

14.0 Tree & Stump Assessment Procedures

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14.0 Tree & Stump Assessment Procedures

14.1 Circular Plots – Tree Assessment

Once the plot centre has been located and pegged (**Chapter 13.0**):

Locate the plot boundary (5.64m radius horizontal distance from plot centreError! Reference source not found.) and identify which measurable stems ($\geq 4\text{cm}$ DBH), whether alive or dead, are within the plot.

1. It is recommended to either use the North bearing, or an easily identifiable object (e.g. a thinning rack, large rock), as a starting & finishing point and work clockwise.
2. Measure the diameter at breast height (DBH) – (**see Chapter 15.0**) and map accurately the location of all measurable stems and fill out all tree level data as per the NFI software. All stems are assumed Normal at this point whether maiden/standard or coppice.
3. Visually estimate the height of any dead tree to its actual top (whether snapped or not), do not 'add on' any snapped tops to the height.
4. Select one Dominant Height Tree (largest live DBH stem, not leaning excessively or snapped) per Storey for all those Storeys captured within the plot only. If there is more than one candidate dominant tree per storey, select the one closest to the plot centre.
5. Change Tree Type to Dominant for stems chosen in 4 above.
6. Assess Total Height of the Dominant Tree for each Storey within the plot.
7. Use software Auto-Assign function to identify 2nd and 3rd Sample Height trees within the plot.
8. Navigate to 2nd Sample Height Tree for a storey, and complete new mandatory fields.
9. As 8 above for 3rd Sample Height Tree.
10. If there are insufficient trees within a storey inside the plot for the software to identify 2nd and 3rd Sample Height Trees, then manually select these from live, un-snapped and not excessively leaning stems out with the plot using 3rd nearest neighbour method (**See Chapter 16.0**). Girth, map accurately and complete Data Fields ensuring Tree Type is '2nd Sample Tree' or '3rd Sample Tree' and 'Outside Plot?' is 'Yes'. Tag with bio-tape to enable relocation for QA.
11. Repeat 7 to 9 for any other storeys.

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14.2 Whole Section Plots – Tree assessments

Once the Points have been located and pegged (**Chapter 13.0**):

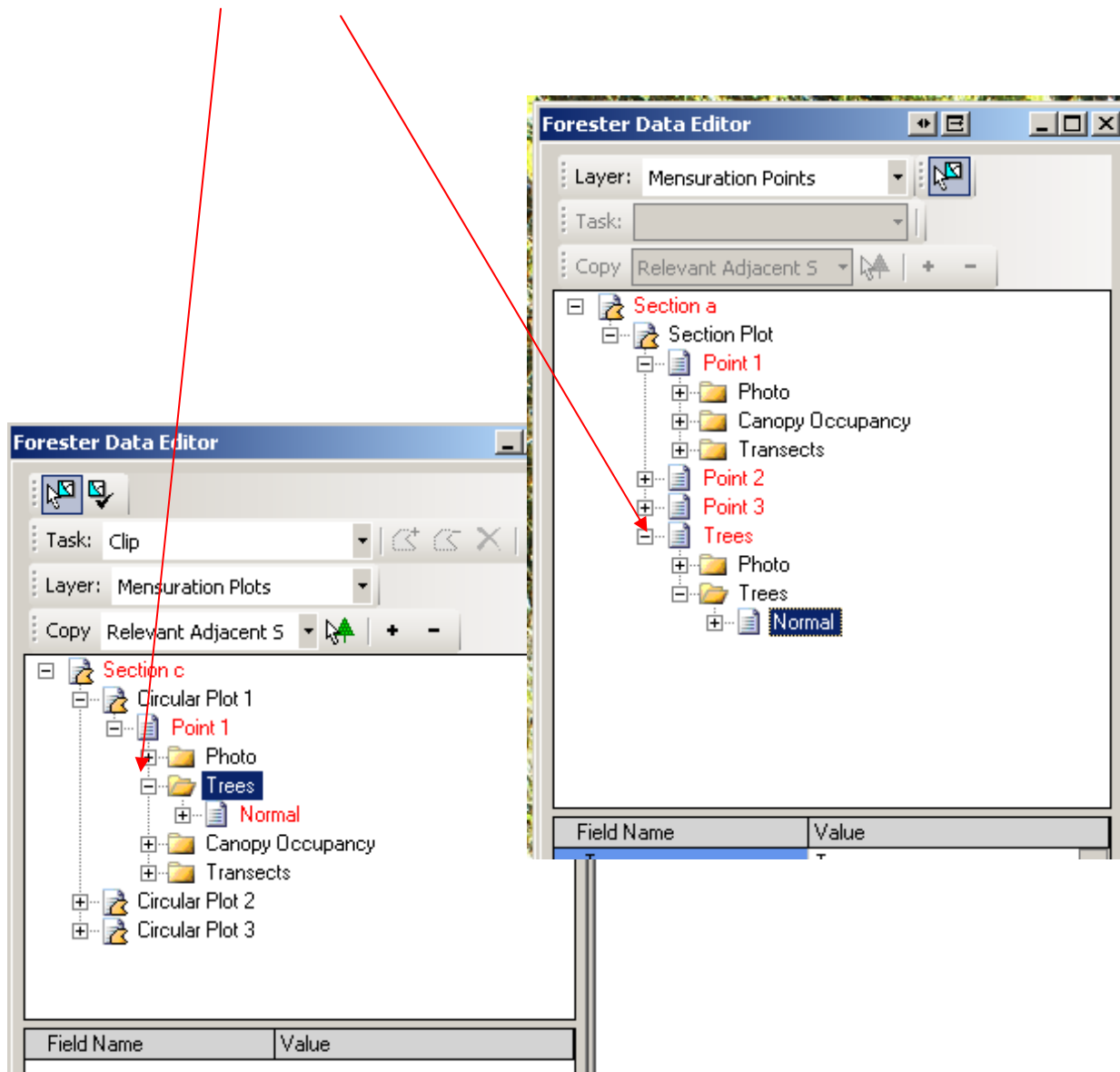
1. Map and measure the diameter at breast height (DBH), (see **Chapter 15.0**), all measurable stems within the section and fill out all tree level data as per the NFI software. All stems are assumed Normal at this point and entered into the 'Trees' folder, whether maiden/standard or coppice.
2. Visually estimate the height of any dead tree to its actual top (whether snapped or not), do not 'add on' any snapped tops to the height.
3. Use the software auto-assign function to select all Height Trees i.e. 3 height trees per storey per Point. Note that the 1st Stand Height Tree has no reference to the mensuration point i.e. it could be any tree within the Section Plot.
4. Accept the software selection, unless this places Height Trees of the **same storey** within the same coppice stool or shared rootstock. In this instance, change the 'non-permitted' Height Tree back to a Normal Tree and manually select a replacement from the remaining trees **within** the Section. Use the '3rd nearest' rule unless there are insufficient stems of that storey, in which case randomly select any stem without bias.
5. Note Height Trees of different storeys can be from the same coppice stool or shared rootstock.
6. If there are insufficient replacement stems within the Section, 2nd and 3rd Sample Trees can be selected from out with the Square boundary.
7. The software selects Height Trees in the order: 2nd Sample Tree (giving the most crown data), 3rd Sample Tree (giving less crown data), and finally 1st Stand Height Trees (giving no crown data). **1st Stand Height Trees must be located within the Section Plot.** If there are insufficient stems to select 3 Height Trees then the 2nd or 3rd must be changed to 1st Stand Height Tree and a replacement for the 2nd or 3rd located outside the square boundary.
8. Where the full complement of Height Trees cannot be recorded, the 'Note' data field must be completed to avoid validation issues.

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14.3 Tree Data Entry

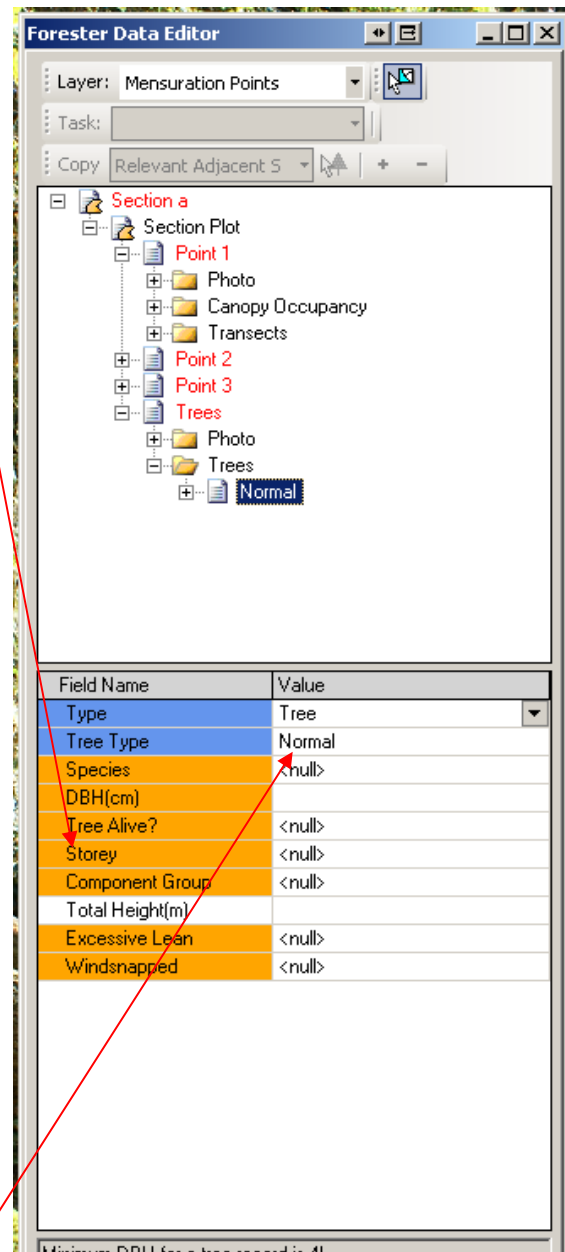
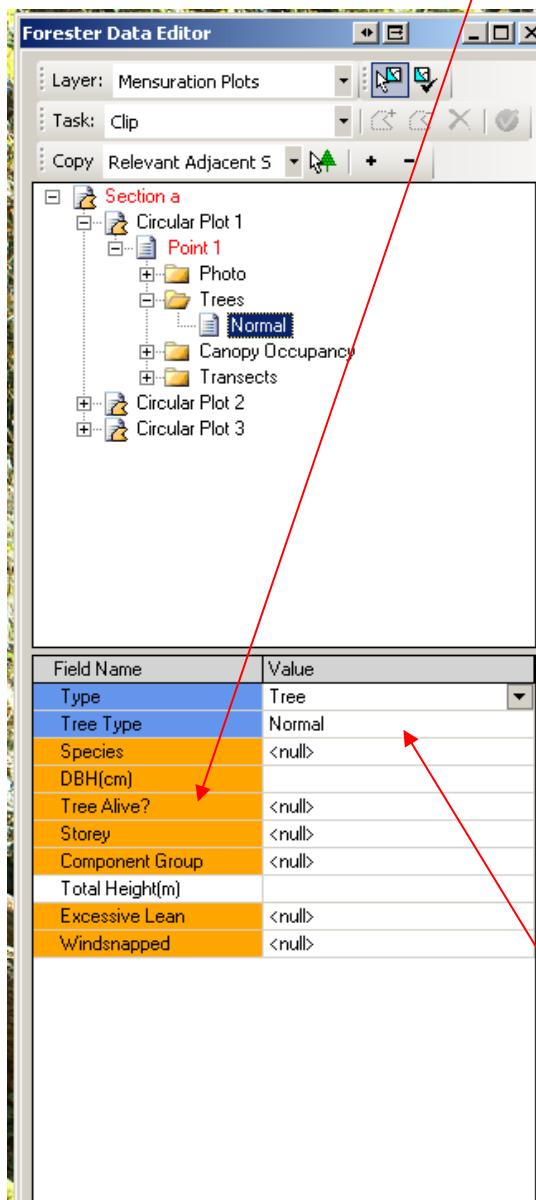
Data entry is via the Trees folder.

Click on the Trees folder to access the 'Normal' folder.



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Click on the Normal record to show the Data Fields to be completed



(Normal in this context simply refers to a stem which is **not** a Sample Height Tree):

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Table 14 - 1: Tree Data Fields – Normal Trees

Data Field	Options	Comments
Location	See Chapter 14.4 Mapping the tree position.	This is required for all measurable stems ($\geq 4\text{cm DBH}$).
Type	<ul style="list-style-type: none"> • Shrub Acting as Trees • Tree • Stump • Coppice Stool • Coppice Stem 	<p>Choose the type of tree/stump to be assessed.</p> <p>See Chapter 9.4.4</p> <p>Maiden/Standard stem</p> <p>For Stump assessments see Chapter 14.7 Stump.</p> <p>For Coppice assessments see Chapter 19.0.</p>
Tree Type	<ul style="list-style-type: none"> • Normal • Dominant • 1st Stand Height Tree. • 2nd Sample Tree • 3rd Sample Tree 	<p>Not a Sample Height Tree</p> <p>The largest DBH tree within the plot within each Storey present in the plot. This tree cannot be leaning excessively or be snapped UNLESS it is representative of the majority Component in which case it needs to be noted as not being snapped or excessively leaning in order for height assessments to be taken.</p> <p>Chapter 16.0 has details on what these tree types are and how they are chosen. Table 14 - 2: Trees Data Fields – Height Sample Trees details what extra measurements are required for these trees.</p>
Species	Various	See Chapter 8.9
DBH	Free text, whole number only	<p>DBH MUST be a whole number 4cm or greater. See Chapter 15.0.</p> <p>The software will prompt for confirmation if a DBH of 50cm or more is recorded.</p>
Tree Alive?	<ul style="list-style-type: none"> • No • Yes 	If 'No' then the two following <i>extra Data Fields</i> are added plus total height is requested after Component Group. Note that Dominant or 2 nd or 3 rd Sample tree CANNOT be dead.

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Data Field	Options	Comments
Dead Tree Cause	<ul style="list-style-type: none"> • Not discernible • Natural mortality • Diseases • Insects • Fire • Windthrow • Physical damage – operations • Waterlogging • Windsnap • Vandalism • Chemical • Mammal • Deer • Rabbit • Squirrel • Sheep • Horse • Ring barking • Effluent • Erosion • Snow 	<p>Choose which option best describes the cause of death.</p> <p>Select the specific mammal where known otherwise select 'Mammal' which covers all mammal damage.</p>
Decay Class	<ul style="list-style-type: none"> • 1 - 9 	Note only classes 3 to 7 can be used for dead trees.
Storey	<ul style="list-style-type: none"> • Upper • Middle • Lower • Complex • Young Trees 	<p>See Chapter 8.8 Error! Reference source not found. for more details</p> <p>Surveyors should NOT use Young Trees here as they are <4cm DBH.</p>
Con Straightness	<ul style="list-style-type: none"> • 1 - 7 	<p>NB: this Data field only appears for Conifers 14cm DBH and above.</p> <p>See file 'FC IN 39 Stem straightness protocol for SS.pdf' in the Additional Document folder for more details.</p>
Lowest dead branch	Free text to 1 decimal place	Assess the height (m) of the lowest dead branch (min dia. of 2cm) for the Dominant/1 st Stand height tree and 2 nd and 3 rd sample trees. Where there is no

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		lowest dead branch insert 99.99. <i>For Normal trees insert 0.</i>
Component Group	• 1 - 5	Choose the Component Group number for that tree.

If Tree Type = Dominant, 1st Stand Height, 2nd Sample or 3rd Sample then the following Data Fields will need to be filled in:

Table 14 - 2: Trees Data Fields – Height Sample Trees

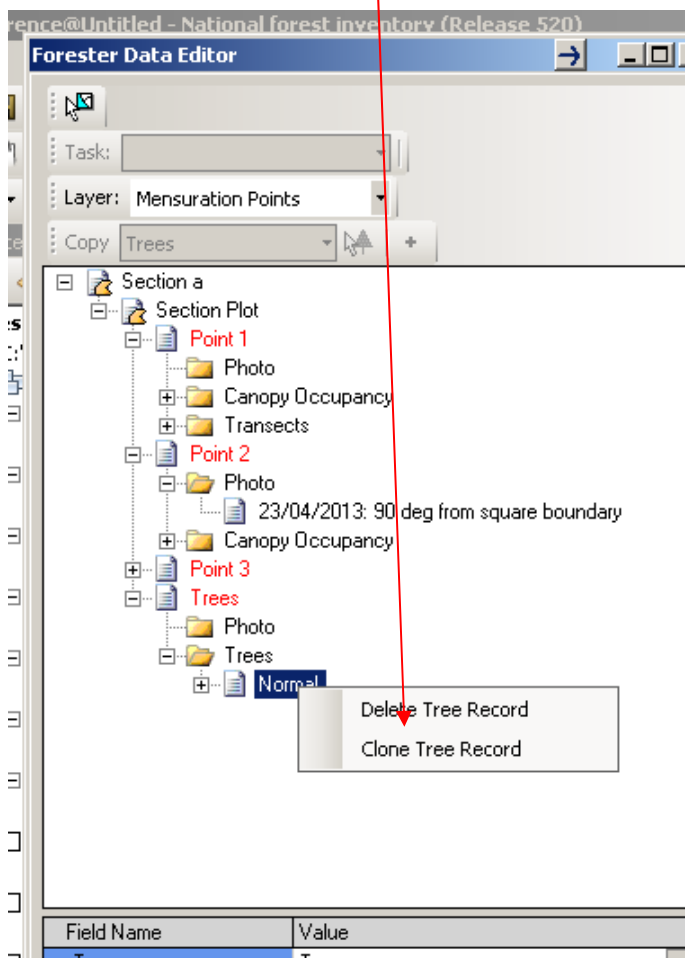
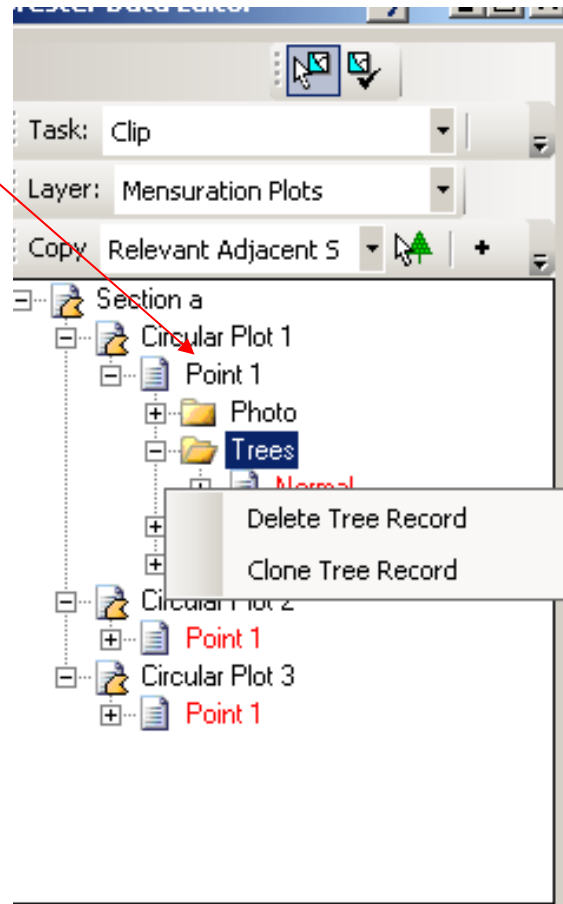
Data Field	Options	Comments
Total Height	Free text to 1 decimal place	See Chapter 16.3 for details for assessing total height trees.
U. Crown Height (2 nd Sample tree only)	Free text to 1 decimal place	See Chapter 16.5: Surveyors need to check to make sure that the Upper Crown Height is not greater than the Total Height.
L. Crown Height (2 nd Sample tree only)	Free text to 1 decimal place	See Chapter 16.5: Surveyors need to check to make sure that the Lower Crown Height is not greater than the Upper Crown Height or Total Height.
Crown Dia. 1 (2 nd and 3 rd Sample trees only)	Free text to 1 decimal place	See Chapter 16.5.2
Crown Dia. 2 nd and 3 rd Sample trees only)	Free text to 1 decimal place	See Chapter 16.5.2
Outside Plot?	<ul style="list-style-type: none"> • No • Yes 	
Excessive lean	<ul style="list-style-type: none"> • No • Yes 	Any lean, of a line drawn from the middle of the stool of the tree to its growing tip, greater than 20° from vertical is considered excessive. If the answer is 'Yes' then normally this tree cannot be a height sample tree. However, if the leaning tree is representative of a leaning Component (majority of Component is leaning) then height can be assessed although in the software a 'No' must be the answer to allow height assessments.
Windsnapped	<ul style="list-style-type: none"> • No • Yes 	If the answer is 'Yes' this tree cannot be a height sample tree. However, if the snapped tree is representative of a snapped Component (majority of Component is snapped) then height can be assessed

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		although in the software a 'No' must be the answer to allow height assessments.
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By right clicking on Normal the following options become available.

- Delete Tree Record
- Clone Tree Record – used for Adding multiple records of the same species of tree. *Surveyors must remember to edit any cloned data correctly.*



14-9 Remember to Save your Edit Session Regularly, Validate the information and Backup the Data

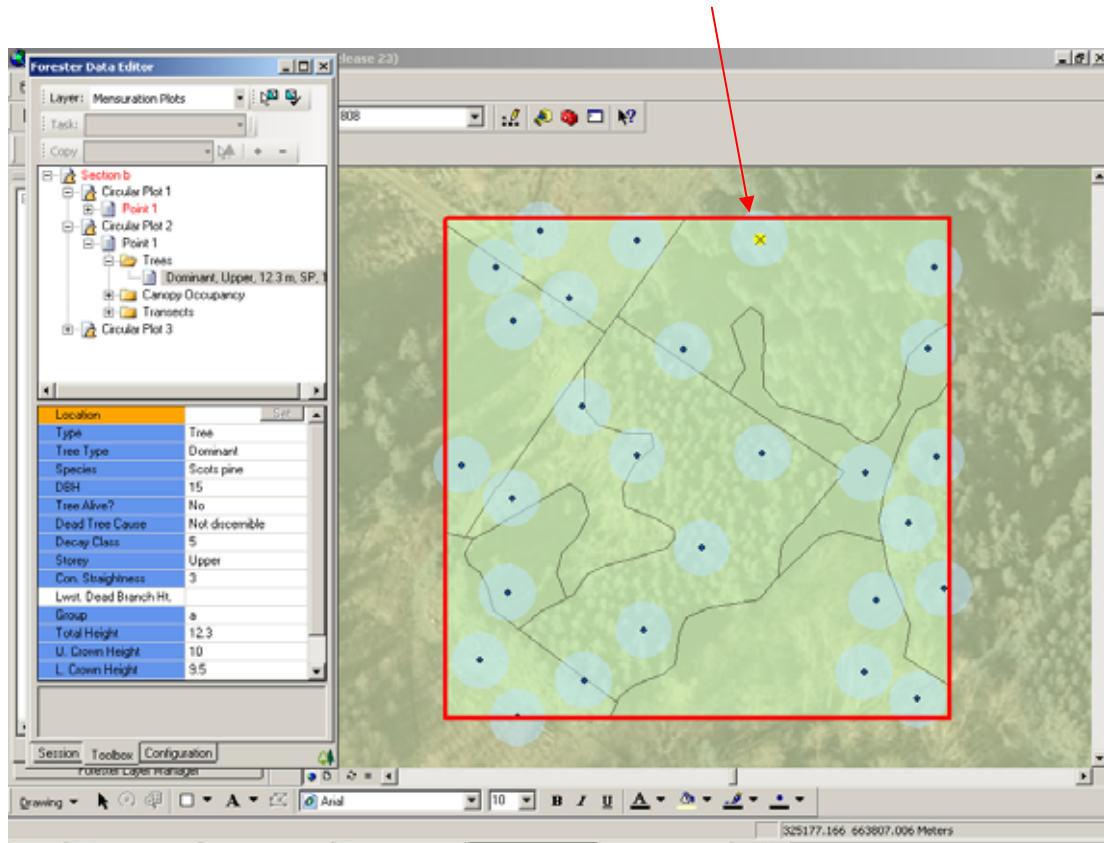


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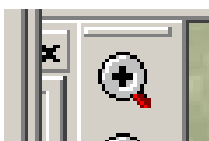
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14.4 Mapping the tree position.

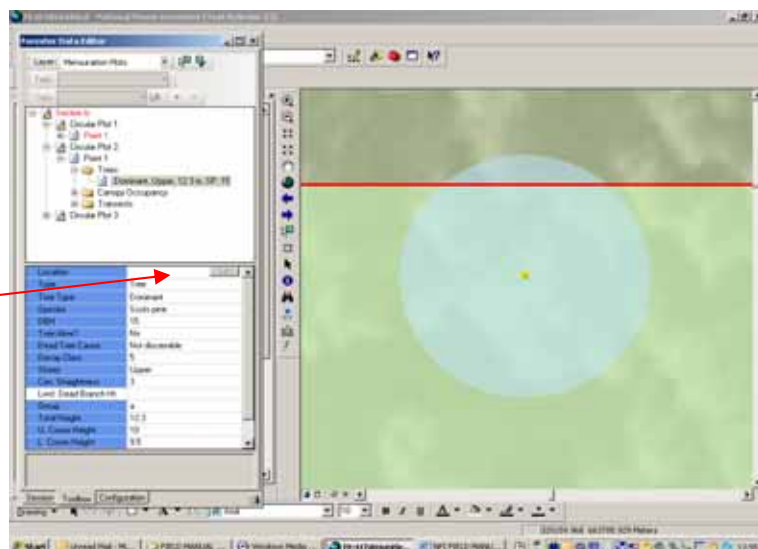
In the example below Plot 2 is being assessed (the centre of the plot is yellow).



Before selecting the location of the tree/stump it is best to zoom in to the plot using the zoom tool.



Click on the white space next to the Location Data Field and to show a small grey box with the word 'Set' in it. Click on this and then click on the tree/stump/stool position within the Plot.

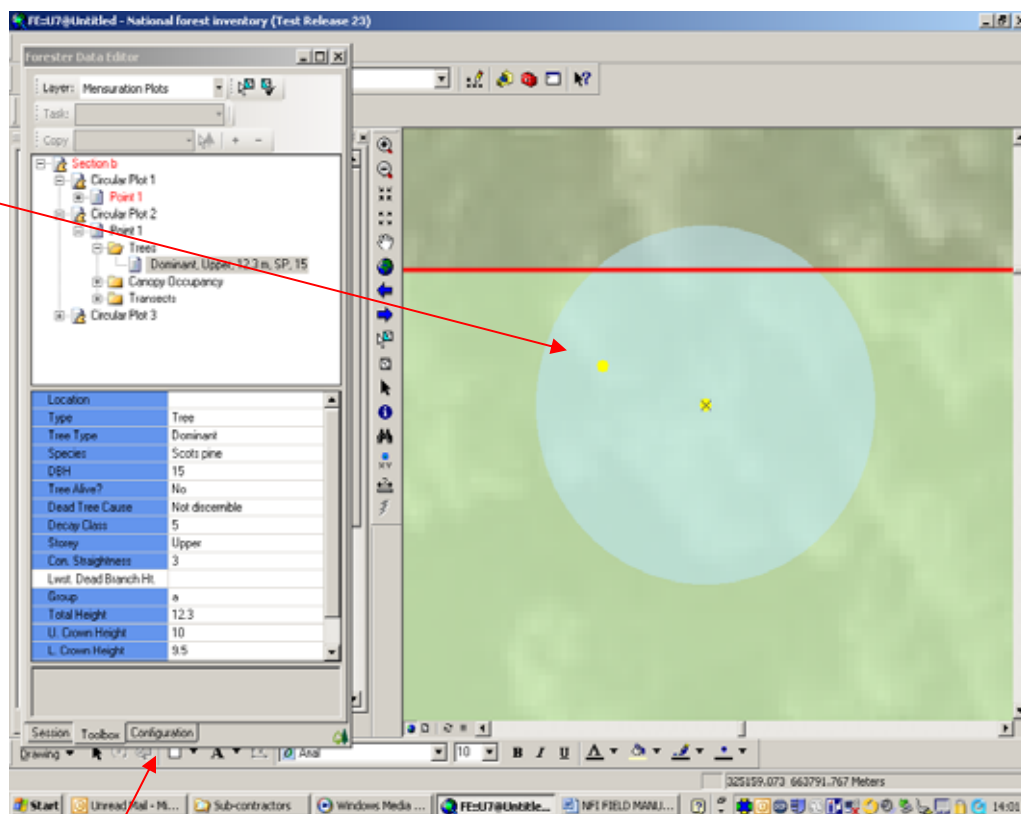


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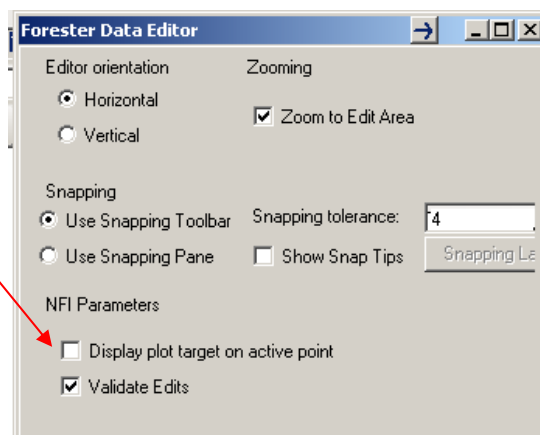
Click on the plot area to locate the tree/stump:

Repeat the assessments for all trees ≥ 4 cm DBH within the plot.

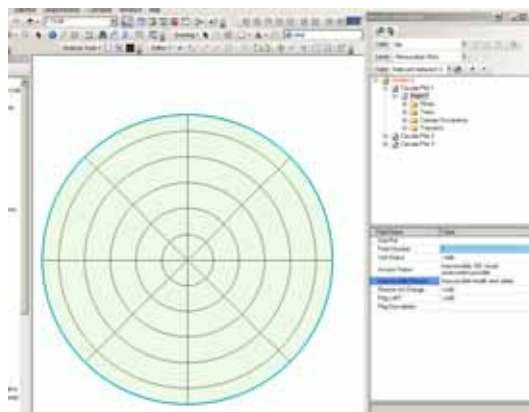
When Locating 2nd and 3rd Sample Trees the location can be anywhere within the Section/RAS. It may help to zoom out from the plot to be able to locate its position on the map.



Clicking on the Configuration tab gives access to the Configuration section of the Forester Data Editor. Ticking the 'Display plot target on active point' will give a guide at each plot to help map stems and stumps/stools more accurately.



As a minimum, trees/stumps/stools should at least be mapped into the correct quadrants of the plot target.



14-11 Remember to Save your Edit Session Regularly, Validate the information and Backup the Data

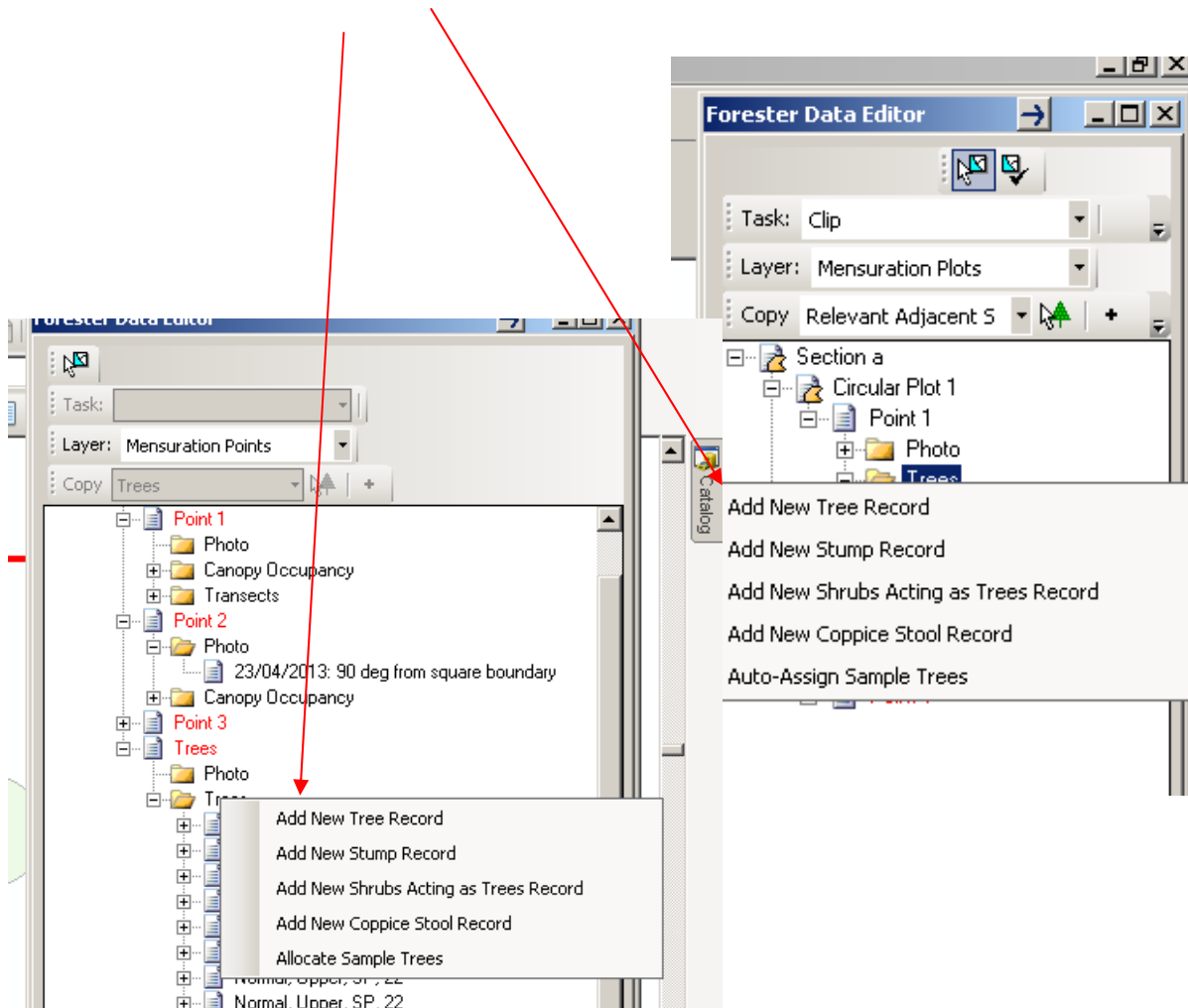


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14.5 Adding new tree records

By right clicking on Trees folder the following options become available:



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Table 14 - 3: New Tree Records Data Fields

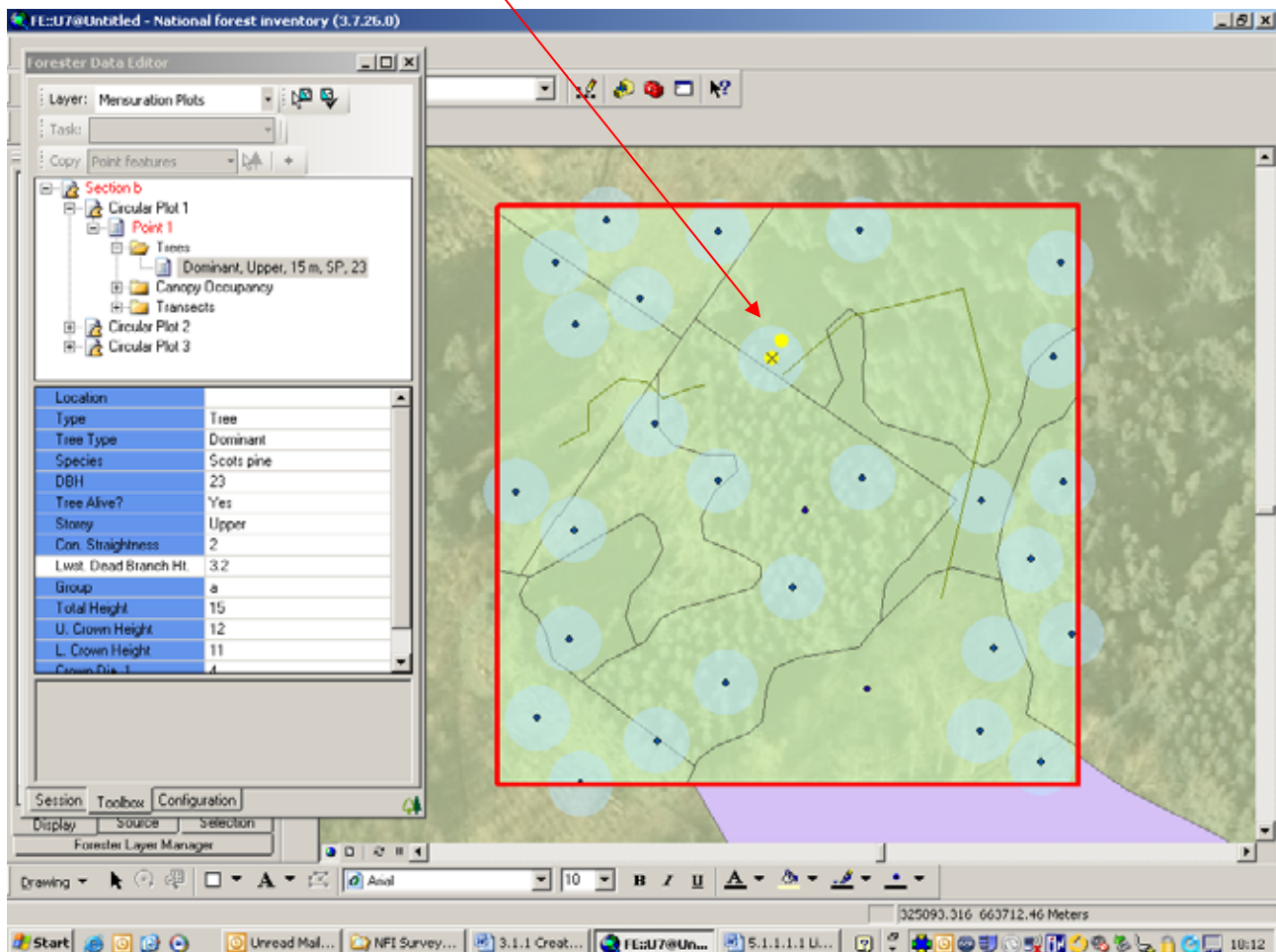
Option	Comment
Add New Tree Record	<p>Allows a new, blank tree record to be added.</p> <p>If there are a number of trees of the same species it is better to fill in one complete record for that tree species and then to Clone the data (see later).</p> <p>In this instance it is better to carry out the Cloning <i>before</i> entering the DBH of the tree to be cloned. This is a good way to ensure that new DBH's need to be entered. If cloning after DBH is entered it is possible to forget to edit the tree data correctly. This is true for any of the fields within the tree data.</p>
Add New Stump Record	<p>Within each plot the nearest stump to the plot centre, where stumps are present, needs to be mapped and measured objectively. To record the stump measures a Stump Record needs to be added.</p> <p>NB: Surveyors can also add a stump by turning a Normal Tree record into a stump in the Tree Data fields under the Field name 'Type'.</p>
Add New Shrubs Acting as Trees Record	<p>Where a shrub is acting like a tree (see Chapter 9.4.4) a Shrubs Acting as Trees Record needs to be added and filled in.</p> <p>NB: Surveyors can also add this by turning a Normal Tree record into a Shrubs Acting as Trees in the Tree Data fields under the Field name 'Type'.</p>
Add New Coppice Stool Record	<p>Add New Coppice stools here.</p> <p>NB: Surveyors can also add this by turning a Normal Tree record into a Coppice Stool in the Tree Data fields under the Field name 'Type'.</p>
Auto-Assign Sample Trees	<p>Once all the Normal trees have been added/cloned and the data completed use the Auto-Assign Sample trees to assign the 2nd and 3rd sample trees. Note that Dominant Height trees need to be manually allocated.</p>

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14.6 Linking Height trees – Circular plots

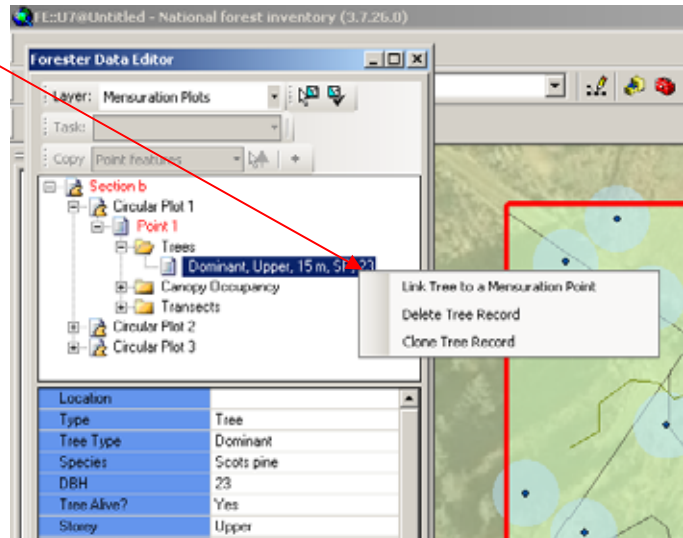
In some cases one, or more, trees may be associated to one or more circular plots. For example a Normal tree in one plot could be the 2nd or 3rd sample tree for another plot. Sample trees which fall out with a plot do not need to be linked to that plot, but may need to be linked to another plot if designated as a height sample tree for this new plot.

In the example below a Dominant Height tree has been assessed and located within a plot. If this tree was also a 2nd or 3rd of the other plot within the section it would need to be Linked to that plot.

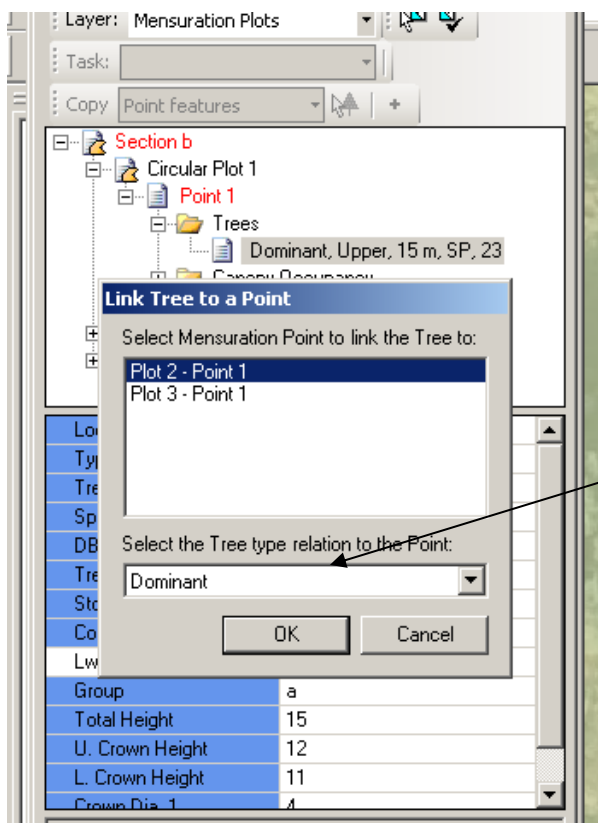


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The tree now needs to be linked to that plot. Right click on the tree record to be linked and choose the 'Link Tree to a Mensuration Point'



Select which Plot to link it to:



Also choose what relation it has with the other point, e.g. 2nd Sample tree.

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14.7 Stump Assessments

14.7.1 Definition

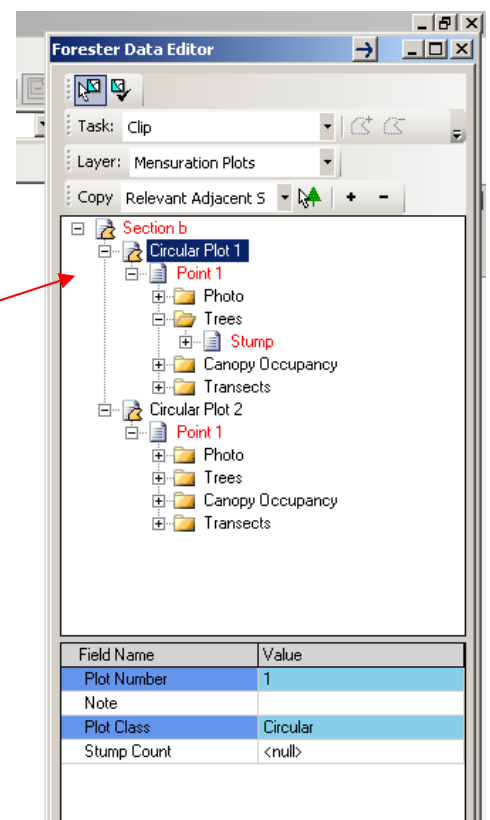
A stump is defined as a part of a tree stem that still has roots attached to the ground, is less than 1.3m in height and has no visible live shoots. Minimum diameter of the stool/stump is 4cm.

Where there is some ambiguity over whether a stump is still a stump or not (e.g. a moss covered mound) surveyor discretion is allowed.

Coppice stools – assess the stool and not individual stems connected to it. Assess to the outside of the stool.

14.7.2 Stump Counts – Circular Plots and Whole Section points

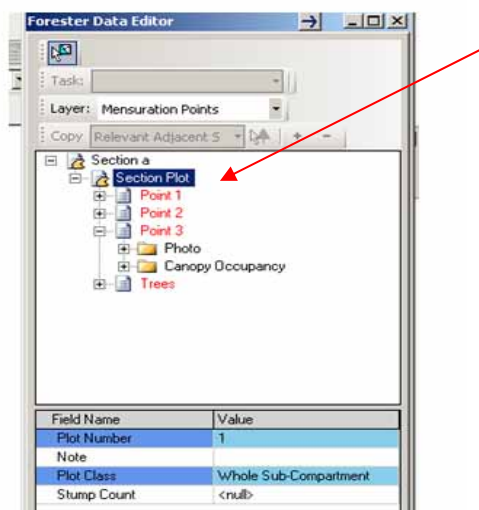
The assessment of stumps for Circular Plots and Whole Section Points is essentially the same with the only difference with respect to where in the software the data is entered. At the Circular Plot level, or Section level for Whole Section plots, **a Stump Count is required for all stumps within 5.64m of the plot centre/Point.** Where stumps are found the following fields need to be filled in (see 14.7.2.1):



The screenshot shows the 'Forester Data Editor' interface. The 'Task' is 'Clip', the 'Layer' is 'Mensuration Plots', and the 'Copy' field is 'Relevant Adjacent 5'. The tree structure is as follows:

- Section b
 - Circular Plot 1
 - Point 1
 - Photo
 - Trees
 - Stump
 - Canopy Occupancy
 - Transects
 - Circular Plot 2
 - Point 1
 - Photo
 - Trees
 - Canopy Occupancy
 - Transects

Field Name	Value
Plot Number	1
Note	
Plot Class	Circular
Stump Count	<null>



The screenshot shows the 'Forester Data Editor' interface. The 'Task' is empty, the 'Layer' is 'Mensuration Plots', and the 'Copy' field is 'Relevant Adjacent 5'. The tree structure is as follows:

- Section a
 - Section Plot
 - Point 1
 - Point 2
 - Point 3
 - Photo
 - Canopy Occupancy
 - Trees

Field Name	Value
Plot Number	1
Note	
Plot Class	Whole Sub-Compartment
Stump Count	<null>

14-16 Remember to Save your Edit Session Regularly, Validate the information and Backup the Data



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14.7.2.1 Stump data entry

1. Note – put any comments in here relating to the plot e.g. guide to location, any issues etc.
2. Stump Count – If there are stumps present within the plot (stump centre, location of original seedling, must be within the plot circumference) enter 'Yes'. If there are no stumps leave as <null>.

Enter the number of stumps, visually assessed, within the following size categories:

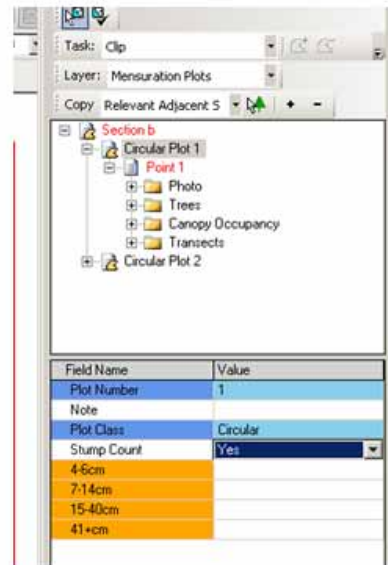
- 4-6cm
- 7-14cm
- 15-40cm
- 41+cm

Size based on visually estimated mean diameter.

All fields must be completed. Where there are no stumps within a given category enter '0'.

Note that the stump nearest to the centre of the plot/Point must be included in the count above AND mapped and measured. For Circular plots these are entered into the Trees folder for each plot. For Whole Section plots these are entered into the Trees folder. See Section 14.7.3 for more details.

Where the stump plot crosses a Section boundary the stumps are only assessed within the Section the plot centre/Point is allocated to. Where the stump plot crosses a Square boundary the stumps can be assessed outside the Square as long as any such area is a continuation of the Section.

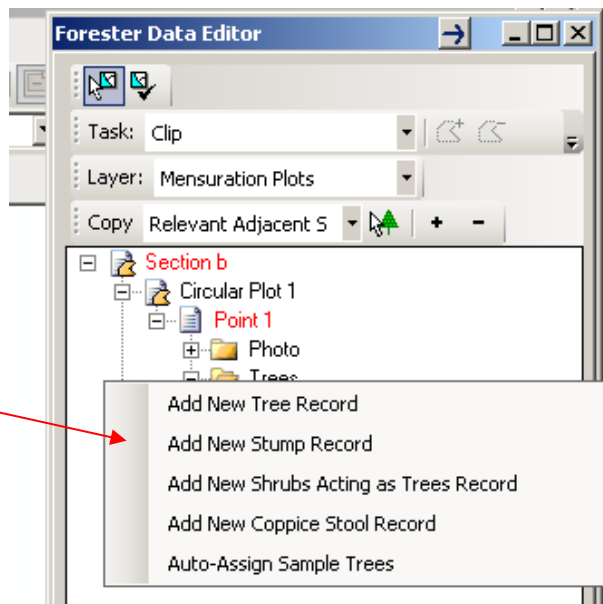


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14.7.3 Mapping & Assessing nearest stump to plot/point centre

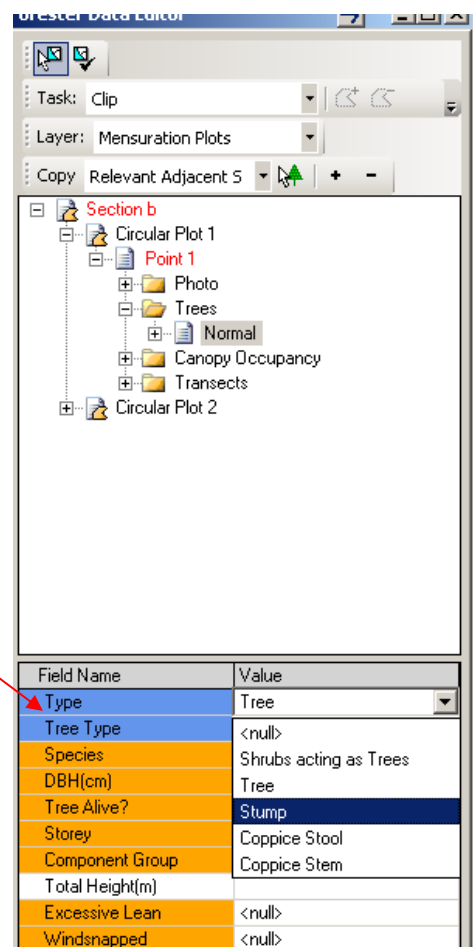
There are two ways to add stumps in Circular and Whole Section plots:

1) Right click on the Trees folder to get a list of options including ADD New Stump Record



OR

2) Click on the Tree Type field within the Normal tree folder to get a list of options including Stump.



14-18 Remember to Save your Edit Session Regularly, validate the information and Backup the Data



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Fill out the Data Fields as required:

Table 14 - 4: Stump Data Fields

Data Field	Options	Comments
Location		Map the location of the Stump - <i>The position of the nearest stump to the plot centre is mapped in the same way as a tree –14.4 Mapping the tree position.</i>
Type	<ul style="list-style-type: none"> • Shrubs Acting as Trees • Tree • Stump • Coppice Stool • Coppice Stem 	Choose Stump
Stumps Present	<ul style="list-style-type: none"> • <Null> • Yes 	Choose Yes if Stumps present. If no Stumps are present in the plot choose 'Null'. The 'Trees' category may not validate if surveyors do not do this when stumps are not present.
If 'Yes' is chosen for 'Stumps Present' surveyors will need to fill in the following		
Species Group	<ul style="list-style-type: none"> • Spruce • Pine • Broadleaved • Other Conifer 	Choose the class the stump fits into.
Stump height (cm)	Free text to 1 decimal place	Height – this is the mean height of the stump in cm. On a slope assess mid-way up the slope.
Diameter 1	Free text to 1 decimal place	Diameter 1 – assessed North to South. Estimation may be necessary if the stump is covered in mosses (do not disturb the vegetation on the stump)
Diameter 2	Free text to 1 decimal place	Diameter 2 - assessed East to West
Decay Class	<ul style="list-style-type: none"> • 8 • 9 	<ul style="list-style-type: none"> • Fresh stump, still fairly solid • Older, partially or almost fully rotted stump. See Chapter 20.0 for more details
Coppice Stool	<ul style="list-style-type: none"> • No • Yes 	Is this a coppice stool?