Wood Supply Working Group Meeting
Analysis of Small-Diameter Wood Supply in Northern Arizona

November 29, 2007
9:00 a.m. – 4:15 p.m.
Large Pod Conference room, Applied Research and Development (AR&D) Building
Northern Arizona University, Flagstaff, AZ

Introductions and Agenda Review

Haydee Hampton welcomed Working Group Members and reminded them that this was the final of seven working group meetings and the purpose was mainly to review the treatment scenario they had developed over the last half year including estimates of wood supply based on their scenario. She introduced Dexter Albert, a meeting facilitator filling in for Rosemary Romero who could not attend. Dexter asked members to introduce themselves.

Working group members present at meeting:

1) Keith Pajkos, Timber Staff for the Arizona State lands Department Forestry Division
2) Bill Greenwood, City Manager for the Town of Eagar
3) Herb Hopper, Community-based forest and wood products advocate, Little Colorado Plateau Resource Conservation & Development
4) Steve Gatewood, Consultant, Wildwood Consulting Inc., representing the Greater Flagstaff Forests Partnership
5) Pascal Berlioux, President and Chief Executive Officer of Arizona Forest Restoration Products, Inc.
6) Lisa McNeilly, Northern Arizona Program Director of The Nature Conservancy
7) Jerry Drury, Timber Staff Officer for Kaibab National Forest
8) Rob Davis, President/Owner of Forest Energy Corporation/Future Forests
9) Todd Shulke, Forest Programs Director for Center of Biological Diversity
10) Diane Vosick, Associate Director of the Ecological Restoration Institute
11) Bob Taylor, Supervisory Natural Resource Specialist, Apache-Sitgreaves National Forest (Alternate for Elaine Zieroth, Forest Supervisor, ASNF)
12) Shaula Hedwall, representative of the U.S. Fish and Wildlife Service, Ecological Services
13) Larry Stephenson, Executive Director of the Eastern Arizona Counties Organization
14) Ethan Aumack, Director of Restoration Programs for Grand Canyon Trust
15) Kim Newbauer, Timber Sales Contracting Officer for Coconino National Forest
16) Sarah Lantz, Urban Wildlife Planner for Arizona Game and Fish Department (Region II Flagstaff Office)
17) Scott Higginson, Executive Vice President, Renergy Holdings Inc.

Working group members not present at meeting:

1) Robert LaCapa, Forest Manager, DOI BIA Fort Apache Agency Branch of Forestry
2) Mary Steuver, Acting Tribal Forester, Forestry Department, White Mountains Apache Tribe
3) Chuck Peone, Fort Apache Timber Co.
4) Molly Pitts, Executive Director of the Northern Arizona Wood Products Association

Project support team present at meeting:

1) Haydee Hampton, Research Associate, Center for Environmental Sciences and Education at NAU; Wood Supply Analysis Project Director and Spatial Analyst, ForestERA
2) Steve Sesnie, Post-Doctoral Research Associate, Center for Environmental Sciences and Education at NAU; Remote Sensing Specialist, ForestERA
3) Brett Dickson, Assistant Research Professor, Center for Environmental Sciences and Education at NAU; Wildlife Ecologist, ForestERA
4) Tom Sisk, Professor, Center for Environmental Sciences and Education at Northern Arizona University (NAU)
5) Gary Snider, Forest Economist and Doctoral student in the School of Forestry at Northern Arizona University
6) Dexter Albert, Meeting Facilitator, Intrinsic

Observers:

1) Bob Baltes, Baltes Distributed Generation and Camp Navajo Tribal Development
2) Diane Williamson, Earth Friendly Fuels
3) Sue Sitko, The Nature Conservancy
4) Ed Smith, The Nature Conservancy
5) Stacey Hamburg, Sierra Club

Overview of Agenda and Group Treatment Scenario

Haydee Hampton presented an overview of the meeting's agenda including that ForestERA would review the working group treatment scenario and that the group had several final decisions related to the scenario to make that day: 1) how to use the results of the Environmental Assessment review, 2) choosing among the three fire-only alternatives the group developed at the Nov. 16 meeting, and, 3) reaching agreement on several details of how wood supply would be determined, including the post-treatment basal area distributions.

Haydee then summarized the overall goals of the project and the "roadmap" for developing treatment scenario(s) that the working group had developed at their second meeting in Pinetop:

1. Identify areas appropriate for restoration treatments that recover wood byproducts ("what's on the map")
2. Define management objectives ("target conditions") to guide selection of treatments
3. Select appropriate treatments.
    - Calculate supply produced by applying the appropriate treatments across the map
    - Once forest growth recommendations are available, discuss as group if and how to best use them in this study.

Haydee displayed a map portraying areas with Mexican spotted owl protected activity centers (MSO PACs), Specially Designated Areas such as Wilderness areas, steep slopes, northern goshawk nesting areas, completed treatments, streamside management zones, soils with limits on mechanized equipment, and other areas deemed otherwise unavailable as a source of wood supply by the working group within the total 2.4 million acre project area. Once these areas are taken into consideration, the resulting acreage in the analysis area is 1.8 million acres. Haydee noted that tree mortality due to fire, insect outbreaks and other natural disturbances are accounted for in reduced volume estimates. She then reviewed the restoration treatment zones

included in the working group's scenario explaining that at the Nov. 16 meeting the group had decided to include an ASNF estimate of 120,000 acres remaining to be treated as part of the White Mountains Stewardship Contracts even though there is no upper limit to number of acres in the White Mountains Stewardship Contract (at least 150,000 acres is the goal). As there is no spatial information available yet on the location of the project areas within the broader NEPA analysis areas, the contracted acres will be discussed in narrative, but a spatially-derived wood supply estimate will not be possible.

Haydee then outlined the group's strategy for defining post-treatment forest structural conditions in each landscape zone using recommended basal area distributions (i.e., in community protection areas the subcommittee recommended a range between 30 and 60 ft^2/acre with a mode, or most common value, of 40; in municipal and aquatic species watersheds 40 to 120 with mode of 60; in MSO Target pine-oak habitat 60 to 120 with mode of 100; in MSO other restricted pine-oak habitat 45 to 120 with mode of 70; and in remaining areas or "wildlands" 40 to 160 with a mode of 80 ft^2/acre). A participant recommended removing the MSO Target threshold distribution as basal areas are not supposed to be reduced below 150 f t^2/ac in areas where MSO Target Threshold conditions are met. In addition, the locations of these areas are unknown and MSO Target conditions cover only a very small percentage of the landscape. The MSO restricted post-treatment basal area distribution tail should be moved to the right and the MSO Target areas should be assumed to be part of that distribution. The group decided that the US Fish & Wildlife working group member should develop a new MSO restricted curve to provide to ForestERA following the meeting. A member commented that ERI-provided ranges for pre-treatment conditions [in 0.1 to 0.25 acre plots] range widely, from 0 to 337 f t^2/ac.

Review of Past Thinning Projects

Haydee and Ethan Aumack, Grand Canyon Trust, then reviewed an environmental assessment (EA) analysis of the National Forests in the analysis area gathered by Gary Snider, a PhD student at the NAU School of Forestry contracted by ForestERA for the Wood Supply Analysis, and Andrew Frost an assistant at the Grand Canyon Trust. The group had expressed interest in possibly adjusting the number of areas not considered a source of wood supply in their treatment scenario based on the EA assessment as a greater number of factors, such as archeological or historical sites, old growth areas, and wildlife movement corridors, are considered at the project level than possible at the landscape-scale. Gary reviewed 6 WUI projects and 2 Wildlands projects and these had an average area not thinned of 22% and burn-only treatments of 20%. Gary also interviewed Forest Service staff who guesstimated a range of 40-50% of the area not treated on the ASNF and found an average of 38% not thinned on the Kaibab NF. Andrew found in a review of 25 EAs (including 6 of the same reviewed by Gary) an average area not thinned of 37% and burn-only treatments of 34% (and higher values by approximately 4% if a larger area was considered as the area of possible treatment). One participant commented that about 7 of these were in wildlands (vs. WUI areas). NAU and GCT compared methods before the meeting and determined they were using the same if the smaller total area was used. An average of all 27 EAs reviewed by both groups resulted in 36% not-thinned and 33% burn-only. There was a large range in the values: from 0 to 97% of areas not thinned. Ethan responded to various questions on specific numbers GCT presented for various projects saying that are various types of inaccuracies and imprecisions in the data, but that overall the numbers were valid and that the status quo percent of areas not thinned are in high 30s. One participant noted un-thinned areas include MSO PACs, steep slopes, so there is some overlap with areas already considered not a

source of wood supply in the group's treatment scenario. Another commented that this validates what we already removed from a wood supply source, but we may need another fudge factor, such as an additional 12% (the difference between 26% and 38%), to account for the greater amount of areas not being thinned in project completed over the last decade. Several members thought this would not be scientifically credible and that past performance does not necessarily represent future desired conditions. Does the group want to extrapolate status quo conditions into the future? What do the Forest Service reps think: will high 30s be the percent of land not-thinned in the future? One FS rep responded that we should stick with the 26% to maintain the spatial perspective we have been working with so far as new projects will occur in areas with differing slopes and other conditions that may be better represented at the landscape scale that on the basis of 27 past projects. On ASNF we will be not be burning more that 10% of the landscape both as burn-only and after thinning, however we may let fires burn that we have not set, such as was done on the Chiti Fire. On Kaibab, we have found that areas not treated are 37%. Participant: we could use these values (e.g., 37%) as error bars. Participant: current conditions represent mainly WUI treatment, so higher than 38% should be used such as done on Gila NF. In about 4 or 5 large landscape scale non-WUI projects 58-78% of areas on Gila NF, 40-75% were burned-only, with some areas are not getting any treatment. I would like to see more fire oriented projects, so do not like the status quo. Tom Sisk commented that we've looked at the systematic reasons (slopes, soils, etc.) for areas not-thinned. There is no technical way to anticipate acres not treated due to idiosyncratic and project specific reasons; so we will always underestimate the areas not-thinned with a landscape scale systematic analysis. There is an undeterminable number that won't be treated that should be included in the report. We should discuss in narrative this additional range of nonsystematic factors. Participant: Holding the 26% up as the scientific standard is an over-statement, it's just what we could do with the time and tools available. Participant: I would argue for more thinning on the Mogollon Plateau than in the Gila NF. Participant: Getting into the project level percentages in dangerous because the ranges in the values are so great and prefer going with the landscape scale. Let's quantify what the consensus is on how many acres to treat and then say there may be some more for this and that reason.

Participant: There is not consensus on the lower "status quo" limit (38% not thinned). The broader environmental community position as you extend out from community protection zones to the larger wildlands on how much should be treated is likely about 40% of all ponderosa pine to be thinned (60% not thinned). This value will differ among the zones in our scenario, such as higher in community protections zones and lower in aquatic. We've done a good job of determining where the pine would most likely come from and within that area, there would be a certain proportion, perhaps 40% on average, that we could obtain agreement that could be thinned. This position existed before this process began. This is a process to clarify positions, not to change them. Participant: We should tease out the extent of the range of acres according to various levels of accuracy, uncertainty and consensus. Participant: If the environmental community's offer on the table is 40%, let's start there and see if we have consensus on at least this amount. Participant: We should assign confidence levels. We have total confidence [agreement] on this value and less on higher values. Participant: Most of the lack of agreement is in wildlands and this makes up only 800,000 acres which is less than ½ the supply area. Participant: The 40% seems arbitrary, but given that the environmental community supports this as a maximum level of thinning, it is the zone of agreement we should present to the Forest Service, however the majority of the rest of the group prefers about 60% be available for

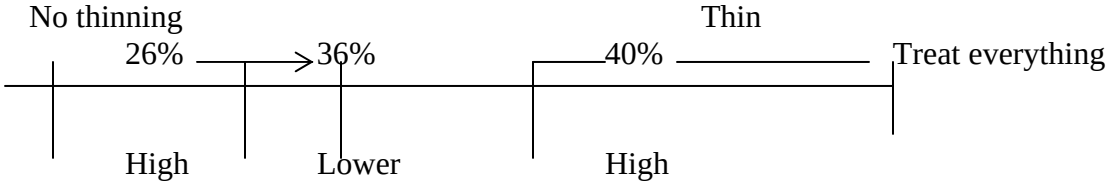
thinning and has a higher level of agreement. The 40% are the highest priority areas to thin mechanically. Participant: I'll throw out these values for consideration: 60% available for thinning in ponderosa pine in communities; 30% in wildlands; 35% aquatic species habitats; 40% municipal watershed, 30% MSO predicted habitat. Participant: Where do these values come from? Answer: The 26% of the area where wood supply is not available that we've come up with here has value. Tom Sisk: It's unreasonable to have expected that the group would all agree. In any problem with a lot of uncertainty, you partition out the where the uncertainty comes from. We have accounted for with great accuracy and high precision, the areas all agree are not a source of wood supply [26%] and have quantified the areas with high uncertainty that we cannot quantify or level of disagreement [between 26% and 60%] due to social and ecological component of the problem that is unknowable. The group has gone as far as it could reasonably be expected to go. Participant: Does the environmental communities' position for an overall 60% of area not thinned (40% to be thinned) include the 26% we already agreed to as a group would not be thinned and if we take out another 6% with no road access, then we're taking out another 28% of the landscape that will not be mechanically thinned? So we do have consensus on the 40% that can be thinned. Answer: yes. Participant: I thought our objective was to reduce the threat of catastrophic wildfire and more acres may need to be thinned in wildlands than 30% to do this. Shouldn't we follow the science? Participant: We're not going through a planning process of what can and should be done. Reality is that 10 years ago many wanted thinning to occur only hundreds of feet from communities. There has been a coming together over time on these issues.

Burn-Only Treatments

Haydee and Brett Dickson then presented the three burn-only alternatives that participants requested ForestERA analyze at the Nov. 16, 2007, working group meeting (see p.8 of the Nov. 16 meeting summary for a description of each), so they could choose one. Alternative 1, Recent project-level burning levels: Brett displayed a map showing where burn-only treatments would be if the lowest basal area regions were selected to total 34% of the landscape outside of community protection and municipal watersheds. Participant: The primary value for mapping this alternative is to provide a process for calculating the reduction in wood supply that would occur if 34% of the landscape had burn-only treatments. Participant: The conversation on the environmental community limit of 40% we had earlier supersedes this discussion. Alt#2 Low risk of wildfire: Brett displayed maps showing areas with less than 100 ft^2/ac and 100 trees/acre, and areas with 80 ft^2/ac and 160 trees/acre; both in terms of 100 acre patches. Alt#3: Wildlands focus with 65% of area with burn-only treatments starting with the lowest basal area regions for all zones except for community protection zones. The basal area threshold ends up being 125 ft^2/ac. Participant: Let's not try to make a decision on burn-only treatments and return to the morning discussion. Participant: Let's try to characterize the zone of agreement on this. The group decided to set aside this discussion aside as it's a subset of the earlier discussion.

Level of Agreement on Percent of Landscape to be Thinned

Steve Gatewood agreed to present the following scale developed by several working group members for describing the group's level agreement on the percentage of the landscape to be thinned and not-thinned:



Landscape
2.4 million acres

Volume
4.6 billion cubic feet

Participant: Where is the science behind 40%? Participant: Some of Mark Finney's work at the Missoula Fire lab informs the treatment of some fraction of the landscape. Tom Sisk: Science has informed the discussions so far, such as the volume estimates and landscape analyses. There is no linear set of logical steps that has lead to the 40%. Society does not run on science. Science can inform society so the deliberative process can reach a social outcome that is acceptable for the greatest number. What's important is what the agreement is, given that we have a wide range of core values around the table. Participant: There are constituents who would like to see their homes protected with greater that 40% of the lands treated. I thought consensus was that two numbers are put out and we work towards the middle. Participant: The 40% is an overall landscape average; the environmental community also would like a higher percentage of area treated near communities, perhaps 70% or more. For the majority of the working group members the 40% is a floor, whereas for the environmental community it is the ceiling. The group discussed two options for determining wood supply: 1) assume the area thinned per zone starts at the highest of the basal areas and go down till the percent for each zone (40% on average) of the landscape is reached, 2) multiply the percent of thinning per zone by the overall wood supply in cu. ft volume for each zone. Participant: There are alternate ideas on how much of the landscape you need to treat. The majority view, not just the minority needs to be expressed. Participant: The variability in post-treatment basal areas is what we should focus on in terms of getting agreement for what the majority has expressed for the 74% area not thinned. So for the high values compared to the low of 40% avg, just use what is left in each zone after 26% is removed. The high value should represent the status quo (~65% of the area not thinned), so adjust per zone percentages to get 65% overall.

The group developed the following language for use in the final report describing their level of agreement: "The group reached consensus that 40% of the landscape should be considered a source of wood supply. There is high level, but not total, agreement that an additional 23% to 34% of the landscape might also be available as a source of wood supply. The group reached consensus that 26% should not be considered a source of wood supply."

Proportion of landscape to be treated in each zone:

	Complete agreement	High level of agreement
Community	70%	63-74%
MSO restricted habitat	30%	63-74%
Municipal Watersheds	40%	63-74%
Aquatic species Watersheds	35%	63-74%
Wildlands	35%	63-74%
Average	41%	63-74%

Wood Volume Estimation

Steve Sesnie presented additional wood volume estimates with a discussion of accuracy for year 2006 forest conditions by three diameter size classes as well as the methodology ForestERA is using to calculate wood supply following treatments specified in the working group's scenario.

Volume category	**Total (billion ft^3)**	**Vol.%**	**Acres (million)**	**Acres%**
Total volume	**4.56**	100	2.4	100
Vol. not considered supply	1.3	28	0.6	26
Vol. considered for supply	3.3	72	1.8	74
Landscape feature		% of total vol.		% of total ac
Community infrastructure	0.64	14	0.35	15
MSO restricted habitat	0.50	11	0.24	10
Municipal watersheds	0.13	3	0.06	3
Aquatic species watersheds	0.67	15	0.31	13
Wildlands	1.31	30	0.79	33
Diameter categories				
Cf <5"	0.12	3		
Cf 5 to 16"	2.45	54		
Cf > 16"	1.96	43		
Sum	**4.53**			

Steve reminded the group that the volume was a whole stem estimate, which includes tops, as was discussed several meetings prior. It does not include branches and needles, but we understand that these residual materials are of interest to some industries. Steve is exploring ways we could estimate whole tree volumes within the time limits of this project to include in the final report. He then turned back to the methodology for estimating supply explaining that he had developed a regression equation between volume and basal area to relate the post-treatment basal areas to post-treatment volume. ForestERA estimated how much basal area was removed in the under 16 inch diameter categories and mapped these spatially. Based on working group comments and advisement from John Bailey (Associate Professor, Oregon State Univ.) we retained 10% of the BA in <5 in. diameter class and 20% of the BA in 5-16 in. class. Haydee

presented maps depicting before and after basal areas in community and wildlands areas. She clarified that the post-treatment basal area layer had been developed by applying the frequency distributions developed by the working group to the pre-treatment basal area in order of low to high BA values. She also displayed maps showing the surplus of basal area that could not be removed solely in the classes below 16 inch DBH. In other words, to achieve the post-treatment desired BA in some areas, it would require taking trees in the > 16 in. diameter class. These areas are few except for the community protection zones where the post-treatment basal area range is lower. Steve explained that in 54% of the area in community protection zones it was not possible to meet the post-treatment BA conditions in the < 16 in classes. The group asked ForestERA to indicate this in the report for each of the zones. The group asked that the post-treatment basal area mode for wildlands be decreased to 70 ft^2/ac and that a sharper decline in values be made.

Wood Supply Final Report

Haydee reminded the group of the timeline for finalizing the project report: ForestERA distributed the report to the working group and Region 3 by Dec. 17, 2007; comments must be provided to ForestERA by January 18, 2008; and a final report will be ready to distribute by late January. The report will include the following major sections:

- Background
- Wood Volume Methods and Results
  - Forest growth review and recommendations
- Description of Treatment Scenario
- Wood Supply Methods and Results
  - Project level considerations
  - Existing Harvesters, Mills, Manufacturers
- Other considerations
  - Old growth
  - Climate change and future disturbances
  - Effects of treatments on wildlife
  - CWPPs
  - Burn-only treatments

Haydee reminded the group that she will be presenting wood supply analysis results at a meeting hosted by the Association for Fire Ecology in Tucson, AZ Jan. 28-31, 2008.

Tom and Haydee thanked the group for their participation over the last half year including recognition of the efforts of the Steering Committee, Region 3 Forest Service, Rosemary Romero, participating experts, scribes, and those who arranged for facilities at the Pinetop AZGFD, Northland Pioneer College, and NAU.