

Green et. al. Error Correction Notes 2/25/05 with 3/4/07 and 10/31/08 additions

In 1989 the Forest Service Chief directed the Regional Foresters to develop “regional definitions of ecological old growth for specific forest types, habitat types, or plant associations . . .”. In response to this direction, in late 1989 Region 1 reconstituted the Regional Old Growth Task Force into a committee to develop descriptions for old growth forests in the Northern Rocky Mountains, consistent with this direction. This committee did much of its work as 3 coordinated sub-committees – one for each zone of the Region (North Idaho, Western Montana, and Eastern Montana). In April 1992 the Regional Old Growth Committee published its report as part of a Sustaining Ecological Systems (SES) Desk Guide, and in May 1992 the Regional Forester mailed this report to Forest Supervisors and Staff Directors. The Region 1 Old Growth Committee Report (Old Growth Forest Types of the Northern Region by P. Green, J. Joy, D. Sirucek, W. Hann, A. Zack, and B. Naumann – commonly referred to as *Green et. al.*), contained descriptions of old growth forest types, documentation of how these descriptions were developed, and discussions of the ecological context to guide the proper use of these descriptions.

In the 12 years since that report was published, users have noticed a few minor editorial errors, inconsistencies, or omissions in some of the data in the Tables of Old Growth Type Characteristics, particularly in Table 1 for Northern Idaho, but also in Tables 2 and 3 for Montana. Cumulatively, all these errors are minor, and were usually handled by talking to former members of the old growth committees to determine their intent. By now any errata should have been discovered, and this is a good time to clean them up. This paper documents what was done to clean up those errors.

Reasons For These Error Corrections

The original North Idaho Old Growth Committee used a working spreadsheet with 23 different categories of old growth (differentiated by habitat type and forest type combinations) to develop site-appropriate descriptions of old growth forests. When preparing its final report, the Region 1 Old Growth Committee incorporated the stand exam plot data analyzed for developing the old growth type descriptions into Table 1, the table was re-formatted to be consistent with Agency-wide formats, and the 23 categories were collapsed to 20 categories. In the April 1992, final published version of *Green et. al.* these 20 categories of old growth were further combined to 9 categories which had common minimum criteria (to reduce unnecessary complexity, and avoid duplication). In this 2-stage process of reformatting and combining categories, a few minor errors and omissions crept in that were not picked up during the editorial process. A few additional errors crept in about 10 years later during the process of scanning and transcribing the 1992 hard copy version of *Green et. al.* to get it in a word processing format that could be distributed electronically. The Montana Old Growth Committees went through a similar process, but those types were not originally as complex, and fewer errors or omissions resulted.

Error corrections were made by several members of the original members of the North Idaho Old Growth Committee (Art Zack, Pat Green, Jim Mital) and Regional Office personnel, who also handled the Montana corrections.

The following paragraphs document the errata corrections that were made:

1. SAF Minimum Diameter for Habitat Type Groups F, G, G1, H, I in Table 1 (Northern Idaho)

Table 1 in the 1992 version of *Green et. al.* has SAF Forest Type for the above Habitat Types listed in both Old Growth Type 4 and OG Type 5. In OG Type 4 it has a 21" minimum diameter, and in OG Type 5 it has a 17" minimum diameter. This was clearly an error introduced by collapsing categories that were the same except for the SAF/MAF forest types, and failing to notice that these needed to be handled differently.

All previous versions of these tables (versions since 1990 with 20-23 separate classes) showed SAF and MAF having a 17" diameter for habitat type groups F, G, G1, H, I (cedar/hemlock and moist lower subalpine series), but having a 21" minimum diameter for habitat type groups C, C1, D, and E (grand fir series). In the grand fir habitat type series the SAF and MAF cover types shared these characteristics with DF, GF, WL, PP, and WP cover types. The DF, GF, WL, WP, PP, and WH cover types also have a 21" minimum diameter for habitat type groups F, G, G1, H, I (cedar/hemlock and moist lower subalpine series), but with these habitat type groups the SAF forest type should only have a 17" minimum diameter.

The easiest way to correct the conflicting diameter standard for the SAF forest type, was to split OG Type 4 (from the 1992 version) into a 4A and 4B, types for Northern Idaho, by splitting the grand fir habitat type groups (C, C1, D, and E) out from the other habitat type groups -- as was done in all previous versions of these tables. The SAF forest type is only associated with the grand fir series (revised type 4A), but not type 4B. This is consistent with the semi-final 20-category version of these tables. The SAF forest type also occurs in a number of other old growth types distinguished by different habitat types. This was corrected for the North Idaho conditions.

SAF and MAF for habitat type groups F, G, G1, H, I (cedar/hemlock and moist lower subalpine series) remain as originally shown in *Green et. al.* Old Growth Type 5 in North Idaho. However, somehow in the 1992 version, unlike the Oct. 1990 version of the tables, habitat type group G1 was dropped. G1 was restored here, to be consistent with previous work, even though it is likely to be very rare with these cover types.

When OG type 4 is split in this way, western hemlock (WH) forest type appropriately fits with group 4B, but does not occur in group 4A.

When Old Growth Types 4A and 4B are separated out for North Idaho conditions, the appropriate associated characteristic values and numbers of plots need to be properly re-assigned to each subgroup. The semi-final 20-category version of these tables was used to do this, in conjunction with the narrative type descriptions. When SAF was showing up in both Old Growth Types 4 and 5 for the F, G, H, and I habitat type groups, some of the SAF plots were apparently double counted in the Number of Samples column. That is been corrected.

2. PP Forest Type

In the 1992, *Green et. al.* version of the North Idaho OG Tables, the PP Forest Type only appears with Habitat Type Groups A and B (ponderosa pine and Douglas-fir series). However, the type descriptions in *Green et. al.* for Old Growth Type 4 identifies ponderosa pine as being a forest type on the grand fir and cedar series. This fits with field experience and data in North Idaho, where ponderosa pine is common on grand fir habitat types, and sometimes found on drier cedar habitat types, as well as on high-energy aspect toe slopes of riparian zones. Previous versions of the old growth tables since 1990 had included ponderosa pine as an old growth forest type for the grand fir and cedar habitat type series. Therefore, it is added back in for the revised Old Growth Forest Types 4A and 4B.

3. Minimum Number Large Trees and Diameter and Age Thresholds

All previous versions of these tables were \geq (greater than or equal to) X” diameter for minimum number of large trees (rather than $>$), consistent with the logic the Old Growth Committee was using, and consistent with the text in all the Old Growth Type Descriptions. Likewise, the minimum ages were all “equal to or greater than” the threshold value. The “equal to” part seems to have gotten lost with new fonts in the 1992 version of the tables and text. Likewise, snag diameters and all other diameter thresholds were for trees and structures \geq (greater than or equal to) that threshold. Working versions of the tables and text make that clear. The R1-EDIT program, which was used for old growth data analysis, always groups things that way as well. The \geq is now put back in the tables and text, since that was the logic the committees were using and intended all the way through.

4. Minimum Basal Area Column in Table 1, 2, and 3

During all its work, the Northern Idaho Old Growth Committee used a minimum basal area as part of its old growth minimum criteria. This was in all the working tables since 1990, up until the semi-final 20 category version. In most of the Northern Idaho Old Growth Type Descriptions in the 1992 paper, a minimum basal area was also included, although, although it was unintentionally left out of a few. The intent by the committee was to have a minimum basal area to ensure that these were stands with had a reasonable level of tree stocking for forests on their respective habitat types, rather than just containing the minimum number of large trees. Consistent with all the Northern Idaho Old Growth Committee’s work, the October 1990 version of the old growth tables, and the Type Descriptions in 1992 *Green et. al.* were used to fill in a minimum basal area column in Table 1 for everything except the yew forest type. For yew, Pat Green went back to the original data analysis to find the minimum basal area. The original old growth types were combined far enough that 2 separate basal area minimums are sometimes needed – distinguished by habitat type group. This is indicated where necessary in the edited version of Table 1, and in the Type Descriptions. A similar situation occurred in both Table 2 and Table 3 in Montana. For some reason, basal area minimums contained in the draft tables and/or in the Old Growth Type Descriptions did not make it into the final tables. This has now been corrected and the date of correction shown on the tables.

5. Whitebark Pine

In the Oct. 1990 North Idaho tables Whitebark Pine shows up in both upper and lower sub-alpine series as an old growth type, and has a 60 ft² basal area in the lower (HT Groups H, I, J) and a 40

ft² basal area in the upper-most (HT Group K) subalpine zone. In the semi-final reformatted draft tables with 20 types, and in the 1992 published version WBP is restricted to only H.T. groups I & J (HT group K disappeared), and the final description of types shows 60 ft² minimum basal area.

Whitebark pine in North Idaho is a common species in HT group K, & this was recognized in the Type Description text, but no stand data was available at that time. However, the narrative recognizes a 40 ft² basal area minimum as being appropriate on this habitat type group. It is therefore now added back in to the table. Consistent with previous versions of these tables and the narrative type description, 60 ft² of basal area is used for habitat type groups I and J, and 40 ft² is used for habitat type group K.

There is no WBP in OG Types for W. MT. The table has WSL which is now defined on page 7 of the document for Old Growth Type descriptions, and includes WBP.

6. Range of Snag Numbers For OG Type 1

The range of snag numbers listed in both the semi-final 20 category version of the tables, and in the 1992 narrative Type Description is 0 – 13. There's no documentation where the 7 for OG Type 1 in Table 1 came from in the 1992 version, and as an upper limit it appears low for Douglas-fir forest types. Therefore, the 0 – 13 snag range is restored, consistent with the type description. In Tables 2 and 3 several editorial errors were found and corrected to match the old growth Type description narratives beginning on page 23.

7. Live and Dead Tree Sizes Analyzed

Snag sizes analyzed by the Old Growth Committees were ≥ 9 " DBH. This size range is added to column heading in Table 1, 2 and 3 to indicate what the snag count applies to. Likewise, the Old Growth Committees analyzed data from live trees ≥ 9 " for determining other old growth characteristics such as forest type, dead/broken topped trees, and percent decay. Text in the Old Growth Type Descriptions already reflects this, & it is now added to footnote 1 in Tables 1, 2, and 3.

8. Percent Dead/ Broken Top

Several mean values and range values were missing or in error on Tables 2 and 3 when compared to the narratives in the Old growth Type description beginning on page 23. These have now been corrected to the values in the narratives. Table 1, Footnote 1, shows ≥ 9 " DBH for % broken top; % decay; and snags, as did the semi-final draft version of these tables. Yet, on page 7 of the original Green et al document the definitions say 5" DBH break for this variable. After researching this with Pat Green who originally developed this section, it was determined that the footnote on page 8 (with the northern Idaho chart), that the 9" breakpoint was the correct one, so that was changed from 5" to 9" on page 7.

9. Probability of Down Wood

In several instances, values in this column of Table 1 are converted from a single value to a range, or the range is expanded, to be consistent with both the narrative Old Growth Type Description, and the range of data in the previous more detailed versions of the tables. In the 1992 version of Table 1, it appears that parts of the range were inadvertently omitted. In a few

other places, the scanned version electronic version of the tables inadvertently missed part of a number that was in the printed 1992 version. These are all restored.

10. Percent Decay

Several mean values and range values were missing or in error on Tables 2 and 3 when compared to the narratives in the Old growth Type description beginning on page 23. These have now been corrected to the values in the narratives. Table 1, Footnote 1, shows ≥ 9 " DBH for % broken top; % decay; and snags, as did the semi-final draft version of these tables. Yet, on page 7 or the original *Green et. al.* document the definitions say 5" DBH break for this variable. After researching this with Pat Green who originally developed this section, it was determined that the footnote on page 8 (with the northern Idaho chart), that the 9" breakpoint was the correct one so that was changed from 5" to 9" on page 7.

11. Minimum Criteria and Associated Characteristics

Forest stand attributes associated with Old Growth were clearly differentiated into "minimum criteria" and "associated characteristics" in all the work the old growth committee did, and in the *Green et. al.* text on pages 5, 6, 7, 11, 12, in the individual type descriptions, and in the footnotes to the tables. However, people who only glance quickly at the tables still sometimes ask questions about what are minimum criteria. Before there were table footnotes explaining this, the semi-final draft of the *Green et. al.* tables actually had column headings separately labeling minimum criteria and associated characteristics. To make this clear at even a casual glance, those identical column headings are now being added back into the tables. And, consistent with this and all other information, the same headings are added to the documentation of all the old growth related attributes on page 7.

12. Old Growth Type Descriptions

The Old Growth Type Descriptions in the body text of *Green et. al.* are edited with some minor additions and corrections to make them consistent with the Table 1 edits described above. The most significant items are filling in minimum basal area for the few types where it was missing, and splitting Table 1 Old Growth Type 4 into Types 4A and 4B, to recognize differences between the grand fir series habitat type, and other habitat types in Old Growth Type 4. Most of the other editorial corrections made to Table 1 were already correct in the Type Descriptions. Minimum basal area values were added to the Type Descriptions for Western Montana as documented in the draft definitions that somehow had been inadvertently omitted in the final descriptions and in Table 2.

13. Calculating and Using Forest Type – Cedar in Northern Idaho and Other Situations

In a few situations, the calculated forest type (based on plurality of basal area based on trees ≥ 9 ") may be different than the species of most of the old trees. This occurs most often in cedar forest types in northern Idaho, as a result of dense cedar understories. The original top paragraph on page 12 of the 1992 version of *Green et. al.* attempted to address this situation. In retrospect, that paragraph is somewhat confusing. A re-write of that paragraph better captures the intent of the Zone Old Growth Committee in regards to the cedar forest type. This paragraph also reiterates that for old growth forest type analysis, plurality of basal area should be based on trees ≥ 9 ", regardless of what's stored in TSMRS. Because no mechanical calculation can capture all the possible combinations of stand conditions, it is made clear that all these are screening devices

meant for broad-scale landscape assessment. At the stand or small watershed scale, more careful analysis should still be useful to make the best old growth selections.

14. Lodgepole Pine Habitat Type Groups.

Habitat Type Group E was in the original North Idaho tables, and is now added back in because it can support lodgepole pine. It was probably either an inadvertent omission, or there was a lack of data. The situation is similar with Habitat Type Group K, where lodgepole pine is actually quite common. The minimum basal area requirement is emphasized in the type description for H.T. Group K, to be sure tree density is high enough to be a true old growth stand.

15. Additional Habitat Types and Forest Type/Habitat Type Group Combinations.

FIA broad-scale vegetation inventory increased the geographic sample of habitat types in Eastern and Western Montana. As expected, additional habitat types and several forest type/habitat type combinations, which were not addressed in the original *Green et al.* publication, were found in the FIA data. With agreement of Forest Silviculturists and Ecologists, appendix tables for Eastern and Western Montana habitat groups are updated (pages 48-52). Additional, new forest/habitat type combinations were identified for Eastern and Western Montana. One typo was found in Eastern Montana Old Growth Type 4, which was corrected with this edit. Barry Bollenbacher, Regional Silviculturist, reviewed the FIA data to assure they were not anomalies. Old Growth Types, in Table 2 on page 9 are updated to incorporate these additions.

16. Addition to the above habitat types found on FIA plots 12/3/07,

Subsequent findings revealed that several habitat types found in habitat type publications used in Region One were found in stand exam data, but not as part of habitat type groups located in the appendix A of the Green et al document. During November of 2007 the same procedure was followed as above with FIA plot data, for stand exam data in Region One. The result of this process was an updated list of habitat types that fall into Old Growth habitat type groups in the green et al document appendix A. Those additions are **identified** in the appendix of that document.

17. Additional Habitat Types added and reformatting of Appendix A completed 10/31/08

In January of 2008 additional habitat types were added to the Green et al document Appendix A that reflects codes and habitat Types that are appropriately used in Id that are from the Montana classification. In addition the format and headers were changed in appendix A to be clearer to the reader.