4FRI Stakeholder Group Comments on the Four Forest Restoration Initiative Draft Environmental Impact Statement

Introduction

The Four Forest Restoration Initiative (4FRI) Stakeholder Group would like to thank the Coconino, Kaibab, Apache-Sitgreaves, and Tonto National Forests for the efforts completed over the last several years to jointly plan this landscape-scale project. We should all be proud that we have an analysis covering almost 1 million acres. This is the scale at which natural disasters happen, and it is a scale that will truly make a difference in the management and ecosystem health of these lands.

We have been a partner with the Forest Service (USFS) staff and leadership, and have together expended countless hours in meetings, discussions, analysis, and documentation to help as the USFS created this Draft Environmental Impact Statement (DEIS). The Stakeholder Group has put forth this tremendous effort because the members believe restoration is the right thing to do. The Stakeholders appreciate the USFS for their willingness to collaborate, listen, explain, participate in joint problem-solving, and to use our input in formulating a progressive and aggressive project that will serve as a showcase for the rest of the nation.

The Stakeholders also appreciate the opportunity to review and comment on the DEIS. The comments presented here are ones that the we, with diverse participation and full formal review, are now pleased to submit in support of making the Final Environmental Impact Statement (FEIS) document as defensible and usable as possible.

Many members and/or member organizations will be submitting separate comments under their own letterhead. The comments included in this letter have been adopted through the use of the 4FRI Stakeholders' review and decision tools. The level of agreement reached is bolded following recommendations in each section. Comments represent formal 100% consensus, except where specifically noted. Below, please find several key issues that we would like to comment on, including commendations, some observations, and some issues.

Key Issues Analyzed by the Stakeholder Group

Key Issue 1: Degree of Openness

Acknowledgements

1. Comparing the 2012 preliminary draft with the DEIS, the DEIS incorporated stakeholders' comments, for example:

a. An overview of the landscape-level changes in density and/or canopy openness was included in Appendix G, throughout Chapter 1, in Chapter 3 in the silvicultural section, and in more detail in the Silvicultural Specialist Report.
b. In particular, Appendix G was intended to summarize landscape effects in terms appropriate for wildlife.
c. An "intensity of treatments" map was developed following canopy cover conversations in mid-2012, which is included in the bridge habitat document, page 703.

2. The DEIS provides specific information about wildlife corridors and specific species needs.

Discussion of Concern: There are 5 key concerns that the stakeholder group identified:

1. **We are concerned about how post-treatment openness will be quantified to determine whether desired conditions are being met and that, without a clear operational plan, heterogeneity in groups and openings may be less than desirable.**

DEIS discussion:

Clarification is needed because different readers have different interpretations or do not understand what the degree of openness will be post-treatment. Table 3 states that the proportion of the analysis area in "moderately closed" to "closed" canopy will change from 74% to 59% of the landscape, a reduction of only 15%. Some stakeholders are concerned that it is not enough of a change to reach desired conditions for understory diversity and abundance, system resiliency and heterogeneity. However, the assumptions the DEIS analysis makes to determine post treatment moderately-closed to closed forest are not stated, so there is a concern that canopy closure may be overestimated, since the analysis appears to be based on forest designations (e.g. MSO PAC = closed), not on actual forest structure metrics.

While the USFS addressed concerns about openings in response to comments made in 2012 by adding an explanation in Appendix D (Implementation strategy), Appendix G (Bridge Habitat Document), and sections of Chapter 1 (History of Issues) and Chapter 3 (Alternative Development), some uncertainty remains:

1. How will post-treatment openness compare with natural conditions; is this on a trajectory toward a restored condition?
2. How will openness be implemented with respect to the range and proportion of various opening sizes?
3. How will openings be selected operationally?
4. What sort of monitoring will be conducted related to degree of openness?

2. **Not enough information is presented in a way that readers can visualize post-treatment stands to evaluate heterogeneity of groups and openings and connectivity of forest conditions.**

DEIS discussion:

a. While tables provide a great deal of information, visual representations of the data would be helpful. From the data provided some readers see the end condition as having too much of the landscape covered with trees, while others see it as being too open. Many believe that there is a risk of repetitious application of opening sizes that could result in homogeneity at various scales. A visual representation is needed to show effects of guidelines for regeneration openings because tables and guidelines do not capture it (for example, if regeneration openings cannot be adjacent to interspaces, then what are the impacts for tree group sizes?).

3. **Depending on the prescription, basal area in groups can be quite high to achieve stand desired condition. This could lead to a dominance of uniform small trees in groups, which may not put those groups on a trajectory toward restoration.**

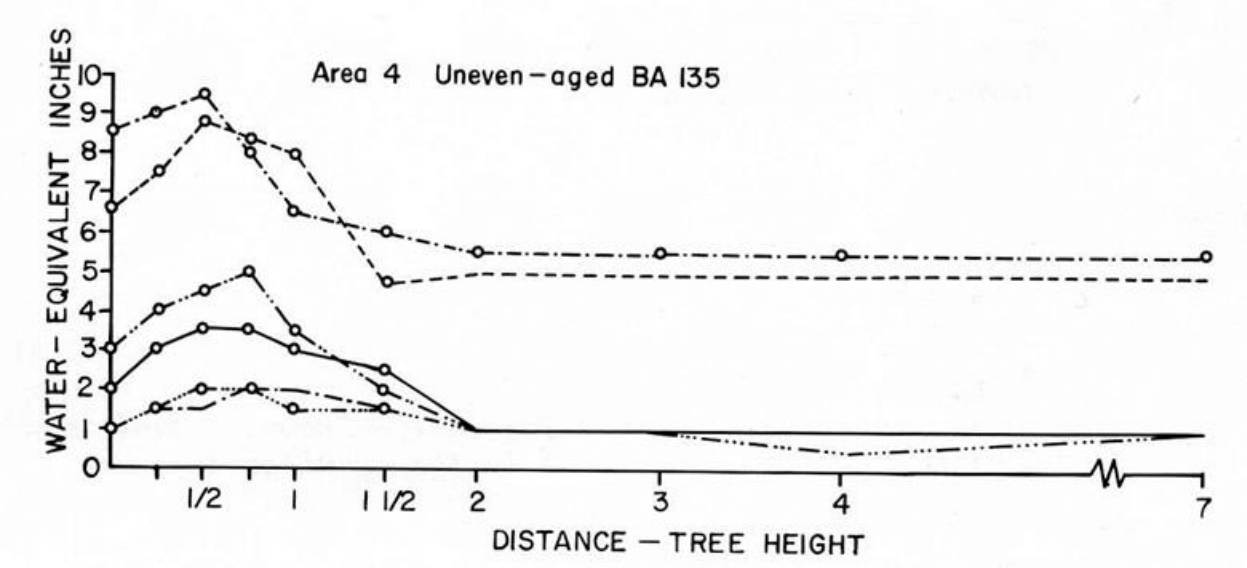
   DEIS discussion:

   Table 140, on page 654 of the DEIS, displays the relationship between interspaces, tree groups, regeneration openings and basal area. As the interspace percentages increase, especially in combination with regeneration opening increases, group basal areas are consistently in the red SDI zone (the red zone indicates a higher level of within group tree mortality as a result of competition). There is a concern that managing for groups under forest plan amended goshawk guidelines, as proposed in the DEIS, may result in post-treatment conditions outside of the stakeholder desired conditions as described in the Landscape Strategy and the Biophysical Monitoring Plan. The basal area (BA) metrics in Table 140, for example, show how difficult it is to pack the entire BA into groups in stands that have higher levels of desired openings unless there are large trees initially. Those high BAs may be reached, even in the red zone, with a few very large diameter trees, but they don't exist now, and it will be difficult to grow large trees in really dense stands.

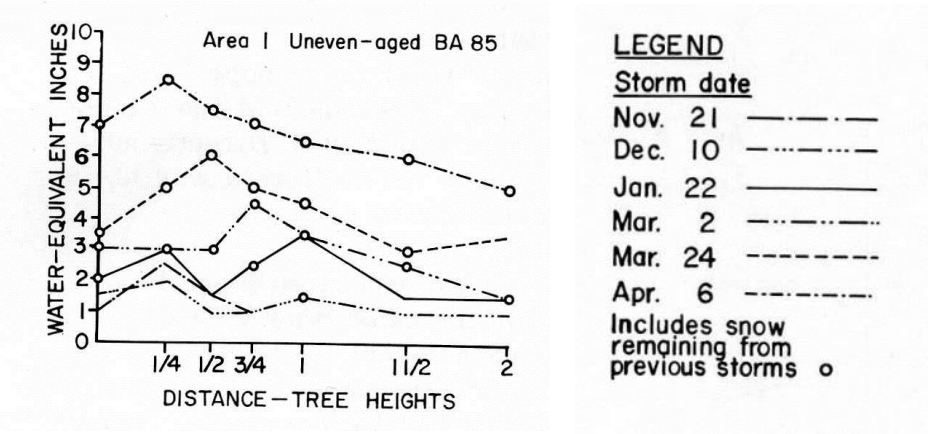
4. **Planned openings on average are smaller than would be optimal for snowpack accumulation and retention, which are important for promoting soil water storage, plant vigor and forest resilience. Few openings of this larger size are planned.**

   DEIS discussion:

   Openings up to 1.5 to 2 times as wide as the height (H) of neighboring trees maximize snowpack accumulation (Fig. 1 and 2, Ffolliott et al. 1965). Optimal snow water equivalence in snowpack in ponderosa pine forest of north central Arizona occurs in openings at ½ to ¾ the height of the surrounding trees. This relationship is not dependent on the density of the neighboring trees. PIPO stands of 60-to 80-foot trees would need openings of 30 to 60 feet for highest snow water equivalence at a given point and 90 to 160 feet for total maximum water storage in snowpack. In the Implementation Plan, Table 120 (Interspace percent and width in LOPFA WUI and UEA treatments), only the most open WUI stands would have average interspace width of 120 feet. Interspaces in intermediate thin (IT) and stand improvement (SI) prescriptions are quite low (25-40 feet to 60-80 feet - see interspace width in Appendix D Implementation Plan tables) which might reduce the available moisture for these tree stands due to reduced snowpack retention.



Figures 1 and 2. Snow water equivalence in snowpack from multiple storm throughout the winter in untreated forest with basal area 135 ft^2 at the Beaver Creek Experimental Watersheds (Ffolliott et al.1965)



5. **The fire behavior analysis was conducted as if all treatments happened simultaneously rather than over time. Hence, at any given time fire desired conditions (less than 10% of landscape with crown fire activity) will not actually be met.**

DEIS discussion:

Treatments will occur over time, rather than instantaneously as the fire model assumes. Because of this, along a time continuum, greater than the DEIS proposed 42% of the landscape will remain in moderately closed to closed condition. As a result, the expected fire behavior post-treatment is conservative because of the assumption that all forest treatments would occur in one year. In reality it will take 10-20 years of implementation to accomplish all proposed forest treatments. In addition, utilizing Shultz Fire conditions (around 85 percentile weather conditions) further diminishes modeled fire behavior. Northern Arizona reaches 97th percentile weather conditions every summer leading to even higher potential crowning activity and fire intensity.

Recommendations:

1. **Degree of post-treatment openness**:
   a. Rather than just giving a range of *average* opening sizes, provide *overall* range of sizes and the approximate *proportion* of different sizes for each treatment type so that the expected proportion of various sizes of opening is clear and the reader can get a sense of how much heterogeneity there will be in opening sizes. This might be written in a similar fashion as how the proportion of different tree densities is discussed on page 619 of the DEIS, but with a clear explanation that these proportions are guidelines, not prescriptive.
   b. Similarly, provide the proportion of different tree group sizes for each treatment type so that it is clear how much heterogeneity there will be in tree group sizes.
   c. Strengthen discussion of how openness will be measured and tie these metrics to the adaptive management plan.
   d. In the Implementation Plan (Appendix D), Chapter 2, Section B add some narrative ahead of Table 139 that describes how operators will be trained to implement "treatment by prescription" to ensure a diversity of opening and group sizes that approximate historic conditions. Specifically, describe how operators will select opening sizes and inspectors will track that the ranges of opening sizes are consistent with historic forest pattern.
   e. Through methods and thresholds described in the adaptive management plan, explain how the USFS will monitor degree of openness and adaptively respond if openness objectives are not met.
2. **Visual clarification**
   a. Provide graphic, such as (planimetric and profile visual representations) to show examples of forest pattern at the stand scale for a set of different treatment types and intensities so that readers have a clearer view of how the end result of different treatment types will look (see fact sheet "Canopy Cover" developed by ERI as an example). Use representative sites where stand data are available (rather than interpolated) and focus on treatment types that occur across much of the landscape, such as UEA 40-55.
3. **Group size and densities**
   a. Expand metrics of post-treatment desired conditions to give better context of basal area. Provide literature-supported trees per acre (TPA) as example depictions of post treatment condition.
   b. Clarify what "red zone" management goals are on Fig 74 (page 657, what does this footnote mean?) and how that translates to Table 140. Does this mean that "red" squares are not a viable management option? Does it mean that existing small, densely treed groups will not be treated but left on the landscape? Or that these groups will not be maintained, but treated in another way?
   c. Provide a link to the indicators in the Stakeholder-developed Biophysical Monitoring Plan and the proposed adaptive management plan so that it is clear how group density will be addressed over time.
4. **Opening size and watershed restoration**
   a. Provide more justification for existing openings size guidelines (additional reference support available).

b. Provide a broader range of opening sizes and shapes capable of retaining a greater volume of snow water.
c. Provide the range and proportion of opening sizes for each treatment type so that it is clear how much heterogeneity there will be in opening sizes.
d. Assuming these are met in the FEIS, please make additions to Table 114 in implementation checklist or Table 139:
    i. Develop guidelines for operators to follow when implementing "designation by prescription" or "designation by description" to ensure a diversity of opening and group sizes consistent with historic conditions and that benefit snowpack retention. Describe guideline development in the EIS.
    ii. Include in operator guidelines directions for selecting tree groups that will provide adequate shading of openings to promote the retention of snowpack.

5. Fire behavior and temporal effects

a. Include a framework for sequencing treatments in the FEIS.
b. Provide better description of how on-going fire (both prescribed ignitions and natural-ignitions) will be utilized to achieve desired conditions. If not captured in this EIS, where is the management direction – new forest plan?
c. The USFS should acknowledge in the FEIS that the fire behavior metrics used to model extreme fire behavior were based on all treatments being completed at once. State the implications of this assumption more clearly and how they influence desired conditions.

Final outcome: Unanimous agreement on recommendations 1 – 4; recommendation 5 is All Agree with one "Agreement with Reservation" by Eastern Arizona Counties Organization (ECO): Reservation documentation (Pascal Berlioux): The Eastern Arizona Counties Organization (ECO) agreed with written Reservation on this issue because ECO believes that developing only a 'framework for sequencing' of the treatments is unsatisfactory. A 'framework for sequencing' has no specific meaning and does not integrate in the NEPA Record of Decision a schedule of execution, a commitment to it, and, therefore, an accountability mechanism for it. The Eastern Arizona Counties Organization fully understands that such sequencing and timing, and the resulting implementation schedule, could be modified as a result of unforeseeable events such as natural ignition fires. This is precisely why the concept of adaptive management is nested within the 4FRI DEIS. The Eastern Arizona Counties Organization strongly disagrees with the argument made during the 4FRI stakeholders meeting that adaptive management precludes an execution plan including timing and sequencing of the treatments. The very concept of adaptive management implies an initial plan, which may be adapted as required, as events unfold. Because the timely implementation of the restoration treatments is critical to meeting the purpose and needs of the proposed action, the Eastern Arizona Counties Organization is concerned that the spatial and temporal sequencing of the treatments has a significant effect on: i) whether the purpose and needs will be met; and, ii) the number, type, intensity, and individual and cumulated effects of the treatments required to meet the purpose and needs. Consequently, the absence in the 4FRI DEIS of spatial and temporal strategic timing and sequencing of the treatments, and the influence of spatial and temporal prioritization of the treatments on the number, type, intensity, and individual and cumulated effects of treatments, may present a process risk for the 4FRI FEIS.

Key Issue 2a: Forest Plan Amendments

Discussion of Concern: Stakeholders considered whether the Land Resource Management Plan (LMRP) should to be amended to accomplish the purpose and need of the project. Appendix B (page 439) in the DEIS covers the Forest Plan amendments. The amendments are also covered in Chapter 2 – Alternatives, and Chapter 3 – Affected Environment and Environmental Consequences. The plan amendments are also linked to plan amendment direction set forth in USFS Manual (FSM) 1926.52 and USFS Handbook (FSH) 1909.12 – 25.4.

Based on reviewing this key concern, the Stakeholder Group also identified two additional sub-concerns, both tied to the question: Are these plan amendments 'significant' as outlined in FSM 1926.52? We looked at the different parts of the proposed amendments, and considered circumstances that constitute significance, specifically, "changes that would significantly alter the long term relationship between levels of multiple-use goods and services originally projected, and changes that may have an effect on the entire land management plan or affect land and resources throughout a large portion of the planning area".

The first sub-concern is that the habitat acreages and percentages stated in the DEIS to support a determination of non-significant, for Amendment 2 on the Coconino and Amendment 1 on the Kaibab, are not clearly displayed. As a result, the public cannot easily identify the number of acres to be affected, compare potential treatment acres across forests, or concur with a non-significant determination. How the USFS determined that the canopy cover portion of the amendment would affect only 18% of goshawk habitat on the Coconino and 20% on the Kaibab is unclear. There are 399,633 acres of goshawk habitat within the 4FRI project area. The amendments apply to both PFA and LOPFA acres. The most intensive treatments would be in LOPFA which covers 369,033 acres in the project area. The analysis covering the Coconino states that only 139,308 acres would be affected (page 465, DEIS). The Kaibab amendment analysis does not give acreage numbers for the portion of the Kaibab potentially affected, just states that 27% of goshawk habitat within the project area would be affected (page 481, DEIS).

When displaying the number of acres and percentages of habitat in the project area to be potentially affected, the USFS should include a clear discussion of any further stratification of data used to support a non-significant determination. Given the gap between potential treatment acres and acres, it is likely that the USFS applied the analysis to only VSS 4, 5 and 6. If this is the case, the DEIS should also analyze the cumulative effects of stratifying the data in this manner.

The second part of the Stakeholder Group's sub-concern (significance of the amendments), is tied to MSO monitoring and the information related to just how that monitoring will occur. The USFS needs to clarify the process for a determination of non-significant when language for standards and guidelines is not included in the DEIS, but referred to as a part of a separate planning process. The DEIS does not contain the appropriate level of information for the reader to see all proposed activities, including monitoring.

For the MSO Amendments, population and habitat monitoring for all action alternatives is deferred to the Fish and Wildlife Service's (FWS) biological opinion for the project. Treatment design under habitat treatment in incremental percentages is also deferred to the FWS biological opinion. While proposed forest plan language contains specific basal area ranges and tree diameters, the analysis cannot be completed when specific direction is deferred to another document not covered in the DEIS.

Tables related to proposed plan language changes direct the reader to "See 'Standards' for Monitoring Directions". This statement appears under the proposed new standards or guidelines language column. Does the Forest plan to add the language to which the reader is referred? If not, where specifically in the DEIS can the standard and guideline language for MSO be found?

Recommendations:

1. For the key part of this issue, the Stakeholder Group would not recommend a change to the DEIS as it relates to plan amendment language under alternatives B, C, and D. We recognize that the plan amendments were necessary to implement the many aspects of these alternatives. However we recommend that the USFS address Key Issue 2b below in relation to analysis of the need for plan amendment.
    a. For the first sub-concern, the Stakeholder Group recommends that the USFS provide more information in the FEIS on the details of the amendments, so the reader can fully understand the process for determining significance or non-significance.
    b. For the second sub-concern of deferring to the FWS biological opinion as currently stated in the amendments, we recommend that the USFS provide more information in the FEIS so the reader can fully understand and locate the information associated with MSO population and habitat monitoring.

Final outcome: Unanimous agreement

Key Issue 2b: Adequate Analysis of Treatment Alternatives Compared to the Proposed Action

Discussion of Concern: Chapter 2 of the DEIS indicates that five issues were identified from the public comments received in scoping, suggesting alternative methods be considered in achieving the purpose and need. The narrative indicates that these five issues were evaluated, with two of the issues being analyzed as detailed Alternatives (Alternatives C & D). However, many stakeholders are concerned that there does not appear to be an adequately-detailed analysis or the range of alternatives needed to effectively evaluate the tradeoffs between these issues and the accomplishment of project objectives stated in the DEIS.

Sub-concern 1: The Purpose and Need includes the objective to "…restore forest structure and pattern, forest health, and vegetation composition and diversity." (page 9, DEIS). Without a detailed analysis to document the variance from the Historic Range of Variability (HRV) there is concern that restoration objectives will not be achieved, and progress toward meeting Desired Conditions cannot be adequately measured.

Sub-concern 2: With respect to the need to amend the forest plans, there isn't an action alternative where a plan amendment would not take place. Without such an alternative it is difficult to understand the environmental effects and tradeoffs for resources that would result from the amendments themselves.

Sub-concern 3: For many resources there are not significant differences between the action alternatives, which results in a limited scope of analysis and only minor differences in outcomes (including the key outcome of meeting the project objectives). The Stakeholder Group is concerned that this limited array of analyzed actions and outcomes may facilitate or expose the DEIS to a significant "procedural risk" that might lead to a vulnerability issue for the document.

Recommendations:

1. The Stakeholder Group did not develop a consensus "new" alternative to add to the analysis. However, we recommend that the USFS re-evaluate the document to confirm, as required under NEPA CEQ regulations (CFR 1502.14, & 1503.4(2)), that there is an adequate analysis and range of alternatives that addresses the Purpose and Need and desired outcomes of the project. The Stakeholder Group also recommends that the USFS provide more analysis and information in the DEIS document to display the tradeoffs between possible treatment options for the identified key issues.

Final Outcome: All agree, with one "agree by acquiescence" by CNRCD with no specific comment

Key Issue 3: Translation of the Old Growth Protection and the Large Tree Retention Strategy (OGP & LTRS) into the 4FRI DEIS

Discussion of Concern: The USFS (FS) use of the 4FRI Stakeholder Group "Old Growth Protection and Large Tree Retention Strategy" (OGP & LTRS) to identify key issues, create alternatives, and develop design features and implementation plans for the DEIS is very important to the stakeholder group. Because of this the DEIS was carefully reviewed by the Stakeholders to assess how well the DEIS incorporated the OGP & LTRS. The two discussions and findings are recorded below.

Issue 1: The following analysis (in italics) pertains to the how the DEIS incorporates protection of old trees. It does not itemize a particular concern or recommendation, but was important for Stakeholder learning and the basis for the following recommendations. The Stakeholders felt it helpful to include in this comment letter.

Discussion of degree to which the OGP was incorporated in the document:

There are several places where the direction to protect and manage for "old trees" is captured in the DEIS. The main direction is found in the Old Tree Implementation Plan – Section C of the Implementation Plan (Appendix D), and within the Implementation Plan itself. There is also direction in the Alternatives section (page 63), where it states; 'all actions alternatives incorporate key components of the old tree protection strategy into the alternatives features'. Additional references include:

Appendix D- Table 112. Annual implementation Checklist, Under NEPA, NFMA, ESA, CFLR Act compliance evaluation (page 601)

There is a check-off line that asks if the treatments are consistent with the Old Tree implementation Plan (section C).

Appendix D - Section C – Old Tree Implementation Plan (page 644)

Old Tree Descriptions and Illustrations:

> *"Old trees (approximately >150 years old; [presettlement trees]) would be retained, with few exceptions, regardless of their diameter, within the 4FRI on the Coconino and Kaibab NF's EIS area. Removal of old trees would be rare. Exceptions would be made for threats to human health and safety, and those rare circumstances where the removal of an old tree is necessary in order to prevent additional habitat degradation. Old trees would not be cut for forest health issues or to balance age or size class distributions.*
>
> *One example of a situation where the removal of an old tree is necessary in order to prevent additional habitat degradation is in the rare case of an old tree growing on the side of an existing curve in a road. Logging equipment may require a wider turning radius. The options are to relocate the road or cut the old tree and widen the curve to accommodate the larger turning radius. Relocating the road would result in a larger area of the forest being permanently disturbed, versus cutting the large tree and widening the curves radius. This is an example where cutting the old tree would result in less habitat degradation then relocating a road."(page 644)*

From Implementation Plan:

> *"Treatments are designed to manage for old age trees in order to have and sustain as much old forest structure as possible across the landscape. Treatments would follow the old tree implementation strategy and old trees would not be targeted for cutting. Live conifer trees with existing cavities, dead tops, and lightning scars would also be favored for retention.*
>
> *Manage for the sustainability of individual/isolated old ponderosa pine trees as defined in the old tree implementation strategy by reducing crown competition and increasing growing space adjacent to these trees. Remove ponderosa pine trees up to 18 inches d.b.h. that do not meet the old tree definition: (1) within a 50-foot radius that are in the intermediate or suppressed crown positions and (2) that would eliminate direct crown competition on two of the four sides of the old tree." (page 618-619 and elsewhere [all treatment descriptions] within the Implementation Plan).*

Section B – Decision Matrix (page 642):

For each feature it has a reference to the 'old tree characteristics (page 642), which identifies leaving old trees regardless of tree size.

In summary, the direction in Section C basically says 'old trees' will not be cut except for "…threats to human health and safety, and those rare circumstances where the removal of an old tree is necessary in order to prevent additional habitat degradation." (page 644). It also sets direction to manage for old trees. The project implementation checklist assures that this direction is implemented. The

Implementation Plan sets direction for treatment design to incorporate direction in the old tree implementation strategy and thereby manage for old trees to have and sustain as much old forest structure as possible.

What is unknown is to what degree there will be 'safety and human health' or 'habitat degradation issue' situations as part of project implementation (new road construction, landings and skid trails), and to what extent project activities might affect old tree mortality (prescribed burning mostly, and some harvest activity).

The charts on pages 132 and 133 and the write up on page 138 and page 140 indicate that with all action alternatives there will be increases in the amount of old trees and there will be reduced threats from wildfire as part of project implementation and completion.

Key Sub Concerns:
There were four key issues identified by the working group that we feel need clarification. These include: 1. Old Growth Allocation; 2. Regeneration Openings and Scale; 3. Road Construction and Reconstruction; and 4. Old-Growth Protection during Managed Fire. Each key issue is stated below with questions and recommendations.

Sub-Concern #1- Old growth allocation

We understand that old growth allocation and old tree protection are two separate issues. Old growth allocation was not discussed in the stakeholder OGP & LTRS. However, old growth allocation has been raised as an important issue because it will contribute to achieving the stakeholder goal of more old growth across the landscape.

The DEIS needs more clarity about how old growth allocation is calculated. For example, the DEIS says, "Currently, all restoration units meet or exceed the 20 percent minimum forest plan requirement [for old growth allocation]" (page 15, DEIS). This statement is contradicted in the very next paragraph which states that, "Most sites currently do not fully meet the minimum criteria for old growth conditions as listed in the forest plans." This apparent contradiction may be semantic but it needs clarification.

In addition, in order to understand the impact of the alternatives on old growth allocation the reader is required to calculate data across 12 to 14 tables in the silviculture report.

Recommendations:
1. Display the old growth allocation by alternative in a single table illustrating the percentages of area in MSO and goshawk habitats as referenced on page 45 of the Silviculture Report. Include how many acres of old growth allocation are in structural stages VSS 5 and 6, and how much of the old growth allocation is close to becoming old growth as defined by the forest plan.
2. The USFS should provide more detail and link the write-ups on old growth on page 138, Chapter 3, DEIS and combine it with the write up on "Large Tree/ Old Forest …" structure on page 140 in order to describe the impacts of each alternative on old growth allocation. This discussion should reference the new requested table (see above recommendation) in the silviculture report.

Sub-Concern #2 – Regeneration openings and scale

Confusion exists regarding how regeneration openings will be implemented. This could impact the protection of old trees. It is also unclear in the document at what scale the USFS will be balancing the distribution of structural stages, as they relate to regeneration openings, interspaces and tree groups. We know from the DEIS that percentages have been assigned at the small spatial scale. What is unclear is how these will be distributed across the mid-scale (100 to 1,000 acres).

Recommendations:

1. In the DEIS in Section C- page 644 add a statement to the Old Tree Descriptions that clearly states old trees will not be cut to create regeneration openings.
2. The USFS should include graphic examples of how regeneration openings will be applied at the fine scale (<100 acres), mid-scale (100-1,000 acres) and restoration unit scale. Use representative sites where stand data is available (rather than interpolated) and focus on treatment types that occur across much of the landscape, such as UEA 40-55.

Sub-Concern #3 - Road construction and reconstruction

Road building is one of the examples (cited on page 644) as a situation where an old tree may need to be removed, rather than relocating a road. When this example was first discussed the USFS thought that very few miles of road would need to be built for this project, citing the high density of existing roads. All action alternatives will have:

- 517 miles of temporary road construction and decommission.
- Up to 30 miles of road reconstruction and improvement.
- Up to 10 miles of road relocation.

As it turns out, the miles of temporary road construction have increased from 183 miles in the proposed action (August 2011), to 517 in the DEIS. It is difficult to tell from information provided in the DEIS, what level of impact the near tripling of road miles might have on the preservation of old trees. The DEIS does not provide enough information to evaluate possible impacts from road construction to old trees, or a direction on minimizing potential impacts from road construction.

Recommendations:

1. We recommend the inclusion of additional information in the effects analysis describing any anticipated effects to old trees from increased road construction and reconstruction in the 4FRI project area.
2. In addition to the old tree protection direction for mechanical treatments, the USFS should ensure new road design and construction work (for all road work including re-construction, new construction and temporary roads) will incorporate the need to protect old trees. This protection objective will be implemented through avoidance and other design attributes.

Sub-Concern #4- Prescribed Fire

Fire is a significant restoration tool throughout the analysis area. We did not find guidance concerning protection of old trees during prescribed burning.

Recommendation:

1. Add guidance that will enhance protection of old trees during prescribed burning. Prescribed fire implementation tactics will also incorporate features that will preserve and minimize impacts to old trees (such as factoring in soil moisture, ignition techniques, and clearing around old trees, in the burn plans to increase their survival rates, see ERI Working papers #3, 16 & 18).

Additional Strengthening Recommendations:

Each action alternative contains a list of proposed restoration activities. Included in each action alternative is a positive statement regarding the allocation of old growth. A similar positive statement regarding the USFS intent to save as many old trees as possible should be included as a restoration activity.

Recommendation:

1. Each action alternative (B, C, and D) should include the following statement: It is the intent of the 4FRI project to protect as many old trees (approximately >150 years old) as possible within the project area. Removal of old trees would be rare, and only would be done in order to prevent additional habitat degradation, as described in Section C, Appendix D, of the 4FRI DEIS.

Final outcome: Unanimous agreement on all above recommendations.

Issue 2: This analysis pertains to the how the DEIS incorporates the large tree retention strategy.

The original Old Growth Protection and Large Tree Retention Strategy (OGP & LTRS) was developed by the collaborative and submitted to the USFS in 2011. "The intention of the exception process is to increase landscape heterogeneity and conserve biodiversity" (OGP & LTRS). The document identified situations where removing post-settlement trees larger than 16 inches diameter at breast height (DBH) would be ecologically and scientifically indicated and therefore socially acceptable. The OGP & LTRS was modified by the USFS into a Large Tree Implementation Plan (LTIP) [section D of the implementation plan (page 646-657)], and incorporated into part of Alternative C (alternative described on page 80 – statement of incorporation page 37).

The key difference between the two large tree retention strategies are shown on page 60 of the DEIS. The primary differences are:

- The USFS removed any requirements for a collaborative process prior to large tree removal. This was done because by law the USFS cannot relinquish its decision making authority.
- The USFS removed the requirement that trees greater than 16 inches could not be removed to create regeneration openings. This was done to mitigate a violation of the forest plans and to allow the USFS to put openings were they conform to the implementation of the desired conditions (DC).

- The USFS incorporated an exception category for situations where there was a preponderance of large young trees that was modified from the OGP & LTRS.

The Stakeholder Group recognized that the USFS did not adopt the stakeholder-produced OGP & LTRS verbatim. Some stakeholders felt strongly that the USFS did not meet the intent of the OGP & LTRS in all areas, while others felt that the "Old Tree" and "Modified Large Tree" implementation plans included in the DEIS reflected the substance and intent of the stakeholder document and were otherwise sufficient. **Consequently, the stakeholder group does not have a 100% consensus statement regarding incorporation of the OGP and LTRS into the DEIS. Because of these differing viewpoints, recommendations on LTRS issues may be provided by individuals and organizations in separate comments.**

Final outcome: Unanimous agreement on above statement.

Key Issue 4: Site Specificity of the Analysis

Discussion of Concern: The Stakeholder Group is concerned that in such a large analysis area, the DEIS might not be detailed enough to disclose site specific impacts of the proposed treatments. To test this concern, three randomly-selected sites were presented to the USFS DEIS development team. For these three stands, we asked to see the data that describes the existing condition, desired condition, proposed treatment, the effects of this treatment on the various resources, and how these effects are considered in the cumulative effects analysis.

It took several hours to find all of the requested information for the three sites, but it does appear that extensive site specific analysis went into the DEIS document and we are satisfied that site-specificity is not an issue. However, in the process of looking at the data, the Stakeholder Group's review team and the USFS realized that the information is spread across a wide variety of reports, files, and locations. At the time, not all of the essential information was available to the public or even part of the official project record.

Recommendations:

1. We recommend that the official project record be updated using our interaction with the USFS as a guide for what information the specialists have that needs to be included in the official project record. Specifically, the USFS should include all the needed information in the project record, organize the information better, and prepare a detailed index of the information. The index should show anyone looking for specific information how to find the desired information. The index needs to link to a map so that a person looking for site specific impacts to a particular location can know where to find the related information.
2. We recommend that this information be attached to the USFS's interactive map that is currently available on the web. Ideally, this map would allow a mouse-over to link the selected location to the existing condition, desired condition, proposed treatment by alternative, the effects analysis information, and if possible, a graphic representation of the area. If these types of map updates are not possible, at least the map could link to the index referencing what information is available and where in the FEIS or in the project record it is located.

Final outcome: Unanimous agreement

Key Issue 5: Cumulative Effects Analysis

Discussion of Concern: With an analysis of 988,674 acres and proposed treatment on up to 593,211 acres, along with 50 other ongoing and foreseeable projects and several wildfires and other natural disturbances in the area, the Stakeholder Group wanted to know whether the DEIS thoroughly analyzes and documents cumulative effects.

Appendix F (Cumulative Effects) of the DEIS gives some short summaries of the cumulative effects and then states that the specialist reports are incorporated by reference. It then gives an extensive list of past vegetation management and prescribed fire projects for the area. It lists the cumulative acres of wildfire by year, discusses insect and disease natural disturbances, lists projects on State and private lands, and identifies projects proposed in the reasonably foreseeable future. However, Appendix F contains little text actually describing the cumulative effects on various resources. It appears that most of the cumulative effects documentation is included in Chapter 3, Affected Environment and Environmental Consequences, and in the specialist reports.

Throughout the DEIS document, the format used to present cumulative effects varies widely. Some of the cumulative effects descriptions are easy to follow and understand and are reasonably supported, while other statements are made without supporting documentation and some are expressed as opinion. As an example, the soils and wildlife cumulative effects seem fairly well presented, and the rationale for conclusions is given. On the other hand, the silviculture specialist report (page 149, DEIS) includes only three small paragraphs to analyze the cumulative effects of over 500,000 acres of treatment. One of these complete paragraphs states:

> "Alternative B restoration treatments would contribute an additional 509,195 acres toward improving forest health and vegetation diversity/composition, sustaining old forest structure over time, and moving forest structure toward the desired conditions."

This statement on the cumulative impacts on silviculture appears to be mostly a professional opinion, and what this statement is based upon or measured against is unclear. While the document does include a long list of projects associated with the 4FRI analysis area, what the impact of these projects actually is, and how they affect silvicultural resources in the 4FRI project area, is also left unclear.

Overall and generally speaking, the Stakeholder Group thinks a good attempt has been made to analyze and document cumulative impacts. However, because the information is presented in many different formats and document locations, is not cross-referenced or indexed, and varies significantly in depth from resource-to-resource, it is difficult to conclude whether an adequate job of disclosure of cumulative effects has occurred.

Recommendations:

1. In the FEIS, cumulative effects analyses for all resources should be presented in a consistent format, such as the format used in the Wildlife and Weed sections. We recommend that the USFS carefully

cross-reference Appendix F to Chapter 3 resource sections and specialist reports where they refer to cumulative effects.

2. The USFS should provide a detailed index to show where in the chapters, the appendix, and the specialist reports cumulative effects information is presented by resource and treatment type.
3. The USFS should carefully represent the measures and methods used to draw the conclusions wherever professional opinions are presented.
4. The USFS should include the Flagstaff Watershed Protection Project into the cumulative effects analyses as a reasonably foreseeable project.

Final outcome: Unanimous agreement

Key Issue 6: Monitoring and Adaptive Management

Discussion of Concern: The Stakeholder Group appreciates and supports the important role given to monitoring and adaptive management in the DEIS, as outlined in Appendix E (*Alternative B Through D Monitoring and Adaptive Management Plan)*, and the important role given to implementation checklists in the DEIS, as outlined in Tables 112 to 115 in Appendix D (*Alternative B Through D Implementation Plan)*. We would like to emphasize the importance of maintaining this component in the FEIS, and request that a more detailed, robust monitoring program be outlined in the FEIS. In the DEIS's treatment of monitoring and adaptive management, we have identified five key concerns:

1. **Gaps and Missing Components:** Overall, the adaptive management plan and monitoring are not complete. Examples of gaps include an incomplete adaptive management plan, missing monitoring components (socio-economic monitoring plan and implementation monitoring plan), and missing cost estimates and financial commitments.
2. **Scale:** The three monitoring scales in the DEIS are stated as: fine, which is the group or site; mid-scale, which is the restoration subunit; and landscape scale, which is the restoration unit and/or project area (page 660, DEIS). This statement is confusing when referencing Table 142, displaying monitoring scales (page 661, DEIS), which does not show any monitoring scales below the sub-unit (1,000 to 10,000 acres). While monitoring is proposed at scales large enough to match the landscape-scale approach of the project, many of the treatments focus on achieving desired conditions and objectives at the group, acre, and stand scales. Data will be collected at four spatial scales, including the site, but does not directly link up with site-level desired conditions in the Silvicultural Specialist Report.
3. **Monitoring and Prioritization:** Overall, the DEIS presents a lower priority for effectiveness monitoring than is reflected in the Stakeholder Group's monitoring documents.
4. **Financing of Monitoring**: The DEIS lacks a transparent commitment to monitoring and linkages to prioritized monitoring Tiers. Stakeholder expectations are to prioritize monitoring dollars to Tier 1 and Tier 2 monitoring. There is an inconsistent presentation of monitoring costs throughout DEIS monitoring plan.
5. **Structure and function of the multi-party monitoring board:** While the DEIS includes the concept of a Multi-Party Monitoring Board (Monitoring Board), such a group is referred to only as part of the Collaborative Forest Restoration Program (CFLRP) monitoring requirements, not as a part of the overall project monitoring and adaptive management plan. We understand that

through our collaborative process the USFS has verbally indicated that some level of partner engagement will occur with project monitoring.

Recommendations:

1. **Gaps and Missing Components:** The stakeholder group recommends that the USFS use the stakeholder-developed monitoring plans (Biophysical and Socio-Economic) in the FEIS, and that the USFS complete the Adaptive Management Plan in partnership with the Stakeholder Group's Landscape Assessment and Monitoring (LAM) Committee. Specific recommendations include:
    a. **Adaptive Management:** The 4FRI Stakeholder Group recommends that the FEIS include a commitment to incorporating the findings of the monitoring program into future management decisions in a finalized Adaptive Management plan, showing clear links to how adaptive management changes will incorporate the collaborative work of the SH group and the USFS decision authority. We recommend clearer linkages among the adaptive management triggers and the range of alternatives analyzed in the FEIS.
    b. **Monitoring:**
        i. Implementation: The 4FRI Stakeholder Group recommends that the DEIS monitoring plan be expanded to include in very specific terms the requirements for an Implementation Monitoring Plan that includes quantitative, qualitative, and effectiveness monitoring (including sampling methodology, frequency of measurements, and data sources).
        ii. Implementation: The purpose of the quantitative implementation compliance monitoring is to answer the question "Was the job done?" The purpose of the qualitative implementation compliance monitoring is to answer the question "Was the job done correctly?" The Stakeholder Group recommends that both questions be addressed in the implementation and compliance monitoring. Verifying that implementation complies not only quantitatively but qualitatively with the management decision is important, as effectiveness can only be meaningfully analyzed if the actual treatment outcomes are aligned with the intended outcomes.
        iii. All Monitoring: In collaboration with the stakeholders, complete all cost columns (e.g., those in Table 143 (page 663) and other similar ones) that will be incorporated from the SH monitoring plans in Implementation/ Compliance, Biophysical, and Socio-Economic Monitoring Plans.
2. **Scale:** The 4FRI Stakeholder Group recommends that the scale of all (Implementation, Biophysical, and Socio-Economic) monitoring be clarified with respect to the scales of the effects analysis and the silviculture implementation plan (e.g., which monitoring indicators are appropriate for the analysis scale, or are we missing appropriately scaled indicators?). We recommend Table 142 be revised (see recent Stakeholder monitoring plan and tables included below) to more clearly link the analysis scales and monitoring scales.

Table 142

Size in Acres	**Stakeholders - From the 4FRI**	**USFS – 4FRI EIS Coconino Kaibab**

	Landscape Strategy	
<1	Group (Implementation)	
1-1000	Site (Implementation)	Stand
1000-10k	Treatment Area (Effectiveness)	Sub-unit
10K-100k	TA/Firescape (Effectiveness)	Restoration Unit
100k-1,000k+	Firescape, Analysis Area, Landscape (Effectiveness)	Analysis Area

3. **Monitoring and Prioritization:** Change description of monitoring tiers in Monitoring Plan to "Note: Tier 1 includes both implementation (compliance) monitoring and effectiveness monitoring. While these are designated as 1a. and 1b. for clarification, priorities between the a. and b. designations remain equal" (page 660); Modify Table 142 as below and in attached supplemental document (AM and Monitoring for 4FRI EIS).

Table 142 displays the monitoring tiers and their prioritization.

Monitoring Tier	Priority for Completion	Who Will Complete	Type of Monitoring	Type of Funding
Tier 1a	1	USFS – Contractor	Implementation	Appropriated, Implementation
Tier 1b	1	Multiparty - USFS - Stakeholders - Agency Partners	Effectiveness	Appropriated, Implementation, Partner
Tier 2	2	Multiparty - USFS - Stakeholders - Agency Partners	Effectiveness	Implementation, Partner
Research	Occurs as approved by Forest Supervisor; Opportunistic	Research Advocate	Implementation, Process, Effectiveness, Validation	Research Advocate, Partner

4. **Financing of Monitoring**: The 4FRI Stakeholder Group recommends:
    a. Including in the FEIS a financial commitment to monitoring as suggested in the 4FRI CFLRP proposal. "Financial resources (both USFS and Stakeholder contributions) will be dedicated to monitoring; in particular, 10% of CFLRP allocated dollars will be appropriated to meet monitoring Tier 1a and 1b indicators"; and
    b. Completing the monitoring plan "costs" column (page 666, DEIS) with Stakeholder Group collaboration.
5. **Structure and function of the multi-party monitoring board.** We request that the FEIS provide additional detail on the structure, function, and pertinence of a Monitoring Board to the multiple variables suggested for monitoring. The diversity of the 4FRI Stakeholder Group and of

all parties and individuals interested in the outcome of this forest restoration project suggest a high level of public interest. Formalizing the involvement of a Board in the monitoring (and an equally important feedback loop in an adaptive management program) is a critical component of implementing this project.

Final outcome: Unanimous agreement

Conclusion

Thank you for the opportunity to comment. The 4FRI Stakeholder group appreciates the efforts to develop the largest restoration project on USFS lands with collaborative input to date. We look forward to continuing to work with our USFS partners to complete the Final EIS incorporating recommendations and finalized Stakeholder documents. For any clarification, please contact the 4FRI current co-chairs.

Sincerely,

Diane Vosick
diane.vosick@nau.edu

Pascal Berlioux
pberlioux@easternarizonacounties.us