

# Field Measurement Approach Information Standard



**Te Uru Rākau**  
Forestry New Zealand

## Emissions Trading Scheme (Forestry)

ETSFMAIS.05

### Authority

This *Field Measurement Approach Information Standard* ("the Standard") is prescribed pursuant to Section 90 of the Climate Change Response Act 2002 ("the Act").

### Scope

This Standard defines the form or electronic format of information provided by the Environmental Protection Agency (EPA) to a *Field Measurement Approach* (FMA) participant under the Climate Change (Forestry Sector) Regulations 2008 ("the Regulations") or the *Field Measurement Approach Standard*. Also defined in this Standard is the form or electronic format of information, or the manner in which information, must be submitted or notified by an FMA participant to the EPA under the Regulations or the *Field Measurement Approach Standard*.

In this Standard a reference to a section means that section in the Climate Change Response Act 2002, and a reference to a regulation means that regulation in the Climate Change (Forestry Sector) Regulations 2008.

This Standard was prescribed on 22 June 2016, and may be revised from time to time or revoked.

### Purpose

This document comprises the Standard that prescribes the form and electronic format of information that an FMA participant will receive when allocated permanent sample plots under the Regulations by the EPA, and the form and format that an FMA participant must use when submitting FMA information to the EPA. The document also provides the list of tree species that must be used by an FMA participant to nominate specific tree species under the *Field Measurement Approach Standard* (Part 7) if the participant elects to collect FMA information for specific tree species only. The document includes the following sections:

1. Interpretation: definition of special terms used in this Standard.
2. Specification of the form and formats available to an FMA participant for receiving information on the location of permanent sample plots allocated by the EPA to a participant's registered post-1989 forest land.
3. Specification of the list of tree species that may be nominated as specific tree species when an FMA participant is collecting FMA information for specific tree species only.
4. Specification of the form and electronic format that an FMA participant must use when submitting FMA information to the EPA.

Guidance on practical implementation of this Standard can be obtained from *A Guide to the Field Measurement Approach for Forest Land in the Emissions Trading Scheme*, available at: [www.mpi.govt.nz/ets](http://www.mpi.govt.nz/ets)



## Part 1 Interpretation

(1) In this Standard, unless the context requires otherwise:

**Waypoint** means a point in physical space with a name and an associated set of geographic coordinates.

(2) Any word or expression defined in:

- (a) the Act or Regulations and used in this Standard has, unless the context requires otherwise, the same meaning as it has in the Act or Regulations; and
- (b) the *Field Measurement Approach Standard* and used in this Standard has, unless the context requires otherwise, the same meaning as it has in the *Field Measurement Approach Standard*.

(3) In this Standard, unless the context requires otherwise, a reference to:

- (c) a Part, means a Part in this Standard; and
- (d) a clause, means a clause in a Part; and
- (e) a paragraph, means a paragraph in a clause; and
- (f) a sub-paragraph, means a sub-paragraph in a paragraph.

## Part 2 Supply of Allocated Permanent Sample Plot Locations to an FMA participant

(1) An FMA participant that applies under the Regulations to the EPA for an allocation of permanent sample plots will receive from the EPA the following information as a PDF (portable document file) document:

- (a) the name of the participant; and
- (b) the participant's New Zealand Emissions Trading Register (NZETR) holding account number;
- (c) the date on which the permanent sample plots listed in the document were allocated to the participant's registered post-1989 forest land; and
- (d) a set of three numbers for each permanent sample plot allocated to the participant's registered post-1989 forest land, with each set comprising:
  - (i) a number that is the identifier for the plot; and
  - (ii) a location that is a set of geographic coordinates that specify the centre point of each plot, with the coordinates consisting of an Easting and Northing given in the New Zealand Transverse Mercator 2000 (NZTM2000) map projection in relation to the New Zealand Geodetic Datum 2000 (NZGD2000) geodetic datum; and
- (e) for each permanent sample plot, the Forest Class of the post-1989 forest land on which the plot centre point is located, if Forest Class has been assigned.

(2) The PDF document provided by the EPA under clause (1):

- (a) must be taken as the definitive record of the permanent sample plots allocated to an FMA participant from the date recorded in the PDF document; and
- (b) may be requested by an FMA participant as:
  - (i) an electronic file attached to an email; or
  - (ii) a printed copy that is posted.

(3) An FMA participant:

- (a) may request the EPA to supply the permanent sample plot identifiers and plot locations specified under clause (1)(d) in one of the following electronic formats:



- (i) as a GPS Exchange Format (GPX) file, that conforms to the GPX 1.1 Schema available at <http://www.topografix.com/GPX/1/1/gpx.xsd>; or
  - (ii) as a shapefile, that conforms to the specification given in the Environmental Systems Research Institute (ESRI) Shapefile Technical Description White Paper dated June 2004, and available at <http://support.esri.com/index.cfm?fa=knowledgebase.whitepapers.listPapers&PID=21>; or
  - (iii) as a text file, that conforms to a comma separated variable (CSV) format with UTF-8 character encoding.
- (b) when making a request under paragraph (a), must specify whether the file is to be supplied:
- (i) as an electronic file attached to an email; or
  - (ii) on a CDROM or DVD that is posted.

### Part 3 Use of Information on Permanent Sample Plots Provided in Electronic Files

- (1) An FMA participant that requests the EPA to supply permanent sample plot identifiers and locations in a GPX file:
- (a) must upload the GPX file to the GPS receiver that will be used under the *Field Measurement Approach Standard* (Part 3) to determine the locations of permanent sample plots allocated to the participant; and
  - (b) must once the GPX file is uploaded ensure:
    - (i) the GPS contains a list of waypoint names that is the same as the list of plot identifiers given in the PDF file provided by the EPA; and
    - (ii) each waypoint has an associated set of geographic coordinates listed in the GPS as a latitude and longitude; and
  - (c) must use the GPS to convert the set of geographic coordinates of a waypoint identified in paragraph (b)(i) to an Easting and Northing in the NZTM2000 map projection, using a geodetic datum of NZGD2000 or if a datum of NZGD2000 is not available a datum of WGS84; and
  - (d) must once converted take each waypoint name to be a plot identifier, and each set of associated geographic coordinates to be the plot location for that plot identifier; and
  - (e) must confirm that the geographic coordinates of the plot location listed by the GPS for each plot identifier are within  $\pm 1$  metres of the geographic coordinates specified by the EPA as the Easting and Northing for that plot identifier under Part 2, clause (1)(d)(ii); and
  - (f) if unable to comply with paragraph (e) must not use a GPX file as the source of information to determine plot locations.
- (2) An FMA participant that requests the EPA to supply permanent sample plot identifiers and locations in a shapefile will receive a shapefile that comprises a set of point features for which:
- (a) each point in the feature set is a permanent sample plot location; and
  - (b) the attributes of each point are:
    - (i) the plot identifier; and
    - (ii) the Easting and Northing of the plot location given in the NZTM2000 map projection in relation to the NZGD2000 geodetic datum; and
    - (iii) the Forest Class of the forest land on which the plot is located; and
  - (c) the name of each attribute in the shapefile is given in Table 1.



**Table 1.** Definition of point feature attributes in a shapefile.

Attribute	Attribute Name
Plot Identifier	Plot ID
Easting	Easting
Northing	Northing
Forest Class	For_Cla

- (3) An FMA participant that requests the EPA to supply permanent sample plot identifiers and locations in a CSV file will receive a file that:
- (a) comprises a set of records, with each record:
    - (i) consisting of a variable-length character string split into three data fields, with each data field separated by a comma; and
    - (ii) if not the last record in the file, terminated by a carriage return and line-feed character; and
  - (b) has as the character string in each record:
    - (i) if the first record, a header that indicates the three data fields in each subsequent record are the plot identifier and the Easting and Northing of the plot location;
    - (ii) if other than the first record, the value of the plot identifier and the values of the Easting and Northing of the plot location associated with that plot identifier.
- (4) An FMA participant that has received from the EPA a shapefile or CSV file containing the identifiers and locations of permanent sample plots specified under Part 2, clause (1)(d), and who wishes to use that information as the basis for determining the location of those plots must:
- (a) convert the information in the shapefile or CSV file to a form that can be uploaded to a GPS, and once converted upload the information to the GPS receiver that will be used to determine the locations of the plots; and
  - (b) ensure the GPS is set to the NZTM2000 map projection, and to the NZGD2000 geodetic datum or if that datum is not available to the WGS84 datum; and
  - (c) confirm that all plot identifiers specified under Part 2, clause (1)(d) are stored in the GPS; and
  - (d) confirm that the geographic coordinates stored in the GPS for each plot identifier are within  $\pm 1$  metres of the geographic coordinates specified under clause Part 2, clause (1)(d)(ii) for that plot identifier; and
  - (e) if unable to comply with paragraph (d), not use the information uploaded to the GPS as the source of information to determine plot locations.

## Part 4 Specifying Tree Species in Relation to Collecting and Recording FMA Information

- (1) An FMA participant that under the *Field Measurement Approach Standard* [Part 7, clause (8)] elects to collect FMA information at permanent sample plots in relation to particular tree species only, must:
- (a) nominate each tree species for which FMA information is to be collected from the list of tree species provided in Appendix 1, Table A3.1 or A3.2; and
  - (b) when notifying the EPA of the specific tree species to be nominated, specify the botanical name of each tree species as given in Appendix 1, Table A3.1 or A3.2.
- (2) An FMA participant that is required to record the tree species when collecting FMA information under the *Field Measurement Approach Standard*:



- (a) must identify the individual tree species and record the species code associated with its botanical name as listed in Appendix 1, Tables A3.1 or A3.2 if:
  - (i) the tree species is a species nominated under Part 7, clause (8) of the *Field Measurement Approach Standard*; or
  - (ii) intermingled trees are present and the species has been identified as either the intended predominant species, or the predominant species at the time of measurement; and
- (b) must in circumstances not subject to paragraph (a):
  - (i) if the individual tree species can be identified, record the species code associated with its botanical name as listed in Appendix 1, Table A3.1 or A3.2; or
  - (ii) if the individual tree species cannot be identified but the Species Sub-group of the species as listed in Table A2 of Appendix 1 can be identified, record the associated Species Sub-group code in that table; or
  - (iii) if neither the individual tree species nor the Species Sub-group of the tree species can be identified, identify the Species Group of the species as listed in Table A1 of Appendix 1 and record the associated Species Group code in that Table.
- (3) For avoidance of doubt, the inclusion of a species as a tree species in Appendix 1 does not guarantee the species is a forest species at the location in which the tree species is growing.

## Part 5 Options for Submission of FMA Information

- (1) The FMA information required to be collected and recorded under the regulations or the *Field Measurement Approach Standard* must be submitted to the EPA by:
  - (a) manually entering all information using the on-line submission process available at [www.mpi.govt.nz](http://www.mpi.govt.nz); or
  - (b) manually entering a sub-set of the information on-line at [www.mpi.govt.nz](http://www.mpi.govt.nz), with the remainder of the information submitted in digital form as an XML (extensible mark-up language) file.
- (2) If FMA information is submitted to the EPA under clause (1)(b):
  - (a) the information listed in Appendix 2, Table A1 must be entered manually; and
  - (b) an XML file containing the remainder of the information must be created by the FMA participant, and uploaded electronically as part of the on-line submission process available at [www.mpi.govt.nz](http://www.mpi.govt.nz).
- (3) An FMA participant that creates an XML file for the purposes of submitting FMA information to the EPA:
  - (a) must ensure the file complies with the XML Schema given in Appendix 3; and
  - (b) must include in the file information on those parameters listed in Appendix 2, Tables A2.1 – A2.9, when information on those parameters is required to be submitted to the EPA under the regulations [or *Field Measurement Approach Standard*]; and
  - (c) must, if including in the file information referenced under paragraph (b):
    - (i) ensure that the information for each parameter complies with the allowable values listed in Appendix 2, Tables A2.1 – A2.9; and
    - (ii) assign a value for each parameter to the associated XML element named in Appendix 2, Tables A2.1 – A2.9; and
  - (d) if it is optional under the regulations (or the *Field Measurement Approach Standard*) to include information on any parameter listed in Appendix 2, Tables A2.1 – A2.9, must ensure such information complies with paragraphs (c)(i) and (c)(ii); and
  - (e) must not include in the file any XML element listed in Appendix 2, Tables A2.1 – A2.9, that has not been assigned a value under paragraph (c)(ii).



## APPENDIX 1

### Lists of Tree Species Groups, Tree Species Sub-groups, and Tree Species

Table A1. Tree Species Groups

Species Group	Species Group code	Common name
<i>Pinus radiata</i>	SGRAD	Radiata pine; pine
Douglas fir	SGDOU	Douglas fir
Exotic hardwoods	SGEXH	Exotic hardwoods
Exotic softwoods	SGEXS	Exotic softwoods (except pine or Douglas fir)
Indigenous forest	SGIND	Indigenous

Table A2. Tree Species Sub-groups

Exotic species	
<i>Species Sub-group</i>	<i>Sub-group code</i>
Acacias	EXACA
Maples/birches	EXACE
Cedars/firs/larches/spruces	EXPIC
Cypresses	EXCUP
Eucalypts	EXEUC
Beeches/oaks	EXFAG
Poplars/aspens/alders	EXPOP
Pines	EXPIN
Willows	EXSAL
Indigenous species	
<i>Species Sub-group</i>	<i>Sub-group code</i>
Beeches	INNOT
Broadleaved species	INBRL
Coprosmas	INCOP
Manuka/kanuka	INLEP
Pittosporums	INPIT
Podocarps	INPOD
Tree ferns	INCYA



Table A3.1. Exotic Tree species

Exotic species			
Botanical name	Common name	Tree species code	Species Group
<i>Abies amabilis</i>	Pacific silver fir	ABAMA	Exotic softwood
<i>Abies concolor</i>	White fir	ABCON	Exotic softwood
<i>Abies grandis</i>	Grand fir	ABGRA	Exotic softwood
<i>Acacia dealbata</i>	Silver wattle	AADLB	Exotic hardwood
<i>Acacia mearnsii</i>	Black wattle	AAMNI	Exotic hardwood
<i>Acacia melanoxylon</i>	Blackwood	AAMEL	Exotic hardwood
<i>Acer pseudoplatanus</i>	Sycamore	ACPSE	Exotic hardwood
<i>Acer rubrum</i>	Swamp or soft maple	ACRUB	Exotic hardwood
<i>Acer saccharum</i>	Sugar or hard maple	ACSAC	Exotic hardwood
<i>Alnus glutinosa</i>	Black alder	ALGLU	Exotic hardwood
<i>Castanea sativa</i>	Spanish chestnut	CASAT	Exotic hardwood
<i>Catalpa speciosa</i>	Northern catalpa	CASPA	Exotic hardwood
<i>Cedrus deodara</i>	Deodar cedar	CEDEO	Exotic softwood
<i>Chamaecyparis lawsoniana</i>	Lawson cypress	CHLAW	Exotic softwood
<i>Cryptomeria japonica</i>	Japanese cedar	CRJAP	Exotic softwood
<i>Cupressocyparis leylandii</i>	Leyland cypress	CCLEY	Exotic softwood
<i>Cupressus arizonica</i>	Arizona cypress	CUARZ	Exotic softwood
<i>Cupressus lusitanica</i>	Mexican cypress	CULUS	Exotic softwood
<i>Cupressus macrocarpa</i>	Macrocarpa	CUMAC	Exotic softwood
<i>Eucalyptus botryoides</i>	–	EUBOT	Exotic hardwood
<i>Eucalyptus camaldulensis</i>	–	EUCAM	Exotic hardwood
<i>Eucalyptus citriodora</i>	–	EUCIT	Exotic hardwood
<i>Eucalyptus cladocalyx</i>	–	EUCLA	Exotic hardwood
<i>Eucalyptus dalrympleana</i>	–	EUDRY	Exotic hardwood
<i>Eucalyptus deglupta</i>	–	EUDEG	Exotic hardwood
<i>Eucalyptus delegatensis</i>	–	EUDEL	Exotic hardwood
<i>Eucalyptus dendromorpha</i>	–	EUDEN	Exotic hardwood
<i>Eucalyptus fastigata</i>	–	EUFAS	Exotic hardwood
<i>Eucalyptus fraxinoides</i>	–	EUFRA	Exotic hardwood
<i>Eucalyptus globoidea</i>	–	EUGBA	Exotic hardwood
<i>Eucalyptus globulus</i>	–	EUGLO	Exotic hardwood
<i>Eucalyptus grandis</i>	–	EUGRN	Exotic hardwood
<i>Eucalyptus microcorys</i>	–	EUMIC	Exotic hardwood
<i>Eucalyptus muellerana</i>	–	EUMUL	Exotic hardwood
<i>Eucalyptus nitens</i>	–	EUNIT	Exotic hardwood
<i>Eucalyptus obliqua</i>	–	EUOBL	Exotic hardwood



Exotic species			
<i>Botanical name</i>	<i>Common name</i>	<i>Tree species code</i>	<i>Species Group</i>
<i>Eucalyptus ovata</i>	–	EUOVA	Exotic hardwood
<i>Eucalyptus pilularis</i>	–	EUPIL	Exotic hardwood
<i>Eucalyptus regnans</i>	–	EUREG	Exotic hardwood
<i>Eucalyptus robusta</i>	–	EUROB	Exotic hardwood
<i>Eucalyptus saligna</i>	–	EUSAL	Exotic hardwood
<i>Eucalyptus tereticornis</i>	–	EUTER	Exotic hardwood
<i>Fagus sylvatica</i>	European or common beech	FASYL	Exotic hardwood
<i>Juglans nigra</i>	Black Walnut	JUNIG	Exotic hardwood
<i>Larix decidua</i>	European larch	L.DEC	Exotic softwood
<i>Larix kaempferi</i>	Japanese larch	L.KAE	Exotic softwood
<i>Paulownia tomentosa</i>	Foxglove tree	PATOM	Exotic hardwood
<i>Picea abies</i>	Norway spruce	PIABI	Exotic softwood
<i>Picea sitchensis</i>	Sitka spruce	PISIT	Exotic softwood
<i>Pinus aycahuite</i>	–	P.AYA	Exotic softwood
<i>Pinus banksiana</i>	Jack pine	P.BAN	Exotic softwood
<i>Pinus caribaea</i>	Caribbean pine	P.CRB	Exotic softwood
<i>Pinus contorta</i>	Lodgepole pine	P.CON	Exotic softwood
<i>Pinus echinata</i>	Shortleaf pine	P.ECH	Exotic softwood
<i>Pinus elliotii</i>	Slash pine	P.ELL	Exotic softwood
<i>Pinus lambertiana</i>	Sugar cone pine	P.LAM	Exotic softwood
<i>Pinus monticola</i>	West white pine	P.MTC	Exotic softwood
<i>Pinus muricata</i>	Muricata pine	P.MCA	Exotic softwood
<i>Pinus nigra</i>	Black pine	P.NIG	Exotic softwood
<i>Pinus nigra ssp. laricio</i>	Corsican pine	P.LCO	Exotic softwood
<i>Pinus nigra ssp. nigra</i>	Austrian pine	P.AUS	Exotic softwood
<i>Pinus palustris</i>	Longleaf pine	P.PAL	Exotic softwood
<i>Pinus patula</i>	Patula pine	P.PTA	Exotic softwood
<i>Pinus pinaster</i>	Maritime pine	P.PIN	Exotic softwood
<i>Pinus ponderosa</i>	Ponderosa pine	P.PON	Exotic softwood
<i>Pinus radiata</i>	Radiata pine; pine	P.RAD	Pinus radiata
<i>Pinus strobus</i>	White pine	P.STB	Exotic softwood
<i>Pinus sylvestris</i>	Scot's pine	P.SYL	Exotic softwood
<i>Pinus taeda</i>	Loblolly pine	P.TAE	Exotic softwood
<i>Populus alba</i>	Silver poplar	POPAL	Exotic hardwood
<i>Populus deltoides</i>	American cottonwood, Frimley poplar	POPDE	Exotic hardwood
<i>Populus nigra 'Italica'</i>	Lombardy poplar	POPNI	Exotic hardwood





Exotic species			
<i>Botanical name</i>	<i>Common name</i>	<i>Tree species code</i>	<i>Species Group</i>
<i>Populus yunnanensis</i>	Chinese or Yunnan poplar	POPYU	Exotic hardwood
<i>Pseudotsuga menziesii</i>	Douglas fir	PSMEN	Douglas fir
<i>Quercus robur</i>	Common oak	QUERO	Exotic hardwood
<i>Robinia pseudoacacia</i>	Robinia	RBPSE	Exotic hardwood
<i>Salix alba (and varieties)</i>	Golden willow	S.ALB	Exotic hardwood
<i>Salix matsudana (and varieties)</i>	Matsudana willow	S.MAT	Exotic hardwood
<i>Sequoia sempervirens</i>	Coast redwood	SQSEM	Exotic softwood
<i>Syncarpia glomulifera</i>	Turpentine tree	SYGLO	Exotic hardwood
<i>Thuja plicata</i>	Western red cedar	THPLI	Exotic softwood

Table A3.2. Indigenous tree species

Indigenous species			
<i>Botanical name</i>	<i>Common name</i>	<i>Tree species code</i>	<i>Species Group</i>
<i>Agathis australis</i>	Kauri	AGAAUS	Indigenous forest
<i>Alectryon excelsus</i>	Titoki	ALEEXC	Indigenous forest
<i>Aristotelia serrata</i>	Wineberry	ARISER	Indigenous forest
<i>Beilschmiedia tarairi</i>	Tarairi	BELTAR	Indigenous forest
<i>Beilschmiedia tawa</i>	Tawa	BELTAW	Indigenous forest
<i>Brachyglottis repanda</i>	Rangiora	BRAREP	Indigenous forest
<i>Carpodetus serratus</i>	Marble leaf	CARSER	Indigenous forest
<i>Coprosma grandifolia</i>	Kanono	COPGRA	Indigenous forest
<i>Coprosma propinqua</i>	Mingimingi	COPPRO	Indigenous forest
<i>Coprosma robusta</i>	Karamu	COPROB	Indigenous forest
<i>Cordyline australis</i>	Cabbage tree	CORAUS	Indigenous forest
<i>Corynocarpus laevigatus</i>	Karaka	CORLAE	Indigenous forest
<i>Cyathea cunninghamii</i>	Gully fern	CYACUN	Indigenous forest
<i>Cyathea dealbata</i>	Silver tree fern	CYADEA	Indigenous forest
<i>Cyathea medullaris</i>	Black tree fern	CYAMED	Indigenous forest
<i>Cyathea smithii</i>	Soft tree fern	CYASMI	Indigenous forest
<i>Dacrycarpus dacrydioides</i>	Kahikatea	DACDAC	Indigenous forest
<i>Dacrydium cupressinum</i>	Rimu	DACCUP	Indigenous forest
<i>Dicksonia fibrosa</i>	Wheki-ponga	DICFIB	Indigenous forest
<i>Dicksonia squarrosa</i>	Wheki	DICSQU	Indigenous forest
<i>Dodonaea viscosa</i>	Akeake	DODVIS	Indigenous forest
<i>Dysoxylum spectabile</i>	Kohekohe	DYSSPE	Indigenous forest



Indigenous species			
<i>Botanical name</i>	<i>Common name</i>	<i>Tree species code</i>	<i>Species Group</i>
<i>Elaeocarpus dentatus</i>	Hinau	ELADEN	Indigenous forest
<i>Elaeocarpus hookerianus</i>	Pokaka	ELAHOO	Indigenous forest
<i>Fuschia excorticata</i>	Kotukutuku	FUCEXO	Indigenous forest
<i>Griselinia littoralis</i>	Shining broadleaf	GRILIT	Indigenous forest
<i>Hedycarya arborea</i>	Pidgeonwood	HEDARB	Indigenous forest
<i>Hoheria angustifolia</i>	Narrow-leaved lacebark	HOHANG	Indigenous forest
<i>Hoheria populnea</i>	Lacebark	HOHPOP	Indigenous forest
<i>Ixerba brexioides</i>	Tawari	IXEBRE	Indigenous forest
<i>Knightia excelsa</i>	Rewarewa	KNIEXE	Indigenous forest
<i>Kunzea ericoides</i>	Kanuka	KUNERI	Indigenous forest
<i>Lagarostrobos colensoi</i>	Silver pine	LAGCOL	Indigenous forest
<i>Laurelia novae-zelandiae</i>	Pukatea	LAUNOV	Indigenous forest
<i>Leptospermum scoparium</i>	Manuka	LEPSCO	Indigenous forest
<i>Libocedrus bidwillii</i>	Pahautea	LIBBID	Indigenous forest
<i>Libocedrus plumosa</i>	Kawaka	LIBPLU	Indigenous forest
<i>Litsea calicaris</i>	Mangeao	LITCAL	Indigenous forest
<i>Melicytus lanceolatus</i>	Narrow-leaved mahoe	MELLAN	Indigenous forest
<i>Melicytus ramiflorus</i>	Mahoe	MELRAM	Indigenous forest
<i>Metrosideros excelsa</i>	Pohutukawa	METEXC	Indigenous forest
<i>Metrosideros robusta</i>	Rata	METROB	Indigenous forest
<i>Metrosideros umbellata</i>	Southern rata	METUMB	Indigenous forest
<i>Monoao colensoi</i>	–	MONCOL	Indigenous forest
<i>Myoporum laetum</i>	Ngaio	MYOLAE	Indigenous forest
<i>Myrsine australis</i>	Mapou	MYRAUS	Indigenous forest
<i>Myrsine salicina</i>	Toro	MYRSAL	Indigenous forest
<i>Nestigis cunninghamii</i>	Black maire	NECUN	Indigenous forest
<i>Nestigis lanceolata</i>	White maire	NESLAN	Indigenous forest
<i>Nestigis montana</i>	Narrow-leave maire	NESMON	Indigenous forest
<i>Nothofagus fusca</i>	Red beech	NOTFUS	Indigenous forest
<i>Nothofagus menziesii</i>	Sliver beech	NOTMEN	Indigenous forest
<i>Nothofagus solandri var. cliffortioides</i>	Mountain beech	NOTCLI	Indigenous forest
<i>Nothofagus solandri var. solandri</i>	Black beech	NOTSOL	Indigenous forest
<i>Nothofagus truncata</i>	Hard beech	NOTTRU	Indigenous forest
<i>Olearia paniculata</i>	Akiraho	OLEPAN	Indigenous forest
<i>Olearia rani</i>	Heketara	OLERAN	Indigenous forest
<i>Olearia traversii</i>	Akeake	OLETRA	Indigenous forest
<i>Paratrophis banksii</i>	Towai	PARBAN	Indigenous forest



Indigenous species			
<i>Botanical name</i>	<i>Common name</i>	<i>Tree species code</i>	<i>Species Group</i>
<i>Paratrophis microphylla</i>	Turepo	PARMIC	Indigenous forest
<i>Pennantia corymbosa</i>	Kaikomako	PENCOR	Indigenous forest
<i>Phyllocladus alpinus</i>	<i>Mountain toatoa</i>	<i>PHYALP</i>	<i>Indigenous forest</i>
<i>Phyllocladus glaucus</i>	Toatoa	PHYGLA	Indigenous forest
<i>Phyllocladus trichomanoides</i>	Tanekaha	PHYTRI	Indigenous forest
<i>Pittosporum crassifolium</i>	Karo	PITCRA	Indigenous forest
<i>Pittosporum eugenioides</i>	Tarata	PITEUG	Indigenous forest
<i>Pittosporum tenuifolium</i>	Kohuhu	PITTEN	Indigenous forest
<i>Plagianthus regius</i>	Ribbonwood	PLAREG	Indigenous forest
<i>Podocarpus hallii</i>	Hall's totara	PODHAL	Indigenous forest
<i>Podocarpus totara</i>	Totara	PODTOT	Indigenous forest
<i>Prumnopitys ferruginea</i>	Miro	PRUFER	Indigenous forest
<i>Prumnopitys taxifolia</i>	Matai	PRUTAX	Indigenous forest
<i>Pseudopanax arboreus</i>	Five finger	PSEARB	Indigenous forest
<i>Pseudopanax colensoi</i>	Five finger	PSECOL	Indigenous forest
<i>Pseudopanax crassifolius</i>	Lancewood	PSECRA	Indigenous forest
<i>Pseudowintera colorata</i>	Horopito	PSEWCO	Indigenous forest
<i>Quintinia acutifolia</i>	Westland quintinia	QUIACU	Indigenous forest
<i>Quintinia serrata</i>	Tawherowhero	QUISER	Indigenous forest
<i>Raukawa edgerleyi</i>	Raukawa	RAUEDG	Indigenous forest
<i>Raukawa simplex</i>	–	RAUSIM	Indigenous forest
<i>Rhopalostylis sapida</i>	Nikau palm	RHOSAP	Indigenous forest
<i>Schefflera digitata</i>	Pate	SCHDIG	Indigenous forest
<i>Sophora microphylla</i>	Kowhai	SOPMIC	Indigenous forest
<i>Sophora tetraptera</i>	Kowhai	SOPTET	Indigenous forest
<i>Syzygium maire</i>	Swamp maire	SYZMAI	Indigenous forest
<i>Toronia toru</i>	Toru	TORTOR	Indigenous forest
<i>Vitex lucens</i>	Puriri	VITLUC	Indigenous forest
<i>Weinmannia racemosa</i>	Kamaha	WEIRAC	Indigenous forest
<i>Weinmannia silvicola</i>	Tawhero	WEISIL	Indigenous forest



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## APPENDIX 2

### Specification of the Information to be Provided when Supplying an XML File

#### Information to Identify an FMA participant and Details Related to FMA Information Submission

**Table A1.** Information to be entered manually as part of submission of FMA Information using an XML file

Parameter	Allowable Values
<i>Identification details:</i>	
Scheme type	ETS (Post-1989), PFSI
participant name	Text – unlimited characters
participant holding account number	NZETR number – 10 characters maximum
Submitter name	Text – 50 characters maximum
<i>Submission details:</i>	
FMA information supplied for	All plots, Subset of plots
FMA information type	Plot, Silviculture, Adverse events
Date the plots for which FMA information is being supplied were allocated	Date – DD-MM-YYYY (must be a value supplied by the EPA)
<i>Key FMA choices made:</i>	
Information collected for shrubs	Yes, No (for all land if Forest Class not assigned, or for each defined Forest Class) – must be “Yes” if information is also being collected for small live trees (those with a diameter at breast height of less than 25 mm, and a height of at least 300 mm)
Information collected for small live trees (those with a diameter at breast height of less than 25 mm, and a height of at least 300 mm)	Yes, No (for all land if Forest Class has not been assigned, or for each assigned Forest Class)
Nominated tree species	Selected from Appendix 1, Tables A3.1 or A3.2 (if a nominated tree species list is to be created or updated)
Nominated tree species single list used	Yes, No (if ‘Yes’, a single list must be used for all land – and must be “Yes” if nominated species are used and Forest Class has not been assigned, or if “No” then a separate list can be used for each assigned Forest Class)
<i>Information collection:</i>	
Inventory provider used	Yes, No
Inventory provider name	Text – 100 characters maximum
Inventory personnel names	Text – 100 characters maximum



## Forest Information Included in an XML File

**Table A2.1.** Forest information included in an XML file under the ForestInfo element

Parameter	XML Element Name	Allowable Values
Scheme type	participantSchemeType	ETS (post-1989), PFSI
participant name	participantName	Text – unlimited characters
participant holding account number	participantNzeurNumber	NZETR number – 10 characters maximum Text
Submitter name	SubmitterName	– 50 characters maximum
FMA information supplied for	FmaInfoSuppliedFor	All plots, Subset of plots
FMA information type	FmaInfoType	Plot, Silviculture, Adverse events
Date the plots for which FMA information is being supplied were allocated	DatePlotsAllocated	Date – YYYY-MM-DD (must be supplied by EPA)

## Permanent Sample Plot Information Included in an XML File

**Table A2.2.** Permanent sample plot information included in an XML file under the SPInfo element

Parameter	XML Element Name	Allowable Values
Plot identifier	PlotID	1, 2, 3 ... n – positive integer (use value set by EPA)
<i>Coordinates of position navigated to:</i>		
– Easting	PositionNavigatedToEasting	Averaged value from GPS (m) – positive integer
– Northing	PositionNavigatedToNorthing	Averaged value from GPS (m) – positive integer
<i>Coordinates of plot centre point:</i>		
– Easting	PlotCentrePointEasting	Averaged value from GPS (m) – positive integer
– Northing	PlotCentrePointNorthing	Averaged value from GPS (m) – positive integer
– Altitude	PlotCentrePointAltitude	Averaged value from GPS (m) – non-negative integer
Plot area	PlotArea	One of (ha): 0.030, 0.040, 0.060, 0.100, 0.200
Plot shape	PlotShape	Circular, Square
Plot average maximum slope	PlotAverageMaxSlope	Measured value (°) – non-negative integer
<i>Plot dimensions:</i>		
– Radius ( $r_p$ )	PlotRadius	Calculated value (m) – positive real number rounded to 2 decimal places
– Length ( $l_p$ )	PlotLength	Calculated value (m) – positive real number rounded to 2 decimal places
<i>Slope-adjusted plot dimensions:</i>		
– Slope-adjusted radius ( $r_{p-s}$ )	PlotSlopeAdjRadius	Calculated value (m) – positive real number rounded to 2 decimal places
– Slope-adjusted length ( $l_{p-s}$ )	PlotSlopeAdjLength	Calculated value (m) – positive real number rounded to 2 decimal places
Plot extends beyond forest land boundary	PlotExtendsBeyondBdry	Yes, No
– Plot percentage area within boundary	PlotPercentAreaWithinBdry	Estimated value (%) – positive integer (1–99)
<i>Table A2.2 continues on the next page</i>		



Table A2.2. continued

Parameter	XML Element Name	Allowable Values
Plot centre point relocated	PlotCentrePointRelocated	Yes, No
– Plot relocated reason	PlotRelocatedReason	Forest land edge, Forest Class edge, Silvicultural trial, Old trees present
Plot centre point re-established	PlotCentrePointReestablished	Yes, No
Plot data collection start date	DateFmalInfoCollectionStarted	YYYY-MM-DD – positive integers comprising a date

### Shrub Information Included in an XML File

Table A2.3. Shrub information included in an XML file under the ShrubInfo<sup>1</sup> or ShrubTypeInfo<sup>2</sup> elements, in relation to live shrubs only.

Parameter	XML Element Name	Allowable Values
Shrubs present	ShrubsPresent <sup>1</sup>	Yes, No
<i>If shrubs are present, the following must be included in relation to <u>all</u> shrubs present if:</i>		
<ul style="list-style-type: none"> <li>trees are recorded as being absent in the permanent sample plot or sub-plot; or</li> <li>it is likely the shrubs first established more than two years before or after those trees that are recorded as being present.</li> </ul>		
– Year first regenerated	RegeneratedYear <sup>1</sup>	YYYY – positive integer comprising a valid year
<i>If shrubs are present, the following must be included for each Shrub Type present:</i>		
– Shrub type	ShrubType <sup>2</sup>	Manuka/Kanuka, Tauhinu, Other indigenous shrubs, Gorse, Broom, Other exotic shrubs
– Crown cover for that shrub type	ShrubTypeCrownCover <sup>2</sup>	Estimated average value (%) – positive integer (1–100)
– Average height for that shrub type	ShrubTypeAverageCrownHeight <sup>2</sup>	Estimated average value (m) – positive real number rounded to 2 decimal places



## Tree Information Included in an XML File

**Table A2.4.a.** Tree information always included in an XML file under the TreeInfo element – in relation to all live and standing dead trees for those trees for which diameter at breast height (DBH) or collar diameter is measured, and/or for live trees only for those small trees for which an average collar diameter is estimated\*\*.

Parameter	XML Element Name	Allowable Values
Trees present	TreesPresent	Yes, No
<i>If trees are present, the following must be included in relation to all trees:</i>		
Low count of live DBH-measured stems	LowStemCount	Yes, No
– Reason for low count of live DBH-measured stems	LowStemCountReason	Stems below DBH threshold, Low final stocking, Maximum plot area used, Unstocked area present, Other
Intermingled trees present	IntermingledTreesPresent	Yes, No
<i>If trees are absent, the following must be included:</i>		
– Reason for absence	TreesAbsentReason	Unstocked due to harvesting, Unstocked due to thinning, Unstocked due to an adverse event, Trees below stem diameter or height thresholds, No nominated tree species present, Permanently unstocked area, PFSI non-eligible forest, Other
– Species Group assigned if trees absent	TreesAbsentAssignedSpeciesGroup	Tree Species Group code – see <i>Table A1</i> in <i>Appendix 1</i> of this Standard

**Table A2.4.b.** Additional tree information included in an XML file under the TreeInfo element when intermingled trees are absent – in relation to all live and standing dead trees for those trees for which diameter at breast height (DBH) or collar diameter is measured, and/or for live trees only for those small trees for which an average collar diameter is estimated\*\*. (Note: if intermingled trees are present, record the alternative additional information in Table A2.4.c.)

Parameter	XML Element Name	Allowable Values
Planted trees present	PlantedTreesPresent	Yes, No
– Planted stocking	PlantedStocking	Counted or estimated value (st/ha) – positive integer
– Planting year	PlantingYear	YYYY – positive integer comprising a valid year
– Planting month	PlantingMonth	MM – positive integer a valid month
Regenerated trees present	RegeneratedTreesPresent	Yes, No
– Year first regenerated	RegeneratedYear	YYYY – positive integer comprising a valid year
– Month first regenerated	RegeneratedMonth	MM – positive integer comprising a valid month

\*\* Under the *Field Measurement Approach Standard (Part 8)*, average collar diameters may be estimated for those live tree stems that have a diameter at breast height (DBH) of less than 25 mm and a height of at least 300 mm.





**Table A2.4.c.** Additional tree information included in an XML file under the TreeInfo element when intermingled trees are present – in relation to all live and standing dead trees for those trees for which diameter at breast height (DBH) or collar diameter is measured, and/or for live trees only for those small trees for which an average collar diameter is estimated\*\*. (Note: if intermingled trees are absent, record the alternative additional information in Table A2.4.b.)

Parameter	XML Element Name	Allowable Values
Intended predominant species	IntendedPredominantSpecies	Species code – see Part 4 and Appendix 1 of this Standard
<i>If the predominant species at the time of measurement is <u>not</u> the intended predominant species, the following must be included:</i>		
Predominant species at time of measurement	PsmSpecies	Species code – see Part 4 and Appendix 1 of this Standard
<i>The following must be included for trees comprising the <u>intended predominant species</u> only – except if those trees include trees planted in more than one year, record the information below for those trees planted at any time during the first year in which planting occurred only:</i>		
Planted trees present	PlantedTreesPresent	Yes, No
– Planted stocking	PlantedStocking	Counted or estimated value (st/ha) – positive integer
– Planting year	PlantingYear	YYYY – positive integer comprising a valid year
– Planting month	PlantingMonth	MM – positive integer a valid month
– Information for oldest planted trees only	PlantedTreeInfoForOldestOnly	Yes, No
Regenerated trees present	RegeneratedTreesPresent	Yes, No
– Year first regenerated	RegeneratedYear	YYYY – positive integer comprising a valid year
– Month first regenerated	RegeneratedMonth	MM – positive integer comprising a valid month
<i>If the intended predominant species is not the predominant species at the time of measurement, the following must be included for the trees comprising the <u>predominant species at the time of measurement</u> only – except if those trees include trees planted in more than one year, record the information below for those trees planted at any time during the first year in which planting occurred only:</i>		
Planted trees present	PsmPlantedTreesPresent	Yes, No
– Planted stocking	PsmPlantedStocking	Counted or estimated value (st/ha) – positive integer
– Planting year	PsmPlantingYear	YYYY – positive integer comprising a valid year
– Planting month	PsmPlantingMonth	MM – positive integer a valid month
– Information for oldest planted trees only	PsmPlantedTreeInfoForOldestOnly	Yes, No
Regenerated trees present	PsmRegeneratedTreesPresent	Yes, No
– Year first regenerated	PsmRegeneratedYear	YYYY – positive integer comprising a valid year
– Month first regenerated	PsmRegeneratedMonth	MM – positive integer comprising a valid month

\*\* Under the *Field Measurement Approach Standard* (Part 8), average collar diameters may be estimated for those live tree stems that have a diameter at breast height (DBH) of less than 25 mm and a height of at least 300 mm.



### Silvicultural Information Included in an XML File

**Table A2.5.** Silvicultural information included in an XML file under the *SilviInfo*<sup>1</sup> or *ThinningInfo*<sup>2</sup> elements. Information is included in relation to all trees when intermingled trees are absent. If intermingled trees are present, information is included in relation to the trees comprising the intended predominant species only – except that if those trees include trees planted in more than one year, record the information in the Table for those trees planted at any time during the first year in which planting occurred only.

Parameter	XML Element Name	Allowable Values
Trees subject to pruning (at any time since planting/regeneration)	TreesSubjectToPruning <sup>1</sup>	Yes, No
Trees subject to thinning (at any time since planting/regeneration)	TreesSubjectToThinning <sup>1</sup>	Yes, No
<i>If trees are subject to thinning, the following must be present for each thinning event:</i>		
– Thinning identifier	ThinningID <sup>2</sup>	1, 2, 3, .... n – positive integer
– Thinning year	ThinningYear <sup>2</sup>	YYYY – positive integer comprising a valid year
– Thinning month	ThinningMonth <sup>2</sup>	MM – positive integers comprising a valid month
– Post-thinning residual stocking (of live stems)	ResidualStocking <sup>2</sup>	Counted or estimated value (st/ha) – non-negative integer
– Residual stocking determined by	ResidualStockingDeterminedBy <sup>2</sup>	Counting, Estimation
– Stocking estimation method	ResidualStockingEstBy <sup>2</sup>	Stand records, Quality control data, Contractor payment records, Personal knowledge of owner or consultant, Other
– Majority of thinnings remain on site	ThinningsRemainOnSite <sup>2</sup>	Yes, No

### Adverse Event Information Included in an XML File

**Table A2.6.** Adverse event information included in an XML file under the *AdverseInfo*<sup>1</sup> or *AdverseEventInfo*<sup>2</sup> elements. Information is included in relation to all trees when intermingled trees are absent. If intermingled trees are present, information is included in relation to the trees comprising the intended predominant species only – except that if those trees include trees planted in more than one year, record the information in the Table for those trees planted at any time during the first year in which planting occurred only.

Parameter	XML Element Name	Allowable Values
Trees subject to adverse events (at any time since planting/regeneration)	TreesSubjectToAdverseEvents <sup>1</sup>	Yes, No
<i>If trees have been subject to any adverse events, the following must be present for each adverse event:</i>		
– Adverse event identifier	EventID <sup>2</sup>	1, 2, 3, .... n – positive integer
– Adverse event year	EventYear <sup>2</sup>	YYYY – positive integer comprising a valid year
– Adverse event month	EventMonth <sup>2</sup>	MM – positive integer comprising a valid year
– Adverse event type	EventType <sup>2</sup>	Fire, Wind, Erosion, Other
– Residual stocking (of live stems) after event	ResidualStockingAfterEvent <sup>2</sup>	Counted or estimated value (st/ha) – non-negative integer
– Residual stocking determined by	ResidualStockingDeterminedBy <sup>2</sup>	Counting, Estimation
– Residual stocking estimation method	ResidualStockingEstBy <sup>2</sup>	Stand records, Information from damage surveys, Personal knowledge of owner or consultant, Other
– Majority of cleared wood remains on site	ClearedWoodRemainsOnSite <sup>2</sup>	Yes, No



## Tree Stem Information Included in an XML File for Trees with Measured Stem Diameters

**Table A2.7.a.** Tree stem information included in an XML file under the StemInfo<sup>1</sup> or SGInfo<sup>2</sup> elements for both live and standing dead trees with measured stem diameters (i.e. diameter at breast height, DBH; or collar diameter). See Tables A2.7.b or A2.7.c for the information to include for small live tree stems for which average collar diameters are estimated.

Parameter	XML Element Name	Allowable Values
<i>For each stem with a measured stem diameter, the following must be present:</i>		
– Stem identifier	StemID <sup>1</sup>	1, 2, 3, ... n – positive integer; new set for each plot, sub-plot or sub-sample
– Stem establishment type code	StemEstablishmentType <sup>1</sup>	Planted, Regenerated
– Stem state code	StemState <sup>1</sup>	Live, Dead
– Stem species code	StemSpecies <sup>1</sup>	Species code – see <i>Part 4</i> , and <i>Table A3</i> in <i>Appendix 1</i> of this Standard
– Stem diameter	StemDiameter <sup>1</sup>	Measured or calculated value (mm) – positive integer
– Stem diameter type code	StemDiameterType <sup>1</sup>	DBH, CD
– Stem diameter at standard height	StemDiameterAtStdHeight <sup>1</sup>	Yes, No
– Stem diameter at standard height estimated due to presence of	StemDiameterEstReason <sup>1</sup>	Fork, Branches, Nodal swelling, Other malformation
– Stem height	StemHeight <sup>1</sup>	Measured value (m) – positive real number rounded to 1 decimal place
– Stem broken-top indicator	StemBrokenTop <sup>1</sup>	Yes, No

## Tree Stem Information Included in an XML File for Live Trees with Estimated Average Collar Diameters

**Table A2.7.b.** Tree stem information included in an XML file under the StemInfo<sup>1</sup> or SGInfo<sup>2</sup> elements if the average collar diameter of small live trees is being estimated\*\*, and intermingled live trees are absent in the permanent sample plot or sub-plot. (Note: if intermingled live trees are present, record the alternative information in Table A2.7.c.)

Parameter	XML Element Name	Allowable Values
<i>If the average collar diameter is estimated for small live trees**, the following must be included for those trees in each Species Group:</i>		
– Species Group name of stems collar diameter is estimated for	SpeciesGroupOfCollarDiameterStems <sup>2</sup>	Species Group code – see <i>Appendix 1</i> of this Standard
– Establishment type of the majority of the collar diameter stems	EstabTypeOfCollarDiameterStems <sup>2</sup>	Planted, Regenerated
– Average collar diameter of stems	AverageCollarDiameterOfStems <sup>2</sup>	Estimated value (mm) – positive integer
– Average height of collar diameter stems of average diameter	AverageHeightOfCollarDiameterStems <sup>2</sup>	Estimated value (m) – positive real number rounded to 1 decimal place
– Stocking of collar diameter stems	StockingOfCollarDiameterStems <sup>2</sup>	Estimated value (st/ha) – positive integer

\*\* Under the *Field Measurement Approach Standard* (Part 8), average collar diameters may be estimated for those live tree stems that have a diameter at breast height (DBH) of less than 25 mm and a height of at least 300 mm.



**Table A2.7.c.** Tree stem information included in an XML file under the StemInfo<sup>1</sup> or SGInfo<sup>2</sup> elements if the average collar diameter of small live trees is being estimated\*\*, and there are any intermingled live trees present in the permanent sample plot or sub-plot. (Note: if intermingled live trees are absent, record the alternative information in Table A2.7.b.)

Parameter	XML Element Name	Allowable Values
<i>If the average collar diameter of small live trees is being estimated**, the following must be included for those small live trees comprising the intended predominant species only:</i>		
– Species code of stems the collar diameter is estimated for	SpeciesOfCollarDiameterStems <sup>2</sup>	Species code (see Part 4, and Table A3 in Appendix 1, of this Standard)
– Species Group name of stems collar diameter is estimated for	SpeciesGroupOfCollarDiameterStems <sup>2</sup>	Species Group code – see Appendix 1 of this Standard
– Establishment type of the majority of the collar diameter stems	EstabTypeOfCollarDiameterStems <sup>2</sup>	Planted, Regenerated
– Average collar diameter of stems	AverageCollarDiameterOfStems <sup>2</sup>	Estimated value (mm) – positive integer
– Average height of collar diameter stems	AverageHeightOfCollarDiameterStems <sup>2</sup>	Estimated value (m) – positive real number rounded to 1 decimal place
<i>If the average collar diameter of small live trees is being estimated**, and the intended predominant species is not the predominant species at the time of measurement, the following must be included for those small live trees comprising the predominant species at the time of measurement only (if present):</i>		
– Species code of stems the collar diameter is estimated for	SpeciesOfCollarDiameterStems <sup>2</sup>	Species code (see Part 4, and Table A3 in Appendix 1, of this Standard)
– Species Group name of stems collar diameter is estimated for	SpeciesGroupOfCollarDiameterStems <sup>2</sup>	Species Group code – see Appendix 1 of this Standard
– Establishment type of the majority of the collar diameter stems	EstabTypeOfCollarDiameterStems <sup>2</sup>	Planted, Regenerated
– Average collar diameter of stems	AverageCollarDiameterOfStems <sup>2</sup>	Estimated value (mm) – positive integer
– Average height of collar diameter stems	AverageHeightOfCollarDiameterStems <sup>2</sup>	Estimated value (m) – positive real number rounded to 1 decimal place
– Stocking of collar diameter stems	StockingOfCollarDiameterStems <sup>2</sup>	Estimated value (st/ha) – positive integer
<i>If the average collar diameter of small live trees is being estimated**, the following must be included for all those small live trees remaining – in each Species Group – that do not comprise either the intended predominant species, or the predominant species at the time of measurement (if present):</i>		
– Species Group name of stems collar diameter is estimated for	SpeciesGroupOfCollarDiameterStems <sup>2</sup>	Species Group code – see Appendix 1 of this Standard
– Establishment type of the majority of the collar diameter stems	EstabTypeOfCollarDiameterStems <sup>2</sup>	Planted, Regenerated
– Average collar diameter of stems	AverageCollarDiameterOfStems <sup>2</sup>	Estimated value (mm) – positive integer
– Average height of collar diameter stems	AverageHeightOfCollarDiameterStems <sup>2</sup>	Estimated value (m) – positive real number rounded to 1 decimal place
– Stocking of collar diameter stems	StockingOfCollarDiameterStems <sup>2</sup>	Estimated value (st/ha) – positive integer

\*\* Under the *Field Measurement Approach Standard* (Part 8), average collar diameters may be estimated for those live tree stems that have a diameter at breast height (DBH) of less than 25 mm and a height of at least 300 mm.



### Sub-plot Information Included in an XML File

**Table A2.8.** Sub-plot information included in an XML file under the SubplotInfo element

Parameter	XML Element Name	Allowable Values
<i>If a permanent sample plot has sub-plot(s), the following must be present:</i>		
– Sub-plot identifier	SubplotID	1, 2, 3, ... N – integer; new set for each plot
– Sub-plot percentage area	SubplotPercentArea	Estimated value (%) – positive integer (1–99)

### Sub-sample Information Included in an XML File

**Table A2.9.** Sub-sample Information Included in an XML File under the SubsampleInfo Element

Parameter	XML Element Name	Allowable Values
<i>For each sub-sample in a permanent sample plot or sub-plot, the following must be present:</i>		
– Sub-sample identifier	SubsampleID	1, 2, 3, ... n – positive integer; new set for each plot or sub-plot
– Sub-sample average maximum slope	SubsampleAverageMaxSlope	Calculated value (°) – positive integer
– Sub-sample radius	SubsampleRadius	One of (m): 0.50, 1.00, 1.50, 2.00, 2.50, 3.00, 3.50, 4.00, 4.50, 5.00, 6.00, 7.00, 8.00, 9.00, 10.00, 12.00, 14.00, 16.00, 18.00, 20.00
– Sub-sample slope-adjusted radius	SubsampleSlopeAdjustedRadius	Calculated value (m) – positive real number rounded to 2 decimal places
– Sub-sample transect width (D <sub>Line-transect</sub> )	SubsampleDLineTransect	Value (m) – positive real number rounded to 2 decimal places
– Trees present	SubsampleTreePresence	Yes, No
– Reason for absence	SubsampleTreeAbsenceReason	Unstocked due to harvesting, Unstocked due to thinning, Unstocked due to an adverse event, Trees below stem diameter or height threshold, No nominated tree species present, Permanently unstocked area, PFSI non-eligible forest, Other



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## APPENDIX 3

### XML Schema to be used when Supplying FMA information Electronically

```
<?xml version="1.0" encoding="utf-8"?>
<!--
=====

Version 1.2

Ministry for Primary Industries, FMA Information Schema.

=====
-->
<xs:schema id="FMAInformation"
  elementFormDefault="qualified"
  targetNamespace="http://fma.mpi.govt.nz/FMAInformation/Schema/01/06/2016/FMAInformation.xsd"
  xmlns:tns="http://fma.mpi.govt.nz/FMAInformation/Schema/01/06/2016/FMAInformation.xsd"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <xs:element name="IntendedPredominantSpecies" type="tns:Codeset" nillable="true"/>
  <xs:element name="PredominantIntermingledSpecies" nillable="true" substitutionGroup="tns:IntendedPredominantSpecies"/>

  <xs:element name="SpeciesGroupOfCollarDiameterStems" type="tns:Codeset" />
  <xs:element name="SpeciesGroupCollarDiameterEstFor" nillable="true" substitutionGroup="tns:SpeciesGroupOfCollarDiameterStems" />

  <xs:element name="ForestInfo">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="participantSchemeType" type="tns:participantSchemeType" />
        <xs:element name="participantName" type="xs:string" />
        <xs:element name="participantNzeurNumber">
          <xs:simpleType>
            <xs:restriction base="xs:string">
              <xs:maxLength value="10" />
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```



```

    <xs:element name="SubmitterName">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:maxLength value="50" />
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="DatePlotsAllocated" type="xs:date" />
    <xs:element name="FmaInfoSuppliedFor" type="tns:FmaInfoSuppliedFor" />
    <xs:element name="FmaInfoType" type="tns:FmaInfoType" />
    <xs:element name="SamplePlotList" type="tns:SamplePlotList" />
  </xs:sequence>
</xs:complexType>
</xs:element>
<xs:complexType name="SamplePlotList">
  <xs:sequence>
    <xs:element name="SPInfo" type="tns:SPInfo" minOccurs="0" nillable="true" maxOccurs="unbounded" />
  </xs:sequence>
</xs:complexType>
<xs:complexType name="SPInfo">
  <xs:sequence>
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    <xs:element name="PlotArea" type="tns:PlotArea" />
    <xs:element name="PlotShape" type="tns:PlotShape" />
    <xs:element name="PlotAverageMaxSlope" type="xs:nonNegativeInteger" />
    <xs:choice minOccurs="1" maxOccurs="1">
      <xs:sequence>
        <xs:element name="PlotRadius" type="tns:PlotSize" minOccurs="0" nillable="true" />
        <xs:element name="PlotSlopeAdjRadius" type="tns:PlotSize" minOccurs="0" nillable="true" />
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        <xs:element name="PlotLength" type="tns:PlotSize" minOccurs="0" nillable="true" />
        <xs:element name="PlotSlopeAdjLength" type="tns:PlotSize" minOccurs="0" nillable="true" />
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    </xs:choice>
    <xs:element name="PositionNavigatedToEasting" type="xs:positiveInteger" />
    <xs:element name="PositionNavigatedToNorthing" type="xs:positiveInteger" />
    <xs:element name="PlotCentrePointEasting" type="xs:positiveInteger" />
    <xs:element name="PlotCentrePointNorthing" type="xs:positiveInteger" />
    <xs:element name="PlotCentrePointAltitude" type="xs:short" />
    <xs:element name="PlotExtendsBeyondBdry" type="tns:YesNo" />
  </xs:sequence>
</xs:complexType>

```





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<xs:element name="PlotCentrePointReestablished" type="tns:YesNo" />
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  <xs:sequence>
    <xs:element name="ShrubInfo" type="tns:ShrubInfo" minOccurs="0" nillable="true" />
    <xs:element name="TreeInfo" type="tns:TreeInfo" minOccurs="1" />
    <xs:element name="SilviInfo" type="tns:SilviInfo" minOccurs="0" nillable="true" />
    <xs:element name="AdverseInfo" type="tns:AdverseInfo" minOccurs="0" nillable="true" />
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    <xs:element name="ShrubTypeList" type="tns:ShrubTypeList" minOccurs="0" nillable="true" />
  </xs:sequence>
</xs:complexType>
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```



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</xs:element>
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</xs:complexType>
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    <xs:element name="TreesAbsentAssignedSpeciesGroup" type="tns:Codeset" minOccurs="0" nillable="true" />
    <xs:element name="IntermingledTreesPresent" type="tns:YesNo" minOccurs="0" nillable="true" />
    <xs:element ref="tns:IntendedPredominantSpecies" minOccurs="0"/>
    <xs:element name="PlantedTreesPresent" type="tns:YesNo" minOccurs="0" nillable="true" />
    <xs:element name="PlantedTreeInfoForOldestOnly" type="tns:YesNo" minOccurs="0" nillable="true" />
    <xs:element name="PlantedStocking" type="xs:positiveInteger" minOccurs="0" nillable="true" />
    <xs:element name="PlantingYear" type="tns:Year" minOccurs="0" nillable="true" />
    <xs:element name="PlantingMonth" type="tns:Month" minOccurs="0" nillable="true" />
    <xs:element name="RegeneratedTreesPresent" type="tns:YesNo" minOccurs="0" nillable="true" />
    <xs:element name="RegeneratedYear" type="tns:Year" minOccurs="0" nillable="true" />
    <xs:element name="RegeneratedMonth" type="tns:Month" minOccurs="0" nillable="true" />
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    <xs:element name="PsmSpecies" type="tns:Codeset" minOccurs="0" nillable="true" />
    <xs:element name="PsmPlantedTreesPresent" type="tns:YesNo" minOccurs="0" nillable="true" />
    <xs:element name="PsmPlantedTreeInfoForOldestOnly" type="tns:YesNo" minOccurs="0" nillable="true" />
    <xs:element name="PsmPlantedStocking" type="xs:positiveInteger" minOccurs="0" nillable="true" />
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</xs:complexType>

```



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<xs:element name="PsmPlantingMonth" type="tns:Month" minOccurs="0" nillable="true" />
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    <xs:element name="TreesSubjectToThinning" type="tns:YesNo" minOccurs="0" nillable="true" />
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  <xs:sequence>
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    <xs:element name="ThinningMonth" type="tns:Month" minOccurs="0" nillable="true" />
    <xs:element name="ResidualStocking" type="xs:nonNegativeInteger" />
    <xs:element name="ResidualStockingDeterminedBy" type="tns:ResidualStockingDeterminedBy" />
    <xs:element name="ResidualStockingEstBy" type="tns:ThinningResidualStockingEstBy" minOccurs="0" nillable="true" />
    <xs:element name="ThinningsRemainOnSite" type="tns:YesNo" />
  </xs:sequence>
</xs:complexType>

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    <xs:element name="EventType" type="tns:EventType" />
    <xs:element name="ResidualStockingAfterEvent" type="xs:nonNegativeInteger" />
    <xs:element name="ResidualStockingDeterminedBy" type="tns:ResidualStockingDeterminedBy" />
    <xs:element name="ResidualStockingEstBy" type="tns:EventResidualStockingEstBy" minOccurs="0" nillable="true" />
    <xs:element name="ClearedWoodRemainsOnSite" type="tns:YesNo" />
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    <xs:element name="StemState" type="tns:StemState" />
    <xs:element name="StemSpecies" type="tns:Codeset" />
    <xs:element name="StemDiameter" type="xs:positiveInteger" />
  </xs:sequence>
</xs:complexType>

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<xs:element name="StemDiameterType" type="tns:StemDiameterType" />
<xs:element name="StemDiameterAtStdHeight" type="tns:YesNo" />
<xs:element name="StemDiameterEstReason" type="tns:StemDiameterEstReason" minOccurs="0" nillable="true" />
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      <xs:maxInclusive value="999.9" />
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    <xs:element name="EstabTypeOfCollarDiameterStems" type="tns:StemEstablishmentType" minOccurs="0" nillable="true" />
    <xs:element name="AverageCollarDiameterOfStems">
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    </xs:element>
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        <xs:element name="TreeInfo" type="tns:TreeInfo" minOccurs="1" />
        <xs:element name="SilviInfo" type="tns:SilviInfo" minOccurs="0" nillable="true" />
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</xs:complexType>

```



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        <xs:enumeration value="PFSI" />
    </xs:restriction>

```



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</xs:simpleType>
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```





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    <xs:enumeration value="CD" />
  </xs:restriction>
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    <xs:enumeration value="Silvicultural trial" />
    <xs:enumeration value="Old trees present" />
  </xs:restriction>
</xs:simpleType>
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  <xs:restriction base="xs:string">
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    <xs:enumeration value="Tauhinu" />
    <xs:enumeration value="Other indigenous shrubs" />
    <xs:enumeration value="Gorse" />
    <xs:enumeration value="Broom" />
    <xs:enumeration value="Other exotic shrubs" />
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    <xs:enumeration value="Unstocked due to an adverse event" />
    <xs:enumeration value="Trees below stem diameter or height thresholds" />
    <xs:enumeration value="No nominated tree species present" />
    <xs:enumeration value="Permanently unstocked area" />
    <xs:enumeration value="PFSI non-eligible forest" />
    <xs:enumeration value="Other" />
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```



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        <xs:enumeration value="Quality control data" />
        <xs:enumeration value="Contractor payment records" />
        <xs:enumeration value="Personal knowledge of owner or consultant" />
        <xs:enumeration value="Other" />
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```



```

        <xs:enumeration value="Personal knowledge of owner or consultant" />
        <xs:enumeration value="Other" />
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