**FRMS Database Design**

**FORMIS II**

Prepared by FORMIS TA

**27.03.2018**

**F O R M I S I I**

Development of a Management Information System for the Forestry Sector in Viet Nam – Phase I

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REVISIONS

| Version | Primary Author(s) | Description of Version | Date Modified |
| --- | --- | --- | --- |
| Version 1.0 | Ha Hai Nam  Nguyen Duy Thao  Phung Van Doanh  Pasi Roti  Raisa Sell | The normalized database is designed for FRMS application. | 12/12/2017 |
| Version 2.0 | Adam Ludvig | Primary and foreign key handling revised to improve reliability of distributed operations. | 03/04/2018 |
| Version 2.1 | Pasi Roti | Added tables: config\_style, config\_mymaps, change\_log and version | 06/04/2018 |

# INTRODUCTION

FORMIS II project aims to build a fully integrated management information system for forestry sector. The project supports effective management of data collected from National Forest Inventory and Statistics (NFIS) project.

## Document Purpose

This document provides description of the database used in FRMS appliction.

## System Scope

The design is limited to storing the NFIS data.

## Intended Audience and Reading Suggestions

This document is intended for stakeholders, TA team, software architects and developers.

## Definitions, Acronyms and Abbreviations

**FORMIS II** Development of a Management Information System for the Forestry Sector in Viet Nam – Phase II

**NFIS** National Forest Inventory and Statistics

**SOA** Service Oriented Architecture

**VNFOREST** Vietnam Administration of Forestry

## References and Acknowledgments

[1] FORMIS Conceptual Architecture

# DATABASE DESIGN

## Logical Database Model

|  |  |  |  |
| --- | --- | --- | --- |
| Table Description This section describes the table structure of the entity classes defined in section 2.1. | | | |
| **Table Name:** | Province | **Description:** | This table contains the fundamental information of provinces | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| ProvinceCode | Code of the province | Integer |  | Y | N/A | PK |
| EcoZoneCode | Code of the ecozone that the province belongs to | Integer |  | Y | N/A |  |
| RegionCode | Code of the region that the province belongs to | Integer |  | Y | N/A |  |
| Name | Name of the province | Character | 100 | Y | N/A |  |
| Area | Area of the province | Double |  |  | N/A |  |
| Geom | Spatial boundary of the province | Geometry |  | Y | N/A |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | District | **Description:** | This table contains the fundamental information of districts |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| DistrictCode | Code of the district | Integer |  | Y | N/A | PK |
| ProvinceCode | Code of the province that the district belongs to | Integer |  | Y | N/A | FK |
| Name | Name of the district | Character | 100 | Y | N/A |  |
| Area | Area of the district | Double |  |  | N/A |  |
| Geom | Spatial boundary of the district | Geometry |  | Y | N/A |  |

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| --- | --- | --- | --- |
| **Table Name:** | Commune | **Description:** | This table contains the fundamental information of communes |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| CommuneCode | Code of the commune | Integer |  | Y | N/A | PK |
| DistrictCode | Code of the district that the commune belongs to | Integer |  | Y | N/A | FK |
| Name | Name of the commune | Character | 100 | Y | N/A |  |
| Area | Area of the commune | Double |  |  | N/A |  |
| Geom | Spatial boundary of the commune | Geometry |  | Y | N/A |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | Compartment | **Description:** | This table contains the fundamental information of compartments |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| ComptCode | Code of the compartment | Character | 5 | Y | N/A | PK |
| CommuneCode | Code of the commune that the compartment belongs to | Integer |  | Y | N/A | PK |
| Area | Area of the compartment (ha) | Double |  | N | 0 |  |
| Geom | Spatial boundary of the compartment | Geometry |  | Y | N/A |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | SubCompartment | **Description:** | This table contains the fundamental information of sub-compartments |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| SubComptCode | Code of the sub-compartment | Character | 5 | Y | N/A | PK |
| ComptCode | Code of the compartment | Character | 5 | Y | N/A | PK |
| CommuneCode | Code of the commune that the compartment belongs to | Integer |  | Y | N/A | PK |
| Area | Area of the sub-compartment (ha) | Double |  | N | 0 |  |
| Geom | Spatial boundary of the sub-compartment | Geometry |  | Y | N/A |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | Plot | **Description:** | This table contains the fundamental information of plots |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| plot\_uuid | Universally unique id of plot row | uuid |  | Y | generated | PK |
| PlotCode | Code of the plot | Character | 10 | Y | N/A | unique combined key |
| SubComptCode | Code of the sub-compartment that the plot belongs to | Character | 10 | Y | N/A |
| ComptCode | Code of the compartment that the plot belongs to | Character | 10 | Y | N/A |
| CommuneCode | Code of the commune that the plot belongs to | Integer |  | Y | N/A |
| ParcelCode | Code of the parcel that the plot belongs to | Integer |  | N | -1 |  |
| MapSheet | Number of base map sheet | Character | 8 | Y |  |  |
| Village | Name of the village that the plot belongs to | Character | 25 | N | “ ” |  |
| Area | Area of the plot (ha) | Decimal | (9,2) | Y |  |  |
| ForestOrgCode | Code of the forest origin (Ref.Table ForestOrigin) | Decimal | (2,0) | Y |  |  |
| ForestTypeCode | Code of the forest type (Ref.Table ForestType) | Decimal | (4,0) | Y |  |  |
| PlantingYear | Planting year | Decimal | (4,0) | Y |  |  |
| AvgYearCanopy | Average years to closed canopy | Decimal | (2,0) | Y |  |  |
| PForestOrgCode | Code of the plantation forest origin (Ref.Table PForestOrigin) | Decimal | (2,0) | Y |  |  |
| PlantStateCode | Code of the state of plantation (Ref.Table PlantationSate) | Decimal | (2,0) | Y |  |  |
| TreeSpecCode | Code of the tree specie (Ref. Table TreeSpecies | Character | 100 | Y | “ ” |  |
| VolumePerHa | Volume per ha (m3/ha) | Decimal | (7,1) | Y |  |  |
| StemPerHa | Number of stems for bamboo and coconut per ha (1000 stems/ha) | Decimal | (9,3) | Y |  |  |
| VolumePerPlot | Volume per the inventory plot (m3/plot) | Decimal | (9,1) | Y |  |  |
| StemPerPlot | Number of the stems for bamboo and coconut (1000 stems/plot) | Decimal | (9,3) | N | 0 |  |
| ActorID | Identifier of the actor | Integer |  | Y |  |  |
| ActorTypeCode | Code of the actor type (Ref. Table ForestActorType) |  |  |  |  |  |
| SiteCondCode | Code of the site condition (Ref.Table SiteCondition) | Decimal | (4,0) | Y |  |  |
| ForFunctionSubCode | Code of the forest function, sub-class (Ref.Table ForestFunction) | Decimal | (2,0) | Y |  |  |
| ConflictSitCode | Code of the conflicting situation (Ref.Table ConflictSituation) | Decimal | (1,0) | Y |  |  |
| ActorIDConflict | Identifier of the actor that has conflicting situation related to the plot | Integer |  | N |  |  |
| LandUseCertCode | Code of the land use certificate (Ref.Table LandUseCertificate) | Decimal | (2,0) | Y |  |  |
| LandUseTenure | Year of land use tenure | Decimal | (5,0) | Y |  |  |
| ProtectionContrCode | Code of the protection contract (Ref.Table ProtectionContract) | Decimal | (1,0) | N | 0 |  |
| ActorIDProt | Identifier of the actor specified in protection contract | Integer |  |  |  |  |
| ForestUseSitCode | Code of the forest use situation (Ref.Table ForestUseSituation) | Decimal | (2,0) | N | 0 |  |
| NatForOrgCode | Code of the natural forest origin (Ref.Table NaturalForestOrigin) | Decimal | (2,0) | Y |  |  |
| OldPlotCode | Old plot number | Character | 6 |  |  |  |
| PosStatusCode | Relative location of the plot compared to actual position ForestUseSituation (Ref: Table PlotPositionStatus) | Integer |  | N |  |  |
| ChangeTypeIDLast | The type of last monitoring change (Ref. Table MonitoringChangeType) | Integer |  | N |  |  |
| Geom | Spatial boundary of the plot | Geometry |  | Y | N/A |  |
| ChangeTypeID | The type of monitoring change that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Integer |  | N |  |  |
| DateTime | The time when the change occurs to the plot | timestamp |  | N |  |  |
| AreaAffected | The area affected by the last change that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Decimal | (10,2) | N |  |  |
| VolumeAffected | The volume affected by the last change that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Decimal | (10,2) | N |  |  |
| StemsNoAffected | The area affected by the last change that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Decimal | (10,2) | N |  |  |
| Method\_plantation | Type of plantation species (Ref. Table 17. Classification and encoding the type of plantation species) that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Decimal | (1,0) | N |  |  |
| DensityWood | Planting density of wood that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Decimal | (10,2) | N |  |  |
| DensityBamboo | Planting density of bamboo that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Decimal | (10,2) | N |  |  |
| StemsNoThin | Removed number of wood stems/plot that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Decimal | (10,0) | N |  |  |
| StemsNoBambooThin | Removed number of bamboo stems/plot that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Decimal | (10,0) | N |  |  |
| DescMonitor | Additional descprtion of the monitor that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Character | 200 |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | PlotHistory | **Description:** | This table contains the historical information of plots |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| plot\_history\_uuid | Universally unique ID of plot\_history row | uuid |  | Y | generated | PK |
| plot\_uuid | Foreign key linking to plot row | uuid |  | Y | NULL | FK |
| PlotCode | Code of the plot | Character | 10 | Y | N/A |  |
| SubComptCode | Code of the sub-compartment that the plot belongs to | Character | 10 | Y | N/A |  |
| ComptCode | Code of the compartment that the plot belongs to | Character | 10 | Y | N/A |  |
| CommuneCode | Code of the commune that the plot belongs to | Integer |  | Y | N/A |  |
| ParcelCode | Code of the parcel that the plot belongs to | Integer |  | N | -1 |  |
| MapSheet | Number of base map sheet | Character | 8 | Y |  |  |
| Village | Name of the village that the plot belongs to | Character | 25 | N | “ ” |  |
| Area | Area of the plot (ha) | Decimal | (9,2) | Y |  |  |
| ForestOrgCode | Code of the forest origin (Ref.Table ForestOrigin) | Decimal | (2,0) | Y |  |  |
| ForestTypeCode | Code of the forest type (Ref.Table ForestType) | Decimal | (4,0) | Y |  |  |
| PlantingYear | Planting year | Decimal | (4,0) | Y |  |  |
| AvgYearCanopy | Average years to closed canopy | Decimal | (2,0) | Y |  |  |
| PForestOrgCode | Code of the plantation forest origin (Ref.Table PForestOrigin) | Decimal | (2,0) | Y |  |  |
| PlantStateCode | Code of the state of plantation (Ref.Table PlantationSate) | Decimal | (2,0) | Y |  |  |
| TreeSpecCode | Code of the tree specie (Ref. Table TreeSpecies | Character | 100 | Y | “ ” |  |
| VolumePerHa | Volume per ha (m3/ha) | Decimal | (7,1) | Y |  |  |
| StemPerHa | Number of stems for bamboo and coconut per ha (1000 stems/ha) | Decimal | (9,3) | Y |  |  |
| VolumePerPlot | Volume per the inventory plot (m3/plot) | Decimal | (9,1) | Y |  |  |
| StemPerPlot | Number of the stems for bamboo and coconut (1000 stems/plot) | Decimal | (9,3) | N | 0 |  |
| SiteCondCode | Code of the site condition (Ref.Table SiteCondition) | Decimal | (4,0) | Y |  |  |
| ForFunctionSubCode | Code of the forest function, sub-class (Ref.Table ForestFunction) | Decimal | (2,0) | Y |  |  |
| ConflictSitCode | Code of the conflicting situation (Ref.Table ConflictSituation) | Decimal | (1,0) | Y |  |  |
| LandUseCertCode | Code of the land use certificate (Ref.Table LandUseCertificate) | Decimal | (2,0) | Y |  |  |
| LandUseTenure | Year of land use tenure | Decimal | (5,0) | Y |  |  |
| ProtectionContrCode | Code of the protection contract (Ref.Table ProtectionContract) | Decimal | (1,0) | N | 0 |  |
| ForestUseSitCode | Code of the forest use situation (Ref.Table ForestUseSituation) | Decimal | (2,0) | N | 0 |  |
| NatForOrgCode | Code of the natural forest origin (Ref.Table NaturalForestOrigin) | Decimal | (2,0) | Y |  |  |
| OldPlotCode | Old plot number | Character | 6 |  |  |  |
| PosStatusCode | Relative location of the plot compared to actual position ForestUseSituation (Ref: Table PlotPositionStatus) | Integer |  | N |  |  |
| Geom | Spatial boundary of the plot | Geometry |  | Y | N/A |  |
| PersonModify | Id of the staff who modifies the plot | Integer |  | N |  |  |
| DateModify | The time when plot is updated | timestamp |  | N |  |  |
| DateApproval | The time when the monitoring change actually occurred and be approved | timestamp |  | N |  |  |
| ActorTypeCode | Code of the actor type (Ref. Table ForestActorType) |  |  |  |  |  |
| ActorID | Identifier of the actor | Integer |  | Y |  |  |
| ActorIDConflict | Identifier of the actor that has conflicting situation related to the plot | Integer |  | N |  |  |
| ActorIDProt | Identifier of the actor specified in protection contract | Integer |  |  |  |  |
| Desc | Additional description of the modifications on plot | character | 200 | N |  |  |
| Change\_type\_id | The type of monitoring change. Used in thematic maps | Integer |  |  |  |  |
| Change\_type\_id\_last | The type of last monitoring change. Used in thematic maps | Integer |  |  |  |  |
| Year\_approval | year of monitoring change (year part of dateapproval). Used in thematic maps | Numeric | (4,0) |  |  |  |
| Last |  | Numeric | (1,0) |  |  |  |
| Forest\_use\_sit\_code\_after | Code of the forest use situation after change occured (Ref.Table ForestUseSituation). Used in Thematic maps | Numeric | (2.0) |  |  |  |
| Forest\_func\_sub\_code\_after | Code of the forest function, sub-class after change occured (Ref. Table ForestFunction). Used in thematic maps | Numeric | (2.0) |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | ForestMonitoring | **Description:** | This table contains information of monitoring changes |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| forest\_monitoring\_uuid | Universally unique ID of forest\_monitoring row | uuid |  | Y | gererated | PK |
| plot\_history\_uuid | Universal ID of plot\_history row (representing the forest\_monitoring row). | uuid |  | Y | NULL | FK |
| plot\_uuid | Foreign key referring to plot row. | uuid |  | Y | NULL | FK |
| CommuneCode | Code of the commune that the plot belongs to | Integer |  | Y | N/A | unique combined key |
| ComptCode | Code of the compartment that the plot belongs to | Character | 10 | Y | N/A |
| SubComptCode | Code of the sub-compartment that the plot belongs to | Character | 10 | Y | N/A |
| PlotCode | Code of the plot | Character | 10 | Y | N/A |
| ChangeTypeID | The type of last monitoring change (Ref. Table MonitoringChangeType) | Integer |  | N | N/A |  |
| DateTime | The time when the monitoring change actually occurred | timestamp |  | N | N/A |  |
| Area | The forest area affected by the monitoring change | Decimal | (10,2) | N | N/A |  |
| Volume | The forest volume affected by the monitoring change | Decimal | (10,2) | N | N/A |  |
| StemsNo | The number of stems affected by the monitoring change | Decimal | (10,2) | N | N/A |  |
| Description | The additional desciption of the monitorin change | Character | 200 | N | “” |  |
| Regeneration | To indicate type of regeneration of natural forest (Ref. Table: RegenerationNFType) | Decimal | (1,0) | N | N/A |  |
| OtherSilvicultural | To indicate the type of other silvicultural treaments (Ref. Table OtherSilviTreamentType) | Decimal | (1,0) | N | N/A |  |
| Method\_plantation | Type of plantation species (Ref. Table 17. Classification and encoding the type of plantation species) that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Decimal | (1,0) | N |  |  |
| DensityWood | Planting density of wood that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Decimal | (10,2) | N |  |  |
| DensityBamboo | Planting density of bamboo that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Decimal | (10,2) | N |  |  |
| StemsNoThin | Removed number of wood stems/plot that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Decimal | (10,0) | N |  |  |
| StemsNoBambooThin | Removed number of bamboo stems/plot that is used as temporary placeholder to trigger the update in the Table ForestMonitoring | Decimal | (10,0) | N |  |  |
| ForestTypeCode | Code of the forest type (Ref.Table ForestType) | Decimal | (4,0) | Y |  |  |
| ForestFuncSubCode | Code of the forest function, sub-class (Ref. Table ForestFunction) | Decimal | (2,0) | Y |  | Unique |
| ForestOrgCode | Code of the forest origin (Ref.Table ForestOrigin) | Decimal | (2,0) | Y |  |  |
| ForestUseSitCode | Code of the forest use situation (Ref.Table ForestUseSituation) | Decimal | (2,0) | N | 0 |  |
| ActorTypeCode | Code of the actor type (Ref. Table ForestActorType) |  |  |  |  |  |
| ActorID | Identifier of the actor | Integer |  | Y |  |  |
| SiteCondCode | Code of the site condition (Ref.Table SiteCondition) | Decimal | (4,0) | Y |  |  |
| PForestOrgCode | Code of the plantation forest origin (Ref.Table PForestOrigin) | Decimal | (2,0) | Y |  |  |
| TreeSpecCode | Code of the tree specie (Ref. Table TreeSpecies | Character | 100 | Y | “ ” |  |
| NarForestOrgCode | Code of the natural forest origin (Ref.Table NForestOrigin) | Decimal | (2,0) | Y |  |  |
| LandUseCertCode | Code of the land use certificate (Ref.Table LandUseCertificate) | Decimal | (2,0) | Y |  |  |
| ConflictSitCode | Code of the conflicting situation (Ref.Table ConflictSituation) | Decimal | (1,0) | Y |  |  |
| PlantStateCode | Code of the state of plantation (Ref.Table PlantationSate) | Decimal | (2,0) | Y |  |  |
| ForestTypeCodeAfter | Code of the forest type after change occured (Ref.Table ForestType) | Decimal | (4,0) | Y |  |  |
| ForestFuncSubCodeAfter | Code of the forest function, sub-class after change occured (Ref. Table ForestFunction) | Decimal | (2,0) | Y |  | Unique |
| ForestOrgCodeAfter | Code of the forest origin after change occured (Ref.Table ForestOrigin) | Decimal | (2,0) | Y |  |  |
| ForestUseSitCodeAfter | Code of the forest use situation after change occured (Ref.Table ForestUseSituation) | Decimal | (2,0) | N | 0 |  |
| ActorTypeCodeAfter | Code of the actor type after change occured (Ref. Table ForestActorType) |  |  |  |  |  |
| ActorIDAfter | Identifier of the actor after change occured | Integer |  | Y |  |  |
| SiteCondCodeAfter | Code of the site condition after change occured (Ref.Table SiteCondition) | Decimal | (4,0) | Y |  |  |
| PForestOrgCodeAfter | Code of the plantation forest origin after change occured (Ref.Table PForestOrigin) | Decimal | (2,0) | Y |  |  |
| TreeSpecCodeAfter | Code of the tree specie after change occured (Ref. Table TreeSpecies | Character | 100 | Y | “ ” |  |
| NarForestOrgCodeAfter | Code of the natural forest origin after change occured (Ref.Table NForestOrigin) | Decimal | (2,0) | Y |  |  |
| LandUseCertCodeAfter | Code of the land use certificate after change occured (Ref.Table LandUseCertificate) | Decimal | (2,0) | Y |  |  |
| ConflictSitCodeAfter | Code of the conflicting situation after change occured (Ref.Table ConflictSituation) | Decimal | (1,0) | Y |  |  |
| PlantStateCodeAfter | Code of the state of plantation after change occured (Ref.Table PlantationSate) | Decimal | (2,0) | Y |  |  |
| plot\_history\_uuid | Universal ID of plot\_history row (representing the forest\_monitoring row). | uuid |  |  | NULL | unique |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | ForestActor | **Description:** | This table contains information of forest owners |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| CommuneCode | The identifier of the commune | Integer |  | Y |  | PK |
| ActorID | The identifier of forest actor | Integer |  | Y |  | PK |
| ActorTypeCode | Code of the actor type (looked up from Table **ForestActorTyp**) | Decimal | (2,0) | Y |  |  |
| ActorName | Name of the actor | Character | 100 | N | “ ” |  |
| ActorAddress | Address of the actor | Character | 200 | N | “ ” |  |
| AdditionalInfo | Additional information about the object | Character | 150 | N | “ ” |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | EcoZone | **Description:** | This lookup table contains information of ecozones |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| EcoZoneCode | Code of the ecozone | Integer |  | Y |  | Unique |
| EcoZoneDef | Definition of the ecozone | Character | 50 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |

The content of the lookup table **EcoZone** is inferred from Annex 1 - **Table 1:** Ecozone description and code.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | ForestOrigin | **Description:** | This lookup table contains code and description of forest origin |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| ForestOrgCode | Code of the forest origin | Decimal | (1,0) | Y |  | Unique |
| ForestOrgDef | Definition of the forest origin | Character | 100 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |
| Lang | Language used in the description | Character | 10 | Y | vi |  |

The content of the lookup table **ForestOrigin** is inferred from Annex 1 - **Table 2:** Classification and encoding of forest origin.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | ForestType | **Description:** | This lookup table contains code and description of forest/land type |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| ForestTypeCode | Code of the forest/land type | Decimal | (3,0) | Y |  | Unique |
| Abbreviation | Abbreviation of the forest/land type | Character | 10 | Y |  |  |
| ForestTypeDef | Definition of the forest/land type | Character | 100 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |
| Lang | Language used in the description | Character | 10 | Y | vi |  |

The content of the lookup table **ForestType** is inferred from Annex 1 - **Table 3:** Classification and encoding of forest types.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | TreeSpecies | **Description:** | This lookup table contains tree species of plantation forest |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| TreeSpecCode | Code of the tree species | Decimal | (4,0) | Y |  | Unique |
| TreeSpecVerna | Vernacular name of the tree species | Character | 100 | Y |  |  |
| TreeSpecLatin | Scientific name of the tree species | Character | 100 | Y |  |  |
| TreeSpecAbbr | Abbreviation of the tree species | Character | 10 | Y |  |  |
| GeoDistribution | Geographic distribution of the tree species | Character | 20 | Y |  |  |
| AgeClass | Age class length (years) of the tree species | Decimal | (2,0) | Y |  |  |
| Source | Source of the definition | Character | 100 | Y |  |  |
| SpecialProduct | The code that incdicates where this specie is a special product (Ref. Table SpecialProductCode) | Integer |  | Y | 0 |  |

The content of the lookup table **TreeSpecies** is inferred from Annex 1 - **Table 4:** Classification and encoding of tree species for plantations.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | PForestOrigin | **Description:** | This lookup table contains code and description of plantation forest origin |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| PForestOrgCode | Code of the plantation forest origin | Decimal | (1,0) | Y |  | Unique |
| PForestOrgDef | Definition of the plantation forest origin | Character | 100 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |
| Lang | Language used in the description | Character | 10 | Y | vi |  |

The content of the lookup table **PForestOrigin** is inferred from Annex 1 - **Table 5:** Classification and encoding of plantation forest origin.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | plantation\_state | **Description:** | This lookup table contains code and description of the state of plantation of a plot |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| PlantStateCode | Code of the state of plantation | Decimal | (1,0) | Y |  | Unique |
| PlantStateDef | Definition of the state of plantation | Character | 50 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |
| Lang | Language used in the description | Character | 10 | Y | vi |  |

The content of the lookup table **StateOfPlantation** is inferred from Annex 1 - **Table 6:** Classification and encoding indicating the state of the plantation.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | SiteCondition | **Description:** | This lookup table contains code and description of site condition |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| SiteCondCode | Code of the site condition | Decimal | (1,0) | Y |  | Unique |
| Abbreviation | Abbreviation of the site condition | Character | 10 | Y |  |  |
| SiteCondDef | Definition of the site condition | Character | 50 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |
| Lang | Language used in the description | Character | 10 | Y | vi |  |

The content of the lookup table **SiteCondition** is inferred from Annex 1 - **Table 7:** Classification and encoding of site condition.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | ForestFunction | **Description:** | This lookup table contains codes and description of forest function |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| ForestFuncSubCode | Code of the forest function, sub-class | Decimal | (2,0) | Y |  | Unique |
| Abbreviation | Abbreviation of the forest function, sub-class | Character | 10 | Y |  |  |
| ForestFuncDef | Definition of the forest function, sub-class | Character | 50 | Y |  |  |
| ForestFuncMainCode | Code of forest function, main class | Decimal | (1,0) | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |
| Lang | Language used in the description | Character | 10 | Y | vi |  |

The content of the lookup table **ForestFunction** is inferred from Annex 1 - **Table 8:** Classification and encoding of forest function

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | ForestActorType | **Description:** | This lookup table contains code and description of forest actor types |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| ActorTypeCode | Code of the forest actor type | Decimal | (2,0) | Y |  | Unique |
| ActorGroupType | Group type of the forest actor | Decimal | (1,0) | Y |  |  |
| Abbreviation | Abbreviation of the forest actor type | Character | 10 | Y |  |  |
| ActorTypeDef | Definition of the forest actor type | Character | 50 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |

The content of the lookup table **ForestActorTypeCode** is inferred from Annex 1 - **Table 9:** Classification and encoding of forest actor.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | ConflictSituation | **Description:** | This lookup table contains code and description of conflict situation |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| ConflictSitCode | Code of the conflict situation | Decimal | (1,0) | Y |  | Unique |
| ConflictSitDef | Definition of the conflict situation | Character | 50 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |
| Lang | Language used in the description | Character | 10 | Y | vi |  |

The content of the lookup table **ConflictSituation** is inferred from Annex 1 - **Table 10:** Classification and encoding of conflict situation.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | LandUseCertificate | **Description:** | This lookup table contains code and description of land use certificate |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| LandUseCertCode | Code of the land use certificate | Decimal | (1,0) | Y |  | Unique |
| LandUseCertDef | Definition of the land use certificate | Character | 50 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |
| Lang | Language used in the description | Character | 10 | Y | vi |  |

The content of the lookup table **LandUseCertificate** is inferred from Annex 1 - **Table 11:** Classification and encoding of land use certificate.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | ProtectionContract | **Description:** | This lookup table contains code and description of protection contract |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| ProtContrCode | Code that indicates the existence of protection contract | Decimal | (1,0) | Y |  | Unique |
| ProtContrDef | Definition of the existence of protection contract | Character | 50 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |
| Lang | Language used in the description | Character | 10 | Y | vi |  |

The content of the lookup table **ProtectionContract** is inferred from Annex 1 - **Table 12:** Classification and encoding of the protection contract.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | NaturalForestOrigin | **Description:** | This lookup table contains code and description of natural forest origin |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| NatForOrgCode | Code of the natural forest origin | Decimal | (1,0) | Y |  | Unique |
| NatForOrgDef | Definition of the natural forest origin | Character | 50 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |
| Lang | Language used in the description | Character | 10 | Y | vi |  |

The content of the lookup table **NaturalForestOrigin** is inferred from Annex 1 - **Table 13:** Classification and encoding of the natural forest origin.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | PlotPositionStatus | **Description:** | This lookup table contains code and description that indicate the relative location of the plot compared to actual position |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| PosStatusCode | Code that indicates the plot position status of the plot | Decimal | (1,0) | Y |  | Unique |
| PosStatusDef | Definition of the plot position status | Character | 50 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |
| Lang | Language used in the description | Character | 10 | Y | vi |  |

The content of the lookup table **PlotPositionStatus** is inferred from Annex 1 - **Table 14:** Classification and encoding that verifies position of the plot

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | ForestUseSituation | **Description:** | This lookup table contains code and description of forest use situation |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| ForestUseSitCode | Code of the forest use situation | Decimal | (1,0) | Y |  | Unique |
| ForestUseSitDef | Definition of the forest use situation | Character | 50 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |
| Lang | Language used in the description | Character | 10 | Y | vi |  |

The content of the lookup table **ForestUseSituation** is inferred from Annex 1 - **Table 16:** Classification and encoding of the forest use situation.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | Location | **Description:** | This table contains the hiarachical relationships of locations for user permission policy |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| ID | Identifier of the location (code of province/district/commune) | Integer |  | Y |  | PK |
| Name | Name of the location (name of province/district/commune) | Character | 50 | Y |  |  |
| Level | Admistrative level (0: National; 1:Province; 2:District; 3: Commune) | Decimal | (1,0) | Y |  | PK |
| ParentID | The identifier of the parent of this location (code of the province/district) | Integer |  | Y |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | Users | **Description:** | This table contains the user information |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| UserID | Identifier of the user account | Integer |  | Y |  | PK |
| UserName | User name of the user to log in the applications | Character | 30 | Y |  |  |
| Password | The password of the user account |  | 50 | Y |  |  |
| FullName | Full name of the user | Character | 100 | Y |  |  |
| Tel | Telephone number of the user | Character | 20 | Y |  |  |
| Email | Email address of the user | Character | 50 | Y |  |  |
| CreatedDate | The date on which the user account is created | TimeStamp |  | N |  |  |
| ModifyDate | The date on which the user account is modified | TimeStamp |  | N |  |  |
| Address | The resident address of the user | Character | 200 | N |  |  |
| Status | Activation status of the account | Integer |  | Y |  |  |
| DepartmentID | The identifier of the department the user works for | Integer |  | N |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | UserRoleLoc | **Description:** | This table contains the information about user permission to access data of certain location(s) |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | | **Description** | | | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| UserID | | Identifier of the user account | | | Integer |  | Y |  | PK |
| RoleID | | Identifier of the role | | | Integer |  | Y |  | PK |
| LocationID | | Identifier of the location (code of province/district/commune) | | | Integer |  | Y |  | PK |
| Level | | Admistrative level (0: National; 1:Province; 2:District; 3: Commune) | | | Decimal | (1,0) | Y |  | PK |
| **Table Name:** | config\_style | | **Description:** | This table contains information of thematic map styles | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| id | Identifier of the thematic map style | integer |  | Y |  | PK |
| layer\_name | Name of the map layer | character varying | 30 | N |  |  |
| style\_name | Name of the thematic map style (thematic map name in Vietnamese) | character varying | 50 | N |  |  |
| style\_qml | Style information, stored in XML file format | text |  | N |  |  |
| style\_sld | Render and symbology information | text |  | N |  |  |
| desc | Name of the thematic map in English | character varying | 200 | N |  |  |
| num\_order | Layer order in “Load thematic maps” window | integer |  | N |  |  |
| sld\_name | File name used when the sld file is used locally | character varying | 100 | N |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | config\_mymaps | **Description:** | This table contains information of user’s myMaps configuration |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| user\_id | User ID (from users table) of owner of mymap configuration | integer |  | Y |  | PK |
| config\_style\_id | style ID – ID of the style definition in config\_style table ( config\_style.id) | integer |  | Y |  | PK |
| year\_filter | Year filter for plot\_history layers | numeric | (4,0) | Y |  | PK |
| layer\_name | the layer - Name of the layer in config\_style table | character varying | 30 | N |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | change\_log | **Description:** | List of installed database patches and dates of installation |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| version | datamodel version # | integer |  | Y |  | PK |
| script | Script # | integer |  | Y |  | PK |
| script\_name | name of the script including the path in version control system | character varying | 100 | N |  |  |
| description | Description of the script | character varying | 1000 | N |  |  |
| update\_date | Time stamp when script is installed into the database | timestamp without time zone |  | Y |  | PK |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table Name:** | version | **Description:** | data model version of the database |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| version | datamodel version # | integer |  | Y |  | PK |
| script | Script # | integer |  | Y |  | PK |
| update\_date | Time stamp when version is updated in the database | timestamp without time zone |  | N | now |  |

**To be added**

MonitoringType

MonitoringChangeType

SpecialProductCode

RegenerationNFType

OtherSilviTreamentType

NForestOrigin

## Universally unique id handling of plot, plot\_history and forest\_monitoring tables

Universally unique ids are 128bit random, generated values used to identify records of plot, plot\_history and forest\_monitoring records. The main feature is that distributed systems can generate these values without any additional coordination with hight probability to avoid colliding keys. More information about uuid can be found at <https://en.wikipedia.org/wiki/Universally_unique_identifier> .

New uuid values can be generated in Local Database and FRMSClient QGIS plugin. Both ways use the version 4 randomly generated uuid values. New records of plot created in QGIS have plot\_uuid assigned in FRMSClient QGIS plugin. New plot\_history and forest\_monitoring records’ primary key values are generated in Local Database upon insertion. The primary key values, plot.plot\_uuid, forest\_monitoring.forest\_monitoring\_uuid and plot\_history.plot\_history\_uuid, are final and generated on insertion of these records, they are not supposed to be updated

The foreign keys of forest\_monitoring.plot\_uuid and plot\_history.plot\_uuid refer to the related plot feature replacing the plot business key (commune\_code, compt\_code, sub\_compt\_code, plot\_code) based relation. All database functions and embedded queries in FRMSClient were updated to use plot\_uuid relation to prevent chaotic situation of colliding business keys and non-trivial joins. Foreign key plot\_uuid is mandatory to be filled for new records but it could be NULL in case during v3 database upgrade there were no plot record found in database with specific business key. This happens in case of plot\_history records of deleted plots or dangling forest\_monitoring records.

The foreign key forest\_monitoring.plot\_history\_uuid connects forest\_monitoring\_records to plot\_history and is mandatory to fill the same way as in 2.0.6 version to properly connect the tables and not to rely on business key and date fields. Foreign keys forest\_monitoring.plot\_history\_uuid, forest\_monitoring.plot\_uuid and plot\_history.plot\_uuid are not supposed to be updated during any operations.

Annex 1: Contents for Classification Tables

|  |  |  |
| --- | --- | --- |
| **Table 1:** Classification and encoding of ecozones. | | |
| **No** | **Classification** | **Code** |
| 1 | North-West Region | 1 |
| 2 | North-East Region | 2 |
| 3 | Hong River Delta | 3 |
| 4 | North Central Region | 4 |
| 5 | South Central Region | 5 |
| 6 | Highlands Region | 6 |
| 7 | South-West Region | 7 |
| 8 | South-East Region | 8 |

|  |  |  |
| --- | --- | --- |
| **Table 2:** Classification and encoding of forest origin. | | |
| **No** | **Classification** | **Code** |
| 1 | Natural forest | 1 |
| 2 | Plantation | 2 |
| 3 | Bareland | 3 |

|  |
| --- |
| **Table 3:** Classification and encoding of forest types. |

| **No.** | **Forest type (LDLR)** | **Classification parameters** | | | | **Abbre-viation** |
| --- | --- | --- | --- | --- | --- | --- |
| **Forest type (TTR)** | **Primary forest** | **Site**  **condi-**  **tion** | **Volume,**  **(M = Vol, m3/ha,**  **N = No. of stems/ha)** |
|  | **1. Forest land** |  |  |  |  |  |
|  | **1.1. Natural forest** |  |  |  |  |  |
|  | **1.1.1. Primary forest** |  |  |  |  |  |
|  | ***1.1.1.1. Primary forest on soil mountain*** |  |  |  |  |  |
|  | *1.1.1.1.1. Primary evergreen broadleaved forest on soil mountain* |  |  |  |  |  |
| 1 | Rich primary evergreen broadleaved forest on soil mountain | 1 | 1 | 1 | M > 200 | TXG1 |
| 2 | Medium primary evergreen broadleaved forest on soil mountain | 1 | 1 | 1 | 100 < M ≤ 200 | TXB1 |
|  | *1.1.1.1.2. Primary deciduous forest on soil mountain* |  |  |  |  |  |
| 3 | Rich primary deciduous forest on soil mountain | 2 | 1 | 1 | M > 200 | RLG1 |
| 4 | Medium primary deciduous forest on soil mountain | 2 | 1 | 1 | 100 < M ≤ 200 | RLB1 |
|  | *1.1.1.1.3. Primary coniferous forest on soil mountain* |  |  |  |  |  |
| 5 | Rich primary coniferous forest on soil mountain | 3 | 1 | 1 | M > 200 | LKG1 |
| 6 | Medium primary coniferous forest on soil mountain | 3 | 1 | 1 | 100 < M ≤ 200 | LKB1 |
|  | *1.1.1.1.4. Primary mixed broadleaved and coniferous forest* |  |  |  |  |  |
| 7 | Rich primary mixed broadleaved and coniferous forest on soil mountain | 4 | 1 | 1 | M > 200 | RKG1 |
| 8 | Medium primary mixed broadleaved and coniferous forest on soil mountain | 4 | 1 | 1 | 100 < M ≤ 200 | RKB1 |
|  | ***1.1.1.2. Primary forest on rocky mountain*** |  |  |  |  |  |
| 9 | Rich primary evergreen broadleaved forest on rocky mountain | 1 | 1 | 2 | M > 200 | TXDG1 |
| 10 | Medium primary evergreen broadleaved forest on rocky mountain | 1 | 1 | 2 | 100 < M ≤ 200 | TXDB1 |
|  | ***1.1.1.3. Primary forest on wetland*** |  |  |  |  |  |
| 11 | Primary forest on saline wetland | 1 | 1 | 3 | M ≥ 10 | RNM1 |
| 12 | Primary forest on alkaline wetland | 1 | 1 | 4 | M ≥ 10 | RNP1 |
| 13 | Primary forest on freshwater wetland | 1 | 1 | 5 | M ≥ 10 | RNP1 |
|  | **1.1.2. Secondary forest** |  |  |  |  |  |
|  | ***1.1.2.1. Secondary forest on woodland*** |  |  |  |  |  |
|  | *1.1.2.1.1. Secondary forest on soil mountain* |  |  |  |  |  |
|  | *1.1.2.1.1.1. Secondary evergreen broadleaved and semi-deciduous forest* |  |  |  |  |  |
| 14 | Rich secondary evergreen broadleaved forest on soil mountain | 1 |  | 1 | M > 200 | TXG |
| 15 | Medium secondary evergreen broadleaved forest on soil mountain | 1 |  | 1 | 100 < M ≤ 200 | TXB |
| 16 | Poor secondary evergreen broadleaved forest on soil mountain | 1 |  | 1 | 50 < M ≤ 100 | TXN |
| 17 | Very poor secondary evergreen broadleaved forest on soil mountain | 1 |  | 1 | 10 < M ≤ 50 | TXK |
| 18 | Rehabilitation secondary evergreen broadleaved forest on soil mountain | 1 |  | 1 | 10 ≤ M ≤ 100 | TXP |
| 94 | Rich secondary semi-deciduous forest on soil mountain |  |  | 1 | M > 200 |  |
| 95 | Medium secondary semi-deciduous forest on soil mountain |  |  | 1 | 100 < M ≤ 200 |  |
| 96 | Poor secondary semi-deciduous forest on soil mountain |  |  | 1 | 50 < M ≤ 100 |  |
| 97 | Very poor secondary semi-deciduous forest on soil mountain |  |  | 1 | 10 < M ≤ 50 |  |
| 98 | Rehabilitation secondary semi-deciduous forest on soil mountain |  |  | 1 | 10 ≤ M ≤ 100 |  |
|  | *1.1.2.1.1.2. Secondary deciduous forest on soil mountain* |  |  |  |  |  |
| 19 | Rich secondary deciduous forest on soil mountain | 2 |  | 1 | M > 200 | RLG |
| 20 | Medium secondary deciduous forest on soil mountain | 2 |  | 1 | 100 < M ≤ 200 | RLB |
| 21 | Poor secondary deciduous forest on soil mountain | 2 |  | 1 | 50 < M ≤ 100 | RLN |
| 22 | Very poor secondary deciduous forest on soil mountain | 2 |  | 1 | 10 < M ≤ 50 | RLK |
| 23 | Rehabilitation secondary deciduous forest on soil mountain | 2 |  | 1 | 10 ≤ M ≤ 100 | RLP |
|  | *1.1.2.1.1.3. Secondary coniferous forest on soil mountain* |  |  |  |  |  |
| 24 | Rich secondary coniferous forest on soil mountain | 3 |  | 1 | M > 200 | LKG |
| 25 | Medium secondary coniferous forest on soil mountain | 3 |  | 1 | 100 < M ≤ 200 | LKB |
| 26 | Poor secondary coniferous forest on soil mountain | 3 |  | 1 | 50 < M ≤ 100 | LKN |
| 27 | Very poor secondary coniferous forest on soil mountain | 3 |  | 1 | 10 < M ≤ 50 | LKK |
| 28 | Rehabilitation secondary coniferous forest on soil mountain | 3 |  | 1 | 10 ≤ M ≤ 100 | LKP |
|  | *1.1.2.1.1.4. Secondary mixed broadleaved and coniferous forest* |  |  |  |  |  |
| 29 | Rich secondary mixed broadleaved and coniferous forest on soil mountain | 4 |  | 1 | M > 200 | RKG |
| 30 | Medium secondary mixed broadleaved and coniferous forest on soil mountain | 4 |  | 1 | 100 < M ≤ 200 | RKB |
| 31 | Poor secondary mixed broadleaved and coniferous forest on soil mountain | 4 |  | 1 | 50 < M ≤ 100 | RKN |
| 32 | Very poor secondary mixed broadleaved and coniferous forest on soil mountain | 4 |  | 1 | 10 < M ≤ 50 | RKK |
| 33 | Rehabilitation secondary mixed broadleaved and coniferous forest on soil mountain | 4 |  | 1 | 10 ≤ M ≤ 100 | RKP |
|  | *1.1.2.1.2. Secondary broadleaved evergreen forest on rocky mountain* |  |  |  |  |  |
| 34 | Rich secondary evergreen broadleaved forest on rocky mountain | 1 |  | 2 | M > 200 | TXDG |
| 35 | Medium secondary evergreen broadleaved forest on rocky mountain | 1 |  | 2 | 100 < M ≤ 200 | TXDB |
| 36 | Poor secondary evergreen broadleaved forest on rocky mountain | 1 |  | 2 | 50 < M ≤ 100 | TXDN |
| 37 | Very poor secondary evergreen broadleaved forest on rocky mountain | 1 |  | 2 | 10 < M ≤ 50 | TXDK |
| 38 | Rehabilitation secondary evergreen broadleaved forest on rocky mountain | 1 |  | 2 | 10 ≤ M ≤ 100 | TXDP |
|  | *1.1.2.1.3. Secondary forest on wetland* |  |  |  |  |  |
| 39 | Rich secondary forest on saline wetland | 1 |  | 3 | M > 200 | RNMG |
| 40 | Medium secondary forest on saline wetland | 1 |  | 3 | 100 < M ≤ 200 | RNMB |
| 41 | Poor secondary forest on saline wetland | 1 |  | 3 | 50 < M ≤ 100 | RNMN |
| 42 | Rehabilitation secondary forest on saline wetland | 1 |  | 3 | 10 < M ≤ 100 | RNMP |
| 43 | Rich secondary forest on alkaline wetland | 1 |  | 4 | M > 200 | RNPG |
| 44 | Medium secondary forest on alkaline wetland | 1 |  | 4 | 100 < M ≤ 200 | RNPB |
| 45 | Poor secondary forest on alkaline wetland | 1 |  | 4 | 50 < M ≤ 100 | RNPN |
| 46 | Rehabilitation secondary forest on alkaline wetland | 1 |  | 4 | 10 ≤ M ≤ 100 | RNPP |
| 47 | Natural forest on freshwater wetland | 1 |  | 5 |  | RNN |
|  | ***1.1.2.2. Bamboo forest*** |  |  |  |  |  |
| 48 | Dendrocalamus bamboo forest on soil mountain | 8 |  | 1 | N ≥ 500 | TLU |
| 49 | Neohouzeana bamboo forest on soil mountain | 9 |  | 1 | N ≥ 500 | NUA |
| 50 | Indosasa bamboo forest on soil mountain | 10 |  | 1 | N ≥ 500 | VAU |
| 51 | Bambusa bamboo forest on soil mountain | 11 |  | 1 | N ≥ 500 | LOO |
| 52 | Other bamboo forest on soil mountain | 12 |  | 1 | N ≥ 500 | TNK |
| 53 | Other bamboo forest on rocky mountain | 12 |  | 2 | N ≥ 500 | TND |
|  | ***1.1.2.3. Mixed wood-bamboo forest*** |  |  |  |  |  |
| 54 | Mixed wood-bamboo forest on soil mountain (mainly wood) | 5 |  | 1 | M ≥ 10 | HG1 |
| 55 | Mixed bamboo-wood forest on soil mountain (mainly bamboo) | 6 |  | 1 | M ≥ 10 | HG2 |
| 56 | Mixed wood-bamboo forest on rocky mountain | 5 |  | 2 | M ≥ 10 | HGD |
|  | ***1.1.2.4. Palm and coconut tree forest*** |  |  |  |  |  |
| 57 | Palm and coconut tree forest on soil mountain | 7 |  | 1 | N ≥ 100 | CD |
| 58 | Palm and coconut tree forest on rocky mountain | 7 |  | 2 | N ≥ 100 | CDD |
| 59 | Palm and coconut tree forest on freshwater wetland | 7 |  | 5 | N ≥ 100 | CDN |
|  | **1.2. Plantation forest** |  |  |  |  |  |
|  | **1.2.1. Wood plantation** |  |  |  |  |  |
| 60 | Plantation on soil mountain | 13 |  | 1 | M ≥ 10 | RTG |
| 61 | Plantation on rocky mountain | 13 |  | 2 | M ≥ 10 | RTGD |
| 62 | Plantation on saline wetland | 13 |  | 3 | M ≥ 10 | RTM |
| 63 | Plantation on alkaline wetland | 13 |  | 4 | M ≥ 10 | RTP |
| 64 | Plantation on sandy soil | 13 |  | 6 | M ≥ 10 | RTC |
|  | **1.2.2. Bamboo plantation** |  |  |  |  |  |
| 65 | Bamboo plantation on soil mountain | 14 |  | 1 | N ≥ 500 | RTTN |
| 66 | Bamboo plantation on rocky mountain | 14 |  | 2 | N ≥ 500 | RTTND |
|  | **1.2.3. Palm and coconut tree plantation** |  |  |  |  |  |
| 67 | Palm and coconut tree plantation on soil mountain | 15 |  | 1 | N ≥ 100 | RTCD |
| 68 | Palm and coconut tree plantation on wetland | 15 |  | 5 | N ≥ 100 | RTCDN |
| 69 | Palm and coconut tree plantation on sandy soil | 15 |  | 6 | N ≥ 100 | RTCDC |
|  | **1.2.4. Other plantation** |  |  |  |  |  |
| 70 | Other plantation on soil mountain | 16 |  | 1 | M ≥ 10 | RTK |
| 71 | Other plantation on rocky mountain | 16 |  | 2 | M ≥ 10 | RTKD |
|  | **2. BAREland planned for forestry** |  |  |  |  |  |
|  | **2.1. New plantation** |  |  |  |  |  |
| 72 | New plantation on soil mountain | 17 |  | 1 | M < 10 | DTR |
| 73 | New plantation on rocky mountain | 17 |  | 2 | M < 10 | DTRD |
| 74 | New plantation on saline wetland | 17 |  | 3 | M < 10 | DTRM |
| 75 | New plantation on alkaline wetland | 17 |  | 4 | M < 10 | DTRP |
| 76 | New plantation on freshwater wetland | 17 |  | 5 | M < 10 | DTRN |
| 77 | New plantation on sandy soil | 17 |  | 6 | M < 10 | DTRC |
|  | **2.2. Regeneration** |  |  |  |  |  |
| 78 | Regeneration on soil mountain | 20 |  | 1 | M < 10 | DT2 |
| 79 | Regeneration on rocky mountain | 20 |  | 2 | M < 10 | DT2D |
| 80 | Regeneration on saline wetland | 20 |  | 3 | M < 10 | DT2M |
| 81 | Regeneration on alkaline wetland | 20 |  | 4 | M < 10 | DT2P |
|  | **2.3. Open land with shrubs** |  |  |  |  |  |
| 82 | Open land on soil mountain | 18 |  | 1 | 0 | DT1 |
| 83 | Open land on rocky mountain | 18 |  | 2 | 0 | DT1D |
| 84 | Open land on saline wetland | 18 |  | 3 | 0 | DT1M |
| 85 | Open land on alkaline wetland | 18 |  | 4 | 0 | DT1P |
| 86 | Open land on sandy soil | 18 |  | 5, 6 | 0 | BC1 |
| 87 | Open land with scattered trees on sandy soil | 19 |  | 6 | 0 | BC2 |
|  | **2.4. Land with agricultural crop** |  |  |  |  |  |
| 88 | Agricultural crop on soil mountain | 21 |  | 1 | 0 | NN |
| 89 | Agricultural crop on rocky mountain | 21 |  | 2 | 0 | NND |
| 90 | Agricultural crop on saline wetland | 21 |  | 3 | 0 | NNM |
| 91 | Agricultural crop on freshwater wetland | 21 |  | 5 | 0 | NNP |
|  | **2.5. Other types of lands** |  |  |  |  |  |
| 92 | Other freshwater wetland | 22 |  | 5 | 0 | MN |
| 93 | Other land | 23 |  | 1 | 0 | DKH |

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| **Table 4:** Classification and encoding of tree species for plantations. |

| **ID** | **Vietnamese name** | **Abbre-viation** | **Latin name** | **Location** | **Special species** | **Age class length, years** |
| --- | --- | --- | --- | --- | --- | --- |
| **Detailed tree species** | | | | | | |
| 1 | Hồng mai (Anh đào giả) | A.dao | Gliricida sepium (Jacq.) Steud. | Centre, north, south | 0 | 5 |
| 2 | Bạch đàn chanh | B.dan | Eucalyptus citriodora Hook. F. | Centre, north, south | 0 | 3 |
| 3 | Bạch đàn đỏ | B.dan | Eucalyptus robusta Sm. | Centre, north, south | 0 | 3 |
| 4 | Bạch đàn grandis | B.dan | Eucalyptus grandis Hill ex Maiden | Centre, north, south | 0 | 3 |
| 5 | Bạch đàn liễu | B.dan | Eucalyptus exserta F. Muell. | Centre, north, south | 0 | 3 |
| 6 | Bạch đàn mũ nhỏ | B.dan | Eucalyptus microcorys F. Muell | Centre, north, south | 0 | 3 |
| 7 | Bạch đàn salinha | B.dan | Eucalyptus saligna Smith | Centre, north, south | 0 | 3 |
| 8 | Bạch đàn trắng caman | B.dan | Eucalyptus camaldulensis Dehnh. | North, centre, south | 0 | 3 |
| 9 | Bạch đàn trắng terê | B.dan | Eucalyptus tereticornis Sm. | North, centre, south | 0 | 3 |
| 10 | Bạch đàn urô | B.dan | Eucalyptus urophylla S.T. Blake | North, centre, south | 0 | 3 |
| 11 | Bồ đề | B.de | Styrax tonkinensis (Pierre) Craib ex Hardw. | North, centre, south | 0 | 3 |
| 12 | Bông gòn | B.gon | Ceiba pentandra (L.) Gaertn. | North, centre, south | 0 | 3 |
| 13 | Bồ kết | B.ket | Gleditsia australis Hemsl. | North, centre | 0 | 5 |
| 14 | Bồ kết tây | B.ket | Albizia lebbeck (L.) Benth. | North, centre, south | 0 | 3 |
| 15 | Bằng lăng (Săng lẻ) | B.lang | Lagerstroemia calyculata Kurz | North, centre, south | 0 | 5 |
| 16 | Bằng lăng cườm | B.lang | Lagerstroemia angustifolia Pierre ex Gagnep. | South | 0 | 3 |
| 17 | Bằng lăng nước | B.lang | Lagerstroemia flos-reginae Retz. | North, centre, south | 0 | 5 |
| 18 | Bời lời đỏ (Kháo vàng) | B.loi | Machilus odoratissima Nees | Centre, north, south | 0 | 5 |
| 19 | Bời lời nhớt | B.loi | Litsea glutinosa (Lour.) C.B. Rob. (Litsea sebifera Willd.) | Centre, north, south | 1 | 5 |
| 20 | Bần chua | Ban | Sonneratia caseolaris (L.) Engl. | Centre, north, south | 0 | 3 |
| 21 | Bần ổi | Ban | Sonneratia ovata Back. | Centre, south, north | 0 | 3 |
| 22 | Bần trắng | Ban | Sonneratia alba Smith | North | 0 | 3 |
| 23 | Bàng | Bang | Terminalia catappa L. | North, centre, south | 0 | 3 |
| 24 | Bứa | Bua | Garcinia oblongifolia Champ. ex Benth. | North, south, centre | 0 | 5 |
| 25 | Cọ khiết (Cọ lá nhỏ) | C.khiet | Dalbergia assamica var. laccifera (Eberh & Dubard.) Niysmdham (Dalbergi balansae Prain) | North, centre | 1 | 3 |
| 26 | Cọ khiết lá to (Cọ khẹt lá to) | C.khiet | Dalbergia assamica Benth. (Dalbergi hupeana var. laccifera Eberh. & Dubard) | North, centre | 1 | 3 |
| 27 | Cẩm lai (Cẩm lai bà rịa, Cẩm lai vú) | C.lai | Dalbergia oliveri Gamble ex Prain (Dalbergia bariaensis Pierre, Dalbergia mammosa Pierre) | Centre, south | 0 | 5 |
| 28 | Chiêu liêu | C.lieu | Terminalia chebula Retz. | Centre, south | 0 | 5 |
| 29 | Cáng lò | C.lo | Betula alnoides Buch. Ham.ex D.Don | North, centre | 0 | 5 |
| 30 | Cà na | C.na | Canarium subulatum Guillaume | Centre, south | 0 | 3 |
| 31 | Cao su | C.su | Hevea brasiliensis (Willd. ex Juss.) Muell - Arg. | North, centre, south | 0 | 3 |
| 32 | Chẹo tía | C.tia | Engeldhartia roxburghiana Wall. (Engeldhartia chrysolepis Hance) | Centre, north, south | 0 | 3 |
| 33 | Căm xe | C.xe | Xylia xylocarpa (Roxb.) Theob. (Xylia dolabriformis Benth.) | Centre, south | 0 | 5 |
| 34 | Chè đắng (Chè khôm) | Ch.dang | Ilex kaushue S.Y.Hu (Ilex kudincha C.J.Tseng, I. latifolia Bl.) | North | 0 | 3 |
| 35 | Chàm cánh | Cham | Indigofera zollingeriana Miq. | North, centre, south | 0 | 3 |
| 36 | Chàm phụng (Đậu chàm) | Cham | Indigofera galegoides D.C. | North, centre, south | 0 | 3 |
| 37 | Chò chỉ | Cho | Parashorea chinensis H. Wang | North, centre | 0 | 5 |
| 38 | Chò đen (Chò chai) | Cho | Parashorea stellata Kurz | North, centre | 0 | 5 |
| 39 | Chò nâu | Cho | Dipterocarpus retusus | North, centre | 0 | 5 |
| 40 | Cóc (Quả cóc) | Coc | Spondias cytherea Sonn. | Centre, south | 0 | 5 |
| 41 | Dầu mít (Dầu cát) | D.mit | D. costatus Gaert.f. (D. artocarpifolius) | Centre, south | 0 | 5 |
| 42 | Dái ngựa (Nhạc ngựa) | D.ngua | Swietenia macrophylla King. | Centre, north, south | 0 | 3 |
| 43 | Dầu rái (Dầu con rái, Dầu nước) | D.rai | Dipterocarpus alatus Roxb. ex G.Don | Centre, south | 0 | 5 |
| 44 | Du sam (Mạy hinh) | D.sam | Keteleeria evelyniana Mast. (Keteleeria roullettii (A.Chev.) Flous | Centre, north | 0 | 5 |
| 45 | Du sam đá vôi | D.sam | Keteleeria davidiana var daviana (Bertrand) Beissn (K. calcarea W.C. Cheng &L.K.Fu) | North | 0 | 10 |
| 46 | Dầu song nàng | D.snang | Dipterocarpus dyeri Pierre ex Laness. | South | 0 | 5 |
| 47 | Dầu trà beng | D.tbeng | Dipterocarpus obtusifolius Teym. ex Miq. | Centre, south | 0 | 5 |
| 48 | Dẻ bắc giang | De | Castanopsis bacgiangensis | North | 0 | 5 |
| 49 | Dẻ bộp (Sồi phảng) | De | Lithocarpus fissus (Champ.ex Benth.) A. Camus; Castanopsis fissa (Champ. ex Benth.) Rehd & Wils | Centre, north | 0 | 5 |
| 50 | Dẻ đỏ | De | Lithocarpus ducampii (Hickel et A. Camus) A. Camus | Centre, north | 0 | 5 |
| 51 | Dẻ gai (Cà ổi) | De | Castanopsis indica (Roxb.) A. DC. | North, centre | 0 | 5 |
| 52 | Dẻ yên thế | De | Castanopsis boisii Hickel et A. Camus | North | 1 | 5 |
| 53 | Dẻ trùng khánh | De.tk | Castanea mollissima Blume | North, centre, south | 1 | 5 |
| 54 | Điều (Đào lộn hột) | Dieu | Anacardium occidentale L. | Centre, north, south | 1 | 3 |
| 55 | Đinh (Thiết đinh) | Dinh | Markhamia stipulata (Wall.) Schum. | Centre, north | 0 | 10 |
| 56 | Đinh hương | Dinh | Dysoxylum cauliflorum Hiern | Centre, south | 0 | 5 |
| 57 | Đinh thối | Dinh | Fernandoa brilletii (Dop) Steen. (Hexaneurocarpon brilletii Dop) | North | 0 | 5 |
| 58 | Dọc | Doc | Garcinia multiflora (Champ. ex Benth.), Garcinia tonkinensis Vesque | Centre, north, south | 0 | 3 |
| 59 | Đưng (Đước bộp) | Duoc | Rhizophora mucronata Lam. | South | 0 | 3 |
| 60 | Đước (Đước đôi) | Duoc | Rhizophora apiculata Blume | South | 0 | 3 |
| 61 | Đước vòi (Đâng) | Duoc | Rhizophora stylosa Griff. | South | 0 | 3 |
| 62 | Gạo | Gao | Bombax ceiba L. (Bombax malabaricum DC.) | Centre, north, south | 0 | 3 |
| 63 | Giáng hương lá to | Gi.huong | Pterocarpus macrocarpus Kurz (Pterocarpus cambodianus Pierre) | Centre, south | 0 | 5 |
| 64 | Giổi ăn hạt | Gioi | Michelia tonkinensis Dandy | North, centre | 1 | 5 |
| 65 | Giổi nhung | Gioi | Michelia braiaensis Gagnep | Centre, south | 0 | 5 |
| 66 | Giổi xanh | Gioi | Michelia mediocris Dandy | North, centre | 0 | 5 |
| 67 | Gõ đỏ (Gõ cà te) | Go | Afzelia xylocarpa (Kurz) Craib. (Pahudia cochinchinensis Pierre; Pahudia xylocarpa Kurz) | Centre, south | 0 | 10 |
| 68 | Gõ nước | Go | Intsia bijuga (Colebr.) O.Ktze (Afzelia bjuga (Colebr.) A. Gray) | South | 0 | 3 |
| 69 | Gội (Gội nếp) | Goi | Aglaia spectabilis (Miq.) Jain.& Bennet. (A. gigantea (Pierre) Pell.) | Centre, centre | 0 | 5 |
| 70 | Gụ lau | Gu | Sindora tonkinensis A. Chev. ex Larsen | North, centre | 0 | 5 |
| 71 | Gụ mật | Gu | Sindora siamensis Teijm ex Miq.(Sindora cochinchinensis Baill.) | Centre, south | 0 | 10 |
| 72 | Hoè (Hoa hoè) | Hoe | Styphnolobium japonica (L.) Schott (Sophora japonica L.) | North, south, centre | 1 | 3 |
| 73 | Hồi (Đại hồi) | Hoi | Illicium verum Hook f. | North | 1 | 3 |
| 74 | Hông | Hong | Paulownia fortunei (Seem.) Hemsl. | North | 0 |  |
| 75 | Huỷnh | Huynh | Tarrietia javanica Blume | Centre, south | 0 | 5 |
| 76 | Kim giao | K.giao | Nageia fleuryi (Hickel) De Laub. (Podocarpus fleuryi Hickel) | North, centre, south | 0 | 5 |
| 77 | Kiền kiền | K.kien | Hopea siamensis Heim | Centre, south | 0 | 10 |
| 78 | Kiền kiền phú quốc | K.kien | Hopea pierrei Hance | Centre, south | 0 | 10 |
| 79 | Keo lá bạc | Keo | A. aulacocarpa A. Cunn. ex Benth. | North, centre, south | 0 | 3 |
| 80 | Keo lá liềm | Keo | A. crassicarpa A. Cunn. ex Benth. | Centre, north, south | 0 | 3 |
| 81 | Keo lá tràm | Keo | A. auriculiformis A. Cunn. ex Benth | Centre, north, south | 0 | 3 |
| 82 | Keo lai | Keo | A. mangium Wild. x A. auriculiformis A. Cunn. ex Benth. | North, centre, south | 0 | 3 |
| 83 | Keo lông | Keo | Acacia torulosa Benth. | North, centre, south | 0 | 3 |
| 84 | Keo tai tượng | Keo | Acacia mangium Wild. | North, centre, south | 0 | 3 |
| 85 | Keo tumiđê | Keo | Acacia tumidae S. Muell | North, centre, south | 0 | 3 |
| 86 | Kháo | Khao | Phoebe cuneate Blume | North, centre | 0 | 5 |
| 87 | Lòng mang lá cụt | L.mang | Pterospermum truncatolobatum Gagnep. | North, centre | 0 | 5 |
| 88 | Lòng mang lá mác | L.mang | Pterospermum lancaefolium Roxb. | North, centre, south | 0 | 5 |
| 89 | Lòng mức (Thừng mức) | L.muc | Wrightia annamensis Eberh. & Dub. | North, centre, south | 0 | 3 |
| 90 | Long não (Dã hương) | L.nao | Cinnamomum camphora (L.) J. Presl | North, centre, south | 0 | 5 |
| 91 | Lõi thọ | L.tho | Gmelina arborea Roxb. | North, centre | 0 | 10 |
| 92 | Lim xẹt | L.xet | Pelthophorum dasyrrachis (Miq.) Kurz. var. tonkinensis (Pierre) K. & S. Larsen | North, centre, south | 0 | 10 |
| 93 | Lát hoa | Lat | Chukrasia tabularis A. Juss. | North, centre, south | 0 | 5 |
| 94 | Lát mêhicô | Latm | Cedrela odorata | North, centre, south | 0 | 5 |
| 95 | Lim xanh | Lim | Erythrophloeum fordii Oliv. | North, centre, south | 0 | 10 |
| 96 | Mạy châu (Mạy chấu) | M.chau | Carya tonkinensis Lecomte | North | 0 | 3 |
| 97 | Mấm biển (Mắm biển) | Mam | Avicennia marina (Fork.) Vierh. | Centre, south | 0 | 3 |
| 98 | Mấm lưỡi đòng (Mắm đen) | Mam | Avicennia officinalis L. | South | 0 | 3 |
| 99 | Mấm quăn (Mắm quăn) | Mam | Avicennia lanata Ridl. | South | 0 | 3 |
| 100 | Mấm trắng (Mắm trắng) | Mam | Avicennia alba Blume | South | 0 | 3 |
| 101 | Me | Me | Tamarindus indica L. | Centre, north, south | 0 | 3 |
| 102 | Mít | Mit | Artocarpus intergrifolius L. f. | North, centre, south | 0 | 5 |
| 103 | Mò lá bạc | Ml.bac | Cryptocarya maclurei Merr. | North, south | 0 | 5 |
| 104 | Mỡ | Mo | Manglietia conifera Dandy,̃ Manglietia glauca Blume) | North, centre | 0 | 5 |
| 105 | Mun | Mun | Diospyros mun A. Chev. ex Le comte | North, centre | 0 | 10 |
| 106 | Mun sọc | Mun | Diospyros sp. | Centre | 0 | 10 |
| 107 | Muỗm | Muom | Mangifera foetida Lour. | North, centre, south | 0 | 3 |
| 108 | Muồng đen | Muong | Cassia siamea Lam. | Centre, north, south | 0 | 3 |
| 109 | Muồng hoa đào (Bò cạp nước) | Muong | Cassia javanica L. | Centre, south | 0 | 3 |
| 110 | Muồng hoàng yến | Muong | Cassia fistula L. | North, centre, south | 0 | 3 |
| 111 | Muồng ngủ (Còng) | Muong | Samanea saman (Jacq.) Merr. | North, centre, south | 0 | 3 |
| 112 | Muồng pháo | Muong | Calliandra calothyrsus Meissner | North, centre, south | 0 | 3 |
| 113 | Muồng ràng ràng (Cườm rắn) | Muong | Adenanthera pavonina L. (A.microsperma Teysm) | North, centre, south | 0 | 3 |
| 114 | Mù u | Muu | Calophyllum inophyllum L. | South | 0 | 3 |
| 115 | Xoan chịu hạn (Neem) | Neem | Azedirachta indica Juss. | North, centre, south | 0 | 3 |
| 116 | Ngô đồng | Ng.dong | Firmiana simplex (L.) W.Wight. | North, centre | 0 | 5 |
| 117 | Nghiến | Nghien | Burretiodendron tonkinensis (Gagnep.) Kosterm. | North, centre | 0 | 10 |
| 118 | Nhội | Nhoi | Bischofia javanica Blume(Bischofia trifoliata (Roxb.) Hook.f.) | North, centre, south | 0 | 5 |
| 119 | Phi lao | P.lao | Casuarina equisetifolia Forst & Forst f | North, centre, south | 0 | 3 |
| 120 | Pơ mu | P.mu | Fokienia hodginsii (Dunn) Henry & Thomas | North, centre | 0 | 5 |
| 121 | Phượng vĩ | Phuong | Denolix regia (Bojer ex Hook,) Raf. | North, centre, south | 0 | 5 |
| 122 | Quế | Que | Cinnamomum cassia (L.) J.Presl. | North, centre | 1 | 5 |
| 123 | Re hoa trắng | Re | Cinnamomum curvifolium (Lour.) Nees (Cinnamomum albiflorum Nees) | North, centre | 0 | 5 |
| 124 | Re hương | Re | Cinnamomum partheroxylum (Jack.) Nees | North, centre | 0 | 5 |
| 125 | Ràng ràng mít | Rr.mit | Ormosia balansae Drake | North, centre | 0 | 5 |
| 126 | Sa mu (Sa mộc) | S.mu | Cunninghamia lanceolata (Lamb.) Hook. | North, centre | 0 | 5 |
| 127 | Sa mu dầu (Ngọc am) | S.mu | Cunninghamia lanceolata var. konishii (Hayata) | North, centre | 0 | 5 |
| 128 | Sau sau | S.sau | Liquidambar formosana Hance | North, centre | 0 | 3 |
| 129 | Sao đen | Sao | Hopea odorata Roxb. | Centre, south | 0 | 5 |
| 130 | Sao mặt quỷ (Táu mặt quỷ) | Sao | Hopea mollissima C.Y.Wu | Centre | 0 | 10 |
| 131 | Sao xanh | Sao | Hopea sp. | Centre | 0 | 5 |
| 132 | Sấu | Sau | Dracontomelon dupperreanum Pierre | North, centre, south | 0 | 5 |
| 133 | Sến bo bo (Vên vên nghệ) | Sen | Shorea hypochra Hance | South | 0 | 5 |
| 134 | Sến mật | Sen | Madhuca pasquieri (Dunbard.) H. J. Lam. | North, south, centre | 0 | 10 |
| 135 | Sến mủ (Sến cát) | Sen | Shorea roxburghii G. Don (Shorea cochinchinensis Pierre) | Centre, south | 0 | 5 |
| 136 | Sến trung (Sến hải nam, Chà ran sến) | Sen | Homalium ceylanicum Benth(Homalium hainanensis Gagnep) | Centre | 0 | 10 |
| 137 | Sến xanh | Sen | Mimusop elengi L. | Centre, south | 0 | 5 |
| 138 | Sếu (Cơm nguội) | Seu | Celtis sinensis Pers. | North, south, centre | 0 | 3 |
| 139 | Sơ | So | Camellia oleifera C. Abel. | North, centre, south | 0 | 3 |
| 140 | Sở thường | So | Camellia sasanqua Thunb. (Thea sasanqua (Thunb.) Pierre) | North, centre, south | 1 | 3 |
| 141 | Sú | Su | Aegiceras corniculatum | North, centre, south | 0 | 3 |
| 142 | Trắc vàng (Sưa, Trắc thối) | Sua | Dalbergia tonkinensis Prain | North, centre | 0 | 5 |
| 143 | Tai chua | T.chua | Garcinia cowa Roxb. | North, centre, south | 0 | 5 |
| 144 | Tông dù (Mạy sao) | T.du | Toona sinensis (A. Juss.) M. Roem | North | 0 | 5 |
| 145 | Tô hạp hương | T.hap | Altingia siamensis Craib. | North, centre | 0 | 5 |
| 146 | Thàn mát | T.mat | Millettia ichthyochtona Drake | North, centre, south | 0 | 3 |
| 147 | Táo mèo | T.meo | Docynia indica (Wall.) Decne | North | 0 | 5 |
| 148 | Thanh thất | T.that | Ailanthus triphysa (Dennst.) Alston | North, centre, south | 1 | 3 |
| 149 | Thanh trà (Sơn trà) | T.tra | Bouea oppositifolia (Roxb.) Meisn. | North, centre, south | 0 | 5 |
| 150 | Táu mật | Tau | Vatica odorata ssp. brevipetiolatum (Vatica tonkinensis A. Chev.) | North | 0 | 10 |
| 151 | Táu muối | Tau | Vatica diospyroides (Vatica fleuryana Tard.) | North,centre | 0 | 5 |
| 152 | Tếch (Gía tỵ) | Tech | Tectona grandis L. | North, centre, south | 0 | 5 |
| 153 | Thông ba lá | Thong | Pinus kesiya Royle ex Gordon | North, centre | 0 | 5 |
| 154 | Thông Ca ri bê | Thong | Pinus caribaea Morelet | North, centre, south | 0 | 5 |
| 155 | Thông đỏ nam | Thong | Taxus wallichianus Zucc. | North, centre | 0 | 5 |
| 156 | Thông đỏ trung quốc | Thong | Taxu chinensis (Pilg.) Rehd. | North | 0 | 10 |
| 157 | Thông hai lá dẹt | Thong | Pinus krempfii Lecomte | Centre | 0 | 5 |
| 158 | Thông mã vĩ (Thông đuôi ngựa) | Thong | Pinus massoniana Lamb. | North, centre, south | 0 | 5 |
| 159 | Thông năm lá | Thong | Pinus dalatensis D. Ferre | Centre | 0 | 5 |
| 160 | Thông nhựa | Thong | Pinus merkusii Jungh.et de Vries | North, south | 0 | 5 |
| 161 | Tống quán sủ (Tống quá sủ) | Tq.su | Alnus nepalensis D. Don | North | 0 | 5 |
| 162 | Trám đen | Tr.den | Canarium pimela Leench. (Canarium nigrum, Canarium tramdenum) | North, centre | 1 | 5 |
| 163 | Trám hồng (Trám ba cạnh) | Tr.hong | Canarium bengalense Roxb. | North, centre | 0 | 5 |
| 164 | Trầm dó (Trầm hương) | Tr.huong | Aquilaria crassna Pierre ex Lecomte | North, centre, south | 0 | 5 |
| 165 | Trám trắng | Tr.trang | Canarium album (Lour.) Raeusch. | North, centre | 1 | 5 |
| 166 | Trâm vối | Tr.voi | Syzygium cuminii (L.) Skeel | North, centre | 0 | 5 |
| 167 | Trắc | Trac | Dalbergia cochinchinensis Pierre | Centre, south | 0 | 10 |
| 168 | Trai | Trai | Shorea obtusa Wall. ex Blume var. kochangensis Heim. (Shorea vulgaris Pierre) | Centre, south | 0 | 10 |
| 169 | Tràm (Tràm cừ) | Tram | Melaleuca cajuputi Powell | North, centre, south | 0 | 3 |
| 170 | Tràm lá bạc | Tram | Melaleuca argentea W. Fitzg. | North, centre, south | 0 | 3 |
| 171 | Tràm lá dài | Tram | Melaleuca leucadendrra (L.) L. | North, centre, south | 0 | 3 |
| 172 | Tràm la ́năm gân | Tram | Melaleuca quinquenervia (Cav.) | North, centre, south | 0 | 3 |
| 173 | Tràm lá rộng | Tram | Melaleuca viridiflora | North, centre, south | 0 | 3 |
| 174 | Tràm salina | Tram | Melaleuca saligna | North, centre, south | 0 | 3 |
| 175 | Trang | Trang | Kandelia candel (L.) Druce | North, centre, south | 0 | 3 |
| 176 | Trẩu | Trau | Vernicia montana Lour. (Aleurites montana (Lour.) Wilson) | North, centre | 1 | 3 |
| 177 | Trẩu cao bằng | Trau | Vernicia fordii (Hemsl.) Airy Shaw (Aleurites fordii Hemsl.) | North, centre, south | 1 | 3 |
| 178 | Vù hương | V.huong | Cinnamomum balansae Lecomte | North | 0 | 10 |
| 179 | Vàng tâm | V.tam | Manglietia dandyi (Gagnep.) Dandy (Magnolia dandyi Gagnep.) | North, centre | 0 | 5 |
| 180 | Vối thuốc (Kháo dặm) | V.thuoc | Schima wallichii var. noronhae (Blume) Bloemb. | North, centre | 0 | 3 |
| 181 | Vạng trứng | V.trung | Endospermum chinense Benth. | North, centre, south | 0 | 5 |
| 182 | Vên vên | V.ven | Anisoptera costata Korth. (Anisoptera cochinchinensis Pierre) | Centre, south | 0 | 5 |
| 183 | Tô mộc (Vang) | Vang | Caesalpinia sappan L. | North, centre, south | 0 | 5 |
| 184 | Vẹt đen (Vẹt khàng) | Vet | Bruguiera sexangula (Lour.) Poir. | South | 0 | 3 |
| 185 | Vẹt dù | Vet | Bruguiera gymnorrhiza (L.) Savigny | South | 0 | 3 |
| 186 | Vẹt tách | Vet | Bruguiera parviflora (Roxb.) Wight et Arn, ex Griff. | South | 0 | 3 |
| 187 | Vẹt thăng (Vẹt trụ ) | Vet | Bruguiera cylindrica (L.) Blume | South | 0 | 3 |
| 188 | Xà cừ (Sọ khỉ̉) | X.cu | Khaya senegalensis (Desr.) A. Juss. | North, south, centre | 0 | 5 |
| 189 | Xoan đào | Xo.dao | Prunus arborea (Blume) Kalkm (Pygeum arboreum Engl.) | North, centre | 0 | 3 |
| 190 | Xoan mộc (Trương vân) | Xo.moc | Toona surenii (Blume) Merr. (Toona febrifuga M. Roem.) | North, centre | 0 | 5 |
| 191 | Xoan nhừ (Lát xoan) | Xo.nhu | Choerespondias axillaris (Roxb.) Burtt. & Hill | North, centre | 0 | 5 |
| 192 | Xoài | Xoai | Mangifera indica L. | North, centre, south | 0 | 5 |
| 193 | Xoan (Xoan ta, Sầu đâu) | Xoan | Melia azedarach L. | North, centre, south | 0 | 3 |
| 194 | Xoan quả to | Xoan | Melia toosendan Sieb. & Zucc. | North | 0 | 3 |
| 195 | Xoay | Xoay | Dialium cochinchinensis Pierre | Centre, south | 0 | 5 |
| 196 | Xu | Xu | Xylocarpus moluccensis (Lamk.) M. Roem. | South | 0 | 3 |
| 197 | Xu ổi | Xu | Xylocarpus granatum Koenig | South | 0 | 3 |
| 198 | Chà là | Ch.la | Phoenix paludosa | North, centre, south | 0 |  |
| 199 | Dừa | Dua | Cocos | North, centre, south | 0 |  |
| 200 | Dừa nước (Dừa lá) | D. nước | Nypa fruticans | Centre, south | 0 |  |
| 201 | Giá | Giá | Excoecaria agallocha | North, centre, south | 0 | 3 |
| 202 | Keo gai (Me keo) | K. gai | **Pithecellobium dulce** | Centre, south | 0 | 5 |
| 203 | Trâm bầu (Chưn bầu) | Tr. Bầu | Combretum quadrangulare [Kurz](https://vi.wikipedia.org/w/index.php?title=Kurz&action=edit&redlink=1" \t "_blank" \o "Kurz (trang chưa được viết)) | Centre, south | 0 | 5 |
|  |  |  |  |  |  |  |
| **Genus for tree species** | | | | | | |
| 500 | Bạch đàn | B.dan | Eucalyptus | North, centre, south | 0 | 3 |
| 501 | Bần | Ban | Sonneratia | North, centre, south | 0 | 3 |
| 502 | Cọ khiết | C.khiet | Dalbergia | North, centre | 1 | 3 |
| 503 | Đước | Duoc | Rhizophora | South | 0 | 3 |
| 504 | Keo | Keo | Acacia | North, centre, south | 0 | 3 |
| 505 | Lòng mang | L.mang | Pterospermum | North, centre | 0 | 5 |
| 506 | Mấm | Mam | Avicennia | Centre, south | 0 | 3 |
| 507 | Mun | Mun | Diospyros | North, centre | 0 | 10 |
| 508 | Re | Re | Cinnamomum | North, centre | 0 | 5 |
| 509 | Sa mu | S.mu | Cunninghamia | North, centre | 0 | 5 |
| 510 | Thông | Thong | Pinus | North, centre | 0 | 5 |
| 511 | Tràm | Tram | Melaleuca | North, centre, south | 0 | 3 |
| 512 | Vẹt | Vet | Bruguiera | South | 0 | 3 |
| 513 | Xoan | Xoan | Melia | North, centre, south | 0 | 3 |
| 514 | Xu | Xu | Xylocarpus | South | 0 | 3 |
| 515 | Cọ | Co | Trachycarpus | North, centre, south | 0 |  |
| 516 | Dà | Dà | Ceriops | Centre, south | 0 | 5 |
| 517 | Luồng | Luong | Dendrocalamus | North, centre, south | 0 |  |
| 518 | Mắc ca | M.ca | Macadamia | North, centre, south | 1 | 3 |
| 519 | Song, mây | Songmay | Calamus | North, centre, south | 0 |  |
| 520 | Tre | Tre | Bambusa | North, centre, south | 0 |  |
| 521 | Trúc | Truc | Ampelocalamus | North, centre, south | 0 |  |
| 522 | Vầu | Vau | Acidosasa | North, centre, south | 0 |  |
| 523 | Lồ ô | Tre | Bambusa | North, centre, south | 0 |  |
|  |  |  |  |  |  |  |
| **Other species** | | | | | | |
| 990 | Other species, fast growing |  |  | North, centre, south | 0 | 3 |
| 991 | Other species, medium growing |  |  | North, centre, south | 0 | 5 |
| 992 | Other species, slow growing |  |  | North, centre, south | 0 | 10 |
| 993 | Other special species, fast growing |  |  | North, centre, south | 1 | 3 |
| 994 | Other special species, medium growing |  |  | North, centre, south | 1 | 5 |
| 995 | Other special species, slow growing |  |  | North, centre, south | 1 | 10 |
| 996 | Other bamboo |  |  | North, centre, south | 0 |  |
| 997 | Other coconut |  |  | North, centre, south | 0 |  |
| 998 | Other special bamboo |  |  | North, centre, south | 1 |  |
| 999 | Other special coconut |  |  | North, centre, south | 1 |  |

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| **Table 5:** Classification and encoding of plantation forest origin. | | |
| **No** | **Classification** | **Code** |
| 1 | Afforestation | 1 |
| 2 | Reforestation | 2 |
| 3 | Coppicing | 3 |

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| **Table 6:** Classification and encoding of state of plantation. | | |
| **No** | **Classification** | **Code** |
| 1 | Plantation (with volume) | 1 |
| 2 | New plantation (without volume) | 2 |

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| **Table 7:** Classification and encoding of site condition. | | | |
| **No** | **Classification** | **Abbreviation** | **Code** |
| 1 | Soil mountain | NDAT | 1 |
| 2 | Rocky mountain | NDA | 2 |
| 3 | Saline wetland | NM | 3 |
| 4 | Alkaline wetland | NP | 4 |
| 5 | Freshwater wetland | NG | 5 |
| 6 | Sandy soil | CAT | 6 |

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| **Table 8:** Classification and encoding of forest function. | | | | | |
| **No** | **Classification** | **Abbreviation** | **Code for forest function, sub-class** | **Code for forest function, main class** | |
| 1 | Watershed | PHDN | 1 | 1 | |
| 2 | Protection forest for tide shielding | PHCS | 2 | 1 | |
| 3 | Wind and sand shielding forest | PHCC | 3 | 1 | |
| 4 | Environmental protection | PHMT | 4 | 1 | |
| 5 | National park | VQG | 5 | 2 | |
| 6 | Nature reserve | BTTN | 6 | 2 | |
| 7 | Scientific research | NCKH | 7 | 2 | |
| 8 | Historical and landscape area | VHCQ | 8 | 2 | |
| 9 | Big timber production | SXGL | 9 | 3 | |
| 10 | Small timber production | SXGN | 10 | 3 | |
| 11 | Bamboo production | SXTN | 11 | 3 | |
| 12 | Other production | MDK | 12 | 3 | |

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| **Table 9:** Classification and encoding of forest owner type. | | | |
| **No** | **Classification** | **Abbreviation** | **Code** |
| 1 | Household | HGD | 1 |
| 2 | Community | CD | 2 |
| 3 | Commune People’s Committee | UBNDX | 3 |
| 4 | Protection Forest Management Board | BQLRPH | 4 |
| 5 | State forest company | LTQD | 5 |
| 6 | Forest company (general) | CTLN | 6 |
| 7 | Private company | DNTN | 7 |
| 8 | Foreign owned company | DNNN | 8 |
| 9 | Other owner | KHAC | 9 |
| 10 | Special Use Forest Management Board | BQLRDD | 10 |
| 11 | Army | DVVT | 11 |

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| **Table 10:** Classification and encoding of conflict situation. | | |
| **No** | | **Classification** | **Code** | |
| 1 | | Conflict | 1 | |
| 2 | | No conflict | 2 | |

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| **Table 11:** Classification and encoding of land use certificate. | | |
| **No** | | **Classification** | **Code** | |
| 1 | | Land use certificate type 1 | 1 | |
| 2 | | Land use certificate type 2 | 2 | |
| 3 | | Other land use certificate | 3 | |
| 4 | | No certificate | 4 | |

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| **Table 12:** Classification and encoding of protection contract. | | |
| **No** | | **Classification** | **Code** | |
| 1 | | Contract | 1 | |
| 2 | | No contract | 2 | |

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| **Table 13:** Classification and encoding of natural forest origin. | | |
| **No** | | **Classification** | **Code** | |
| 1 | | Primary forest | 1 | |
| 2 | | Secondary forest | 2 | |

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| **Table 14:** Classification and encoding that verifies position of the plot. | | |
| **No** | **Classification** | **Code** |
| 1 | Plot postions on map and field are consistent | 1 |
| 2 | Plot postions on map and field are not consistent | 2 |

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| **Table 15:** Classification and encoding of the relationship between inventory plot and forest owner. | | |
| **No** | **Classification** | **Code** |
| 1 | Forest owner | 1 |
| 2 | Forest protector | 2 |
| 3 | Conflicting forest owner | 3 |

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| **Table 16:** Classification and encoding the forest use situation. | | |
| **No** | **Classification** | **Code** |
| 1 | In forestry use (in boundary planned for 3 types of forest) | 0 |
| 2 | Outside forestry use (out of boundary planned for 3 types of forest) | 1 |
| 3 | Previous forestry land | 2 |

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| **Table 17:** Classification and encoding the type of plantation species. | | |
| **No** | **Classification** | **Code** |
| 1 | One specie plantation | 0 |
| 2 | Mixed species plantation | 1 |

**REMOVED TABLES**

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| **Table Name:** | PlotForestActor | **Description:** | This table indicates the relationship between forest actor and plots |

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| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| CommuneCode | Code of the commune that the plot belongs to | Integer |  | Y |  |  |
| ComptCode | Code of the compartment that the plot belongs to | Character | 5 | Y |  |  |
| SubComptCode | Code of the sub-compartment that the plot belongs to | Character | 5 | Y |  |  |
| PlotCode | Code of the plot | Character | 5 | Y |  |  |
| ActorID | The identifier of the forest actor | Integer |  | Y |  |  |
| Relationship | Relationship between the plot and the forest use object (see lookup table **PlotObjectRelType**) | Decimal | (1,0) | Y |  |  |

plot.

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| **Table Name:** | PlotActorRelType | **Description:** | This lookup table contains code that indicates relationship type between plots and forest actors |

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| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | **Default Value** | **Constraint** |
| PlotActorRelCode | Code that indicates the type of relationship | Decimal | (1,0) | Y |  | Unique |
| PlotActortRelDef | Definition of the type of relationship | Character | 50 | Y |  |  |
| Source | Source of the definition | Character | 100 | N | “ ” |  |

The content of the lookup table **PlotObjectRelType** is inferred from Annex 1 - **Table 15:** Classification and encoding of the relationship between plots and forest actors.

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| **Table Name:** | PlotTreeSpec | **Description:** | This table contains information about tree species planted in an inventory plot |

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| **Column Name** | **Description** | **Data Type** | **Size** | **Required** | | **Default Value** | **Constraint** |
| CommuneCode | Code of the commune that the inventory plot belongs to | Integer |  | Y | N/A | | PK |
| ComptCode | Code of the compartment that the inventory plot belongs to | Character | 5 | Y | N/A | | PK |
| SubComptCode | Code of the sub-compartment that the inventory plot belongs to | Character | 5 | Y | N/A | | PK |
| TreeSpecCode | Code of the tree species | Decimal | (4,0) | Y |  | | PK |