Four Forest Restoration Initiative

Coconino and Kaibab National Forests

Objection Resolution Agreement

On December 5, 2014 the Forest Supervisors of the Coconino and Kaibab National Forests, Earl Stewart and Mike Williams, released the Four Forest Restoration Initiative (4FRI) Final Environmental Impact Statement (FEIS) and Draft Record of Decision (DROD). On January 20, 2015, Kevin Mueller filed an objection on behalf of WildEarth Guardians.

On March 16, 2015, the Forest Supervisors (Responsible Officials) and Cal Joyner, Regional Forester (Objection Reviewing Officer), met with Kevin Mueller and Bryan Bird of WildEarth Guardians to explore opportunities to resolve their objection. Several follow up conference calls were held to continue to discuss resolution of the issues (March 25 and 27, April 1, 2, 6, and 8). As a result of these discussions, we were able to resolve WildEarth Guardians' objection issues by agreeing to make the following modifications/clarifications in the final ROD, FEIS, and various supporting documents in the project record.

1. To resolve WildEarth Guardians' issues around monitoring and implementation of combined (Mechanical/Fire) treatments in Mexican spotted owl (MSO) Protected Activity Centers (PACs), the Forest Supervisors agree to make the following changes (in **bold**) to the MSO Monitoring Plan (FEIS, Appendix E):

    - **Four** PACs will initially be selected from the pool of 18 for combined treatment, and at **least 4 reference PACs** will be selected for comparison.

    - **Treatment of the remaining 14 PACs will be contingent upon the results of monitoring during this initial phase of PAC treatments.**

    - **Of the 18 candidate PACs, those dominated by stands proposed for 9 inch dbh cutting limits will be prioritized for treatment and monitoring, provided that they are currently occupied.**

    - **In the 18 combined treatment PACs, trees up to 17.9 inches dbh may be cut; however, trees over 14 inches dbh will not be removed. These select trees between 14-17.9 dbh may be felled and left onsite as logs, converted into snags, or burned. Coarse woody debris / surface fuels in treated PACs will be retained at levels compliant with forest plans.**

    - **Pending U.S. Fish and Wildlife Service (FWS) approval and to the extent possible, all MSO residing in treated and reference PACs will be banded with unique color-coded leg bands to allow for individual identification and monitoring before, during, and after treatments have been implemented.**

- Surveys for occupancy and reproductive success will be conducted for two seasons before any PACs where MSO are detected receive combined treatments.

- **In the event that any of the 18 aforementioned PACs are surveyed for MSO occupancy for 3 consecutive seasons and no MSO are detected, treatment within those PACs may commence to retain and improve MSO habitat components (in addition to the 4 PACs discussed above). Monitoring within these PACs will remain consistent with occupied PACs.**

- Surveys for occupancy and reproductive success will be conducted in consecutive years post-treatment starting with the year of mechanical treatment and continuing until two years post-prescribed fire treatments.

- Vegetation data will be collected prior to treatment, then one year post-mechanical treatment and two years post-fire treatment for a total of three visits per PAC.

- Vegetation and spotted owl survey protocols will remain consistent across treatment groups and throughout the monitoring period.

- **If any of the 18 PACs being monitored, burn at mixed or high severity, the monitoring will continue for 3 consecutive seasons.**

- **In the event that a mixed- or high-severity fire burns in any of the 117 PACs within the analysis area, MSO monitoring will be initiated and will continue for at least three consecutive years in all burned PACs. However, no more than 6 PACs affected in this way will be monitored during any given year. If monitoring objectives other than post-fire occupancy are included in this monitoring plan then there will be reductions in sample size to offset increasing expense per PAC. If the number of PACs burned as described exceeds the number to be monitored then there will be a preference to continue monitoring PACs for which baseline (pre-burn) data exist.**

- **A summary of the data collected during PAC monitoring will be made publically available and presented to the stakeholder group on an annual basis.**

- **The Multi-Party Monitoring Board will evaluate monitoring outcomes and other relevant science to develop and provide recommendations regarding future treatments in MSO PACs.**

- **Funds for the MSO monitoring will be established and demonstrated to the Multi-Party Monitoring Board prior to any treatments occurring in the 18 PACs.**

2. To resolve WildEarth Guardians' concern that findings of key scientific sources regarding historical forest structure and fire regimes, and Mexican spotted owl responses to fire are currently missing from the record, the Forest Supervisors agreed to modify (in **bold**) the FEIS, Silviculture Report, and Fire Report as follows:

- Add language and references to the Silviculture Report outlining the forest density structure of Williams and Baker, et.al.

  The forest structure described in various literature (Reynolds, et, al., 2013; Williams and Baker, 2012; William and Baker 2013; Woolsey, 1911; Pearson. 1950; Covington and Moore, 1994; Swetnam and Baisan, 1996; Covington, et. al., 1997) is very similar to that described in this project. While the individual metrics used in the literature to describe the desired stand structure vary slightly, it is clear that almost all of the stand densities in the 4FRI EIS fall within the Natural Range of Variability described in the relevant literature.

- Compare the forest structure indicated in the literature to what is being proposed by the 1st 4FRI EIS (the forest densities are very similar).

Literature-indicated Forest Structure	What the Silviculture Report/FEIS Propose (language can be added where needed)
Defined small trees as > 10cm up to 40 cm (3.9" up to 15.7" DBH). Defines high density forests with approximately 141-145 trees/ha (57-59 trees per acre), and 17.3% of the forest exceeded 200 trees per hectare (81 Trees per acre), and 4.2% of the area exceeding 300 trees per acre (122 trees per acre). 58 TPA over 4" DBH 16-18% of forest areas >81 TPA 52-81% of trees under 16": DBH	**In Alternative C, 4FRI proposes mechanical treatment on 431,049 acres.** **Post-treatment structure is:** **VSS 2 (4.0-4.9") = 18.24 TPA (0-604) (28.1%)** **VSS 3 (5.0-11.9") = 24.39 TPA (0-639) (37.5%)** **VSS 4 (12.0-17.9") =12.7 TPA (0-84) (19.5%)** **VSS 5 (18-23.9" = 6.89 TPA (0-53) (10.6%)** **VSS 6 (24"+) = 2.83 TPA (0-18) (4.3%)** **Total Trees Per Acre = 65.05** **Projections for post-treatment density figures are:**[1] **65.05 TPA across the treatment stands (4.0"+ DBH)** **29.3% of stands are > 81TPA** **90.3% of the stands have >52% of the trees <16" DBH.** **The range of TPA is approximately 0-639 TPA**

- Add language and reference to Fire Ecology Report (Introduction, p. 1, 5th paragraph)**:**

  Landscape scale analyses are important for understanding how ecosystems responded historically to climate change or disturbances across environmental gradients (White and Jentsch, 2001). Fire is a keystone process in healthy ponderosa

[1]Refer to Project Record #954, Summary of Projected Post-Treatment conditions by Type.

pine ecosystems as well as grasslands, aspen, and other ecosystems within the analysis area. Fire Ecology is the study of the symbiotic relationship of fire with all spatial and temporal components of an ecosystem…

- In both the Fire Ecology Report and the Fire Ecology section of the FEIS, change "Opposing Science" heading to "**Other Science Reviewed**" and modify language in this section:

  Commenters also cited publications (Williams and Baker, 2013; Williams and Baker 2012) to support their comments. **Over the last several years, there has been a series of publications with differing conclusions about the role of fire in ponderosa pine forests in Arizona.** Williams and Baker compiled a large set of historical data that consists of records made by land surveyors for the General Land Office (GLO) in the late 1800s and early 1900s. Surveyors marked trees around corner points that delineated square miles and quarter-miles, sometimes making additional comments about the country they were walking through. This research provided new data in the form of estimates of forest density, species, and diameters of trees at the time of the survey **(Williams and Baker, 2012). Based on the density and size-class data, they devised a method for determining past fire regimes, concluding that the proportion of high-severity fire in recent fires was less than or similar to the proportion in historical fires (Williams and Baker 2012).** They also concluded that, **historically,** high severity fire was more prevalent across the ponderosa pine in Arizona than had been indicated by previous research **(cited elsewhere in this report). Fulé et. al. (2013) responded with concerns about Williams and Baker's (2012) methods and conclusions about high severity fire.**

  In evaluating the available research that is specific to fire regimes in ponderosa pine in Arizona and the project area, many people feel that ecological, social, and economic values are not consistent with the pre-restoration disturbance regime of large, high severity fires, especially under changing climate. However, ecological restoration in the project area will lead to a restored fire regime with historical levels of low, mixed, and high-severity fire, even if the details of the historical levels remain under on-going study.

- Add paragraph and modify language in Affected Environment, Historic conditions affecting the 4FRI analysis, section:

  The 4FRI project area lies between Grand Canyon National Park's South Rim and the southern boundary of the Coconino National Forest. This area is dominated by ponderosa pine that is intermixed with pinyon pine, juniper, Gambel oak, aspen, grassland, and shrubland vegetation. Across the landscape, this mosaic of vegetation supported, and was supported by, a mosaic of fire regimes, ranging from low to high severity (Williams and Baker 2013). The driest part of the project area is on the Coconino Plateau, where ponderosa pine forests may have been less continuous, with significant portions of the landscape being pinyon/juniper or grass and shrubs, and more of the ponderosa pine is intermixed with shrubs (such as sage), or

pinyon/juniper. Studies done in this area showed that, particularly where pinyon/juniper and mixed conifer intermixed with ponderosa pine, low-severity fire likely structured the majority of the forest while roughly a third was structured by mixed-severity fire, probably including small, patchy crown fires (Williams and Baker 2013; Huffman et. al., 2008).

Historically, both lightning and human-caused fires, once started, could burn until extinguished by rain, or until they ran out of fuel (typically when they reached an area that had recently burned). Fires could burn for months and cover thousands of acres (Swetnam 1990, Swetnam and Baisan 1996). Effects from these long burning fires would vary as conditions changed over the weeks they burned. As a result, most ponderosa pine in the southwest burned every 2 to 22 years as **mostly** low-severity, often area-wide fires (Weaver 1951, Cooper 1960, Dieterich 1980, Swetnam et al. 1990, Swetnam 1990, Swetnam and Baison 1996, Fulé et al. 1997a, Fulé et al. 2003, Covington et al. 1997, Heinlein et al. 2005).

Across the treatment area, the desired condition would allow the use of prescribed fires to supplement unplanned ignitions, producing an average annual Fire Return Interval (FRI) in the ponderosa pine of no more than 20 years, with a 10 year FRI being preferred unless monitoring indicates a change is warranted. The FRI on the southern end of the project would average less than 10 years because the higher precipitation produces faster regeneration and growth (Puhlick et al. 2012), while the northern, drier portion of the project area could go for 20 – 30 years, depending on environmental conditions affecting fuel accumulations, regeneration, and initial condition (Fulé and Laughlin 2007). Across the treatment area, forest conditions would allow for the use of fire as addressed in the land and resource management plan. Frequent surface fires would rarely move up into tree crowns and, when crown fire did occur, it would **mostly** be passive crown fire, limited to the tree or the group within which it started, **or small patchy areas of crown fire**. Restored sustainable fire regimes, from a combination of planned and unplanned ignitions, would regulate landscape structure, pattern, and composition, aligning forest changes with climate changes.

While researchers generally agree that there was mixed and/or high severity fire in ponderosa pine (Williams and Baker 2013, Roccaforte et al. 2008), there are some unresolved questions about the amount, pattern, and distribution of these fires. Some studies on the rates of these fires suggest they were relatively infrequent (Williams and Baker 2012). This is corroborated by Jenkins et al. (2011), whose paleoecological reconstruction found high-severity fires in transitional ponderosa and dry mixed-conifer forests at 200-600 year intervals over the last 1000 years. Some science indicates the size and extent of high severity fires are much larger than historic data indicates was typical of ponderosa pine in the southwest (Swetnam 1990, Covington and Moore 1994; Swetnam and Betancourt 1998, Westerling et al. 2006, Climate Central 2012, Miller and Safford 2012) and, while the number of fires reported in and adjacent to the project area has decreased over the last 40 years, the average size has increased.

3. To resolve WildEarth Guardians' concerns regarding heterogeneity across the landscape, the Forest Supervisors agree to modify (in **bold**) the ROD, FEIS, Silviculture Report and Fire Report as follows:

- Add the following language to promote heterogeneity to the Final ROD:

  The objective of the project is to restore forest structure, pattern, composition, diversity and landscape heterogeneity, within the ponderosa pine (Pinus ponderosa) ecosystem that will lead to increased forest resiliency and function and restore the historical fire regime. The intent of the 4FRI project is to obtain a high level of vegetative responses that will increase ecosystem diversity by increasing horizontal and vertical heterogeneity. Restoration initiates or accelerates ecosystem recovery with respect to ecological health, integrity, and sustainability (Reynolds et al 2013). Resiliency increases the ability of the ponderosa pine forest to survive natural disturbances such as insects, diseases, fire, and climate change (FSM 2020.5) without changing its inherent function (SER 2004). Restoration activities proposed with this project are expected to put the project area on a trajectory towards comprehensive, landscape-scale restoration, with benefits that include improved vegetation biodiversity, wildlife habitat, soil productivity, and watershed function, as well as increased forest structure heterogeneity. To ensure that the project will maintain and restore historical forest structure, the restored landscapes of the project area are projected to have an average of at least 65 trees/acre over 4" diameter, 29% of forest area with > 81 trees/acre, and 90% of forest stands with > 52% of the trees < 16" diameter as documented by scientific reconstructions of historical forest structure. Restoration treatments will expand burn windows for both planned and unplanned ignitions, so that the proportion of the project area with restored historical levels of low, mixed, and high-severity fires is maximized. While the 4FRI does not provide any direction for managing unplanned ignitions, treatments are expected to increase the decision space for line officers deciding how to manage lightning caused fires wildfires. This can be expected to increase the area that can be managed for historic fire regimes, including low, mixed, and high severity fire.

- This language in the Final ROD will be supported in the FEIS, Silviculture Report, and Fire Report by adding the following language to those documents:

  - **Alternative C includes mechanical treatments on 431,049 acres.**

  - **The post-treatment tree density (trees per acre, TPA), after mechanical treatments and prescribed fires, across the 431,049 acres, is projected to be no less than 65 TPA (mean).**

  - **In the post-treatment landscape, across the 431,049 acres, it is projected that more than 16% of stands will have no less than 81 TPA (mean).**

- **The post-treatment landscape, across the 431,049 acres, is projected to be dominated by small trees, with more than 51.8% of the trees smaller than 15.7" DBH.**

- Discussion and explanation of other scientific references, published prior to the completion of the 4FRI EIS analysis, will be added or expanded upon in the FEIS, Silviculture Report, and Fire Report for the following literature and findings:

  - **Williams and Baker (2013) found the mean density of historical forests was 142-144 trees/ha (57-59 TPA), and 16-18% of forest area was dense, with > 200 trees/ha (81 TPA).**

  - **Leiberg et al. (1904): "The light stands in many cases represent tracts which were burned clear, or nearly so, one hundred or one hundred and twenty years ago, and now are stocked chiefly with sapling growths, ranging in age from 35 to 90 years."**

  - **Jenkins et al. (2011 p. 138-139): "…the evidence indicates that severe wildfire was an important influence on the pre-European-settlement landscape in transitional PIPO and PIPO-MC…Fires are recorded in our study area with a frequency of several centuries, ranging from 600 to 200 years for multiple-basin events."**

  - **Williams and Baker (2012): This study found that the historical fire regime in ponderosa pine forests on the Mogollon Plateau included 62.4% of the area with evidence of only low-severity fire, 23.1% of the area with mixed-severity fire, and 14.5% of the area with high-severity fire (Williams and Baker 2012, Table 2). Also, the historical fire rotation for high-severity fire was 828 years across the Mogollon Plateau, thus these fires were infrequent, as also found by Jenkins et al.**

  - **Williams and Baker (2013): This study found that the historical fire regime in ponderosa pine forests on the Coconino Plateau included 58.8% of the area with evidence of only low-severity fire, 38.7% of area with mixed-severity fire, and 2.5% of area with high-severity fire (Williams and Baker 2013, Table 2).**

As part of this resolution, WildEarth Guardians agrees to withdraw their objection in whole. The fact that WildEarth Guardians is withdrawing its objection to the Four Forest Restoration Initiative does not constitute any waiver of its claims concerning the adequacy of the 2012 Revised Recovery Plan for the Mexican spotted owl and the operative programmatic Biological Opinions for the Region 3 national forests. The withdrawal of the objection as to the Four Forest Restoration Initiative is a compromise settlement of WildEarth Guardians' objection as to that particular project, and WildEarth Guardians specifically reserves the right to assert that the 2012 Revised Recovery Plan and the programmatic Biological Opinions are arbitrary and capricious and inconsistent with the requirements of the Endangered Species Act.

	4/10/2015
Kevin Mueller, WildEarth Guardians	Date
	4/10/15
Earl Stewart, Coconino Forest Supervisor	Date
	4/10/2015
Mike Williams, Kaibab Forest Supervisor	Date