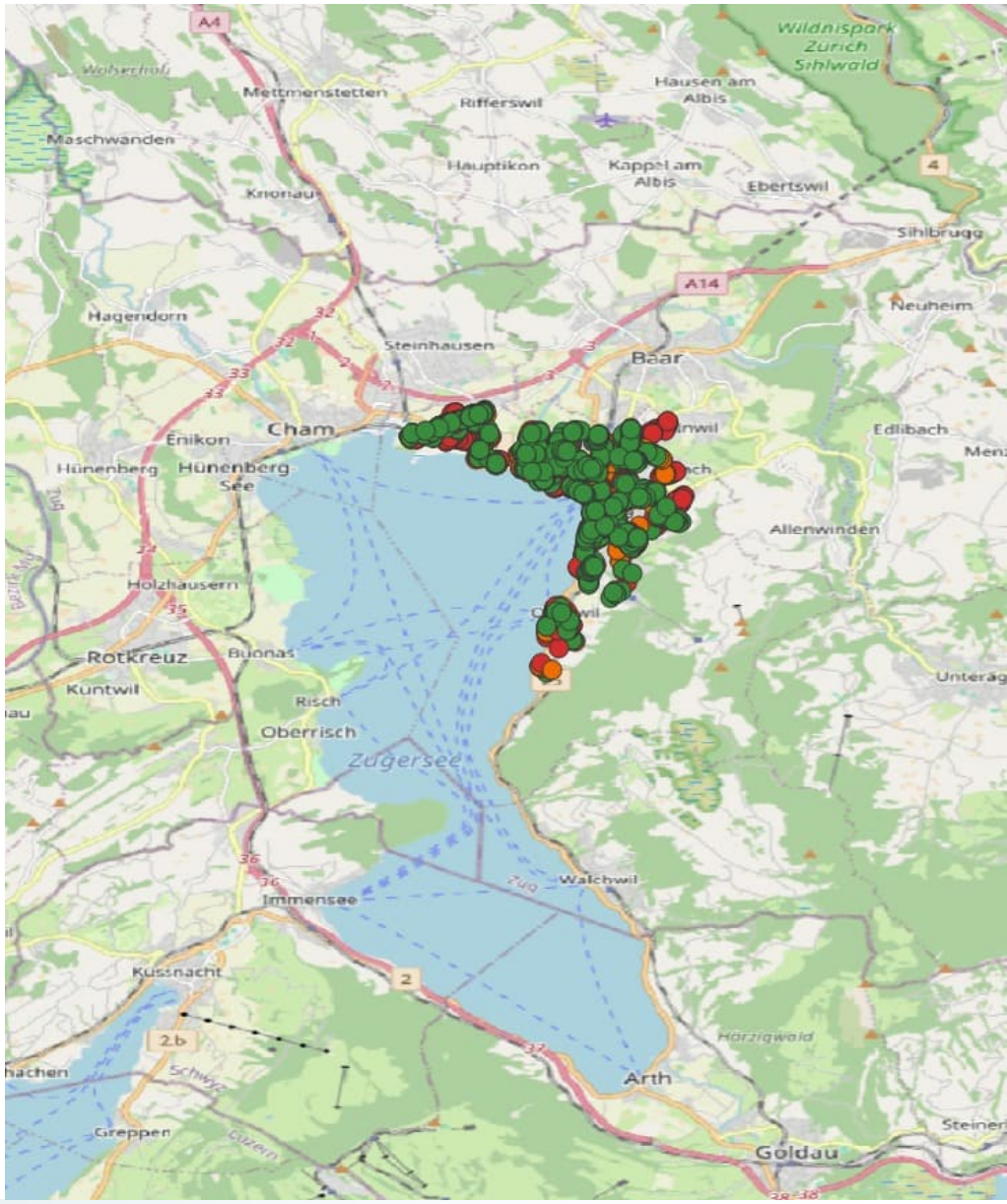
FREE3 tool

A step-by-step user guide

Decision-support tool for assessing urban tree inventories by harmonising species names, screening for potential pest–host associations, and analysing tree diversity and population structure

Part 3 of 3 Quick reference, troubleshooting and glossary
Also Part 1: Table and QGIS plugin · Part 2: Shiny app



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FREE3 user guide

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Start here

The 10 steps

1 Table

Check your table

Find the species column; note names

Guide 1 ›

2 Table

Prepare the table

5 yes/no questions; fix the NOs

Guide 1 ›

3 QGIS

Install QGIS + plugin

Once: QGIS 3.44 LTR + plugin ZIP

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4 QGIS

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Save Features As… › CSV

Guide 1 ›

8 Shiny app

Install R, run the app

Once: R + RStudio; then Run App

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Upload, map columns

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Read, download, check

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Where are you now?

First time on this computer

Before you start · Guide 1 ›

New inventory, tools installed

Step 1 · Guide 1 ›

I have the harmonised CSV

Step 8 · Guide 2 ›

I have done this before

Quick reference · Guide 3 ›

Something doesn’t work

Troubleshooting · Guide 8 ›

Your inventory table

Steps 1–2. Start from your own file; fix only what the check finds.

	Where you are	Click or choose	You should see
1	Your inventory file	**Open it** › **find the species column** (note its name)	You know your column names
2	Same file	Check: header in row 1 · one tree per row · species in its own column · DBH in cm	All yes? Go straight to row 6
3	Data ribbon **if needed**	**Filter** › **arrow on species header** › **(Blanks)** › **delete those rows**	No rows without a species name
4	DBH column **if needed**	Numbers only, in centimetres. From mm: ÷ 10. From circumference: ÷ π.	Numbers aligned to the right
5	Template **optional**	**Open FREE3_inventory_template.xlsx** › **click A2** › **Paste Values**	Your data under 8 headers
6	File menu	**Save As** › **Excel Workbook (*.xlsx)** › **name it** (keep the original)	A new .xlsx next to the original

✓ **You are done when** One sheet, header in row 1, one tree per row, every row has a species, DBH is a number in cm.

QGIS plugin

Steps 3–7. Rows 1–2 are needed only once per computer.

	Where you are	Click or choose	You should see
1	QGIS menu bar Once only	**Plugins** › **Manage and Install Plugins…**	The Plugins window opens
2	Plugins window, left list Once only	**Install from ZIP** › **‘…’** › tree_inventory_harmonizer_….zip › **Install Plugin** › **Yes**	A green tree icon in the toolbar
3	QGIS toolbar	**Green tree icon**	Tree Inventory Harmonizer window
4	Species Harmonization tab	**Input file: Browse…** (your inventory) › **Species column** (from your P1 notes) › **Output folder: Browse…** › **Run harmonization**	Progress bar to 100 %, then a match summary
5	Match summary	Note the number of ‘Unmatched’ records; spot-check ‘Medium’ and ‘Genus-level’.	Unmatched records are not screened
6	Pest Risk Assessment tab	**Browse…** (harmonized_inventory.gpkg) › **Output folder: Browse…** › **Run pest risk assessment**	New red / orange / green layer
7	Map	**Identify Features tool** › **click a tree**	Harmonised name, class and pests
8	Layers panel	**Right-click ‘Tree Inventory Harmonized’** › **Export** › **Save Features As…**	The ‘Save Vector Layer as…’ dialog
9	Save dialog	**Format: Comma Separated Value [CSV]** › **File name: ‘…’** › **OK**	A .csv in the folder you chose

✓ **You are done when** you have a CSV of the harmonised inventory — that file goes into the Shiny app.

Shiny app

Steps 8–10. Keep RStudio open while the app is running.

	Where you are	Click or choose	You should see
1	Your computer Once only	Install R first, then RStudio Desktop. Default settings are fine.	RStudio starts without errors
2	RStudio menu bar	**File** › **Open File…** › **app3.1.R** (newest version) › **Open**	The script in the editor
3	Editor, top-right	**Run App**	Packages load; first time takes minutes
4	App window, top	**Upload CSV: Browse…** › **your CSV** (from QGIS, Step 7)	The file name next to Browse…
5	What type of dataset?	Choose Individual trees (one row per tree) or Species frequencies (one row per species with a count).	The matching option selected
6	Column drop-downs	**Species** (harmonised name) › **Genus** › **Family** › **Frequency** (counts only) › **DBH (cm)**	Results appear below the fields
7	Results, scrolling down	Dataset summary, species frequency, 10–20–30, Melbourne, DBH, pest–host.	Tree total matches your inventory
8	Bottom of the app	**Save report** › **Download Word report**	FREE3_report.docx in Downloads

✓ You are done when the Word report is in Downloads and the checklist ‘before you share’ is done.

The whole job on one page

Print this page and keep it next to the computer. Work down each column, left to right.

Your inventory table

Excel · Steps 1–2

1. **Open your file › find the species column**
2. Check: header in row 1, one tree per row, DBH in cm
3. Fix only what fails (P3–P4)
4. Template only if the table is messy
5. **File › Save As › Excel Workbook (*.xlsx)**

QGIS plugin

QGIS · Steps 3–7

1. **Plugins › Install from ZIP › .zip › Install** (once)
2. **Tree icon › Species Harmonization**
3. **Input file › Species column › Output folder**
4. **Run harmonization › check ‘Unmatched’**
5. **Pest Risk Assessment › .gpkg › Run**
6. **Right-click Tree Inventory Harmonized › Export › Save Features As… › CSV › OK**

Shiny app

RStudio · Steps 8–10

1. Install R, then RStudio (once)
2. **File › Open File… › app3.1.R › Run App**
3. **Upload CSV: Browse… › your CSV**
4. **Dataset type › Species › Genus › Family › DBH**
5. Scroll through the results
6. **Save report › Download Word report**

RESULT FREE3_report.docx in Downloads. Before sending it, go through ‘Before you share’.

Installation

QGIS, the plugin, R and RStudio.

Problem	Likely cause	Solution
The installer is blocked	Managed computer without administrator rights.	Ask IT to install QGIS 3.44 LTR, R and RStudio (see ‘Before you start’).
'Install from ZIP' rejects the file	The ZIP was extracted — some browsers (Safari) do this automatically — or the wrong file was chosen.	Select the original .zip. If only a folder exists, download the ZIP again.
Python error when the plugin starts	QGIS version not supported, e.g. QGIS 4.x.	Check Help › About. Install QGIS 3.44 LTR and the plugin again.
The tree button does not appear	QGIS was not restarted, or the plugin is not enabled.	Restart QGIS. Plugins › Manage and Install Plugins › Installed › tick 'Tree Inventory Harmonizer'.
'Run App' does nothing / R not found	R is missing, or RStudio was installed before R.	Install R, restart RStudio and open the script again.
Packages fail to install on first run	No internet, a firewall or no permission to write the package library.	Connect and retry. In the Console run install.packages("name") for the package named in the error.

Still stuck? Send the FREE3 team the error text, a screenshot and your QGIS / R version (Help › About).

QGIS plugin

Harmonisation, screening and the map.

PROBLEM	LIKELY CAUSE	SOLUTION
Species column list is empty or odd	Title rows above the header, or data not on the first sheet.	Header in row 1 of the first sheet (Step P2).
'Run harmonization' does nothing	No output folder was chosen.	Choose an output folder — the field is obligatory (Step A6).
Very high unmatched count	Wrong species column, or names mixed with other text.	Re-run Step A6 with the right column; move notes out of the species cells (Step P3).
Screening tab does not accept the file	The original inventory was selected.	Select harmonized_inventory.gpkg from the Step A6 output folder.
Every tree is 'No known risk'	Very few names were matched.	Check the counts from Step A7; usually the wrong column was selected.
Trees are missing, in the sea or at 0,0	x and y swapped, or coordinates not in WGS84.	x = longitude, y = latitude, decimal degrees (Step P3).
Red / orange / green colours are gone	'Classify' was pressed while styling the layer.	Remove the layer and run Step A8 again.

Still stuck? Send the FREE3 team the error text, a screenshot and your QGIS / R version (Help › About).

Shiny app and report

Running the app, uploading the CSV and downloading the report.

Problem	Likely cause	Solution
'Run App' button is missing	The file was not opened as an R script.	File › Open File… and select app3.1.R (Step B2).
App closes with red text in the Console	A package is missing or failed to load.	Read the package name in the error, install it, then Run App again.
App opens but stays empty	No CSV uploaded, or species column not mapped.	Complete the upload and species fields (Step B5).
Strange characters (Ã©, ?) in names	The CSV is not UTF-8.	Export again from QGIS with UTF-8 encoding (Step A14).
Tree total is wrong	Wrong dataset type, or frequency mapped for individual trees.	Check dataset type and leave frequency empty (Step B5).
A whole section is missing	A required column was not mapped.	See ‘Which columns are required for each analysis’.
App stops responding	RStudio was closed, or the Console is busy.	Keep RStudio open; press Stop in the Console and Run App again.

Still stuck? Send the FREE3 team the error text, a screenshot and your QGIS / R version (Help › About).

Data and results

When the numbers look wrong rather than the software.

Problem	Likely cause	Solution
DBH section missing although DBH exists	DBH is stored as text (‘34 cm’).	Numbers only, in cm (Step P4, line 4).
Basal area looks far too large	DBH was recorded in mm.	Divide by 10 (Step P4, line 5) and run the analysis again.
The same species appears twice	The original species column was mapped in the app.	Map the harmonised species column (Step B5).
10–20–30 only at species level	Genus and family columns are missing or not mapped.	Add or map them — see step P1 (slide 8).
Excel turned values into dates	Automatic formatting when pasting.	Undo, set the columns to ‘Number’, paste again (Step P4).
Fewer trees in the app than in Excel	Rows without species, or rows lost during cleaning.	Compare with the totals from Step A7 and with the original file.

Still stuck? Send the FREE3 team the error text, a screenshot and your QGIS / R version (Help › About).

Glossary — names and screening

Harmonisation

Matching inventory names to an accepted reference taxonomy, so spelling variants, synonyms and other inconsistencies are recognised consistently.

Match confidence

How reliably a name was matched: high, medium, genus-level or unmatched (Step A7).

Major host

A tree species identified as a primary host of at least one regulated pest.

No known risk

Not listed as a host in the FREE3 database for the 11 screened pests. It does not mean pest-free.

Reference taxonomy

The accepted list of families, genera and species (126 · 540 · 2,219) that inventory names are matched against.

Regulated pest

A pest subject to official control measures because of the damage it may cause. FREE3 screens 11 of them.

Host

A tree species identified as a secondary host of at least one regulated pest.

Pest–host association

A documented link between a tree species and a regulated pest that can use it as a host.

Reference (Glossary 2 of 2)

Glossary — diversity, data and files

DBH

Diameter at breast height — trunk diameter measured 1.3 m above ground. The app expects centimetres.

Basal area

Cross-sectional stem area at breast height, per tree or summed per species. A size-based measure of representation.

10–20–30 rule

Diversity guideline: no more than 10% of one species, 20% of one genus and 30% of one family.

Melbourne recommendations

A stricter benchmark: at most 5% per species, 10% per genus and 20% per family.

Dataset type

Individual trees: one row per tree. Species frequencies: one row per species with a count in a frequency column.

GPKG (GeoPackage)

An open, single-file format for spatial features and attributes. The plugin’s main spatial output.

CSV · UTF-8

CSV: a plain-text table, one row per line. UTF-8: the encoding that keeps characters such as ×, ä or ł intact.

CRS · WGS84

Coordinate reference system: how coordinates relate to places on Earth. WGS84 (EPSG:4326) is latitude/longitude.