DESCRIPTION OF SHARED FOREST SUBAREA DATA MANAGED BY THE STATE FORESTS NATIONAL FOREST HOLDING

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A. Description of the contents of the data package files

Master Tables

F_ARODES – table containing subareas address

adress_forest – forest address

arodes_int_num – serial number

a_year – data status year

arodes_typ_cd – object type code

F_SUBAREA – table containing subareas description

arodes_int_num – serial number

a_year – data status year

area_type_cd – surface type

site_type_cd – forest site type

moisture_cd – soil moisture variant

degradation_cd – site degradation level

soil_subtype_cd – soil type and sub-type

plant_comm_cd – plant sub-community

stand_struct_cd – stand vertical structure

forest_func_cd – forest function

silviculture_cd – holding

rotation_age – felling age

sub_area – stand area

veg_cover_cd – cover type

damage_degree – damage percentage

cause_cd – damage cause

F_AROD_STOREY – table containing layers of the stand

arodes_int_num – serial number

a_year – data status year

density_cd – density

mixture_cd – species mixture

standdensity_index – afforestation

tree_stock_cd – closure

st_rank_order_act – stand layer rank

storey_cd – stand layer code

F_STOREY_SPECIES – table describing subarea species

arodes_int_num – serial number

a_year – data status year

storey_cd – stand layer code

sp_rank_order_act – species rank

species_cd – species code

species_age – species age

part_cd_act – share

site_class_cd – site class

height – height

bhd – diameter at breast height

volume – volume

F_AROD_CUE – table containing economic indicators

arodes_int_num – serial number

a_year – data status year

site_nr – plot number

measure_cd – economic indicator code

urgency – urgency

cutting_nr – number of cutting plot

cutting_area – work site

large_timber_perc – percentage of merchantable timber

cue_rank_order – indicator rank

F_AROD_CATEGORY – table containing protection categories

arodes_int_num – serial number

prot_category_cd – protection category

prot_rank_order – protection category rank

a_year – data status year

F_AROD_PROT_SITE – table containing natural habitat description

site_int_num – numer wewnętrzny cechy

arodes_int_num – serial number

prot_site_cd – natural habitat code

prot_site_state – habitat conservation status code

a_year – data status year

F_INSPECTORATE – table containing data for forest inspectorate

arodes_int_num – serial number

a_year – data status year

inspectorate_name – forest inspectorate name

G_SUBAREA – table containing subareas geometry

a_i_num – serial number – the full field name is arodes_int_num

adr_for – forest address

area_type – surface type

site_type – forest site type

silvicult – holding

forest_fun – forest function

stand_stru – stand vertical structure

rotat_age – felling age

sub_area – stand area

prot_categ – dominant protection category

species_cd – dominant species code

part_cd – dominant species share

spec_age – dominant species age

a_year – data status year

G_COMPARTMENT – table containing divisions geometry

a_i_num – serial number – the full field name is arodes_int_num

adr_for – forest address

a_year – data status year

G_FOREST_RANGE – tabela z danymi geometrycznymi dla warstwy leśnictw

a_i_num – serial number – the full field name is arodes_int_num

adr_for – forest address

f_r_name – forest range name

a_year – data status year

G_INSPECTORATE – table containing inspectorate geometry

a_i_num – serial number – the full field name is arodes_int_num

adr_for – forest address

i_name – forest inspectorate name

a_year – data status year

Dictionary tables

f_forest_func_dic – forest functions dictionary

f_prot_categ_dic – protective forest categories dictionary

f_area_type_dic – surface types dictionary

f_density_dic – density types dictionary

f_mixture_dic – species mixture types dictionary

f_part_dic – species share dictionary

f_plant_comm_dic – plant communities dictionary

f_site_type_dic – forest site type dictionary

f_storey_dic – stand layers dictionary

f_tree_species_dic – tree species dictionary

f_prot_site_dic – natural habitats dictionary

f_silviculture_dic – holding dictionary

f_soil_subtype_dic – soil subtype dictionary

B. Description of the data packet

The data packet contains geometric and descriptive information pertaining to the forests of the forest district, indicated by the user when configuring the option `Data for forest districts`. If more than one forest district is indicated, a separate data package is provided for each district. Single packet contains files of information layers in SHP format and files in TXT format that contain information from selected tables of taxation description of tree stands. Relationships between particular elements of data packet are presented on data model.

C. Description of the data model

Data model (separate file: ModelData_DataModel.pdf) is a graphical presentation of the structure of individual data files (tables) and their mutual dependencies (relationships). The information provided allows to recreate the data structure in the database system.

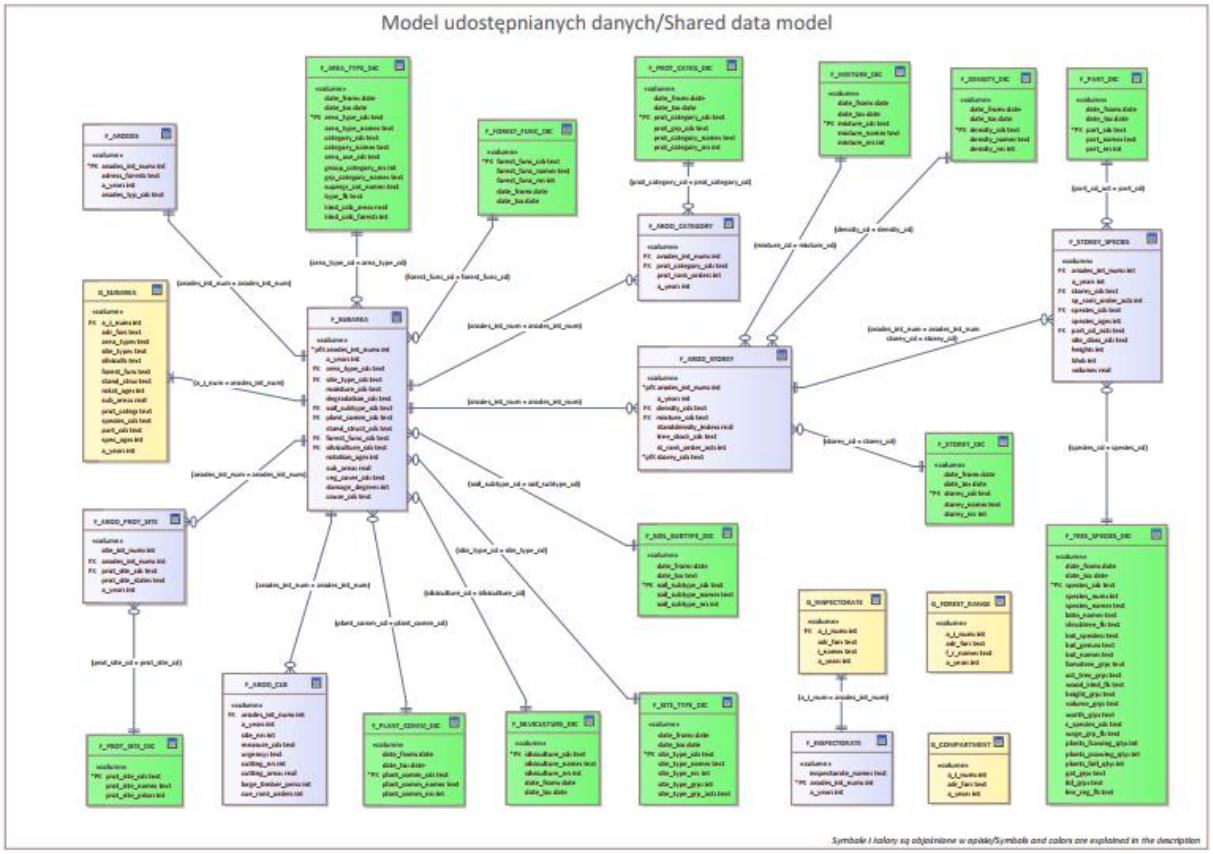


Fig. 1 The data model – initial visualization

Explanation of used symbols

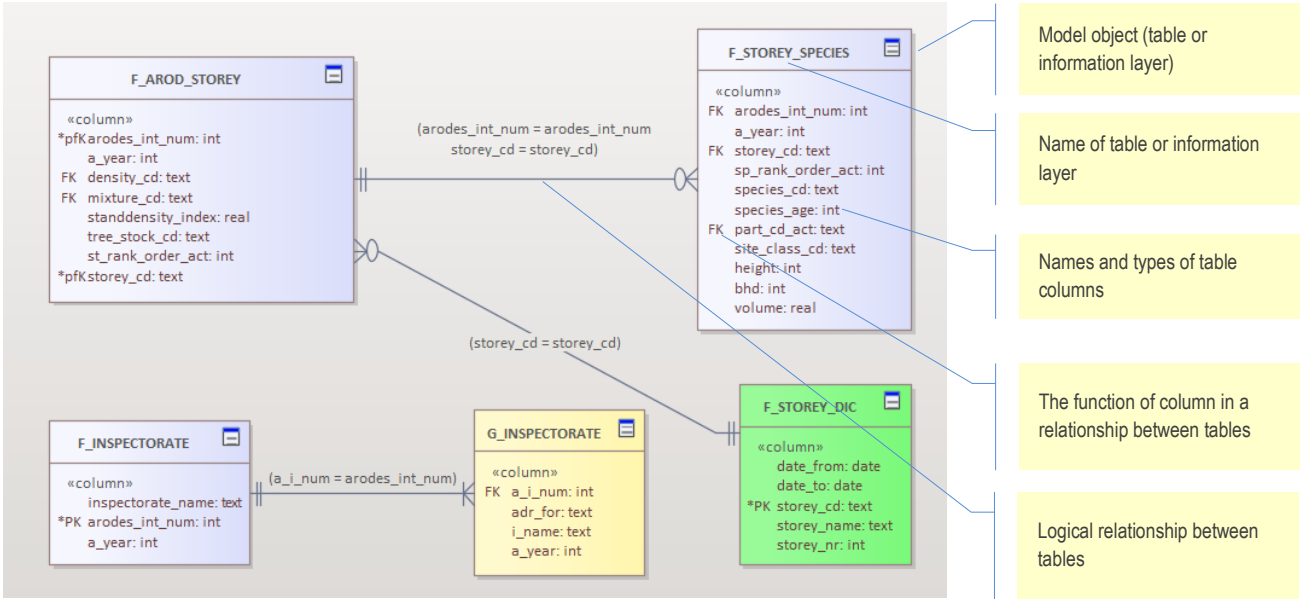


Fig. 2 Example of symbols used in the data model

Model object

A model object is an extracted set of geometric (SHP) or descriptive (TXT) data in a file. The used colors identify:

- – a data attribute table of an information layer,
- – a descriptive data table,
- – a descriptive data table acting as a glossary (explanation of codes used in other tables).

Object name

The object name corresponds to the file name of the data package. It can be freely changed by the user at the stage of its creation in accepted GIS or database software.

Column name and data type

The structure of a table is created by columns. When defining a column, you must specify its name and the type of data to be stored. In files that store data, column names are already defined in the first row. The data type is assigned automatically (not always correctly) when the data is loaded.

Table column function in relationships

Columns in a table can play many roles:

- ***PK** – (primary key) the values in the column or columns marked with this symbol uniquely identify each row of the table (the combination of values in these columns will never be repeated in the table),
- **FK** – (foreign key) values in the column or columns labeled with this symbol allow a link to the key values of the parent table to which the slave table data is appended. In these columns, the values need not be unique,
- ***pfK** – a column or columns act as both a primary key and a foreign key.

Logical relationship between tables

The relationship between the tables is defined by specifying the columns that join the two tables:

(arodes_int_num = arodes_int_num
storey_cd = storey_cd) – column names used to connect tables. In the parent table, the selected columns must act as a PK key. In the slave (join) table, the selected columns act as a foreign key FK.

An additional parameter of the compound is its multiplicity:

 – one-to-one relationship – one row of the table on the left **must** correspond to only one row of the table on the right,

– one-to-many relationship - one row of the table on the left **must** correspond to one or more rows of the table on the right,

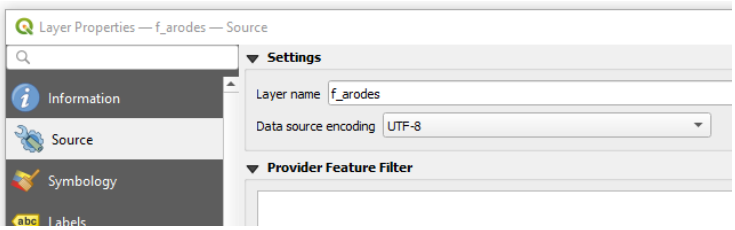
– one-to-many relationship - one row of the table on the left **can** correspond to one or more rows of the table on the right.

D. Tips and examples of data use

Loading data from a TXT file into a QGIS project

Data contained in TXT files have an ordered tabular structure, where the columns are separated by the tab character. To load such data into a QGIS project, proceed as follows:

- change the file name extension from TXT to CSV, e.g.: f_arodes.txt -> f_arodes.csv,
- load the file into QGIS project,
- open the properties of the loaded file, find the Source tab, and then change the encoding to UTF-8.



Joining table f_storey_species to table f_arod_storey

In GIS data editors, where table joins are implemented by indicating only one pair of columns, the join between tables `f_arod_storey` and `f_storey_species` can be implemented only after appropriate data preparation:

- create new text type columns in the `f_arod_storey` and `f_storey_species` tables,
- using the field calculator, fill the created columns with a string created from the values of the `arodes_int_num` and `storey_cd` columns,
- use the created columns to join the tables.

Obtaining information on the dominant stand species

The dominant species in a stand division is the one assigned the highest rank (`SP_RANK_ORDER_ACT = 1`) in the stand layer (`STOREY_CD`) designated by one of the `TREE`, `IP`, or `IIP` codes having the highest rank (`ST_RANK_ORDER_ACT = 1`). To create such a statement:

- join the f_storey_species table to the f_arod_storey table,
- select rows in the f_arod_storey table that simultaneously meet the criteria listed above. Example of a filter query in QGIS (`Advanced filter (Expression)`):

```
(TRIM("storey_cd") IN ('DRZEW','IP','IIP')) AND
("st_rank_order_act" = 1) AND
("f_storey_species_sp_rank_order_act" = 1)
```

Obtaining information about the dominant protection category

The dominant conservation category of a stand unit is the one that has the highest rank (`PROT_RANK_ORDER = 1`). To create such a statement:

- join the `f_arod_category` table to the `f_subarea` table,
- in the `f_subarea` table, select the rows that satisfy both criteria mentioned above. Example of a filter query in QGIS (**`Advanced filter (Expression)`**):

```
("f_arod_category_prot_rank_order" = 1)
```