QGIS Level 2 – Stuart Ladd

Introduction

This guide will take you through some more advanced, field work-related tasks that can be done with QGIS. It assumes you have successfully been through the Level 1 exercises.

- This guide is aimed at QGIS v2.6 which has some performance improvements although a number of things may have changed in the interface – development is fairly rapid! *N.B. At the time of finalising this guide, QGIS was at v2.12. The interface has changed but most of the principles are the same. Outdated versions can be downloaded here: http://qgis.org/downloads/*
- It's still a good idea to save the project file regularly!
- A mouse will be useful if using a laptop.
- Ensure you have set up your installation to default to **EPSG 27700 OSGB 1936 / National Grid** as we are working within the UK using the Ordnance Survey National Grid (see Level 1 guide for instructions on doing this for **both** new projects **and** newly added layers). **Failure** to do this will cause problems later.

This guide will go through the following tasks:

- Exercise 1: Digitising site plans. Converting a hand drawn site plan to a digitised GIS project with data attached.
- Demonstration: Digitising aerial photos. Tracing features from aerial photographs into a project.
- Exercise 2: Field walking. Setting up a field walking grid and logging finds data.

Exercise 1 – Digitising Plans

1 Introduction

This guide will take you through the process of taking a 'flat' pencil-drawn site plan (map) that has already been scanned in and turning it into a useful, multi-layered GIS project. Some knowledge of the site hand-drawing conventions would be useful, but not essential.

Digitising is a process is akin to data-entry but we are entering spatial information in to a GIS instead of numbers in to spreadsheet. With an accurate GPS or photogrammetry, this process may become redundant in the near future! However, it is tried, tested and reliable.

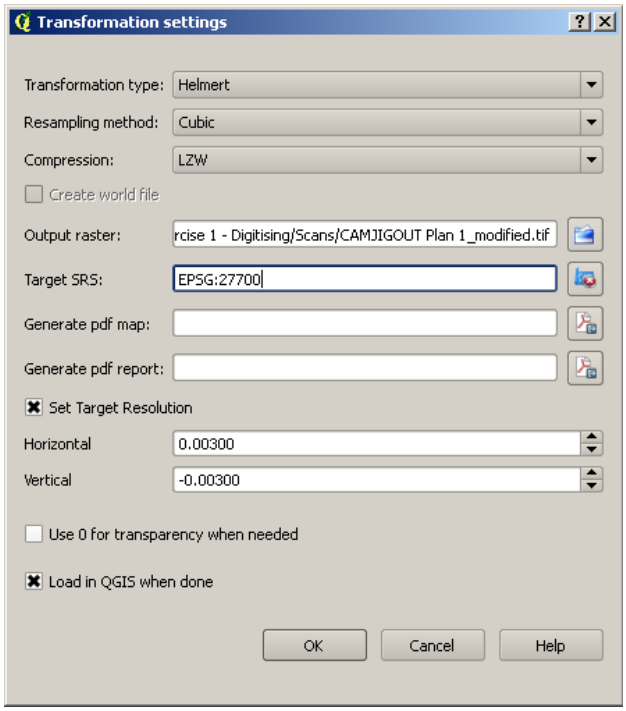
1. Open the prepared project in *Exercises/Exercise 1 – Digitising/Ex 1 – Digitising.qgs*

Four layers should appear in the Layers Panel. If you don't have a layers panel, got to View > Panels > Layers Panel

2 Georeferencing

The first step is to get scans of our site plans into QGIS as *raster* images. There are two scanned plans in *Exercises/Exercise 1 – Digitising/Scans.*

1. Georeference the site plans (Raster > Georeferencer > Georeferencer… and within the Georeferencer window, File > Open Raster) using some of the coordinates written on the plan. This is something we did on the Level 1 course for National Grid co-ordinates of X and Y. Here we are using our arbitrary local grid starting at x=100, y=100. Remember to use two point, then press 'play'.



2. Under the **Transformation settings** window (which appears when you press the 'play button'), make sure **Transformation Type** is **Helmert**. Also, ensure the target resolution is **Horizontal: 0.005 / Vertical: -0.005** (this keeps the file size smaller i.e. output files have 1 pixel for every 5mm on the map). Also, untick '**Use 0 for transparency**'.

3. Repeat for the second scan (there should be two scan files).

4. Close the georeferencer when both plans are displayed overlapping in the right place in the main window. You will want to slide the plan layers down the list so that they are displayed below the digitising layers. If anything looks wrong, remove the scan layer from the layers panel (Right click > Remove), go back to the georeferencer and check your coordinates and Transformation settings.

In practice you would use a GPS or theodolite in order to accurately locate your site's drawing grid points. Here we are using an arbitrary grid, but it is in metres so all digitised features will be to scale.

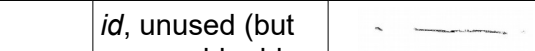
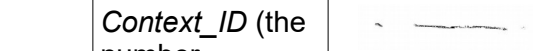
There are two plans for this site. We can digitise both at the same time as they overlap. In practice you might digitise one at a time.

3 Layers

Each part of the site plan will be digitised to a different layer. A layer scheme has already been set up for you. This is designed to correspond to the conventions on the scanned drawing, but in practice this is open to modification according to project requirements.

In the QGIS project, the layers have already been styled to make them easier to understand (although they are currently empty of shapes!). Some layers have attribute data attached to them.

The table below summarises each layer,

Layer name	**Description**	**Type (point/line/polygon)**	**Attribute data**	**Hand drawing convention**
Limit of excavation	Defines the area that was open for excavation	Line	*id*, unused (but you could add an attribute for trench or test pit number)	 Dot-dashed line
Archaeological feature	The full area of an archaeological feature: ditches, post holes, pits	Polygon	*Context_ID* (the number assigned to the feature)	Solid lines
Excavated slot	The sub-set area of a feature excavated by hand	Polygon	*Context_ID* (the number assigned to the feature at this slot)	 Dot dashed line again! (But within a feature)
Section Line	The line on the plan indicating where a vertical section was drawn	Line	*Section_ID* (the number assigned to the section drawing)	 Usually arrows and number *s.#* next to the edge of an excavated slot

Note: We won't be digitising the 'break of slope' or hachures approximating the profile within excavated slots in this guide, but normally we would use an additional line layer and trace into that.

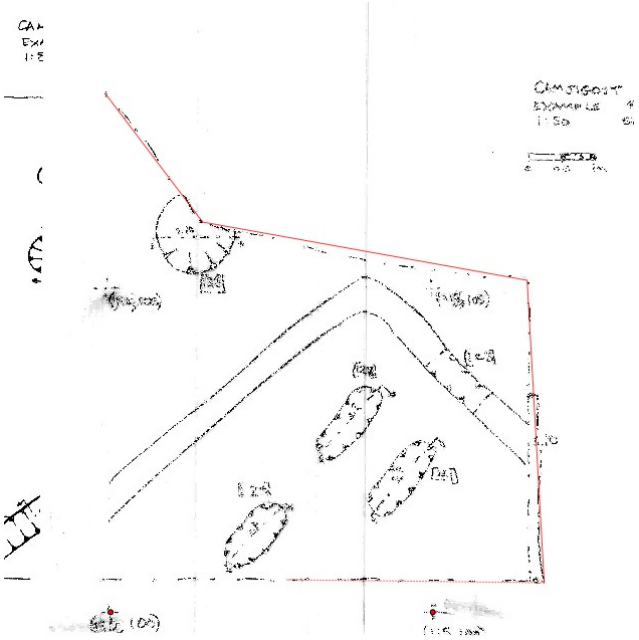
4 Limit of Excavation

In QGIS you can only edit layers if they are unlocked ('toggled') for editing.

We will begin by digitising our limit of excavation (the edge of the excavation area on the plan).

1. Select the Limit of Excavation layer.
2. Enable editing for the layer (right click on Limit of Excavation, then click **Toggle editing**). A pencil-like symbol will appear next to the layer name when it is unlocked.
3. Select the Add Feature tool  (or click Edit>Add feature).

4. Using the **left mouse button only**, trace around the limit of excavation line on the plan. You can use the middle mouse button to drag the map around and scroll in/out while you do this. A red line will show how far you have got. If you make a mistake, press the **Del/Delete** key on your keyboard to step back.



5. Remember you can move around the map while doing other tasks but using the middle mouse button to drag the map around or to scroll up and down to zoom in and out.
6. When you have traced the whole line back to the start, press the **right mouse button**. This tells QGIS that the shape is complete. A window will pop up prompting for 'id'. Leave it blank and press OK.
7. It is a good idea to save the changes for this layer now. Right click on the layer and click **Save Layer Edits**.

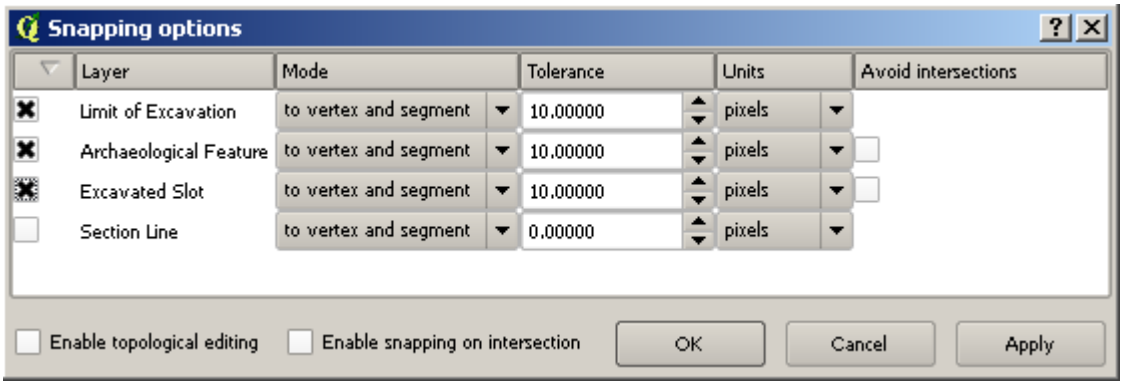
If you can not see your changes, make sure the Limit of Excavation layer is at the top of your layers panel (you can drag layers up and down within the panel) and that the scans are at the bottom.

5 Snapping

When we digitise the rest of the layers, we will probably want shapes to line up precisely with the Limit of Excavation and each other. So the corner points at the ends of the ditches, say, line up exactly on the lines of the Limit of Excavation.

To do this we have to tell QGIS which layers to snap to – i.e. when we trace around shapes, the pointer will automatically click into place along existing lines.

1. Click **Settings>Snapping Options**.
2. Tick Limit of Excavation, Archaeological Feature and Excavated Slot and set each “Mode” to 'Vertex and Segment', Tolerance to '10' and units to 'pixels' as below.



3. Press **OK**.

We are now ready to digitise the rest of the drawing.

Node editing – For reference

The small red crosses indicate nodes (corners) along your lines. These remain visible while a layer is editable. There is a tool to manipulate these if you make a mistake in the initial digitising.

1. Pick the node tool 
2. Select the layer you want to correct
3. Click on the edge of a shape to select it for editing – the crosses will now have red boxes around them 
4. Click and drag boxes to the right place.
5. If you need more points on a line, double click on the line where you want them and they will be added.
6. Save changes to the layer!
7. Remember to switch back to the Add Feature tool if you want to trace a new shape.

Deleting shapes – For reference

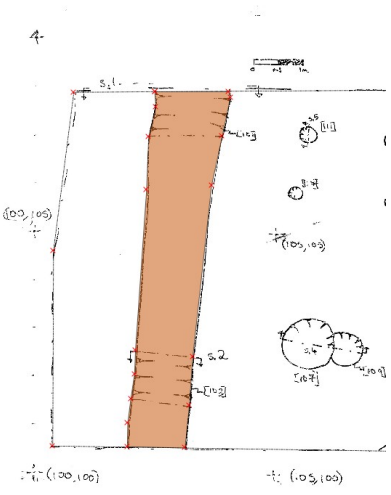
Should you make a mistake and close a shape before finishing it, you can either add nodes as above or delete the shape entirely and start again

1. Select: 
2. Click and drag a rectangle around shapes you do not want
3. Click Delete feature: 
4. If you accidentally select the wrong shape, use the Deselect all button: 

7 Archaeological feature

It is usually best to proceed in this order: Archaeological Features fit to the Limit of Excavation; Excavated Slots snap to features; and Section Lines usually snap to Excavated slots. We will trace one each of these, then you may proceed to repeat for the rest of the drawing.

1. Select the Archaeological Features layer and turn editing on (Right click on layer > Toggle Editing).
2. Select the Add Feature tool. 
3. Trace around the ditch numbered **101**. This time, a red polygon will show the area digitised so far. If you make a mistake, press the **Del/Delete** key on your keyboard to step back. The pointer will snap onto the line of the Limit of Excavation at either end of the ditch. The number of points you use is a matter of preference, just try to capture any changes in direction along the lines of the feature.
4. When finished, press the **right mouse button**. You will now be prompted to enter the Context_ID for this shape, type in **101** and press enter.

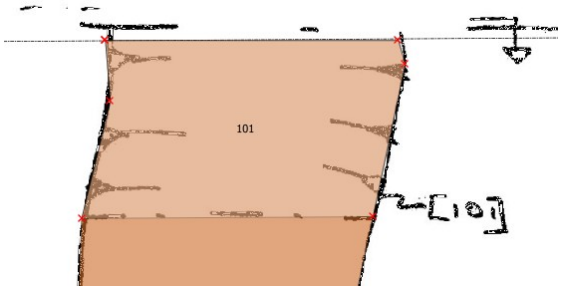


5. Save changes to the layer (right click, Save Layer Edits).
6. Continue with other features. For earlier features cut by others, follow the cut lines of the overlying features (not where you think the feature would have been).

You can repeat this for some of the other features now, or carry on to the next layer for this feature. **SAVE LAYERS OFTEN!** Remember there is a difference between saving a project (which manages the list of layers, their order and their styles) and saving layers (which contain the spatial data) – the latter tends to be more crucial as you digitise more features.

8 Excavated Slot

Look at the area indicated by **101**. This represents the portion excavated by hand. We want to digitise this into our Excavated Slot layer. The process is the same as above



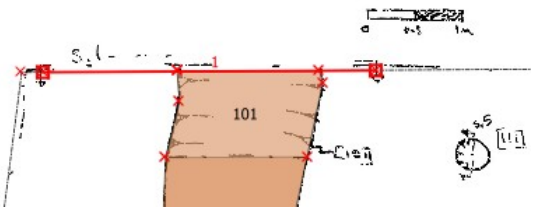
1. Click on the Excavated Slot layer in the Layers panel
2. Toggle editing for the layer
3. Choose the 'Add Feature' tool 
4. Trace the shape around that slot
5. Right click to close the shape. You will be asked for Context_ID, enter **101**. Note that the shape is displayed with a label '**101**', this is because the style (already set up) for this layer is set to use Context_ID for labels.
6. Repeat this for the Excavated Slot marked **103**.

Note: Although we numbered the ditch **101** for the whole feature, it has two numbers where excavated. This is to distinguish the finds from the two slots but the Archaeological Feature layer can only store one of these numbers – a potential weakness in this data scheme!

9 Section Line

Now digitise the two section lines marked *s1* and *s2* on the plan.

1. Toggle editing for the Section Line layer.
2. Add Feature tool 
3. Trace the line for Section 1 (s1), right click to finish and enter '1' for Section_ID when prompted.
4. The section numbers will be displayed automatically (because of the layer's style).

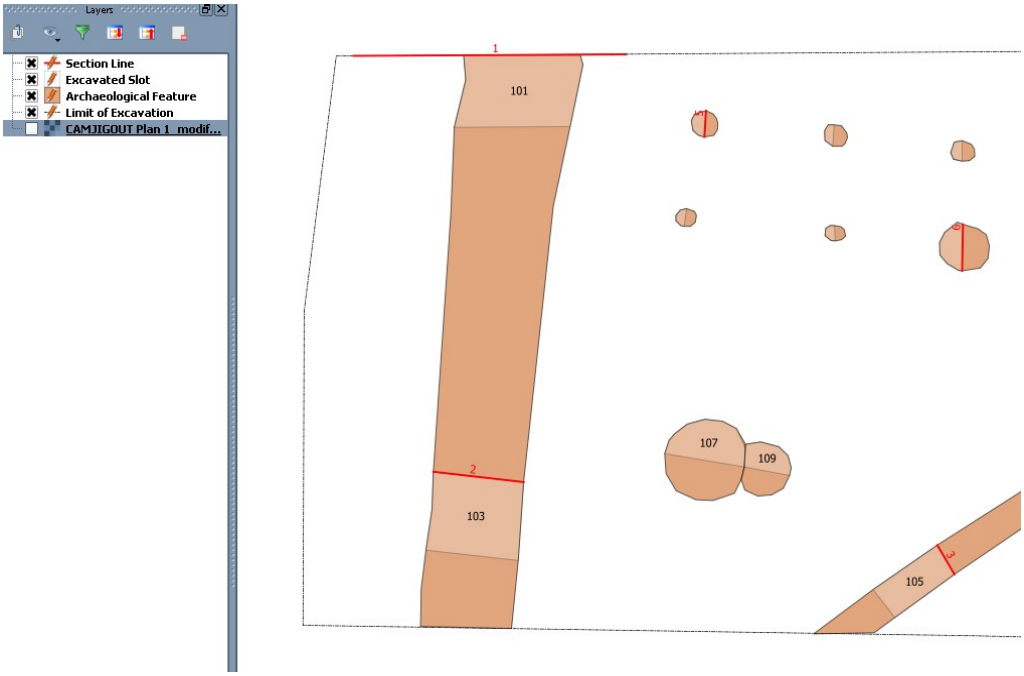


10 Repeat!

You will have to repeat the process for the whole drawing eventually! Spot the deliberate mistake – ditch **105** does not line up across the two plans. Someone has made a mistake in drawing on site. At this point, reference to photos or a best guess may be required! You may need to edit individual nodes.

1. To hide the editing nodes (crosses), disable editing for each layer (right click on layer, then click Toggle Editing).
2. Finally, hide the original plans by un-checking the box next to those layers

Your map should now look something like this:



11 Post-excavation use

Some of the benefits of digitising all this data in QGIS come from the analysis you can perform without leafing through all the hand plans. (In this case there were only two, but there may be hundreds!)

Obviously you could now add in background mapping if wanted (if our grid points were on the OS grid – in this example they are not).

A brief example: we might want to measure the diameter of a pit.

1. Choose the ruler tool 
2. Left click to start measuring, right click to select the final point. Use this to measure the diameter of pit **107**.
3. Do the same for the length of ditch **101**.
4. What about the length of the 6-post structure (from posthole **111** to **115**)?

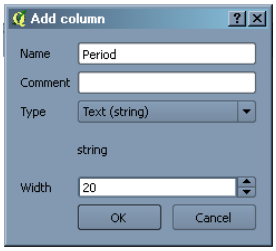
Try using the identify tool  (covered briefly in Level 1) by clicking on an excavated slot. This will display attribute data for all where clicked. It also gives additional data such as polygon area or line length.

Further on during the post excavation process, additional data such as phase/period can be assigned to shapes and then retrieved using the Identify tool.

12 Optional – Adding Attribute (Column) data

We may wish to attach other data to the archaeological features, such as what period they date from. Undertake this if there is time!

1. Toggle editing on and then open the attribute table for Archaeological Feature (right click > Open attribute table).
2. Click on the New Column button at the top right 
3. Fill in the details for a new column (attribute) called Period, of type Text with width 20.
4. Press OK.



5. Suppose in post-excavation we assign the following periods to the features, fill in each cell in the table by double clicking the cell, typing in the period and pressing enter. Leave *NULL* as it is (for undated)

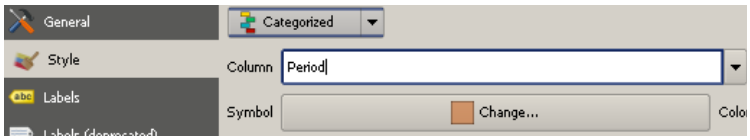
	Context_ID	Period
8	101	Roman
1	107	Late Iron Age
0	109	Late Iron Age
7	111	Roman
6	113	Roman
4	115	Roman
2	117	Roman
3	119	Roman
5	121	NULL

NOTE: There are more efficient way of doing this with larger data sets automatically – but that's a more advanced course!

6. Save the layer.

With this data now entered, you can colour code the features according to period automatically. Details of colour styling according to attribute are covered in the Level 1 course and also in the field walking exercise below.

1. Go into the Archaeological Feature layer's style tab (Right click>Layer Properties>Style) and choose 'Categorised' styles from the top right and Column: 'Period'.
2. Press Classify and a set of categories will be generated: Roman, Late Iron Age and a blank one (for shapes with no Period assigned).



3. You can edit each symbol by double clicking on it (there is a range of options), or leave them as they are.

Demonstration – Tracing from Aerial Photographs

Due to time restrictions, there will be only a demonstration of this process. It is essentially the same process as digitising from site plans only working at a broader scale. *If you are following this guide outside of the class, the points below summarise the process but you may need to refer back to earlier stages or the Level 1 guide. There are also many resources online if you search for specific QGIS features or troubleshooting.*

- First georeference the aerial photograph using base mapping (e.g. download free basic mapping available from OS Open Data – an example was covered in the Level 1 guide). The image used here is: https://commons.wikimedia.org/wiki/Category:RAF_Fowlmere#/media/File:Fowlmere-13April1947.png
- Create a layer for features you want to trace (Layer>Create Layer>New Shapefile Layer...) – perhaps lines representing crop mark ditches (or in the example, airfield features)
- Digitise by tracing lines on the photographs
- Remove the photograph layer
- Work with traced data as required (styling, add attributes, print over base maps)

An alternative method is to use Google Earth. Within this you can trace lines (and check against historical imagery). If you organise a set of lines into a folder in 'My Places', you can export that folder as a KML file. Although this will be in a lat/long (not an easting/northing) co-ordinate system, QGIS will automatically display these lines in the correct locations for you to work with.

N.B. You can not trace entire maps from Google Earth:
https://www.google.co.uk/permissions/geoguidelines.html

Exercise 2 – Field Walking Design

Introduction

This exercise shows you one way to set up a field walking project using only QGIS. Without using other software it is somewhat limited at this stage, producing only North-South/East-West grids where you might have preferred to follow a major field boundary, for example.

Different projects may call for different methodologies but this method provides a starting point from creating a grid to displaying data collected in the field.

We will:

- Create a regular grid of points, fitting inside a defined walking area.
- Create a table of co-ordinates for those points (to use in the field or upload to GPS).
- Add our results to the table.
- Display our results in QGIS.

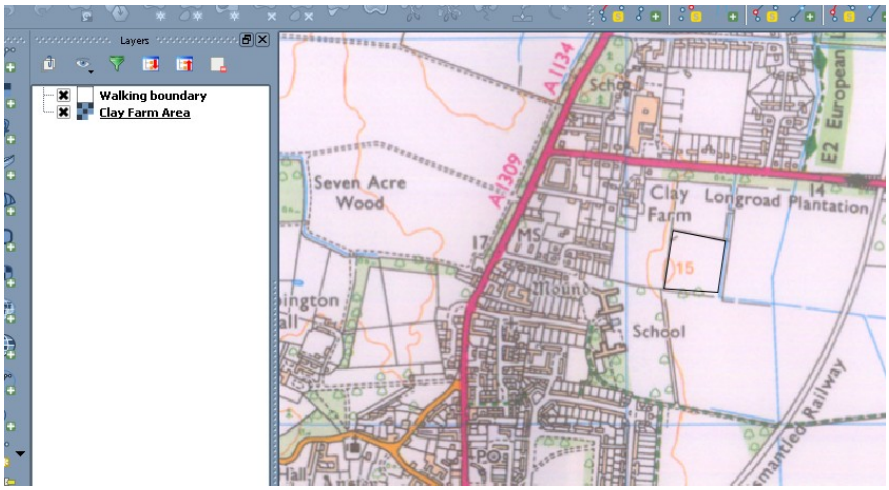
1 One-time Setup

We use the *fTools* plugin to create our grid. Make sure you have the *fTools* plugin installed. This may be installed by default with QGIS 2.6 and later.

1. **Plugins > Manage and Install Plugins**, click 'Installed', check *fTools* is installed and ticked.
2. If it is not, click 'All', find it in there and install it.

2 Open the project

1. Find and open the project file in *Exercises/Exercise 2 - Fieldwalking/Ex 2 – Field Walking.qgs* (Project > Open)



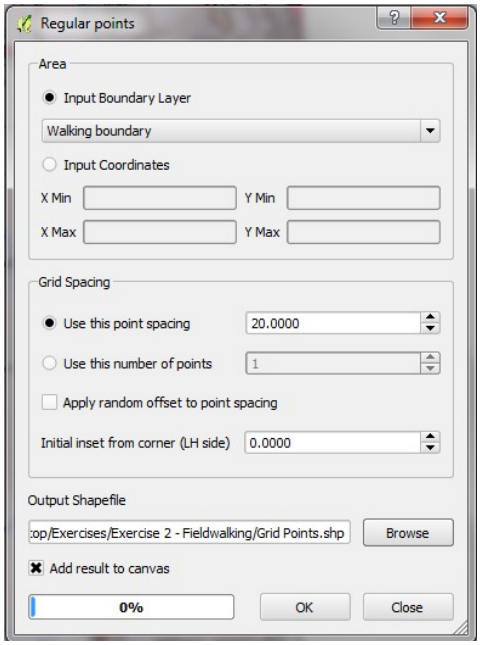
Contains Ordnance Survey data (C) crown copyright 2015

1. This project file contains a *raster* background map (of the Clay Farm area, now redeveloped) and a *vector* polygon shapefile layer with a single area digitised. This has been created so that you all have the same file to work with, but you should know by now

how to create a shapefile layer for your own projects.

2. Find the regular points tool (**Vector>Research Tools>Regular Points...**) **NOTE**: This requires the *fTools* plugin be installed.

3. Fill in these fields:



   - **Input Boundary Layer:** 'Walking Boundary'. This means our grid will be constrained to the polygon around that field.
     NOTE: If you choose 'Clay Farm Area' instead it will grid the entire map! Slowly!
   - **Grid spacing: Use this point spacing:** 20 (this is in map units for a 20m grid).
   - **Output shapefile:** Click **Browse**, navigate to Exercises/Exercise 2 – Field walking/Shapefiles and call it something like 'Grid points'.
   - Tick '**Add result to canvas**'.
   - Press **OK**. Wait. Press **Close**.

4. You should now have a grid of points over the whole area. Look at the attribute table (right click > Open Attribute Table) for 'Grid Points' and you will see each point has an ID number – we will use this to tie our finds back to the point later.

5. Tell QGIS to display the ID number next to each point (we covered this in the Level 1 exercises: right click on the layer or click Layer>Properties...>Labels and then next to 'Label with', select 'ID').

6. You will probably also want to print this at various scales (**Project>Composer Manager.../Print composers...**) for reference when undertaking the field work.

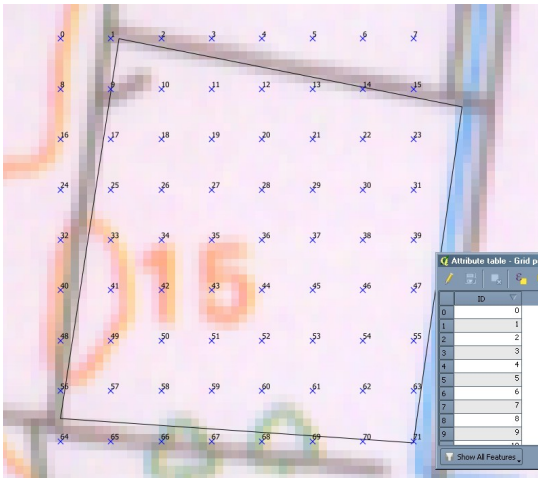


Illustration 1: Contains Ordnance Survey data (C) crown copyright 2015

3 Advanced – Clean up the grid

Please skip this step during the course as it may be time consuming. The following is provided for reference only.

The grid plugin is limited and still creates points outside of our walking boundary, within a square area surrounding it. There are two options to get rid of unwanted points. One is to manually edit the layer (right click or **Layer>Toggle editing**), select the unwanted points and delete them.

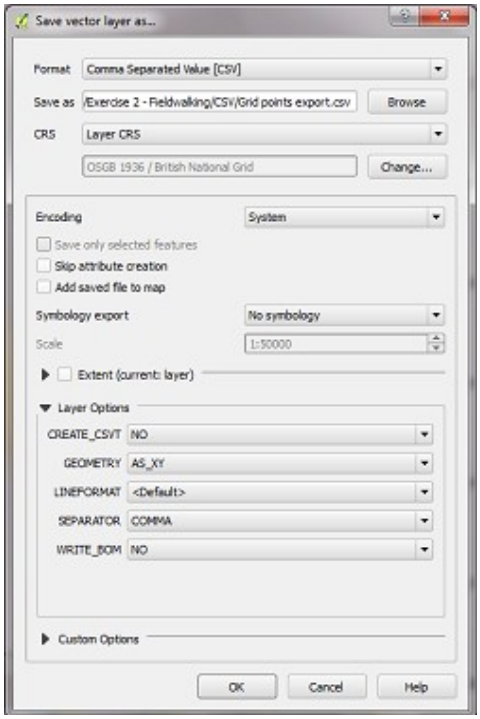
- Toggle editing for the layer
- Select: 
- Click and drag a rectangle around points you do not want
- Click Delete feature: 
- If you accidentally select the wrong points, use the Deselect Features from all Layers button: 
- Finally save changes to the layer and turn editing off (**Layer>Toggle editing**)

4 Exporting points

Somehow we need to map these points onto the ground for field walking. Some GPS devices may just accept shapefiles (remember to transfer all the different helper files too: .shp, .shx, .dbf, ...). KML or GML are also export formats that may work with a hand-held GPS.

If not, the most useful intermediate format is CSV (comma separated variables). This is a text-based file which describes a table and can be viewed in Excel or Calc. The other advantage is these are human-readable, so if desperate, you can map out your points by following printed co-ordinates.

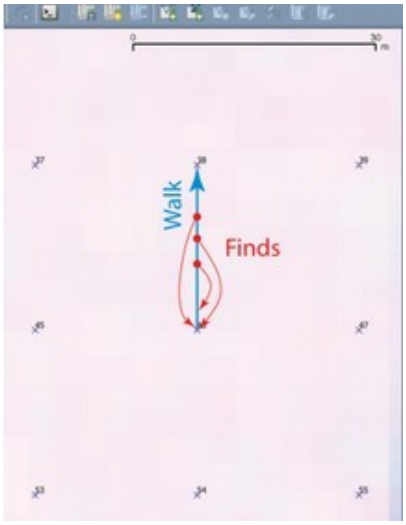
We will also need this CSV file for our next step so we will export it here.



1. Right click on the *Grid Points* layer. Choose **Save As**...
2. Choose the following options:
    1. **Format:** Comma Separated Value [CSV].
    2. **Save as:** Browse to *Exercises/Exercise 2 – Field walking/CSV* and call the file 'Grid points export'.
    3. Untick '**Add saved file to map**' – we don't want another copy on the grid displayed at this point.
    4. Leave most other options as they are, but check under **Layer Options** that:
    GEOMETRY is set to AS_XY
    and SEPARATOR is set to COMMA.
    5. Press **OK** and the window will disappear. This should now have now created a .csv file

containing x and y (easting and northing) coordinates for our field walking points. It should be possible to load this file into a handheld GPS. We will use this at the next stage.

5 Preparing for fieldwork



This step requires Excel or OpenOffice/Libre Office Calc. If you do not have either of those, skip this step as a finished, populated field walking table has been prepared for you.

We are going to add columns matching each point ID with the finds allocated to that point. The fieldwork methodology will vary here but assume if we are walking from point A north to point B then all finds along that line are allocated to point A. This methodology will depend on the project but ultimately, finds have to be allocated to a point in a consistent manner.

1. Using windows explorer, browse to *Exercises/Exercise 2 – Field walking/CSV* folder and open the 'Grid points export.csv' file. It should open with Excel/Calc, it may prompt you with some options on how the file is read. If the file won't open, try opening Libre/OpenOffice Calc or Excel directly then open the file using File>Open...
2. You should see a table of X, Y (for the National Grid eastings and northings) and ID.

Grid points export.csv - LibreOffice Calc

File Edit View Insert Format Tools Data Window Help

Liberation Sans 10

A1 X

	A	B	C	D	E	F
1	X	Y	ID			
2	545102.851739363	255502.76745209	0			
3	545122.851739363	255502.76745209	1			
4	545142.851739363	255502.76745209	2			
5	545162.851739363	255502.76745209	3			
6	545182.851739363	255502.76745209	4			
7	545202.851739363	255502.76745209	5			
8	545222.851739363	255502.76745209	6			
9	545242.851739363	255502.76745209	7			
10	545102.851739363	255482.76745209	8			
11	545122.851739363	255482.76745209	9			
12	545142.851739363	255482.76745209	10			
13	545162.851739363	255482.76745209	11			
14	545182.851739363	255482.76745209	12			
15	545202.851739363	255482.76745209	13			
16	545222.851739363	255482.76745209	14			

The following steps will depend on your own project, a finished file has been provided for the next stages.

3. In practice, you would need to add additional columns for finds. Put the column title in the first row and numerical values only in the rows below.
4. You could always delete unwanted points at this stage (a job we skipped earlier) if they fall outside the area – just delete their rows from the table.
5. On saving, Excel/Calc will suggest you use their own formats. This is fine, but you will eventually need to convert back to CSV at the end of the work. This is done by clicking File > Save As... and choosing CSV as the format. **NOTE** that this format will eliminate any font styling, comments etc. that you have applied to the spreadsheet (so it is best to keep the

spreadsheet simple: columns, headings and numbers only). **NEVER** merge cells as this won't fit into the CSV format and QGIS won't understand it.

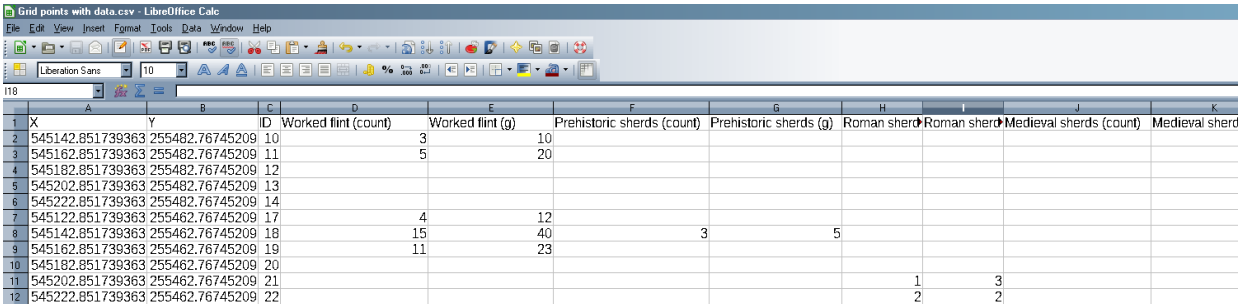
6 Data Entry

Your table then has to be updated with all relevant field walking data depending on your project methodology. An example has been prepared based on the grid we have used so far.

7 Re-importing Data

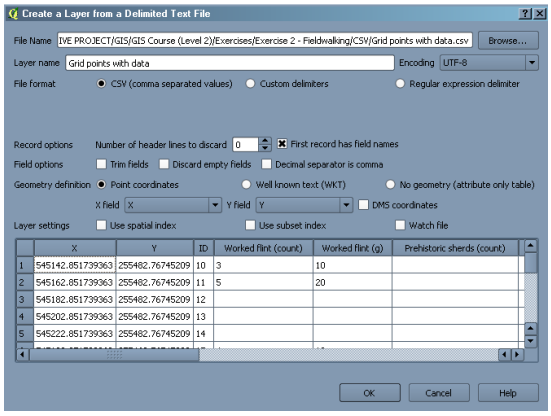
A mock-up table has been prepared with some fictional data filled in for each grid point. You can find it in the CSV folder: Exercises/Exercise 2 – Field walking/CSV called 'Grid points with data.csv'

You can open this to view in Excel/Calc, it will look like this:

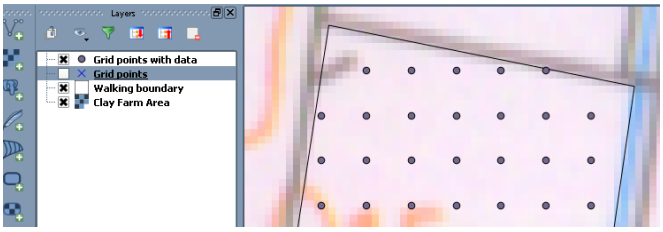


	A	B	C	D	E	F	G	H	I	J	K
1	X	Y	ID	Worked flint (count)	Worked flint (g)	Prehistoric sherds (count)	Prehistoric sherds (g)	Roman sherd	Roman sherd	Medieval sherds (count)	Medieval sherd
2	545142.851739363	255482.76745209	10	3	10						
3	545162.851739363	255482.76745209	11	5	20						
4	545182.851739363	255482.76745209	12								
5	545202.851739363	255482.76745209	13								
6	545222.851739363	255482.76745209	14								
7	545122.851739363	255462.76745209	17	4	12						
8	545142.851739363	255462.76745209	18	15	40	3	5				
9	545162.851739363	255462.76745209	19	11	23						
10	545182.851739363	255462.76745209	20								
11	545202.851739363	255462.76745209	21					1	3		
12	545222.851739363	255462.76745209	22					2	2		

1. Import this into QGIS: in the main window click on Layer > Add Layer > Add Delimited Text Layer… (as in the Level 1 course) and browsing to the CSV folder, select 'Grid points with data.csv'. Remember to map the X and Y fields to X and Y (this should happen automatically).
2. Ensure the preview looks sensible, like this (i.e. column headings and data in the right places).
3. Press OK.
4. At this point, you can switch off the old 'Grid points' layer in QGIS, it is no longer needed (and may be confused with the results layer).



You will now have the 'Grid points with data' layer visible, but with a flat style and no labels.



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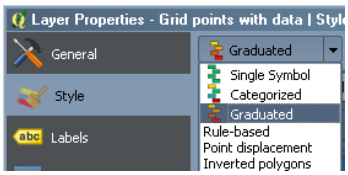
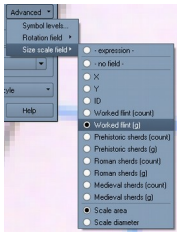
What remains now is to style the layer, as was covered at the end of the Level 1 course (not everyone will have had time to do the last stage).

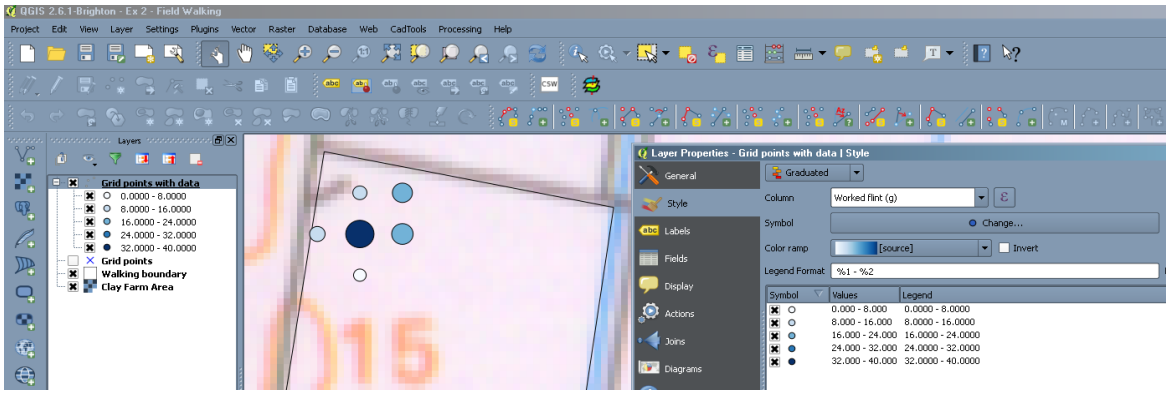
8 Styling by Finds Type



1. Open layer styling (right click on the 'Grid points with data' layer, click 'Layer properties...'; click on the style tab on the left hand side).
2. Switch the drop down menu at the top left from 'Single Symbol' to 'Graduated'
3. In the 'Column' drop down, select 'Worked flint (g)'
4. Choose a 'Colour ramp' and press 'Classify'. This automatically generates coloured symbols according to the range of data values.
5. Optional: vary the size of the dots automatically according to mass:
    - Click Advanced (lower left) > Size scale field > Worked flint (g)
6. Press Apply



This will now display only the points with worked flint data, hiding all the others. They are also colour coded (and, optionally, sized) according to the value in the 'Worked flint (g)' field.



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Within this Style window, using graduated styling you can assign different value ranges (instead of 0-8, 8-16...) as customised symbols. You can also edit each legend item by double clicking on it. This will change the details displayed in the Layers pane. **NOTE**: Clicking 'Classify' again at any point will remove your styles and regenerate them based on the colour ramp and automatic ranges.

So far this only shows data for one column of our survey, Worked flint (g).

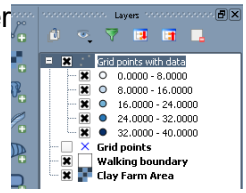
9 One Data Source, Multiple Layers

From here, you could, repeatedly switch the styling around to apply to different columns (Medieval sherds (count), Roman sherds (g)...) but you could still only display one at a time. In Level 1 it was covered that each layer on the left hand pane in QGIS represents a link to underlying data (shapefiles, raster, CSV...). This means that you can load a single data file as a layer more than once in the same project.

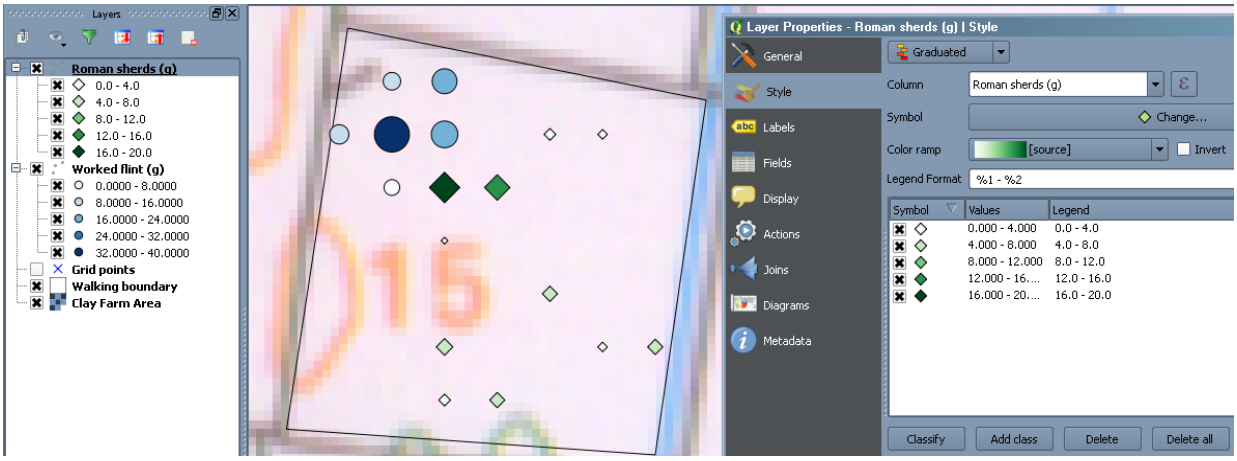
In this case we want to view a layer for each type of find, i.e. for each column in our field walking data. So we will load the same data file repeatedly as different layers, and style each layer to show what we want.

To keep track of this, we need to rename the layer in the Layers pane. **NOTE**: This does **NOT** change the name of the underlying CSV file.

1. Rename 'Grid points with data' to 'Worked flint (g)'. Right click on the layer and click rename, enter the new name.



2. Add the CSV layer again (Layer > Add Layer > Add Delimited Layer...) as before. It will be added as 'Grid points with data' again.
3. Rename this layer as 'Roman sherds (g)' and then change its style as before to Graduated, choosing a different colour ramp, and/or different symbol before pressing 'Classify'.
4. Optional: Set the size multiplier field to Roman sherds (g) (Advanced>Size scale field>Roman sherds (g))
5. Press ' OK'



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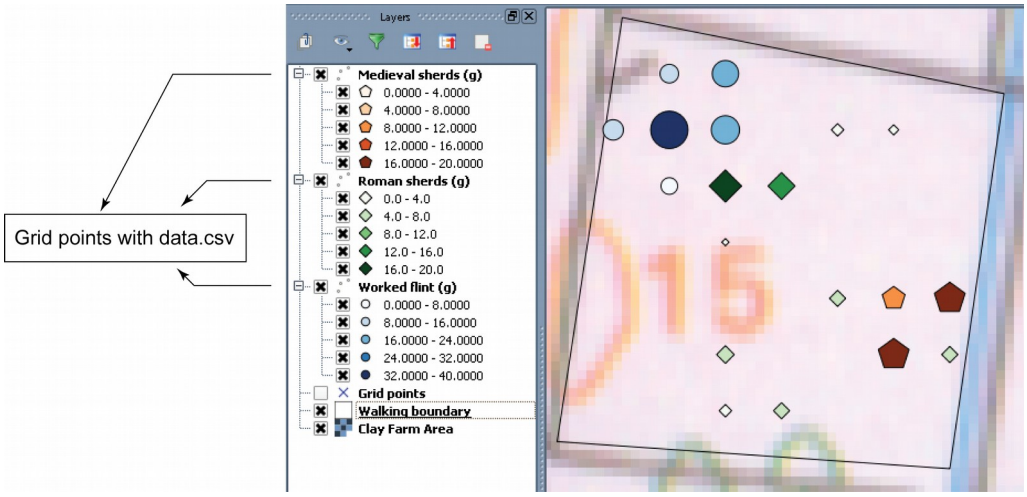
We now have two layers in QGIS, both driven from one data source, our CSV file. If you update the



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CSV file in Excel/Calc, the numbers will be reflected immediately in QGIS too.

You can repeat the process for the other data columns as layers. You are then free to turn each on and off as desired.

Once all the data you wish to display is loaded into QGIS, you can add background mapping and other decorations for production of figures, using the print composer. (A brief introduction to the print composer is included with the Level 1 guide).