

# Chapter 19: Linear Features

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## 19.0 Linear Features


Linear Features are drawn to highlight the spatial location of Cultural Boundaries, Woodland Edges, Transport links, Recreation features, Hazards and Water Features.

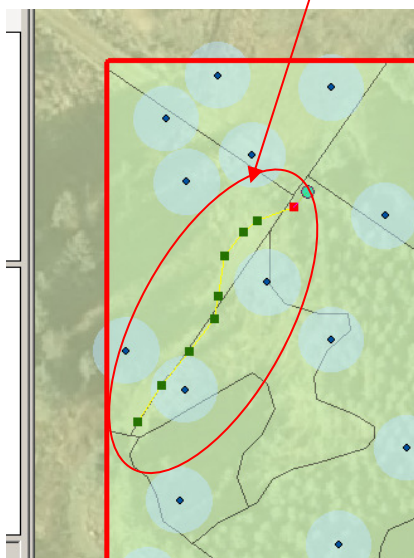
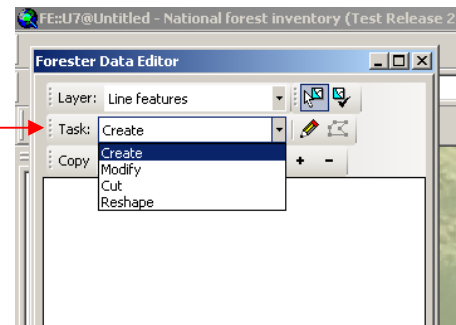
Linear features need only to be recorded within NFI Treed and NFI Open Sections and up to 10m outside the woodland edge (in Open non-NFI sections). The exception to this is where the Linear feature is a H&S issue. The definition of H&S in this instance is where it would impact upon a surveyor getting to, and assessing, the sample square. For instance if the western 50% of a square is non-NFI open land which needs to be crossed to access the woodland then any H&S issues should be assessed. If, however, the surveyor approaches this square from the east and does not need to cross the western 50% then mapping of the H&S issues within the western part of the square is not required.

### 19.1 Create Linear Features

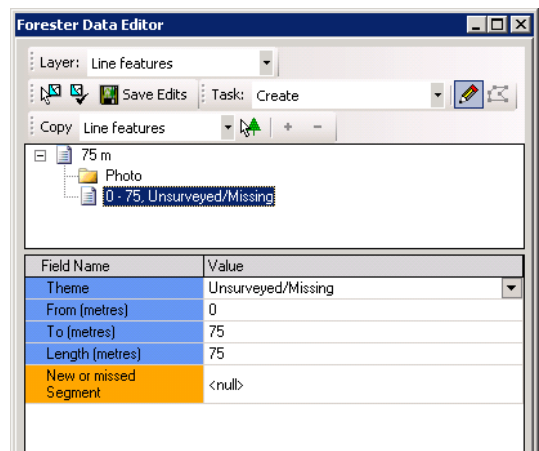
In the Data Editor choose Line Features from the Layer drop down menu and then Create from the Task menu.



Select the  button and click on the screen to highlight the location of the line. Ignore the Feature Construction pop-up box.



Double click to complete the line. Within the Data Editor window Data Fields will appear.



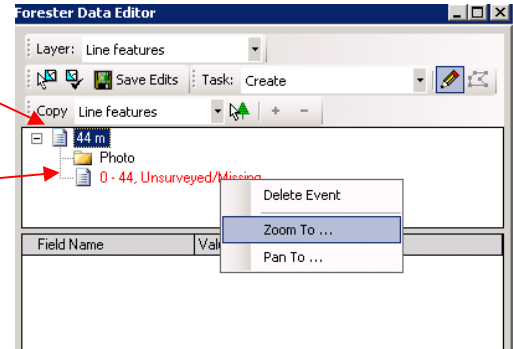
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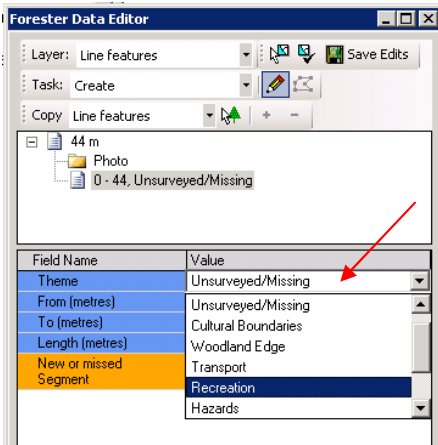
A Linear Feature can denote a single or multiple Themes along a line. By changing the 'From' and 'To' Data Fields along the length of the Linear Feature, different Themes can be allocated to a single line along different parts of the length. For example, a wall and a fence may share the same line in parallel or first one half and then the other.

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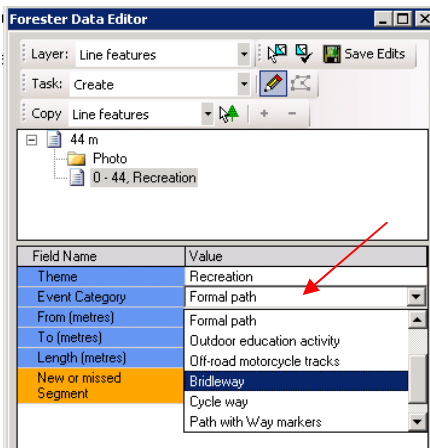
Linear Features can be Added, Deleted, Zoomed To and Panned To by right clicking on the Feature length in the Data Editor window. Delete, Zoom To and Pan To can also be accessed by right clicking on the Linear Feature information.



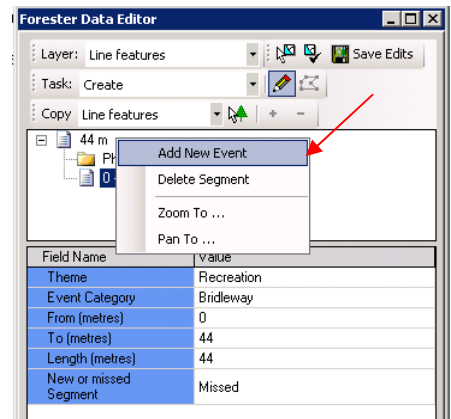
Linear Theme choices available in drop down menu.



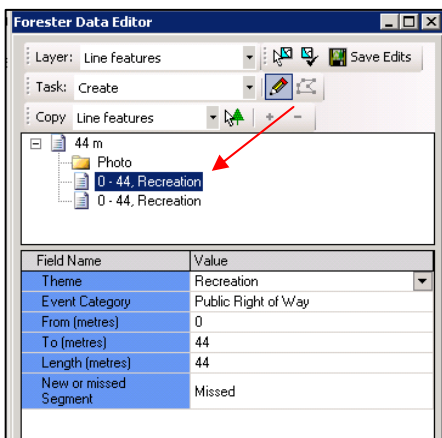
Event Category then selected from drop down menu.



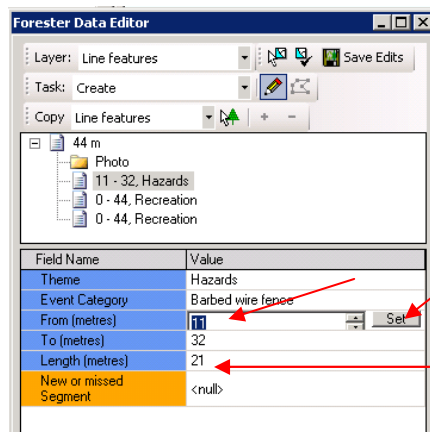
New Event theme can be added for multiple values on the line with RH click on top line.



Multiple Events can be added on the same line.



Events along partial lengths –adjust From and to distances.



NB Partial Length

## 19.2 Theme Data

### 19.2.1 Initial Data Fields until Theme is chosen

**Table 19 - 1: Linear Features Themes Data Fields**

<b>Data Field</b>	<b>Options</b>	<b>Comments</b>
Theme	<ul style="list-style-type: none"> <li>• Unsurveyed/Missing</li>   <li>• Cultural Boundaries</li> <li>• Woodland Edge</li> <li>• Transport</li> <li>• Recreation</li> <li>• Hazards</li> <li>• Water Feature</li> <li>• Smallwoods Hedge?</li> <li>• Not Surveyed?</li> </ul>	<ul style="list-style-type: none"> <li>• The line has been recorded, e.g. from map data, but not surveyed and no Theme added.</li>   <li>• Choose appropriate theme.</li> </ul>
<b>The next 3 Data Fields relate to where, on the Linear Feature, a Theme is.</b>		
From (metres)	Set by the software initially but can be changed by surveyor	Change the value either using the Set buttons, the pen or by free text.
To (metres)	Set by the software initially but can be changed by surveyor	Change the value either using the Set buttons, the pen or by free text.
Length (metres)	Calculated by software	Do not change this value

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## 19.2.2 Common Data Fields for all Themes

If a Theme other than Unsurveyed/missing is chosen the following data Fields appear:

**Table 19 - 2: Theme Common Data Fields**

<b>Data Field</b>	<b>Options</b>	<b>Comments</b>
Visit Status	<ul style="list-style-type: none"> <li>• Unvisited</li> <li>• In progress</li> <li>• Completed</li> <li>• Refused Access</li> <li>• Inaccessible</li> </ul>	<ul style="list-style-type: none"> <li>• The line has been drawn from map data but not visited yet</li> </ul> <p>In progress can be used if surveyor needs to leave the site before completing data entry (e.g. it gets dark before completion)</p>
Reason for Change	<ul style="list-style-type: none"> <li>• No change</li> <li>• Real change</li> <li>• Error change</li> <li>• Spatial error</li> <li>• 1<sup>st</sup> Assessment</li> <li>• Original</li> </ul>	<ul style="list-style-type: none"> <li>• For use in the 2<sup>nd</sup> NFI</li> <li>• For use in the 2<sup>nd</sup> NFI</li> <li>• A change in the data due to an error found by IFOS</li> <li>• As above but a Spatial error</li> <li>• The normal Reason – the 1<sup>st</sup> assessment of the site</li> <li>• Unchanged data from IFOS</li> </ul>

## 19.2.3 Cultural Boundaries Theme

**Table 19 - 3: Cultural Boundaries Data Fields**

<b>Data Field</b>	<b>Options</b>	<b>Comments</b>
Event Category	<ul style="list-style-type: none"> <li>• Fence (internal or external)</li> </ul>	<ul style="list-style-type: none"> <li>• Any type of fence unbroken along its length but can be in good to very poor repair. If fence is broken map separate lengths.</li> </ul> <p>NB: Electric and Barbed wire fences also come under Hazards and should be assessed as both.</p>

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	<ul style="list-style-type: none"> <li>• Wall</li> <li>• Hedge</li>   <li>• Avenue</li>   <li>• Ditch</li>   <li>• Woodbank</li>   <li>• Earthworks</li>   <li>• Historic (old) Pollarding</li> </ul>	<ul style="list-style-type: none"> <li>• As above but any type of wall</li> </ul> <p>A hedge or hedgerow is a line of closely spaced shrubs and tree species, planted <b>or</b> trained in such a way as to form a barrier or to mark the boundary of an area. <b>This includes mature overgrown hedgerows as well as those that are maintained.</b></p> <ul style="list-style-type: none"> <li>• Traditionally, an avenue is a straight road with a line of trees or large shrubs running along each side, it can also be a single line of trees</li> <li>• A ditch is usually defined as a small to moderate depression created to channel water.</li> <li>• A feature often associated with a ditch that in the past had a wall or hedge on top to keep grazing animals out.</li> <li>• In archaeology, earthworks are artificial changes in land level often known as 'lumps and bumps'.</li> <li>• Evidence of old pollarding. Pollarding is a pruning system in which the tree is cut back (tree stem or minor branches removed) above the browse line as part of management. This pruning encourages lateral branches and is normally done two or three metres above ground</li> </ul>
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		level.
Type	<p>Choice is dependent upon <u>Event Category</u>:</p> <p><u>Fence</u></p> <ul style="list-style-type: none"> <li>• Deer</li> <li>• Pheasant pen</li> <li>• Electrical</li> <li>• Security fencing</li> <li>• Stock</li> </ul> <p><u>Wall</u></p> <ul style="list-style-type: none"> <li>• Stone</li> <li>• Brick</li> </ul> <p><u>Hedge</u></p> <ul style="list-style-type: none"> <li>• Dead Hedge</li> <li>• Hawthorn</li> <li>• Beech</li> <li>• Mixed</li> <li>• Ancient</li> <li>• New</li> </ul> <p><u>Avenue</u></p> <ul style="list-style-type: none"> <li>• No 'Type' choices</li> </ul> <p><u>Ditch</u></p> <ul style="list-style-type: none"> <li>• No 'Type' choices</li> </ul> <p><u>Woodbank</u></p> <ul style="list-style-type: none"> <li>• No 'Type' choices</li> </ul> <p><u>Earthworks</u></p> <ul style="list-style-type: none"> <li>• No 'Type' choices</li> </ul> <p><u>Historic (old) pollarding</u></p> <ul style="list-style-type: none"> <li>• No 'Type' choices</li> </ul>	



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## 19.2.4 Woodland Edge

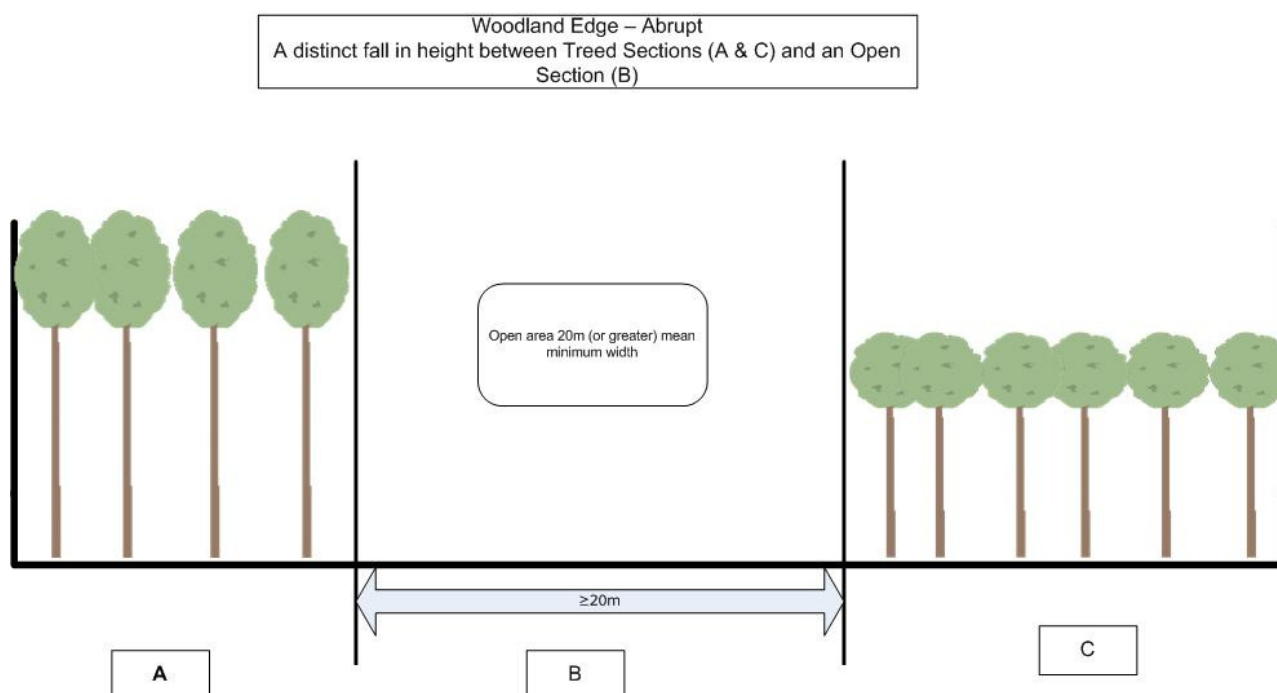
Where a Treed Section is adjacent to an Open Section (whether within or without the NFI external map boundary) which has a minimum mean width of 20m (including going outside the Square boundary) then a description of the woodland edge between the two Sections is required.

**Table 19 - 4: Woodland Edge Data Fields**

Data Field	Options	Comments
Event Category	<ul style="list-style-type: none"><li>• Abrupt Edge</li><li>• Tapered By Height</li><li>• Variable Density Ecozone</li></ul>	See below for details

### 19.2.4.1 Abrupt Edge

An Abrupt Edge is defined by an abrupt change from Treed to non-treed. Ideal examples of this are a treed section next to an agricultural field or a treed section adjacent to a public highway.



**Figure 19 - 1: Woodland Edge - Abrupt**

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## 19.2.4.2 Tapered by Height

The boundary between the Treed Section and Open Section is less abrupt and gradually reduces moving from the treed section into the open area. An example would be natural regeneration spreading from the Treed Section out into an open area.

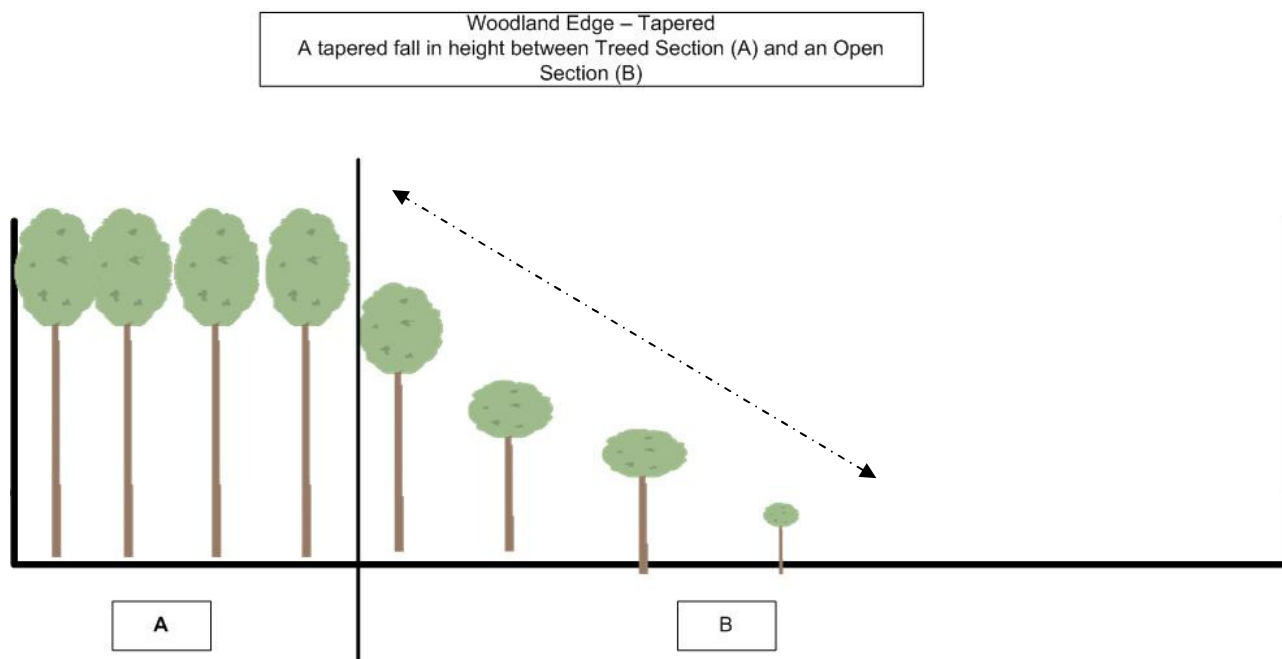


Figure 19 - 2: Woodland Edge - Tapered

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## 19.4.2.3 Variable Density Ecozone

The fall in height from the treed section to the open section is more varied and tree heights do not decrease as regularly moving away from the Treed Section as in the Tapered Woodland Edge.

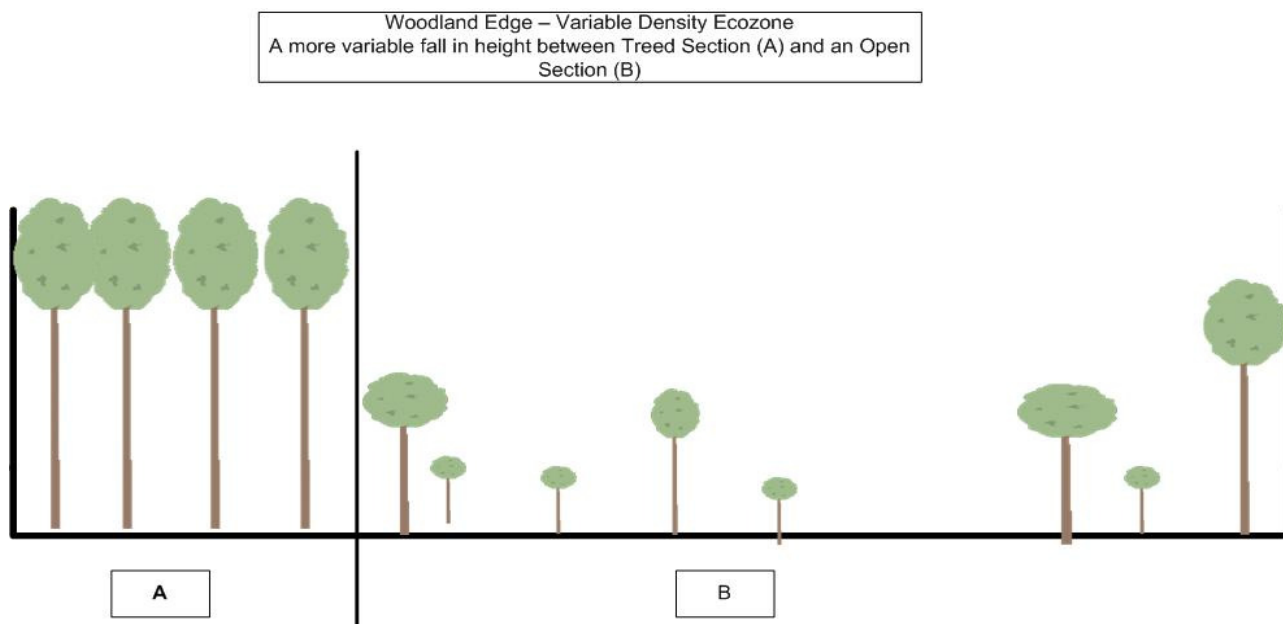


Figure 19 - 3: Woodland Edge – Variable Density Ecozone

## 19.2.5 Transport

Table 19 - 5: Transport Data Fields

Data Field	Options	Comments
Event Category	<ul style="list-style-type: none"> <li>• Public Road</li> <li>• Railway</li> <li>• Public greenway</li> <li>• Forest Road - sealed surface</li> </ul>	<ul style="list-style-type: none"> <li>• A road over which the public has the right of access. Also includes Private roads.</li> <li>• A railway track of any gauge</li> <li>• A greenway is a historical right of way for any persons or vehicles usually denoted by a lack of surface, often used for recreation and pedestrian and bicycle traffic</li> <li>• A road through the forest for use by the owner and workers – tarmacadamed</li> </ul>

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	<ul style="list-style-type: none"> <li>• Forest Road - unsealed surface</li> <li>• Ride sealed surface</li> <li>• Ride unsurfaced</li> <li>• Extraction rack – Dozed</li> <li>• Extraction rack</li> <li>• Soil damaged and compacted through Ops.</li> </ul>	<ul style="list-style-type: none"> <li>• As above but metalled not tarmacadamed</li> <li>• Rides are often vegetated, un-metalled or un-surfaced corridors often giving access to or through a forest. They also include de-classified CAT 1A roads that are no longer maintained but still surfaced.</li> <li>• Rides are vegetated, un-metalled or un-surfaced corridors often giving access to or through a forest.</li> <li>• A dozed path through the forest that is used to extract timber (assign Linear Feature to the main Rack only)</li> <li>• A path through the forest that is used to extract timber (assign Linear Feature to the main Rack only)</li> <li>• Soil that has been obviously damaged (e.g. deep ruts) and/or compacted by forestry vehicles</li> </ul>
Road Width	Widths in 2m increments, e.g. 0-2m, 2-4m....	<ul style="list-style-type: none"> <li>• Choose most appropriate for the mean road width within along the linear feature</li> </ul>

### 19.2.6 Recreation

**Table 19 - 6: Recreation Data Fields**

<b>Data Field</b>	<b>Options</b>	<b>Comments</b>
Event Category	<ul style="list-style-type: none"> <li>• Public Right of Way</li> <li>• Informal Path</li> <li>• Formal path</li> <li>• Outdoor education</li> </ul>	<ul style="list-style-type: none"> <li>• Footpaths, bridleways and byways which give members of the public the right to travel across land.</li> <li>• Where people walk but there are no formal signs etc.</li> <li>• A planned and created pathway</li> <li>• Any linear outdoor education facility</li> </ul>

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	<p>activity</p> <ul style="list-style-type: none"> <li>• Off-road motorcycle tracks</li> <li>• Bridleway</li> <li>• Cycle way</li> <li>• Path with Way markers</li> </ul>	<ul style="list-style-type: none"> <li>• Tracks for off-road motorcycles</li> <li>• A track along which the public have a right to walk or ride horses.</li> <li>• Segregated cycle facilities are roads, tracks, paths or marked lanes designated for use by cyclists from which motorised traffic is generally excluded</li> <li>• A path with markers to guide users along routes.</li> </ul>
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### 19.2.7 Hazards

**Table 19 - 7: Hazards Data Fields**

<b>Data Field</b>	<b>Options</b>	<b>Comments</b>
Event Category	<ul style="list-style-type: none"> <li>• Powerlines overhead</li> <li>• Powerlines underground</li> <li>• Gas lines underground</li> <li>• Telephone lines overhead</li> <li>• Cliff</li> <li>• Steep ground</li> <li>• Other Hazard</li> <li>• Scheduled Monument</li> <li>• Mine area</li> <li>• No Go Area</li> <li>• Working quarry</li> <li>• Abandoned quarry</li> <li>• Dangerous scree/boulders</li> <li>• Electric fence</li> <li>• Barbed wire fence</li> </ul>	<ul style="list-style-type: none"> <li>• Self explanatory</li> <li>• Self explanatory</li> <li>• Self explanatory</li> <li>• Self explanatory</li> <li>• Self explanatory</li> <li>• A slope of <math>\geq 33\%</math> (<math>\geq 18^\circ</math>)</li> <li>• Any other hazard</li> <li>• Self explanatory</li> <li>• Self explanatory</li> <li>• Self explanatory</li> <li>• Self explanatory</li> <li>• Self explanatory</li> <li>• Self explanatory</li> <li>• Self explanatory</li> <li>• Self explanatory</li> </ul>
Comments (if Other Hazard chosen in Event Category)	Free text	Make a note on what the hazard is.

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## 19.2.8 Water Feature

**Table 19 - 8: Water Feature Data Fields**

Data Field	Options	Comments
Event Category	<ul style="list-style-type: none"> <li>• Ditch/Drain</li> <li>• Stream</li> <li>• River</li> <li>• Canal</li> </ul> <p><b>Note that if any areas of Active Erosion or any Dams seen along a water feature should be located as a Point feature.</b></p>	<ul style="list-style-type: none"> <li>• The Main Ditch/Drains in a Section</li> <li>• A stream is a body of water with a current, confined within a bed and stream banks. For the NFI the mean width of the stream along its mapped length must be &lt;5m.</li> <li>• A river is a natural watercourse, usually freshwater, normally flowing toward an ocean, a lake, or another river. For the NFI the mean width of the river along its mapped length must be ≥5m.</li> <li>• Canals are human-made channels for water. There are two types of canal:               <ol style="list-style-type: none"> <li>I. <u>Aqueduct</u> (or water conveyance) canals that are used for the conveyance and delivery of fresh water, for human consumption, agriculture, etc.</li> <li>II. <u>Waterway</u> canals that are navigable transportation canals used for carrying ships and boats loaded with goods and people, often connected to existing lakes, rivers, or oceans</li> </ol> </li> </ul>
Water Feat. Width	Widths in 1m increments e.g.:0-1m, 1-2m... Up to: <ul style="list-style-type: none"> <li>• 20m+</li> </ul>	Estimate the MEAN width of the Water Feature over its mapped length.
Water Feat. Depth	<ul style="list-style-type: none"> <li>• Depths in 1m increments, up to 5m+, plus</li> <li>• Dry</li> </ul>	Estimate the MEAN depth of the Water Feature over its mapped length on the day of the assessment.

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For Streams, Rivers and Canals the following also have to be completed		
Contaminants	<ul style="list-style-type: none"> <li>• None</li> <li>• Woody harvesting and fallen tree debris</li> <li>• No list A, possibly min. list B litter present</li> <li>• Traces of list A and/or occasional List B</li> <li>• List A widespread &amp; / or occasional or widespread List B</li> </ul>	<ul style="list-style-type: none"> <li>• Self explanatory</li> </ul> <p>See below for LIST A and B contaminants</p>
Tree Shading %	Free text (numerical)	The proportion of the feature that is shaded by trees.

## 19.2.8.1 Contaminants list

**Table 19 - 9: Water contaminants list**

<b>List A contaminants</b>	<b>List B contaminants</b>
Sewage derived litter and solids, including <ul style="list-style-type: none"> <li>- faeces</li> <li>- toilet paper</li> <li>- contraceptives</li> <li>- sanitary towels</li> <li>- tampons</li> <li>- cotton buds</li> </ul> Oils Non natural foam, scum or colour Sewage fungus Sewage or oily smells	General non sewage derived litter Builders waste Gross litter, including <ul style="list-style-type: none"> <li>- shopping trolleys</li> <li>- furniture</li> <li>- motor vehicles</li> <li>- road cones</li> <li>- bicycles/prams</li> </ul>

## 19.3 Re-measure squares

### 19.3.1 Existing Linear Features

For each entity (e.g. road) a single field will be chosen at random to be confirmed by the surveyor. This is an 'aide' memoir' to remind surveyors to check everything observed by the previous surveyor. Likewise some fields will be left blank or incorrect values have been inserted to keep people on their toes.

### 19.3.2 Tolerances

When assessing whether a linear feature assessed by a previous surveyor is correct or not the surveyor should bear the following tolerances in mind:

- In the feature within 10m of where the current surveyor feels it should be?
- Is the feature in the correct place spatially in relation to other features, sections etc.? I.e. is it on the correct side of building or section?
- Are the attributes recorded against it reasonable, e.g. is it a fence rather than a wall? Is it 2-4m wide rather than 10-11m wide for a stream?

### 19.3.3 New Linear Features

Where a new Linear Feature is recorded the surveyor will be asked if this is a New, Missed or Evolved feature.

**New** – A linear feature that has been created since the last survey e.g. a new forest road has been created.

**Missed** – a linear feature that was obviously present during the last survey but was not created by the previous surveyor

**Evolved** – A linear feature that has changed and evolved since the last survey. An example of this would be a dry stone wall that was only partially built at the time of the last survey but now extends further than the previously created linear feature.