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January 16, 2020

4FRI Rim Country DEIS  
c/o Coconino National Forest Supervisor's Office  
1824 South Thompson Street  
Flagstaff, AZ 86001

Dear Robbin Redman and John Souther,

The Salt River Valley Water Users' Association ("Association") and the Salt River Project Agricultural Improvement and Power District ("District"; collectively "SRP")<sup>1</sup> appreciate the opportunity to provide comments to the U.S. Forest Service's ("USFS") Four Forest Restoration Initiative ("4FRI") Draft Environmental Impact Statement ("DEIS").<sup>2</sup>

SRP is a municipal power utility ("District") and water provider ("Association") located in Phoenix, Arizona. The Association is a private corporation formed in 1903 under the laws of the Territory of Arizona to contract with the United States under the Reclamation Act of 1902 for construction of Roosevelt Dam, one of the first dam projects constructed under the Reclamation Act. In 1917, the United States transferred the care, operation and maintenance of the Salt River Project to the Association. The District, formed in 1937 as a political subdivision of the State of Arizona, provides electric services to residential, commercial, industrial, agricultural and mining customers. SRP provides electric power to more than 1,000,000 customers in the Phoenix Metropolitan Area and northern Pinal County, as well as large mining and commercial/industrial customers in east-central Arizona. To accomplish this, SRP relies on a diverse portfolio of owned and purchased generation resources that include coal, natural gas, hydroelectric, nuclear, solar, wind, biomass, and geothermal. In addition, SRP owns, operates and maintains 380 miles of high voltage transmission and distribution lines, plus substations, communications sites, microwave sites, radio towers and other associated infrastructure on National Forest System ("NFS") lands in Arizona.

SRP operates seven dams and reservoirs that are fed from the Verde and Salt Rivers and East Clear Creek watersheds, which are located on approximately 13,000 square miles within central and northern Arizona. Sixty percent of the Salt and Verde watershed and 100 percent of the East Clear Creek watershed lie within NFS lands.<sup>3</sup> SRP's system also includes an extensive array of stream monitoring gages, precipitation gages,

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<sup>1</sup> Collectively, the District and Association operate the Salt River Project

<sup>2</sup> Environmental Impact Statements; Notice of Availability. 84 Fed. Reg. 202 (Oct. 18, 2019)

<sup>3</sup> In 1905, President Roosevelt created the Tonto National Forest to set aside lands primarily for the protection of the watershed supplying the Salt River Federal Reclamation Project

snow monitoring equipment, and microwave sites on NFS lands. SRP's water business delivers approximately 750,000 acre-feet of water annually to a 375-square mile service area in central Arizona and is one of the largest raw-water suppliers in the state.

National Environmental Policy Act ("NEPA") environmental analyses for restoration of NFS lands in across the Mogollon Rim, and more specifically, those areas on the Salt River, Verde River and East Clear Creek watersheds, are integral to the success of the Salt River Federal Reclamation Project ("Reclamation Project"). These lands play a key role in the success of the Reclamation Project as the majority of these lands were set aside in the early 1900s for the express purpose of ensuring a reliable and sustainable water supply for the Reclamation Project. SRP and its customers and shareholders have a vested interest in ensuring that forest health is restored on these watersheds. It is for these reasons that SRP has engaged USFS in different partnerships to protect the East Clear Creek, Verde, and Salt River watersheds, including the Cragin Watershed Protection Project and the 4FRI Phase Two Request for Proposals.

Overgrown and unhealthy forests fuel unnatural, high-severity crown fires that devastate forested landscapes. Catastrophic wildfires put at risk the reliable and sustainable water and power supply that serves the Phoenix Metropolitan Area and other outlying areas. Timely and expedient treatment and restoration of NFS lands are critical to protecting these watersheds and their corresponding ecosystems. SRP also regularly engages with USFS for construction, operation, and maintenance of power infrastructure within rights-of-ways and easements on NFS lands. It is imperative that mechanical and restorative treatments are implemented to protect these important and critical power assets.

SRP respectfully submits the following comments in response to the October 18, 2019, Environmental Impact Statement; Notice of Availability ("NOA").<sup>4</sup> SRP's comments also draw from our extensive experience in working with the USFS and with the NEPA process.

Overall, SRP supports the efforts by USFS to propose a suite of restoration actions across the Apache-Sitgreaves, Coconino, and Tonto National Forests over the next 20 years. SRP strongly supports USFS's Alternative Two: the modified proposed action and preferred alternative that would mechanically treat vegetation on up to 889,340 acres and would treat up to 953,130 acres with prescribed fire. SRP is supportive of USFS Flexible Toolbox Approach that provides the opportunity to treat the most acres over the next 20 years, however, SRP recommends that consistency in applying the Toolbox Approach across districts and National Forests is also preferred. In addition, SRP is supportive of USFS analysis on the effects of uncharacteristic wildfire has on watershed function, water quality, surface water supplies and infrastructure. SRP believes that Alternative Two best meets the purpose and need of the project to restore NFS lands to the desired conditions that are resilient to insect and disease infestations, climate change, and most importantly, uncharacteristic wildfires.

In addition, SRP opposes Alternative One the no-action alternative. SRP believes that the no-action alternative will perpetuate a future fueled with high-severity and uncharacteristic wildfire that puts at risk natural resources, a sustainable and reliable water supply, billions of dollars' worth of power and water

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<sup>4</sup> Environmental Impact Statements; Notice of Availability. 84 Fed. Reg. 202 (Oct. 18, 2019)



infrastructure, wildlife and their habitats, and the livelihood of thousands of Arizonans. SRP's detailed comments are provided in the table below and follow the structure used in the DEIS.

SRP greatly appreciates the opportunity to comment on this DEIS that provides a detailed framework for long-term forest restoration activities across the Apache-Sitgreaves, Coconino, and Tonto National Forests. In addition, SRP also appreciates USFS's objective to create a collaborative environment, working with stakeholders, on this important analysis. SRP supports USFS's forest restoration planning and implementation of projects stemming from this analysis. If you or your team have any questions, please do not hesitate to contact Elvy Barton, Senior Water Policy Analyst, at 602-236-5104 or [elvy.barton@srpnet.com](mailto:elvy.barton@srpnet.com)

Sincerely,



Bruce Hallin

Director Water Supply

| <b>Comments to the Abstract and Summary</b>                   |        |   |
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| Section Heading   | Page # | Comment   |
| Abstract  | 3      | SRP recommends that the USFS include a statement in the abstract that clearly describes that the action alternatives are consistent with the Coconino and Apache-Sitgreaves Forest Plans and that Forest Plan amendments are not needed.  |
| Alternatives  | iii    | SRP recommends that USFS provide a short paragraph description that outlines the key differences between Alternative Two and Three.   |
| Forest Plan Consistency                                       | v      | SRP suggests adding “the current Tonto National Forest Plan as amended or as amended by this decision and analyzed in this EIS.”  |
| <b>Comments to Chapter One Purpose of and Need for Action</b> |        |   |
| Background  | 2      | USFS uses the terms “associated ecosystems” in this section and other sections throughout the document, but does not define what associated ecosystems means. SRP recommends adding either a clarifying sentence about associated ecosystems here or in the glossary.   |
| Background  | 3      | SRP recommends adding a statement that “although this analysis is independent, it does take into consideration the cumulative effects of previous and future projects and environmental impact analyses of those actions.”  |
| Current Management Direction                                  | 10     | For Table 3 Tonto Forest Plan Management Areas, include a footnote that informs the reader that the Tonto Forest Plan is undergoing revision and the items in the table may be subject to change.   |
| Existing and Desired Conditions                               | 14     | SRP suggests that USFS provide additional clarification and definition of “passive”, “active”, and “all fire”.  |
| Existing and Desired Conditions                               | 18     | Table 8, USFS provides the number of riparian stream miles that are functioning, functioning-at-risk, and non-functioning. The USFS should provide a footnote of the definition of “functioning riparian stream” and provide a reference, if available, to the report(s) classifying the stream conditions (Also see page 21).  |
| Existing and Desired Conditions                               | 18     | USFS states that “Planting, burning, and other management actions will be considered to encourage reforestation.” SRP suggests USFS more fully describe the types and locations (or criteria) of planting activities. SRP recommends that USFS provide additional explanation of the reforestation activities or direct the public to the appropriate section in the DEIS that would provide greater details on these activities. |

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| Existing and Desired Conditions                         | 18     | <p>SRP recommends that USFS provide a short description of the riparian treatments in the last paragraph similar to the springs description, “Spring restoration would include reducing tree encroachment and noxious weeds, returning fire to the system (through prescribed fire),” etc...</p> <p>We recommend new language that is in alignment with the 5<sup>th</sup> bullet on page 21 related to “Restore woody riparian vegetation.”</p>   |
| Existing and Desired Conditions                         | 19     | <p>USFS states that “Any negative effects on these species from management actions will be mitigated and plant numbers will remain the same or increase.” SRP recommends that USFS slightly revise the statement to state that “Negative effects on these species from management actions will be mitigated and that the goal is for plant numbers to remain the same or increase.”</p>  |
| Purpose and Need for Action                             | 19- 20 | <p>SRP suggests moving the 4FRI Collaborative Forest Landscape Restoration Project paragraphs to the background section to improve the flow of the Purpose and Need for Action section.</p>  |
| Purpose and Need for Action – Forest Product Industries | 23     | <p>SRP suggests revising the following sentence “Engaging industry would offer the opportunity to cover all, or nearly all, of the cost of removal of forest restoration byproducts by the value of the products removed.” SRP believes that industry engagement alone may not create the opportunity for costs to be covered or nearly covered. SRP suggests that USFS include language that supports a cooperative relationship between USFS and industry that promotes business friendly processes in order to create an opportunity for industry to conduct the activities being evaluated in this EIS. USFS should also recognize that there are some areas, even with industry engagement or a more cooperative industry relationship, that the costs will still greatly outweigh the value of the products being removed.</p> |
| Significant Issues – Issue 1                            | 25     | <p>SRP suggests that USFS clarify that the final EIS will incorporate information from the Biological Opinion that will be issued along with the final EIS.</p>  |
| Significant Issues – Issue 3                            | 26     | <p>SRP recommends that USFS inform the public where they can find more information related to the Old Growth Protection and Large Tree Retention Strategy.</p>   |
| Significant Issues – Issue 5                            | 27     | <p>SRP recommends that USFS include a statement explaining how in-woods processing sites provide for economic viability. In addition, USFS should also include further explanation on whether they considered any other economic factors and, if so, why they were dismissed.</p> <p>USFS states that “Alternative 2 provides for treating the most acres in the project area as identified by the Mechanical Treatments Flexible Toolbox Approach and determined during implementation.” USFS should provide</p>  |



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|  |        | additional explanation of why the Flexible Toolbox Approach addresses the economic viability that is brought up in Issue 5.   |
| Significant Issues – Issue 6   | 27     | Under the How Issue 6 is addressed, USFS should provide an explanation of how Alternative 2 addresses Issue 6.  |
| Significant Issues – Issue 7   | 28     | USFS should provide a statement that explains how Alternative 2 is addressing Issue 7. SRP recommends that USFS highlight the use of the design features and best management practices related to roads that will greatly mitigate negative short-term and long-term effects of temporary roads.                                      |
| Decision to be Made  | 28     | SRP recommends that USFS clarify that the 2 <sup>nd</sup> bullet pertains to the Tonto National Forest Plan amendments.   |
| <b>Comments to Chapter Two Alternatives, Including the Proposed Action</b> |        |   |
| Section Heading  | Page # | Comment   |
| Alternative 2 – The Modified Proposed Action                               | 30     | SRP recommends dividing the 2 <sup>nd</sup> paragraph discussion between the dwarf mistletoe and other restoration activities.  |
| Alternative 2 – The Modified Proposed Action                               | 30     | In item 3, USFS should explain the term “regular restoration activities” or use other terms that have been introduced.  |
| Alternative 2 – The Modified Proposed Action                               | 30     | USFS mentions mechanical treatments in the 2 <sup>nd</sup> paragraph, but does not define the term. SRP suggests USFS define mechanical treatment or state that mechanical treatment and mechanical thinning are the same and then revise and reference in the glossary.  |
| Alternative 2 – The Modified Proposed Action                               | 30     | USFS states that changes were made to the Proposed Action in response to public comment, but does not provide detail about what specific changes were made in items 1 and 2. SRP recommends that USFS provide additional details to item 1 and 2 to understand how USFS is being responsive to the public comments and concerns.      |
| Alternative 2 – The Modified Proposed Action                               | 30     | USFS provides a list of all the proposed activities. SRP recommends that USFS also include a statement that directs the reader to the implementation plan, in order to facilitate the understanding of how these treatments will occur. This will help tie the analysis together on the types and methods used in various treatments. |
| Alternative 2 – The Modified Proposed Action                               | 31     | In the additional actions list, USFS should add the 12 in-woods processing sites to the list.   |

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| Alternative 2 –<br>The Modified<br>Proposed Action | 31 | In the additional actions list, USFS analyzes the construction or improvement of approximately 330 miles of temporary roads to facilitate mechanical treatments. SRP believes that 330 miles of temporary roads is substantially inadequate to meet the size and scope of project area. SRP conducted a review of recent forest thinning projects and found that on average 1 mile of temporary roads is needed for every 179 acres of mechanical thinning. Based on these prior projects, Alternative 2 could need up to 4,971 miles of temporary roads to mechanically treat all 889,340 acres. As analyzed in the EIS, 330 miles of temporary roads could limit the available thinning acreage to 59,039 acres. SRP suggests that the USFS review prior thinning projects, coordinate with industry experts and USFS on-the-ground project (contract) managers to improve the estimate of temporary roads that could be required for implementation of Alternative 2. The Final EIS should include a full analysis of the increase amount of temporary roads along with mitigation measures across all resources. |
| In-woods<br>Processing and<br>Storage Sites        | 49 | SRP recommends that USFS provide a map of all the existing forest product industry instead of only providing two examples of forest product industry businesses. This map could replace the third and fourth paragraphs.   |
| In-woods<br>Processing and<br>Storage Sites        | 49 | SRP suggests that USFS include a statement in the 5 <sup>th</sup> paragraph that addresses the increased weight limits that Arizona Dept. of Transportation (ADOT) is implementing and the possibility the USFS may also increase weight limits on USFS roads. On May 2, 2019, ADOT announced that it was expanding its Healthy Forest Initiative to allow trucks to haul up to 90,800 pounds on state routes if they have a sixth axle to distribute the added weight.  |
| In-woods<br>Processing and<br>Storage Sites        | 49 | Also USFS should revise the 40,000 board feet of green logs because it is an inaccurate number and probably should be 4,000 board feet.  |
| In-woods<br>Processing and<br>Storage Sites        | 49 | SRP recommends that the USFS cite the 60-day drying time or research and include a range of drying times in the analysis up to 120 days. SRP suggests expanding the drying time because it improves the economic viability of the project (lower transportation costs), which would address Issue 5 – economic viability. The Final EIS should include an analysis among all affected resources of additional drying time coupled with project design features or best management practices that would minimize or mitigate any potential impacts.   |
| In-woods<br>Processing and<br>Storage Sites        | 49 | SRP urges USFS to include the use of air curtain devices/ technology on in-woods processing and storage sites.   |



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| In-woods Processing and Storage Sites | 52 | SRP recommends that USFS include an additional in-woods processing site located on the east side of the project area. This would allow for additional in-woods processing activities to occur from thinning stemming from this project and could improve economic viability. The Final EIS should include an analysis of this additional in-woods processing site(s) within all affected resource sections.   |
| In-woods Processing and Storage Sites | 52 | USFS should note that restoration of in-woods processing sites will occur once the use of the site is complete.   |
| Rock Pit Use                          | 52 | SRP has concerns about the lack of analyzed rock pits for the project area. In order to accomplish the necessary road maintenance activities for 889,340 acres of mechanical thinning, significant amounts of rock material will be needed. In addition, there are long haul distances between the rock pits that were included in the analysis. SRP urges USFS to include additional rock pits in the analysis and evaluate the potential impacts among all affected resources and the design features and mitigation measures that minimize or avoid potential impacts. |
| Rock Pit Use                          | 52 | SRP also has concerns over the lack of a rock pit inclusion on the Tonto National Forest. Hauling rock material over long distances is a significant cost. In order to address Issue 5 (economic viability), USFS should include at least one rock pit in the Tonto National Forest in addition to analyzing local commercial sources.  |
| Comparison of Alternatives            | 60 | USFS should include in the table the difference between Alternative 2 and 3 for in-woods processing sites and rock pits.  |
| Comparison of Alternatives by Issue   | 61 | USFS should update the basal area in the table to be measured in square feet and not inches.  |
| Comparison of Alternatives by Issue   | 63 | SRP recommends that USFS include a statement on how snag conditions increase would be increased.  |
| Comparison of Alternatives by Issue   | 65 | SRP suggests that USFS include a statement that reflect the average annual salary for the 1,890 jobs that are used in the analysis. The inclusion of this data point would provide a deeper understanding of the economic benefits in the analysis.   |
| Comparison of Alternatives by Issue   | 77 | USFS uses a maximum skidding distance of 1,250 feet or less. While SRP is supportive of including a higher distance for skid trails, it should be noted that 1,250 feet distance is probably the exception and that skid distances are typically 700 feet or less. We recommend the final EIS be updated to assure the range of distances is analyzed and available during  |



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|   |               | implementation. Additionally, it should be noted that skid trails that are 1,250 feet are neither operationally nor economically efficient.   |
| <b>Comments to Chapter Three Affected Environment and Environmental Consequences – Water and Riparian</b> |               |   |
| <b>Section Heading</b>  | <b>Page #</b> | <b>Comment</b>  |
| General Comment   |               | SRP recommends that USFS include analysis related to climate change in the water and riparian section similar in scope to other sections. See SRP's comments on page 688 for updated information related to climate change and precipitation.   |
| Absence of Riparian, Stream, and Upland Improvements  | 107           | SRP recommends that USFS clarify that the statement: "stream reaches within the Rim Country Project area are experiencing increased water flows" relates to increased peak flows during high precipitation events. USFS could use similar language in the preceding paragraph.  |
| Water Quality   | 109           | In the last paragraph, USFS describes how BMPs are effective in preventing long-term degradation of water quality. SRP recommends that USFS also include a similar statement related to BMPs reducing any potential short-term degradation of water quality.  |
| Water Quantity  | 109           | USFS includes a short analysis on increased water yields stemming from mechanical treatments. SRP recommends that USFS expand upon this analysis in the EIS to include the full range of literature that exists on this topic. This expanded analysis should include that increased water yields from mechanical treatments are highly variable and that there are many factors, including basal area reductions, which need to be taken into consideration when determining if there would be increases in water yields. SRP also recommends including a statement that mechanical treatments could see reductions in evapotranspiration and that additional water could be recharged in environment. SRP recommends that USFS use language in the soil section on page 124 to complement the analysis in Water Quantity analysis. |
| Water Quantity  | 110           | USFS states that "In drier ponderosa pine stands, increased yields....the observed response would be greatest in wet years and smallest or non-detectable in dry years." SRP suggest that in addition to explaining the relationship between thinning and extremes in seasonal precipitation, the EIS should include a description of the potential for increased yields during moderate runoff years. Because extreme wet years may overrun the benefits of the thinning and during drought years little benefit may be realized, the intermediate precipitation years may, over time, provide the highest benefit to yields.  |

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| In-woods Processing Sites  | 112   | SRP recommends that USFS not specify the specific methods used to protect or cover exposed soil. This approach allows for flexibility and site-specific techniques over the next 20 years.   |
| Upland Mechanical Vegetation and Prescribed Fire Treatments                                  | 113   | USFS states the “higher-intensity thinning would likely have the greatest potential for groundwater recharge...” SRP recommends that USFS include a clarification that higher-intensity thinning means greater basal area reductions. This would be consistent with subsections of the analysis.   |
| Rock Pits and In-woods Processing Sites  | 114   | SRP recommends adding a statement about the use of rock pits even if the effects are non-existent or limited.  |
| Road Activities  | 114   | USFS states that “It should be noted that a potential increase in the magnitude or duration of effects from a greater number of temporary roads will likely be spread over a larger geographical area, including many additional watersheds, this in essence spreading out potential effects”. SRP recommends the USFS apply this statement to the Road Activities subsection in the Riparian and Wetland Resources. |
| Road Activities  | 114-5 | As noted in a previous comment, SRP recommends that USFS increase the amount of temporary roads in the analysis, including in this section.  |
| <b>Comments to Chapter Three Affected Environment and Environmental Consequences – Soils</b> |       |  |
| Watershed Condition Class and Prioritization Information                                     | 119   | USFS states that “no long-term, cumulative adverse effects from ground disturbance caused by mechanical thinning... are anticipated”. SRP recommends that USFS include a similar statement related to short-term localized effects and that the inclusion of the Best Management Practices would minimize any potential impacts.   |
| Absence of Upland Vegetation Treatments and Prescribed Fire                                  | 121   | USFS states that “detrimental effects to surface water quality and water storage capacity in livestock and wildlife waters.” SRP suggests USFS combine this paragraph with the 4 <sup>th</sup> paragraph that provides more in-depth analysis on the impacts of sedimentation on water quality, supplies and infrastructure.   |
| Absence of Rock Pits and In-woods processing sites   | 123   | In the 3 <sup>rd</sup> paragraph, USFS should add air curtain devices/ technology to the list of activities on in-woods processing sites.  |
| Upland Vegetation Treatments   | 124   | SRP suggests USFS include the use on in-woods processing sites in the list of areas that may cause short-term accelerated soil erosion.  |



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| Road Decommissioning  | 128 | USFS states that “However, this practice rarely improves hydrologic function where roads have interrupted or redirected surface flows via ditches and cross drain culverts, road surfaces are severely compacted, or have channelized flow in the existing roadbed. Additionally, slash can be burned in wildfires and prescribed fires, leaving roads essentially reopened to unauthorized use. Slash alone does not appreciably contribute to native plant propagation within retired roadbeds.” SRP recommends that USFS provide a citation, and suggests USFS recognize that as part of the project’s purpose and need, retaining and using slash provides for an economically viable project and can provide efficient and ecologically beneficial options in some instances for road decommissioning. |
| Mechanical Forest Restoration Treatments, including Timber Harvesting   | 133 | SRP recommends that USFS include a sub-section that includes analysis related to effects of Alternative 2 and 3 related to increased carbon sequestration in the soil from mechanical treatment.  |
| <b>Comments to Chapter Three Affected Environment and Environmental Consequences – Vegetation</b>                   |     |   |
| Modeling Assumptions  | 141 | USFS includes a modeling assumption that all tree cutting and removal was modeled in 2019. SRP recommends that USFS update this assumption to include tree cutting occurring over a period of 20 years.   |
| Modeling Assumptions  | 142 | USFS also includes a modeling assumption that “All other biomass resulting from the cutting is assumed to be removed.” This assumption may not reflect actual on the ground implementation as described in the project description. SRP recommends that USFS include a range of biomass removal options in order to analyze and disclose the potential range of effects of the project.   |
| Timber Harvests   | 192 | USFS states that the Cragin Watershed Protection Project “would mechanically treat 41,046 acres”. SRP recommends USFS revise this number to reflect the final EA analysis approved in July 2018. “Hazard fuel reduction and forest restoration activities proposed for the Cragin Watershed Protection Project area consist of mechanical vegetation treatments on approximately 37,764 acres and prescribed burning treatments are proposed over about 63,634 acres within the project area.   |
| <b>Comments to Chapter Three Affected Environment and Environmental Consequences – Fire Ecology and Air Quality</b> |     |   |
| Surface Fuel loadings   | 238 | SRP believes surface fuel loading standards for Alternative 2 meets both the purpose and need to reach the desired condition and improve the economic viability of the thinning activities. Allowing all the required   |

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|  |     | treatments to be applied in order to meet the desired conditions will ensure the long-term resiliency of the forests and economic viability.   |
| Emissions and Air Quality  | 242 | SRP believes that Alternative 2 meets the purpose and need, and the desired conditions for Air Quality, while still remaining within the legal and regulatory requirements outlined by Federal and State air quality regulations.  |
| <b>Comments to Chapter Three Affected Environment and Environmental Consequences – Climate Change</b>  |     |  |
| All Alternatives   | 269 | SRP suggests USFS include a statement in the beginning of the section to explain to the public that resource specific climate change analysis is included in the resource sections and that this section addresses carbon sequestration.   |
| All Alternatives   | 269 | SRP recommends that USFS revise this section to provide an analysis for each alternatives (or include statements that compare alternatives).   |
| All Alternatives   | 269 | SRP recommends that USFS include a statement that acknowledges that Alternative 1 will continue the existing forests conditions that are at risk for uncharacteristic wildfire and that this Alternative is likely to see more wildfire, which will emit more carbon and sequester less. In addition, USFS should acknowledge that some wildfires will have high-severity burns that could destroy the carbon sink altogether for a certain period of time or change the vegetation for the area and that also has an impact on the amount of carbon that will be sequestered. |
| All Alternatives   | 269 | SRP also recommends that USFS address the potential long-term impacts from mechanical thinning treatments. Recent studies have indicated that initially thinning may reduce the amount of carbon sequestered, but over time, more carbon could be sequestered. SRP suggests inclusion of the Large-scale forest restoration stabilizes carbon under climate change in Southwest United States (2019) as a reference.   |
| All Alternatives   | 269 | USFS should include a section on the affected environment and current conditions related to carbon sequestration.  |
| <b>Comments to Chapter Three Affected Environment and Environmental Consequences – Socio-Economics</b> |     |  |
| Assumptions  | 282 | USFS uses a cost of \$400 per acre for mechanical treatment. SRP recommends that USFS include a range of costs for mechanical treatment to understand the full range of costs associated with restoration.   |
| Economic Efficiency  | 286 | USFS uses an avoided cost to demonstrate the net benefit to taxpayers. To understand the full range of costs and benefits, SRP recommends that USFS calculate the total costs to implement all the treatments in each of   |



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|   |       | the Alternatives, report the net costs (total costs – timber value = net costs), and compare the net costs to avoided costs. Using total costs would provide for a robust and comprehensive view of the all the costs and benefits associated with the Alternatives.  |
| Effects from Use of In-Woods Processing and Storage Sites   | 287   | USFS states that the project would authorize 13 in-woods sites, which is inconsistent with the analysis in the other sections.  |
| <b>Comments to Chapter Three Affected Environment and Environmental Consequences – Lands and Minerals</b>       |       |   |
| Effects from Use of In-Woods Processing and Storage Sites   | 296   | USFS states that the project would authorize 13 in-woods sites, which is inconsistent with the analysis in the other sections.  |
| <b>Comments to Chapter Three Affected Environment and Environmental Consequences – Terrestrial Wildlife</b>     |       |   |
| Affected Environment  | 314   | SRP recommends that USFS incorporate the best management practices into the effects analysis for each species, which minimize or mitigate potential impacts. In addition, USFS should ensure that analysis for each species includes a discussion of the beneficial long-term effects that Alternative 2 and 3 would provide by reducing the threat of uncharacteristic wildfire. |
| Effects Common to Both Action Alternatives  | 345   | SRP recommends that USFS include in the analysis the effects of in-woods processing sites and rock pits will have on MSO, even if the effects are limited or non-existent.  |
| <b>Comments to Appendix C Design Features, Best Management Practices, Mitigation, and Conservation Measures</b> |       |   |
| BT005   | 551   | USFS should clarify the USFS would provide the contractor with the necessary information.   |
| RS010/ RS011  | 565-6 | Stump heights are inconsistent between these two items. USFS should select either 6" or 8".   |
| RS011   | 567   | SRP recommends that USFS change this item to state that "After burning is complete, burn sites that are visible from roads, trails, developed sites, or private dwellings <u>may</u> be covered with natural duff, if natural material is available nearby. SRP also recommends that the USFS allow for <u>up to</u> 3" of material to be used for coverage.                      |

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| RS020 | 569 | USFS states that entrances would be gated. SRP recommends that USFS change the statement to “...entrances <u>may</u> be gated.” Gating may not be effective or could be cost prohibited in some locations. This would provide greater flexibility during implementation.   |
| SI010 | 570 | USFS states that identified wildlife trees cannot be felled. SRP recommends that USFS include an exception in cases of safety where the tree can be felled. Also SRP recommends that USFS clarify who is going to identify the wildlife tree.  |
| SW023 | 578 | SRP suggests USFS update this item to allow for the water bar lead outs to be long enough to function and remove the minimum length requirement. In addition, SRP recommends removal of the references to specific equipment used to install water bars. USFS should clarify that water bars could be seeded, mulched, and/ or cross-ripped. |
| SW026 | 578 | SRP recommends the following change “All piling equipment must be equipped with a brush rake, <u>if possible</u> , to minimize disturbance to the soil surface.”   |
| SW028 | 579 | USFS should allow for flexibility during restoration if native seed mix is not available and provide reasonable alternatives.  |
| SW039 | 580 | USFS should clarify that USFS approves landings and decks, but does not designate them. Also USFS should clarify that this item applies to cable thinning operations.  |
| SW042 | 580 | SRP recommends that erosion control measures could include the use of slash material.  |
| SW051 | 582 | SRP recommends that USFS increase the allowable depth of a rut, and recognize that any rutting that occurs would be restored as soon as possible.  |
| SW052 | 583 | SRP recommends the following change “Skidders should not be turned on roads, <u>when feasible</u> .”   |
| SW054 | 583 | USFS should define “consistently” and provide additional flexibility in this item.   |
| SW070 | 586 | SRP recommends that USFS provide more flexibility by allowing mitigation through ripping, seeding <u>or</u> covering.  |
| WL019 | 593 | SRP suggests that USFS consider, in consultation with U.S. Fish and Wildlife Service, that limited waivers for goshawks be available during the breeding seasons.  |



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| General Comment   |     | USFS should provide the contractor completing the service work with the locations of the protected resource.  |
| <b>Comments to Appendix E Monitoring and Adaptive Management Plan</b> |     |   |
| General Comment   |     | USFS should include references throughout Appendix E to include current data and information that is currently being used.  |
| General Comment   |     | SRP is supportive of the monitoring plan options and the flexibility to use various assessments for the project area.   |
| Introduction  | 662 | USFS should update language about the 4FRI multi-party monitoring board and they are the entity that will oversee the monitoring. <i>"The 4FRI Stakeholder Group will also create a Multi-Party Monitoring Board (Monitoring Board) which will work with the USFS....."</i>   |
| Monitoring: Desired Conditions, Indicators, Thresholds, and Triggers  | 667 | USFS should update the 1 <sup>st</sup> paragraph.   |
| Prioritization: Monitoring Tiers                                      | 668 | USFS states that "Budgetary limitations will dictate how much and what type of monitoring can be accomplished", USFS should clarify, other than Operational monitoring done by USFS, if there is any <u>required</u> monitoring that could potentially not get done if budget does not exist.   |
| Biophysical Monitoring Plan   | 674 | USFS should include a monitoring section on mixed conifer desired conditions. In addition there are several statements on forest openings and snowpack accumulation. USFS should include a more recent publications (Broxten et al., 2019) that documents some of these impacts.  |
| Tier 1 Suggested Indicators   | 677 | SRP recommends that USFS add snowpack accumulation monitoring as an assessment/trigger for Tier 1 indicator canopy openness or Tier 1 indicator soil moisture related to forest opening size and orientation.   |
| Tier 1 Suggested Indicators   | 678 | In the 3 <sup>rd</sup> bullet, USFS should include trends of decreasing snowpack to the soil moisture trigger.  |
| Tier 1 Suggested Indicators – Rare Ecosystems                         | 680 | USFS should update this section to include recent Phase one monitoring work related to spring monitoring.   |
| Description and Justification   | 688 | USFS states that "Future Climate models for the southwestern United States predict warmer and drier conditions (Seager et al 2007)". While most climate models predict warmer conditions it does not necessarily indicate drier conditions for the entire southwest (possibly changing when precipitation is received). USFS should revise the statement to |

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|  |     | <p>states that “Future Climate models for the southwestern United States predict warmer conditions and varying precipitation.” SRP has included statements from more recent and more regional information that USFS could include.</p> <p>“Precipitation in the winter over the Salt-Verde basins occurs from storms that track from west to east across the southwestern United States. In a warmer world, winter storm tracks are expected to shift poleward (Seager and Vecchi 2010; Barnes and Polvani 2013). For lower mid-latitude areas like Arizona, this would result in less winter storm activity (Seager and Vecchi 2010). Storm tracks are not expected to shift poleward uniformly and the storm track that impacts Arizona may only shift north by 0.8 degrees latitude on average, or about 50 miles (Barnes and Polvani 2013).</p> <p>While winter storms may become less frequent in a warmer world, the intensity may increase, particularly for the more extreme events such as atmospheric rivers (Singh et al. 2018; Lu et al. 2018). This is largely in response to more water vapor in a warmer world. Accordingly, increases in future atmospheric river frequency have been suggested for the lower mid-latitudes (Espinoza et al. 2018; Lu et al. 2018). In addition, atmospheric river events themselves are expected to produce more precipitation in a warmer world (Singh et al. 2018).”</p> <ul style="list-style-type: none"> <li>• Seager R and GA Vecch, 2010, Greenhouse warming and the 21<sup>st</sup> century hydroclimate of southwestern North America. PNAS. doi/10.1073/pnas.0910856107</li> <li>• Barnes, EA, and L Polvani, 2013, Response of the midlatitude jets, and of their variability, to increased greenhouse gases in the CMIP5 models. J. Climate, 26, 7117–7135, <a href="https://doi.org/10.1175/JCLI-D-12-00536.1">https://doi.org/10.1175/JCLI-D-12-00536.1</a>.</li> <li>• Lu J, X Daokai, G Yang, G Chen, LR Lueng, and P Staten, 2018, Enhanced hydrological extremes in the western United States under global warming through the lens of water vapor wave activity. NPJ -Climate and Atmospheric Sciences.</li> <li>• Singh I, F Dominguez, E Demaria, and J Walter, 2018, Extreme landfalling atmospheric river events in Arizona: Possible future changes. Journal of Geophysical Research: Atmospheres, 123. <a href="https://doi.org/10.1029/2017JD027866">https://doi.org/10.1029/2017JD027866</a></li> <li>• Espinoza V, Waliser DE, Guan B, Lavers DA, and F.M. Ralph, 2018, Global Analysis of Climate Change Projection Effects on Atmospheric Rivers. Geophysical Research Letters 45;9:4299-4308.</li> </ul> |
| Fine Scale Assessment                                  | 691 | USFS should move Surface Water Response assessment to the next Suggested Tier (Fuel/fire hazard, fire occurrence, soil, and watershed function) after Groundwater Response item on page 692.   |
| Tier 1 Suggested Indicator Soil and Watershed Function | 692 | USFS should consider adding an assessment of sediment erosion/transport/accumulation.  |
| Broad Scale Assessment                                 | 694 | In reference to Table 131, USFS should:  |



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|  |  | <ul style="list-style-type: none"> <li>• Add Snowpack monitoring to assessment for forest structure (indicator no. 6 or 16) or with soil moisture.</li> <li>• Revise Indicator No. 28 to assess snowpack and soil moisture, removing other components evaporation, surface water flow, groundwater that may have been addressed in new questions.</li> <li>• Indicators 33 and 34 Surface water and Ground water would fall under Tier 1.</li> <li>• Indicators 35-40 would be Tier 2 based on text for suggested indicators.</li> <li>• Several of the thresholds/triggers and cost have TBD, USFS should provide updated information.</li> </ul> |
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