Data product specification

Vicmap™ Vegetation

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Version 6.0 December 2021

Applies to data model Version 6.0 December 2021

AS/NZS ISO 19131:2008 compliant

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# Document history

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| --- | --- | --- |
| Version | Date | Note |
| 1.0 | August2014 | Initial publication |
| 1.4 | March 2015 | Update MoG changes |
| 1.5 | May 2015 | Re-instated plantation information & other minor edits |
| 1.6 | October 2015 | Added “Unknown” as a feature type to Plantation Type Table |
| 2.0 | October 2015 | Update MoG changes & other minor edits |
| 2.1 | October 2015 | Minor edits |
| 2.2 | October 2015 | Minor edits |
| 3.0 | May 2016 | New template & update MoG changes  |
| 4.0 | January 2018  | New template & update MoG changes |
| 4.1 | March 2019 | Minor edits |
| 5.1 | May 2021 | Major edits  |
| 6.0 | November 2021 | Inclusion of new datasets and major review of content |

This document has been formatted and structured in compliance with AS/NZS ISO 19131:2008 Geographic Information – Data product specifications.

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# Overview

## Vicmap™

Vicmap™ is the foundation that underlies most spatial information in Victoria. This portfolio of spatial related authoritative data products, made up from individual datasets, is developed and managed by the Department of Environment, Land, Water & Planning. The information provides the foundation to Victoria’s primary mapping and spatial information systems, and is used for building business information and systems.

Vicmap is a registered trademark of the Victorian Government and is synonymous with authoritative statewide mapping since 1975.

The Vicmap portfolio includes:

|  |  |
| --- | --- |
| Vicmap AddressVicmap AdminVicmap Building (proposed)Vicmap Crown Land TenureVicmap ElevationVicmap Features of InterestVicmap HydroVicmap ImageryVicmap Index | Vicmap InfrastructureVicmap LiteVicmap PlanningVicmap PositionVicmap PropertyVicmap Survey (proposed)Vicmap Topographic MappingVicmap TransportVicmap Vegetation |

Vicmap data is supported by a collection of Reference Tables, Vicmap Reference Tables. A reference table may list the full name, description and other attributes associated with a feature code or identifier.

Further information can be found at https://www.land.vic.gov.au/maps-and-spatial/spatial-data

## Data product specification title

Vicmap™ Vegetation

### Topic Category

Biota.

## Responsible party

Department of Environment, Land, Water and Planning

PO Box 527, Melbourne VIC 3001 Australia

vicmap@delwp.vic.gov.au.

## Terms and definitions

For the purpose of this document, the following terms and definitions apply.

|  |  |
| --- | --- |
| **Term** | **Definition** |
| ANZLIC ID | A unique identifier enabling metadata records to be discovered and differentiated within a structured data library. |
| Attribute | A characteristic of a feature that may occur as a type or an instance. |
| Custodian | An organisation responsible for ensuring the accuracy, currency, distribution of their data and the terms and conditions of access and use. |
| Data type | Specification of a value domain with operations allowed on values in this domain Refer to AS/NZS ISO 19103 |
| Dataset | Identifiable collection of data. Maybe as small as a single feature or feature attribute contained within a larger dataset. A hardcopy map maybe considered a dataset. Refer to AS/NZS ISO 19115 |
| Dataset series  | Collection of datasets sharing the same product specification, also known as a product. |
| Domain | A well-defined set both necessary and sufficient, as everything that satisfies the definition in the set and everything that does not satisfy the definition is necessarily outside the set. Refer to ISO/TS 19103 |
| the Department | Meaning the Department of Environment, Land, Water & Planning (DELWP). |
| Entity | A unit of data that can be classified and have stated relationship with other entities. |
| Feature  | An abstraction of real-world phenomena. A feature may occur as a type or an instance. Feature type or instance shall be used when only one is meant. The feature structure of the feature based data model can be summarised as: feature instance = [spatial object + attribute object] |
| Metadata | Metadata is ‘data about data’ and provides a synopsis about the data lineage, accuracy and details about access permissions. Refer to ISO 19115 Geographic information ― Metadata |
| Parent metadata record | Parent metadata records act as a cover note for a product that contains a dataset series for search, discovery & delivery purposes.  |
| Persistent Feature Identifier (PFI) | The unique code provide at creation of the feature which remains until the feature is retired.  |
| Product | Dataset or dataset series that conforms to a data product specification. |
| Quality | Totality of characteristics of a product that bear on its ability to satisfy stated and implied needs. Refer to:ISO 19113 Geographic information ― Quality principlesISO 19114 Geographic information ― Quality evaluation procedures |
| the State | Victoria. |
| Unique Feature identifier (UFI) | Each feature is uniquely identified and renewed with each change. |

## Acronyms & Abbreviations

For the purpose of this document, the following acronyms and acronyms apply.

|  |  |
| --- | --- |
| **Acronym** | **Definition** |
| CFA | Country Fire Authority |
| DALA | DELWP Data Access License Agreement |
| DELWP | Department of Environment, Land, Water & Planning |
| FIB | Forest Industry Brigade |
| NES | Notification for Editing Service |
| RMSE | Root-Mean-Square Error |
| SDM | Spatial DataMart |
| SPOT | Satellite Pour l’Observation de la Terre (French) |
| VGDD | Victorian Government Data Directory |

## Informal description of the data product

Vicmap Vegetation can be used to map the location of tree vegetation across the State of Victoria.

Vicmap Vegetation contains four different vegetation datasets used to represent vegetation. These datasets represent features mapped at different scales and resolutions.

# Specification scope

### Level

Dataset.

### Extent & coverage

Vicmap Vegetation Tree Extent covers the State of Victoria.

Vicmap Vegetation Tree Density covers the State of Victoria.

Vicmap Vegetation Tree Urban covers the built environment across Metropolian Melborne, Sale, Shepparton, Wangaratta and Ballarat.

Vicmap Vegetation Plantations covers regions across the State of Victoria.

# Data product identification

### Title

Vicmap™ Vegetation

### Alternative title

Vicmap Vegetation: Tree Extent

Vicmap Vegetation: Tree Density

Vicmap Vegetation: Tree Urban

Vicmap Vegetation: Plantation

VMVEG

### Purpose

Vicmap Vegetation consists of four datasets:

*Tree extent:* Consists of a statewide 20cm pixel raster showing the presence and absence of trees (woody vegetation over approximately two metres in height) across the landscape. The trees were mapped utlising high resolution aerial photography and a machine learning technique to extract the presence of trees.

*Tree density:* Consists of data created from the Vicmap Vegetation Tree Extent statewide dataset (20cm pixels). The Vicmap Vegetation Tree Extent dataset was generalised to 2m pixels and then clustering rules were applied to group the data into three density classes. These density classes are Dense, Medium, and Sparce and show the spatial separation of woody vegeation. This classification was a pixel-by-pixel assessment where a pixel was allocated a density classification based on neighbouring pixels. The raster dataset was then converted to the statewide Vicmap Vegetation Tree Density vector dataset.

*Tree Urban:* Consists of tree points across the built environment across Metropolitan Melbourne and the urban environment within four regional councils: Wangaratta, Sale, Shepparton and Ballarat. High resolution aerial photography was used as the source information and a machine learning technique was utlised to extract the location of individual trees. A canopy height model derived from LiDAR which covered the tree Urban extent was used to assign height to each of the mapped trees.

*Plantations:* Consists of information showing the extent of softwood and hardwood plantings. Most of this information is supplied through a cooperative data sharing agreement between DELWP, CFA and the plantation managers or owners who are registered as a Forest Industry Brigade. Small plantation estates which fall under the Forest Industry Brigade threshold will be progressively added over time.

# Data content and structure

Vicmap Vegetation contains the datsets outlined in Table 1.

|  |  |  |  |
| --- | --- | --- | --- |
| **ANZLIC ID** | **Dataset name** | **Description** | **Data type** |
| [ANZVI0803002618](http://services.land.vic.gov.au/SpatialDatamart/dataSearchViewMetadata.html?anzlicId=ANZVI0803002618&extractionProviderId=1) | VICMAP\_VEGETATION | Parent metadata record\* | N/A |
| [ANZVI0803004754](http://services.land.vic.gov.au/SpatialDatamart/dataSearchViewMetadata.html?anzlicId=ANZVI0803004754&extractionProviderId=1) | VMVEG\_PLANTATION | Vector - Restricted dataset of hard wood and softwood plantation cover | Feature |
| ANZV10803009332 | VMVEG\_TREE\_EXTENT | Raster - Tree presence/absence 20cm raster resolution | Coverage |
| ANZV10803009330 | VMVEG\_TREE\_DENSITY | Vector - Woody vegetation features represented by polygons, including tree density.  | Feature |
| ANZV10803009333 | VMVEG\_TREE\_URBAN | Vector - Trees represented by points | Feature |

Table 1: Datasets that comprise Vicmap Vegetation.

*\*Parent metadata record for VMVEG. Parent metadata records act as a cover note for a product that contains a dataset series for search, discovery & delivery purposes. Refer to the Appendix A: Data & object models.*

Vicmap Tree Density *(VMVEG\_TREE\_DENSITY)* consists of polygons features representing woody vegetation which includes:

* Feature Type: Tree Density:
	+ Dense
	+ Medium
	+ Sparse

Vicmap Tree Urban *(VMVEG\_TREE\_URBAN)* consists of point features representing tree locations. The tree Urban includes numerous feature types to describe the mapped tree features.

* Feature Type: Tree

Vicmap Plantations *(VMVEG\_PLANTATION)* consists of polygon features representing plantations, which includes:

* Feature Type: Agriculture area
* Feature Subtype: Plantation
* Plantation Type: Hardwood, Softwood & Unknown

A plantation type may be unknown if the type of plantation is unknown or the area is in fallow and the plantation type that will be planted is unknown or cannot be assumed.

Only planted or to be planted areas are mapped. Linear plantings including wind breaks and screen plantings, failed plantings, ornamental plantings, remnant vegetation and non-productive areas such as clearings, roads, water bodies, grasslands, pasture land and rocky outcrops are normally not included in this dataset.

### Data structure

The structure includes:

* Topologically structured (vertical topology) with other Vicmap products
* Conforms to national data models (i.e. ICSM)
* Additional information about features contained in attribute tables (i.e. data quality, feature type).

Rules and/or characteristics that apply:

* A Persistent Feature Identifier (PFI) is generated once for each feature at the point of creation and remains constant until a feature is retired. A PFI is unique to, and cannot be reused within, a particular table. However, you may have the same PFI number in different tables but does not relate to the same feature entity.

The Unique Feature Identifier (UFI) is generated for each feature at the point of creation and changes with each modification or version. This allows users to track the changes made to a feature over time.

### Coverage-based data

Vicmap Vegetation contains the coverage-based dataset shown in Table 2.

|  |  |  |  |
| --- | --- | --- | --- |
| **Density classification** | **Radius for assessment** | **Rules** | **Minimum patch size** |
| ANZV10803009332 | VMVEG\_TREE\_EXTENT | Tree presence/absence 20cm raster resolution | Raster |

Table 2: Coverage-based datasets within Vicmap Vegetation.

Vicmap Tree Extent *(VMVEG\_TREE\_Extent)* consists of a 20cm resolution statewide raster dataset with each of the pixels representing the presence or absence of trees.

### Data model

See Appendix A: Data & object models.

The Vicmap Vegetation product data model is published on the Department’s website [VMVEG (land.vic.gov.au)](https://www.land.vic.gov.au/__data/assets/pdf_file/0025/543850/Change-276-Vicmap-Vegetation-Data-Model-5_0.pdf) : [Vicmap Data Model](https://www.land.vic.gov.au/__data/assets/pdf_file/0025/543850/Change-276-Vicmap-Vegetation-Data-Model-5_0.pdf)

### Data dictionary

See Appenxdix B contains attribute information for the products.

# Reference systems

Vicmap Vegetation is mapped to the Geocentric Datum of Australia (GDA) and the Australian Height Datum (AHD). Data is held in geographic latitude and longitude computed in terms of the GDA2020.

The temporal reference system for Vicmap is the Gregorian calendar.

Vicmap Vegetation – Tree Extent is mapped in VicGrid2020 Datum. Details of the Imagery used for this product creation can be found using the ANZLIC ID metadata found in the corresponding Vicmap Vegetation – Tree Density dataset.

# Data quality

## Accuracy

Vicmap Vegetation has been built on the existing Vicmap products and maintains a strong relative positional accuracy. Deficiencies within Vicmap data may have been inherited by the overlying data to ensure vertical alignment with other Vicmap datasets.

The following procedures are undertaken as normal update/maintenance routines, to ensure conformity of the data to specification:

* Customised menus for data editing which provide on the fly logical consistency attribute checking as data is edited. This currently only applies to Vicmap Plantations in the Vicmap Vegetation theme,
* Automated data loading routines, reflecting business rules for data population, to ensure data accuracy,
* Independent review of data upon loading including aspatial attributes, spatial extents and successful data load,
* Validation of accepted types according to approved reference tables, and
* Validation of entity PFI/UFI tags for uniqueness.

The horizontal spatial accuracy is dependent upon the theme:

* **Tree Extent:** Primary input was derived from aerial photography which has a pixel resolution of 20cm (or was downsampled to 20cm from a higher resolution). The accuracy of this product has been defined using the machine learning process Interdection over Union (IoU) score. The IoU score compares the amount of area shared by the human delineated data and machine learning prediction (intersection) to the total area covered by either (union) in the accuracy data samples. The IoU for this dataset is 0.8, or 80% accurate across the State.
* **Tree Density:** The density dataset is derived from the Tree Extent product, there is no additional numeric measure of accuracy reported.
* **Tree Urban:** This accuracy was derived using an F1 score. The F1 score assesses the model on its ability to find all the trees in the image, while penalising it for overpredicting. The accuracy of this dataset is 78%.
* **Plantation:**Primary source of input is from the custodian of the original data source, with the positional accuracy unknown. The mapping of plantations is as provided by the data provider and is usually not spatially edited. Checks against high resolution aerial photography indicate the spatial accuracy is high and is within 20m.

## Feature and attribute accuracy

### Tree Extent

This data was derived from a machine learning output. The Vicmap Vegetation Tree Extent dataset was created by assigning each pixel in the aerial photography into two classes: tree or not tree. The Vicmap Vegetation Tree Extent data was created using a machine learning method called semantic segmentation. In semantic segmentation, the machine learning model is trained on aerial images, learning from a corresponding raster mask that indicates which pixels represent trees. From the training examples, the machine learning model learns to distinguish pixels that belong to woody vegetation from those that belong to all other features, such as ground cover, roads, and human-built structures. The model was trained on 20cm aerial photography.

After processing the state-wide tree extent a waterbody and crop mask were applied to remove any incorrectly classified pixels as tree cover found over those areas. No additional human intervention post processing was performed on the data.

### Tree Density

The three density classes are derived by pixel-by-pixel assessment, thereby ensuring consistency by classifying each tree pixel (identified in the Vicmap Vegetation Tree Extent dataset) based on its neighbouring pixel classification of tree or non tree. The attribute accuracy of the density classes is solely dependent on the accuracy of the tree cover identified in the Vicmap Vegetation Tree Extent layer. The tree cover extent layer has an accuracy of 80%.

The Vicmap Vegetation Tree Density dataset was created by applying a set of rulesets across the Vicmap Vegetation Tree Extent data when processing the pixel-by-pixel assessment. The rulesets are listed in the Table 3.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Density classification** | **Radius for assessment** | **Rules** | **Minimum patch size** | **Additional step**  |
| Dense  | 8 metres (49 pixels) | If 21 or more pixels in the radius are classified as tree extent, the selected pixel is classified as Dense.  | 2 hectares | Gaps equal to, or smaller than 0.1 hectares are infilled. |
| Medium | 15 metres (197 pixels) | If 10 or more pixels in the radius are classified as tree extent, the selected pixel is classified as Medium.  | 1 hectare | Gaps equal to, or smaller than 0.25 hectares are infilled. |
| Sparse | 30 metres (709 pixels) | If 9 or more pixels in the radius are classified as tree extent, the selected pixel is classified as Sparce.  | 1 hectare | Remove Sparse regions that are smaller than 1 hectare are removed. |

**Table 3: Coverage-based datasets within Vicmap Vegetation.**

This data has no post analysis human intervention that is not detailed above.

### Tree Urban

The model accuracy of this product is 78%. This accuracy was derived using an F1 score. The F1 score assesses the model on its ability to find all the trees in the image, while penalising it for overpredicting. This model does not identify every tree and has known issues identifying trees in a dense canopy where many trees overlap.

### Plantation

While auditing of Plantation attributes against the custodial source establishes a high level of confidence in the data, there is no audit of the data against the corresponding real-world features, as this is seen as the responsibility of the relevant custodians.

Vicmap Vegetation Plantation relies on the Custodial source for accuracy against ground truth (real world). The Department may conduct ad hoc audit for due diligence.

## Logical Consistency

Logical consistency is a measure of the degree to which data complies with the technical specification.

### Plantation

The test procedures are a mixture of software scripts and on-screen, visual checks.

All polygons are closed and labelled consistently. All relationships between attributes are logical.

# Data capture

Vicmap relies on the agreements and MoU’s signed with authoritative Custodians, through the *Vicmap Spatial Servcies Custodianship Program*, for its data.

The Department may also use imagery to improve the completeness of a dataset in absence of an authoritative Custodian.

Examples of Custodians and/or those that may supplement or verified data are listed below:

* Federal, State and Local Government
* Government agencies and authorities (e.g. Parks Victoria, Melbourne Water, VicRoads)
* Registrar of Geographic Names – Department of Environment, Land, Water, and Planning
* Crown Land Management – Department of Environment, Land, Water, and Planning
* Fire Management - Department of Environment, Land, Water, and Planning
* Emergency & Essential Services, and
* Utility companies.

### Vicmap Imagery

Refer to ANZLIC ID number.

### Plantations

The majority of the content is sourced from large plantation owners or managers who currently have a FIB under a cooperative arrangement data sharing agreement with DELWP and the CFA. Plantations which have not been sourced from the plantation owners or /managers are obtained via the standard Vicmap edit/update procedures.

Due to the varying sources of information the input data has been generalised to the common standard in regard to the attribution to create the plantation type. However, the spatial boundaries have not been changed from the original source. This may result in overlap of separate plantation extents.

# Data maintenance

Vicmap can change under one of the following two terms:

* *Vicmap maintenance -* The incorporation of new data to an existing dataset via an M1, spatial change requests or scheduled Custodial supply. No changes are made to the data or object model, therefore does not require change management processes. Additions can be seen in the weekly Vicmap update.
* *Vicmap improvements –* changes to a dataset that may see existing data over a large area replaced and/or may require the data model changed. Vicmap Improvement must be managed through the Vicmap Change Management Committee and are typically carried out as part of a project requiring additional funding. and may reinvolve a new Custodial data requiring change management.

DELWP obtains updates to data from Custodians at various intervals based on the agreed Custodianship arrangements (i.e. quarterly, yearly and ad hoc). Updates are incorporated into Vicmap daily and made available weekly: noting that Vicmap data is never deleted, only retired and archived for legal purposes. Data is date stamped to reflect the last time the record was verified.

Reported errors or omissions are verified with the authoritative source before a change is made. Most notifications regarding anomalies are received via the Vicmap Editing Service (VES) and once verified will be incorporated into Vicmap. Feedback from users and stakeholders, including emergency services dispatch providers, ensures that the highest standards are maintained.

Approximately 5% of all maintenance advice notices processed are separately audited by DELWP to confirm accuracy, completeness and correctness in the capture process.

Data made available to Vicmap under Cross Border agreements is subject to the maintenance regime of the relevant jurisdiction and is not subject to the same maintenance regime of the Vicmap datasets. Cross border data made available in Vicmap is not updated regularly.

Major updates to the Plantation data will occur annually based upon information received from the main custodian of the input data. Minor updates may occur throughout the year on an irregular basis. These updates are based upon notification of errors or to add small areas which have not been included from the major input sources.

### Vicmap Vegetation - Tree extent, Tree density and Tree Urban maintenance

Vicmap Vegetation: Tree Extent, Tree Density and Tree Urban are static datasets, however they could be updated temporally depending on the aerial imagery captured every year.

# Data product delivery

## Access & licensing

**Data ava**i**lable under the DataVic policy** [www.data.vic.gov.au](http://www.data.vic.gov.au)

Vicmap Vegetation: Tree Cover, Tree Density and Tree Urban is freely available through the Victorian Government Open Data Platform at [www.data.vic.gov.au](http://www.data.vic.gov.au) under a Creative Commons Attribution 4.0 Australia license.

The data.vic.gov site also provides details such as:

* Timetable for release
* Usage and availability restrictions
* License restrictions and conditions
* Access constraints
* Exclusion of liability
* Supply and media formats
* Projections.

Vicmap Vegetation: Plantation is only available under a DELWP’s Data Access License Agreement (DALA). A DELWP DALA outlines the rights and restrictions in relation to the use of the Vicmap Vegetation Plantation dataset. In general, a DELWP DALA allows licensees to use the data for personal use or within their own business but does not permit the data to be commercialised or on-sold. To organise a DELWP DALA and order the data please send a request to gis.helpdesk@delwp.vic.gov.au.

Certain Vicmap datasets are also available through a network of Data Service Providers listed at: [How to access spatial data (land.vic.gov.au)](https://www.land.vic.gov.au/maps-and-spatial/spatial-data/how-to-access-spatial-data).

Historical versions of Vicmap data is only available under special and exceptional circumstances, such as a legal proceeding, and may incur an administration fee.

# Metadata

The metadata, abstract, and preview for the datasets within Vicmap products can be viewed at [Datashare](https://datashare.maps.vic.gov.au/) located at <https://datashare.maps.vic.gov.au/> by searching for the ANZLIC ID.

# Appendix A: Data & object models

Vicmap data models can be located at [Vicmap Data Models](https://www.land.vic.gov.au/maps-and-spatial/spatial-data/vicmap-catalogue/)



# Appendix B: Data dictionary

|  |  |  |
| --- | --- | --- |
| **Vicmap Vegetation: Tree Urban Attribute** |  **Field type/size** | **Description** |
| Objected | Object ID | ESRI generated identifier that is used as a primary key (unique and not null). This identifier may be regenerated at any time. |
| UFI | Text(36) | Generated UUID. This UUID may be used to uniquely identify a polygon when reporting and investigating processing issues. |
| Canopy\_x\_m | Float (5,2) | Tree canopy in x-dimension in metres |
| Canopy\_y\_m | Float (5,2) | Tree canopy in y-dimension in metres |
| Canopy\_radius\_m | Float (5,2) | Tree canopy average radius in metres |
| Height\_m | Float (5,2) | 95th percentile in metres  |
| Source\_md\_id | Text(36) | ANZLIC\_ID |
| Source\_begin\_date | Date | Begin date of the source imagery |
| Source\_end\_date | Date | End date of the source imagery |
| Height\_md\_id | Text(36) | ANZLIC\_ID |
| Height\_begin\_date | Date | Begin date of the source height data |
| Height\_end\_date | Date | End date of the source height data |
| Source\_map\_no | Text(10) | Index Map Number |
| Is\_dense | Text(1) | Tree feature is within the ‘dense’ category in the tree density dataset. Y/N (Yes/No). Trees may be incorrectly identified where the canopy is dense. |
| UFI\_created | Datetime | Date UFI was created |
| Geom | Geometry | Geometry column containing coordinates in EPSG:7899 |

|  |  |  |
| --- | --- | --- |
| **Vicmap Vegetation: Tree Density Attribute** | **Field type/size** | **Description** |
| Objected | Object ID | ESRI generated identifier that is used as a primary key (unique and not null). This identifier may be regenerated at any time. |
| UFI | Text(36) | Generated UUID. This UUID may be used to uniquely identify a polygon when reporting and investigating processing issues. |
| Tree\_density | Text(10) | Valid values are: sparse, medium and dense. VMREFTAB.VG\_TREE\_DENSITY |
| Fire\_mask | Text(1) | Valid values are: Y/N. The fire\_mask is a Yes if there was a fire within 5 years of the imagery begin capture date. |
| Source\_md\_id | Text(36) | ANZLIC\_ID |
| Source\_begin\_date | Date | Begin date of the source imagery |
| Source\_end\_date | Date | End date of the source imagery |
| Source\_map\_no | Text(10) | Index Map Number. This Number is from the Vicmap 1:25KM Mapsheet Doubles.  |
| Feature\_type | Text(30) | Always vegetation |
| Feature\_subtype | Text(30) | Always forest |
| UFI\_created | Date | Date UFI was created |
| Geom | Geometry | Geometry column containing coordinates in EPSG:7899 |

|  |  |  |
| --- | --- | --- |
| **Vicmap Vegetation: Plantations Attribute** | **Field type/size** | **Description** |
| UFI | Number(9) | This unique identifier facilitates reporting quality or enhancement issues.  |
| Feature\_type | Text(30) | As defined by VMREFTAB.FT\_FEATURE\_TYPEValid value in this table is:Agricultural Area |
| Feature\_subtype | Text(30) | Valid value in this table is:Plantation |
| Plantation\_type | Text(8) | As defined by VMREFTAB.VG\_PLANTATION\_TYPEValid values are:SOFTWOODHARDWOODUNKNOWN |
| Create\_Date\_UFI | Date | Data UFI was created. |

# Appendix C: Reference tables

## Theme: Tree extent

|  |  |  |
| --- | --- | --- |
| **Feature Type Code** | **Description** | **Feature Type Code** |
| 0 | Not Tree | 0 |
| 1 | Tree | 1 |

## Theme: Tree density

### VMREFTAB.VG\_TREE\_DENSITY

|  |  |
| --- | --- |
| **Feature Type Code** | **Description** |
| Dense | Dense tree cover |
| Medium | Medium tree cover |
| Sparce  | Sparce tree cover |

## Theme: Plantations

### VMREFTAB.FT\_FEATURE TYPE

|  |  |
| --- | --- |
| **Feature Type Code** | **Description** |
| Agricultural Area | Agriculture area. |

### VMREFTAB.VG\_PLANTATION\_TYPE

|  |  |
| --- | --- |
| **Plantation Type Code** | **Plantation\_type** |
| SW | SOFTWOOD |
| HW | HARDWOOD |
| UNK | UNKNOWN |