

## APPENDIX C—DESIRED FUTURE CONDITIONS FOR FOREST VEGETATION/WILDLIFE HABITAT

In the tables below are components of wildlife habitat and desired future condition (DFC) for forest wildlife habitat vegetation. **Table C-1** displays Forested Potential Vegetation Groups (PVGs). Forested vegetation refers to land that contains at least ten percent crown cover by coniferous forest trees of any size or land that formerly had coniferous forest cover and is presently at an earlier seral stage. Forested vegetation is described using habitat type, which uses potential climax vegetation as an indicator of environmental conditions. At the level for the RMP, forested habitat types have been further grouped into PVGs that share similar environmental characteristics, site productivity, and disturbance regimes.

**Table C-1**  
**Potential Vegetation Groups**

Potential Vegetation Groups	
PVG 1—Dry Ponderosa Pine/Xeric Douglas-Fir	
PVG 2—Warm Dry Douglas-Fir/Moist Ponderosa Pine	
PVG 3—Cool Moist Douglas-Fir	
PVG 4—Cool Dry Douglas-Fir	
PVG 5—Dry Grand Fir	
PVG 6—Cool Moist Grand Fir	
PVG 7—Cool Dry Subalpine Fir	
PVG 8—Cool Moist Subalpine Fir	
PVG 9—Hydric Subalpine Fir	
PVG 11—High Elevation Subalpine Fir	

### Tree Size Class

A stand's tree size class is determined by the average diameter of the tree in the overstory or uppermost tree layer. A canopy layer has a distinct break in height and must have a non-overlapping canopy closure of at least ten percent. A few individual trees (such as relict trees) representing a distinctly different tree size are not recognized as defining a distinct canopy layer if the total canopy cover of those trees is less than ten percent. For example, if the overstory trees average 22 inches diameter at breast height (DBH), then the stand is classified as a large tree size class, regardless of the size of trees that may occur in understory layers. Within any canopy layer, diameter may vary considerably between individual trees.

Tree size class is based on the following diameter groupings:

Grass/Forb/Shrub/Seedling	<4.5 feet tall
Sapling	>4.5 feet tall
Small trees	5.0—11.9" DBH
Medium trees	12.0—19.9" DBH
Large trees	>20" DBH
Old Growth Criteria	From Hamilton 1993 and Green et al. 1992 (errata corrected 02/05)

Shown in **Table C-2** are the desired amounts for each tree size class in areas identified for forest vegetation DFC objectives. This table displays the range in the percent of area's forested vegetation desired for each tree size class. The range in **Table C-2** was developed from estimates of the historical range of variability derived from adjacent National Forest Lands (Payette National Forest). The low end of the large tree size class range is based on half the low end of Historic Range of Variability, provided that the minimum value does not fall below 20 percent. The upper end of the range for large trees is equal to the mean Historic Range of Variability value. The 20 percent value is a threshold that represents the minimum percent of an area (e.g., designated area, watershed, landscape) retained in the large tree size class deemed necessary to assure terrestrial wildlife species' viability. The range for the grass/forb/shrub/seedling growth stage is based on the range of the large trees and the time interval needed for this growth stage to advance to the next tree size class. The information presented in **Table C-2** represents the full range of desired future conditions for tree size classes in areas where there are desired future characteristics for targeted forested/wildlife habitat.

**Table C-2**  
**Forest Vegetation/Wildlife Habitat Desired Future Conditions**

<b>Area-Wide Range of Desired Size Classes Expressed As a Percentage of Forested Vegetation within Each PVG<sup>1,2,3</sup></b> <b>(includes forested vegetation in riparian conservation areas)</b>										
<b>Tree Size</b>	<b>PVG-1</b>	<b>PVG-2</b>	<b>PVG-3</b>	<b>PVG-4</b>	<b>PVG-5</b>	<b>PVG-6</b>	<b>PVG-7</b>	<b>PVG-8</b>	<b>PVG-9</b>	<b>PVG-11</b>
G/F/S/S	1-18	5-7	9	14-15	3-7	7-9	7-16	15-17	13-15	9-15
Saplings	2-12	3-7	9	7-9	3-7	7-9	11-15	11-15	8-15	14-15
Small	2-18	5-21	18-27	19-22	4-22	11-27	21-22	22-23	17-22	19-22
Medium	3-29	7-35	23-36	24-36	7-30	18-36	32-36	28-29	25-29	22-38
Large	24-91	20-80	20-41	20-34	15-84	20-56	20-21	20-21	20-37	20-38
Old Forest <sup>1,2,3</sup>	10	10	10	10	10	10	10	10	10	10

<sup>1</sup>Hamilton, R. C. 1993. Characteristics of Old-Growth Forests in the Intermountain Region. US Department of Agriculture, Forest Service, Intermountain Region, Ogden, Utah. 86 pp.

<sup>2</sup>Green, P., J. Joy, D. Sirucek, W. Hann, A. Zack, and B. Naumann. 1992. Old-Growth Forest Types of the Northern Region. USDA Forest Service, Northern Region, Missoula, Montana. R-A SES 4/92. 38 pp.

<sup>3</sup>The old forest (old growth) is a component of, and not in addition to, the large tree component.  
G/F/S/S = Grass/Forb/Shrub/Seedling

### Snags and Coarse Woody Debris

Snags and coarse woody debris are much finer-scale elements than vegetation components such as species composition, size class, and canopy closure. As such, they are to be evaluated during project planning for the activity area, which better reflects the scale at which to consider these elements and to plan projects that provide for maintaining or improving trends in snag and coarse wood amounts. The area of consideration for snags and coarse woody debris is at the project area and stand level where the effects are positive or negative. Actions affecting the area of consideration that need to be assessed include timber harvest, reforestation, timber stand improvement, and prescribed fire activities.

Snags and coarse wood are known to fluctuate both spatially and temporally. Snags are often found in clumps, whereas coarse wood recruitment is recruited from snags and over time becomes more

evenly distributed. These tables are not meant to provide an even distribution of snags and coarse wood across every acre of the forested landscape but to provide a number that serves as a guide to approximate an average condition for an activity area.

When planning an activity, the intent is to either maintain a desired condition or to trend toward the desired condition. If an area is already within the range of desired conditions, a management action should either keep the area within the desired ranges or, when the action results in moving outside the range, a mechanism to move back into the range should be provided. An example of this is a prescribed burn that would burn some of the coarse woody debris. If an area is above or below the desired range, it may not be possible to meet the desired ranges. This would include leaving some portion of the snags and coarse woody debris that is available, although perhaps not enough to meet desired ranges. Another example is an action that over the long term produces large size class trees, which would eventually become large snags and coarse woody debris.

**Tables C-3** and **C-4** display the desired ranges for snags and coarse woody debris that contribute toward wildlife habitat and long-term soil productivity. Desired ranges were developed for each PVG so that the numbers would reflect productivities and disturbance regimes. Agee (2002<sup>1</sup>) presents several diagrams that depict the spatial and temporal variability found in snag/coarse wood numbers according to the fire regimes of different forest types.

**Table C-3**  
**Desired Range of Snags Per Acre for Potential Vegetation Groups**

Diameter Group	PVG-1	PVG-2	PVG-3	PVG-4	PVG-5	PVG-6	PVG-7	PVG-8	PVG-9	PVG-11
10"-20"	0.4-0.5	1.8-2.7	1.8-4.1	1.8-2.7	1.8-5.5	1.8-5.5	1.8-5.5	1.8-7.5	1.8-7.5	1.4-2.2
>20"	0.4-2.3	0.4-3.0	0.2-2.8	0.2-2.1	0.4-3.5	0.2-3.5	0.2-3.5	0.2-3.0	0.2-3.0	1.4-2.2
Total	0.8-2.8	2.2-5.7	2.0-6.9	2.0-4.8	2.2-9.0	2.0-9.0	2.0-9.0	2.0-10.5	2.0-10.5	2.8-4.4
Min. Ht.	15'	30'	30'	30'	30'	30'	30'	30'	30'	15'

Note: This table is not meant to provide an even distribution of snags across every acre of the forested landscape but to provide numbers that serve as a guide to approximate an average condition at the stand level or project area.

**Table C-4**  
**Desired Range of Coarse Woody Debris in Tons Per Acre and Desired Amounts in Large Classes for Potential Vegetation Groups**

Diameter Group	PVG-1	PVG-2	PVG-3	PVG-4	PVG-5	PVG-6	PVG-7	PVG-8	PVG-9	PVG-11
Dry weight (Tons per acre) In Decay Classes I and II	3 - 10	4 - 14	4 - 14	4 - 14	4 - 14	4 - 14	5 - 19	5 - 19	5 - 19	4 - 14
Distribution* >15"	>75%	>75%	>65%	>65%	>75%	>65%	>50%	>25%	>25%	>25%

\*The recommended distribution is to try to provide coarse wood in the largest size classes, preferably over 15" in DBH, which provide the most benefit for both wildlife and soil productivity. This table is not meant to provide an even distribution of coarse wood across every acre of the forested landscape but to provide numbers that serve as a guide to approximate an average condition at the stand level or project area.

<sup>1</sup>Agee, J.K. 2002. Fire as a Coarse Filter for Snags and Logs, In: Proceedings of the Symposium of the Ecology and Management of Dead Wood in Western Forest, USDA Forest Service, Pacific Southwest Research Station, General Technical Report, PSW-GTR-181

## Green Tree Snag Replacement

Management actions should result in both short-term and long-term replacement of snags by retaining sufficient number of live trees, including those with such features as broken tops, cavities, lightning scars, and dead portions as future recruitment. Rely on site-specific information, normal mortality rates, and experience with mortality of residual trees following vegetation management activities when determining the number of trees needed to provide for future snag recruitment.

Protecting existing large diameter snags will not assure long-term snag occurrence on BLM lands. Managing live trees for long-term snag recruitment is as important as protecting existing snags (Thomas et al.1979<sup>2</sup>; Schommer et al.1993<sup>3</sup>). Green tree replacements may be lost to other causes before becoming available as desirable snags. Causes of loss include wind throw, salvage, falling for safety concerns, or slash burning. Therefore, the recommendations for green tree replacement snags are greater than the desired range of snags.

The recommendations in **Table C-5** consider the work of Schommer et al. (1993<sup>4</sup>), and Ritter and Davis (1994<sup>5</sup>), and the snag guidelines from the Payette National Forest<sup>6</sup> (Forest Service 1995b). They are adapted to the same habitat type groups/PVG groups as in the snag recommendations above. They must be considered provisional and studies, modeling, and monitoring would be needed to evaluate their adequacy and required updates. One purpose of these guidelines is to assure that some green trees are available for snag and down wood recruitment in the future.

Leave trees should represent the range of species and size classes most likely to survive natural fire disturbance, and be located in the clustering patterns and locations most likely to have survived natural fires in the local setting (e.g., open ridges or rocky areas), and be likely to survive harvesting operations and post-harvest exposure.

Recommendations for smaller diameter green trees are estimated as twice the number of smaller diameter snags, or twice the numbers of larger snags if no small snags were recommended. This is to provide for variable growth, mortality, and soil wood recruitment over time. As stated above updated studies, modeling, and monitoring would be required for modification of these guidelines.

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<sup>2</sup>Thomas, J.W., R.G. Anderson, C. Maser, and E.L. Bull. 1979. Snags. Pages 60-75 in J.W. Thomas, ed. Wildlife habitats in managed forests – The Blue Mountains of Oregon and Washington. USDA Forest Service Agriculture Handbook 553. US Government Printing Office. Washington D.C.

<sup>3</sup>Hitchcox, Susan, M. 1996. Abundance and nesting success of cavity-nesting birds in unlogged and salvaged-logged burned forest in northwestern Montana. M.S. Thesis. Univ. of Montana. Missoula, MT. 89 pp.

<sup>4</sup>Schommer, T., E. Collard, and K. Wiedenmann. 1993. Wallowa-Whitman National Forest green tree snag replacement guidelines. Report on file at Forest Headquarters, Baker, OR. 13 pp.

<sup>5</sup>Ritter, S. and D. Davis. 1994. Clearwater National Forest snag management guidelines. Report on file at Forest Headquarters, Orofino, ID. 16 pp.

<sup>6</sup>Forest Service (US Department of Agriculture). 1995b. Snag and coarse woody debris guidelines for NEPA analysis of the 1994 fires. Payette National Forest. Report on file at Forest Headquarters, McCall, ID. 26 pp.

**Table C-5  
Green Tree Snag-Replacement Guidelines**

<b>Cover Type</b>	<b>Trees/Acre 11-19.9 inches DBH</b>	<b>Trees/Acre &gt;= 20 inches DBH</b>	<b>Average Green Trees/Acre</b>
Warm dry ponderosa pine and Douglas fir (PVGs 1 and 2)	4	2	6
Grand fir and cool Douglas fir (not lodgepole cover types) (PVGs 3, 4, and 5)	8	4	12
Cool, wet and dry grand fir and subalpine fir (not lodgepole pine cover types) (PVGs 6, 7, 8, 9)	14	2	15
Cool, wet and dry grand fir and subalpine fir (lodgepole cover types) (any PVG)	12	3 or as available	15
High elevation cold habitat types	8	2 or as available	10

### **Scale at Which to Apply Snag and Snag Recruitment Prescriptions**

Snag retention and recruitment prescriptions should be applied, where possible, at the stand and project scale. Success of snag retention and recruitment would be monitored at the stand level or project area.

Clumping of snags and retention green trees in one to two acre patches within the stand level or project area is acceptable and even desirable for nesting birds and other wildlife species<sup>7</sup> recognizing it is necessary to provide for safety, operability, and long-term retention of leave trees. Look for natural clumps of snags or for areas where snags and green trees can be most logically maintained through logging and slash treatments.

### **Operational Considerations in Snag and Green Tree Retention**

Not all snags are a human hazard, and no snags are of such high value that they should be required to be retained where a safety risk has been identified.

In marking leave trees, attempt to avoid likely landing sites, roads, cable corridors, and within 1.5 tree lengths of the outer unit boundary on broadcast burn units.

Do not mark snags for retention 300 feet uphill of a road that will be open for firewood cutting unless they can be protected or unless they will not count toward the retention requirement.

<sup>7</sup>Raphael, M. and M. White. 1984. Use of snags by cavity-nesting birds in the Sierra Nevada. Wildlife Monograph 86, 1-66.

Where one desirable safe snag or green tree is left in isolation on tractor units being machine piled, it should be feasible and economical to retain 20 to 50 feet of some brush and a few small saplings or poles around this tree to mitigate its isolation. This may not be feasible in broadcast burn units.

**ACEC Recommendations for DFC**

Table C-6 displays the desired amounts for each tree size class in ACECs identified for forest vegetation DFC objectives.

**Table C-6  
Forest Vegetation/Wildlife Habitat Desired Future Conditions—ACECs**

Tree Size	PVG-1	PVG-2	PVG-3	PVG-4	PVG-5	PVG-6	PVG-7	PVG-8	PVG-9	PVG-11
<b>Captain John Creek ACEC/RNA</b>										
<b>Range of Desired Size Classes Expressed as a Percentage of Forested within Each PVG (includes forested vegetation in RCAs)</b>										
G/F/S/S	1-18	5-7	9	14-15	3-7	7-9	n/a	n/a	n/a	n/a
Saplings	2-12	3-7	9	7-9	3-7	7-9	n/a	n/a	n/a	n/a
Small	2-18	5-21	18-27	19-22	4-22	11-27	n/a	n/a	n/a	n/a
Medium	3-29	7-35	23-36	24-36	7-30	18-36	n/a	n/a	n/a	n/a
Large	35-91	35-80	25-41	25-34	35-84	20-56	n/a	n/a	n/a	n/a
Old Forest <sup>1,2,3</sup>	20	20	20	15	20	10	n/a	n/a	n/a	n/a
<b>Lower Lolo Creek ACEC</b>										
<b>Range of Desired Size Classes Expressed As a Percentage of Forested within Each PVG (includes forested vegetation in RCAs)</b>										
G/F/S/S	1-18	5-7	9	14-15	3-7	7-9	n/a	n/a	n/a	n/a
Saplings	2-12	3-7	9	7-9	3-7	7-9	n/a	n/a	n/a	n/a
Small	2-18	5-21	18-27	19-22	4-22	11-27	n/a	n/a	n/a	n/a
Medium	3-29	7-35	23-36	24-36	7-30	18-36	n/a	n/a	n/a	n/a
Large	35-91	35-80	25-41	25-34	35-84	20-56	n/a	n/a	n/a	n/a
Old Forest <sup>1,2,3</sup>	20	20	20	15	20	10	n/a	n/a	n/a	n/a

<sup>1</sup>Hamilton, R.C. 1993. Characteristics of old-growth forests in the Intermountain Region. US Department of Agriculture, Forest Service, Intermountain Region, Ogden, Utah. 86 pp.

<sup>2</sup>Green, P., J. Joy, D. Sirucek, W. Hann, A. Zack, and B. Naumann. 1992. Old-Growth Forests Types of the Northern Region. USDA Forest Service, Northern Region, Missoula, Montana. R-A SES 4/92. 38 pp.

<sup>3</sup>The old forest (old growth) is a component of, and not in addition to, the large tree component.

G/F/S/S = Grass/Forb/Shrub/Seedling