Chapter 2: Editing the NFI Sample Squares in Forester

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2.0 Editing the NFI Sample Square in Forester

2.1 Toughbook Login

The Toughbook has been configured to a Forestry Commission standard. The first screen to appear at start-up is "Log On to Windows". Enter the username and password issued by the FC. Wait while Windows XP loads.

2.2 Opening ArcMap

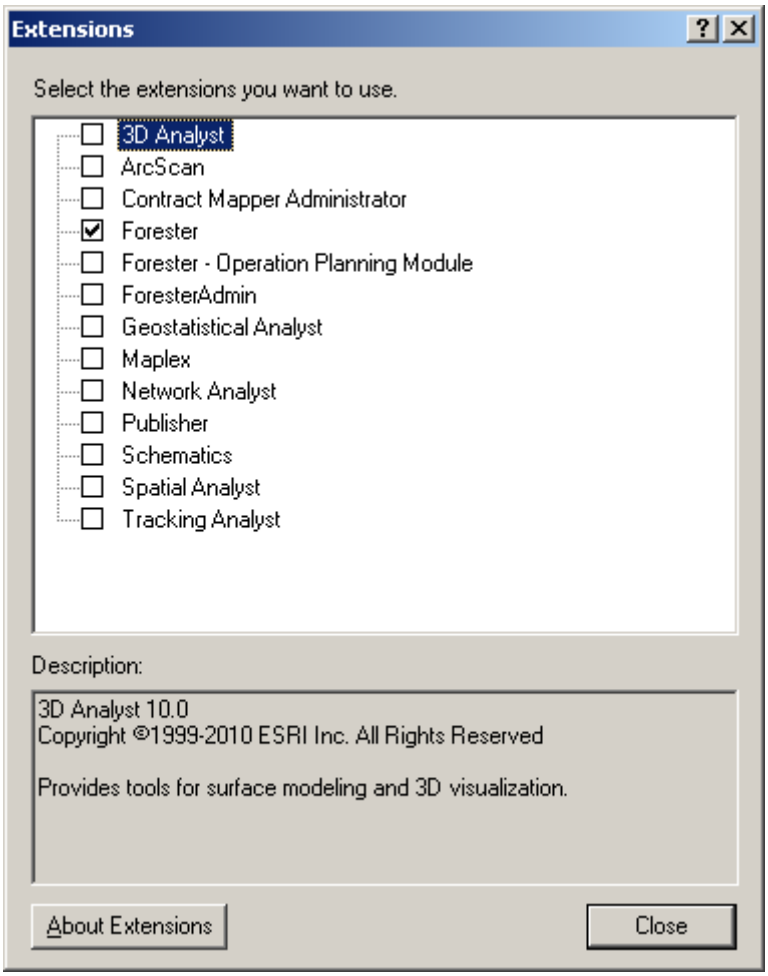
On the Toughbook desktop, double-click on the GIS Editor icon and wait for ArcMap to open (this may take a couple of minutes).

2.2.1 Adding toolbars and individual tools

(This is only required the first time a user logs on).

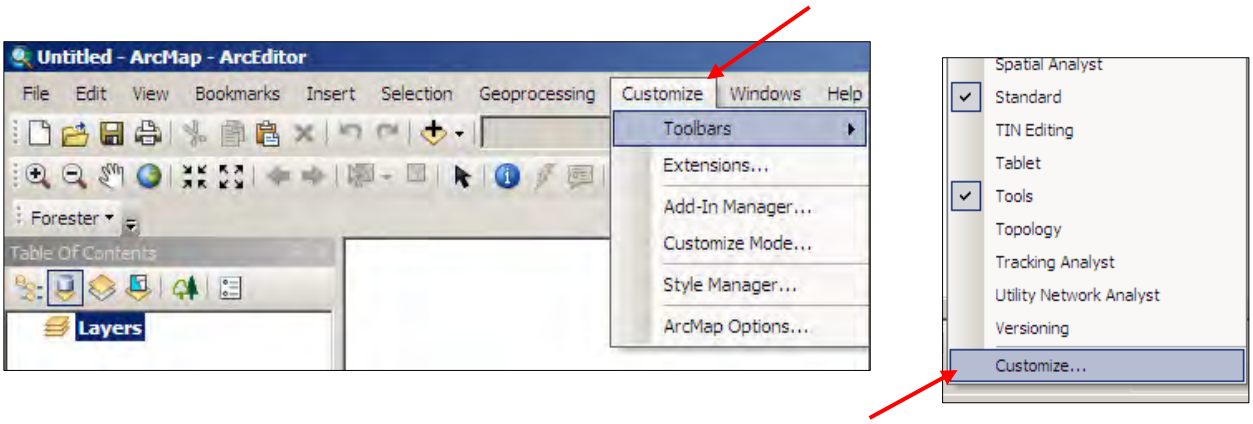
2.2.1.1 Switch on Forester Extension

1. Click on "Customize" and select "Extensions" and check "Forester":

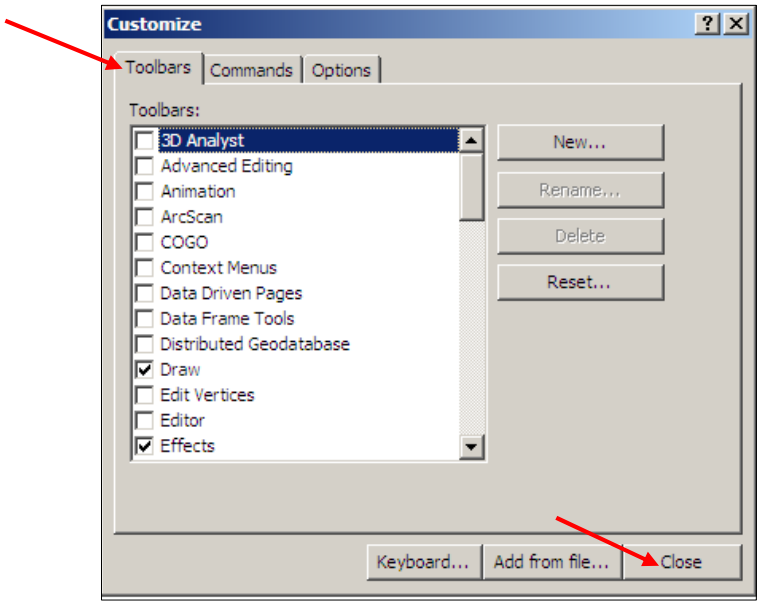


2.2.1.2 Adding toolbars

1. Click on "Customize" and select "Toolbars". Scroll down to the bottom of the toolbar list and click on "Customize".



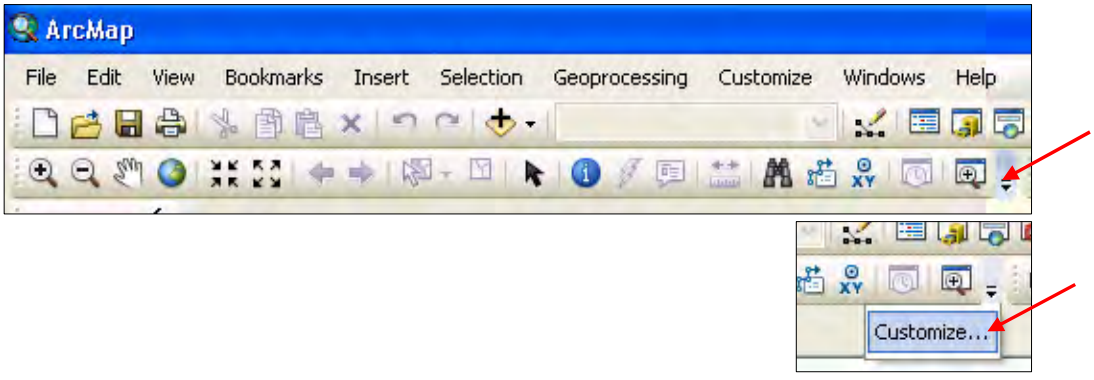
2. Select the "Toolbars" tab and scroll through the list. Forester, Main Menu, Standard and Tools should already be ticked. Place a tick against the "Draw" and "Effects" toolbars, and any others that may be of use. Click on the Close button.



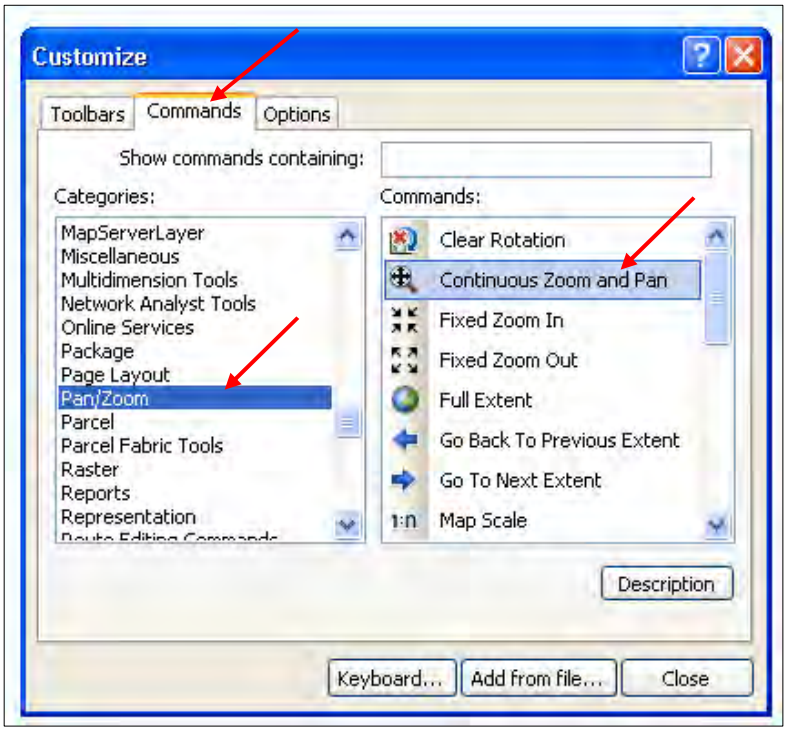
2.2.1.2 Adding individual tools

"**Continuous zoom and pan**" is a useful tool that may be added.

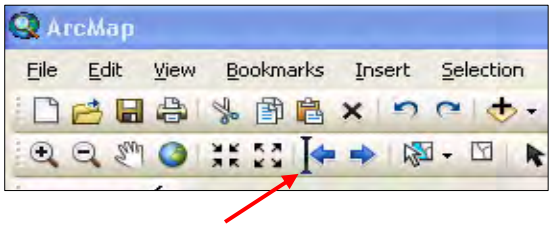
3. Call up the Customize box as outlined for "Adding toolbars" previously, or click on the drop-down button at the right side of any of the toolbars, and click on "Customize".

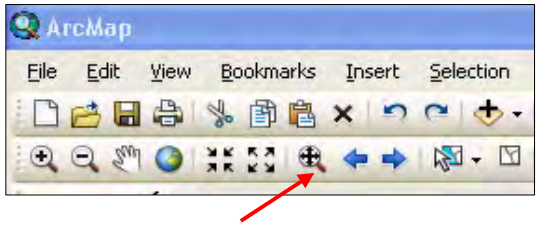


4. Select the Commands tab. Scroll down through the Categories list on the left, click on "Pan/Zoom" and then click on "Continuous Zoom and Pan" in the Commands list on the right, so that it is highlighted in blue.



5. Click-and-drag the "Continuous Zoom and Pan" tool up out of the Customize box, and drop it **into** one of the **existing** ArcMap toolbars- a black pin will be displayed until the tool is dropped. The tool will **not** be added if it is dropped outside of an existing toolbar i.e. in the grey surrounding area.

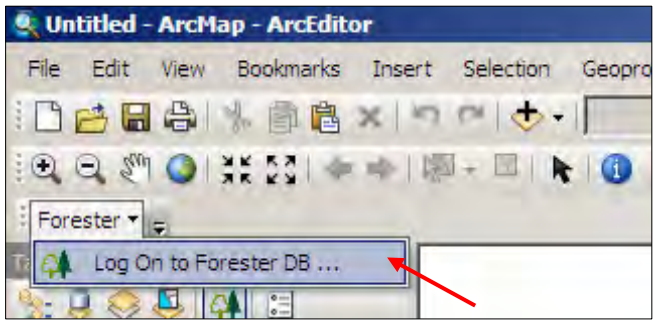




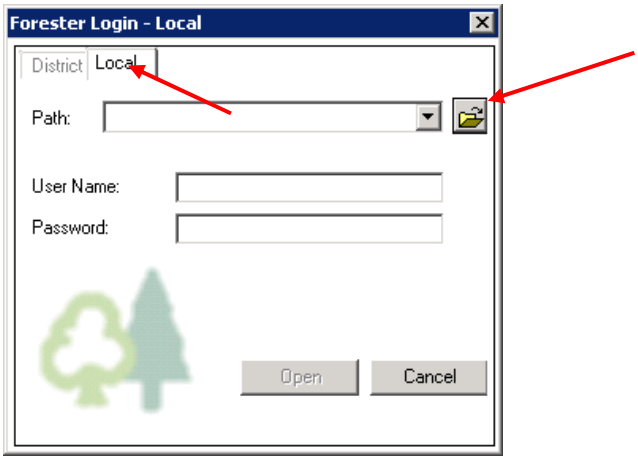
6. With the tool successfully added, close the Customize box.

2.3 Logging On to Forester and Loading in the Square Geodatabase

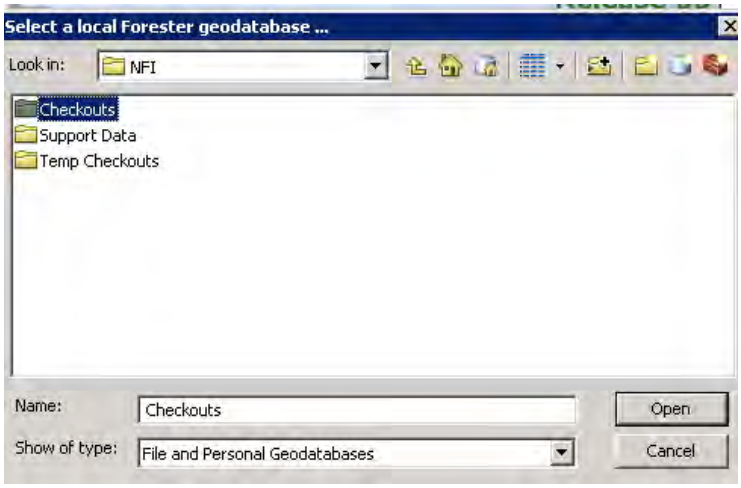
7. Click on the Forester button and then select "Log On to Forester DB…."



8. In the Forester Login box, click on the Local tab.



Click on the yellow folder icon to browse to a square geodatabase.



Square geodatabase names are composed of a prefix, the square grid reference and the square id (SQUID), e.g.:

NEW SP140330_12456.mdb

RE SP300330_78910.mdb

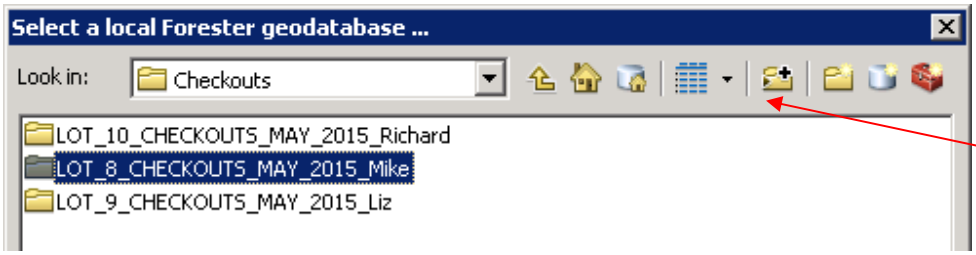
The prefix for new surveys is 'NEW' (new or 1st assessment squares) and for re-measure squares is 'RE'.

This prefix will help you to quickly discern whether you have a new or re measure square to undertake, which will help with your logistics and any prioritisation between new or re measure squares.

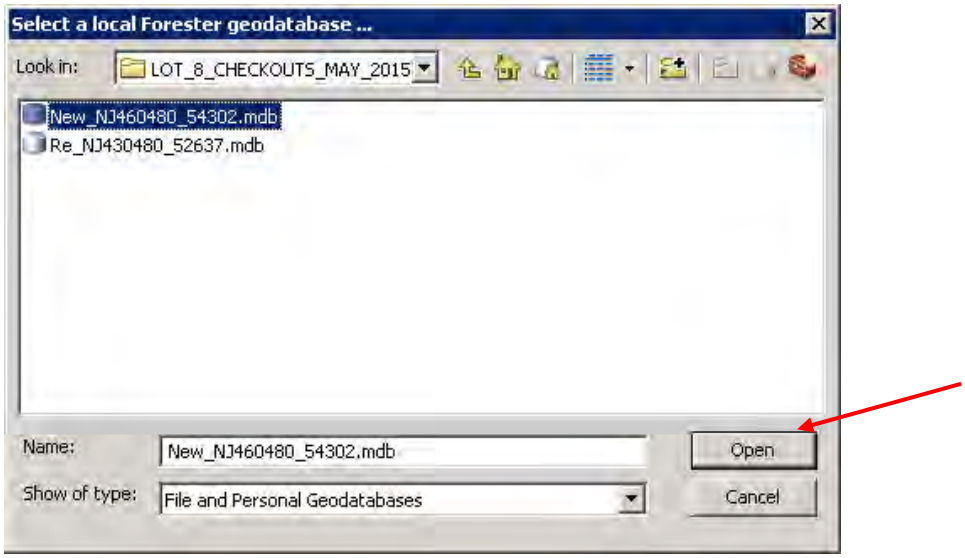
The grid reference will give you a quick idea of the square's location.

To gain a more detailed overview of the location, nature and status of all the squares you have, you can access the 'Generate Multi Square Map' tool (by choosing in the Forester menu; Forester, Modules, NFI) and a map highlighting your squares and their current survey status will be generated. Details of how to use this utility can be found in the Additional Documents folder on your toughbook: file name - 2nd_Cycle_software_tools V2.doc.

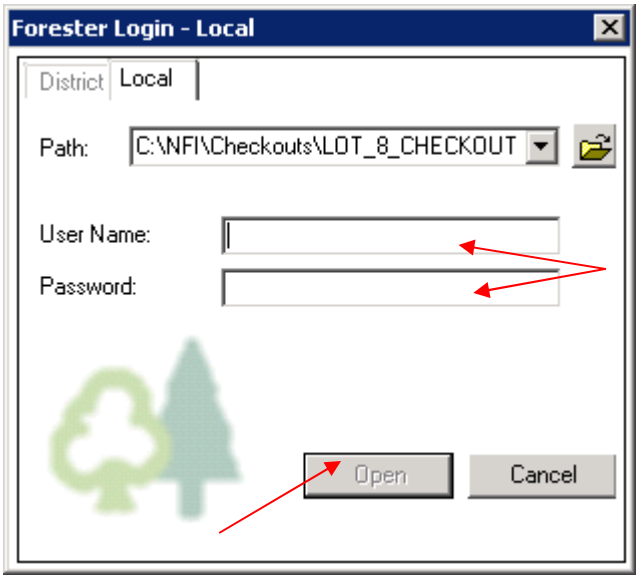
9. Click on the "Connect To Folder" button at the top right of the box and navigate to C:\NFI\Checkouts (or simply select this pathway from the "Look in" field drop-down menu if already listed). **All squares for survey must be stored in Checkouts**.



10. Select the square geodatabase to be loaded into Forester, and then click on the Open button.



11. In the Forester Login box, enter username and password. Then click on the Open button and wait for the "Starting Forester" progress bar to complete.

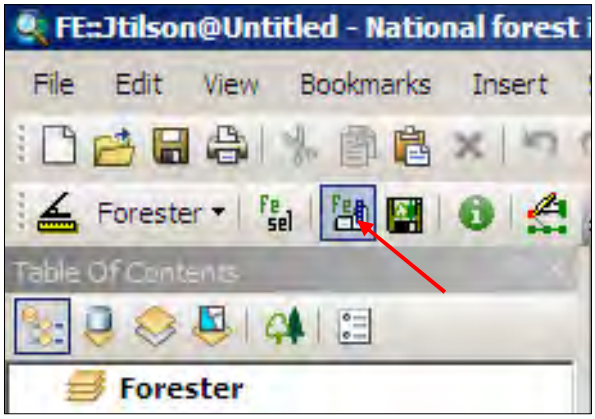


Note: Login details will only work for the Bid Area(s) allocated to a survey team. Contract managers must contact the NFI Head of Surveys for new login details when temporarily required to work in another survey team's Bid Area.

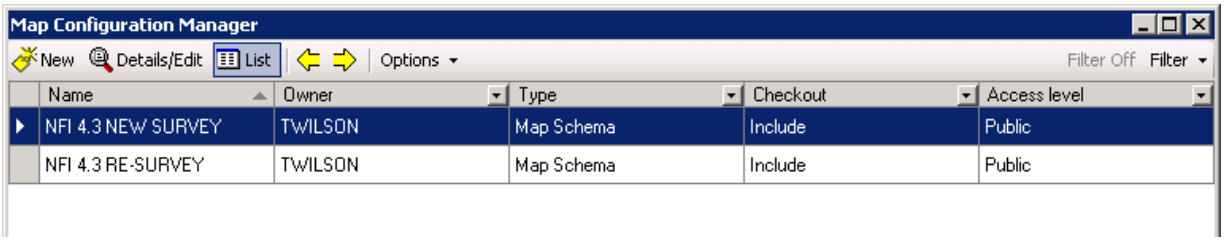
2.4 Opening the Map Schema to Load in Background Data

2.4.1 Opening the default NFI map schema

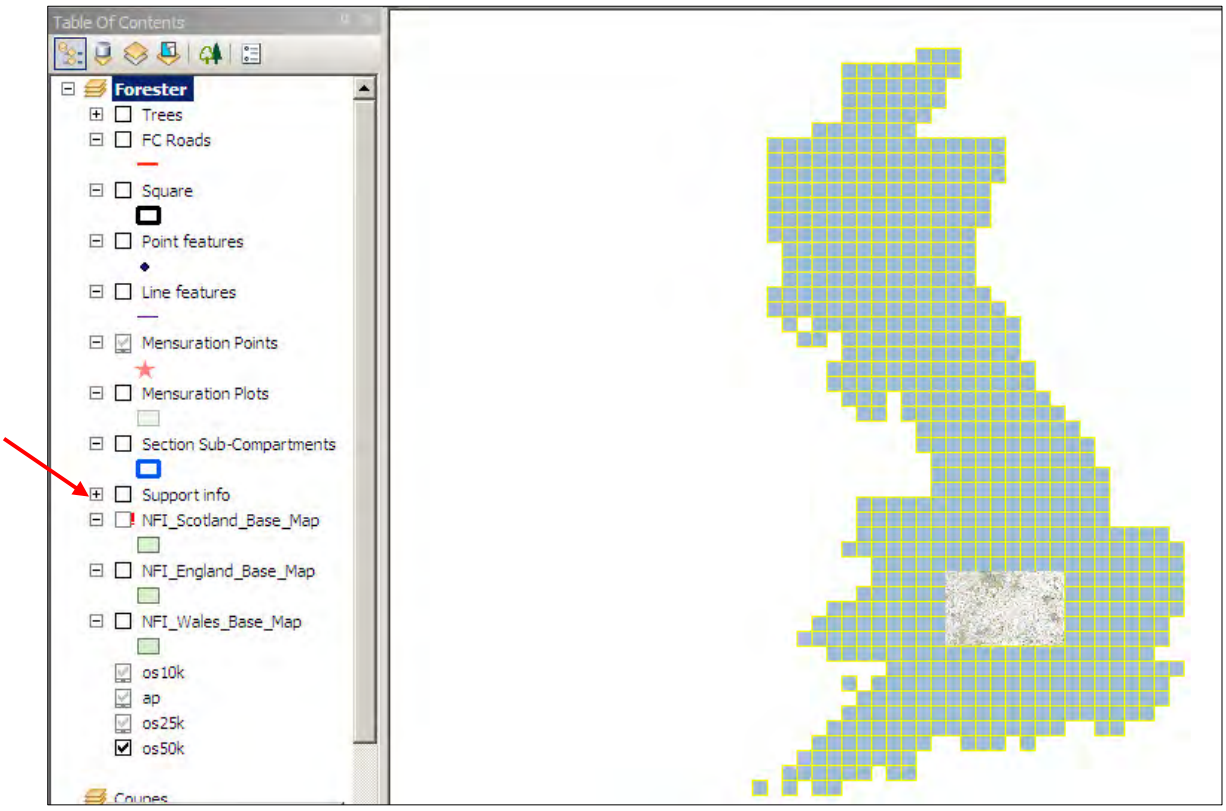
12. Click on the "Map Configuration Manager" button.



13. In the Map Configuration Manager box, double-click on the NFI map schema **name** to open it. Then minimise (if personalising the Schema) or close (to edit the square) the Map Configuration Manager window .

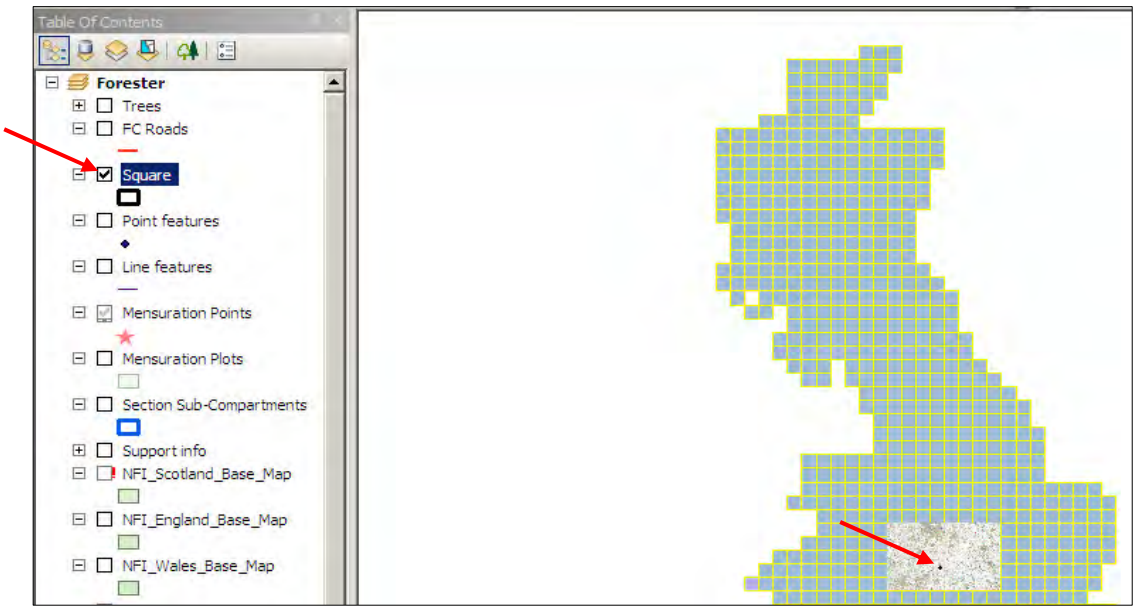


14. The background data automatically loads in. This includes the Ordnance Survey map and aerial photo image catalogues for the Lot Number, the NFI Woodland Maps for Scotland/England/Wales, and the grouped "Support info" layers (SSSI, Scheduled Ancient Monuments, Ancient Woodland, Beech Zone, Pine Zone, Coal Authority hazards etc.). Click on the + sign to the left of the "Support info" layer to expand down through the group.



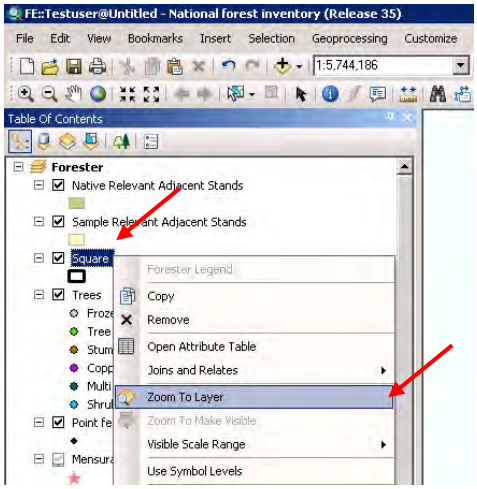
2.4.1.1 Zooming in to the square

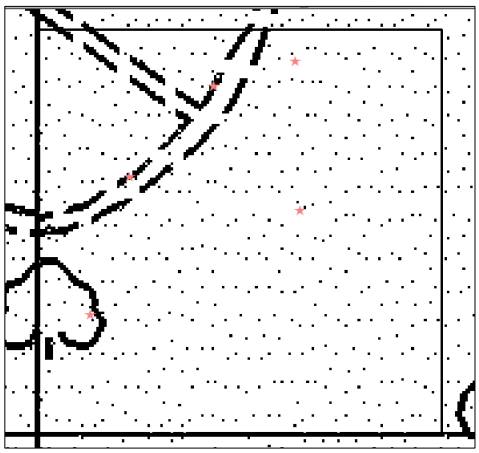
15. Tick the Square Layer on in the Table of Contents so that the square location is displayed on the map.



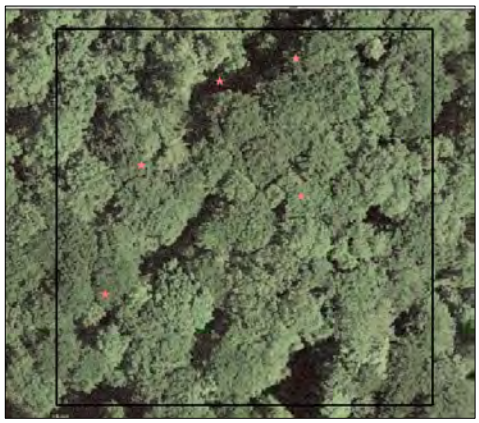
16. Gradually zoom in closer to the square using the "Zoom In" button or by adjusting the map scale (select a scale from the drop-down list or type one in the box and press the Enter key).

17. To zoom directly to the square, right-click on the Square layer in the Table of Contents and then select, "Zoom To Layer". The square is displayed with the OS10k map layer as a backdrop.





18. Tick off the "os10k" layer in the Table of Contents so that the aerial photo comes into view.



There are two default map schemas to help you with the different aspects of New Squares and Re Measure squares, each tailored to the different data they have to display.
The main difference being that the Re Measure squares schema displays the trees measured in the previous survey, in two ways;

- 1 by broad diameter class and 'size rank' of tree within the plot.
- 2, displayed by tree species and tree type.

These map schemas also have the old aerial photography from the previous survey as a separate layer named "OLD AP", this will help to ascertain change between the surveys in Re-measure Squares, as per the images below.

Old AP

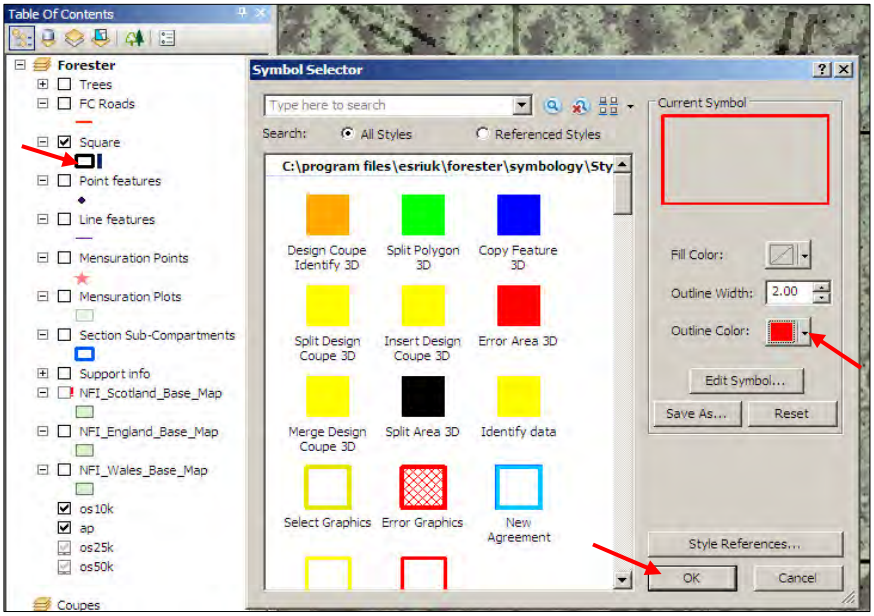
Current AP

2.4.2 Personalising the map schema

The NFI default map schema can be modified to individual preferences e.g. the surveyor can change the symbology of individual layers, make the OS10k layer transparent so that the aerial photo layer is visible beneath, change the order of the layers in the Table of Contents, and adjust the scale thresholds for the OS map and aerial photo layers coming into view.

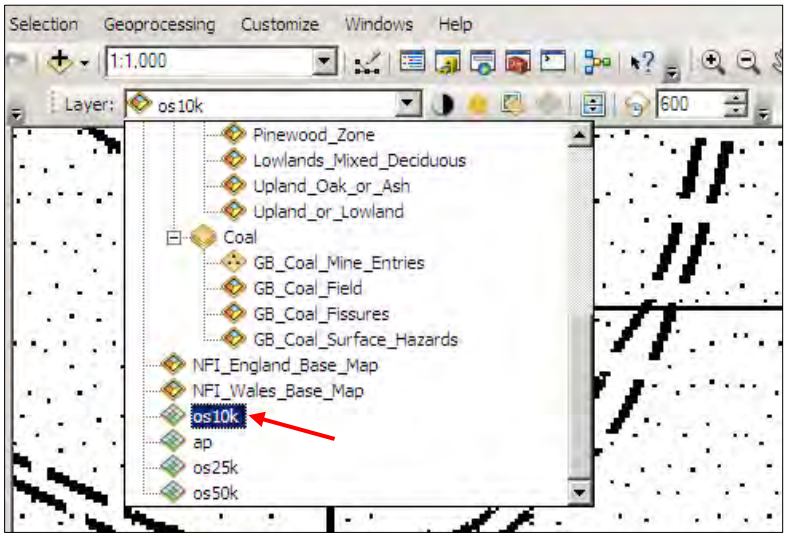
2.4.2.1 Changing the symbology of individual layers

Simply left-click on the symbol beneath the layer name in the Table of Contents, adjust the settings in the "Symbol Selector" box and click the OK button to finish. In this example, the square boundary has been changed from black to red.

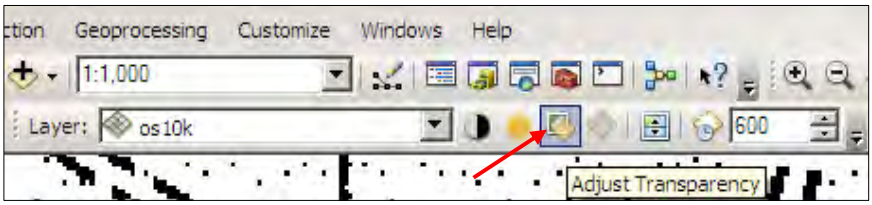


2.4.2.2 Making the OS10k layer transparent

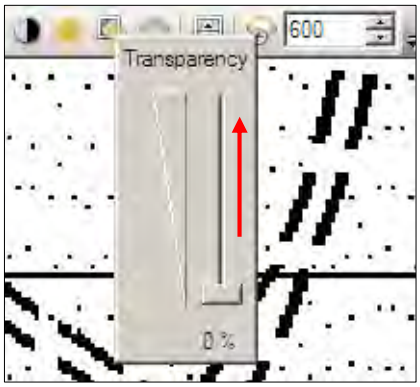
19. In the Effects toolbar, select "os10k" from the Layer drop-down menu.

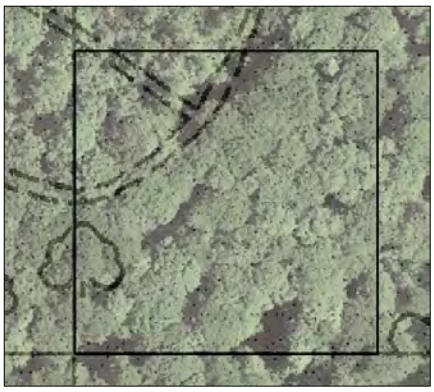


20. Click on the "Adjust Transparency" button.



21. Slide the bar to set transparency at 70-80%.





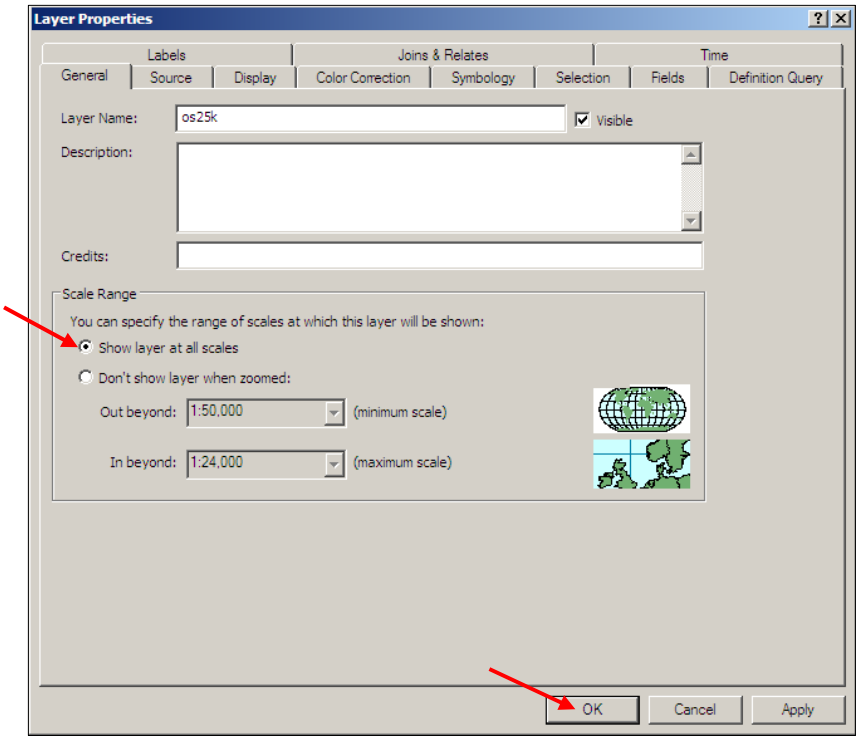
2.4.2.3 Changing the order of the layers in the Table of Contents

Click-and-drag a layer to a different position in the list.

2.4.2.4 Changing the scale thresholds for individual OS map and aerial photo layers

22. In the Table of Contents, double-click on the layer name (in this example os25k).

23. A Layer Properties box appears with the General tab selected. At the bottom left of the tab, the range of scales at which the layer to be shown can be specified i.e. the layer can be visible at all scales or the default scale thresholds can be adjusted using the drop-down lists.



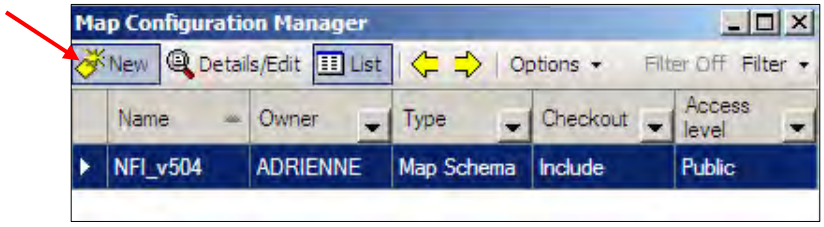
24. Click on the OK button to finish

2.4.3 Saving the personalised map schema

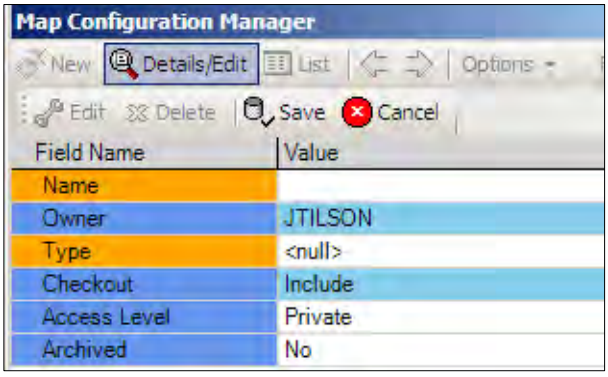
The personalised map schema can be saved so that it is available for selection every time the particular square is loaded into Forester i.e. the personalised map schema will not over-write the original NFI map schema, it will just be listed alongside it in the Map Configuration Manager box.

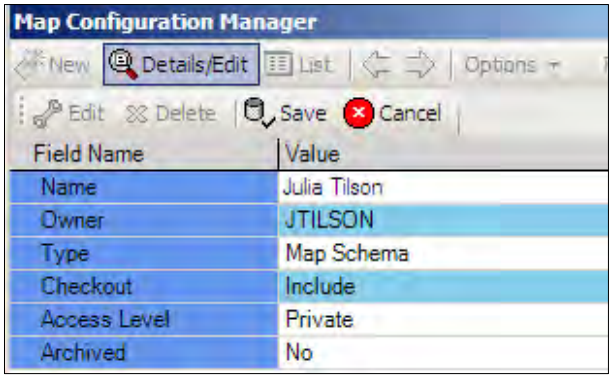
25. Restore the Map Configuration Manager box. To do this, left-click on the "Restore Up" button.

26. Click on "New" in the top left corner of the Map Configuration Manager box.

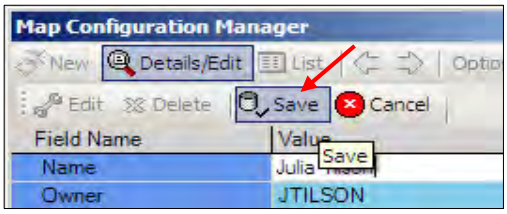


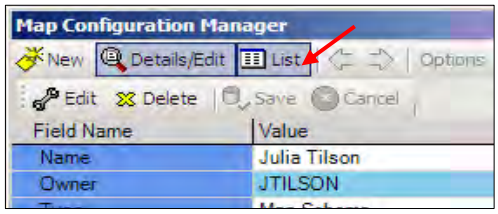
27. Complete the orange data fields: Name [surveyor name] and Type [select "**Map Schema**" from the drop-down menu].



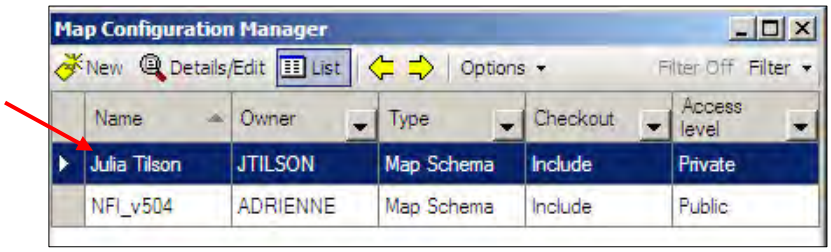


28. Click on the Save button and then on the List button.





29. The personalised map schema has been saved and added to the list. When the square is next loaded into Forester, open the Map Configuration Manager and double-click on the name of the personalised map schema to open it.



30. Close the Map Configuration Manager box.

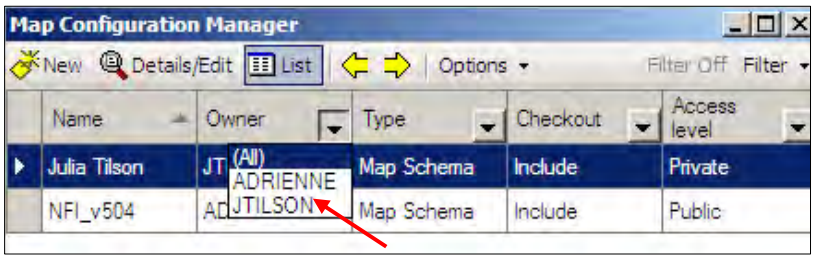
2.4.4 Importing the personalised map schema into other squares

The personalised map schema can be exported from the Map Configuration Manager box to a place on the Toughbook so that it is available to be imported into the next square to be surveyed (and the next, and the next) rather than having to modify the default NFI map schema every time a new square is loaded into Forester.

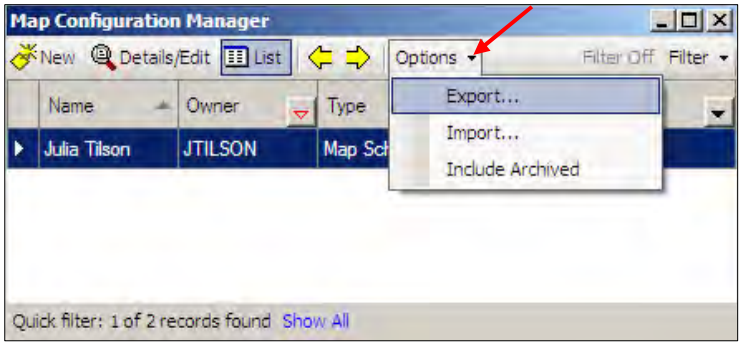
2.4.4.1 Exporting the personalised map schema

31. Load the square containing the personalised map schema into Forester and then click on the "Map Configuration Manager" button.

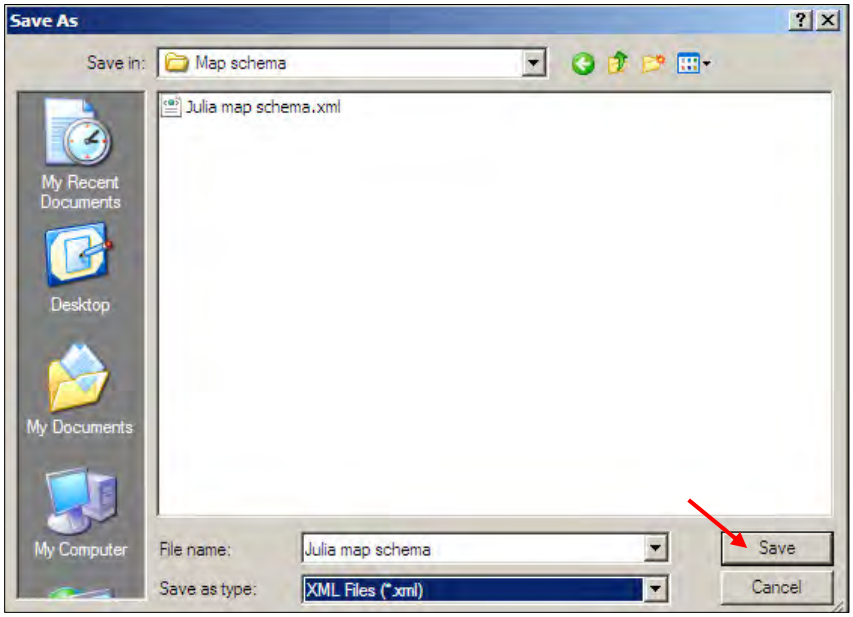
32. Apply a filter so that the personalised map schema is the only one listed in the box (i.e. the default NFI map schema becomes hidden). To do this, click on the drop-down button at the right of the "Owner" column and select the personalised map schema.



33. Click on the "Options" button in the Map Configuration Manager box and select "Export".



34. In the Save As box, in the "Save in" field, navigate to the place on the Toughbook where the map schema is to be stored. Change the "File name" field as desired. In the "Save as type" field, select "XML Files (*.xml)". Then click on the Save button.



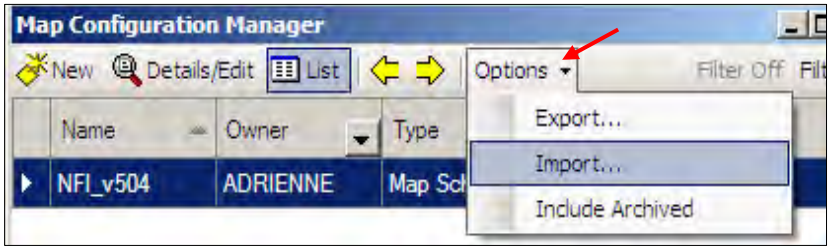
35. A message box appears confirming that 1 record has been exported. Click on the OK button.

36. Close the Map Configuration Manager box.

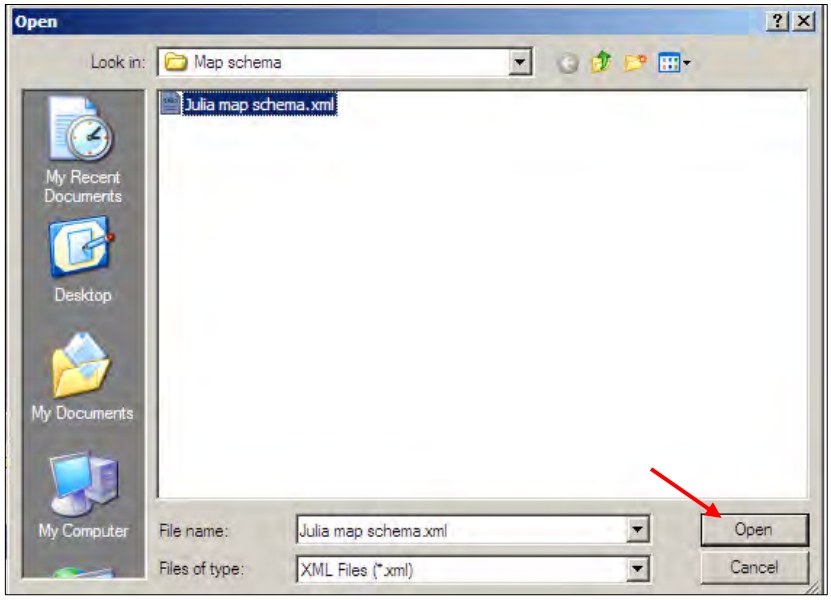
2.4.4.2 Importing the personalised map schema to a new square

37. Load a new square into Forester and then click on the "Map Configuration Manager" button. See just the default NFI map schema listed.

38. Click on the "Options" button in the Map Configuration Manager box, and select "Import".

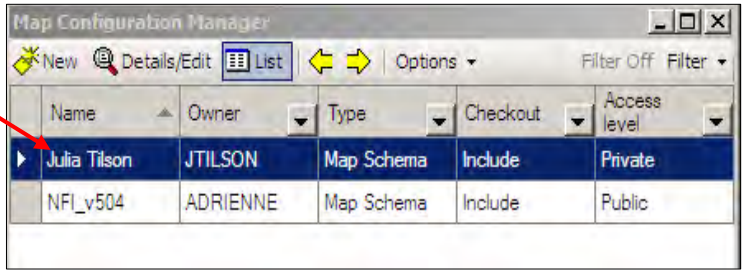


39. In the Open box, in the "Look in" field, navigate to the place on the Toughbook where the personalised map schema is stored. Click on the map schema .xml file name so that it is highlighted in blue and then click on the "Open" button.



40. A message box appears confirming that 1 record has been imported. Click on the OK button.

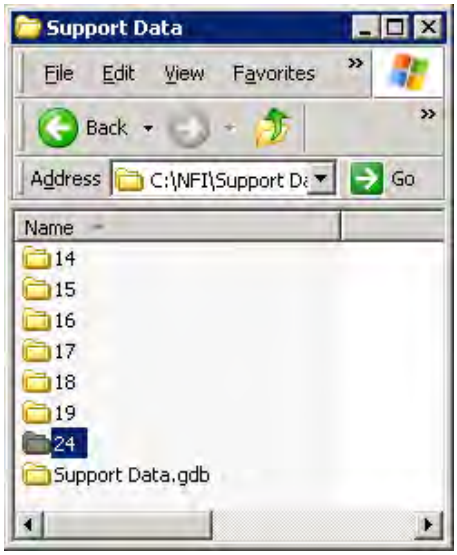
41. The personalised map schema is now listed in the Map Configuration Manager box. Double-click on the schema name to open it.



42. Close the Map Configuration Manager box.

2.4.5 Background data folder structure

Background data is stored under C:\NFI\Support Data on the Toughbook. Under C:\NFI\Support Data you should see a folders numbered for each lot(s) you are working on, as well as Support data.gdb. Support data.gdb contains GB layers such as the NFI Map and the lot number folders contain the aerial photography and OS data, which are too large to supply a GB-wide copy, so a copy per lot area is provided.



Do **not** alter the folder structure or the folder names. The map schema will not be able to find the data and a red exclamation mark will appear against the layer name in the Table of Contents.

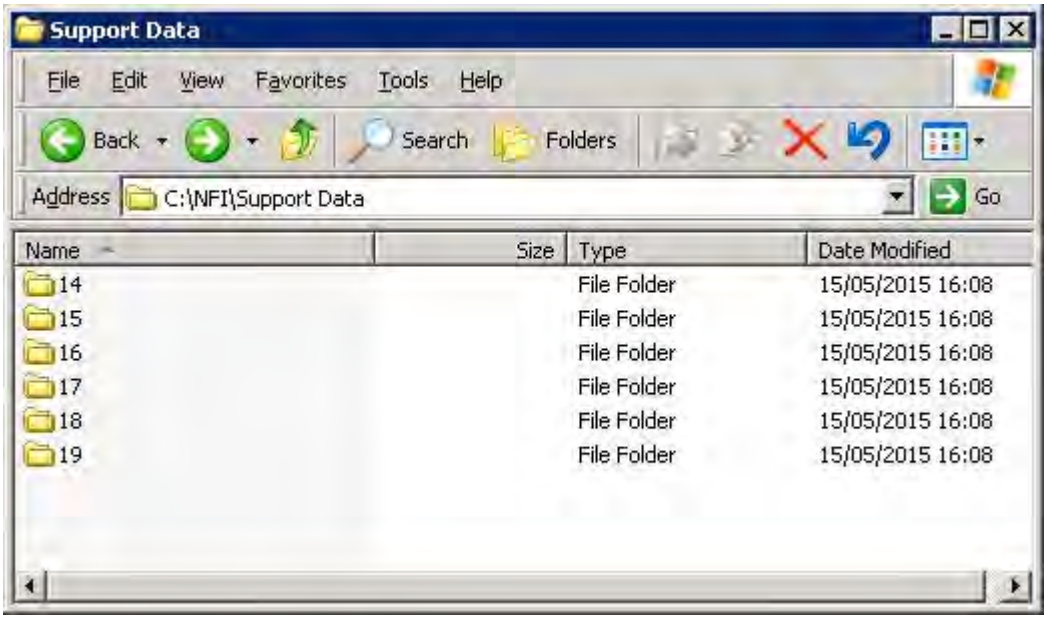
2.4.6 Swapping data between Lot Areas

The Toughbook can hold background data for multiple Lot Areas at once without unduly slowing down. This will suit most surveyors with two to ten lots and once their background data is loaded it will not need to be changed. However the tough book could not hold the background data for the whole of GB and as some surveyors have either many lots, or lots in different parts of GB, they need to have a way to swap their background data when working in different regions.

The Support Data folder for the Lot Areas that the surveyor is actively working in **must** be held within **C:\NFI \Support data** in order for the map schema to find the data.

The Support Data folder for the other Lot Areas that the surveyor is **not** actively working in are stored in the external hard drive. This covers background data for the whole of GB.

For example if a surveyor was working in Lot areas 14-19, they would copy these folders from the hard drive and drop them into **C:\NFI \Support data.**

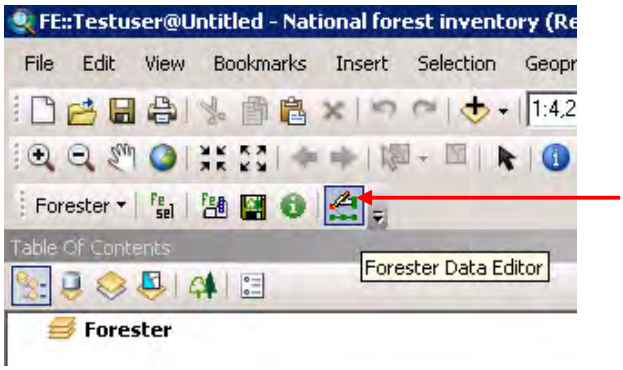


When the surveyor wants to undertake work in another Lot Area, additional to 14-19, they can copy that lot folder across from the hard drive and drop it into the Support

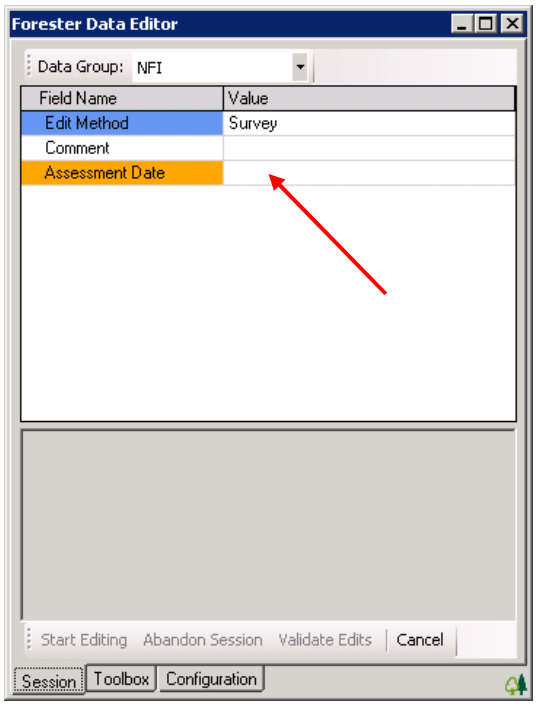
Data folder. If many lots are worked on at once and many lots worth of support data has been copied across to the toughbook and performance starts to slow, simply delete the folders for the lots not currently worked in. Then if necessary can copy them back from the hard drive at a later date.

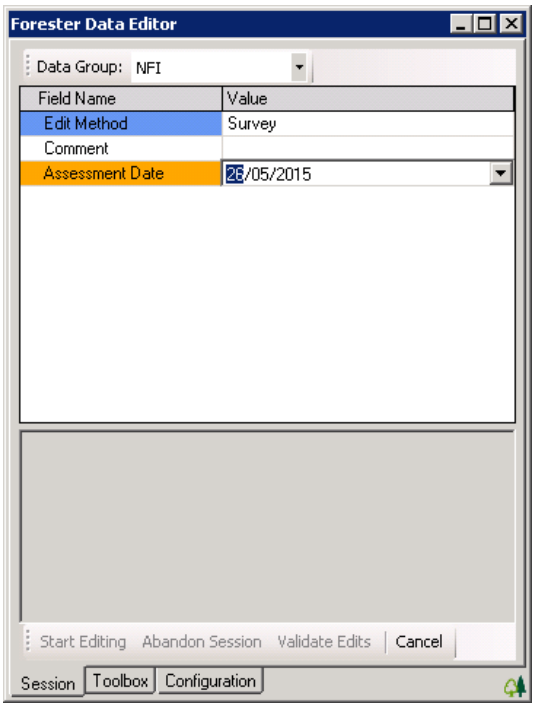
2.5 Starting the Forester Data Editor Session

43. Click on the "Forester Data Editor" button.

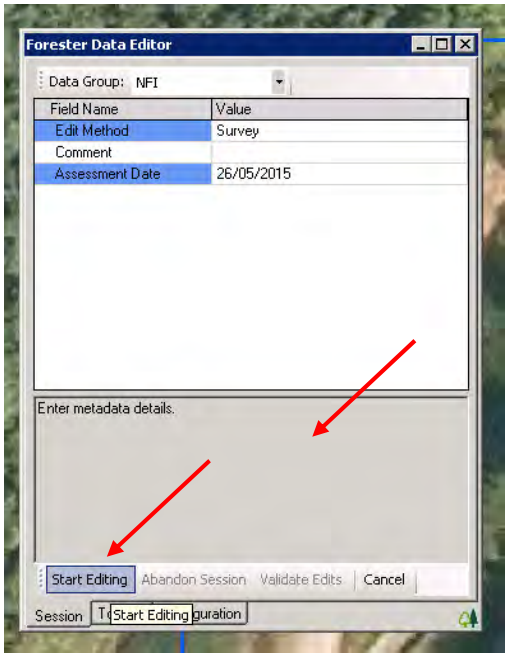


44. The Forester Data Editor window opens with the Session tab automatically selected. Complete the orange "Assessment Date" data field. To do this, simply click in the white Value field to the right and the software will automatically fill-in the current date.

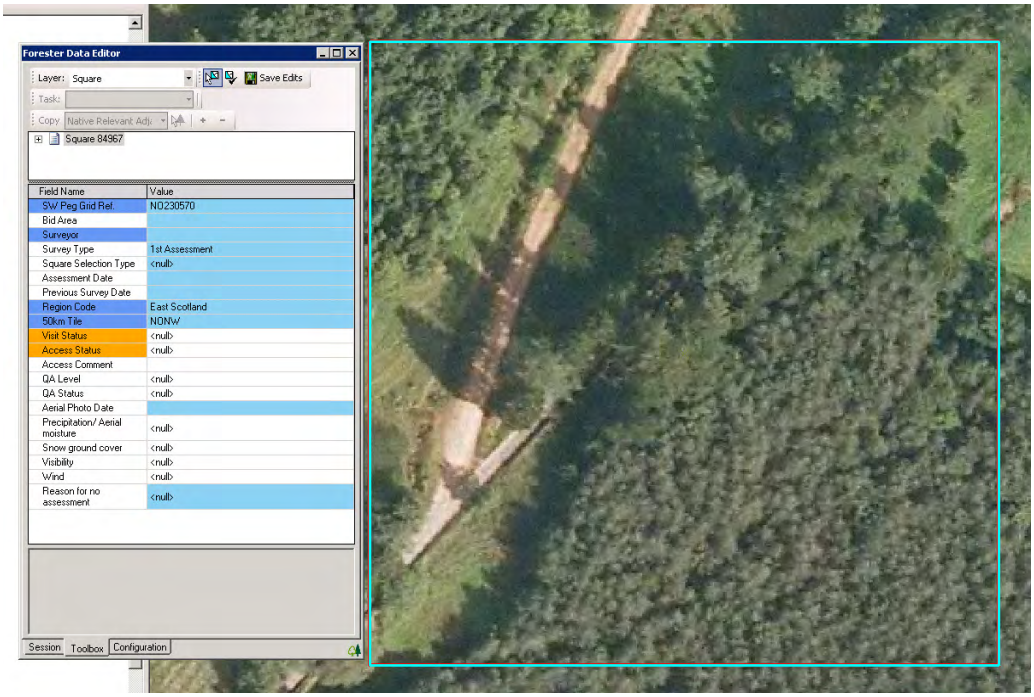




45. Click within the grey area beneath and then click on the "Start Editing" button.



46. The Forester Data Editor session opens with the square fully zoomed in.



47. Minimise the Forester Data Editor window so that the Table of Contents is in view. Tick on **all** of the GIS layers, including those grouped under the "Support info" layer. Restore the Forester Data Editor window.

As you grow used to the protocol and software you will develop your own preferences for which layers of data you have on and off at the various stages of the survey.

Now you have the data displayed, the square open and ready for editing, you can begin to undertake the survey and in turn begin to edit the data.

The following section covers how you 'finish the square' at the end of that process.

2.6 Validating Edits

At the end of every field survey session, and on completion of the square, surveyors are required to use a series of software validation tools to highlight sources of error in their data.

There are **three** software validation tools, which should be used in combination.

- The "Validate features in edit area" tool is used for detecting sources of error within an **individual Layer across the square as a whole**. So, for example, all Section Layer errors for the square are highlighted in one go.

- The "Show Invalid Items" tool is used for detecting sources of error within an **individual Section**, but only for the Section Layer and Mensuration Plot/Point Layer data. So, for example, all Plot Layer errors within the Section are highlighted in one go.

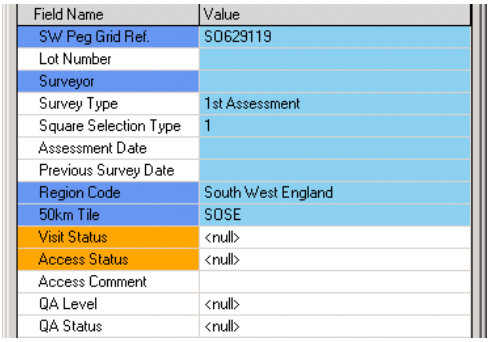
- The "Validate Edits" tool is used for detecting sources of error **within all Layers across the square as a whole** i.e. all errors relating to any Layer are highlighted in one go.

2.6.1 Validation errors

Sources of error highlighted by the software validation tools are termed "validation errors". These are displayed in red font in the top half of the Forester Data Editor window. Wherever a folder or a record is displayed in red font, this indicates that an

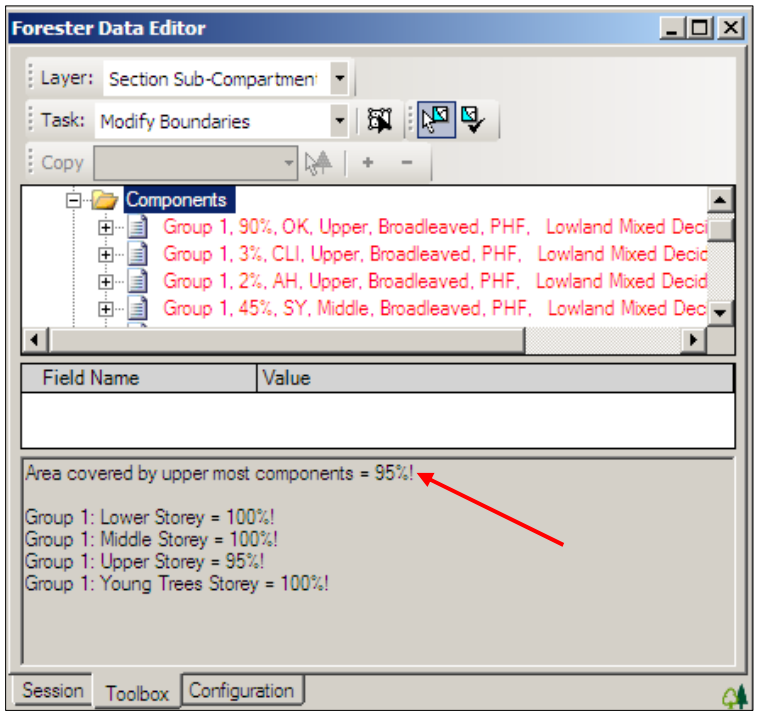
error is buried somewhere in the data, and the cause **must** be investigated and corrected.

Validation errors are most often caused by mandatory data fields not being completed, in which case the empty data field remains orange.



Field Name	Value
SW Peg Grid Ref.	SO629119
Lot Number	
Surveyor	
Survey Type	1st Assessment
Square Selection Type	1
Assessment Date	
Previous Survey Date	
Region Code	South West England
50km Tile	SOSE
Visit Status	<null>
Access Status	<null>
Access Comment	
QA Level	<null>
QA Status	<null>

Validation errors may also occur as a result of a survey protocol rule being broken. In the example below, the Component % areas for the upper storey do not sum to 100% of the Section and so an error message is displayed in the grey area at the bottom of the Forester Data Editor window.



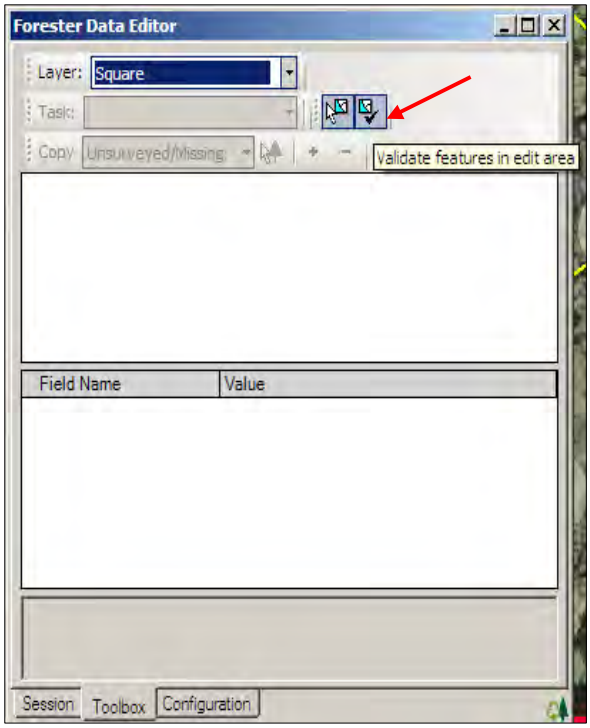
Genuine validation errors **must** be corrected prior to submitting the square to the FC.

2.6.2 Using the "Validate features in edit area" tool

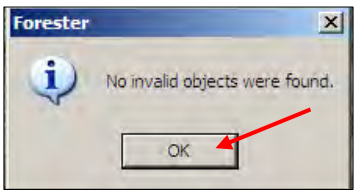
The "Validate features in edit area" button is located on the Toolbox tab at the top of the Forester Data Editor window.

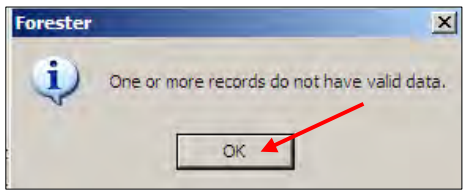
2.6.2.1 Checking for errors in the Square Layer data

48. In the Forester Data Editor window, select "Square" from the Layer drop-down menu and then click on the "Validate features in edit area" button.



49. A message box appears advising whether errors were found. Click on the OK button.





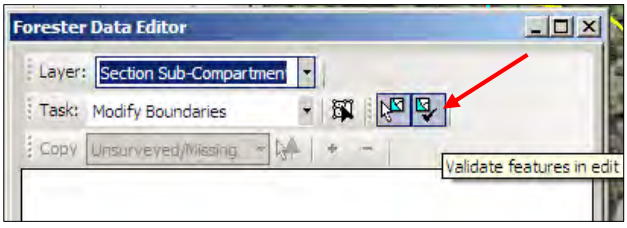
50. If errors are found, scroll down through the square data fields to locate these i.e. search for empty (orange) data fields.

In Re Measure Squares a certain proportion of fields will be set to orange, even if validly populated by the previous surveyor. This is an 'aide memoir' to surveyors to ensure that each entity within the survey is re assessed.

51. Enter the missing data confirm the previous surveyors work in re-measure squares and then click on the "Validate features in edit area" button to ensure that all errors have been corrected.

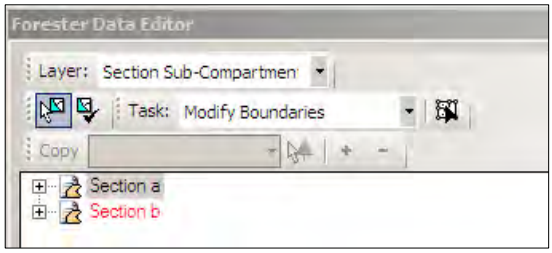
2.6.2.2 Checking for errors in the Section, Mensuration Plot, plot feature and Linear Feature Layer data

52. In the Forester Data Editor window, select "Section Sub-Compartments" from the Layer drop-down menu and then click on the "Validate features in edit area" button.

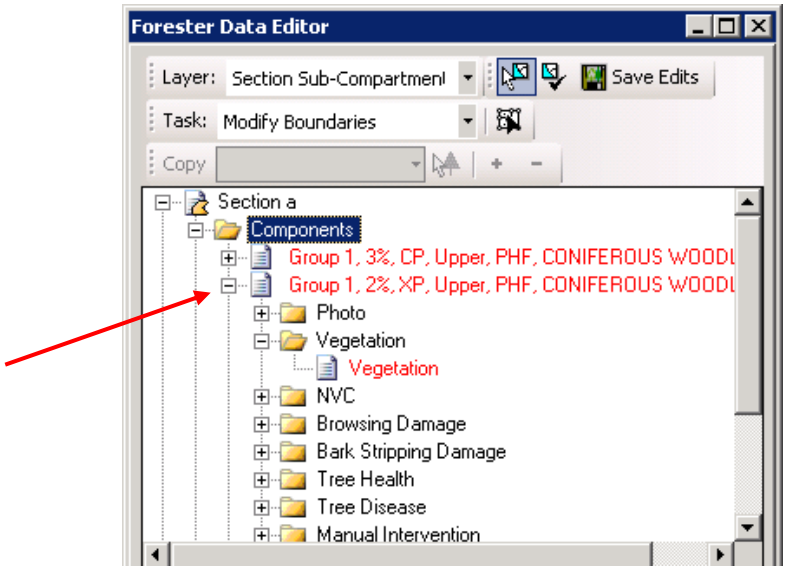


53. A message box appears advising whether errors were found. Click on the OK button.

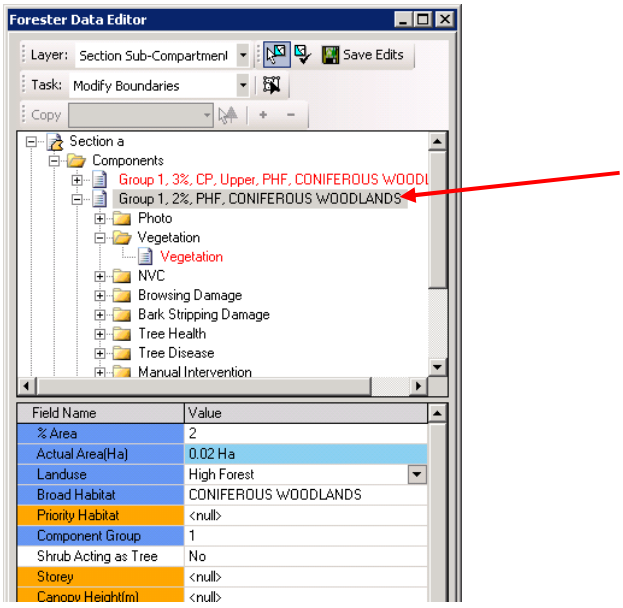
54. Sections containing errors are listed in the Forester Data Editor window.



55. Fully expand the data for each listed Section by clicking on the folder + signs.



56. Click on anything displayed in red font to investigate the source of the error.



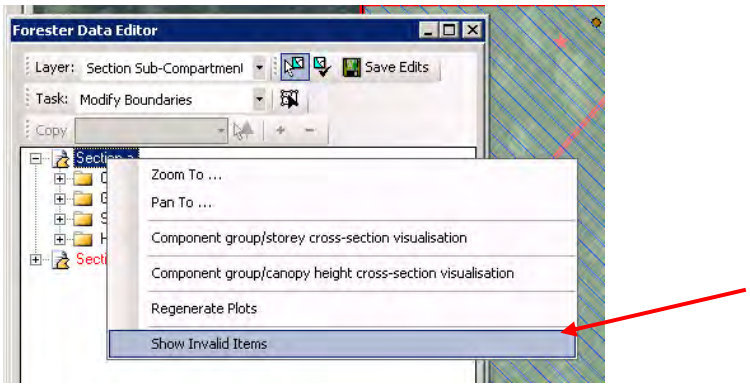
57. Correct the data so that the red font turns to black. Click on the "Validate features in edit area" button again after each sequence of corrections.

58. In the Forester Data Editor window, change the Layer field to "Mensuration Plots" or "Linear Features". Then click on the "Validate features in edit area" button and follow the same procedure as outlined in steps 2-6.

As per square level data in Re Measure Squares a certain proportion of fields will be set to orange, even if validly populated by the previous surveyor. This is an 'aide memoir' to surveyors to ensure that each entity within the survey is re assessed.

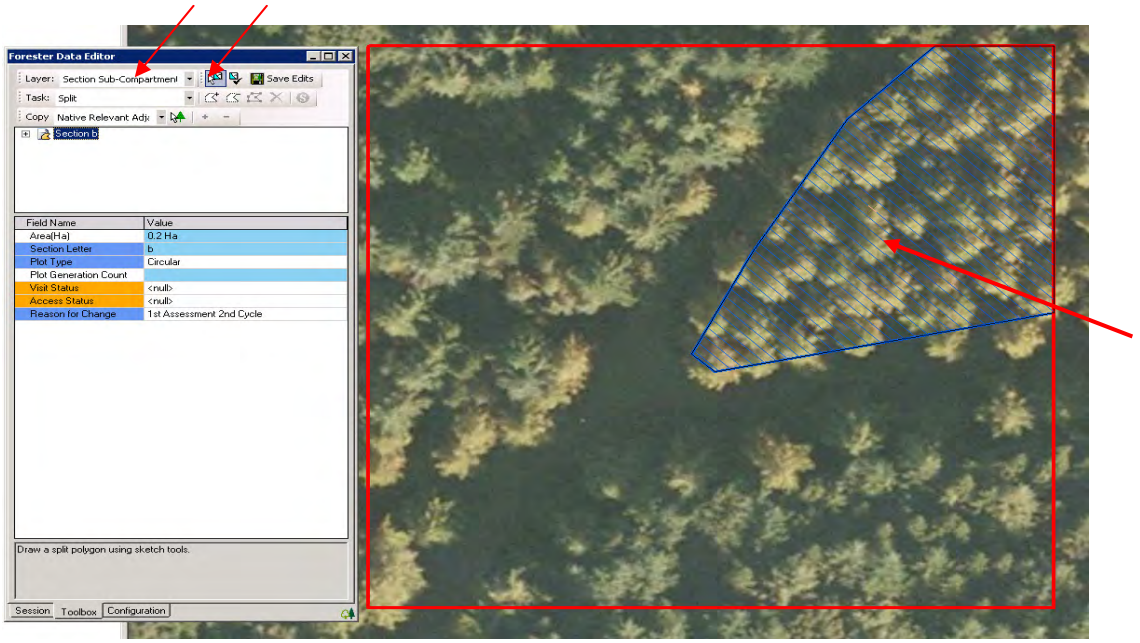
2.6.3 Using the "Show Invalid Items" tool

The "Show Invalid Items" tool is accessed by right-clicking on the Section name in the Forester Data Editor window.

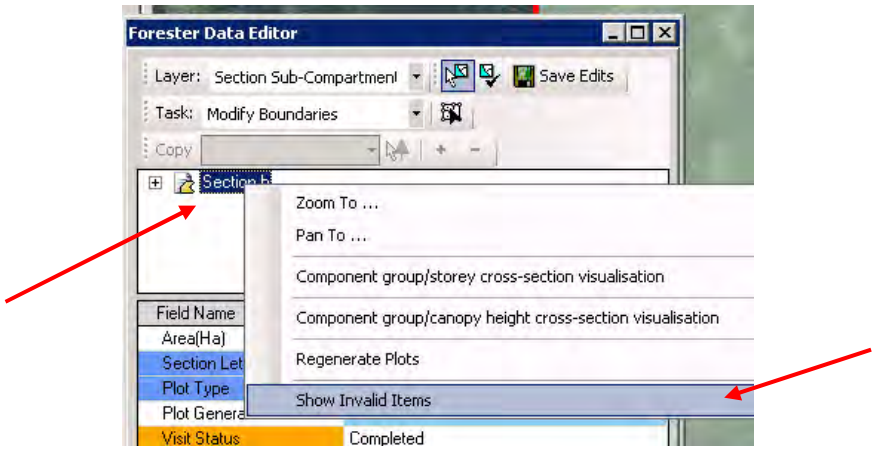


2.6.3.1 Checking for errors in the Section data for an individual Section

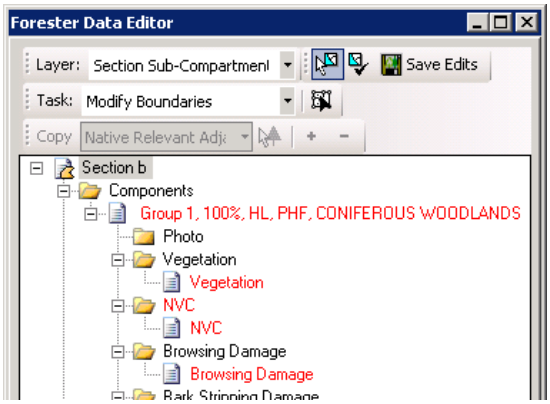
59. Select the Section. To do this, in the Forester Data Editor window, select "Section Sub-Compartments" from the Layer drop-down menu, click on the "Select features" button to the right of the Task box and then left-click anywhere in the Section on the map. The Section name will appear in the Forester Data Editor window.



60. Right-click on the Section name in the Forester Data Editor window and select "Show Invalid Items".



61. The Section folder automatically opens with the data expanded to show sources of error, which are highlighted in red font.

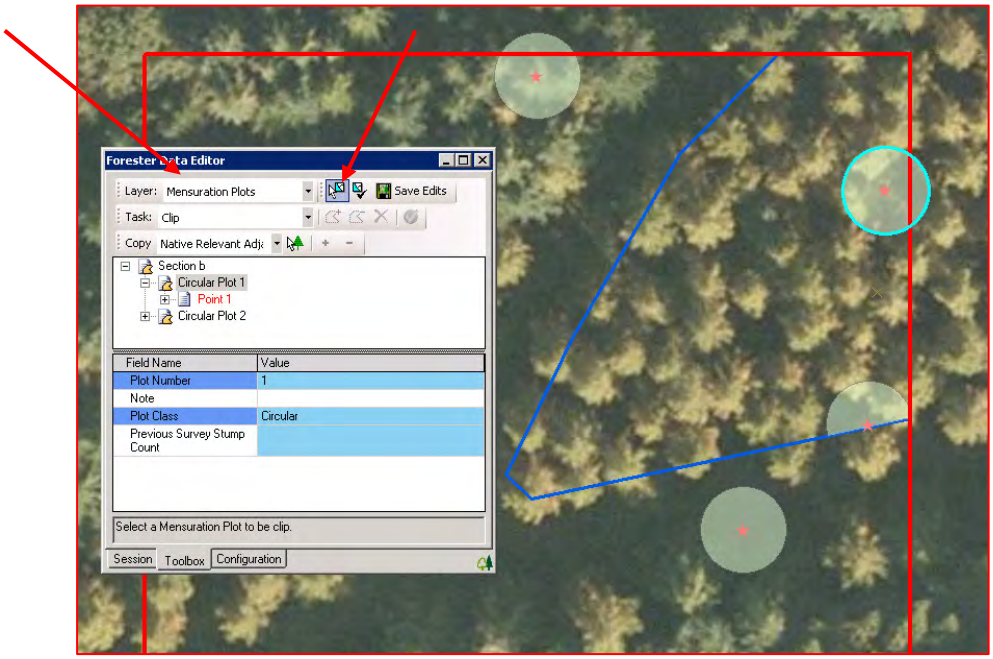


62. Click on anything displayed in red font to investigate the source of the error.

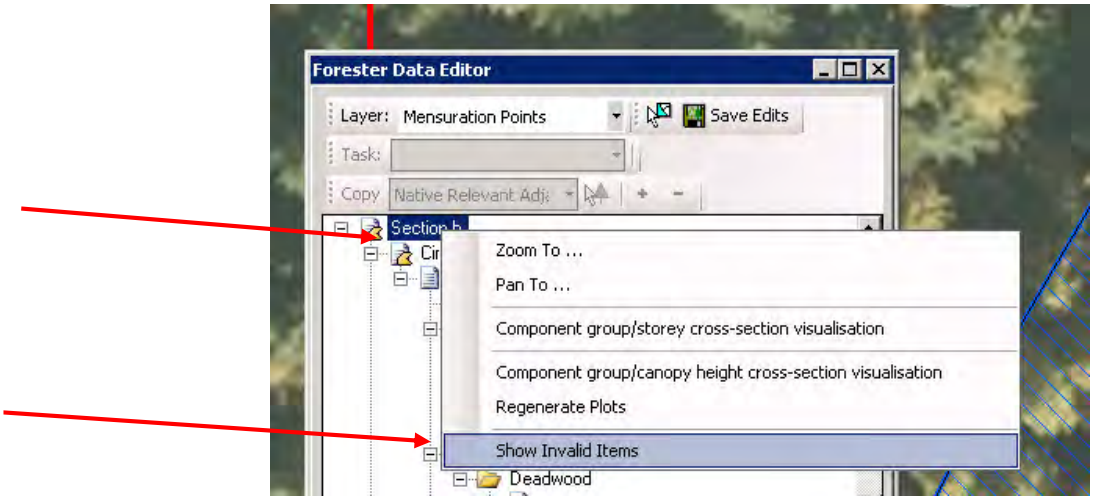
63. Correct the data so that the red font turns to black. Right-click on the Section name and select "Show Invalid Items" after each sequence of corrections.

2.6.3.2 Checking for errors in the Plot data for an individual Section

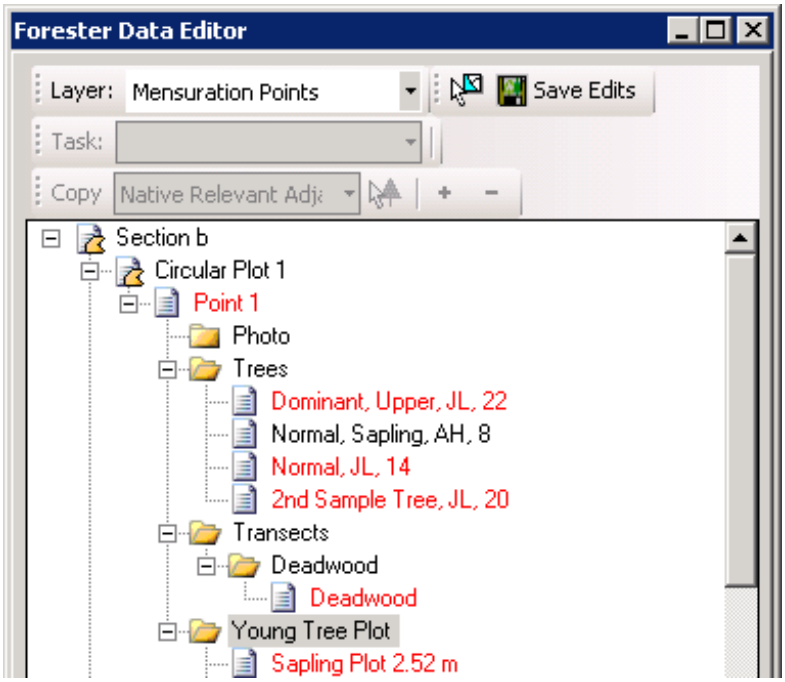
64. Select the Plots. To do this, in the Forester Data Editor window, select "Mensuration Plots" from the Layer drop-down menu, click on the "Select features" button to the right of the Task box and then left-click in any of the Plots on the map. The Section name and Plots are listed in the Forester Data Editor window.



65. Right-click on the Section name in the Forester Data Editor window and select "Show Invalid Items".



66. The Plot folders automatically open with the data expanded to show sources of error, which are highlighted in red font.

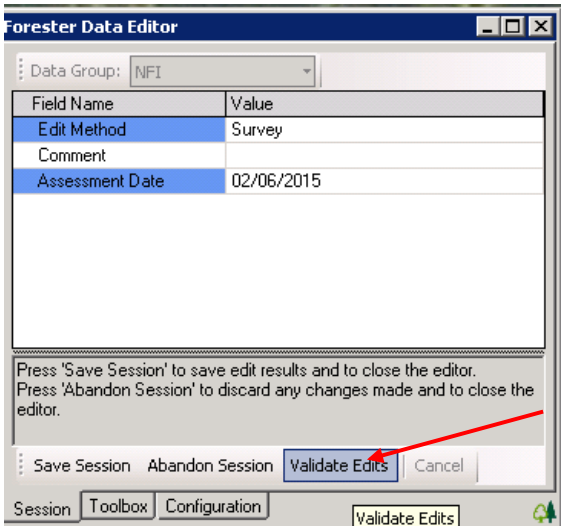


67. Click on anything displayed in red font to investigate the source of the error.

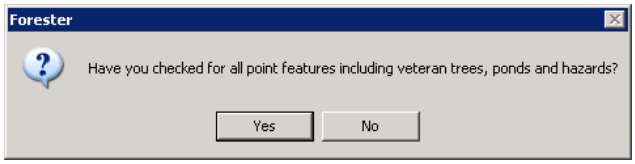
68. Correct the data so that the red font turns to black. Right-click on the Section name and select "Show Invalid Items" after each sequence of corrections.

2.6.4 Using the "Validate Edits" tool

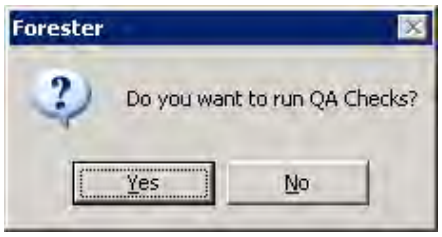
69. Surveyors MUST click on the "Validate Edits" button located on the Session tab at the bottom of the Forester Data Editor window before leaving a completed square to ensure all the validation checks are made. Note that the check for components matching plot trees is only carried out when using this button.



- When first clicking on the Validate Edits option, the surveyor will be prompted with a series of questions to remind them to check for linear features, point features and relevant adjacent stands. If you click 'No' to any of these options then the square is invalid until you select Validate Edits again and then select 'Yes'. This is a reminder to ensure all these features have been captured where required.



- Next, surveyor will be prompted if wants to run QA Checks:

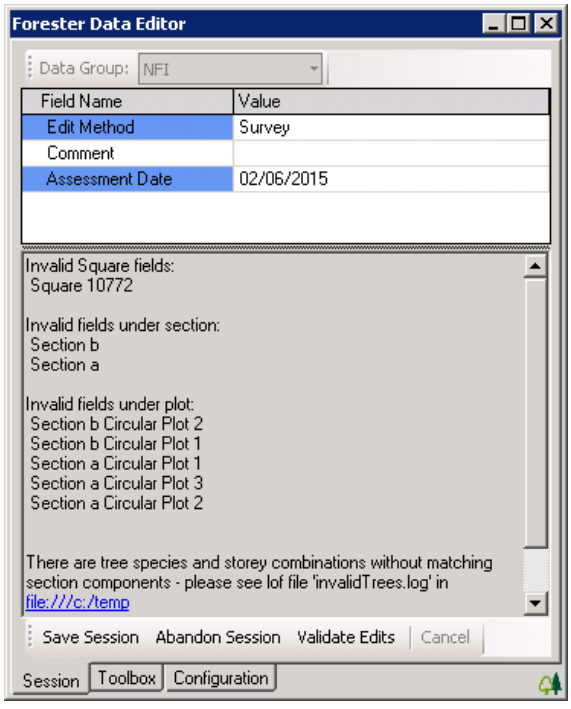


These QA checks are slightly different to the regular validation checks which predominantely only look for missing data. The QA Checks run slightly more complex queries and are designed to be run towards the end of the survey once all or most data has been entered or validated for the survey.

On a re-survey square it is a good idea to run the QA Checks to begin with to be aware of any problems from the 1st Survey that need to be fixed.

There is the option to run the QA Checks each time run Validate Edits, however in order to be a valid square for submission, the checks must be run at least once and any issues corrected.

70. An error listing appears in the grey area at the bottom of the Forester Data Editor window. Use the other software validation tools to pinpoint the errors.

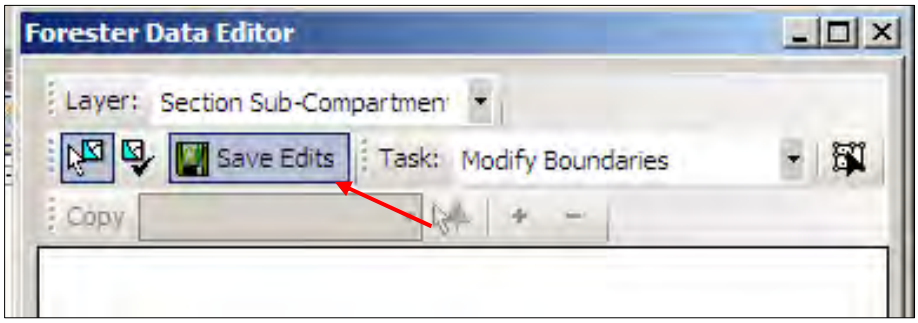


2.7 Saving Edits

Surveyors are strongly advised to **save** edits at **regular** intervals to avoid risk of losing data. A number of events can occur in the field e.g. software failure, Toughbook failure, loss of battery power, which could potentially result in hours of extra work recapturing data or possibly repeating the entire survey. There are two ways of saving edits:

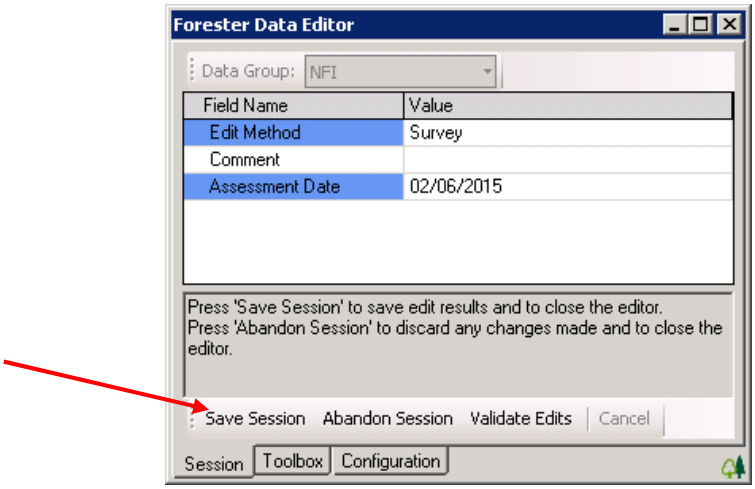
2.7.1 Using the Save Edits button

In the Forester Data Editor window, click on the Save Edits button to save the data **without** exiting the Forester Data Editor session.



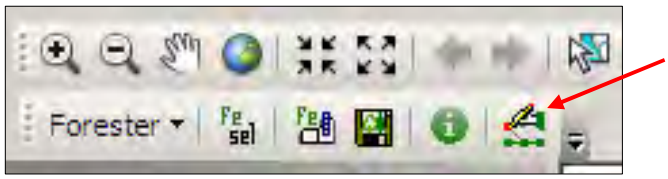
2.7.2 Using the Save Session button

71. In the Forester Data Editor window, click on the "Save Session" button at the bottom of the Session tab to **save and exit** the Forester Data Editor session.



72. In the "Save Session?" box, click on the Yes button.

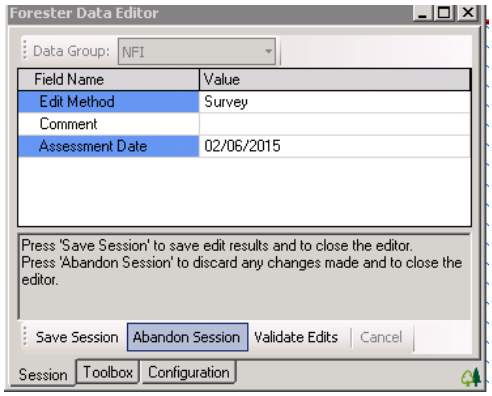
73. To resume editing, click on the "Forester Data Editor" button and start a new Forester Data Editor Session.



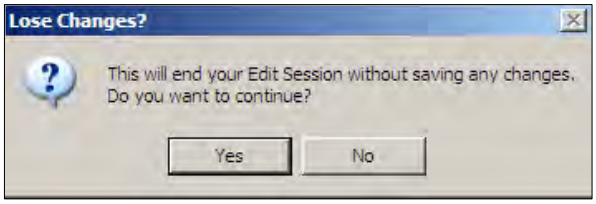
2.7.3 Abandoning the Forester Data Editor session

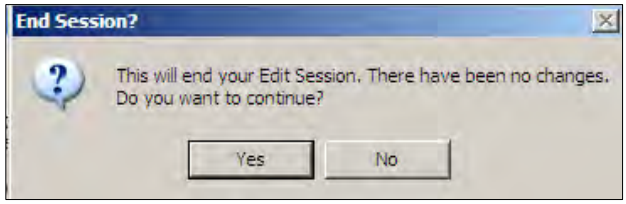
Sometimes it may be desirable to close the Forester Data Editor session **without** saving edits. To do this:

74. In the Forester Data Editor window, click on the "Abandon Session" button at the bottom of the Session tab.



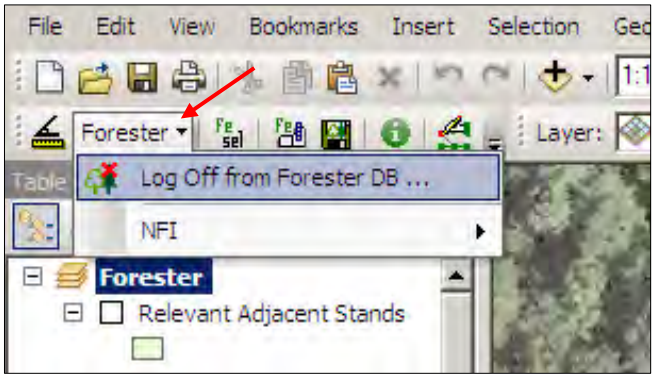
75. In the "Lose Changes?" or "End Session?" box, click on the Yes button.



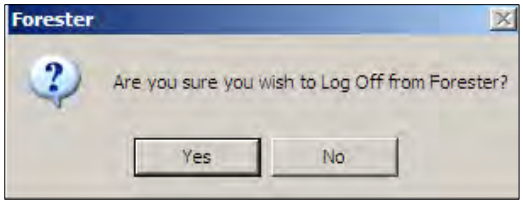


2.8 Logging Off from Forester

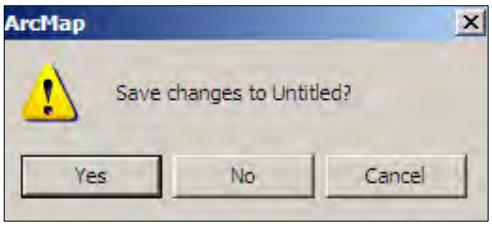
76. Click on the "Forester" button, and then select "Log Off from Forester DB…."



77. In the "Forester" box, click on the Yes button.



78. In the "ArcMap" box, click on the No button.



79. Close the ArcMap window.