ERRATA & CLARIFICATION

26 March 2014

This document lists the corrections of errors and clarifications with respect to VMD0002 E*stimation of carbon stocks in the dead-wood pool (CP-D)*, v1.0.

Project proponents and validation/verification bodies should refer to the most recent version of this document when applying the module or when assessing a project´s conformance with the module.

VM0007 is currently under revision and to avoid numerous revisions to the methodology and corresponding modules, these errata and clarifications will be incorporated into the forthcoming methodology revision.

In Part 2, page 6, the procedure for estimating carbon stocks from lying dead wood from sample plots must be read as follows (new text is in red and the deleted text is in strikethrough):

Part 2: Lying Dead Wood

Step 1: Lying dead wood must be sampled using the line intersect method (Harmon and Sexton 1996)[1]. Two 50-meter lines (164 ft) are established bisecting each sample plot and the diameters of the lying dead wood (≥ 10 cm diameter [≥ 3.9 inches]) intersecting the lines are measured. The first line is oriented along a random bearing, the second line is oriented perpendicular to the first. The "plot" referenced below refers to the combined length of the sample lines.

Step 2: The dead wood is assigned to one of the three density states (sound, intermediate and rotten) using the 'machete test', as recommended by *IPCC Good Practice Guidance for LULUCF* (2003), Section 4.3.3.5.3. Dead wood density class (*dc*) is assessed at the point of intersection with the sample line, as per measured parameters section below.

Step 3: The volume of lying dead wood per unit area is estimated using the equation (Warren and Olsen 1964)[2] as modified by Van Wagner (1968)[3] separately for each density state:

$$V_{LDWdc,sp,i} = \frac{\pi^2 * \left(\sum_{n=1}^{N} Dia_{dc,n,sp,i}^{\ 2} \right)}{8 * L} \qquad (7)$$

Where:

$V_{LDW,sp,i}$	Volume of lying dead wood per unit area in density class *dc* in plot *sp* in stratum *i*; m^3 ha^{-1}
$Dia_{n,sp,i,t}$	Diameter of piece n of dead wood along the transect in plot *sp* in stratum *i;* cm
n	1, 2, 3, … *N* sequence number of wood pieces in density class *dc* intersecting the transect

[1] Harmon, M.E. and J. Sexton. (1996) Guidelines for measurements of wood detritus in forest ecosystems. US LTER Publication No. 20. US LTER Network Office, University of Washington, Seattle, WA, USA.

[2] Warren, W.G. and Olsen, P.F. (1964) A line intersect technique for assessing logging waste. *Forest Science* 10: 267-276.

[3] Van Wagner, C.E. (1968). The line intersect method in forest fuel sampling. *Forest Science* 14: 20-26.

L	Length of the transect; 100 m
dc	dead wood density class – sound (1), intermediate (2), and rotten (3); dimensionless
sp	1, 2, 3, … P_i sample plots in stratum *i*
i	1, 2, 3, … *M* strata in the project scenario

Step 4: Volume of lying dead wood shall be converted into biomass using the following relationship. Density of each dead wood density class (D_{DWdc}) is estimated as per guidance in measured parameters section below.

$$B_{LDWsp,i} = \sum_{dc=1}^{3} (V_{LDWdc,sp,i} * D_{DWdc}) \quad (8)$$

Where:

$B_{LDWsp,i}$	Biomass of lying dead wood per unit area in sample plot *sp* in stratum *i*; d.m. ha^{-1}
$V_{LDWdc,sp,i}$	Volume of lying dead wood per unit area in density class *dc* in sample plot *sp* in stratum *i*; m^3 ha^{-1}
D_{DWdc}	Mean wood density of dead wood in the density class (dc) – sound (1), intermediate (2), and rotten (3); t d.m. m^{-3}
dc	dead wood density class – sound (1), intermediate (2), and rotten (3); dimensionless
sp	1, 2, 3, … P_i sample plots in stratum *i*
i	1, 2, 3, … *M* strata

Step 5: The mean biomass stock per unit area in lying dead wood for each stratum shall be calculated using the following:

$$B_{LDWi} = \frac{1}{P_i} * \sum_{sp=1}^{P_i} B_{LDWsp,i} \quad (9)$$

Where:

B_{LDWi}	Biomass of lying dead wood in stratum *i*; t d.m. ha^{-1}
$B_{LDWsp,i}$	Biomass of lying dead wood per unit area in plot *sp* in stratum *i*; d.m. ha^{-1}
sp	1, 2, 3, … P_i sample plots in stratum *i*
P_i	Total number of sample plots in stratum *i*
i	1, 2, 3, … *M* strata

~~**Step 5**~~ **Part 3: Mean Carbon Stocks of Dead Wood**

Mean carbon stock in dead wood for each stratum is then calculated as the sum of standing and lying dead wood components, converted to carbon dioxide equivalents

$$C_{DWi} = \left(\left(B_{SDWi} + B_{LDWi}\right) * CF_{DW}\right) * \frac{44}{12} \quad (~~9~~10)$$

Where:

C_{DWi}	Mean carbon stock of dead wood in stratum *i*; t CO_2-e ha^{-1}

B_{SDWi}	Biomass of standing dead wood in stratum *i*; t d.m. ha^{-1}
B_{LDWi}	Biomass of lying dead wood in stratum *i*; t d.m. ha^{-1}
CF_{DW}	Carbon fraction of dry matter in dead wood; t C t^{-1} d.m.
i	1, 2, 3, … *M* strata
44/12	Ratio of molecular weight of CO_2 to carbon, t CO_2-e t C^{-1}

IV. DATA AND PARAMETERS MONITORED

Data / parameter:	$Dia_{n,sp,i,t}$
Data unit:	cm
Used in equations:	7
Description:	Diameter of piece *n* of dead wood along the transect in plot *sp* in stratum *i*, at time *t* in *cm*
Source of data:	Field measurements in sample transects
Measurement procedures (if any):	Lying dead wood must be sampled using the line intersect method (Harmon and Sexton 1996[4]). Two 50-meter lines are established bisecting each sample plot and the diameters of the lying dead wood (≥ 10 cm diameter) intersecting the lines are measured. The first line is oriented along a random bearing, the second line is oriented perpendicular to the first.
Monitoring frequency:	Where dead wood is an included pool monitoring must occur at least every ten years for baseline renewal. Where carbon stock enhancement is included and dead wood is an included pool monitoring shall occur at least every five years
QA/QC procedures:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory including field data collection and data management shall be applied. Use or adaptation of QA/QCs already applied in national forest monitoring, or available from published handbooks, or form the *IPCC GPG LULUCF 2003*, is recommended.
Any comment:	Where carbon stock estimation occurs only for determination of the baseline this parameter shall be known ex-ante. Where part of project monitoring, ex-ante it shall be assumed that dead wood diameters remain constant during the baseline period.

[4] Harmon, M.E. and J. Sexton. (1996) Guidelines for measurements of woody detritus in forest ecosystems. US LTER Publication No. 20. US LTER Network Office, University of Washington, Seattle, WA, USA.