to harbor a wide range of federally and state listed species and other species of concern, including several rare community types, but the area has not been fully surveyed. The 1988 Cooperative Inventory of Endangered, Threatened, Sensitive, and Rare Species, Daniel Boone National Forest, Somerset Ranger District produced by the U.S. Forest Service, The Nature Conservancy, Kentucky State Nature Preserves Commission, and Kentucky Department of Fish and Wildlife Service identifies six distinct “Unique Areas” within the Greenwood project area on account of high prevalence of rare species. But, as has the Forest Service has been repeatedly made aware, these surveys are incomplete. The EA and Wildlife Resources Report wrongfully ignore Forest Plan direction to survey for rare species and rare communities during project analysis, and instead relies on incomplete datasets and inadequate surveys on which to base an informed decision in the DN and FONSI. And, as further explained above, the District cannot tier to the Forest Plan to avoid consideration of these impacts because the Forest Plan explicitly defers the survey and analysis of these impacts to the project level.

Concerns over rare species, and rare plant species in particular, represent a significant issue that should have been addressed in the EA in a thorough manner.

The CEQ regulations at 40 CFR 1502.6 require that:

The disciplines of the preparers shall be appropriate to the scope and issues identified in the scoping process (§1501.7).

The significance of rare plant issues was raised during the scoping process by Objectors and the Kentucky State Nature Preserves Commission.

The Forest Service’s NEPA Handbook at FSH 1909.15, Chapter 10 under 12.2 – Interdisciplinary Team Selection states:

In selecting other team members, consider the variety of disciplines needed, based on issues, and resources affected (Chapter 10, 12.22)

And further states that team members should have:

3. Knowledge of and degree of experience in the subject discipline and the environmental analysis process. (Chapter 10, 12.22)

Appendix A- Preparers in the EA lists no one with significant botanical experience. Vegetation issues are listed as being addressed by the Silviculturalist, though no rare plant issues are addressed in the Vegetation report. Rare plants, to the extent that they are addressed, are addressed by the Wildlife Biologist, who’s resource area is listed as “Wildlife Resources.” Commenters raised the importance of rare plant species early and often in the process. But the Forest Service failed to select team members with the “knowledge of and degree of experience” needed to address this issue.

As described above, the Forest Plan also provides that rare communities will be looked for during project planning (see **I.1. Consideration of rare communities** above), and yet the Forest Service

has refused to do this. References to consideration of these issues do not point to any actual consideration of these issues. Failing to address state-listed rare species and rare communities in any meaningful way, particularly after the extensive and substantive input provided to the Forest Service on this issue, violates NEPA and NFMA.

II.3. Proposed, Endangered, Threatened, and Sensitive Species (PETS)

The extent of the Forest Service's analysis with regard to rare species appears to be limited to ESA and NFMA concerns with regard to PETS. However, even here the analysis is insufficient. As we noted in our comments on the EA, several species were improperly eliminated from detailed analysis. This issue was raised in our comments on the EA, where we state:

The Wildlife Resources Report does a good job describing many species that may occupy areas proposed for management. However, the report also eliminated a great number of species from detailed analysis (particularly difficult to identify rare plants species), stating that "These species have not been recently document from the project area." As indicated by KSNPC, there have not been full or recent surveys of the area to make such a determination. Therefore, we are concerned that some species may have been overlooked for consideration. (Comments at 12)

Below we describe some of the species incorrectly eliminated from detailed analysis. Each of the following species was eliminated on account of "Suitable habitat and/or current known distribution not within area of influence." For each of the species, we demonstrate that this is an incorrect determination given the available information for each species. The determination that these species are not present is further inconsistent with NFMA, NEPA, and the ESA because the Forest Service has made these determinations without actually looking for them, despite the presence of suitable habitat and the project are being within the known range of each species.

Royal catchfly (*Silene regia*): Royal catchfly is on the Regional Forester's list of Sensitive Species and listed as Endangered in Kentucky. It's only known occurrences in eastern Kentucky are in McCreary County. The species is limited to dry woods, barrens and prairies, and roadsides. The Biological Assessment and Evaluation (BAE-56) states that this species was eliminated from detailed analysis because "Suitable habitat and/or current known distribution not within area of influence." This is demonstrably not the case. The eastern Kentucky range of Royal catchfly includes precisely the habitat types and geography of the Greenwood project. The Forest Service cannot refuse to look for a species in its known habitat and range, and then say it does not need to be analyzed in detail because it doesn't occur in the area.

Canby's mountain-lover (*Paxistima canbyi*): Canby's mountain lover is on the Regional Forester's list of Sensitive Species and listed as Threatened in Kentucky. According to KSNPC this species habitat includes "Calcareous rocks and slopes (generally near the top of cliffs or bluffs), rocky woods in the mountains, usually above major streams."² The species is recorded in McCreary and Pulaski Counties, and its habitat type is in the project area. KSNPC further states that "Timber removal would increase light and change moisture conditions and could detrimentally impact this species." This species was eliminated from detailed analysis because "Suitable habaitat and/or distribution not within area of

² <http://eppcapp.ky.gov/nprareplants/Details.aspx>

influence” (BAE-56). The Forest Service has erred here in failing to analyze potential impacts to this Canby’s mountain-lover, as it could reasonably be present in the project area and impacted by proposed management.

Sweet pinesap (*Monotropis odorata*): Sweet pinesap is a saprophytic plant associated with ericaceous shrubs or yellow pines. It is on the Regional Forester’s list of Sensitive Species and is listed as Threatened in Kentucky. Sweet pinesap is known to occur in McCreary County, and its habitat type is a common habitat type in the Greenwood project area. The species was eliminated from detailed analysis because “Suitable habitat and/or distribution not within area of influence” (BAE-55). The Forest Service has erred in considering impacts to this species, as it is known to be in the general area of the project with suitable habitat in the project area.

American barberry (*Berberis canadensis*): American barberry is on the list of Regional Forester’s Sensitive Species and is listed as Endangered in Kentucky. It’s preferred habitat is limestone woodlands, which are in the project area. Known Kentucky occurrences are limited to McCreary County. This species was eliminated from detailed analysis because “Suitable habitat and/or current known distribution not within area of influence” (BAE-55).

Cumberland stitchwort (*Arenaria cumberlandensis* [*Minuartia cumberlandensis*]): Cumberland stitchwort is listed as Endangered under the ESA and is listed as Endangered in Kentucky. According to its listing notice in the Federal Register³:

Arenaria cumberlandensis is known from a limited portion of the Cumberland Plateau in north-central Tennessee and adjacent Kentucky. It is restricted to shady, moist rockhouse floors, overhanging ledges, and solution pockets in sandstone rock faces. Rockhouses were defined by Wofford (1976) as “cave-like overhangs resulting from differential weathering of sandstone.” This species occurs where the correct combination of shade, high moisture, cool temperatures, and high humidity provides appropriate habitat conditions

And further that:

Timber removal in or adjacent to the habitat supporting the species would also have significant adverse impacts on the population by eliminating the shade, high moisture and humidity, and cool temperatures which *Arenaria cumberlandensis* requires

This species’ only known Kentucky location is in McCreary County and its required habitat is common within the project area. According to the Federal Register notice, the type of management proposed in the Greenwood project (timber harvest and fire) could have negative impacts on this species were it to be present. This species was eliminated from detailed analysis because “Suitable habitat and/or current known distribution not within area of influence” (BAE-19). Because the Forest Service has not performed any surveys to look for this species, and because it is known to be in the same county with the appropriate habitat, it cannot be eliminated from detailed analysis.

³ Federal Register/Vol 53, No. 121/Thursday, June 23, 1988

In order to address these issues within the requirements of the ESA, NFMA, and NEPA, the Forest Service must conduct appropriate surveys and analyze the possible effects to PETS species resulting from the proposed action.

II.4. Resolution of rare species issues

The Forest Service can resolve these issues with regard to rare species, but it cannot proceed with the EA/FONSI without gathering enough information to justify the conclusion of no significant impact. Resolution of these issues requires the Forest Service to do the following:

1. Perform or contract for rare plant surveys, including PETS and state-listed species, of the project area using personnel with appropriate botanical training.
2. Identify and designate areas consistent with the 1.G. Rare Communities prescription in the Forest Plan for proactive management to maintain and recover rare species and their habitats.
3. Correct the deficiencies in the analysis with regard to PETS eliminated from detailed study.
4. Consider alternative locations for management prescriptions in the project area (e.g., timber harvest, non-commercial mechanical treatment, and prescribed fire) to maximize benefits and minimize harms to previously identified rare plant communities, as well as those identified through the surveys requested in resolution point II.4.1.

III. Wildlife openings

The Greenwood project proposes to change management on 75 wildlife openings totaling 222 acres. The project proposes to shift to management through broadcast spraying with herbicides and replanting with either non-native forage or native grasses and pollinator mixes. We raised concerns and questions relating to wildlife openings in our scoping comments on page 7 comments on the EA at 13. The Forest Service has violated NEPA by failing to disclose and therefore properly analyze the effects of planting native versus non-native vegetation in wildlife openings. The Forest Service has further erred and violated NEPA by failing to provide a clear and logical rationale in the Purpose and Need for adopting broadcast spraying of herbicides in lieu of tilling to plant forage in wildlife openings.

III.1 Native vs. non-native plantings

We have repeatedly raised a central question regarding what proportion of the 75 wildlife openings or 222 acres will be allocated to non-native forage versus native grasses and pollinator mixes. This is a relevant issue. The Forest Service failed to provide this information in the EA, and neither is it answered in the Consideration of Comments. The Forest Service's only response is as follows:

Herbicide use would occur in any of the proposed 222 acres of wildlife openings as needed for site preparation followed by planting of wildlife plot mixtures, pollinator mixtures, or native grass mixtures. Planting of any of the abovementioned mixtures would occur in any of the wildlife openings proposed for treatment in order to create a mosaic of conditions within wildlife openings across the project area. Total acreage would vary each year based on management constraints and available resources. Site specificity would be based on

wildlife opening size. For example, larger openings would allow for more specific treatment options (e.g. partial or entire treatment of the opening, multiple treatments in one opening) while smaller openings would allow for less specific treatment options (e.g. complete treatment of entire opening). In essence, the areas proposed for treatment would be managed as a conglomerate.

Pollinator mixtures would consist of wildflower and native grass mixes that are suited to this geographic area. Wildlife plot mixtures would consist of corn, milo, sunflower, and possibly other non-invasive species depending on operational constraints and availability. These species would provide diversity of forage opportunities. Some fields are historically planted with these plots interspersed in them for public dove hunting opportunities. The fields in the Keno area have been identified by KDFWR as fields that are ideal for these activities. Sometimes areas planted with these mixtures may be left fallow for a year or two and allowed to grow weedy forbs among the stalks and stubble for ground nesting broods to “bug” or forage as chicks. Properly maintained, these areas could remain beneficial to wildlife for 3-5 years. These plots would receive wildlife usage during transitional periods. Availability coincides with spring and fall hunting seasons. There is strong support from the hunting public to have these types of areas in wildlife management areas. These areas are also important for hunters who are mobility limited and beginning youth hunters. There are many non-consumptive members of the public that use these types of areas for wildlife viewing and photography.

This response simply does not answer the question. There is no specific or general acreage goal for the different treatments provided, or detailed information on how decisions would be made. If the Forest Service is going to make post-decision, on-site determinations regarding management direction for given wildlife openings, then the Forest Service must include in the analysis a rubric or sidebar clearly explaining how the site-based decision making process will be carried out (including both beneficial and detrimental environmental effects resulting from the action (40 CFR 1508.8(b))). The Forest Service’s NEPA Handbook FSH 1909.15 Chapter 10 section 15 states:

Adaptive management is appropriate for any proposal when the effects of the possible adjustments identified are included in the estimated effects. (sec. 14.1)

Adaptive management allows the agency flexibility after a decision is made to modify management within certain parameters. However, those parameters have to be disclosed and analyzed with regard to their environmental effects.

It is not a serious supposition that planting 222 acres with non-native forage for game or 222 acres of native plants are interchangeable and highly similar with regard to environmental effects or benefits. The EA and Consideration of Comments essentially say “we’re going to plant things in places” and leave it at that. This is not appropriate. Nor should it be difficult to provide *some* level of detail regarding general goals or guidelines with regards to making decisions about whether to plant non-native forage or native plants.

The problems here are procedural and substantive. Objectors and others have written to support the restoration of native species in wildlife openings, and opposed herbicide to facilitate the planting of non-native forage. These are different actions with different environmental effects, and different levels of acceptability to the public.

The Forest Service similarly and arbitrarily fails to acknowledge differences between the planting of non-native wildlife forage and native plant restoration in the response to comments submitted by the Kentucky State Nature Preserves Commissions. The KSNPC states:

We support the USFS effort of converting wildlife openings to native species, especially pollinator habitat. However, instead of introducing seed from outside of the area and species not necessarily native to the region, we would like to work with the Forest Service to integrate their efforts into a true pine woodland restoration that includes restoring the herbaceous understory. The project area is located within an area of the Daniel Boone NF that supports some of the last open grassland remnants in the area including several rare plant species. If management is conducted carefully, this project would provide a unique opportunity for restoration of these rare natural communities. It is possible that after removing exotic species and burning might encourage native grassland vegetation to reestablish from existing seed source without the need for seeding, at least in some of the openings. Seeding select conservative plant species occurring in or near the project area is another viable option that we would like to partner on with the Forest Service, possibly in collaboration with the native plant society.

The Forest Service's response in the Consideration of Comments is:

General support for wildlife opening management and expressions of interest in collaboration on projects. (Consideration of Comments at 39)

This response is not accurate or, frankly, honest. The KSNPC did not express "General support for wildlife opening management." They express support for the restoration of native plants in wildlife openings. The proposed action includes an undisclosed amount of native versus non-native plantings. It is not a serious supposition to treat these as the same.

The Forest Service cannot rationally analyze the effects or make an informed decision based on the non-specific and vague direction in the project.

If the deciding officer cannot answer this significant question with clarity, then it is simply an arbitrary action and no informed decision has been made. This clearly violates NEPA. To resolve this issue, the Forest Service needs to present clear goals or a clear decision-making rubric that will direct site-specific decisions regarding if a wildlife opening will be managed for non-native wildlife forage or native plant species.

III.2 Herbicides and no-till management

With regard to our questions and concerns of changing management of wildlife openings from tilling to broadcast spraying of herbicides and no-till planting, again the Forest Service has failed to adequately address the issue. Whether or not to broadcast spray herbicide on 222 acres is a significant and controversial issue to consider in detail. The Forest Service received a great many comment letters, including from Objectors, expressing concerns over broadcast spraying of herbicides in the wildlife openings. The EA and supporting documents provide no justification whatsoever, other than vague statements about the environmental benefits of no-till agriculture. In our comments we supposed that the reason was to reduce erosion, which we argued is not a problem in the project area. However, it was the only possible benefit that we could think of given that no other reasoning was provided in the EA or supporting documents. The Consideration of Comments responds only that:

No-till practices have been common for decades and the benefits are well-known (Ratton et al. 2007). While erosion prevention is one of many benefits of this practice, it is not a major factor at these sites and is not referenced as such in the EA. (Consideration of Comments at 36)

This evasion of public comment is not consistent with the letter or spirit of NEPA. NEPA is intended to engage and inform the public, not force them to guess why a decision is being made and then sidestepping the issue by telling them they've guessed wrong (but providing no further explanation of the agency's rationale). Plain and simple, this statement does not provide a response as to why deciding to broadcast spray herbicides to plant corn, sunflowers, etc., is environmentally preferable to tilling. The Interpretive Summary for the single cited paper to justify this method (Evolution of the plow over 10,000 years and the rationale for no-till farming), states:

The beginning of civilization depended on agriculture for food production -- so does civilization's future. Intensive tillage and use of heavy machinery and agricultural production systems were a cause of mixed blessings. The specific objective is to present a historical perspective on the development of civilization and its dependence on the plow-based agriculture. The soil and environmental impacts of intensive tillage are discussed and the rationale for adopting less intensive forms of tillage with more emphasis on minimum soil disturbance, continuous crop residue cover, and diverse crop rotations are described. **Accelerated soil erosion plagued the earth since the dawn of settled agriculture, and has been a major issue in the rise and fall of early civilization. Soil erosion has become a global issue with regard to its on-site impact on productivity and agricultural sustainability. Both water and wind erosion are exacerbated by plow tillage.** The agricultural revolution transformed the landscape, ecosystems, vegetation, soils and water resources. These transformations had far reaching and often irreversible impact on the cycles of water and other elements. While it is certainly not a panacea, conversion of plow tillage to no-till farming can address some of the issues by providing alternatives that are environmentally and economically compatible and sustainable while maintaining a high degree of social acceptability. Understanding the role of plow tillage in greenhouse gas emission will enable intelligent policy decisions for improved environmental quality. These results are significant to farmers and policy makers in that intensive tillage results in substantial short-term gaseous losses of carbon dioxide. This information will assist scientists and engineers in developing improved tillage methods to minimize the gaseous loss and to improve soil carbon management. Farmers can develop and utilize new management techniques for enhancing soil carbon by increasing the quantity and quality of crop residues and by changing the type and intensity of tillage. This information will be of direct benefit to the farmers to enable them to maintain crop production with minimal impact on air quality and the environment. (Emphasis added)

Notably, the two main environmental benefits cited here are erosion (which the Forest Service has stated isn't the reasons for adopting this method) and soil carbon management. We agree that carbon emissions from agriculture, including soil carbon losses, are a huge societal and global issue. But is the Forest Service saying here that the decision to adopt broadcast spraying of herbicides and no-till agriculture on 222 acres of national forest system lands is to address concerns about carbon emissions? The Climate section of the EA does not discuss wildlife openings at all. In fact, the EA states:

Implementation of Alternative 2 would result in no direct effects to climate change because climate change does not occur as the result of any single direct action. (EA-30)

So it's not carbon. And it's not erosion.

The Technical Abstract states:

Agriculture originated 10 to 13 millennia ago in the Fertile Crescent of the Near East, mostly along the Tigris, Euphrates, Nile, Indus and Yangtze River valleys and was introduced into Greece and southeast Europe > 8000 years ago. Sumerian and other civilizations developed a wide variety of simple tools (digging sticks) to place and cover seed in the soil that led to more complex paddle-shaped spades or hoes pulled by human or animals. A wooden plow, called "ard," was developed in Mesopotamia about 4000 to 6000 BC that led to the "Triptolemos ard" named after the Greek god and hero. Historical documents and archaeological evidence illustrate the "mystique" of tillage implements that were thought to "nourish the earth" and to "break the drought" as is evidenced in several ancient texts. The ard evolved into the "Roman plow," with an iron plowshare, described by Vergil around 1 AD and was used in Europe until the 5th century. It further evolved into a soil inverting plow during 8th to 10th century. In the U.S., a moldboard plow used was designed by Thomas Jefferson in 1784, patented by Charles Newfold in 1796, and marketed in 1830s as a cast iron plow by a blacksmith named John Deere. Use of the plow expanded rapidly with the introduction of the "steam horse" in 1910 and instigated severe soil erosion and environmental degradation culminating in the Dust Bowl of 1930s. The transition from the moldboard plow through forms of conservation tillage to no till began with the development of 2,4-D after World War II. No till is presently practiced on about 95 million hectares globally. **The no-till technologies are very effective in minimizing soil and crop residue disturbance, controlling soil evaporation, minimizing erosion losses, sequestering C in soil and reducing energy needs. However, no-till is effective only with the use of crop residue as mulch, which has numerous competing uses.** No-till farming can reduce yield in poorly drained, clayey soils where springs are cold and wet, and site-specific research is needed to enhance its applicability. (Emphasis added)

Again, the main benefits raised are minimizing erosion and reducing soil carbon losses. But if those aren't the purpose for adopting these methods, then what is the need? Also, will the management of the wildlife openings in the Greenwood project area utilize crop residues as mulch, which is described above as necessary toward effectiveness of no-till agriculture.

No-till agriculture can offer environmental benefits, as well as costs (ask any organic farmer). Many of the issues and impacts are situational and land-use specific. None of that is addressed in the EA or supporting documents. Without any justification, and only one citation that doesn't really explain the Forest Service's reasoning, any decision to approve the broadcast spraying of herbicides for wildlife plantings is completely arbitrary and in violation of NEPA.

III.3 Resolution of wildlife openings issues

The Forest Service cannot justify the decision without further disclosure and analysis, or inclusion of a rubric or sideboards that describe the site-specific decision-making processes to be applied, to wit:

1. Disclose clearly how many acres will be planted in native species versus non-native wildlife forage. If there is no discrete number, then provide estimates or goals along with a clear description of how site-specific decisions will be made.

2. Provide an analysis of effects that describes both beneficial and detrimental effects of the different management directions (i.e., planting native plants versus non-native forage).
3. Remove the broadcast spraying of herbicides for management of wildlife openings as a management tool⁴,
4. Present an appropriate, legally adequate discussion of the site-specific needs and benefits that will be addressed by approving the proposed management action.

IV. Forest and timber management

Objectors addressed issues relating to forest and timber management in detail in our scoping comments in section **5. Woodlands Management and Pine Restoration** and section **16. Citizen's Alternative**, and in our comments on the EA in sections **4. Pine Restoration**, **5. Woodland Establishment**, and **13. Silvicultural Assumptions**. Issues related to Action 2 Woodland Establishment and Action 8 Shortleaf Pine Restoration overlap, and are covered jointly and separately in this section. The Forest Service has issued a draft decision that contradicts the Forest Plan, is based on objectively incorrect information about existing forest conditions, and arbitrary, contradictory statements regarding management limitations with respect to vegetation conditions and responses. Suggestions for remedies are at the end of this section.

IV.1. Southern pine beetle and existing forest structure

As we are all aware, the southern pine beetle (SPB) inflicted substantial damage and mortality on pine species in the Greenwood project area and elsewhere during the 1999-2001 outbreak. The project analysis acknowledges this insofar as it is a justification for logging to plant pine for "restoration," but ignores this fact in justifying the need for timber harvest to establish woodland canopy densities. As we state in our comments on the EA:

According to the scoping document under **Existing Conditions for Action 9 – Shortleaf Pine Restoration**, 10,468 acres of the project area lost, at minimum, 30% of their canopy to southern pine beetle (SPB) mortality. The **Five-Year Review of Implementing the Forest Plan (2009)** states:

“Trend in Forest Cover - A significant change occurred to the forest during 1999-2001 because of a widespread southern pine beetle (SPB) outbreak. Based on the trends from the stand exams done since then, some of the stands that were overstocked with mixtures of pine and hardwood have been naturally thinned”

And later that:

“Many of the pine stands sampled since then, have a significant component of hardwood of the same age remaining, although stocking has been significantly reduced.”

Notably, the EA and associated documents fail to provide any reasonable description or analysis of forest stand structure in the stands impacted by the SPB. The scoping document

⁴ We strenuously note here that this is a separate consideration from the use of herbicides to control non-native invasive plant species.

actually appears to provide more information on this than the EA. The best information we can find in the EA and associated document is the following from the Vegetation Report:

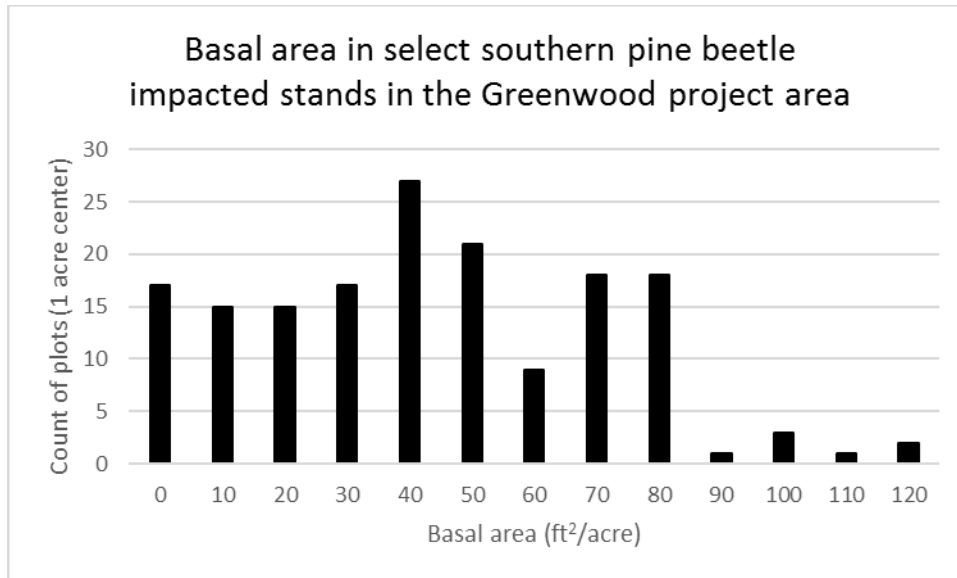
“The pine beetle eliminated pine seed sources and there was an absence of pine advance reproduction in the understory due to a lack of appropriate growing conditions (e. g. shortleaf pine is intolerant of shade) which resulted in hardwood regeneration upon the mortality of overstory pines (Oswalt et al. 2012; South and Buckner 2003). While these communities are minimally represented in Figure 2, there could be more acres present; however, data collected prior to the pine beetle epidemic that contains pine vegetation types cannot be relied upon.” (VEG-3)

As we have pointed out in our comments and in field meetings with the project team, the project area includes large areas of former pine-hardwood stands that are now low-density hardwood stands meeting basal area targets for the proposed logging prescriptions. As we have also pointed out repeatedly, these stands in many cases represent the best and most in-need sites for the restoration of fire-adapted forest communities. However, the Forest Service has ignored or arbitrarily dismissed this information.

In our comments on the EA we discuss our requests to the Forest Service to perform a detailed and appropriate analysis of stands severely impacted by SPB. In section **5. Woodland Establishment** in our comments we use satellite imagery to show multiple sections within the project area that clearly show severe canopy loss. Several of these sections were pointed out in the field to project team members during the analysis.

Because we were concerned that the Forest Service would not properly survey areas as requested in our comments on the EA, we opted to perform a quantitative analysis of the forest sections illustrated in our comments. In April 2017, Kentucky Heartwood surveyed seven areas in the Blue John, Bauer, and Curt Pond Ridge areas⁵. Each of these areas was included in our comments on the EA. We used a fishnet overlay in ArcGIS to set up 1-acre grids and measured basal area at the center point for each grid plot using a 10 BAF wedge prism. Data were taken at 164 plots. The distribution of basal areas for the plots were as follows:

⁵ Data sheets are attached to this objection



Through this detailed survey process, we made other important site specific observations that should have been covered by the Forest Service during the analysis process. Several of the areas have been subject to fire – apparently arson though we are not sure. Some appear to be part of existing burn units. Because of past and recent fires, many of the overstory trees recorded in our basal area measurements had severe damage and were in marked decline. As such, it is likely that overstory basal area will continue to drop in coming years. Overstory trees were largely oaks (*Quercus spp.*) and hickories (*Carya spp.*), with a surprisingly small amount of red maple (*Acer rubrum*). Many of these areas also had few trees in pole-timber size classes because of fire. Understory vegetation was largely dominated by brush, briars, and sapling sprouts. We observed a high proportion of post oak (*Quercus stellata*) and blackjack oak (*Q. marilandica*) in these sites, especially in the Blue John area. Both of these species are good indicators of historic barrens-type communities, and are relatively absent in many of the stands proposed for woodland or pine management in the project. These are all observations that the Forest Service should have made during the analysis of the project area.

We also observed what appears to be a good quality sandstone glade community just east of US 27 in one of the areas surveyed. The section had an excellent grass/forb component and was dominated by blackjack oak with some young shortleaf pine. Julian Campbell said that there are historic references to a good sandstone glade community in that area.

Our surveys were not comprehensive across the project area, and we know that other disturbed canopy forests are in the project area. But this sample provides a view of some of the existing vegetation. We will refer again to this in our discussions on the specific issues with the Woodland Establishment and Shortleaf Pine Restoration prescriptions below.

IV.2 Woodland Establishment

The project is inconsistent with the Forest Plan in that the Plan requires the Forest Service to consider naturally created woodland conditions – which the Forest Service has refused to do.

Relatedly, there is a failure here to abide by NEPA whereby the purported “need” for Action 2 Woodland Establishment has been constructed around incomplete or inaccurate information about the existing forest condition.

Issues relating to Action 2 Woodland Establishment were addressed in detail in our comments on the EA. As stated in our comments:

The Proposed Action includes 674 acres of timber harvests to 30 to 50 ft²/ac to establish canopy densities associated with woodland forest communities. The Vegetation Report states:

Woodland

The desired future condition is forested stands in the project area that are relatively open in the understory with more grasses and forbs, and thin to dense patches of low shrubs < 3 feet in height. A low density (< 5 ft² of basal area per acre) of midstory trees may be present. An overstory comprised of healthy, long-lived, fire resilient tree species such as shortleaf pine and chestnut oak with a basal area ranging from 30 - 50 square feet per acre are desired (USDA-FS 2004a). Tree crowns ideally would not be touching, and would provide 25-60% cover. (Veg-9)

The scoping document provides more specific information regarding the status of woodlands in the project area, including the purpose and need for this action, than are found in the EA and associated documents. The scoping document states that, since 2007, only 156 acres of woodland has been created on the DBNF, and an additional 359 acres will be provided through implementation of the Freeman Fork Oak Woodland Restoration Project. The specific justification given for timber harvesting in the Purpose and Need for woodland establishment is to create mid-density forests meeting specific basal area targets that ostensibly do not exist in the project area.

The purpose of this proposed action is to meet the desired future condition for the woodland habitat type described in the Forest Plan (page 3-33). **The purpose of the proposed timber sale would be to establish the low to moderate basal area.** The purpose of the proposed midstory control treatment would be to further develop woodland structure. The purpose of the proposed prescribed burning would be to maintain woodland structure and function.

Since only 156 acres of hardwood and hardwood-yellow pine woodlands have been established on the DBNF since 2007, and only 359 more acres will be established as part of the Freeman Fork Oak Woodland Restoration Project, there is a need to establish and maintain 1,875-2,620 more acres of this habitat type within the Cumberland River Management Area in the first decade (2004-2014). Proposed action 2 would move the project area towards this land management objective by establishing 1,028 more acres of this habitat type within the Cumberland River Management Area. **The mature closed canopy hardwood stands found in the project area provide an opportunity to increase the amount of hardwood and hardwood-yellow pine woodland habitat** needed in the Cumberland River Management Area and on the DBNF as a whole. (Scoping document at 8, emphasis added)

We have raised this issue more than any other throughout the three years of the development of the Greenwood project. The Purpose and Need for the project states that timber harvest is needed in order to establish overstory densities in the 30 to 50 ft²/ac range, and asserts that no forest in the project area (other than areas in the Freeman Fork project area) falls in this range. We have argued the case, since the beginning, that forests with basal areas in this range exist throughout the project area. These claims have been ignored over and over again. In our comments on the EA we point to specific locations that appear to have basal areas in this range. We now have provided quantitative data using standard forestry measurements to demonstrate that what is known to be on the ground is actually on the ground.

Areas proposed for management in the Greenwood Project are largely in the 1.K Habitat Diversity Emphasis prescription of the Forest Plan. The Forest Plan states:

Emphasis of Condition: This area is managed for the purpose of maintaining biodiversity. Various management techniques are utilized to maintain this area in a variety of habitat conditions, not necessarily supported or found in other Prescription Areas. **Planned management considers the type and amounts of habitat conditions created by unplanned disturbance regimes such as wildland fire, severe weather events, and insect or disease epidemics.** (Forest Plan 3-31, emphasis added)

The Plan therefore explicitly requires the District to account for naturally created conditions when assessing whether there is a need for woodland creation. The Greenwood decision does not, and it is therefore inconsistent with the Plan. The Forest Plan goes on to state:

Within these fire-adapted blocks, fire is a dominant tool used to maintain and restore specific structural and compositional habitat conditions. These blocks include both target (i.e., fire-mediated) and non-target (i.e., fire-influenced) habitat associations where fire is desired in the former, and is not necessarily desired but accepted in the latter. It is within these fire emphasis blocks that open, low basal area (BA) oak or southern yellow pine forest with grassy or shrubby ground layers; warm season grasslands; southern yellow pine forests, and many of the moderate basal area oak forests are to be found. These are the target communities. (Forest Plan 3-31)

The Forest Service responds in the Consideration of Comments to our comments regarding enhancing woodland structure in SPB impacted stands by stating:

These issues were addressed during scoping. Reasons for the dismissal of the Citizens Alternative are disclosed in the EA, Appendix F (Issue Analysis), Table 5 on pages 25 – 28.

Specifically, using fire alone to establish woodland structure would be inefficient. Repeated prescribed fire would be required over a long term period (decades) in order to reduce the mid and understory to desired levels where herbaceous cover and grass species could become established. There would also be a high risk of overstory mortality due to the increased number of prescribed fires that would be required. By removing the material through a harvest, the process of woodland establishment would be jump started and fewer burns would be required to reach the desired future condition. (Consideration of Comments at 28)

This response assumes that woodland structure would only be established in *closed canopy* forests. The issue raised in our comments is that there are abundant *open-canopy* forests in the project area meeting the basal area distributions cited in the Purpose and Need for the project. This is a

fundamental difference. Furthermore, the Forest Service is basing the response with regard to midstory conditions on assumptions that are not borne out by the site-specific facts.

The Forest Service also suggests in the Consideration of Comments that establishing woodland in areas affected by natural canopy disturbance, absent commercial timber harvest, would be ineffective or impractical due to the development of understory and midstory vegetation. However, the Proposed Action includes removal of saplings, stump sprouts, and midstory trees in proposed harvest units through prescribed fire and mechanical methods (cutting, grinding, etc.).

Site preparation in these areas would remove a portion of the understory, primarily stems 1.5 to 4 inches DBH regardless of species, which would result in prolific stump sprouting and an increase in stems per acre. These sprouts would compete with the existing vegetation or, in areas where prescribed fire would be applied, could be killed as previously described. (Vegetation Report at 25)

And as we point out below in **IV.3 Pine Restoration**, the Forest Service is planning shortleaf pine restoration in some areas with midstory and understory conditions similar to those in areas we have pointed to, where the Forest Service says here that restoration is impossible or impractical.

It's worth noting that on August 30, 2017 the Forest Service, as part of a Cumberland River Fire Learning Network field day, took us to a site in the London District in the Heath Ridge area that sustained substantial SPB damage, but through prescribed fire management is developing good woodland structure including natural shortleaf pine regeneration and reasonably good herbaceous response. District and Forest personnel discussed how and why fire management had been effective in moving the forest toward its current condition. This is the exact type of thing that the Stearns District says is impossible. The Heath Ridge site is about 2 miles north of the Greenwood project area, with essentially the same land type and position as areas proposed for management in the Greenwood project.

The Forest Service is simply not responding the conditions that factually exist, and which have been raised as an issue repeatedly throughout the analysis process. To the extent that these issues are addressed in the record, the responses provided by the Forest Service are arbitrary in their assertions that similar midstory and understory conditions can be managed effectively with prescribed fire and non-commercial mechanical treatment following a timber harvest, but cannot be managed effectively with prescribed fire and non-commercial mechanical treatment in stands that don't require timber harvest to reduce the overstory. The Forest Service is violating NFMA by failing to follow Forest Plan direction by failing to meaningfully consider "unplanned disturbance" and is violating NEPA by failing to address significant issues and facts that get to the heart proposed Action 2 – Woodland Establishment. An "informed decision" cannot be made under these circumstances.

IV.3 Shortleaf Pine Restoration

The Forest Service has erred and ignored available information to inform the decision with regard to Action 9 – Shortleaf Pine Restoration. Conflicting and arbitrary statements are presented regarding the viability of restoring shortleaf pine in stands heavily impacted by SPB, in violation of NEPA. Issues of consistency with the Forest Plan, and therefore NFMA, arise from improper determinations regarding former Yellow-Pine Dominated Forests.

The Purpose and Need for Action 9 – Restore Shortleaf Pine is stated as:

There is a need to establish (restore) and maintain approximately 467 to 1470 acres to forest types that have >30% component of yellow pine, in order to meet the desired future condition of 18-24% of forest acreage in forest types having a significant (> 30%) component of yellow pine. (Scoping at 15)

The Scoping document describes at length how restoration of native shortleaf pine is necessary because of the impacts of the SPB outbreak.

We note here that the Forest Plan Prescription 1.K Habitat Diversity emphasis Habitat Components definition for Yellow-Pine Dominated Forest is:

Yellow-Pine Dominated Forest – A portion of the forest communities within this Prescription Area consist of stands containing at least 50 percent softwood, of which the plurality stocking is southern yellow pine (predominantly shortleaf and pitch pine) Approximately 17,100-22,800 acres of this forest type in various forest conditions is restored within 80 years. (Forest Plan 3-34)

The EA for the project states that the proposed action helps meet Forest Plan 1.K-Goal 2 to:

Develop and maintain 120,000 to 160,000 acres of yellow pine and oak forest, woodland, and wooded grassland/shrubland in various mixtures of species and habitat within a fire-medicated system. (Forest Plan 3-36, EA-24)

Though the EA doesn't cite it, it appears clear that Action 9 – Shortleaf Pine Restoration is aimed at meeting Forest Plan 1.K-Objective 2.D, which states:

Establish 7,030 to 9,370 acres of yellow pine and yellow pine hardwood on sites decimated by the southern pine beetle epidemic of 1999-2000 (Forest Plan 3-37)

We emphasize here the language in the Forest Plan about restoring pine “on sites decimated” by the SPB outbreak.

The EA does cite 1.K-Objective 2.F to:

Establish and maintain 5,320 to 6,970 acres of hardwood and hardwood- yellow pine woodland in the 1st decade. This should be developed within management areas on both dry-mesic and dry-xeric sites based on the following: See Forest Plan p. 3-38 – Actions 2, 13 (EA-4)

However, Action 9 – Shortleaf Pine Restoration is not cited above as helping to meet 1.K-Objective 2.F. The EA does state that Action 9 Shortleaf Pine Restoration fulfills 1.K-Objective 1.A. to

Maintain 5 to 6 percent within each 5th level watershed in the 0-10 age class, including the effects of catastrophic events. (EA-4)

But nowhere in the Purpose and Need for the action is creating forest in the 0-10 age class provided as the reasoning behind the shortleaf pine restoration prescription. So the rational interpretation here is that the Shortleaf Pine Restoration prescription helps restore pine per Forest Plan 1.K-Objective 2.D.

The definition of Yellow-Pine Dominated Stand in this prescription area as having “at least 50 percent softwood, of which the plurality stocking is southern yellow pine” is substantively different

from the “>30%” criterion of pre-SPB canopy composition presented in the project documents. In this way, the project deviates from the Forest Plan in a substantive manner. For example, in our comments on the EA we raise concerns about stands 5036-9 and 5058-63 having had only a minor amount of shortleaf pine prior to the SPB outbreak. The Consideration of Comments presents a quantitative response estimating that pine species represented 32.5% and 33% of the stands prior to the SPB outbreak. Having spent time in these stands it is hard to believe this, but we will accept these numbers. Regardless, the Forest Plan defines Yellow-Pine Dominated Forest as forest with at least 50% pines, and not 30%. The Forest Service is violating the Forest Planning by proposing to harvest nearly all trees in closed-canopy hardwood stands that never met the Forest Plan definition of Yellow-Pine Dominated Forest to “restore” Yellow-Pine Dominated Forest. This is improper, and doubly so given the large inventory of stands being left unmanged that were truly Yellow-Pine Dominated Forest and “decimated” by the SPB outbreak.

In our comments on the EA, we state:

Kentucky Heartwood supports the restoration of pine communities, especially fire-adapted pine communities, on sites where a significant majority of the canopy was in pine prior to the SBP outbreak. To achieve this goal, we support a combination of non-commercial mechanical treatments (including felling and mastication), prescribed fire, and plantings. We also support the proposed planting of “some native grasses and pollinator species” (EA-9) in these stands. (Comments at 5)

Our comments are completely consistent with the Forest Plan, and help direct the Forest Service toward an approach that is defensible in its site-specific considerations, meets the need to “restore” pine on former pine-dominated sites, and brings the Forest Service in to compliance with the Forest Plan (and therefore NFMA).

The Kentucky State Nature Preserves Commission similarly states in their comments on the EA that:

We support the USFS idea in restoring pine woodlands on the DBNF. However, these should occur in areas that have recently had pine or pine oak forests instead of clearing mature hardwood dominated stands.

The Forest Service, however, turns this statement in the response in the Consideration of Comments to:

Expression of support for pine woodland restoration. (Consideration of Comments at 34)

The KSNPC does not unequivocally support the pine restoration prescription in the project. They object to “clearing mature hardwood dominated stands,” which is what the Forest Service proposes to do in several locations to “restore pine.”

In the Consideration of Comments the Forest Service responds to Kentucky Heartwood’s suggestion to restore pine on sites that were predominantly pine and had been most severely impacted by the SPB that such management is impractical or impossible.

With regards to the other stands proposed for shortleaf pine restoration, all stands have been evaluated both on the ground and through data analysis. Data collected before (when available) and after the SPB epidemic was analyzed. Data indicate all stands proposed for shortleaf pine restoration had a notable pine component prior to the SPB epidemic. Based on recent field observations (Hull field notes 2017) many of the stands contain live mature

shortleaf pine, shortleaf pine saplings, shortleaf pine natural regeneration, or a combination thereof. All stands contain varying degrees, ranging from mild to heavy, of dead and down shortleaf pine coarse woody debris. Based on these findings, the stands as proposed in Alternatives 2 and 3 would be suitable for shortleaf pine restoration.

Non-commercial restoration of shortleaf pine would be inefficient. Areas impacted by SPB have been regenerating for over 15 years. In a non-commercial scenario, cut and leave would be required to open the canopy and reduce existing mature trees, poles, saplings, and seedlings to provide appropriate light levels for planted shortleaf pine. Stem densities would be dictated by canopy cover with high stem densities being present under more open conditions and lower stem densities under more closed conditions. Non-commercial cut and leave would drastically increase fuel loads to the point where burning would likely have to be postponed for several years to reduce the risk of residual overstory mortality. In areas with high stem densities fuel loading would be more contiguous increasing the risk and potential damage of wildfire. During this time period between cut and leave and the implementation of the first prescribed fire, the understory would vigorously regenerate in the form of stump sprouts and seedlings creating extremely competitive and unfavorable conditions in which to plant shortleaf pine. Once conditions become appropriate for the first prescribed fire, repeated prescribed fires would be necessary to reduce the understory and slash from the non-commercial cut and leave to create conditions in which shortleaf seedlings could compete. Preparing the site with a commercial harvest, in which a large amount of the material would be removed from the site, would allow the desired future condition to be reached much more efficiently. A prescribed fire could be implemented soon after harvest followed by planting. (Consideration of Comments at 32)

The Forest Service response here does not respond to the conditions found in the project area that we present in our comments. Firstly, the response assumes that a “non-commercial restoration” approach would necessarily mean felling and leaving a large number of canopy trees. But as we have made very clear throughout this process, we are talking about forests that currently have substantially open canopies. We identified these forests in the field, noted them in our comments on the EA, and presented a quantitative analysis in this objection to put numbers to these assertions.

Secondly, the Forest Service states that “Areas impacted by SPB have been regenerating for over 15 years,” and suggest that existing regrowth makes restoration of pine impossible or impractical. However, as we noted in our comments, the Forest Service has identified stands that meet the criteria we support and included them in the pine restoration prescription.

There are many sites in the project area that lost a majority of canopy cover, and where, absent fire, red maple and tulip poplar are beginning to dominate. We stressed in our scoping comments and in conversations with project team members over the past 2 ½ years that these are the sites most in need of restoration. An example of a suitable site proposed for pine restoration is the 17 acre stand at the junction of Blue John Road and Valentour Road (FID 77, LOCATION 5035). The 12 acre stand behind the Alpine recreation site (FID 156, LOCATION 5058) is also a good site. We have identified other similar sites in the field with Forest Service project team members through Greenwood and CRFLN field trips. (Comments at 6)

The Forest Service has proposed pine restoration management in stands that the Forest Service says cannot be restored to pine. Many of the stands we are pointing to as alternative pine restoration sites have nearly identical vegetation conditions as the stands cited above. This is an arbitrary response at best.

Thirdly, the Forest Service responds that targeting pine restoration through non-commercial felling would not work because of sapling growth and stump sprouting. Set aside here for a moment that our suggestions in our comments on the EA do not include the felling of overstory trees for pine restoration. Under the suggested prescriptions we have offered, there would be no need to wait years to burn sites to prepare them for planting. As stated previously, some of these stands have already been burned. But even so, the conditions cited in the Consideration of Comments as being an impediment to pine restoration (“the understory would vigorously regenerate in the form of stump sprouts and seedlings creating extremely competitive and unfavorable conditions in which to plant shortleaf pine”) are no different than those following the commercial felling that the Forest Service has proposed. In the EA, the description for the proposed action for Shortleaf pine restoration states that:

Following the harvest, site preparation for planting would be conducted by mechanical methods (e. g. masticator) on slopes up to 35%. On slopes exceeding 35%, site preparation would be conducted manually. (EA-9)

And that:

Based on current data, natural hardwood regeneration would be expected to occur through hardwood seedlings already present, stump sprouting, or acorn and nut germination from remaining overstory trees. (EA-9)

The Forest Service is arbitrarily arguing that pine restoration cannot work following the felling of trees absent a timber sale because of sapling release and stump sprouting, but that pine restoration will be carried out using a masticator for post-harvest site prep, and that natural hardwood regeneration through seedling/sapling release and stump sprouting are acceptable or will be dealt with.

IV.4 Alternatives

Objectors requested in our scoping comments under section 16. Citizen’s Alternative that the Forest Service consider a range of alternatives that included the following:

Woodland and Pine Restoration management will occur without commercial logging by using prescribed fire and limited non-commercial felling of infill (saplings) established since the SPB outbreak, followed by the planting of Shortleaf (*Pinus echinata*) and Pitch (*Pinus rigida*) pines in sites with the most optimal conditions. (Scoping comments at 13)

The Forest Service has refused to consider such an approach based on inconsistent and arbitrary reasoning in violation of the CEQ regulations and the Forest Service NEPA Handbook. Under the CEQ regulations, the Forest Service is required 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 as provided by section 102(2)(E) of the Act. (40 CFR 1501.2(c))

The Forest Service’s NEPA Handbook, Chapter 10 states:

Reasonable alternatives to the proposed action should fulfill the purpose and need and address unresolved conflicts related to the proposed action. Be alert for alternatives suggested by participants in scoping and public involvement activities.

The Forest Service's decision to avoid a hard, honest look at reasonable alternatives to the proposed silvicultural action violates NEPA.

IV.5 Resolution of forest and timber management issues

There are a number of things that the Forest Service can and should do to remedy the deficiencies in the analysis with regards to forest and timber management. These include:

1. Inventory and disclose the acreages, basal areas, and species composition for sections of forest most impacted by the southern pine beetle (SPB).
2. Correct arbitrary, contradictory, and incorrect positions presented in the record stating that management of naturally disturbed areas cannot occur on account of understory growth.
3. Rearrange woodland establishment and prescribed fire units to incorporate areas most impacted by natural disturbance events and exhibiting basal areas in or near the target range for woodland establishment harvests. We strongly recommend shifting management, including fire management, to the extensive areas of SBP disturbed forests in the Blue John area as described in Kentucky Heartwood's comments on the EA (Comments at 8). In addition to canopy structure, these areas exhibit a species composition strongly suggesting historic fire-adapted woodland community structure, and much more so than some mesic stands proposed for woodland establishment.⁶
4. Rearrange pine restoration management activities to focus only on stands that were previously Yellow-Pine Dominated Forest with formerly >50% yellow pine component per Forest Plan definitions.

Objectors hereby request the opportunity for a meeting per 36 CFR § 218.11(a) to discuss this objection and options for resolution.

⁶ See Kentucky Heartwood comments on the EA at 10: "On the northwest side of Blue John Road is a 43 acres stand (FID 81, LOCATION 5036) proposed for woodland establishment. A significant portion of the stand is a north-facing mesic forest with an understory with spicebush (*Lindera benzoin*), maidenhair fern (*Adiantum pedatum*) and abundant and large black cohosh (*Actaea racemosa*). These understory plants are contrary indicators for woodland establishment."

Comments to Greenwood Vegetation Management project

Submitted by Kentucky State Nature Preserves Commission March 6, 2017.

Thank you for the opportunity to comment on this proposed project. We have reviewed the proposal and developed the following comments.

Exotic species

While we support the removal of exotic species from wildlife openings within the project area, we are concerned that other aspects of the proposal will further the spread of exotic species. For example the large number of roads and logging stations proposed in this project will inevitably lead to an increase in the spread of exotic species into the project area. The proposal acknowledges that exotic species will have to be controlled but does not provide details on how this is going to be accomplished.

Wildlife openings

We support the USFS effort of converting wildlife openings to native species, especially pollinator habitat. However, instead of introducing seed from outside of the area and species not necessarily native to the region, we would like to work with the Forest Service to integrate their efforts into a true pine woodland restoration that includes restoring the herbaceous understory. The project area is located within an area of the Daniel Boone NF that supports some of the last open grassland remnants in the area including several rare plant species. If management is conducted carefully, this project would provide a unique opportunity for restoration of these rare natural communities. It is possible that after removing exotic species and burning might encourage native grassland vegetation to reestablish from existing seed source without the need for seeding, at least in some of the openings. Seeding select conservative plant species occurring in or near the project area is another viable option that we would like to partner on with the Forest Service, possibly in collaboration with the native plant society.

Pine restoration/burning

We support the USFS idea in restoring pine woodlands on the DBNF. However, these should occur in areas that have recently had pine or pine oak forests instead of clearing mature hardwood dominated stands.

A carefully handled burn regime could play an important part in restoring rare pine woodland ecosystems. That would require frequent burning of small tracts in favor of less intense/frequent burning of larger areas.

Rare species

The proposal did not address occurrences and possible impacts on state listed rare plants and rare plant communities within the project area. The Forest Service has obtained rare species data from our natural heritage database for the whole Forest and we are surprised that s they were not addressed in this proposal. We would be glad to resubmit a report and map for your area, if you are interested, but I would recommend that you first contact the Winchester office for this data.

As I mentioned before, the project area has not been systematically surveyed for rare state listed species and before any management decisions are made on the ground, we recommend that every stand be surveyed by a qualified biologist to determine, which management activities might be the most appropriate. While some stands might be best managed for old-growth to benefit the unique species diversity associated with it, (in this area i.e. snails and other inverts), other stands might be chosen for a more intense fire regime to encourage fire dependent species associated with more open conditions.

Seep

We appreciate that the Forest Service has excluded an occurrence of Appalachian acid seep from the proposed management activities. However, the area has not been surveyed systematically, and more seeps are likely occurring. We recommend that the area be carefully surveyed by a qualified botanist to identify these rare and sensitive communities. We are especially concerned, as some proposed activities, such as the installation of additional vernal pool could easily coincide with seep locations and/or impact their hydrology. Seep hydrology could also be impacted by the installation of logging roads and logging stations, as well as timber management activities within a seep's watershed. Early successional regrowth appears to have reduced the amount of water reaching the seep in a similar setting in Pulaski County.

Thank you for the opportunity to comment on this proposed project. Please keep us in the loop, as this project progresses. We would like to work with you closely to help explore effective ways to realize some of the unique opportunities created by this project for restoration of rare species and community habitats.

Sincerely,

Martina Hines

Natural Heritage Program Manager

Date submitted (UTC): 8/27/2014 12:00:00 AM
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Comments:
August 22, 2014

Dear Mr. Reed,

Thank you for the opportunity to comment on the Greenwood Vegetation Management Project.

We support some of the proposed management practices (including the conversion of white pine plantations and managing for open woodlands. However, we are concerned about possible impacts on rare species and communities within project area as well as within the Beaver Creek Wilderness area , especially the inadvertent spread of exotic species. Any disturbance of the substrate can be expected to lead to the introductions of exotics, particularly *Microstegium viminium* (Japanese stiltgrass), and *Lonicera japonica* (Japanese honeysuckle). Those species can easily spread from the project into the wilderness area. In addition to the measures proposed in the project description, we recommend the following measures to reduce the risk of invasion by exotics into the Wilderness area: maintain forested buffers of at least 300ft above the rim of the wilderness area , as well as around any streams, including ephemeral waters leading into the wilderness area; require contractors to steam wash tires of any equipment to be used in the project area; carefully monitor project area in the years following the treatment applications and promptly treat any infestations; close roads promptly to prevent OHVs from spreading exotics into project area.

A forested buffer along waterways, including ephemeral streams and minor drains, is also critical to avoid increased sedimentation or changes of water chemistry that could impact the two federally endangered fish species , blackside dace (*Chrosomus cumberlandensis*) and the Cumberland arrow darter (*Etheostoma sagitta*), which occur in Beaver Creek and some of its tributaries.

Federally listed bats known to occur within the project area include northern long-eared bat (*Myotis septentrionalis*, proposed endangered), gray bat (*Myotis grisescens*), and Indiana bat (*Myotis sodalis*). To avoid impacting these species, follow USFWS guidelines.

We are also concerned about possible impacts of the proposed activities on the numerous other rare species and communities within the project area. KSNPC listed species and communities, known to occur within the project area include:

Animals

Rare animal (sensitive species, contact KSNPC for more info), (KSNPC listed endangered) (seeps)
eastern small-footed myotis (*Myotis leibii*, KSNPC listed threatened)
evening bat (*Nycticeius humeralis*, KSNPC listed special special concern)
Rafinesque's big-eared bat (*Chorynorhinus rafinesquii*),
sharp-shinned hawk (*Accipiter striatus*, KSNPC listed special concern)
southern cavefish (*Typhlichthys subterraneus*, KSNPC listed special concern) (caves)
a limnephilid caddisfly (*Manophylax butleri*, KSNPC listed special concern)(wet cliffs in mesophytic forest)
cave crayfish (*Orconectes packardi*, KSNPC listed threatened) (cave)
southeastern five-lined skink (*Eumeces inexpectatus*, KSNPC listed special concern) (open woodland, glade)

Plants

eastern silvery aster (*Symphotrichum concolor*, KSNPC listed threatened) (open woodland)
wood lily (*Lilium philadelphicum* , KSNPC listed threatened) (open woodland)
Southern clubmoss (*Lycopodiella appressa*, KSNPC listed endangered) (seep, woodland)
Lucy Braun's white snakeroot (*Ageratina luciae-brauniae*, KSNPC listed special concern) (cliff in mesophytic

and hemlock forest)

roundleaf fameflower (*Talinum teretifolium*, KSNPC listed endangered) (glade)

mock orange (*Philadelphus inodorus*) (mesophytic forest)

bearded-skeleton-grass (*Gymnopogon ambiguus*, KSNPC listed special concern) (glade, open woodland)

Appalachian cypress-swamp sedge (*Carex jorii*, KSNPC listed endangered) (seep)

globe beaked-rush (*Rhynchospora recognita*, KSNPC listed special concern) (open woodland, seep)

Appalachian sandwort (*Minuartia glabra*, KSNPC listed threatened) (glade)

nettle-leaf sage (*Salvia urticifolia*, KSNPC listed endangered) (mesophytic forest)

common silverbell (*Halesia carolina*, KSNPC listed endangered) (mesophytic forest)

spreading false foxglove (*Aureolaria patula*, KSNPC listed special concern) (open cliff, glade)

northern witchgrass (*Dicanthelium boreale*, KSNPC listed special concern) (open woodland)

wild honeysuckle (*Lonicera dioica* var. *borealis*, KSNPC listed endangered) (open woodland)

white walnut (*Juglans cinerea*, KSNPC listed special concern) (mesic bottomland)

Saint Peter's-wort (*Hypericum crux-andreae*, KSNPC listed threatened) (wet meadows, open woodland)

Communities

High ranking occurrences of Appalachian mesophytic forest, hemlock mixed forest, Cumberland Plateau sandstone glade (globally rare), and Appalachian seep/bog (globally rare) are located within the project area. Of these communities, seeps are probably the most likely to be impacted by the proposed activities. Stand #17 (woodland establishment) includes a high quality seep and at least two rare species. We recommend that this stand be excluded from the proposed project. It is likely that more seeps occur within the project area. The location of proposed ponds is likely to coincide with location of seeps in the area and therefore inadvertently destroyed. Seeps can also easily be impacted by changes in hydrology through opening of the surrounding canopy, trails and logging roads in and near the seep, including downstream of the seep. A thorough survey for these sensitive communities should be conducted by a botanist to avoid accidental impacts.

At least one high ranked occurrence of Appalachian mesophytic forest is proposed to be included in a two-aged shelterwood (stand 14).

For location specific information and occurrence data, please contact David Taylor. Not every section of the proposed project locations has been thoroughly surveyed, and additional rare species populations could occur. We recommend that a thorough survey be conducted by a team of qualified biologists for rare species and communities of all stands proposed to be managed as part of this project, so that impacts on rare species and communities can be avoided.

Some of the proposed activities, such as creation of pine woodlands, might improve habitat condition for some of rare species, especially if located in vicinity of existing species occurrences.

Please feel free to contact me if you have any question or we if could provide additional information.

Thanks again for the opportunity to comment on this proposed project.

Sincerely,

Donald S. Dott, Jr.
Executive director

Basal areas for selected SPB-impacted plots in the Greenwood project area. All counts taken in April 2017 using a 10 BAF wedge prism on 1-acre plot centers. Tallies taken with and without red maple. Final basal area includes red maple.

TARGET_FID	Stand Area (acres)	Site Name	Tree tally	Tree tally w/o red maple	Basal Area (ft ² /ac)
0		23 Bauer Rd South 1	8	8	80
1		23 Bauer Rd South 1	0	0	0
2		23 Bauer Rd South 1	2	2	20
3		23 Bauer Rd South 1	0	0	0
4		23 Bauer Rd South 1	7	6	70
5		23 Bauer Rd South 1	8	8	80
6		23 Bauer Rd South 1	1	1	10
7		23 Bauer Rd South 1	0	0	0
8		23 Bauer Rd South 1	7	7	70
9		23 Bauer Rd South 1	4	4	40
10		23 Bauer Rd South 1	8	5	80
11		23 Bauer Rd South 1	0	0	0
12		23 Bauer Rd South 1	0	0	0
13		23 Bauer Rd South 1	4	4	40
14		23 Bauer Rd South 1	8	8	80
15		23 Bauer Rd South 1	5	5	50
16		23 Bauer Rd South 1	4	3	40
17		23 Bauer Rd South 1	0	0	0
18		23 Bauer Rd South 1	5	5	50
19		23 Bauer Rd South 1	7	3	70
20		23 Bauer Rd South 1	7	7	70
21		23 Bauer Rd South 1	0	0	0
22		23 Bauer Rd South 1	4	4	40
146		11 Blue John North 1	7	7	70
147		11 Blue John North 1	6	4	60
155		11 Blue John North 1	3	3	30
156		11 Blue John North 1	0	0	0
157		11 Blue John North 1	2	2	20
158		11 Blue John North 1	3	3	30
159		11 Blue John North 1	3	2	30
164		11 Blue John North 1	9	8	90
165		11 Blue John North 1	5	5	50
166		11 Blue John North 1	4	4	40
167		11 Blue John North 1	4	4	40
175		12 Blue John North 2	2	2	20
176		12 Blue John North 2	4	4	40
178		12 Blue John North 2	1	1	10
179		12 Blue John North 2	7	7	70
180		12 Blue John North 2	3	3	30
181		12 Blue John North 2	7	7	70
182		12 Blue John North 2	5	4	50
183		12 Blue John North 2	5	5	50
184		12 Blue John North 2	2	2	20
185		12 Blue John North 2	6	6	60
186		12 Blue John North 2	8	8	80
187		12 Blue John North 2	2	1	20
87		46 Blue John South 1	5	4	50
88		46 Blue John South 1	5	5	50
89		46 Blue John South 1	1	1	10

90	46 Blue John South 1	5	3	50
94	46 Blue John South 1	5	3	50
95	46 Blue John South 1	2	2	20
96	46 Blue John South 1	5	2	50
97	46 Blue John South 1	6	6	60
98	46 Blue John South 1	2	1	20
99	46 Blue John South 1	12	12	120
100	46 Blue John South 1	4	4	40
101	46 Blue John South 1	8	7	80
102	46 Blue John South 1	7	7	70
103	46 Blue John South 1	0	0	0
104	46 Blue John South 1	0	0	0
105	46 Blue John South 1	5	5	50
106	46 Blue John South 1	8	8	80
112	46 Blue John South 1	3	2	30
113	46 Blue John South 1	6	6	60
114	46 Blue John South 1	8	8	80
115	46 Blue John South 1	1	1	10
116	46 Blue John South 1	4	4	40
117	46 Blue John South 1	0	0	0
118	46 Blue John South 1	4	4	40
119	46 Blue John South 1	8	6	80
120	46 Blue John South 1	4	4	40
121	46 Blue John South 1	10	10	100
122	46 Blue John South 1	7	7	70
127	46 Blue John South 1	3	3	30
128	46 Blue John South 1	0	0	0
129	46 Blue John South 1	5	5	50
130	46 Blue John South 1	1	1	10
131	46 Blue John South 1	4	3	40
132	46 Blue John South 1	1	1	10
133	46 Blue John South 1	1	1	10
134	46 Blue John South 1	5	5	50
135	46 Blue John South 1	3	3	30
136	46 Blue John South 1	5	4	50
137	46 Blue John South 1	6	6	60
139	46 Blue John South 1	3	3	30
140	46 Blue John South 1	7	7	70
141	46 Blue John South 1	8	3	80
142	46 Blue John South 1	2	2	20
148	46 Blue John South 1	5	5	50
149	46 Blue John South 1	4	4	40
72	18 Curt Pond North 1	3	3	30
73	18 Curt Pond North 1	4	4	40
74	18 Curt Pond North 1	3	2	30
79	18 Curt Pond North 1	4	4	40
80	18 Curt Pond North 1	11	11	110
81	18 Curt Pond North 1	10	10	100
82	18 Curt Pond North 1	8	8	80
83	18 Curt Pond North 1	6	5	60
91	18 Curt Pond North 1	6	6	60
92	18 Curt Pond North 1	4	4	40
93	18 Curt Pond North 1	7	4	70
107	18 Curt Pond North 1	6	5	60
108	18 Curt Pond North 1	4	4	40
109	18 Curt Pond North 1	8	7	80

110	18 Curt Pond North 1	7	7	70
111	18 Curt Pond North 1	7	7	70
124	18 Curt Pond North 1	7	7	70
125	18 Curt Pond North 1	4	4	40
126	18 Curt Pond North 1	12	6	120
48	26 Curt Pond South 1	3	3	30
49	26 Curt Pond South 1	10	10	100
50	26 Curt Pond South 1	5	4	50
51	26 Curt Pond South 1	4	4	40
55	26 Curt Pond South 1	6	4	60
56	26 Curt Pond South 1	4	2	40
57	26 Curt Pond South 1	8	5	80
58	26 Curt Pond South 1	1	1	10
59	26 Curt Pond South 1	0	0	0
60	26 Curt Pond South 1	5	5	50
61	26 Curt Pond South 1	1	1	10
62	26 Curt Pond South 1	7	7	70
63	26 Curt Pond South 1	4	1	40
64	26 Curt Pond South 1	2	1	20
65	26 Curt Pond South 1	4	2	40
66	26 Curt Pond South 1	1	1	10
67	26 Curt Pond South 1	0	0	0
68	26 Curt Pond South 1	2	2	20
69	26 Curt Pond South 1	4	4	40
70	26 Curt Pond South 1	8	5	80
75	26 Curt Pond South 1	2	2	20
76	26 Curt Pond South 1	3	1	30
77	26 Curt Pond South 1	3	2	30
78	26 Curt Pond South 1	7	5	70
84	26 Curt Pond South 1	5	4	50
85	26 Curt Pond South 1	8	4	80
23	28 US27 East 1	3	3	30
24	28 US27 East 1	2	2	20
25	28 US27 East 1	1	1	10
26	28 US27 East 1	0	0	0
27	28 US27 East 1	1	1	10
28	28 US27 East 1	8	8	80
29	28 US27 East 1	2	2	20
30	28 US27 East 1	2	2	20
31	28 US27 East 1	4	4	40
32	28 US27 East 1	8	7	80
33	28 US27 East 1	7	7	70
34	28 US27 East 1	1	1	10
35	28 US27 East 1	5	5	50
36	28 US27 East 1	4	4	40
37	28 US27 East 1	3	3	30
38	28 US27 East 1	5	5	50
39	28 US27 East 1	1	1	10
40	28 US27 East 1	3	3	30
41	28 US27 East 1	7	7	70
42	28 US27 East 1	5	5	50
43	28 US27 East 1	2	2	20
44	28 US27 East 1	1	1	10
45	28 US27 East 1	4	3	40
46	28 US27 East 1	0	0	0
47	28 US27 East 1	8	4	80

52	28 US27 East 1	3	3	30
53	28 US27 East 1	4	4	40
54	28 US27 East 1	0	0	0