

## FMA Information Checklist

The tables on the following pages are provided to help Field Measurement Approach (FMA) participants in the Forestry Emissions Trading Scheme ensure all of the information required to complete calculation of participant-specific carbon tables is collected. The information collected must be consistent with the choices that FMA participants make under the FMA Standards in relation to:

- whether or not to collect information for shrubs;
- whether or not to collect information for small trees (DBH less than 25 mm and height at least 300 mm);
- whether to collect information for all trees, or only nominated tree species; and
- whether the choices above vary, or are the same, for different Forest Classes (if Forest Class has been assigned).

### Notes:

1. The tables given in this document are summarised versions of those given in Appendix 1 of the *Guide to the Field Measurement Approach*, and the *FMA Information Standard*. Please consult the *Guide* and *Standard* for further information (available on the MPI web site).
2. If required to record whether trees are present or absent, the presence/absence test **only** applies to those live or standing dead trees for which FMA information must be collected under the choices made above. **Trees excluded under the choices are treated as if they don't exist.**  
*Example:* a participant has elected not to record information for small trees, but at a particular sample plot there are only small trees. **Trees would be recorded as being “absent” for that plot** (i.e. there are no live or standing dead trees present at the time of measurement for which FMA information is required to be collected). The reason for the absence must also be recorded, from an allowable list of reasons.
3. If collecting FMA information for indigenous forest, it is required that the height of all cabbage trees, nikau palms and tree ferns be recorded, as methods for estimating the height of these species from stem diameter are not available. To ensure heights of other indigenous species can be accurately estimated, ensure that the heights of at least 8 other indigenous species are also recorded for each sample plot.
4. Where a number is specified in the tables that follow as “1, 2, 3, .... n – integer”, it means a number in the sequence of positive whole numbers (1, 2, 3, ....). If the number is to be selected by the participant, the values **must** comprise a continuous sequence beginning at 1.
5. The names of field personnel involved in collecting or processing FMA information must also be recorded.

### Disclaimer

While every effort has been made to ensure the information in this document is accurate, the Crown does not accept any responsibility or liability for any error of fact, omission, interpretation or opinion that may be present, nor for the consequences of any decisions based on this information. Individuals should seek advice from a qualified forestry professional/expert before completing FMA requirements.

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## Permanent Sample Plot Information

| Parameter   | Allowable Values   | When Recorded                     |
|---|--|-----------------------------------|
| Plot identifier   | 1, 2, 3, .... n – integer; must be a value supplied by MPI   | Always                            |
| <b>Coordinates of position navigated to:</b>  |  |                                   |
| – Easting   | Averaged value from GPS (m) – integer  | Always                            |
| – Northing  | Averaged value from GPS (m) – integer  | Always                            |
| <b>Coordinates of plot centre point:</b>  |  |                                   |
| – Easting   | Averaged value from GPS (m) – integer  | Always                            |
| – Northing  | Averaged value from GPS (m) – integer  | Always                            |
| – Altitude  | Averaged value from GPS (m) – integer  | Always                            |
| Plot area   | One of (ha): 0.030, 0.040, 0.060, 0.080, 0.100, 0.200  | Always                            |
| Plot shape  | Circular, square   | Always                            |
| Plot average maximum slope  | Measured value (°) – integer   | Always                            |
| <b>Plot dimensions** (required for plots on slopes &lt;10° if not recording a slope-adjusted plot dimension, otherwise optional):</b> |  |                                   |
| – Radius ( $r_P$ )  | Calculated value (m) – rounded to 2 decimal places   | If required, and a circular plot  |
| – Length ( $l_P$ )  | Calculated value (m) – rounded to 2 decimal places   | If required, and a square plot    |
| <b>Plot dimensions (required for plots on slopes ≥10°; optional for plots on slopes &lt;10°):</b>                                     |  |                                   |
| – Slope-adjusted radius ( $r_{P,S}$ )   | Calculated value (m) – rounded to 2 decimal places   | If required, and a circular plot  |
| – Slope-adjusted length ( $l_{P,S}$ )   | Calculated value (m) – rounded to 2 decimal places   | If required, and a square plot    |
| Plot extends beyond forest land boundary  | Yes, No  | Always                            |
| – Plot percentage area within boundary  | Estimated value (%) – integer (1–99)   | If recording data for a part-plot |
| Plot centre point relocated   | Yes, No  | Always                            |
| – Plot relocated reason   | <b>1</b> – Forest land edge; <b>2</b> – Forest Class edge;<br><b>3</b> – Silvicultural trial, <b>4</b> – Old trees present | If plot centre point is relocated |
| Plot centre point re-established  | Yes, No  | Always                            |
| Plot data collection start date   | Date – DD-MM-YYYY  | Always                            |

\*\* It is recommended this parameter always be recorded, even though under the current FMA Standards recording is optional in some circumstances

## Shrub Information

Information for shrubs is only collected if an FMA participant has elected to collect such information (by Forest Class if applicable). If information is being collected for shrubs, but shrubs are absent in a particular plot or sub-plot, record data for the parameters in the grey-shaded sections of the table only.

| Parameter   | Allowable Values   | When Recorded                            |
|---|--|--|
| Plot identifier   | 1, 2, 3, .... n – integer; must be a value supplied by MPI   | Always                                   |
| Sub-plot identifier   | 1, 2, 3, .... n – integer; new set for each plot   | If using a sub-plot                      |
| Shrubs present  | Yes, No  | If collecting FMA information for shrubs |
| <b><i>If trees are recorded as being absent in the plot or sub-plot, or if it is likely the shrubs that are present first established more than 2 years before or after those trees recorded as being present, then record an estimate of the year the first of the shrubs regenerated:</i></b> |  |  |
| Year first regenerated  | Year first regenerated   | If required when shrubs are present      |
| <b><i>If shrubs are present in the plot/sub-plot, then for each Shrub Type present record the:</i></b>  |  |  |
| – Shrub type  | 1 – Manuka/Kanuka; 2 – Tauhinu; 3 – Other indigenous shrubs; 4 – Gorse; 5 – Broom; 6 – Other exotic shrubs | Always                                   |
| – Crown cover for that shrub type   | Estimated value (%) – integer (1–100)  | Always                                   |
| – Average height for that shrub type  | Estimated value (m) – rounded to 2 decimal places  | Always                                   |

## Tree Information – Use When Intermingled Trees are Absent Only

1. Only use this table when intermingled trees are **absent**. Use the Tree Information table on the next page below **if intermingled trees are present**.
2. Information recorded is **only** for those trees (live or standing dead) for which FMA information must be collected under the choices made for collecting FMA information for small trees and nominated tree species – by Forest Class if applicable.
3. If live or standing dead trees for which FMA information must be collected are absent, record information for the parameters in the grey-shaded section of the table only – except if trees are absent due to the last thinning or adverse event, also record information for all remaining parameters listed in the table as if the trees that existed just prior to the last thinning or adverse event **are still present**.

| Parameter   | Allowable Values   | When Recorded  |
|---|--|--|
| Plot identifier                                   | 1, 2, 3, .... n – integer; must be a value supplied by MPI   | Always   |
| Sub-plot identifier                               | 1, 2, 3, .... n – integer; new set for each plot   | If using a sub-plot  |
| Trees present                                     | Yes, No  | Always   |
| – Reason for absence                              | 1 – Unstocked due to harvesting; 2 – Unstocked due to thinning; 3 – Unstocked due to an adverse event; 4 – Trees below stem diameter threshold; 5 – No nominated tree species present; 6 – Permanently unstocked area; 7 – PFSI non-eligible forest; 8 – Other | If no relevant trees are present (i.e. those for which FMA information must be collected) in the plot/sub-plot – choose the <b>first reason</b> in the list that applies |
| – Species Group assigned if trees absent          | One of SGRAD, SGDOU, SGEXH, SGEXS, SGIND   | Only if relevant trees are absent  |
| Intermingled trees present                        | No   | Always   |
| Low count of live DBH stems                       | Yes, No  | Always if relevant trees are present   |
| – Reason for low count of live DBH-measured stems | 1 – Stems below DBH threshold; 2 – Low final stocking; 3 – Maximum plot area used; 4 – Unstocked area present; 5 – Other   | Always, if a low stem count. Use “4” if any part of the plot is unstocked, irrespective of the reason  |
| Planted trees present                             | Yes, No  | If any relevant planted trees are present  |
| – Planted stocking                                | Counted or estimated value (st/ha) – integer   | If planted trees are present   |
| – Planting year                                   | YYYY – integer   | If planted trees are present   |
| – Planting month                                  | MM – integer   | If planted trees present, and month known  |
| Regenerated live/dead trees present               | Yes, No  | If any relevant regenerated trees are present  |
| – Year first regenerated                          | YYYY – integer   | If regenerated trees are present   |
| – Month first regenerated                         | MM – integer   | If regenerated trees present, and month known  |

## Tree Information – Use When Intermingled Trees are Present Only

- The information in the grey-shaded sections of the table is collected in relation to all trees present for which FMA information must be collected. That in the green-shaded sections is collected for the intended predominant species only – and if that species includes planted trees that were planted in different years, the information recorded for the planted trees of that species is for the trees planted in the earliest year only.
- If the intended predominant species is not the predominant species at the time of measurement, also record the name of the single species that is actually predominant, and then for that species separately record the information in the green shaded sections of the table. If the actual predominant species includes planted trees that were planted in different years, the information recorded for the planted trees of that species is for the trees planted in the earliest year only.

| Parameter   | Allowable Values   | When Recorded  |
|---|--|--|
| Plot identifier                                   | 1, 2, 3, .... n – integer; must be a value supplied by MPI   | Always   |
| Sub-plot identifier                               | 1, 2, 3, .... n – integer; new set for each plot   | If using a sub-plot  |
| Trees present                                     | Yes, No  | Always   |
| – Reason for absence                              | 1 – Unstocked due to harvesting; 2 – Unstocked due to thinning; 3 – Unstocked due to an adverse event; 4 – Trees below stem diameter threshold; 5 – No nominated tree species present; 6 – Permanently unstocked area; 7 – PFSI non-eligible forest; 8 – Other | If no relevant trees (i.e. those for which FMA information must be collected) are present in the plot/sub-plot – choose the <b>first reason</b> in the list that applies |
| – Species Group assigned if trees absent          | One of SGRAD, SGDOU, SGEXH, SGEXS, or SGIND  | Only if relevant trees are absent  |
| Intermingled trees present                        | Yes  | Always   |
| Intended Predominant Species                      | Species code – see <i>FMA Information Standard</i> , Appendix 1, Table A3  | Always   |
| Predominant Species at measurement                | Species code – see <i>FMA Information Standard</i> , Appendix 1, Table A3  | If required  |
| Low count of live DBH stems                       | Yes, No  | Always if relevant trees are present   |
| – Reason for low count of live DBH-measured stems | 1 – Stems below DBH threshold; 2 – Low final stocking; 3 – Maximum plot area used; 4 – Unstocked area present; 5 – Other   | Always, if a low stem count. Use “4” if any part of the plot is unstocked, irrespective of the reason.   |
| Planted trees present                             | Yes, No  | If any relevant planted trees are present  |
| – Planted stocking                                | Counted or estimated value (st/ha) – integer   | If planted trees are present   |
| – Planting year                                   | YYYY – integer   | If planted trees are present   |
| – Planting month                                  | MM – integer   | If planted trees present, and month known  |
| Regenerated live/dead trees present               | Yes, No  | If any relevant regenerated trees are present  |
| – Year first regenerated                          | YYYY – integer   | If regenerated trees are present   |
| – Month first regenerated                         | MM – integer   | If regenerated trees present, and month known  |

## Silvicultural Information

- Information recorded is **only** for those trees (live or standing dead) for which FMA information must be collected, taking into account choices in relation to collecting FMA information for small trees and nominated tree species, and also whether intermingled trees are present – by Forest Class if applicable.
- If trees for which FMA information must be collected are absent in a plot/sub-plot, no silvicultural information is recorded **unless** the absence is due to the most recent thinning event – in which case information is recorded for all parameters listed for the trees as they existed up to and including the last thinning.
- If both planted and regenerated trees are/were present, silvicultural information is recorded for the planted trees only. If the planted trees were planted in different years, the information recorded for planted trees is for the trees planted in the earliest year only.
- If intermingled trees are present, information is recorded for the single intended predominant species only – and if that species includes planted trees that were planted in different years, the information recorded for the planted trees of that species is for the trees planted in the earliest year only.

| Parameter   | Allowable Values  | When Recorded                                 |
|---|---|---|
| Plot identifier   | 1, 2, 3, .... n – integer; must be a value supplied by MPI  | Always  |
| Sub-plot identifier   | 1, 2, 3, .... n – integer; new set for each plot  | If using a sub-plot                           |
| Trees subject to pruning (at any time since planting/regeneration)                            | Yes, No   | Always  |
| Trees subject to thinning (at any time since planting/regeneration)                           | Yes, No   | Always  |
| <b><i>If trees are subject to thinning, then for each thinning, record the following:</i></b> |   |   |
| – Thinning identifier   | 1, 2, 3, .... n – integer   | Always  |
| – Thinning year   | YYYY – integer  | Always  |
| – Thinning month  | MM – integer  | If known                                      |
| – Post-thinning residual stocking (of live stems)   | Counted or estimated value (st/ha) – integer  | Always  |
| – Residual stocking determined by   | 1 – Counting; 2 – Estimation  | Always  |
| – Stocking estimation method  | 1 – Stand records; 2 – Quality control data; 3 – Contractor payment records; 4 – Personal knowledge of owner or consultant; 5 – Other | If residual stocking determined by estimation |
| – Majority of thinnings remain on site  | Yes, No   | Always  |

## Adverse Event Information

1. Information recorded is **only** for those trees (live or standing dead) for which FMA information must be collected, taking into account choices in relation to collecting FMA information for small trees and nominated tree species, and also whether intermingled trees are present – by Forest Class if applicable.
2. If trees for which FMA information must be collected are absent in a plot/sub-plot, no adverse event information is recorded **unless** the absence is due to the most recent adverse event – in which case all information is recorded for all parameters listed for the trees as they existed up to and including the last adverse event.
3. If both planted and regenerated trees are/were present, adverse event information is recorded for the planted trees only. If the planted trees were planted in different years, the information recorded for planted trees is for the trees planted in the earliest year only.
4. If intermingled trees are present, information is recorded for the single intended predominant species only – and if that species includes planted trees that were planted in different years, the information recorded for the planted trees of that species is for the trees planted in the earliest year only.

| Parameter  | Allowable Values  | When Recorded                                 |
|--|---|---|
| Plot identifier  | 1, 2, 3, .... n – integer; must be a value supplied by MPI  | Always  |
| Sub-plot identifier  | 1, 2, 3, .... n – integer; new set for each plot  | If using a sub-plot                           |
| Trees subject to adverse events (at any time since planting/regeneration)                            | Yes, No   | Always  |
| <b><i>If trees have been subject to any adverse events, then for each adverse event, record:</i></b> |   |   |
| – Adverse event identifier   | 1, 2, 3, .... n – integer   | Always  |
| – Adverse event year   | YYYY – integer  | Always  |
| – Adverse event month  | MM – integer  | If known                                      |
| – Adverse event type   | 1 – Fire; 2 – Wind; 3 – Erosion; 4 – Other  | Always  |
| – Residual stocking (of live stems) after event  | Counted or estimated value (st/ha) – integer  | Always  |
| – Residual stocking determined by  | 1 – Counting; 2 – Estimation  | Always  |
| – Residual stocking estimation method  | 1 – Stand records; 2 – Information from damage surveys;<br>3 – Personal knowledge of owner or consultant; 4 – Other | If residual stocking determined by estimation |
| – Majority of cleared wood remains on site   | Yes, No   | Always  |

## Tree Stem Information – Use for Stems with Measured Diameters Only

Information recorded for tree stems with measured diameters is **only** for those trees (live or standing dead) for which FMA information must be collected, taking into account choices in relation to collecting FMA information for small trees and nominated tree species – by Forest Class if applicable. If no such tree stems are present, no stem information is collected.

The information to be collected when estimating (instead of measuring) the collar diameter of small trees is given in tables further below (and depends on whether intermingled trees are present or absent).

| Parameter   | Allowable Values  | When Recorded   |
|---|---|---|
| Plot identifier   | 1, 2, 3, .... n – integer; must be a value supplied by MPI  | Always  |
| Sub-plot identifier   | 1, 2, 3, .... n – integer; new set for each plot  | If using a sub-plot   |
| Sub-sample identifier   | 1, 2, 3, .... n – integer; new set for each plot or sub-plot  | If using a sub-sample   |
| <b><i>For each stem with a measured stem diameter, record the:</i></b>  |   |   |
| – Stem identifier   | 1, 2, 3, .... n – integer; new set for each plot, sub-plot or sub-sample  | Always  |
| – Stem establishment type code  | <b>P</b> – Planted; <b>R</b> – Regenerated  | If stem regenerated, otherwise optional (i.e. if absent taken as “ <b>Planted</b> ”)              |
| – Stem state code   | <b>L</b> – Live; <b>X</b> – Dead  | If stem dead, otherwise optional (i.e. if absent taken as “ <b>Live</b> ”)                        |
| – Stem species name code  | See rules in the <i>FMA Information Standard, Part 5</i> . Select from lists in the <i>FMA Information Standard, Appendix 1</i> | Always  |
| – Stem diameter   | Measured or calculated value (mm) – integer   | Always  |
| – Stem diameter type code   | <b>DBH</b> – diameter at breast height; <b>CD</b> – Collar diameter   | If collar diameter measured, otherwise optional (i.e. if absent taken as “ <b>DBH</b> ”)          |
| – Stem diameter at standard height                                      | Yes, No   | If not measured at standard height, otherwise optional (i.e. if absent taken as “ <b>Yes</b> ”)   |
| – Stem diameter at standard height estimated because of the presence of | <b>1</b> – Fork; <b>2</b> – Branches; <b>3</b> – Nodal swelling;<br><b>4</b> – Other malformation                               | If stem diameter not recorded at standard height  |
| – Stem height   | Measured value (m) – rounded to 1 decimal place   | If a height-measured tree   |
| – Stem broken-top indicator   | Yes, No   | If more than one-third of top missing, otherwise optional (i.e. if absent taken as “ <b>No</b> ”) |



## Tree Stem Information for Stems with Estimated Collar Diameters – Use When Intermingled Species are Absent

Information recorded for tree stems is **only** for those **live** standing small trees for which the average collar diameter is being estimated, and for which FMA information must be collected (taking into account choices made for collecting FMA information for small trees and nominated tree species – by Forest Class if applicable. If no such tree stems are present, no stem information is recorded.

Do not use this table if **intermingled trees are present** in a plot or sub-plot (irrespective of whether the intermingled trees have measured or estimated diameters); use the table on the next page below.

| Parameter  | Allowable Values   | When Recorded         |
|--|--|-----------------------|
| Plot identifier  | 1, 2, 3, .... n – integer; must be a value supplied by MPI   | Always                |
| Sub-plot identifier  | 1, 2, 3, .... n – integer; new set for each plot             | If using a sub-plot   |
| Sub-sample identifier  | 1, 2, 3, .... n – integer; new set for each plot or sub-plot | If using a sub-sample |
| <b><i>If collar diameters estimated, record for the small trees in each Species Group present:</i></b> |  |                       |
| – Species Group name   | One of SGRAD, SGDOU, SGEXH, SGEXS, or SGIND                  | Always                |
| – Establishment type of the majority of the collar diameter stems                                      | <b>P</b> – Planted; <b>R</b> – Regenerated                   | Always                |
| – Average collar diameter of stems   | Estimated value (mm) – integer                               | Always                |
| – Average height of collar diameter stems  | Estimated value (m) – rounded to 1 decimal place             | Always                |
| – Stocking of collar diameter stems  | Estimated value (st/ha) – integer                            | Always                |

## Tree Stem Information for Stems with Estimated Collar Diameters – Use When Intermingled Species are Present

This table is only used when **intermingled trees are present** in a plot or sub-plot and are included in the stems for which FMA information is being collected – irrespective of whether the stems that are intermingled are those with a measured diameter at breast height, an estimated collar diameter, or a mixture of both.

Information recorded under this table is **only** for those **live** standing small trees for which the average collar diameter is being estimated, and for which FMA information must be collected (taking into account choices made for collecting FMA information for small trees and nominated tree species – by Forest Class if applicable). If no such tree stems are present, no stem information is collected.

Information for the parameters in the green-shaded sections of the table is collected **separately** for different subsets of the small live trees – those comprising:

- the intended predominant species
- the predominant species at the time of measurement, if that species is not the intended predominant species; and
- trees other than those above, separately for the trees in each Species Group

| Parameter  | Allowable Values  | When Recorded   |
|--|---|---|
| Plot identifier  | 1, 2, 3, .... n – integer; must be a value supplied by MPI                          | Always  |
| Sub-plot identifier  | 1, 2, 3, .... n – integer; new set for each plot                                    | If using a sub-plot   |
| Sub-sample identifier  | 1, 2, 3, .... n – integer; new set for each plot or sub-plot                        | If using a sub-sample   |
| <b>For the tree stems with estimated average collar diameters in each identified subset, record the:</b> |   |   |
| – Species name code  | From selected list (see the <i>FMA Information Standard</i> , Appendix 1, Table A3) | <b>Only recorded</b> if the information below is for collar diameter stems belonging to the intended predominant species, or to the predominant species at the time of measurement (if not the intended predominant species). |
| – Establishment type of the majority of the collar diameter stems  | <b>P</b> – Planted; <b>R</b> – Regenerated  | Always  |
| – Species Group name   | One of SGRAD, SGDOU, SGEXH, SGEXS, or SGIND   | Always  |
| – Average collar diameter of stems   | Estimated value (mm) – integer  | Always  |
| – Average height of collar diameter stems  | Estimated value (m) – rounded to 1 decimal place                                    | Always  |
| – Stocking of collar diameter stems  | Estimated value (st/ha) – integer   | Always  |

## Sub-plot Information

| Parameter  | Allowable Values                                 | When Recorded       |
|--|--|---------------------|
| <b>If a sample plot has sub-plot(s), record for each sub-plot the:</b> |  |                     |
| – Sub-plot identifier  | 1, 2, 3, .... n – integer; new set for each plot | If using a sub-plot |
| – Sub-plot percentage area   | Estimated value (%) – integer (1–99)             | If using a sub-plot |

## Sub-sample Information

| Parameter   | Allowable Values   | When Recorded   |
|---|--|---|
| <b>If a sample plot is being sub-sampled, record for each sub-sample the:</b> |  |   |
| – Plot identifier   | 1, 2, 3, .... n – integer; must be a value supplied by MPI   | If sub-sampling a plot  |
| <b>If a sub-plot is being sub-sampled, record for each sub-sample the:</b>    |  |   |
| – Sub-plot identifier   | 1, 2, 3, .... n – integer; new set for each plot   | If sub-sampling a sub-plot  |
| <b>For each sub-sample, record the:</b>                                       |  |   |
| – Sub-sample identifier   | 1, 2, 3, .... n – integer; new set for each plot or sub-plot   | Always  |
| – Sub-sample average maximum slope  | Calculated value (°) – integer   | Always  |
| – Sub-sample radius   | One of (m): 0.50, 1.00, 1.50, 2.00, 2.50, 3.00, 3.50, 4.00, 4.50, 5.00, 6.0, 7.0, 8.0, 9.0, 10.0, 12.0, 14.0, 16.0, 18.0, or 20.0  | Always  |
| – Sub-sample slope-adjusted radius  | Calculated value (m) – rounded to 2 decimal places   | If maximum average slope $\geq 10^\circ$  |
| – Sub-sample transect width ( $D_{\text{Line-transect}}$ )                    | Value (m) – rounded to 2 decimal places  | If line-transect sub-sampling used  |
| – Trees present   | Yes, No  | Always  |
| – Reason for absence  | 1 – Unstocked due to harvesting; 2 – Unstocked due to thinning; 3 – Unstocked due to an adverse event; 4 – Trees below stem diameter threshold; 5 – No nominated tree species present; 6 – Permanently unstocked area; 7 – PFSI non-eligible forest; 8 – Other | If no trees are present in the sub-sample (choose the <b>first reason</b> in the list that applies) |