



Field Measurement Approach Information Standard

Emissions Trading Scheme (Forestry) ETSFMAIS.8

9 January 2023

TITLE

MPI Standard: Field Measurement Approach Information Standard

COMMENCEMENT

This MPI Standard was prescribed on 9 January 2023, and comes into force on 11 January 2023

REVOCATION

This Standard revokes and replaces the *Field Measurement Approach Information Standard* issued 12 May 2021.

ISSUING AUTHORITY

This *Field Measurement Approach Information Standard* (“the Standard”) is issued pursuant to regulation 14(1) of the Climate Change (Forestry) Regulations 2022 (“the Regulations”) which is authorised under section 163(1)(d)(ii) of the Climate Change Response Act 2002 (the Act), and Section 90 of the Act.

Dated at Wellington, 9 January 2023



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Introduction

This introduction is not part of the MPI Standard, but is intended to indicate its general effect.

Purpose

This Standard prescribes the form and electronic format of information that a Field Measurement Approach (FMA) participant will receive when allocated permanent sample plots under the Climate Change (Forestry) Regulations 2022 (“the Regulations”) by the Environmental Protection Agency (EPA), and the form and format that an FMA participant must use when submitting FMA information to the EPA.

The Standard 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 1.7) if the participant elects to collect FMA information for specific tree species only.

This Standard specifies:

- The form and formats available to an FMA participant for receiving information on the location of permanent sample plots allocated by the EPA.
- 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.
- The form and format that an FMA participant must use when submitting FMA information to the EPA.

Background

This Standard defines the form and electronic format of information provided by the EPA to a FMA participant, and vice versa, under the Regulations or the *Field Measurement Approach Standard*. This Standard is issued under regulation 14(1) and must be provided in the format prescribed by the EPA as per section 90 of the Climate Change Response Act 2002 (“the Act”).

Who should read this MPI Standard?

This MPI Standard should be read by Emissions Trading Scheme (ETS) participants that are FMA Participants under the Regulations, forestry consultants and other industry professionals.

Why is this important?

This standard contains important information for FMA participants on the form and formats for receiving and providing information to the EPA, which is needed for the participant to engage with the FMA scheme, and provide accurate data for participant specific tables that are used for carbon calculations.

Document History

| Version Date | Section Changed | Change(s) Description |
|----------------|-----------------|--|
| 12 May 2021 | | |
| 1 January 2023 | Entire document | Minor changes have been made to update the Standard in line with the new regulations. The Standard was also reformatted to meet updated MPI branding guidelines. |

Other information

- It is important to note that there are two Standards relating to FMA, the *Field Measurement Approach Standard* and the *Field Measurement Approach Information Standard* (this document). These Standards work together to deliver critical information for FMA participants.
- The manner in which FMA sample plots are allocated by the EPA, the information required from participants to make the plot allocations, and information that must be gathered and recorded from those plots can be found in the *Field Measurement Approach Standard*.
- Guidance on practical implementation of this Standard can be obtained from [*A Guide to the Field Measurement Approach for the Emissions Trading Scheme*](#).
- All documents are available at <https://www.mpi.govt.nz/forestry/forestry-in-the-emissions-trading-scheme/emissions-returns-and-carbon-units-nzus-for-forestry/the-field-measurement-approach-fma>
- MPI holds delegated authority from the EPA to make and issue this Standard. Te Uru Rākau – New Zealand Forest Service is the branch of MPI responsible for forestry in the Emissions Trading Scheme (ETS). Guidance documents, web content and forms will be issued by Te Uru Rākau – New Zealand Forest Service.

References

- The Environmental Systems Research Institute (ESRI) Shapefile Technical Description White Paper, dated July 1998, contains technical specifications for GIS files. The Paper can be found at: <https://support.esri.com/en/white-paper/279>

Part 1: Requirements

1.1 Definitions

- (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:
the Act or the Regulations and used in this Standard has, unless the context requires otherwise, the same meaning as it has in the Act or Regulations; and
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 a reference to:
 - a) a Part means a Part in this Standard; and
 - b) a clause means a clause in a Part; and
 - c) a paragraph or sub-paragraph means a paragraph or sub-paragraph in a clause.
 - d) a Section means a section of the Act.

1.2 Supply of Allocated Permanent Sample Plot Locations to an FMA participant

- (1) An FMA participant that applies under Subpart 3 of 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 Unit Register (NZEUR) holding account number; and
 - 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 a 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 July 1998; 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 3(a), the FMA participant must specify whether the file is to be supplied:
- i) as an electronic file attached to an email; or
 - ii) on a USB drive that is posted.

1.3 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 1.3) 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 +1 metres of the geographic coordinates specified by the EPA as the Easting and Northing for that plot identifier under Part 1.2(1)(d)(ii) of this Standard; and
 - f) if unable to comply with paragraph (e) above, 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 1.2(1)(d) of this Standard, and 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 1.2(1)(d) are stored in the GPS; and
 - d) confirm that the geographic coordinates stored in the GPS for each plot identifier are within +1 metres of the geographic coordinates specified under clause Part 1.2(1)(d)(ii) for that plot identifier; and
 - e) if unable to comply with paragraph (d) above, not use the information uploaded to the GPS as the source of information to determine plot locations.

1.4 Specifying Tree Species in Relation to Collecting and Recording FMA Information

- (1) An FMA participant that under the *Field Measurement Approach Standard* (Part 1.7) 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 1.7 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. A tree species must be capable of reaching at least 5 metres in height at maturity in the place where it is located, and not be managed in a way that would prevent this from happening, to be considered a forest species in the ETS.

1.5 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 <https://www.mpi.govt.nz/forestry/forestry-in-the-emissions-trading-scheme/ets-online-system/>; or
 - b) manually entering a sub-set of the information on-line at <https://www.mpi.govt.nz/forestry/forestry-in-the-emissions-trading-scheme/ets-online-system/>, 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 <https://www.mpi.govt.nz/forestry/forestry-in-the-emissions-trading-scheme/ets-online-system/>.
- (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

- (4) 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 | | | |
|---------------------------------|-------------------------------------|-------------------|-----------------|
| Botanical name | Common name | Tree species code | Species Group |
| <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 |
| <i>Populus yunnanensis</i> | Chinese or Yunnan poplar | POPYU | Exotic hardwood |

| Exotic species | | | |
|--|-------------------|-------------------|-----------------|
| Botanical name | Common name | Tree species code | Species Group |
| <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</i> (and varieties) | Golden willow | S.ALB | Exotic hardwood |
| <i>Salix matsudana</i> (and varieties) | 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 | | | |
|---------------------------------|------------------|-------------------|-------------------|
| Botanical name | Common name | Tree species code | Species Group |
| <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 | COR AUS | 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 |
| <i>Elaeocarpus dentatus</i> | Hinau | ELADEN | Indigenous forest |
| <i>Elaeocarpus hookerianus</i> | Pokaka | ELAHOO | Indigenous forest |
| <i>Fuschia excorticata</i> | Kotukutuku | FUCEXO | Indigenous forest |

| Indigenous species | | | |
|--|------------------------|-------------------|-------------------|
| Botanical name | Common name | Tree species code | Species Group |
| <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 |
| <i>Paratrophis microphylla</i> | Turepo | PARMIC | Indigenous forest |
| <i>Pennantia corymbosa</i> | Kaikomako | PENCOR | Indigenous forest |
| <i>Phyllocladus alpinus</i> | Mountain toatoa | PHYALP | Indigenous forest |
| <i>Phyllocladus glaucus</i> | Toatoa | PHYGLA | Indigenous forest |

| Indigenous species | | | |
|------------------------------------|--------------------|-------------------|-------------------|
| Botanical name | Common name | Tree species code | Species Group |
| <i>Phyllocladus trichomanoides</i> | Tanekaha | PHYTRI | Indigenous forest |
| <i>Pittosporum crassifolium</i> | Karo | PITCRA | Indigenous forest |
| <i>Pittosporum eugenioides</i> | Tarata | PIEUG | 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 |

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 | NZEUR 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 Forest Info 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 | NZEUR number – 10 characters maximum |
| Submitter name | SubmitterName | Text – 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 |

| Parameter | XML Element Name | Allowable Values |
|--|------------------------------|---|
| Plot extends beyond forest land boundary | PlotExtendsBeyondBdry | Yes, No |
| – Plot percentage area within boundary | PlotPercentAreaWithinBdry | Estimated value (%) – positive integer (1–99) |
| 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 | DateFmalInfoCollectionStart | 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 ShrubInfo1 or ShrubTypeInfo2 elements, in relation to live shrubs only.

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

| 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 Table A1 in Appendix 1 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^b. (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 |

^a Under the *Field Measurement Approach Standard* (Part 1.8), 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.

^b Under the *Field Measurement Approach Standard* (Part 1.8), 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.

| Parameter | XML Element Name | Allowable Values |
|---------------------------|------------------|--|
| – Month first regenerated | RegeneratedMonth | MM – positive integer comprising a valid month |

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^c. (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 intended predominant species (IPS) only – except if there are any IPS planted trees present that were planted in more than one year, record the date of planting and planted stocking for the subset of trees planted during the earliest year of planting 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 (if the planted year/month and stocking are for only a subset of planted IPS trees); No (otherwise) |
| 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 predominant species at the time of measurement only – except if those trees include trees planted in more than one year, record the date of planting and planted stocking for the subset of trees planted during the earliest year of planting 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 |

^c Under the *Field Measurement Approach Standard* (Part 1.8), 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.

| Parameter | XML Element Name | Allowable Values |
|---|---------------------------------|---|
| – 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 |

Silvicultural Information Included in an XML File

Table A2.5. Silvicultural information included in an XML file under the SilvilInfo¹ or ThinningInfo² elements. Information must be 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 earliest year in which planting occurred only.

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

Adverse Event Information Included in an XML File

Table A2.6. Adverse event information included in an XML file under the AdverseInfo¹ or AdverseEventInfo² elements. Information must be included in relation to all trees when intermingled trees are absent. If intermingled trees are present, information must be 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 earliest year in which planting occurred only.

| Parameter | XML Element Name | Allowable Values |
|--|---|--|
| Trees subject to adverse events (at any time since planting/regeneration) | TreesSubjectToAdverseEvents ¹ | 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 ² | 1, 2, 3, n – positive integer |
| – Adverse event year | EventYear ² | YYYY – positive integer comprising a valid year |
| – Adverse event month | EventMonth ² | MM – positive integer comprising a valid year |
| – Adverse event type | EventType ² | Fire, Wind, Erosion, Other |
| – Residual stocking (of live stems) after event | ResidualStockingAfterEvent ² | Counted or estimated value (st/ha) – non-negative integer |
| d– Residual stocking determined by | ResidualStockingDeterminedBy ² | Counting, Estimation |
| – Residual stocking estimation method | ResidualStockingEstBy ² | Stand records, Information from damage surveys, Personal knowledge of owner or consultant, Other |
| – Majority of cleared wood remains on site | ClearedWoodRemainsOnSite ² | 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 StemInfo¹ or SGInfo² 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 ¹ | 1, 2, 3, n – positive integer; new set for each plot, sub-plot or sub-sample |
| – Stem establishment type code | StemEstablishmentType ¹ | Planted, Regenerated |
| – Stem state code | StemState ¹ | Live, Dead |
| – Stem species code | StemSpecies ¹ | Species code – see Part 4, and Table A3 in Appendix 1 of this Standard |
| – Stem diameter | StemDiameter ¹ | Measured or calculated value (mm) – positive integer |

| Parameter | XML Element Name | Allowable Values |
|---|--------------------------------------|--|
| – Stem diameter type code | StemDiameterType ¹ | DBH, CD |
| – Stem diameter at standard height | StemDiameterAtStdHeight ¹ | Yes, No |
| – Stem diameter at standard height estimated due to presence of | StemDiameterEstReason ¹ | Fork, Branches, Nodal swelling, Other malformation |
| – Stem height | StemHeight ¹ | Measured value (m) – positive real number rounded to 1 decimal place |
| – Stem broken-top indicator | StemBrokenTop ¹ | 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 StemInfo¹ or SGInfo² elements if the average collar diameter of small live trees is being estimated^d, 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^e, the following must be included for those trees in each Species Group:</i> | | |
| – Species Group name of stems collar diameter is estimated for | SpeciesGroupOfCollarDiameterStems ² | Species Group code – see <i>Appendix 1</i> of this Standard |
| – Establishment type of the majority of the collar diameter stems | EstabTypeOfCollarDiameterStems ² | Planted, Regenerated |
| – Average collar diameter of stems | AverageCollarDiameterOfStems ² | Estimated value (mm) – positive integer |
| – Average height of collar diameter stems of average diameter | AverageHeightOfCollarDiameterStems ² | Estimated value (m) – positive real number rounded to 1 decimal place |
| – Stocking of collar diameter stems | StockingOfCollarDiameterStems ² | Estimated value (st/ha) – positive integer |

^d Under the *Field Measurement Approach Standard* (Part 1.8), 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.

^e Under the *Field Measurement Approach Standard* (Part 1.8), 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 StemInfo¹ or SGInfo² 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^f, 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 ² | 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 ² | Species Group code – see Appendix 1 of this Standard |
| – Establishment type of the majority of the collar diameter stems | EstabTypeOfCollarDiameterStems ² | Planted, Regenerated |
| – Average collar diameter of stems | AverageCollarDiameterOfStems ² | Estimated value (mm) – positive integer |
| – Average height of collar diameter stems | AverageHeightOfCollarDiameterStems ² | Estimated value (m) – positive real number rounded to 1 decimal place |
| – Stocking of collar diameter stems | StockingOfCollarDiameterStems ² | Estimated value (st/ha) – positive integer |
| <i>If the average collar diameter of small live trees is being estimated^g, 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 ² | 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 ² | Species Group code – see Appendix 1 of this Standard |
| – Establishment type of the majority of the collar diameter stems | EstabTypeOfCollarDiameterStems ² | Planted, Regenerated |
| – Average collar diameter of stems | AverageCollarDiameterOfStems ² | Estimated value (mm) – positive integer |
| – Average height of collar diameter stems | AverageHeightOfCollarDiameterStems ² | Estimated value (m) – positive real number rounded to 1 decimal place |
| – Stocking of collar diameter stems | StockingOfCollarDiameterStems ² | Estimated value (st/ha) – positive integer |
| <i>If the average collar diameter of small live trees is being estimated^h, 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 ² | Species Group code – see Appendix 1 of this Standard |

^f Under the *Field Measurement Approach Standard* (Part 1.8), 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.

^g Under the *Field Measurement Approach Standard* (Part 1.8), 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

^h Under the *Field Measurement Approach Standard* (Part 1.8), 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.

| Parameter | XML Element Name | Allowable Values |
|---|---|---|
| – Establishment type of the majority of the collar diameter stems | EstabTypeOfCollarDiameterStems ² | Planted, Regenerated |
| – Average collar diameter of stems | AverageCollarDiameterOfStems ² | Estimated value (mm) – positive integer |
| – Average height of collar diameter stems | AverageHeightOfCollarDiameterStems ² | Estimated value (m) – positive real number rounded to 1 decimal place |
| – Stocking of collar diameter stems | StockingOfCollarDiameterStems ² | Estimated value (st/ha) – positive integer |

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 |
| – 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 |

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: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>
        <xs:element name="PlotID" type="xs:positiveInteger" />
        <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" />
            </xs:sequence>
        </xs:choice>
    </xs:sequence>
</xs:complexType>
</xs:element>
```

```
<xs:sequence>
    <xs:element name="PlotLength" type="tns:PlotSize" minOccurs="0" nillable="true" />
    <xs:element name="PlotSlopeAdjLength" type="tns:PlotSize" minOccurs="0" nillable="true" />
</xs:sequence>
</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:element name="PlotPercentAreaWithinBdry" type="tns:Percentage" minOccurs="0" nillable="true" />
<xs:element name="PlotCentrePointRelocated" type="tns:YesNo" />
<xs:element name="PlotRelocatedReason" type="tns:PlotRelocatedReason" minOccurs="0" nillable="true" />
<xs:element name="PlotCentrePointReestablished" type="tns:YesNo" />
<xs:element name="DateFmaInfoCollectionStarted" type="xs:date" />
<xs:element name="AdditionalPlotInformation" minOccurs="0" maxOccurs="1" nillable="true">
    <xs:simpleType>
        <xs:restriction base="xs:string">
            <xs:maxLength value="100" />
        </xs:restriction>
    </xs:simpleType>
</xs:element>
</xs:sequence>
```



```
        <xs:element name="ShrubTypeList" type="tns:ShrubTypeList" minOccurs="0" nillable="true" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="ShrubTypeList">
    <xs:sequence>
        <xs:element name="ShrubTypeInfo" type="tns:ShrubTypeInfo" maxOccurs="unbounded" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="ShrubTypeInfo">
    <xs:sequence>
        <xs:element name="ShrubType" type="tns:ShrubType" />
        <xs:element name="ShrubTypeCrownCover">
            <xs:simpleType>
                <xs:restriction base="xs:positiveInteger">
                    <xs:maxInclusive value="100" />
                </xs:restriction>
            </xs:simpleType>
        </xs:element>
        <xs:element name="ShrubTypeAverageCrownHeight">
            <xs:simpleType>
```

```
<xs:restriction base="xs:decimal">
    <xs:fractionDigits value="2" />
    <xs:totalDigits value="4" />
    <xs:minInclusive value="0" />
    <xs:maxInclusive value="99.99" />
</xs:restriction>
</xs:simpleType>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType name="TreeInfo">
    <xs:sequence>
        <xs:element name="TreesPresent" type="tns:YesNo" />
        <xs:element name="TreesAbsentReason" type="tns:TreesAbsentReason" minOccurs="0" nillable="true" />
        <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:sequence>
</xs:complexType>
</xs:sequence>
</xs:element>
</xs:sequence>
</xs:complexType>
</xs:sequence>
</xs:element>
</xs:simpleType>
</xs:restriction>
```

```
<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" />
<xs:element name="LowStemCount" type="tns:YesNo" minOccurs="0" nillable="true" />
<xs:element name="LowStemCountReason" type="tns:LowStemCountReason" minOccurs="0" nillable="true" />
<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" />
  <xs:element name="PsmPlantingYear" type="tns:Year" minOccurs="0" nillable="true" />
  <xs:element name="PsmPlantingMonth" type="tns:Month" minOccurs="0" nillable="true" />
  <xs:element name="PsmRegeneratedTreesPresent" type="tns:YesNo" minOccurs="0" nillable="true" />
  <xs:element name="PsmRegeneratedYear" type="tns:Year" minOccurs="0" nillable="true" />
  <xs:element name="PsmRegeneratedMonth" type="tns:Month" minOccurs="0" nillable="true" />
  <xs:element name="TreeAdditionalInformation" minOccurs="0" maxOccurs="1" nillable="true">
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      <xs:restriction base="xs:string">
        <xs:maxLength value="300" />
      </xs:restriction>
    </xs:simpleType>
  </xs:element>
</xs:element>
```

```
        </xs:restriction>
    </xs:simpleType>
</xs:element>
<xs:choice minOccurs="1" maxOccurs="1">
    <xs:element name="SubsampleList" type="tns:SubsampleList" minOccurs="0" nillable="true" />
    <xs:element name="TreeStemList" type="tns:TreeStemList" minOccurs="0" nillable="true" />
</xs:choice>
</xs:sequence>
</xs:complexType>
<xs:complexType name="SilviInfo">
    <xs:sequence>
        <xs:element name="TreesSubjectToPruning" type="tns:YesNo" minOccurs="0" nillable="true" />
        <xs:element name="TreesSubjectToThinning" type="tns:YesNo" minOccurs="0" nillable="true" />
        <xs:element name="ThinningList" type="tns:ThinningList" minOccurs="0" nillable="true" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="ThinningList">
    <xs:sequence>
        <xs:element name="ThinningInfo" type="tns:ThinningInfo" maxOccurs="unbounded" />
    </xs:sequence>
</xs:complexType>
```

```
</xs:complexType>

<xs:complexType name="ThinningInfo">
  <xs:sequence>
    <xs:element name="ThinningID" type="xs:positiveInteger" />
    <xs:element name="ThinningYear" type="tns:Year" />
    <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>

<xs:complexType name="AdverseInfo">
  <xs:sequence>
    <xs:element name="TreesSubjectToAdverseEvents" type="tns:YesNo" />
    <xs:element name="AdverseEventList" type="tns:AdverseEventList" minOccurs="0" nillable="true" />
  </xs:sequence>
</xs:complexType>

<xs:complexType name="AdverseEventList">
  <xs:sequence>
```

```
<xs:element name="AdverseEventInfo" type="tns:AdverseEventInfo" maxOccurs="unbounded" />
</xs:sequence>
</xs:complexType>
<xs:complexType name="AdverseEventInfo">
  <xs:sequence>
    <xs:element name="EventID" type="xs:positiveInteger" />
    <xs:element name="EventYear" type="tns:Year" />
    <xs:element name="EventMonth" type="tns:Month" minOccurs="0" nillable="true" />
    <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" />
  </xs:sequence>
</xs:complexType>
<xs:complexType name="TreeStemList">
  <xs:sequence>
    <xs:element name="MeasuredStemsList" type="tns:MeasuredStemsList" minOccurs="0" nillable="true" />
    <xs:element name="EstimatedStemsList" type="tns:EstimatedStemsList" minOccurs="0" nillable="true" />
  </xs:sequence>
</xs:complexType>
```

```
</xs:complexType>

<xs:complexType name="MeasuredStemsList">
  <xs:sequence>
    <xs:element name="StemInfo" type="tns:StemInfo" maxOccurs="unbounded" />
  </xs:sequence>
</xs:complexType>

<xs:complexType name="StemInfo">
  <xs:sequence>
    <xs:element name="StemID" type="xs:positiveInteger" />
    <xs:element name="StemEstablishmentType" type="tns:StemEstablishmentType" />
    <xs:element name="StemState" type="tns:StemState" />
    <xs:element name="StemSpecies" type="tns:Codeset" />
    <xs:element name="StemDiameter" type="xs:positiveInteger" />
      <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" />
    <xs:element name="StemHeight" minOccurs="0" nillable="true">
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:fractionDigits value="1" />
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

```
        <xs:totalDigits value="4" />
        <xs:minInclusive value="0" />
        <xs:maxInclusive value="999.9" />
    </xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="StemBrokenTop" type="tns:YesNo"/>
</xs:sequence>
</xs:complexType>
<xs:complexType name="EstimatedStemsList">
    <xs:sequence>
        <xs:element name="SGInfo" type="tns:SGInfo" maxOccurs="unbounded" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="SGInfo">
    <xs:sequence>
        <xs:element name="SpeciesOfCollarDiameterStems" type="tns:Codeset" nillable="true" minOccurs="0"></xs:element>
        <xs:element ref="tns:SpeciesGroupOfCollarDiameterStems" />
        <xs:element name="EstabTypeOfCollarDiameterStems" type="tns:StemEstablishmentType" minOccurs="0" nillable="true" />
        <xs:element name="AverageCollarDiameterOfStems">
```

```
<xs:simpleType>
  <xs:restriction base="xs:positiveInteger">
    <xs:minInclusive value="1" />
    <xs:maxInclusive value="120" />
  </xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="AverageHeightOfCollarDiameterStems">
  <xs:simpleType>
    <xs:restriction base="xs:decimal">
      <xs:fractionDigits value="1" />
      <xs:totalDigits value="4" />
      <xs:minInclusive value="0.1" />
      <xs:maxInclusive value="10.0" />
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="StockingOfCollarDiameterStems" type="xs:positiveInteger" />
</xs:sequence>
```

```
</xs:complexType>

<xs:complexType name="SubplotList">
  <xs:sequence>
    <xs:element name="SubplotInfo" type="tns:SubplotInfo" minOccurs="2" maxOccurs="unbounded" />
  </xs:sequence>
</xs:complexType>

<xs:complexType name="SubplotInfo">
  <xs:sequence>
    <xs:element name="SubplotID" type="xs:positiveInteger" />
    <xs:element name="SubplotPercentArea" type="tns:Percentage" />
    <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" />
  </xs:sequence>
</xs:complexType>

<xs:complexType name="SubsampleList">
  <xs:sequence>
    <xs:element name="SubsampleInfo" type="tns:SubsampleInfo" maxOccurs="4" />
  </xs:sequence>
</xs:complexType>
```

```
</xs:complexType>

<xs:complexType name="SubsampleInfo">
  <xs:sequence>
    <xs:element name="SubsampleID" type="xs:positiveInteger" />
    <xs:element name="SubsampleAverageMaxSlope" type="xs:nonNegativeInteger" />
    <xs:element name="SubsampleRadius" type="tns:SubsampleRadius" />
    <xs:element name="SubsampleSlopeAdjustedRadius" type="tns:PlotSize" minOccurs="0" nillable="true" />
    <xs:element name="SubsampleDLineTransect" minOccurs="0" nillable="true">
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:fractionDigits value="2" />
          <xs:totalDigits value="4" />
          <xs:minInclusive value="0.01" />
          <xs:maxInclusive value="10.00" />
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="SubsampleTreePresence" type="tns:YesNo" />
    <xs:element name="SubsampleTreeAbsenceReason" type="tns:TreesAbsentReason" minOccurs="0" nillable="true" />
    <xs:element name="TreeStemList" type="tns:TreeStemList" minOccurs="0" nillable="true" />
  </xs:sequence>
</xs:complexType>
```

```
</xs:sequence>

</xs:complexType>

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    <xs:maxInclusive value="99.99" />
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="YesNo">
  <xs:restriction base="xs:string">
    <xs:enumeration value="No" />
    <xs:enumeration value="Yes" />
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="Year">
  <xs:restriction base="xs:short">
    <xs:minInclusive value="1900" />
    <xs:maxInclusive value="2100" />
  </xs:restriction>
</xs:simpleType>
```

```
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="Month">
  <xs:restriction base="xs:short">
    <xs:minInclusive value="1" />
    <xs:maxInclusive value="12" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="participantSchemeType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="ETS" />
    <xs:enumeration value="PFSI" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="FmaInfoSuppliedFor">
  <xs:restriction base="xs:string">
    <xs:enumeration value="All plots" />
    <xs:enumeration value="Subset" />
  </xs:restriction>
</xs:simpleType>
```

```
<xs:simpleType name="FmaInfoType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Plot" />
    <xs:enumeration value="Silviculture" />
    <xs:enumeration value="Adverse Events" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="Percentage">
  <xs:restriction base="xs:short">
    <xs:minInclusive value="1" />
    <xs:maxInclusive value="99" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="PlotShape">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Circular" />
    <xs:enumeration value="Square" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="StemEstablishmentType">
```

```
<xs:restriction base="xs:string">
    <xs:enumeration value="Planted" />
    <xs:enumeration value="Regenerated" />
</xs:restriction>
</xs:simpleType>
<xs:simpleType name="StemState">
    <xs:restriction base="xs:string">
        <xs:enumeration value="Live" />
        <xs:enumeration value="Dead" />
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="StemDiameterType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="DBH" />
        <xs:enumeration value="CD" />
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="PlotRelocatedReason">
    <xs:restriction base="xs:string">
        <xs:enumeration value="Forest land edge" />
    </xs:restriction>
</xs:simpleType>
```

```
        <xs:enumeration value="Forest class edge" />
        <xs:enumeration value="Silvicultural trial" />
        <xs:enumeration value="Old trees present" />
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="ShrubType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="Manuka/Kanuka" />
        <xs:enumeration value="Tauhinu" />
        <xs:enumeration value="Other indigenous shrubs" />
        <xs:enumeration value="Gorse" />
        <xs:enumeration value="Broom" />
        <xs:enumeration value="Other exotic shrubs" />
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="TreesAbsentReason">
    <xs:restriction base="xs:string">
        <xs:enumeration value="Unstocked due to harvesting" />
        <xs:enumeration value="Unstocked due to thinning" />
        <xs:enumeration value="Unstocked due to an adverse event" />
    </xs:restriction>
</xs:simpleType>
```

```
<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" />

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="LowStemCountReason">

  <xs:restriction base="xs:string">

    <xs:enumeration value="Stems below DBH threshold" />

    <xs:enumeration value="Low final stocking" />

    <xs:enumeration value="Maximum plot area used" />

    <xs:enumeration value="Unstocked area present" />

    <xs:enumeration value="Other" />

  </xs:restriction>

</xs:simpleType>

<xs:simpleType name="ThinningResidualStockingEstBy">

  <xs:restriction base="xs:string">

    <xs:enumeration value="Stand records" />

    <xs:enumeration value="Quality control data" />

  </xs:restriction>

</xs:simpleType>
```

```
<xs:enumeration value="Contractor payment records" />

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

<xs:enumeration value="Other" />

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="EventType">

  <xs:restriction base="xs:string">

    <xs:enumeration value="Fire" />

    <xs:enumeration value="Wind" />

    <xs:enumeration value="Erosion" />

    <xs:enumeration value="Other" />

  </xs:restriction>

</xs:simpleType>

<xs:simpleType name="PlotArea">

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    <xs:enumeration value="0.040" />

  </xs:restriction>

</xs:simpleType>
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    <xs:enumeration value="Information from damage surveys" />
    <xs:enumeration value="Personal knowledge of owner or consultant" />
    <xs:enumeration value="Other" />
  </xs:restriction>
</xs:simpleType>
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  <xs:restriction base="xs:string">
    <xs:enumeration value="Fork" />
    <xs:enumeration value="Branches" />
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    <xs:enumeration value="Other malformation" />
  </xs:restriction>
</xs:simpleType>
```

```
    </xs:restriction>
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    <xs:enumeration value="Counting" />
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  </xs:restriction>
</xs:simpleType>
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</xs:simpleType>
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</xs:schema>
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