



Manaaki Whenua
Landcare Research

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Basic spatial visualisation GIS manual

Example using
kiwi populations

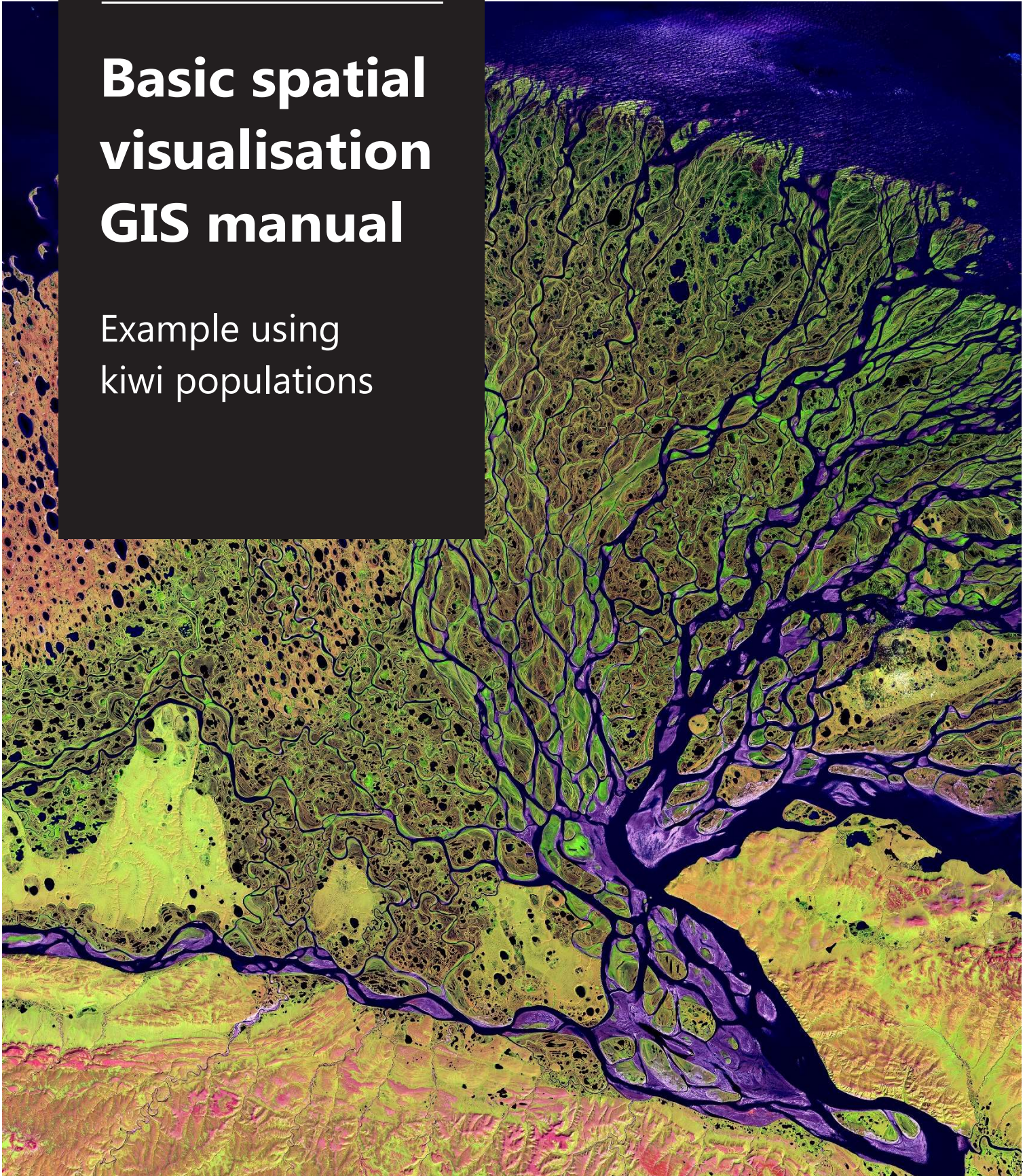


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1 INTRODUCTION

The following basic spatial visualisation package is a collection of publicly available shapefiles put together for the public to use. It is intended as a place for interested landowners, community groups, and iwi to start visualising their current conservation efforts and map out where they can focus future endeavours to achieve conservation goals.

This package has come from discussions between Kiwi for Kiwi consultant Morgan Cox and Anne Sutherland and Kiri Reihana (Manaaki Whenua) who saw an opportunity to collate freely available data in a package to support community conservation aspirations.

These files can be used with the free open source software QGIS (Section 3 of the manual) or any other GIS software as well as on google maps, so maintaining open access for the public. We have also decided to use the QGIS 3.4.15 Madeira operating systems, as at the time of this publication it was the most stable and well-utilised open-sourced program.

2 SHAPEFILES

The following shapefiles¹ have been collated and provide the following information about any given area in New Zealand. The file, which you can download from https://drive.google.com/file/d/1neov4fOY_VCZ6b5NNiWBK2rNdsI8WmQP/view?usp=sharing is called the Basic_Conservation_File_2020. Zip. (BCF).

2.1 Layers

The following layers² are all provided as shapefiles in the BCF; each of them having come from survey projects that have concentrated on a specific land cover aspect. Here we give a brief overview of what these aspects are and what information is shown on the layer. The BCF is set up with two background layers 'National layers' and 'Base Maps' that contain specific information relating to the National and Base maps information databases – National Layers contains all the mapping information on landcover information and Base Maps are the basic terrain layers of New Zealand. The third layer is study_area_data, where project specific information can be uploaded.

2.1.1 LCDB 4.1 Land Cover Database NZ

The Land Cover database is held by Manaaki Whenua – Landcare Research and updated at selected intervals. Version 4.1 is the latest mapping that describes land cover as captured on satellite imagery during the summer of 2012/13. The file is accessed via a web feature service (WFS) from the LRIS portal and released under Creative Commons Attribution 3.0 International.

More information on this file and the database can be found at <https://lris.scinfo.org.nz/layer/48423-lcdb-v41-land-cover-database-version-41-mainland-new-zealand/>.

Version 5, captured on satellite imagery during the summer of 2017/2018, is due for release early in 2020, which can be sourced at this link location.

2.1.2 Potential Vegetation of NZ (2012)

¹ Shapefiles a simple, nontopological format for storing the geometric location and attribute information of geographic features. These can be represented by points, lines, or polygons.

² Layer is a link reference to actual data, such as a series of shapefiles relating to an aspect.

This file is a prediction of potential forest composition from regressions relating the distributions of major canopy tree species to the physical environment. Predictions of species abundance were made and classified to derive groups of similar composition that would provide a context and view for potential vegetation cover in NZ had man not altered the landscape. These data are expected to provide a context both for the assessment of the biodiversity value of surviving forest remnants and for the subsequent management and/or restoration of sites. It is accessed via a web feature service (WFS) from the LRIS portal and released under the Landcare Data Use License.

More information on this file and the data base can be found at <https://lris.scinfo.org.nz/layer/48289-potential-vegetation-of-new-zealand/>.

2.1.3 NZ River Centrelines Topo 1:250k

This file is a component of the Topo250 map series. It presents as lines on the maps indicating natural, flowing bodies of water that empty into the ocean, lakes, or other bodies of water and that are usually fed along their course by converging tributaries. It has been downloaded from the LINZ Data Service and released under Creative Commons Attribution 4.0 International.

For more information go to <https://data.linz.govt.nz/layer/50327-nz-river-centrelines-topo-150k/>

2.1.4 NZ River Polygons Topo 1:250k

This file is a component of the Topo250 map series. It presents as geometric areas indicating natural, flowing bodies of water that empty into the ocean, lakes, or other bodies of water and that are usually fed along their course by converging tributaries. It has been downloaded from the LINZ Data Service and released under Creative Commons Attribution 4.0 International.

For more information go to <https://data.linz.govt.nz/layer/50327-nz-river-centrelines-topo-150k/>

Together, the River Centrelines and Polygons form a river network, the centrelines representing the narrow sections and the polygons the wider sections of the rivers.

2.1.5 Māori Land Spatial Dataset 2017

The Māori Land Spatial Dataset is a combination of the spatial data available from the Māori Land Online website and static data about management structures from the Māori Land Information System. This file has been downloaded from the Māori Land Court website and released under Creative Commons Attribution 4.0 International.

For more information go to

<https://www.landcareresearch.co.nz/resources/maps-satellites/maori-land-visualisation-tool>

<https://maorilandcourt.govt.nz/your-maori-land/maori-land-data-service/#spatial-data>

2.1.6 Iwi Areas of Interest 2017

This file represents areas of interest of iwi authorities, hāpu groups, and other Māori organisations as recorded in Te Kahui Mangai (www.tkm.govt.nz) directory. It has been downloaded from data.govt.nz. and released under Creative Commons Attribution 4.0 International.

2.1.7 Iwi Areas of Interest Oct 2018

This file represents updated boundaries for the following areas only: Ngāti Tūwharetoa, Ngāi Tūhoe, Ngāti Kahungunu, and Rangitāne. Most of the data on this file are current as at 2017, with updates in 2018. It has been downloaded from data.govt.nz website and released under Creative Commons Attribution 4.0 International.

For more information go to

<https://www.arcgis.com/home/item.html?id=57126dc2c577429792b10e4d478406db>

2.1.8 NZ Aerial Imagery

The NZ Aerial Imagery basemap provides a seamless, nationwide imagery layer with the most recent highest resolution data and covers 95% of New Zealand. The date of imagery varies between locations but the most recently captured imagery available is provided for each location. It is accessed via a web map tile service (WMTS) from LINZ Data Service and released under Creative Commons Attribution 4.0 International.

For more information go to <https://data.linz.govt.nz/set/4702-nz-aerial-imagery/>

2.1.9 NZ Topo50 Gridless Maps

The Topo50 map series provides topographic mapping at 1:50,000 scale for the New Zealand mainland, the Chatham Islands, and offshore islands. It is accessed via a web map tile service (WMTS) from LINZ Data Service and released under Creative Commons Attribution 4.0 International.

For more information go to <https://www.linz.govt.nz/land/maps/topographic-maps/topo50-maps>

2.1.10 NZ Rainfall

This file has been downloaded from the Koordinates website:

<http://koordinates.com/layer/305/>.

Added 2008, revised 2011, from Oliver & Co as a shapefile. Described as NZ Forest Service rainfall.

2.1.11 Conservation example – Kiwi maps

Kiwi population maps, some specialist maps on individual species, such as the kiwi series may be made available on request from the Department of Conservation. These maps indicate kiwi populations, specifically the species in each region and their population ranges. The population ranges have records for Pre-European and present-day ranges. Examples of what these maps can provide are shown in Appendix 1.

2.1.12 Additional maps

Other maps which can be added into the basic data sets which are not included in our package file list are DoC estates and QEII covenants. These can be sourced from the following links. You may also want to include NZ Property Titles as a default layer.

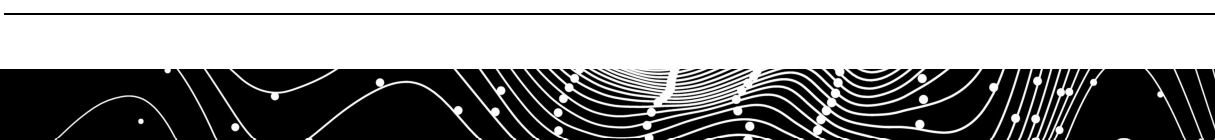
<https://data.linz.govt.nz/layer/50804-nz-property-titles/>

https://catalogue.data.govt.nz/dataset?q=doc&sort=score+desc%2C+metadata_modified+desc

<https://qeiiinternationaltrust.org.nz/publications-and-resources/gis-data/>

Another source of Māori land mapping is Ngā Whenua Rahui you can request information from them here.

<https://www.doc.govt.nz/get-involved/funding/nga-whenua-rahui/>



3 BASIC OPERATIONS WITH QGIS

These instructions will:

- help you download the open source QGIS system
- load the basic project created for you by Manaaki Whenua – Landcare Research
- describe the features and tools in the system
- tell you how to create and then print a map.

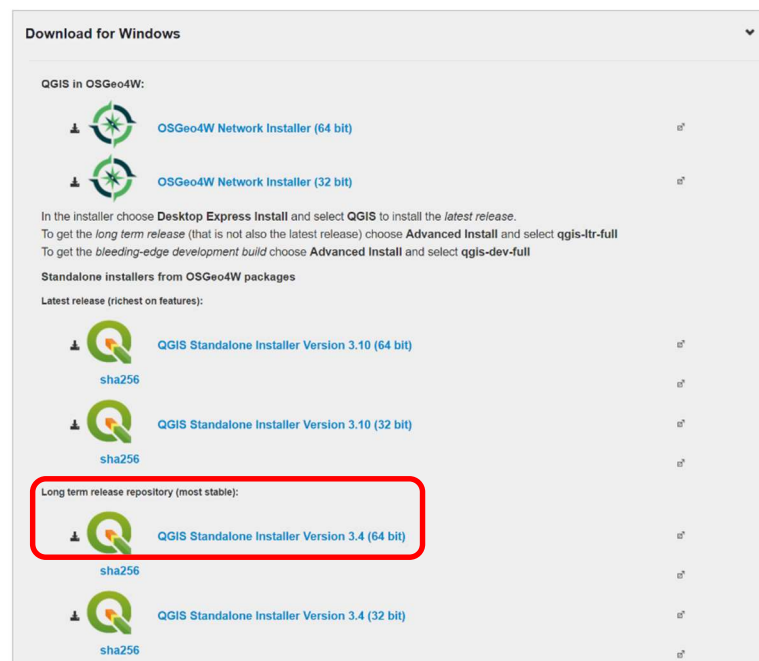
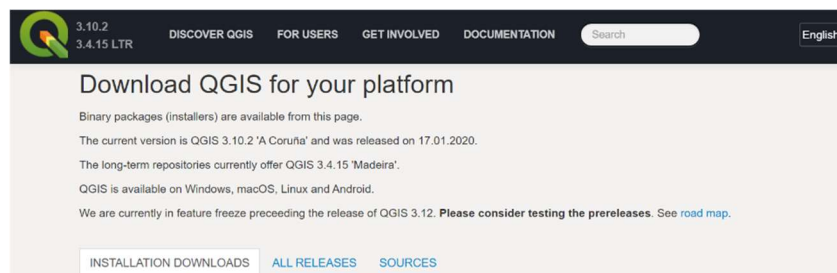
3.1 Starting with QGIS

QGIS is an open-source, community-driven GIS (Geographic Information System).


Here is the site for downloading QGIS:

<https://www.qgis.org/en/site/forusers/download.html>

Please note that this project is set up using QGIS 3.4.15 Maderia



We recommend downloading the most recent Long term release version. Use this option for downloading if your PC is 64 bit.

To check whether your PC is 64 bit or 32 bit in Windows 10 go to Start menu -> Settings  -> System -> About -> then look for System Type. For other Windows versions go to Start menu -> Control Panel -> System and Security -> System -> then look for System Type.

Once you have downloaded the software, two icons should appear on your desktop or be accessible through the Start menu:



QGIS Desktop



QGIS Browser

The Desktop is the main GIS program this project will be using. The Browser is an easy and fast data viewer used to preview GIS and attribute data of a layer. You do not need to open either of these at this stage as the Desktop will automatically open when you select the project that has been prepared for you.

3.1.1 First step

The files for this project are supplied in a package called the Basic_Conservation_File_2018.7z, which is a zip file. To be able to use the files in a GIS, they need to be extracted from the zip file. To extract the files, right click on the zip folder and select Extract All, then select the filepath where you would like to save the files. It is recommended to save them into a new folder on your PC.

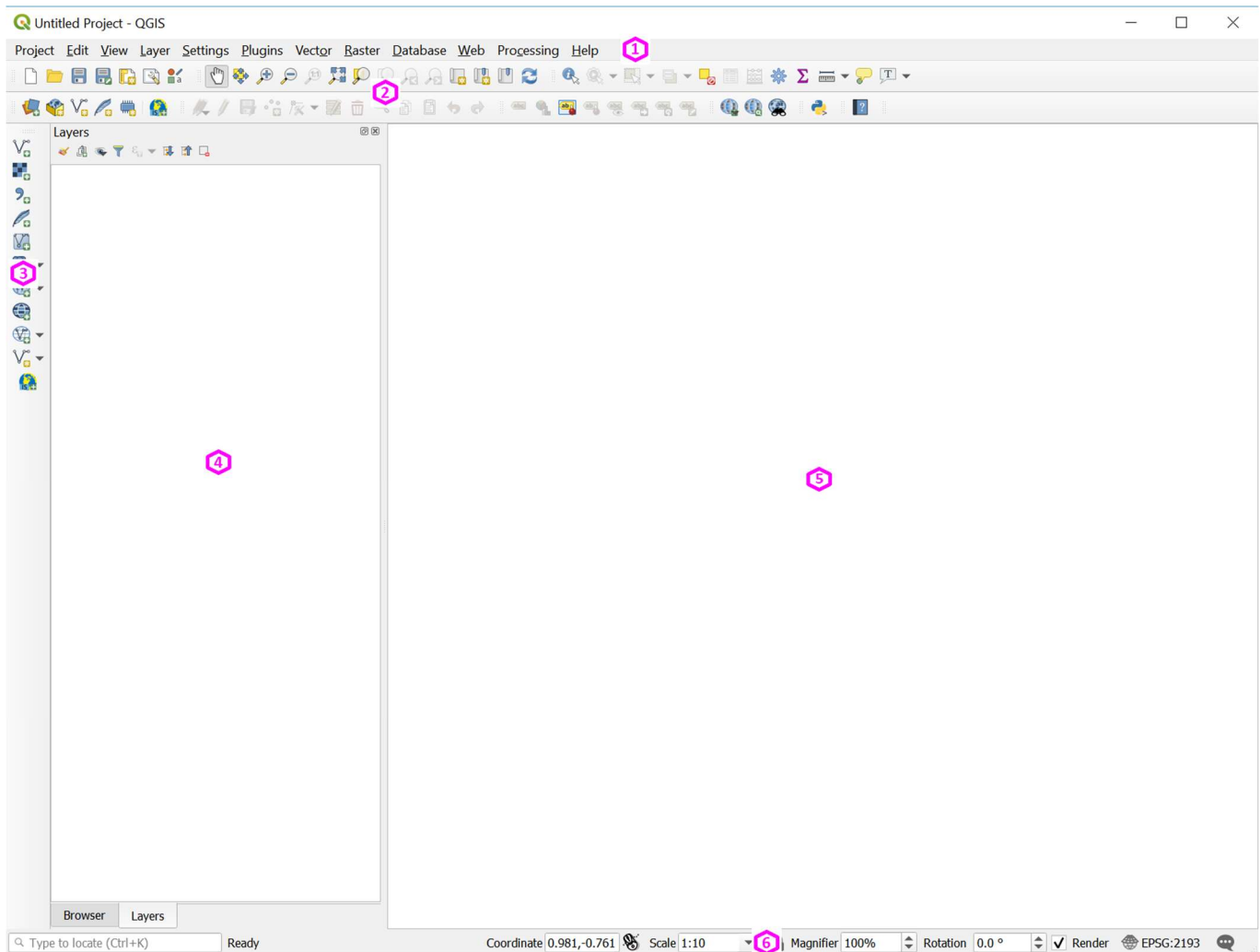
Open the folder in which you have chosen to save the extracted files, and double click on QGIS Project file nz_base_data_QGIS3_4.qgs. A Windows command screen will open, followed by the QGIS program. It may take a few seconds for the program to open.

You should now be able to see a topographic map of New Zealand and the study_area highlighted in red. Version 4.1 of the New Zealand Land Cover Database and the Māori Land Blocks for the study_area are also displayed but barely visible at this national scale.



3.1.2 User interface

Below is an overview of the user interface:



1: The menu bar 2: Toolbars 3: Side toolbar

4: Layers List/ Browser Panel (can alternate between these by clicking on the tabs at the bottom of the window)

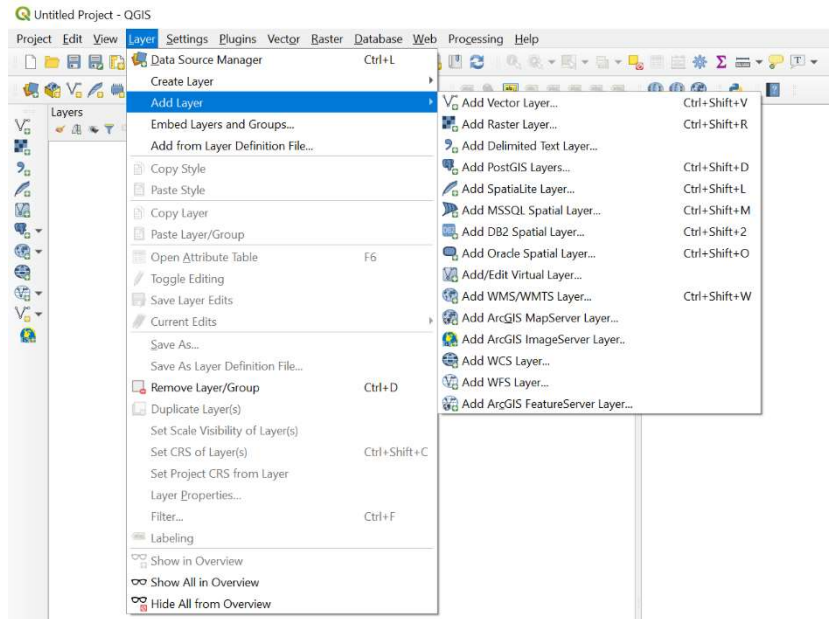
5: Map canvas 6: Status bar

1. The menu bar

Left click on a heading to see a list of options. If an option has an arrow pointing to the right, you will get a further list of options by highlighting that option.

In the example below you will see that if you left click on Layer in the menu, hover over Add Layer and then left click on Add Vector Layer, a window will pop up where you can select the file you wish to add. To navigate to a new filepath, click the three dots to the right of the Vector dataset(s) subheading.

You can add several files at once. If they are contiguous, select the first layer, hold down the Shift key and select the last layer. If they are not contiguous, hold down the Ctrl key and select each layer separately.

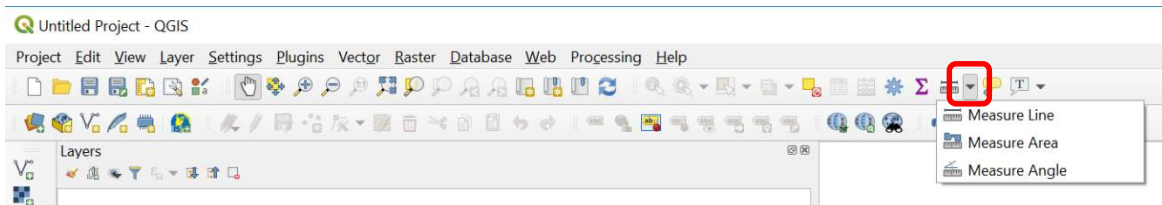


2 & 3. Toolbars

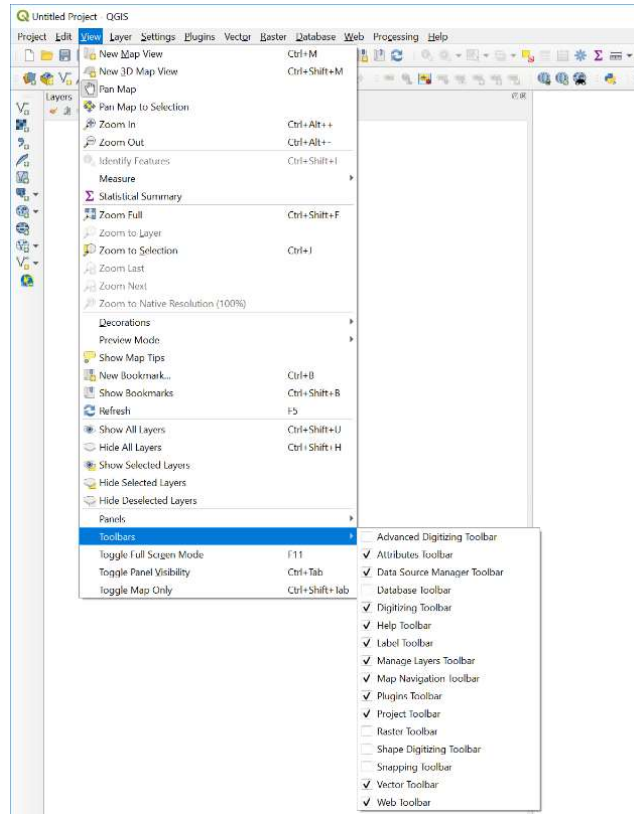
QGIS has a set of standard tools and the ability to run custom tools via a plugin system.

If you hover over an icon for a tool on either of the toolbars it will give you additional information to describe what that tool will do.

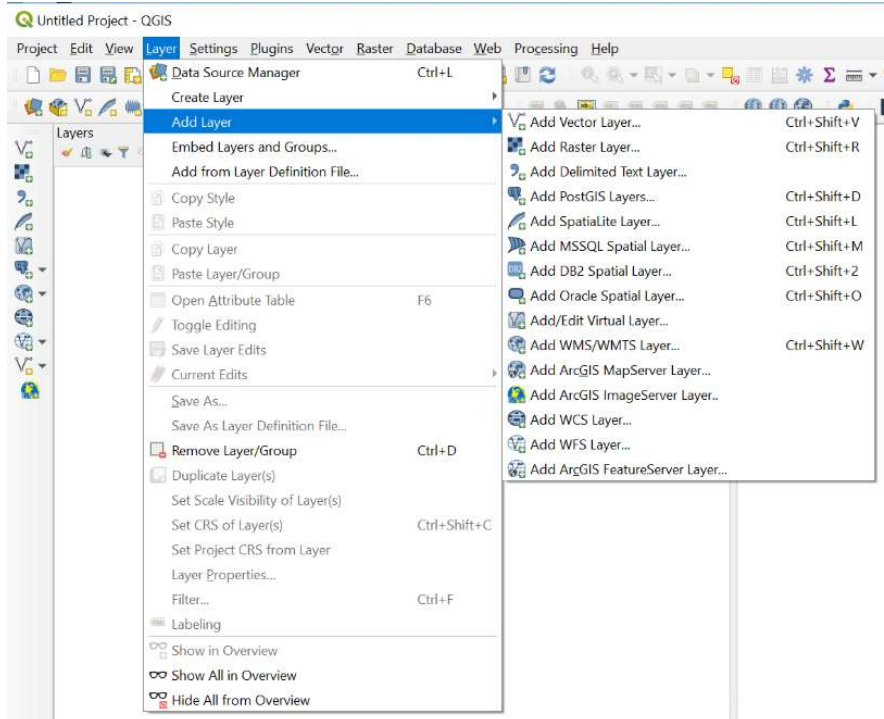
If a tool has a down arrow on the right-hand side, then further options are available by clicking on the arrow.



You can choose which toolbars you wish to have on display by clicking on 'View' in the menu -> Toolbars. The toolbars that are displayed will have an '✓' in their tick box. You can turn them on or off from here.



You can access all the toolbars via the menus as well.



4. Layers List/Browser Panel

In the Layers List you can see all the layers that are available to you.

You can turn a layer on and off by clicking on the '✓' in the tick box beside it.

The Browser Panel lets you navigate to database, files, etc., that you may have stored either in this directory or in other places on your computer system.

5. Map canvas

This is where the map is displayed.

6. Status bar

The status bar at the bottom shows information about the current map, such as map scale, which can be adjusted from here. It also displays coordinates for the point where the mouse cursor is positioned on the map. At the bottom of the window the scale of the map and the geographic coordinates of the point under the cursor are displayed.

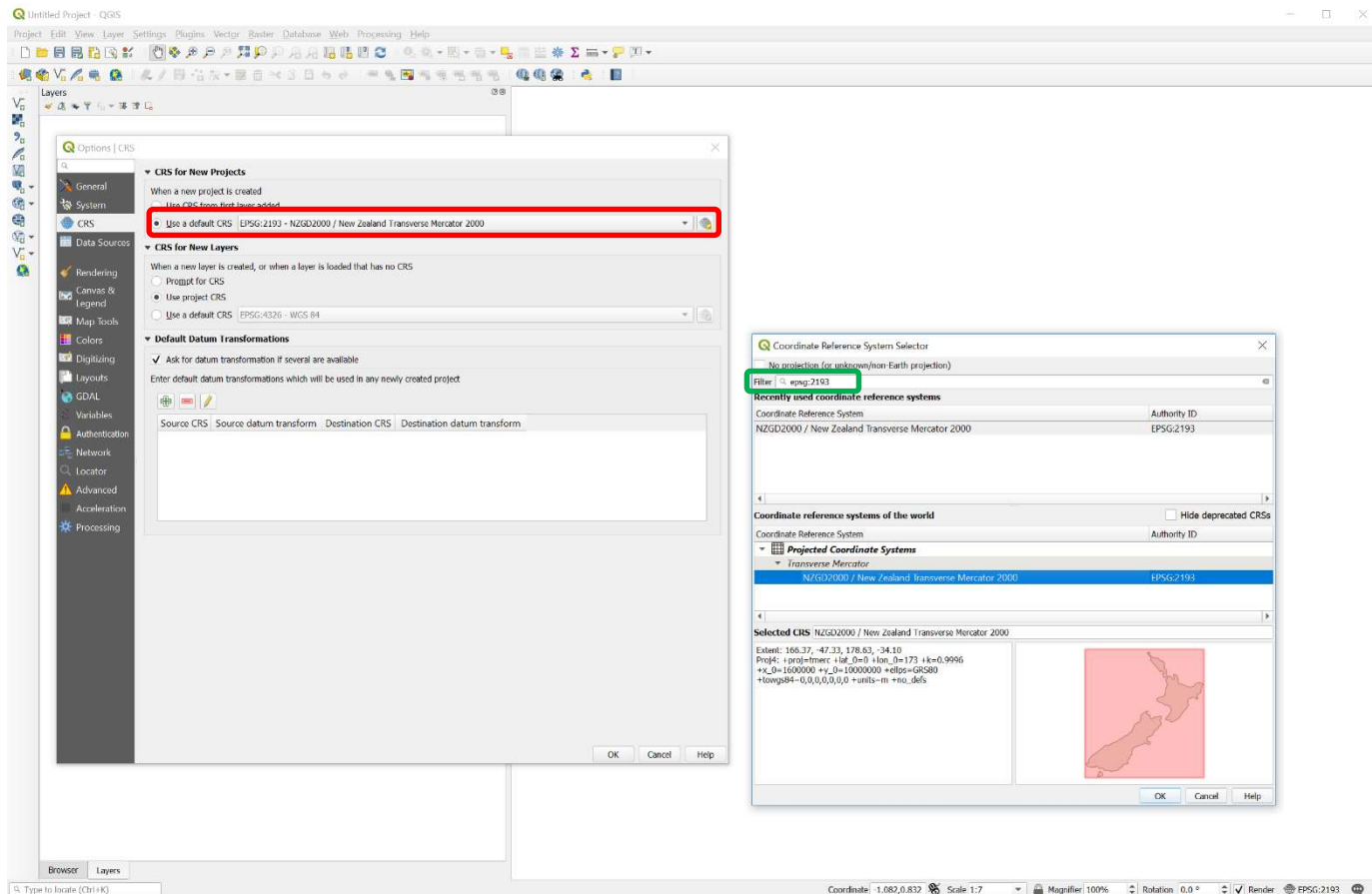


3.1.3 Preferences

Before setting up a project, these settings should be checked to make sure they are correct.


These are the recommended settings. This should need to be done only once.

Go to SETTINGS on the menu -> options -> CRS



CRS for New Projects:

Check the Use a default CRS on. We need to set the dropdown box to NZTM (we are working in NZTM New Zealand Transverse Mercator for this project); projects will be explained in section 3.1.4.

To set it to NZTM, click Select CRS,  which is at the right-hand side of dropdown box. Another window will pop up. In the Filter box of that window type EPSG:2193.

NZGD2000 / New Zealand Transverse Mercator 2000 should appear under the heading Coordinate reference systems of the world, select this by clicking on it, and then click OK.

CRS for New Layers:

Turn on the Use project CRS button.


Alternatively, you can also set a projection specific to a project under Project on the menu -> Project Properties -> CRS.

3.1.4 Project

A project is defined as the saved workspace incorporating a set of layers/views/preferences and connections to data sources. The QGIS help page defines project as saved layers, styles, map extents and settings for use at a later time. This information is stored as a QGIS project file and has an extension of .qgs or .qgz, with .qgz being the default file format in QGIS going into the future.

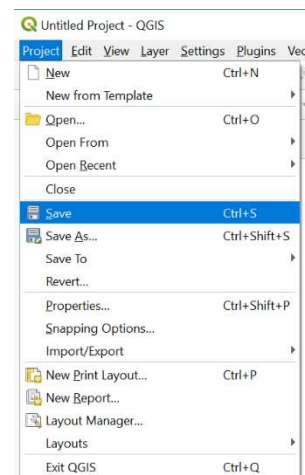
Here, this is to look at and make maps of areas of New Zealand of interest to landowners, community, and iwi groups, and the project has been set-up to display the data relating to those requests. The project name is nz_base_data.qgs.


A project is used to save the current session in QGIS, and you can therefore return to the same session at a later stage. While it will save the layers that are open, it does not store layer data. If you are editing a layer (adding points, digitising, etc.) you need to save both *the layer* and *the project* to ensure all your work is saved.


To load a project, click on Project menu, then Open or click the Open button on the toolbar  (there is usually more than one way of doing things in QGIS), navigate to your project, select it and click Open – it will then load. This may take a little while if you have big files, such as imagery.

The project name will then appear in the top title window.

You can save this project at any time by clicking on Project menu then on Save



or click on Save button . This will save the project as it is in that instance.

You can also save project to another name by clicking on Project menu, then on 'Save As' or click on the Save As button .

WE RECOMMEND that if you wish to keep this original project as it was delivered, it is best to make a copy (Save As and give it another name) before you begin working on it. Alternatively, make sure you do not delete the original zip file and keep it in a safe place in case you need to reinstall it.



3.1.5 Navigation

The basic tools for navigating around the map are contained in the toolbar. Hover over each tool and the tooltip will explain what each tool does – pan, zoom in, etc.



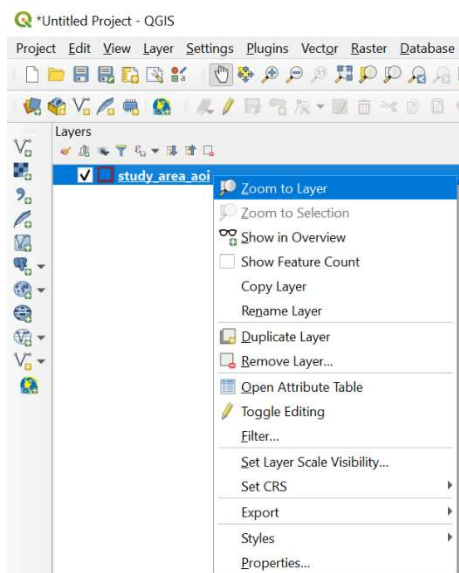
For example, the hand icon allows you to pan around the image.

To pan: left click in the map and keep holding down and drag map to desired location.

To zoom in: select the + icon and either left click in the map (each click will take you in a further step, centred on the cursor) or hold down and drag. To draw a shaded box around the area of interest, release the mouse to zoom into the area.


To zoom out: do the same, with the Zoom Out tool selected.


Another useful option is to highlight a layer in the layer panel by right clicking on it, then you can Zoom to Layer. This will take you to the selected layer's full extent:



3.1.6 Bookmark

This allows you to save a view of the map so you can return to it at a later stage (good for saving areas of interest).

When you have an extent, you wish to save in the map canvas, click on the New Bookmark button . A window will pop up (bookmark manager) and you can double click the text in the name section and give it a meaningful name. Then, at any time later you can highlight any bookmark you have created, click the Zoom to button at the top left, and it will take you back to that original extent.

To open your bookmarks, click on Show Bookmarks button . This window will pop up showing all your stored bookmarks.



Name	Project	xMin	yMin	xMax	yMax
crossroads		1833106.946487	5553505.543192	1896445.111062	5667544.151193
forest		1660815.174137	5345618.769262	1914167.832437	5801773.201266
river_bank		1787865.400362	5560235.690549	1851203.564937	5674274.298551

3.1.7 Layers

These are managed through the Layers Panel on the left-hand side of the map canvas.

Any layer that is not turned on (does not have a tick in its checkbox) will be displayed in italics.

If you click on the name of a layer, it will be underlined and will become the 'active layer'. The selection and editing tools will only work on an active layer and as long as you have rights to edit it.

If you right click on the active layer, a menu will give you other options, some of which are explained below:

Remove – removes layer from project.

Open Attribute Table – this allows you to view all attributes for this layer (Layer attributes are described in section 3.1.9).

Properties – a pop-up box contains all the information relevant to this layer. The Layer properties window has several tabs, with general information about the file, options for displaying the data, etc.

Export – a copy of a layer can be saved to a new format by using the Save As option or, if you have made a selection of certain features from a layer, that can be Saved As a new layer.

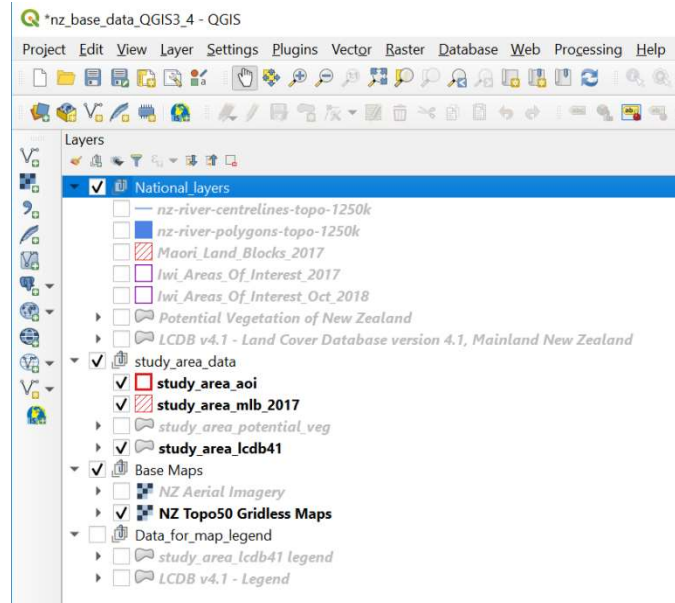
Note: If nothing is selected, then the entire layer will be saved; otherwise, only your selected features will be saved to a new layer.

Layers can be reordered in the layer panel by dragging them up and down. In the map canvas, the layers are displayed in the order they are on the list, so the top layer will be displayed over the subsequent layers.

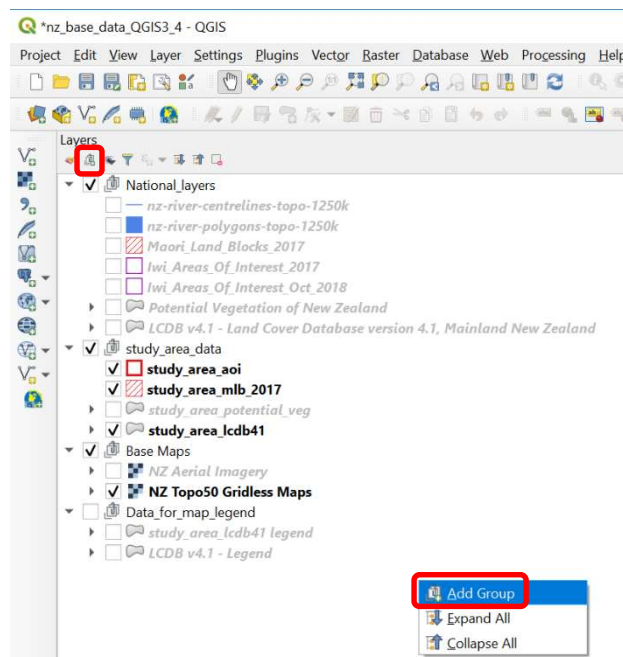
Note: the more layers you have displayed in the map canvas at a time, the longer it takes to redraw the display as you navigate within it.

Layers can also be grouped, as with the National_layers, study_area_data, and Base Maps in the example below. This allows for a group of layers to be managed as one. They can all be turned off or on with one click. You can also turn these layers off individually. If some of the layers are on and some are off, the tick box beside the group layer name will have a black box. If you click on the blackened tick box, all the layers will then be turned on.





Groups can be created by either clicking the Add Group button  at top of Layers Panel:

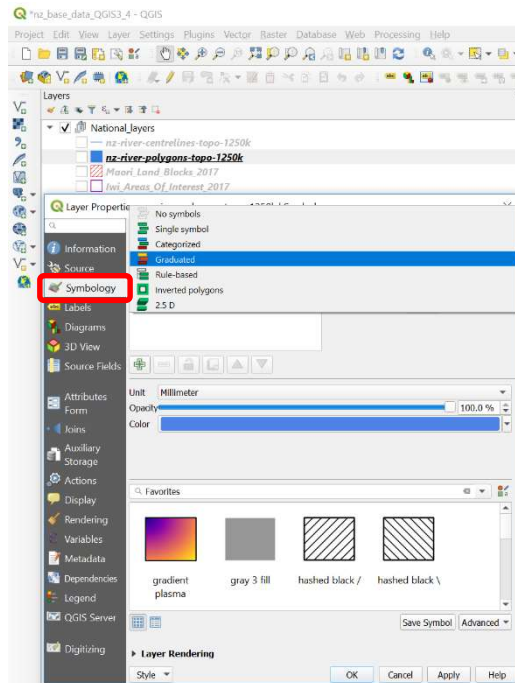


or by right clicking in the blank space at the bottom of the Layers Panel and selecting Add group from the pop-up menu. You can then add layers into the group by dragging them and releasing them over the group layer title or layers within the group. If the layers are in an existing group, they will be removed and added to the new group. To create a copy of a layer in a new group, right click on the layer and select Duplicate. This creates a copy you can then move to the new group.

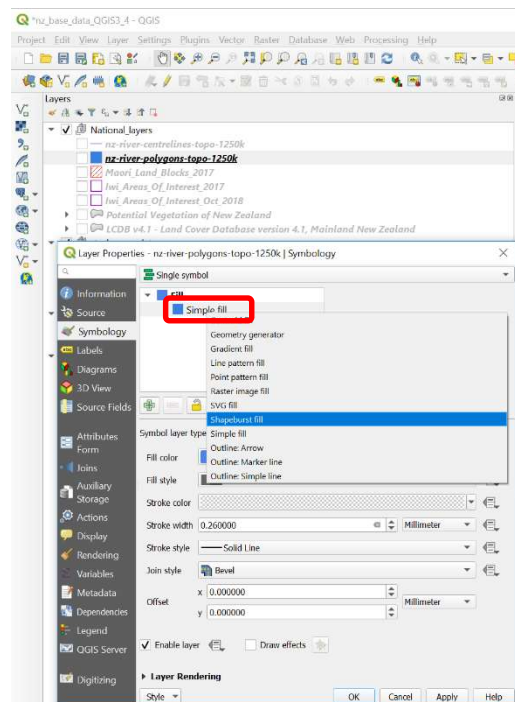
3.1.8 Styles and labels

Each layer can be styled separately.

The style options can be accessed by either right clicking on the layer name and selecting properties, and then selecting the Symbology tab on the left or double clicking on the style symbol for the layer in Layer Panel.




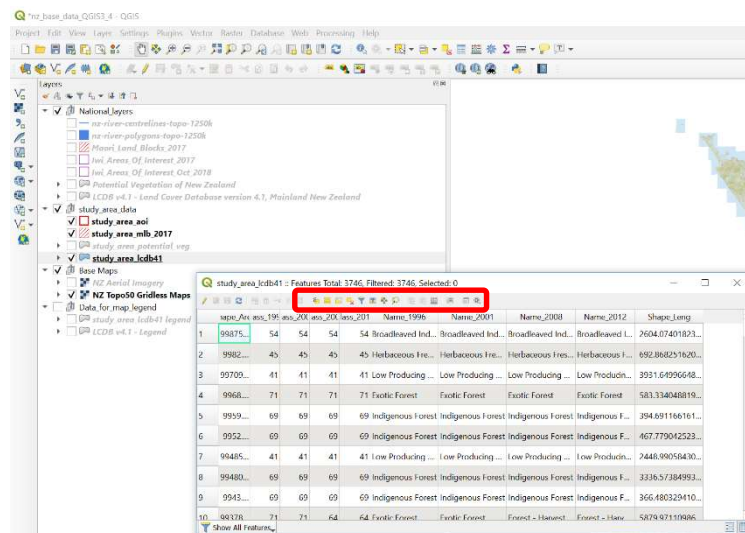
You can choose to use a single symbol. By clicking on the Simple fill symbol, as below, options come up to enable you to change the colour of all features in the layer.



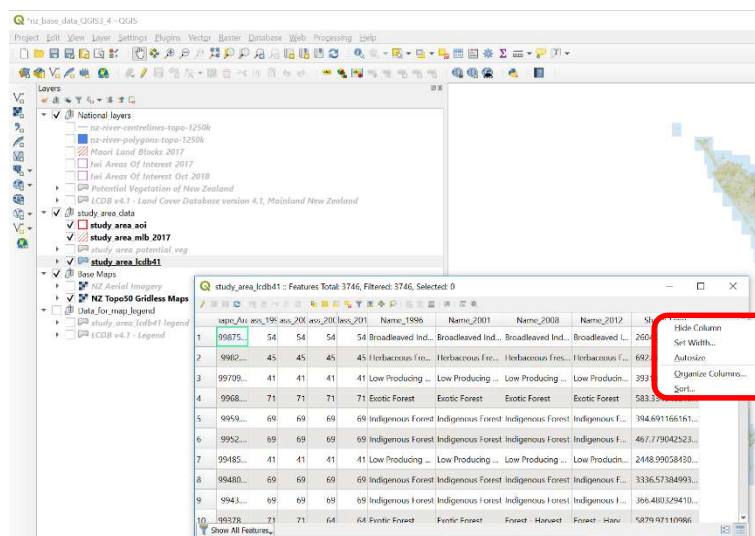
Additional options apart from single symbol include categorized, graduated, and rule-based, which allow you to change the colour of different features within the layer

3.1.9 Attributes

Layer attributes can be viewed by right clicking on the layer in the layer panel -> Open Attribute Table. Features can be selected or edited. The table will become editable if you click on the edit button , which will allow you to add another column, add or delete features, etc., using the tools on the Attribute Table window.



A menu of column options is shown when you right click on the column heading. You may sometimes wish to hide certain columns to reduce the size of the table. To make them visible again, right click on any heading -> Organise columns -> tick box on for columns you wish to show.

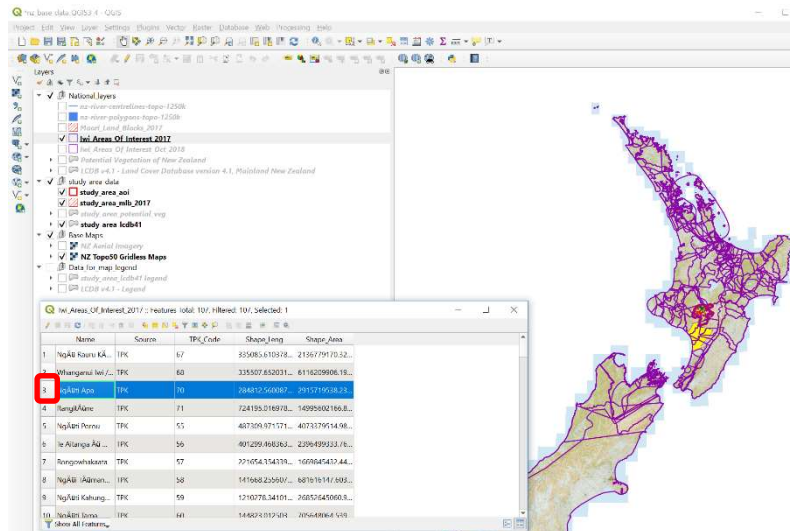


Note: there is an Undo option found by clicking on 'Edit' -> Undo on the menu.

3.1.10 Using the attribute table to create a layer from an existing layer

It is possible to create a separate layer of a single area of interest from an existing layer, for example the study_area created from the Iwi Areas of Interest).

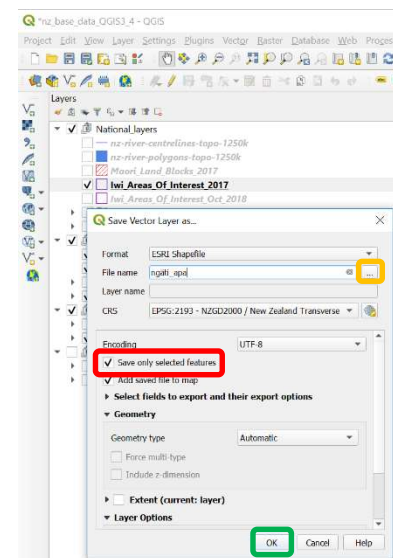
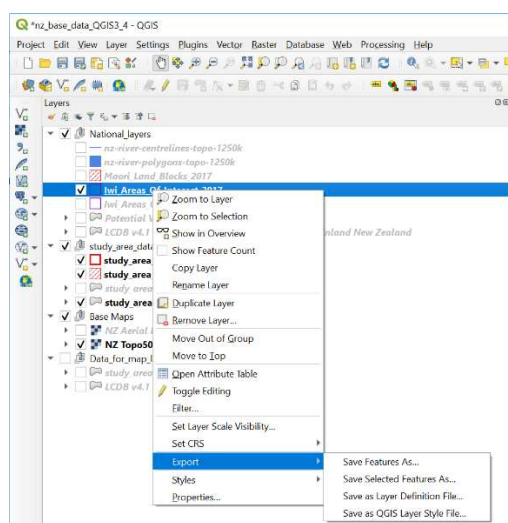
Open the attribute table for Iwi Areas of Interest (highlight in Layers Panel -> right click -> Open Attribute Table). Select a row by clicking on ID number in left-hand column (it is possible to select several by holding down 'Ctrl' while selecting).



Your selection will be highlighted in yellow on your map if you have that layer turned on.

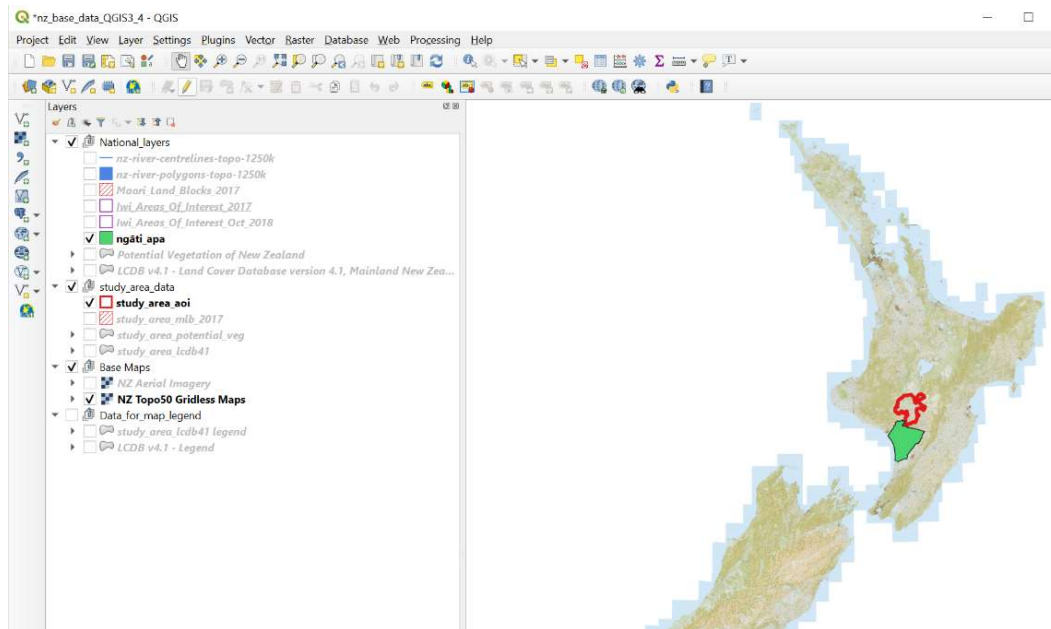
Once again, right click on layer in Layers Panel -> click on Export. You can choose to Save Features As... or Save Selected Features As.... Note there is also a tick box to Save only selected features in the Save Features As... option. Select Format (ESRI Shapefile) and type name for file, and make sure it is saving in the right place by clicking on the Browse box. In this case our new layer is called 'ngāti_apa'.

Click -> OK. Your new layer will be added to the Layers Panel.

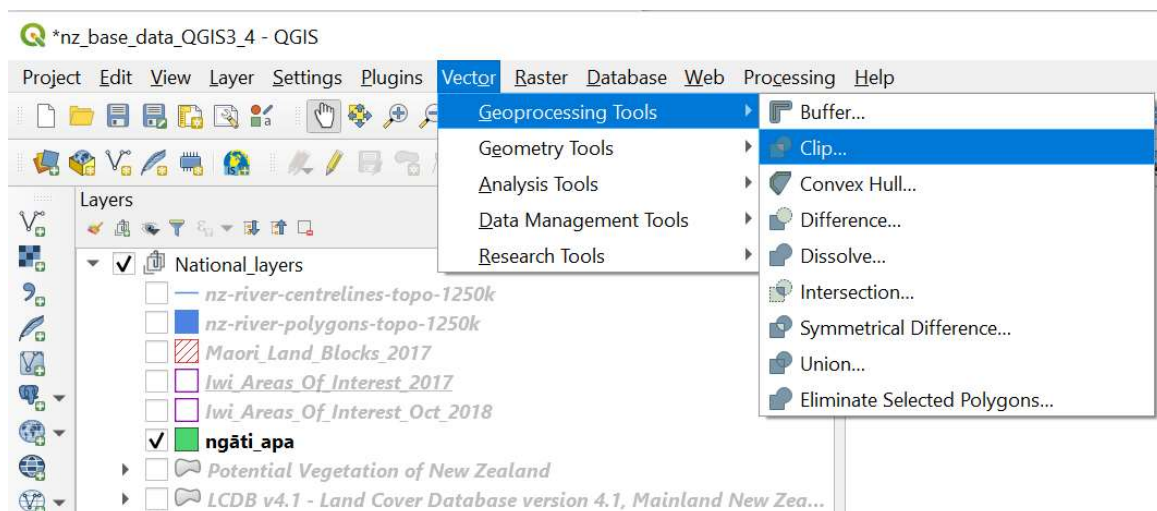


3.1.11 Clipping

The ngāti_apa layer can be used to restrict information from other layers to the area of interest (known as clipping). This enables values to be calculated specifically for the area of interest.



To clip from an existing layer, Click on Vector on main menu -> Geoprocessing Tools -> Clip -> populate with relevant layers.



This example is using the newly created ngāti_apa boundary file to clip information from the national LCDB4.1 layer creating a new file named ngāti_apa_lcdb41

If you click on the dropdown arrow it will provide a list of all the layers you have in your project and you can either choose one of those or you can use the browse box to navigate to a layer.

Parameters

Log

Input layer

LCDB v4.1 - Land Cover Database version 4.1, Mainland New Zealand [EPSG:2193]

Selected features only

Overlay layer

ngāti_apa [EPSG:2193]

Selected features only

Clipped

K:/landcare_jobs/mas/kiri/SL1703_kiwi_rescue/data/map_data/ngāti_apa_lcdb41.shp

Open output file after running algorithm

Clip

This algorithm clips a vector layer using the features of an additional polygon layer. Only the parts of the features in the Input layer that fall within the polygons of the Overlay layer will be added to the resulting layer.

The attributes of the features are not modified, although properties such as area or length of the features will be modified by the clipping operation. If such properties are stored as attributes, those attributes will have to be manually updated.

0%

Cancel

Run as Batch Process...


Run

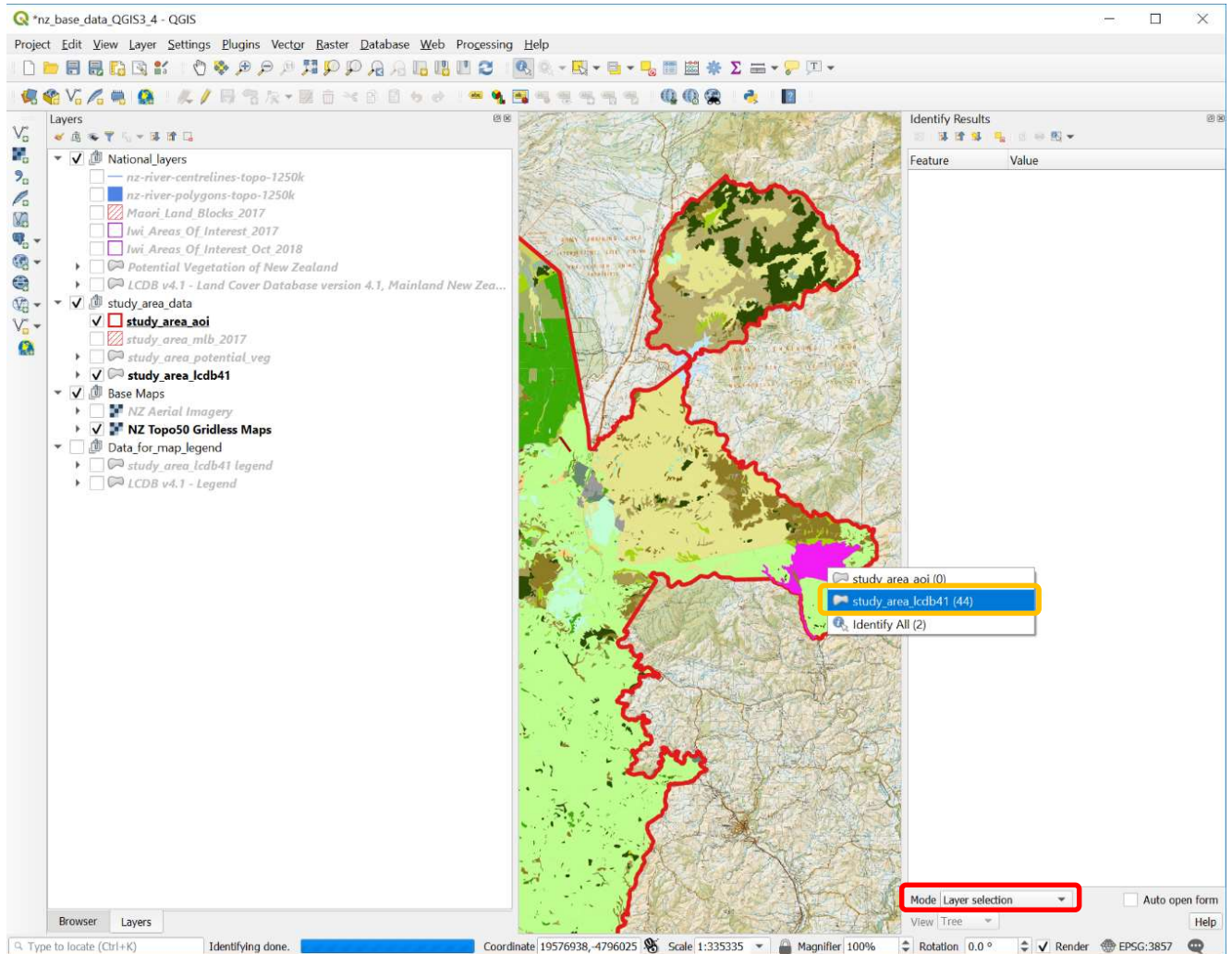
Close

Help



3.1.12 Identify

To see the attributes of a particular feature, click on Identify button  on the top menu bar and then click on the feature of interest in the map. The details will be displayed in a panel on the right-hand side of the main window. You can alter the mode of selection; in this case, it is a layer selection, so it has shown that there are two visible layers at this location.



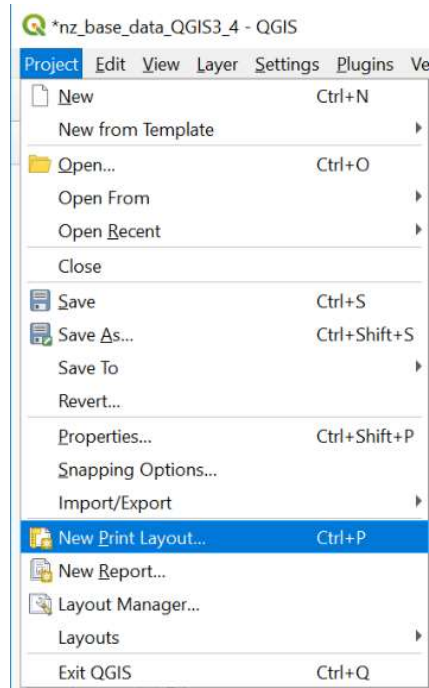
Shown in the outlined selection area are the vegetation class (lcdb41) and the area of interest (study_area_aoi). If you hover over each layer name it will be highlighted and show the entire extent of the selection and if you right click on one of the layers, the full list of attributes will be shown in the result window, where they can easily be read. Depending on how many layers are being drawn, the process of displaying the results could take some time.


3.2 Making a sample map

Once you have navigated around the information layers to an area of particular interest, you may wish to generate a printable map of it.

To produce a map output, use a Composer window.

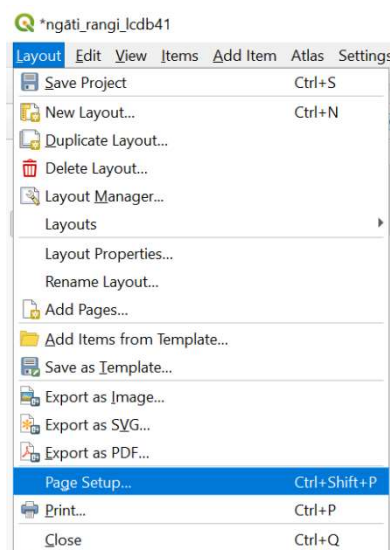
Click on Project on the main menu bar -> New Print Layout



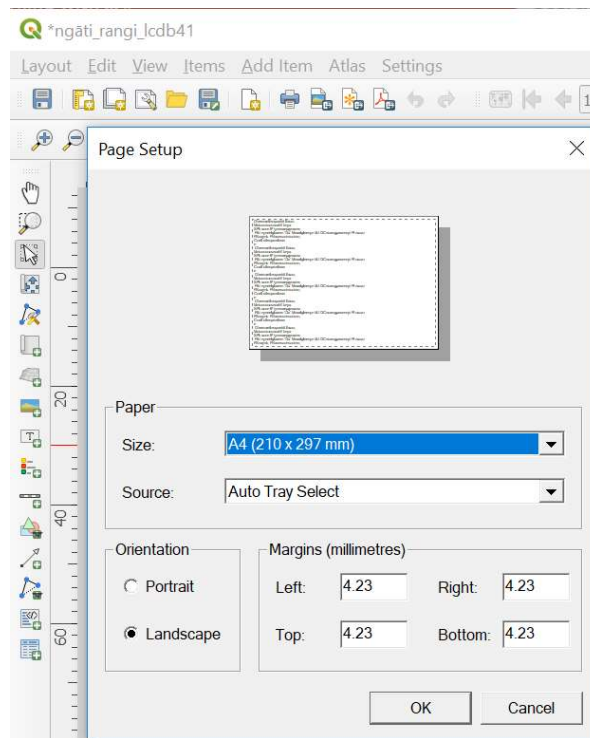
or use New Print Layout button  on top menu.

You will be asked for a name for your print (this example is ngāti_rangi_lcdb41). Your composer window will then appear.

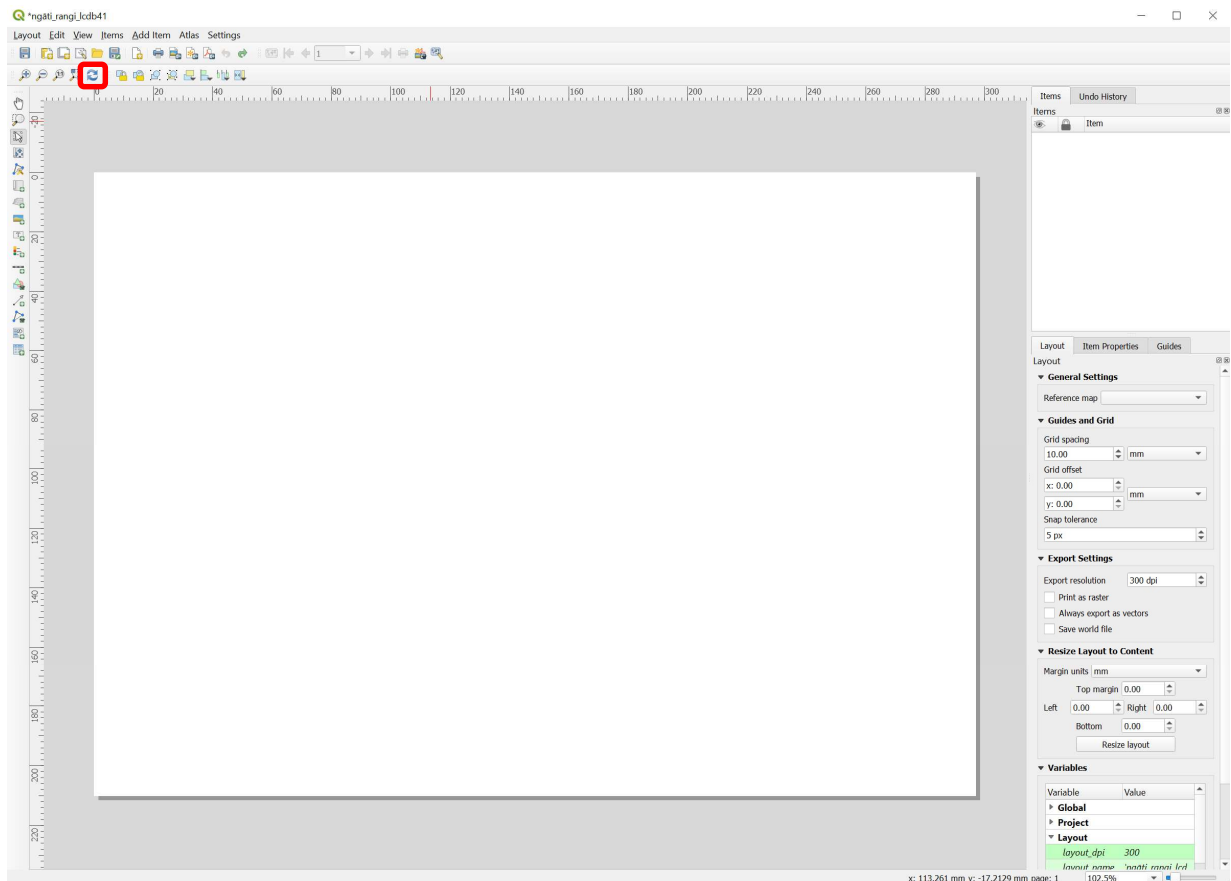
Set your page size first. To set your page size for printing click on Layout (top left) in menu, then Page Setup:



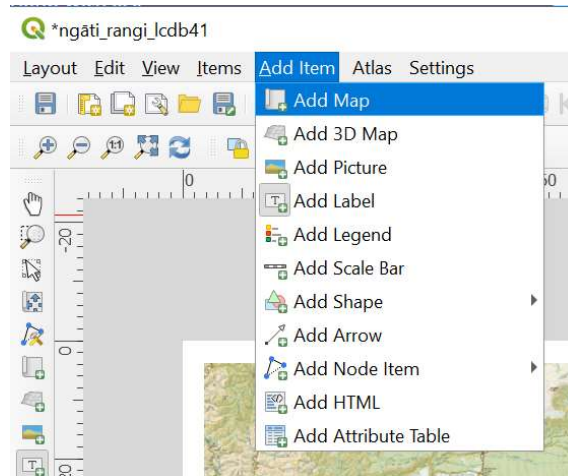
This window then appears, and you can make your selections:



In the Print Layout window, click on Zoom full button to display the full extent of the Layout:

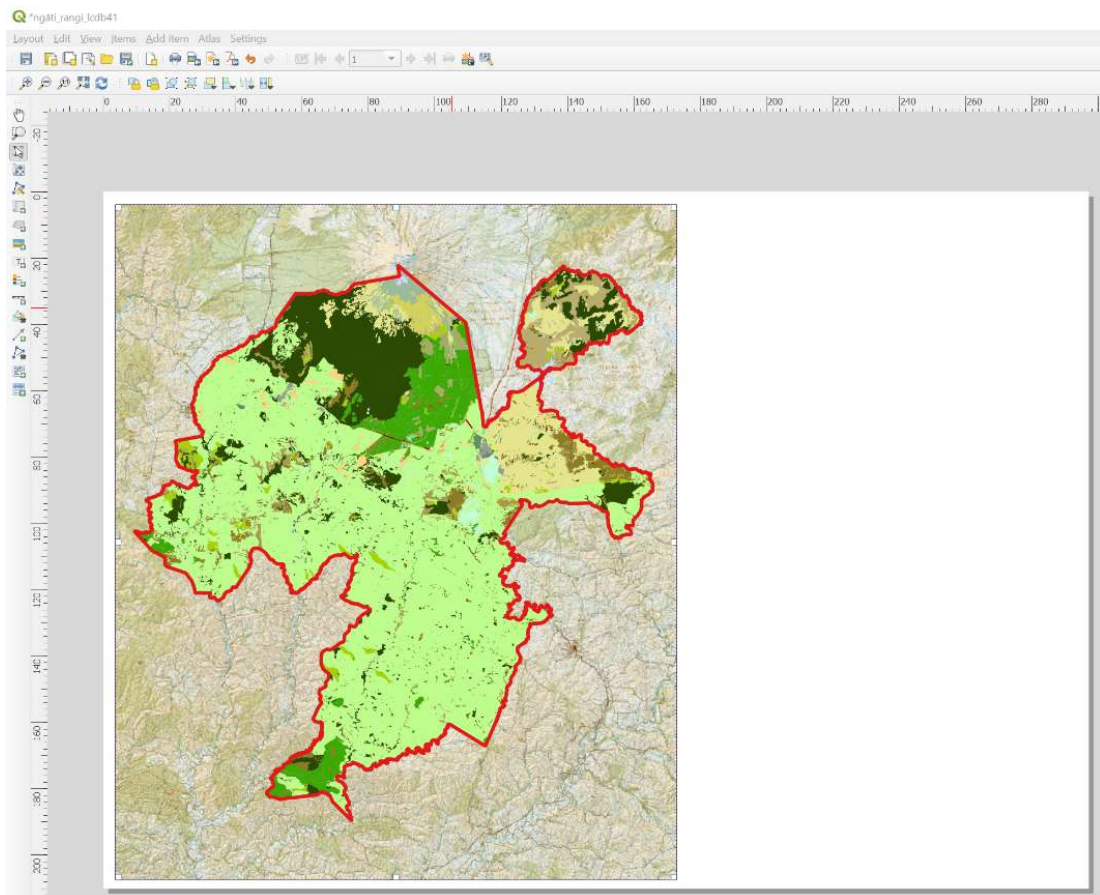


Next, you need to add a map frame so you can see the map view that we see in the QGIS canvas. Select from the menu Add Item -> Add Map,

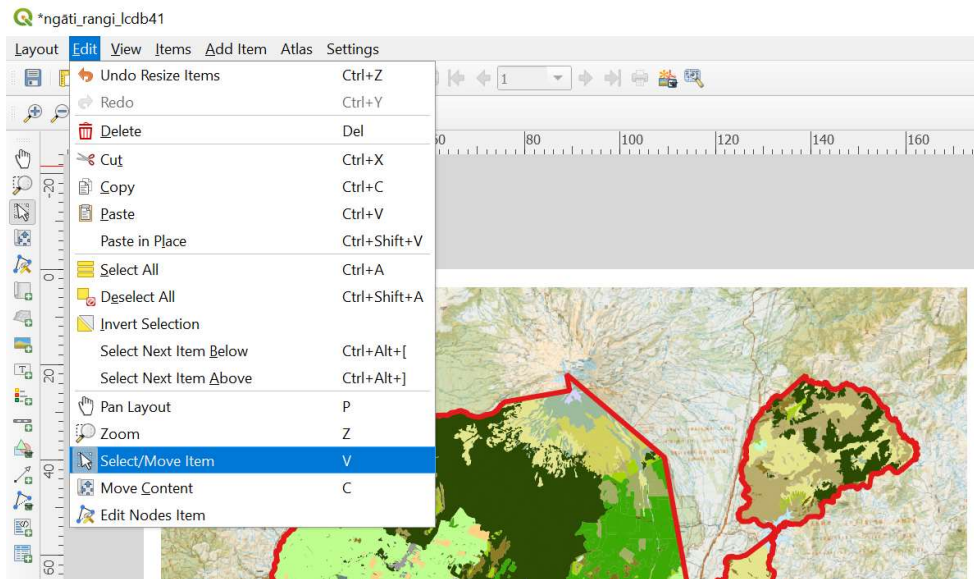


then move the cursor into the map canvas and drag (hold the left-hand-mouse button down and move the cross hairs across the canvas). A rectangle will appear on the canvas to draw the extent of the map area. This will then reflect the contents of your main GIS window.

You can add more than one map frame, if you wish.

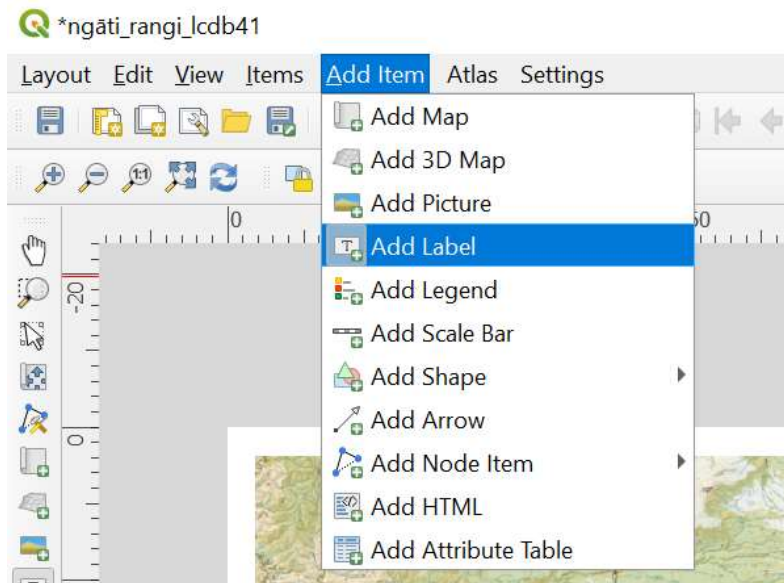


You can change the size of the map frame you have selected by dragging the small white boxes that appear on the map frame when it is selected. You can also use the menu options Edit -> Select/Move or Move Content to pan the map in the window or centre it in the composer.

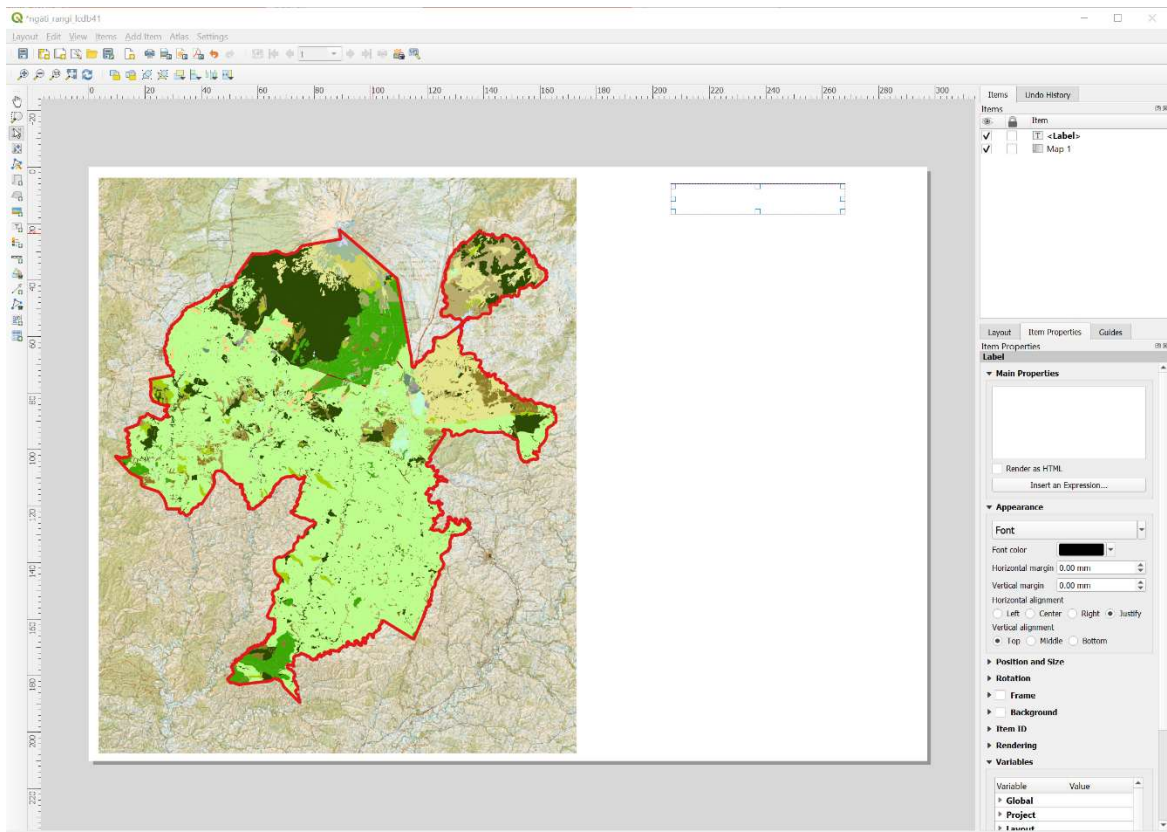


There is always Edit -> Undo if you get it wrong!

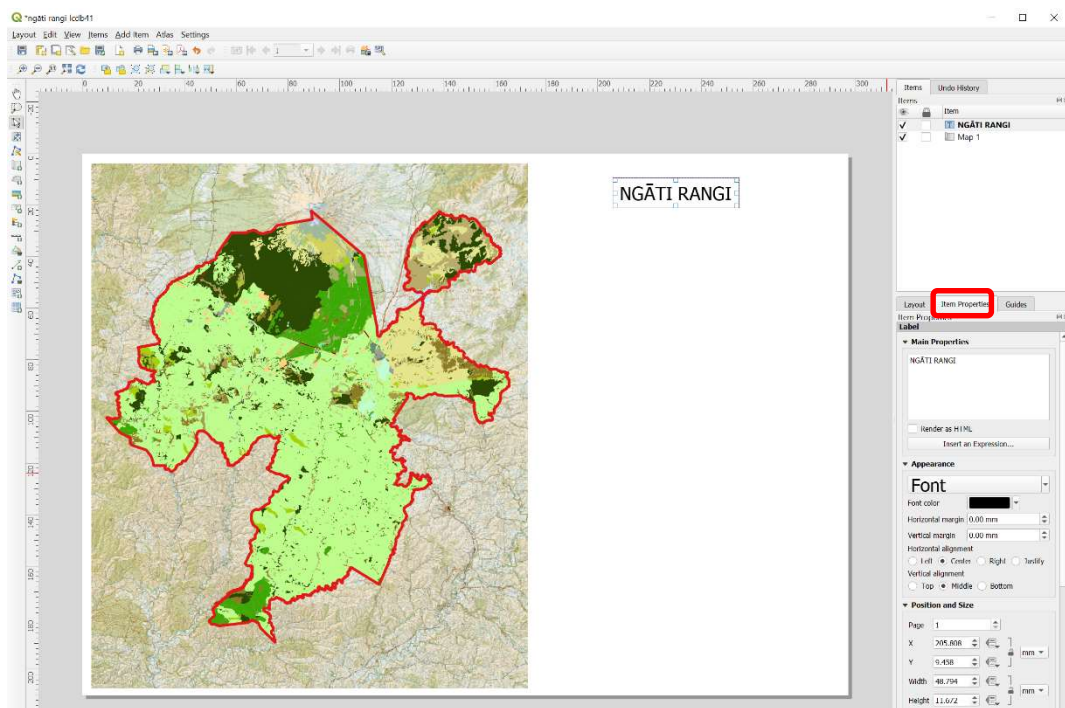
Labels can be added using the menu, select from the menu Add Item -> Add Label.



Click in the canvas and drag to create a box for your label.



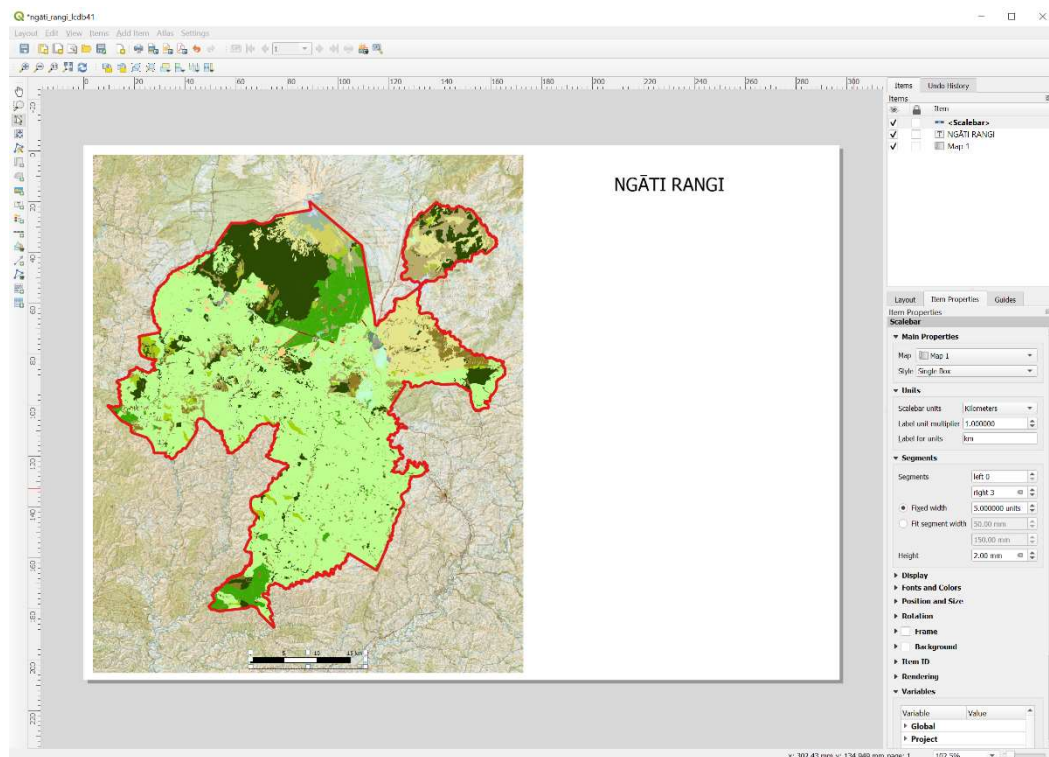
After creating the label box select the Item properties tab.




You can then adjust labels Text (in this case, the new title which is written in capitals is NGĀTI RANGI), Font, Colour, Position, etc., from the label menu. The item (label, map frame, etc.) needs to be selected to view its properties.

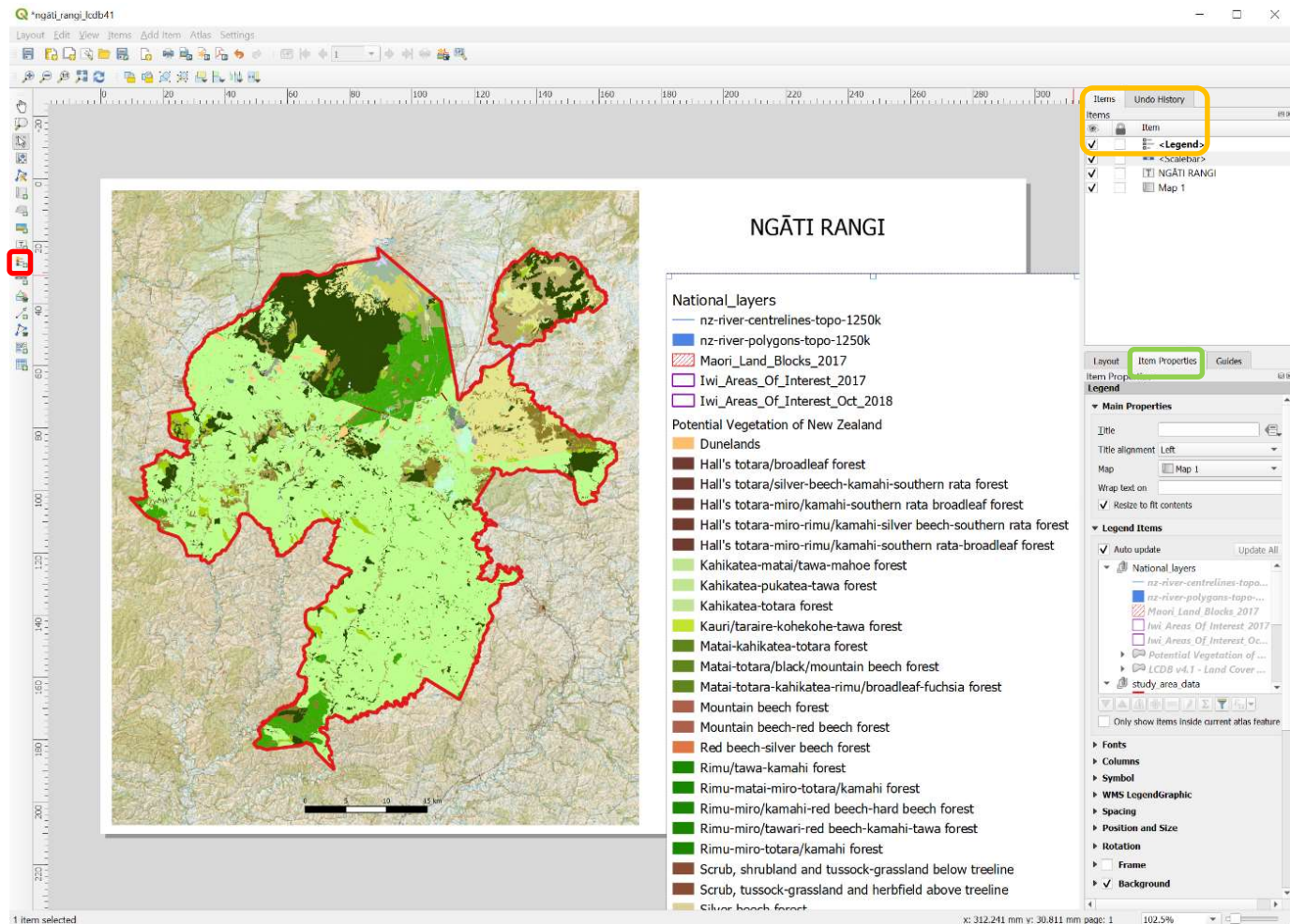
To add a Scale Bar, select from the menu Add Item -> Add Scale Bar, click in canvas and drag box to position it.

This can also be adjusted from its Item properties tab.



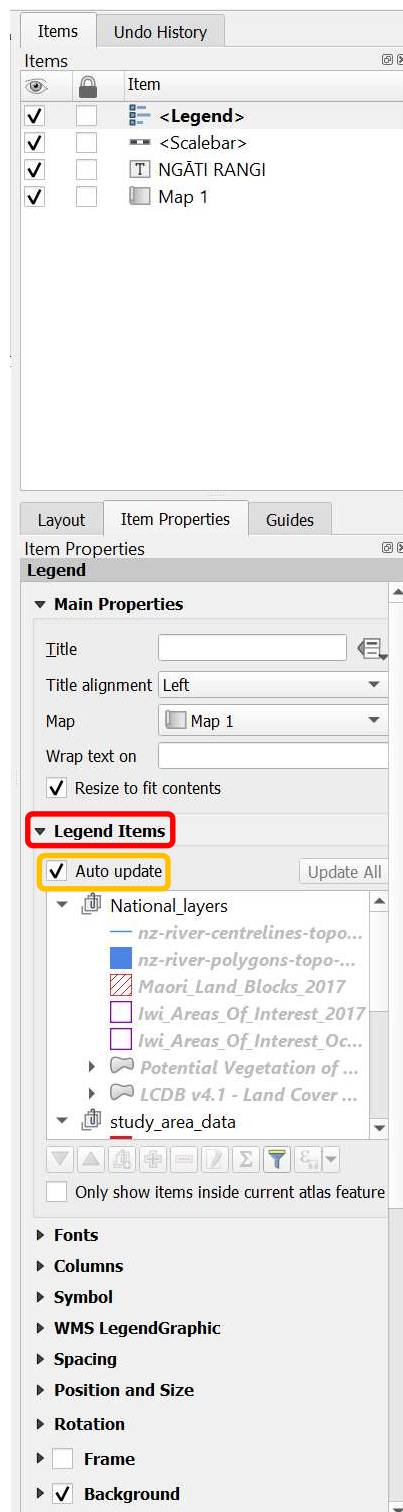
A map legend can be added by selecting from the menu Add Item -> Add Legend, click in the map canvas and then drag the box to position it.

All these elements can also be added by clicking on the icons that are shown on the left-hand side of the map composer, e.g. Add new legend .



Adjustments can also be made from the Item properties tab (select the legend from Items box and then click on item properties).

If you wish to remove any of the legend items (all layers will appear by default in your legend at first) then go to the Legend Items section.



Untick the Auto update box to make the Legend tools live.

Select layers you wish to remove, then click the remove button:

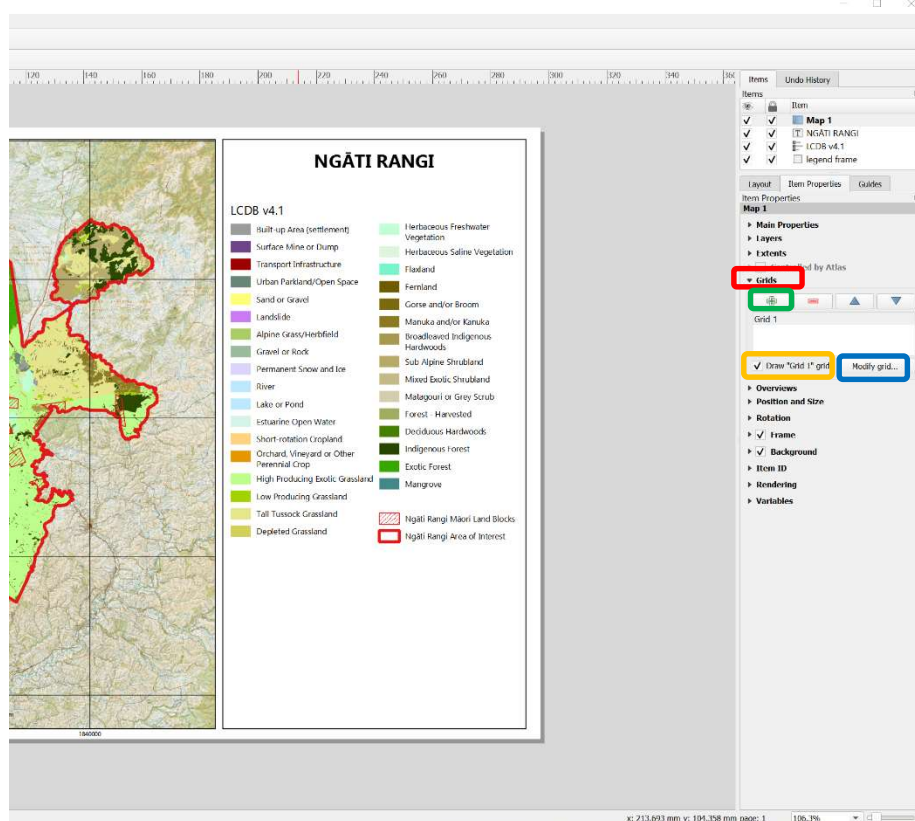


You can also alter the position of an item, add items, edit the name of the item as it appears in legend, etc., from the above toolbar.

You can turn any of these elements (Legend, Title, etc.) on and off by using the tick boxes beside each element in the main Item window.

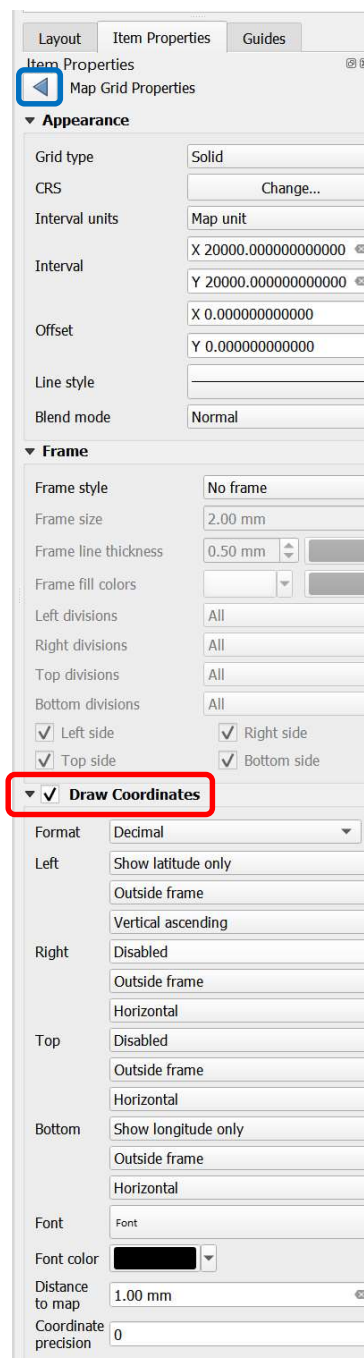
Each item can be selected by clicking on it or selecting it in the Item window. When it is selected, small white boxes will appear around the selected item.

A grid can be added to your map. Select the map, then in Item properties expand the Grids section by clicking the arrow beside it. The grid can be turned on and off by clicking in the Draw Grid * grid tick box.



Use the green plus sign to add a grid, highlight the grid, then click Modify grid button if you wish to change any of the details.

The grid coordinates are drawn by first ticking the Draw coordinates tick box.



You can then decide whether you want both sides and/or both the top and bottom of your grid coordinates labelled and whether you want labels inside or outside your frame. There are also options to choose the colour of your labels, lines, etc.

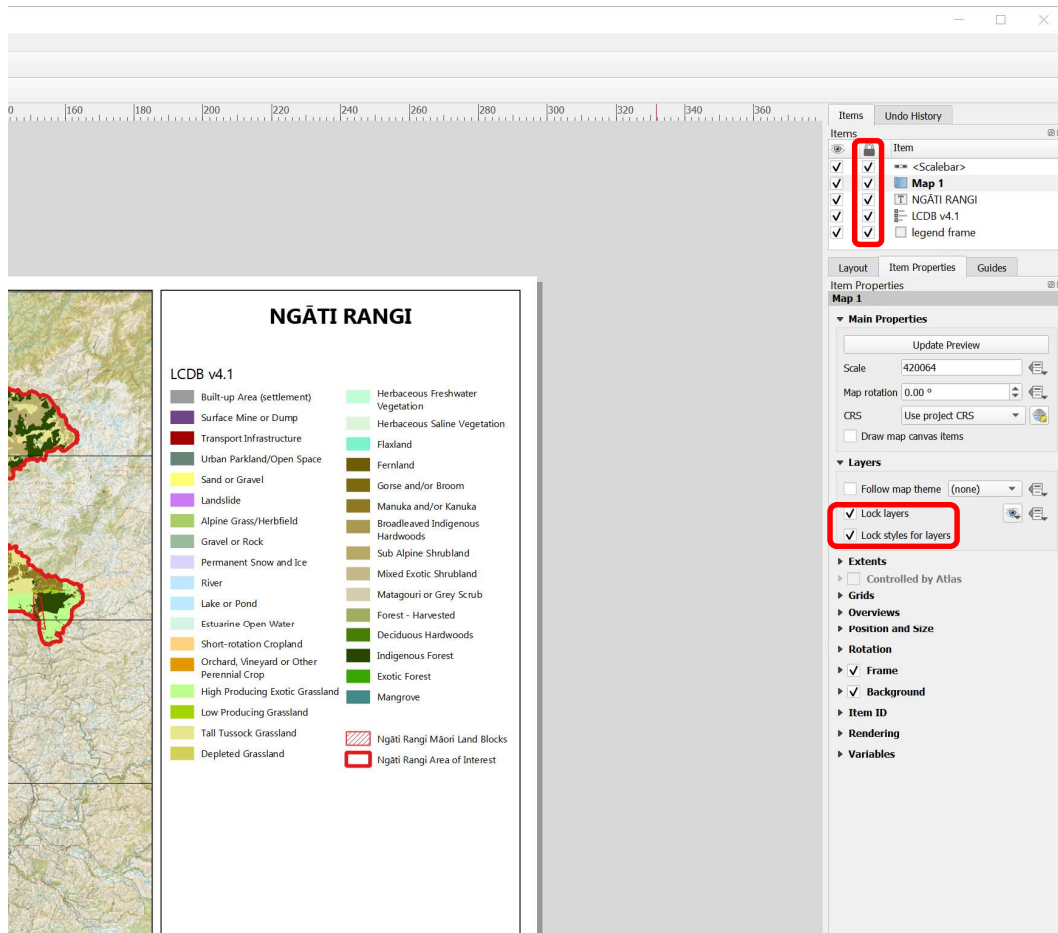
In this example, only the left side and bottom have been labelled outside the frame. The right side and top have been disabled.

To exit from the menu, click on the blue arrow .



Note: remember to save your map composition at regular intervals.

If you wish to keep the layers as you see them in the map composition, you need to lock the layers and their styles, otherwise if you make any changes in your main window these changes will automatically be made to your composition. If you wish to make a change, you can unlock the layers at any time.



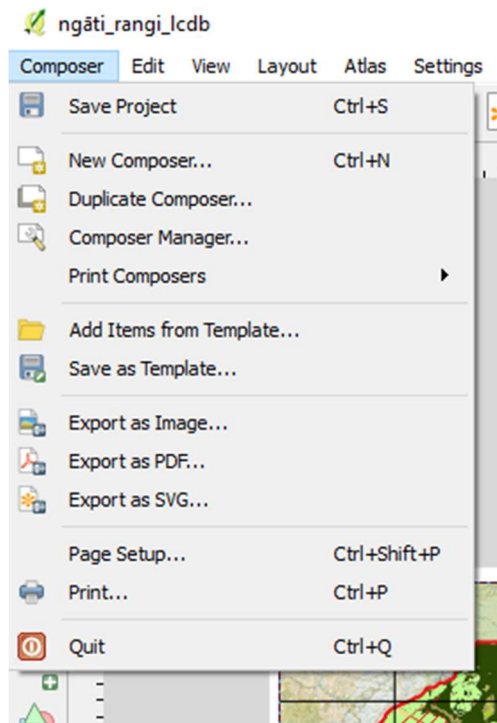
All the maps you have composed can be viewed and managed by clicking on the Layout Manager

button , or from Layout -> Layout Manager.

Select a particular composition by clicking on it. There are options to Show, Duplicate, Remove or Rename it, the layer for viewing and editing to reveal different information.

3.2.1 Exporting and Printing

You can export your map as a PDF or as several other formats from the Map Composer window, or you can choose to print directly from this window to your printer. Printing from a PDF is probably the faster option.



4 FILE GEODATABASES

File geodatabases are a collection of geographic datasets of various types held in a common file folder. They were developed by ESRI as a replacement for shapefiles and are becoming popular. They support multiple layers in one directory, have no size limitations, have a rich set of data types, provide fast performance, and include useful metadata (data that provide information about other data). We have not used geodatabases (gdb) in this manual but as many agencies are now supplying data in this form, it is useful to know they exist and how to access the data in them using QGIS.

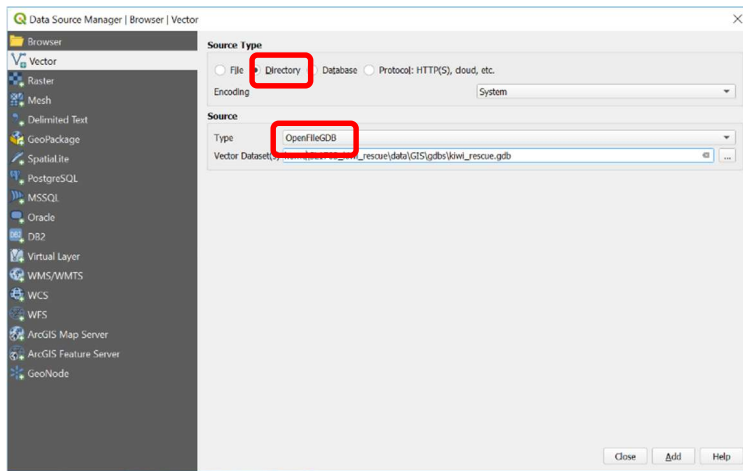
4.1.1 Adding data from a geodatabase

To open a File Geodatabase in QGIS click on the Open Data Source Manager Icon

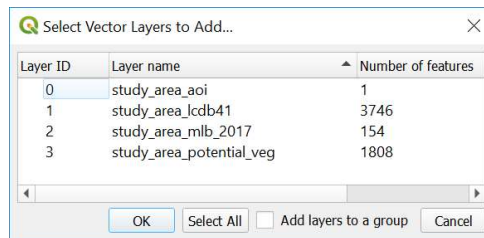


In the window that opens, select Vector, check Directory as the Source type, select OpenFileGDB as the Source and navigate to your gdb.

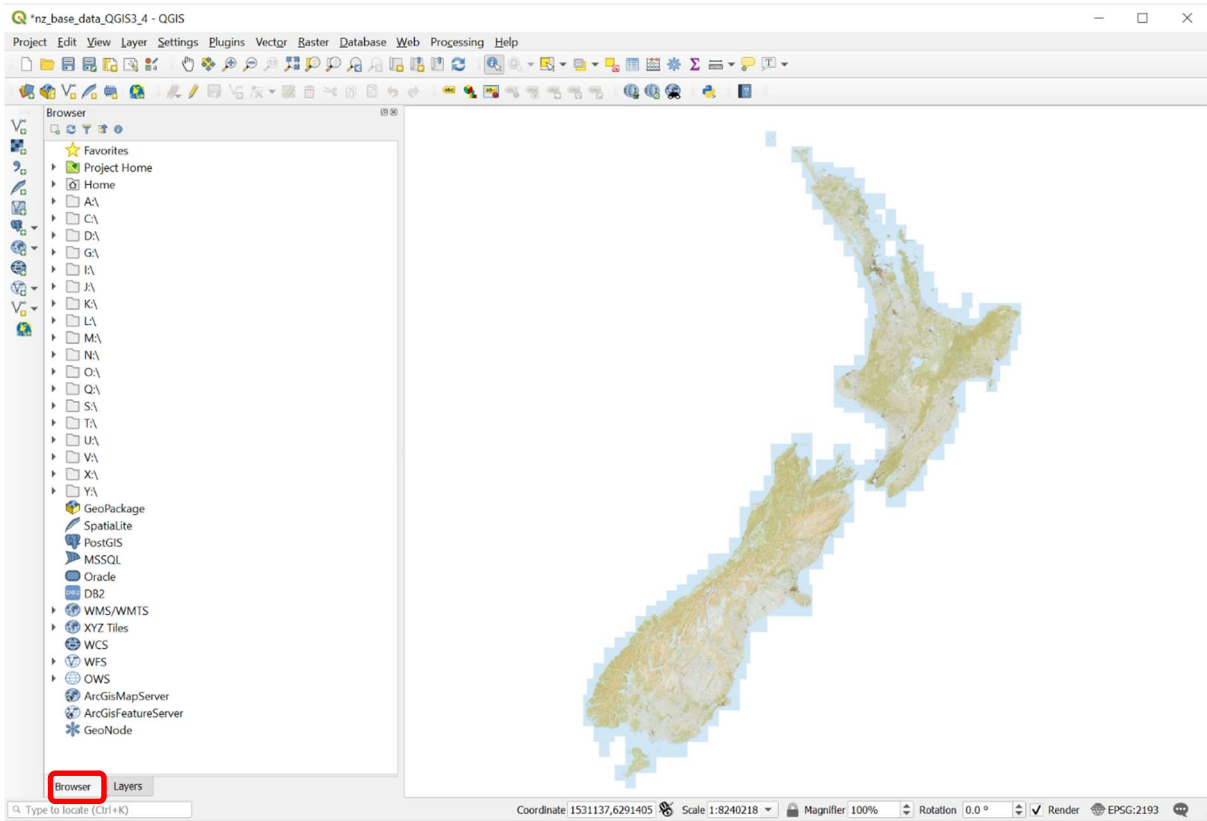




Once you have selected the geodatabase, click Add and you will be able to select and add your layer or layers to your QGIS project.



You can also navigate to your gdb layers in your Browser, select them, then drag and drop them into the map canvas.



5 ACKNOWLEDGEMENTS

We would like to acknowledge and give our sincere appreciation to our reviewers of this manual who ensured its industry relevance and usability: Elise Arnst from Manaaki Whenua and Dean Walker from University of Canterbury, your feedback was essential. Our deepest gratitude to you both for your time and contributions to this edition.

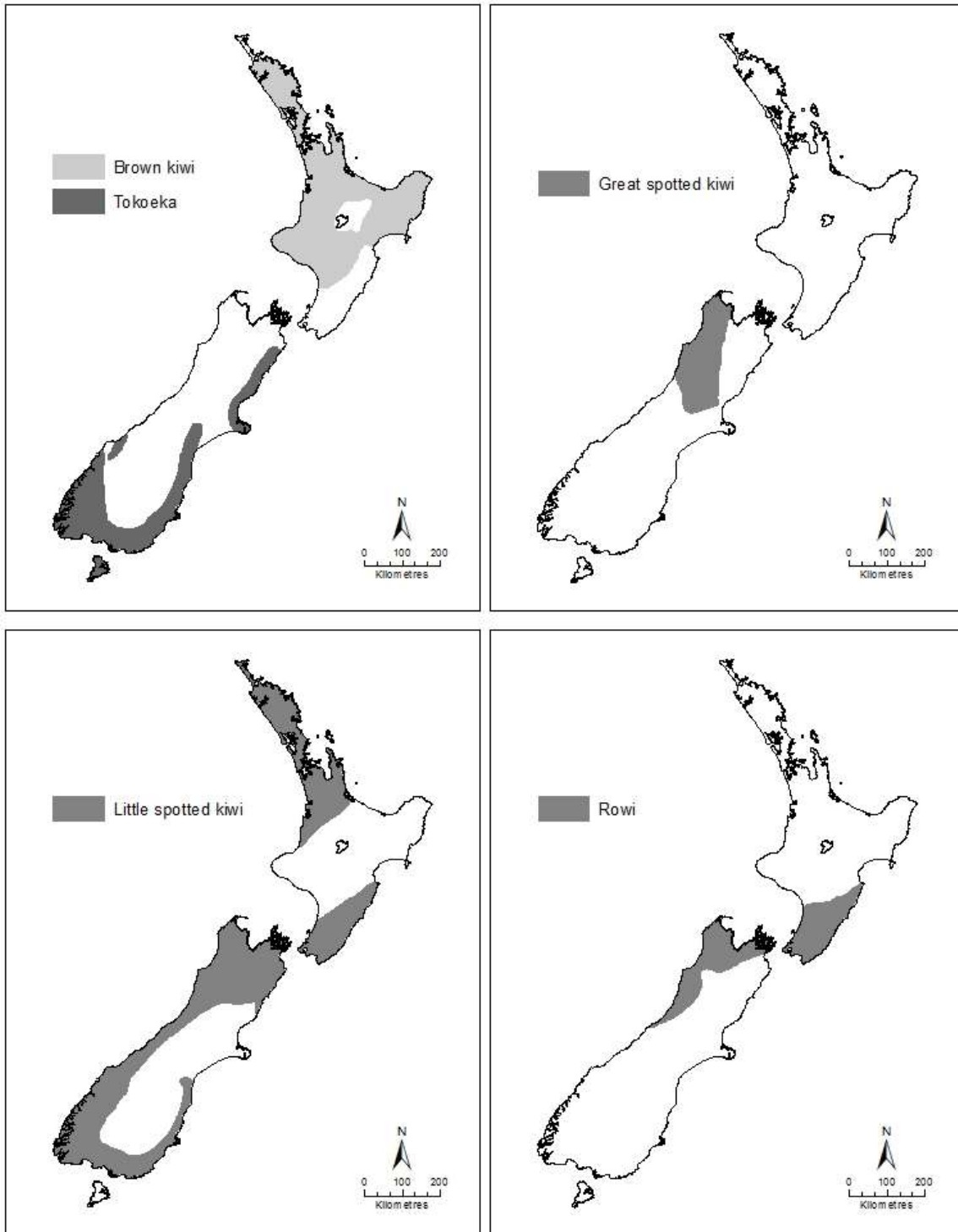
And to our editorial team, Anne Austin and Cissy Pan, our gratitude for formatting, proofing, and refining our final version.



6 APPENDICES

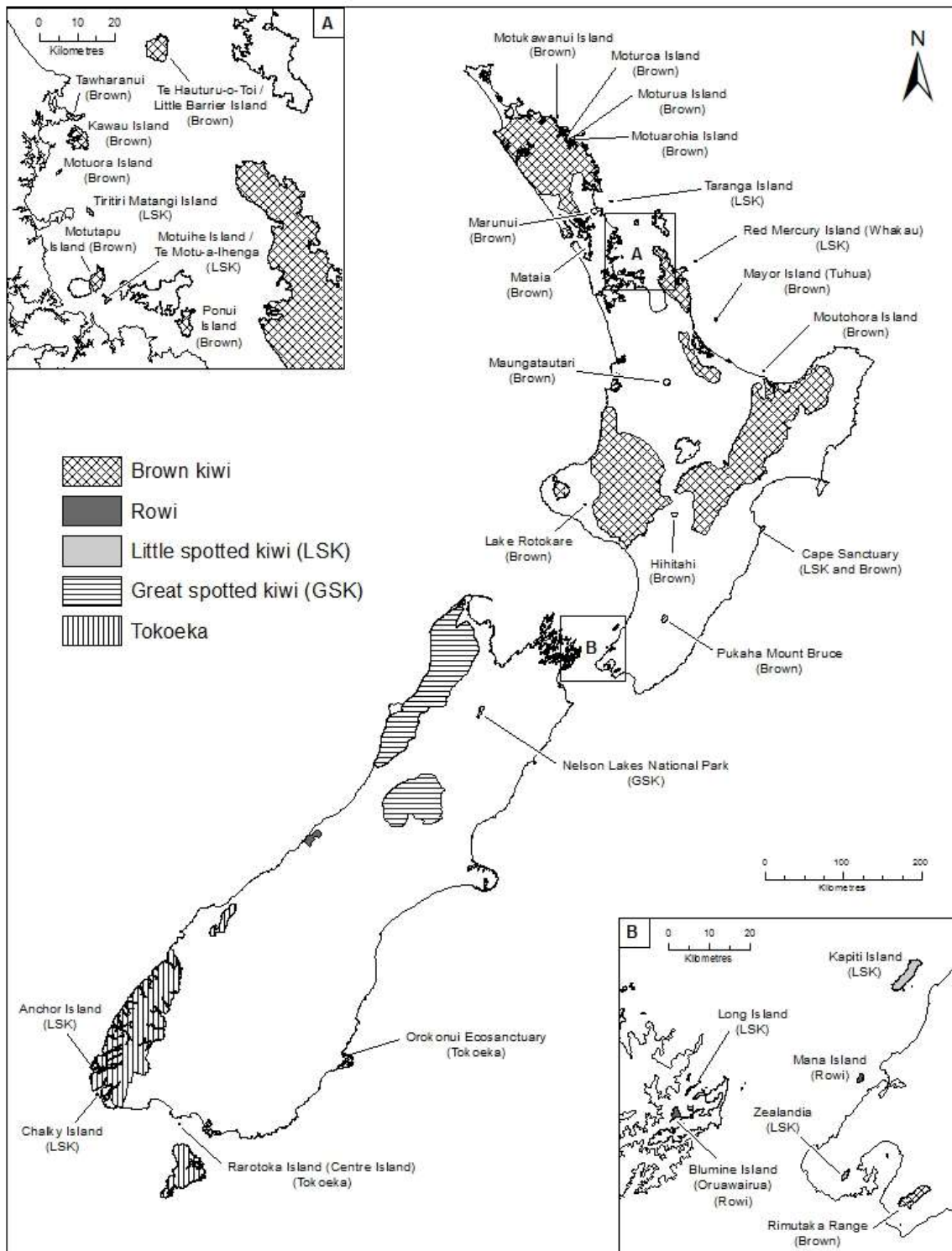


6.1 Appendix 1

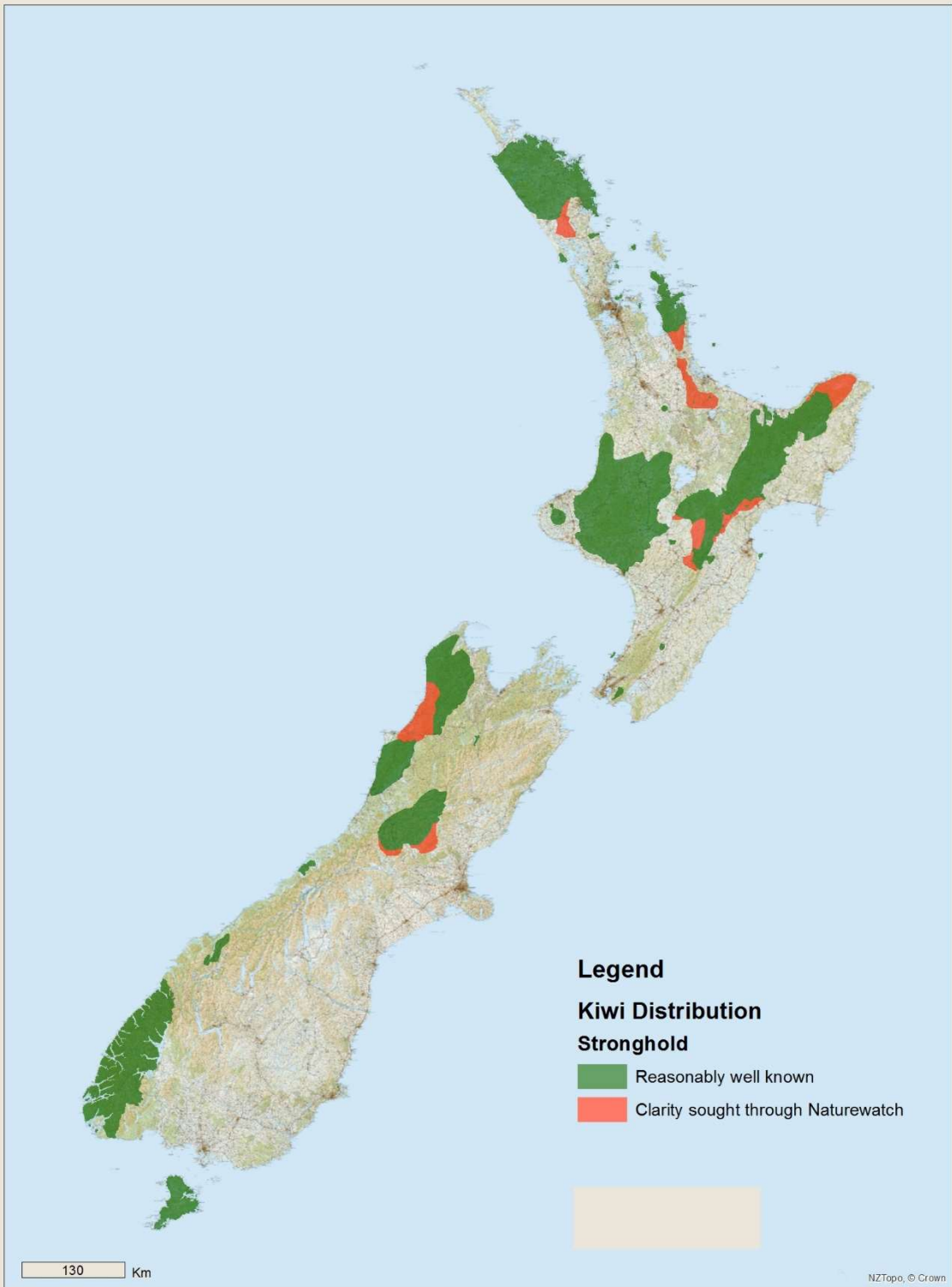


Pre-European Kiwi distribution map - DoC





Kiwi distributions 2015 - DoC



Kiwi Distribution

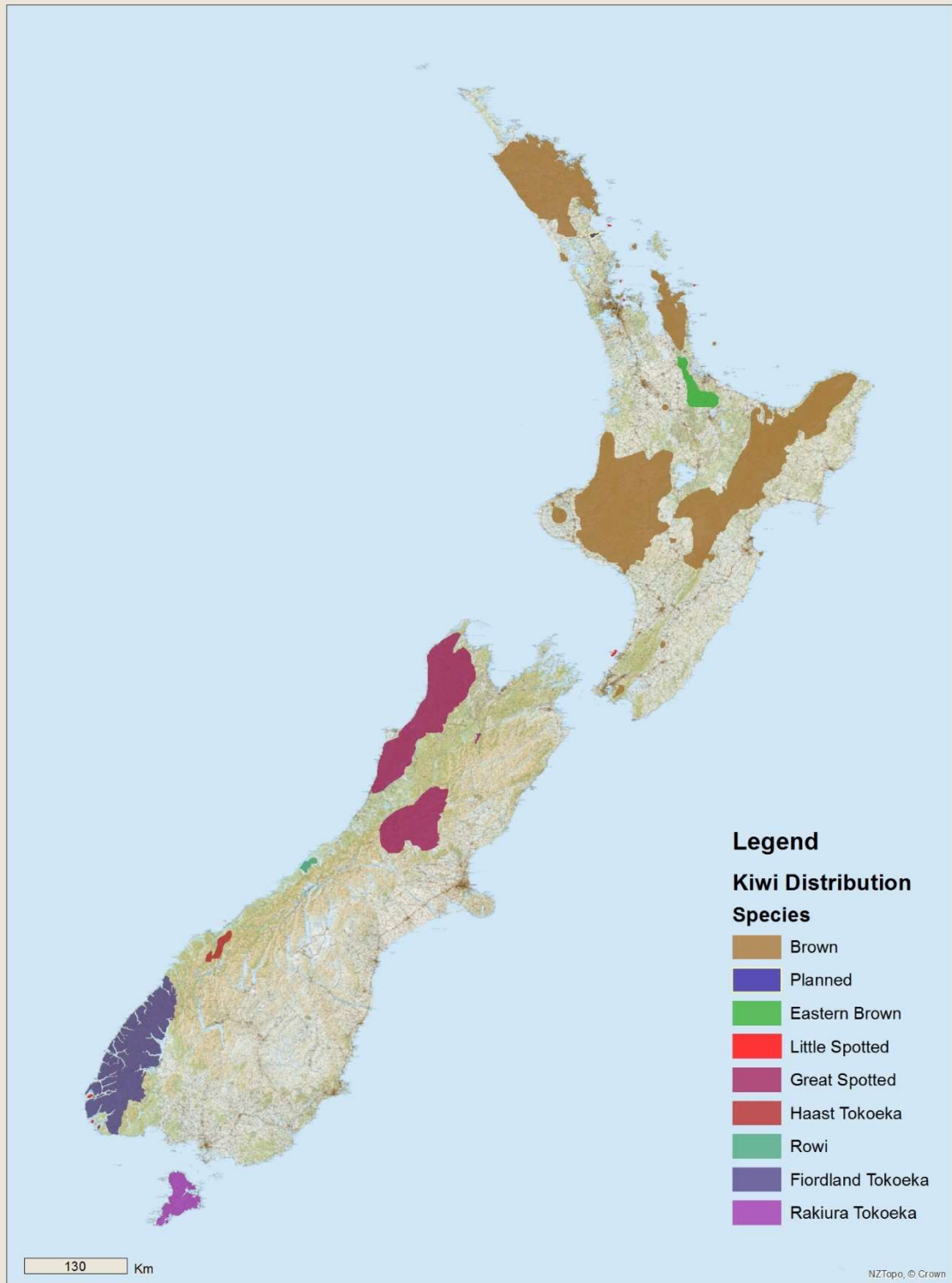


Department of Conservation
Te Papa Atawhai

newzealand.govt.nz

File path: G:\GIS_TM\Projects\KiwDistribution_Template.mxd





Kiwi Taxa Distribution

File path: G:\GIS_TM\Projects\KiwDistribution_Template.mxd



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newzealand.govt.nz