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Bill Williams Mountain Steep Slope Thinning

Request for Information

Kaibab National Forest, Arizona

BACKGROUND AND STATEMENT OF WORK

The National Forest Foundation (NFF) and community partners are working to restore forests, reduce wildfire risk, and protect watersheds on National Forests in northern Arizona as part of the Northern Arizona Forest Fund (NAFF) program. Forest thinning (cutting and removal of live trees and forest debris) is a major component of these restoration treatments. Over the past several years the NFF has partnered with forestry companies and organizations to conduct mechanical and hand-thinning projects across the Coconino, Kaibab and Prescott National Forests.

On the Kaibab National Forest, the NFF, the Forest Service, Coconino County, and other project partners are working together to reduce the likelihood of high severity fire behavior on Bill Williams Mountain (BWM). It is expected that uncontrolled wildfire occurring under current forest conditions would yield high severity fire impacts, devastating the mountain's ecology as well as local infrastructure, water supplies and additional downstream damages, estimated at nearly $400 million. Treatments prescribed across the entire BWM landscape (approximately 15,000 acres) include a variety of implementation tools to reduce hazardous fuels and minimize fire risk such as the use of hand thinning, mechanical thinning, prescribed fire and importantly, the removal of significant amounts of dead and down hazardous fuels.

For this effort, we are seeking **your expert input** on the application of unique and creative forestry techniques and approaches for tree harvesting and fuels reduction on the steep slopes of BWM. Following detailed silvicultural prescriptions, trees and accumulations of existing downed forest fuels will be removed to achieve desired future conditions and fuel reduction goals as stated in the 2015 Record of Decision for the Bill Williams Mountain Restoration EIS. These restoration and fuels reduction efforts will help protect the greater Williams, Arizona community from direct impacts of wildfire and post-fire floods, while also helping to safeguard a renewable water supply, protect local economies, enhance wildlife habitat, maintain the mountain's regal beauty and yield a myriad of other benefits.

Specifically, the purpose of this Request for Information (RFI) is to invite forestry contractors with experience working with mechanical equipment on steep slopes to provide conceptual plans for how their company would treat each of six treatment units of steep, rocky terrain on BWM (see attached maps and unit specifications). This RFI also invites contractors to inform the project team about what additional information is needed to prepare their future proposals

in the RFP process. **Your RFI response will allow NFF and project partners to craft a Request for Proposals (RFP) given any constraints and opportunities to treatment methods identified in the RFI process, and to provide the best information possible.** Project funding has been secured for treatment implementation during the 2021 calendar year.

The NFF and project partners will host a VIRTUAL site visit at **10 am MST on Friday, January 8, 2021.** During this time we will answer questions, share and discuss project the maps and models referenced in Appendix A, and run through a "virtual tour" of the project area using both static and digital interactive photographs to help illustrate the varied topography and site characteristics across the units. This will be recorded and made available for later viewing. Please RSVP to Mark Brehl by Wednesday January 6th, 2021 if you will attend the virtual meeting. Zoom link HERE:
https://us02web.zoom.us/j/88422792528?pwd=NTQ3dnMrV3RYNGYzUmhIbkJlZHk0dz09
An in-person site visit will be scheduled in spring 2021, in concurrence with the release of the RFP. If a company interested in this work does not provide a response to the RFI, it may still submit a proposal for the RFP.

This work will be accomplished via a service contract with the National Forest Foundation. Please note that fuels reduction is a primary project objective. As such, it is required that all activity slash produced through harvesting operations and residual slash, including the greatest amount possible of dead and down hazardous 1,000 hr. fuels (>3 inches) must be removed from the project area.

The NFF shall prefer proposals to fully harvest, yard, merchandise, process and transport logs and/or biomass material to available markets. Alternative proposed approaches for off-site materials removal will be considered. Please note in your RFI how your organization would address processing and marketing/utilizing materials from this project.

SITE CONDITION

The maps and products provided in Appendix A (Project Area Maps and Link to Google Drive) display information on 515.3 acres arranged into 6 treatment units numbered according to treatment priority (1-6). These priority units must be treated to reach project-level objectives and to help achieve the overall desired conditions as described in the Bill Williams Mountain Restoration EIS.

Summary tables of map and model analyses is listed in Appendix B and includes Stand Basal Area, Canopy Load Biomass, Total Cubic Foot Volume, Merchantable Cubic Foot Volume, Estimated Trees Per Acre, Slope Degree and Slope Percent. The estimated values listed are based upon quality level 1 LiDAR data, field plots collected across the forest and linear regression modeling.

We are seeking input on how your organization would treat the blocks displayed considering mechanical operations and techniques, access, and other defining circumstances. Based on the information received, the project team will then select approximately 300 acres as a subset of those blocks for treatment through the spring 2021 RFP. Additional steep slope acreage has been prioritized for future treatment in subsequent years.

NFF is interested in receiving plans demonstrating innovative methods to overcome complex conditions, including:

- Varied rocky, uneven terrain and steep slopes (see attached maps)
- Potentially limited access/haul routes and limited landing locations.
    - Construction of any necessary roads/temporary roads will be the contractor's responsibility.
- Removal requirements
    - Activity slash - Removal of all trees, branches and all biomass produced through harvesting activities and application of unit specific silvicultural prescriptions. Fuels reduction goals include removal of all cut material in addition to a dead and downed fuels removal component
    - Residual slash - Removal of substantial amounts of existing 1,000 hour fuels (>3" diameter) dead and down forest debris in various stages of decay and quantities across the units.
- Seasonal restrictions (listed in the section below).

The Bill Williams Mountain Restoration Implementation Team will consider adjustments to constraints within our control, such as but not limited to unit boundary adjustment, closure exemption needs, or prescription adjustments to account for logging system limitations. Please note adjustments your organization would need to make your plan successful.

Traditional ground-based, helicopter yarding and steep slope ground-based treatment methods will be considered. Cable logging and excaline operations are not allowed. Additional methods may also be considered if adequate demonstration of the techniques are available for review.

As described above, this is a long-term, complex project that may require multiple approaches within a single unit to meet desired conditions, or may require a phased approach over multiple years. This RFI seeks efficiencies of scale and scope given the resources available in 2021. Ultimately, decisions made for moving forward based on RFI feedback may only represent a subset of acres for treatment in the final RFP, understanding that additional acres and/or treatment types will be considered for future phases.

LOCATION

All work will be conducted on the Williams Ranger District of the Kaibab National Forest. See attached Vicinity and Project Area Maps in Appendix A.

TIMING RESTRICTIONS

Portions of these units have timing restrictions for Mexican Spotted Owl constraining operations from March 1 – August 31 and are depicted on attached maps. Due to high fire risk and the sensitive nature of this watershed, summer Fire Restrictions and Closures are common.

In addition to general Fire and Safety Plans and adherence to requirements of the forest's standard Industrial Fire Plan, an additional and more robust Wildfire Mitigation Plan may be required for review and approval, prior to initiation of any operations during potential Area Closures and other periods of significantly elevated fire danger. Items and actions potentially necessary may include a dedicated fireguard, augmented communications, additional

firefighting tools, bladder bag availability, water tender available on-site, maintaining a full port-a-tank/pumpkin or other potential mitigation factors specific to fire risk level, location and operational approach.

FUELS TREATMENT DESCRIPTION

Fuels treatments include thinning (live and dead trees), removal of those trees, and removal of the greatest amount possible of dead and downed material, given proposed treatment methods.

Activity-generated Slash (Thinning)

Individual Tree Marking will not be used; all prescriptions will be Designation by Prescription or Designation by Description.

Treatment specifications for each unit of this project will be written by the Kaibab National Forest. The following general specifications are intended as guidelines for the project.

- In general, trees over 18” will be retained though larger trees may be removed for project operability. Most of the trees smaller than 18” DBH will be cut and removed to achieve target basal areas (ranging from 60-80 sqft/ac averaged across entire contiguous blocks of ground). Snags will be cut and removed primarily up to 14” DBH with removal of larger snags permitted as necessary for life and safety protection. Live tree species will be retained in the following order of preference: ponderosa pine > Doug-fir > spruce > white fir. Only conifers are targeted for thinning.
- Thinning prescriptions will include areas of thinning from below and areas where all size classes may be thinned to prescribed basal area targets.
- All cut or fallen trees and all material produced during harvesting and/or in-woods processing must be removed to the landing within the same season and may be required prior to entering subsequent units. Complete off-site removal of all logs and/or biomass is desired within the same season to the extent possible.
- Areas too rocky, steep or otherwise determined to be inoperable for ground-based treatment and removal may be deferred or excluded from treatment upon agreement and project team approval. Deferral and exclusion processes will be developed based upon RFI responses and specific proposed approaches.

Residual Slash (Dead and Down Hazardous Fuels)

The entire fuels profile, from the smallest sticks and needles to the largest logs, adds to the problem of extreme fire severity that the project is trying to solve. The goal of this treatment is to remove as much of that fuels profile as possible.

Fuel loadings (the accumulation of fuels) have a wide range of variability within the project area with an estimate of 20-80 tons per acre. The NEPA and land management plan calls to remove that loading down to single digits. The goal for this project is to remove the existing fuels (dead and down) larger than 3” in diameter off of the landscape. These fuels vary in size (generally targeting 1,000hour fulels >3” diameter), condition (decay class, integrity)and concentration (estimated range of 20-80 tons/acre.) **Proposals that concentrate on the largest amount of removal will be favored as it is a key purpose of the project**. Contractors will be required to:

- Remove substantial amounts of existing dead and down forest debris (1,000 hour fuels, >3" diameter) in various stages of decay and quantities across the units. An estimated 20-60 tons per acre of dead and down will be removed overall.
- Pile all slash materials in approved landings for subsequent off-site removal that is desired within the same season.

All Slash Treatment
All slash created during operations, activity-generated slash and residual slash will be chipped, ground, and hauled or otherwise removed in the same operating season.

PROJECT CONSIDERATIONS
As this project is located on National Forest System lands, contractors must also comply with all applicable U.S. Forest Service direction and regulations. NFF will administer and oversee the implementation of the work. Please be prepared to appoint a supervisor to coordinate and work closely with NFF and Kaibab National Forest representatives. Preferred start date is summer 2021.

RFI RESPONSE TEMPLATE
This is a multi-year, complex project. Information is needed to inform decision-making on selecting specific project acres and appropriate treatment methods in 2021. The information you provide will help us develop a comprehensive RFP. We will consider multiple treatment types given the need to both cut standing live trees and remove dead and downed materials to the greatest extent possible from steep slopes on Bill Williams Mountain.
Please include the following components:

A) Cover Page:
1. Company name
2. Name(s) of individual(s) preparing the response,
3. Primary contact: mailing address and physical address, office phone, and email.
4. DUNS Number (https://www.grants.gov/applicants/organization-registration/step-1-obtain-duns-number.html)
5. List of names of positions (operators, technicians, sawyers etc.) and subcontractors that may work on this project.
6. Lists of heavy equipment to be used; what is currently owned (include year, manufacturer, model) and what may be leased.

B) Proposed Operating Plan: Given the information provided, please provide how your company would treat each unit in a timely, safe, and cost-effective manner. To the extent possible use simple, clear language to illustrate the methods you propose. At a minimum we suggest providing the following information:

1. Units: Please describe the number of acres (or percent) you could treat in each treatment block based on type of treatment methodology proposed and any foreseen on the ground constraints.
    - Is there anything about the way the units are currently delineated that prevent success/operability? Is there a need to modify units? Why?

2. Thinning Methods: Please describe the method (or methods) and equipment you would use to cut trees, move trees to landings, and stack or pile materials in each selected block. Provide an explanation of the benefits of this method and a description of the limitations given the site, and how those limitations may be overcome.

3. Slashing Methods: Please describe the methods and equipment you would use to remove and pile dead and down materials at landing sites. Provide an explanation of the benefits of this method and a description of the limitations of this method and how those limitations may be overcome.

4. Removal: All material to be felled and/or collected and removed must be relocated to approved landing areas, as identified on the Project Area Map (Appendix A). If additional landings would be needed based on your plan of operations, please identify potential desired locations and additional considerations.

   The NFF shall prefer proposals to fully harvest, yard, merchandise, process and transport logs and/or biomass material to available markets. Alternative proposed approaches for off-site materials removal will be considered. Please note in your RFI how your organization would address processing and marketing/utilizing materials from this project; please include merchandizing specifications or information you would need to remove and manage material according to your utilization scheme.

5. Order of Operations: Describe the order of operations your company would follow to initiate, conduct, and close out the project. A numbered list of detailed steps is fine. Based on prior experience working in similar conditions, provide an estimate of the number of acres per day that can be completed. If you have a preferred operating window please note that here.

6. Safety: Please provide the safety training, equipment and protocol your company uses when operating. Operations may need to occur during periods of Stage I fire restrictions, provide a list of equipment and procedures your company uses to operate safely under these conditions. If helicopter yarding is proposed, all aspen snags and smaller decadent conifer snags more prone to falling should be felled and removed for operational safety.

7. Estimated Cost: Please provide an estimated cost/acre for each treatment type proposed OR a range of costs per treatment type from past projects performed. Include piling and slashing costs. **NOTE: This is NOT an official bid and contractors will not be held to these estimations. RFI information will be kept confidential and not shared beyond the evaluation team.**

8. Additional Information Needs: Please provide any additional questions you have about the project and information needed to provide a robust RFP response.

9. Past experience: Please provide a list of the projects that your company or employees have completed that have involved steep slope logging. For each project list the

number of acres, project location, general description of cutting specifications, landowner and/or project manager, and time required to complete the project. Photos would be appreciated if available.

10. References: Please provide three (3) reference that you have worked with in the past five years. Provide contact name, email, work phone number and name of project(s) that you worked on together.

RESPONSES
Due by Friday, January 22, 2021. Please e-mail your documents to Mark Brehl at mbrehl@nationalforests.org. If you have any issues or additional questions please contact Mark Brehl at 928.853.7578. All RFI information will be kept confidential and not shared beyond the evaluation team.

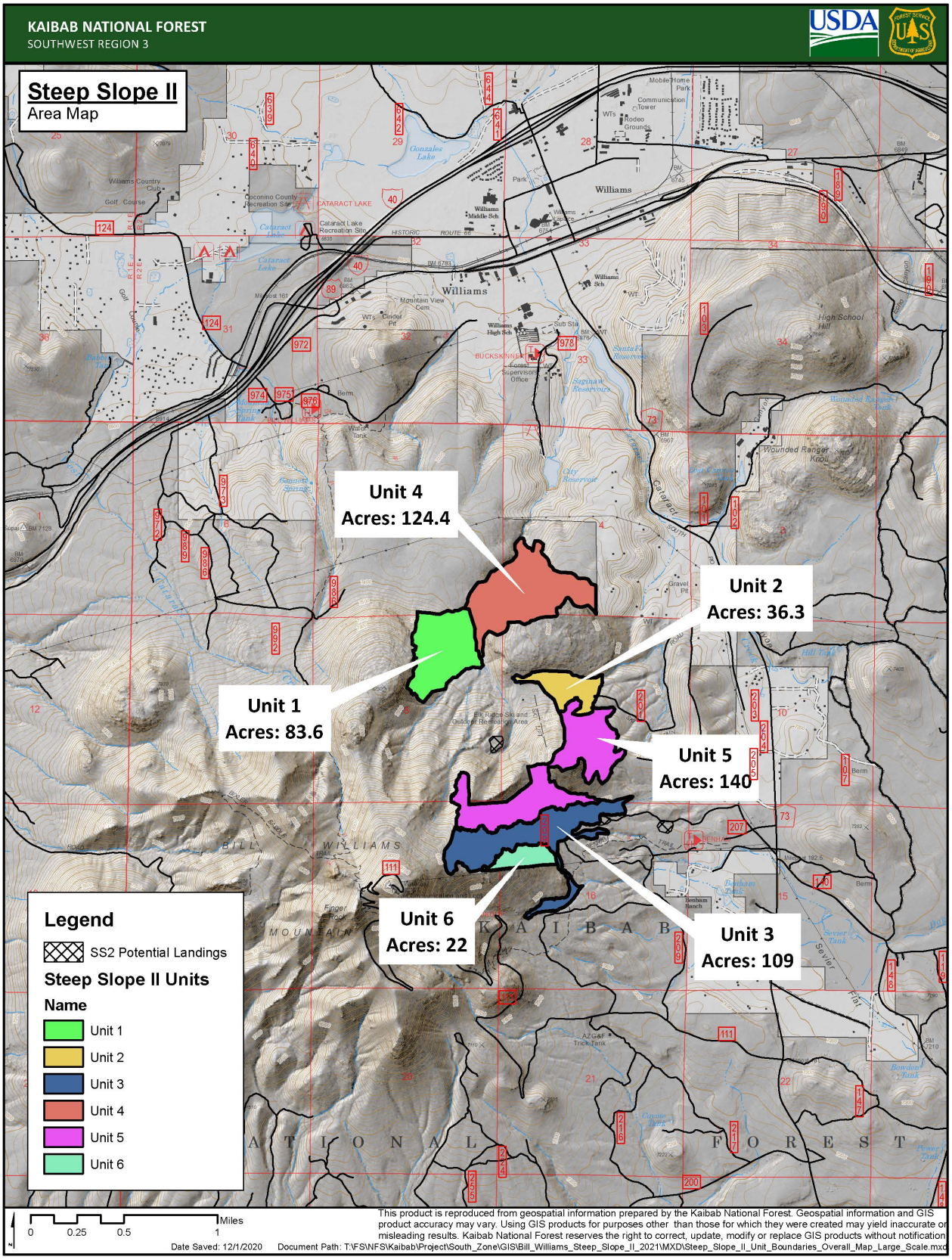
NEXT STEPS
The NFF, Kaibab National Forest and Coconino County will review the information provided in the RFI and may ask for additional information or contact the references provided. An RFP will be issued in spring 2021 following review of the RFIs.

If you wish to visit the project site before the RFP site visit please contact Mark Brehl at 928.853.7578.

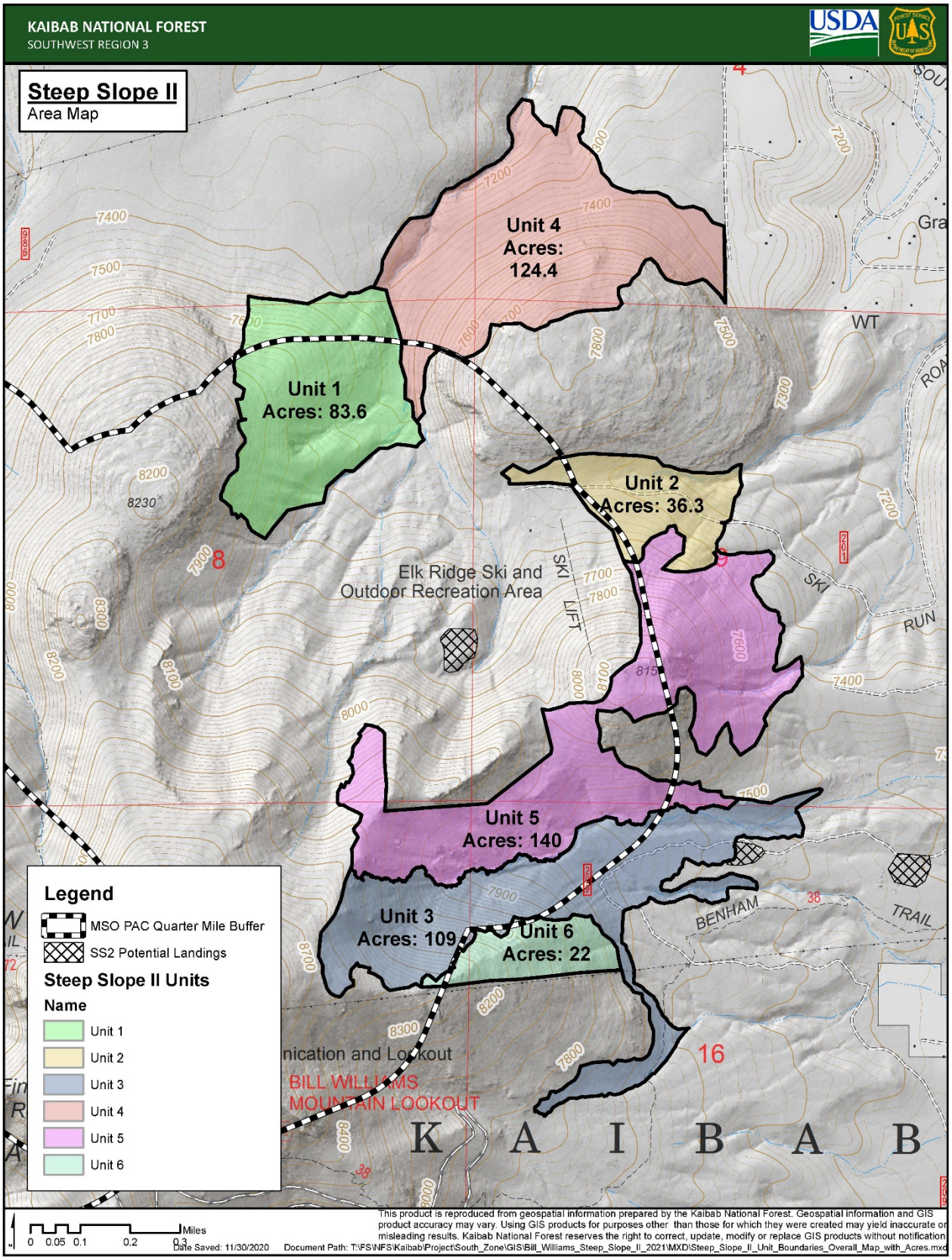
APPENDIX A
PROJECT AREA MAPS – LINK TO GOOGLE DRIVE
CLICK HERE to access the documents below.
(https://drive.google.com/drive/folders/12IzBsj2mBuawfV6MuzauQVabLFg-Hf3D?usp=sharing)

	Product Name	Definition
1	Project Area a. Unit Boundaries Large Scale b. Unit Boundaries with Acres	a. "Vicinity Map" showing proposed unit boundaries, existing Forest System roads, and proximity to the nearby town of Williams. b. "Project Area Map" showing proposed unit boundaries at a larger scale, with acres.
2	Bare Earth[1, 2] • Units 1-6 • Overall	All maps depict a bare earth hillshade as a background.
3	Canopy Load Biomass[1, 2] • Units 1-6 • Overall	All maps depict a raster dataset of canopy load biomass in tons per acre. Pixel size is 20m x 20m. Canopy load biomass includes all standing tree material (live and dead).
4	Merchantable Cubic Foot Volume[1, 2] • Units 1-6 • Overall	All maps depict a raster dataset of merchantable cubic foot volume (live trees >5" DBH[3]). Pixel size is 20m x 20m.
5	Total Cubic Foot Volume[1, 2] • Units 1-6 • Overall	All maps depict a raster dataset of total cubic foot volume (all live trees). Pixel size is 20m x 20m.
6	Stand Basal Area[1, 2] • Units 1-6 • Overall	All maps depict a raster dataset of basal area (ft^2/ac) (all live trees). Pixel size is 20m x 20m.
7	Curvature - Roughness[1, 2] • Units 1-6	All maps depict the curvature roughness of the area. Curvature roughness is a graphical representation of the terrain. The model removes slope as a factor and estimates the change in terrain exposing large boulders and other ground obstructions. The data was then merged back with the hillshade to provide perspective of the steepness of the landscape. Pixel size is 20m x 20m.
8	KML Unit Boundaries – Colored KML Unit Boundaries - Perimeter	These files are for use in Google Earth.
9	Virtual Tour Products • Units 1-2 (Others TBD)	Maps and associated photo points and link to interactive digital images helping depict topography and terrain.
Reference	[1] The bare earth hillshade and models are derived from quality level 1 (8 pulses per square meter) LiDAR collected in 2018. Using field plots collected across the forest, linear regression models were derived showing the different variables (Canopy Load Biomass, Stand Basal Area etc). In testing these models showed a high degree of accuracy, however, no model is a perfect representation of ground conditions. Ground conditions may have changed since data was collected. [2] All maps depict contour lines, Mexican Spotted Owl ¼ mi buffer (for timing restrictions), and existing Forest System roads. In addition, tables describing the individual unit metrics are provided. [3] DBH = Diameter at Breast Height	

VICINITY MAP
(1.a)



PROJECT AREA
MAP (1.b)



APPENDIX B
PROJECT ANALYTICS

Table 1. Stand Basal Area

Name	MIN	MAX	RANGE	MEAN	STD
Unit 1	47.5	231.4	183.9	135.6	28.6
Unit 2	25.3	220.4	195.1	145.6	33.1
Unit 3	0.8	246.1	245.4	133.3	46.4
Unit 4	20.5	244.3	223.9	132.7	32.4
Unit 5	0.8	218.9	218.2	107.9	36.7
Unit 6	57.8	216.0	158.2	126.3	27.2

Table 2. Canopy Load Biomass

Name	MIN	MAX	RANGE	MEAN	STD
Unit 1	7.3	23.3	16.0	15.5	2.5
Unit 2	2.3	22.2	19.8	15.4	2.5
Unit 3	0.2	24.4	24.2	14.9	4.7
Unit 4	0.9	24.1	23.2	14.9	2.8
Unit 5	0.2	21.9	21.8	12.8	3.7
Unit 6	6.7	21.3	14.6	14.7	2.4

Table 3. Total Cubic Foot Volume

Name	MIN	MAX	RANGE	MEAN	STD
Unit 1	533.4	5955.3	5421.9	2885.1	843.7
Unit 2	297.9	5373.7	5075.8	3107.1	829.7
Unit 3	3.0	5689.4	5686.4	2929.2	1208.8
Unit 4	3.0	7051.5	7048.5	2840.1	884.0
Unit 5	3.0	5407.3	5404.3	2160.6	1002.4
Unit 6	651.7	5186.8	4535.1	2556.0	755.4

Table 4. Merchantable Cubic Foot Volume

Name	MIN	MAX	RANGE	MEAN	STD
Unit 1	436.5	4897.8	4461.3	2191.0	690.0
Unit 2	262.4	4130.6	3868.3	2361.3	646.8
Unit 3	0.0	4499.0	4499.0	2234.3	929.7
Unit 4	0.0	5806.1	5806.0	2158.3	709.3
Unit 5	0.0	4221.0	4221.0	1623.7	782.8
Unit 6	291.6	3946.1	3654.4	1893.9	594.6

Table 5. Estimated Number of Trees (>2m in height) per Unit – per Acre

Name	Est. Total Trees	Trees Per Acre
Unit 1	6737	81
Unit 2	3254	90
Unit 3	11052	101
Unit 4	10902	88
Unit 5	13580	97
Unit 6	2462	112

Table 6. Slope Degree

Name	MIN	MAX	RANGE	MEAN	STD
Unit 1	0.0	72.0	71.9	20.7	7.1
Unit 2	0.0	56.4	56.4	15.8	7.2
Unit 3	0.0	82.6	82.5	20.6	8.8
Unit 4	0.0	82.1	82.1	19.6	9.0
Unit 5	0.0	83.6	83.6	24.5	8.5
Unit 6	0.3	76.8	76.5	27.2	8.3

Table 7. Slope Percent

Name	MIN	MAX	RANGE	MEAN	STD
Unit 1	0.1	307.2	307.1	38.5	15.0
Unit 2	0.0	150.3	150.3	29.0	14.4
Unit 3	0.1	765.9	765.9	38.7	18.6
Unit 4	0.0	721.9	721.9	37.1	22.0
Unit 5	0.1	894.7	894.6	47.0	20.3
Unit 6	0.5	426.2	425.7	53.1	22.3

* The estimated values listed above are based upon quality level 1 LiDAR data, field plots collected across the forest and linear regression modeling.