APPENDIX F
OLD GROWTH DEFINITIONS

Old growth definitions for the GMUG have been modified from Mehl (1992) to reflect forest conditions.

Table F-1. Spruce-Fir Old Growth Definition.

STANDARD ATTRIBUTES		COMMENTS
LIVE TREES:		
Upper Canopy – Older Component		
Minimum DBH (inches)	16	Assumed if very large trees are present than large trees would also be present
Minimum Number of Trees per Acre	10	
Minimum overstory canopy closure	40	Overstory needs to provide the majority of the canopy closure.
Variation in Tree Diameter	Yes	
Decadence – dead, broken or deformed tops and/or bole or root rot	Yes	
Multiple Tree Canopy Layers	Yes	
Minimun Total Live Canopy Closure (including overstory)	60	
DEAD TREES:		
Standing		
Minimum DBH (inches)	10	
Number of Trees Per Acre	3	Where biologically and physically available.
Down		
Minimum Pieces Per Acre	Some	
ADDITIONAL ATTRIBUTES		
Trees in Upper Canopy are Slow Growing	Yes	
Net Growth Near Zero	Yes	Would need stand exam data to determine this. If we want to manage a stand for old growth attributes/conditions we would want this information to be able to selectively treat/harvest and still keep stand at net growth near zero.
Patchiness	Yes	
Many Stages of Decomposition	Yes	
QUALITY ATTRIBUTES:		Score cards need to be set up to rank stands with quality attributes as higher quality old growth
Above Attributes in Excess of Minimums	Yes	
Wide Range of Tree Vigor	Yes	
Distinctive Bark	Yes	

"Multiple tree species" may be added as a quality attribute.

Table F-2. Douglas-Fir Old Growth Definition (Note: This definition will apply to all mixed conifer types where Douglas-Fir is the dominant species).

STANDARD ATTRIBUTES		COMMENTS
LIVE TREES:		
Upper Canopy – Older Component		
Minimum DBH (inches)	16	Dropped from 18 to be consistent with Spruce-Fir definition and site potential on forest.
Minimum Number of Trees per Acre	10	
Variation in Tree Diameter	Yes	
Decadence – dead, broken or deformed tops and/or bole or root rot	Yes	
Multiple Tree Canopy Layers	No	Usually stands have multiple layers, so no need to require as an attribute of old growth.
DEAD TREES:		
Standing		
Minimum DBH (inches)	10	
Number of Trees Per Acre	2	Where biologically and physically available.
Down		
Minimum Pieces Per Acre	Some	
ADDITIONAL ATTRIBUTES		
Trees in Upper Canopy are Slow Growing	Yes	
Wide Range of Tree Vigor	Yes	
QUALITY ATTRIBUTES:		Score cards need to be set up to rank stands with quality attributes as higher quality old growth
Above Attributes in Excess of Minimums	Yes	
Multiple Tree Canopy Layers	Yes	
Patchiness	Yes	

The difference between more open, drier Douglas-fir sites compared to moister Douglas-fir sites can be differentiate with score card results.

Canopy closure criteria was not included so that more open stands (fire maintained open) would not be overlooked.

Table F-3. Southwest Ponderosa Pine Old Growth Definition.

STANDARD ATTRIBUTES		COMMENTS
LIVE TREES:		
Upper Canopy – Older Component		
Minimum DBH (inches)	18	This is too low for Unc. Plateau where trees < 24" DBH are usually < 120 years old. Minimum okay for Gun. District. Score card will be adjusted to reflect the difference.
Minimum Number of Trees per Acre	10	
Variation in Tree Diameter	Yes	
Decadence – dead, broken or deformed tops and/or bole or root rot	Yes	
Multiple Tree Canopy Layers	No	
DEAD TREES:		
Standing		Where biologically and physically available.
Minimum DBH (inches)	10	
Number of Trees Per Acre	2	
Down		
Minimum Pieces Per Acre	Some	
ADDITIONAL ATTRIBUTES		
Trees in Upper Canopy are Slow Growing	Yes	
QUALITY ATTRIBUTES:		Score cards need to be set up to rank stands with quality attributes as higher quality old growth
Above Attributes in Excess of Minimums	Yes	
Distinctive Bark	Yes	
Down Dead Trees	Yes	
Distinctive Crowns	Yes	
Mosaic of age class patchiness	Yes	Patches of different ages, even-aged within a given patch.

Current conditions in ponderosa pine are missing standing dead and horizontal diversity components.

Table F-4. Lodgepole Old Growth Definition.

STANDARD ATTRIBUTES		COMMENTS
LIVE TREES:		
Upper Canopy – Older Component		
Minimum DBH (inches)	12	Based on existing conditions found on the GMUG, 12 inches minimum DBH better correlated with trees being 150 years old, plus.
Minimum Number of Trees per Acre	10	
Variation in Tree Diameter	No	Tend to be even-aged stands
Decadence – dead, broken or deformed tops and/or bole or root rot	Yes	
Multiple Tree Canopy Layers	No	
Minimum total live canopy closure	60%	Some species require closed canopies.
DEAD TREES:		
Standing		Where biologically and physically available.
Minimum DBH (inches)	8	
Number of Trees Per Acre	2	
Down		
Minimum Pieces Per Acre	Some	
ADDITIONAL ATTRIBUTES		
Trees in Upper Canopy are Slow Growing	Yes	
QUALITY ATTRIBUTES:		Score cards need to be set up to rank stands with quality attributes as higher quality old growth
Above Attributes in Excess of Minimums	Yes	
Net Growth Near Zero	Yes	
Multiple Tree Canopy Layers	Yes	
Multiple Tree Species	Yes	
Patchiness	Yes	Gaps in overstory
Many Stages of Decomposition	Yes	
Distinctive Crowns in the Upper Canopy	Yes	

Old growth lodgepole pine is a relatively short lived condition (as is aspen) compared to other timber types. We need to consider this in designing management direction, to consider old growth lodgepole pine as dynamic and moving across the landscape.

Table F-5. Pure Aspen Old Growth Definition.

STANDARD ATTRIBUTES		COMMENTS
LIVE TREES:		
Upper Canopy – Older Component		
Minimum DBH (inches)	14	
Minimum Number of Trees per Acre	20	
Variation in Tree Diameter	No	
Decadence – dead, broken or deformed tops and/or bole or root rot	Yes	
Multiple Tree Canopy Layers	No	
DEAD TREES:		
Standing		Older aspen usually has lots of dead and/or decaying parts so there is no requirement for additional dead as a minimum.
Minimum DBH (inches)	No	
Number of Trees Per Acre	No	
Down		
Minimum Pieces Per Acre	No	
ADDITIONAL ATTRIBUTES		
Trees in Upper Canopy are Slow Growing	Yes	
Canopy Closure Greater than 50%	Yes	Many wildlife species that use old growth aspen key in on the size of boles versus the canopy closure (with the exception of Goshawk – nesting sites usually where >50% canopy closure), so this is just an additional attribute.
QUALITY ATTRIBUTES:		Score cards need to be set up to rank stands with quality attributes as higher quality old growth
Above Attributes in Excess of Minimums	Yes	
Multiple Tree Canopy Layers	Yes	
Standing Dead Trees 10” plus DBH	Yes	
Down Dead Trees	Yes	
Variation in Tree Diameters	Yes	

Attributes would identify majority of pure aspen on GMUG as old growth. Score cards will need to differentiate quality old growth in rankings.

Later stages of aspen old growth can have less canopy closure than earlier stages. Score cards should differentiate on canopy closure as a quality attribute.

Live tree attributes will separate mature stands from old growth stands.

Need to determine cut off in score card scores to determine old growth.

Table F-6. Aspen-Conifer Mix Old Growth Definition.

STANDARD ATTRIBUTES		COMMENTS
LIVE TREES:		
Upper Canopy – Older Component		
Minimum DBH (inches)	16	Aspen tends to be older and larger in mixed stands. May have aspen and conifer species of same age. Upper canopy would consist of both aspen and conifer as codominants
Minimum Number of Trees per Acre	10	
Aspen and Conifer Codominant in Overstory	Yes	
Variation in Tree Diameter	Yes	
Decadence – dead, broken or deformed tops and/or bole or root rot	Yes	
Multiple Tree Canopy Layers	Yes	
Minimum Total Live Canopy Closure	60%	
DEAD TREES:		
Standing		Where biologically and physically available.
Minimum DBH (inches)	10	
Number of Trees Per Acre	3	
Down		
Minimum Pieces Per Acre	Some	
ADDITIONAL ATTRIBUTES		
Trees in Upper Canopy are Slow Growing	Yes	
Patchiness	Yes	
Many Stages of Decomposition	Yes	
QUALITY ATTRIBUTES:		Score cards need to be set up to rank stands with quality attributes as higher quality old growth
Above Attributes in Excess of Minimums	Yes	
Wide range of vigor	Yes	

There are functional differences between pure aspen old growth and aspen/conifer mixed old growth, so they are defined separately.

Table F-7. Pinyon-Juniper Old Growth Definition.

STANDARD ATTRIBUTES		COMMENTS
LIVE TREES:		
Upper Canopy – Older Component		
Minimum Diameter at Root Collar (DRC) (inches)	12	
Minimum Number of Trees per Acre	30	
Variation in Tree Diameter	Yes	
Decadence – dead, broken or deformed tops and/or bole or root rot	Yes	
Multiple Tree Canopy Layers	Yes	
DEAD TREES:		
Standing		
Minimum DRC (inches)	10	
Number of Trees Per Acre	1	Where biologically and physically available.
Down		
Minimum Pieces Per Acre	2	
ADDITIONAL ATTRIBUTES		
Trees in Upper Canopy are Slow Growing	Yes	
Canopy Closure Greater Than 35%	Yes	