Chapter 9: Sub-Component Data

Contents

1st Assessment (New) Squares

Sub–components are used to describe events or characteristics of a component that can occur more than once per component. For example an oak component /area, may have been thinned multiple times, or it may have more than one type of shrub growing beneath it.

9.1 Components with trees

Double click on the Component (highlighted in the figure opposite), or single click on the + sign next to the Component, to add sub-component data.

Fill out the sub-components.

9.2 Components without trees

Note that fewer data Fields that need to be filled in for a non-tree area.

9.3 Photo

Photos are very useful to describe or highlight issues.

Mandatory: any Pest & Disease or Tree Health issue within the Component must have a photo taken with an appropriate comment, e.g. Chalara, to highlight the issue.

Optional: Photos of interest within the Component

Right click on the Photo sub-component to Add New Photo.
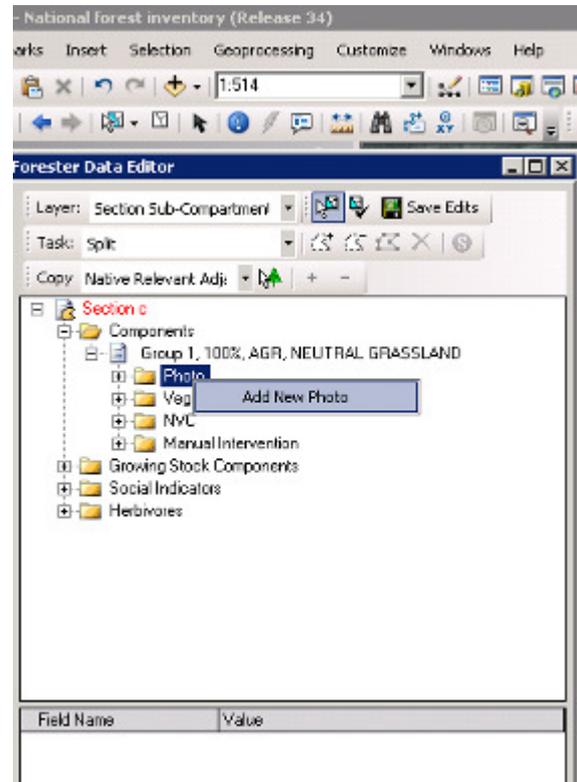
Browse to the folder holding the photo file.
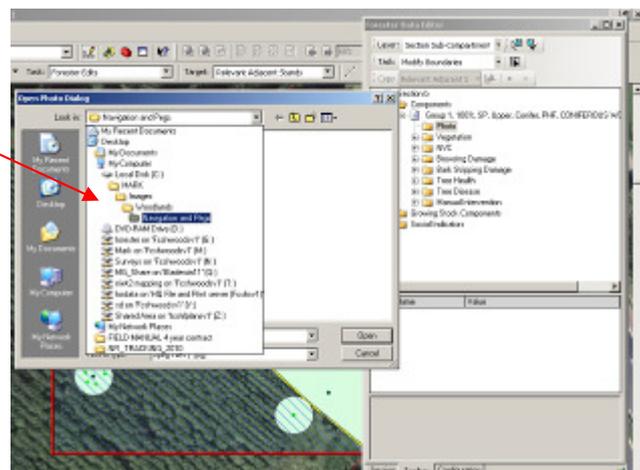
Locate the photograph and Open it. The photo will appear in the Forester Data Editor screen.

Fill in the following Fields:

Table 9 - 1: Sub-component Data Fields

Field Name	Value	Comments
Photo Date	Blank until the Value box is clicked on then the current date is automatically filled in.	Edit the date as required.
Comment	Blank	Add in any useful comments
Include in Checkout	No Yes	To include the photo in the Checkout so that the FC gets the photo click on 'Yes'.
Photo file	filename	Filename for the photo
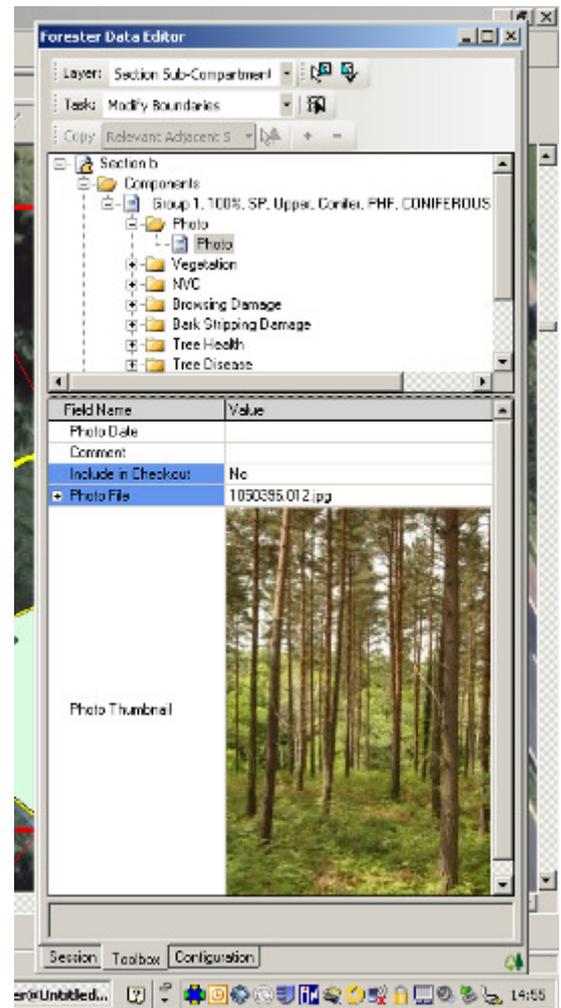
9.4 Vegetation

The vegetation that sits underneath a tree canopy and the vegetation that grows between the gaps in canopy are an integral part of the woodland ecosystem. Similarly the vegetation that grows adjacent to woodland also has a direct impact on the quality of that woodland habitat.

Therefore the location, composition, and richness of vegetation both in and around woodland impacts directly on the overall condition of woodland habitat. Rich and diverse vegetation is 'good' in itself, but if that is in combination with good quality tree cover the habitats becomes one that hosts the highest levels of overall biodiversity value, providing a unique and valuable habitat for flora and fauna.

It is for these reasons that we assess vegetation cover. When assessing vegetation cover you will need to consider:

- Vegetation under canopy
- Vegetation outside the canopy.
- The extent of that vegetation.
- The species composition of vegetation.
- The physical layering or structure of the vegetation.

The physical 'layering' or structure of that vegetation (its height) is important to ascertain, as different depths of vegetation provide different habitat niches for different species. NFI classifies vegetation into 3 height strata; shrub layer, field layer and ground layer.

Tree Canopy

Shrub layer (2m-5m)

Field layer (10 cm to 2m)

Ground layer (0cm to 10cm)
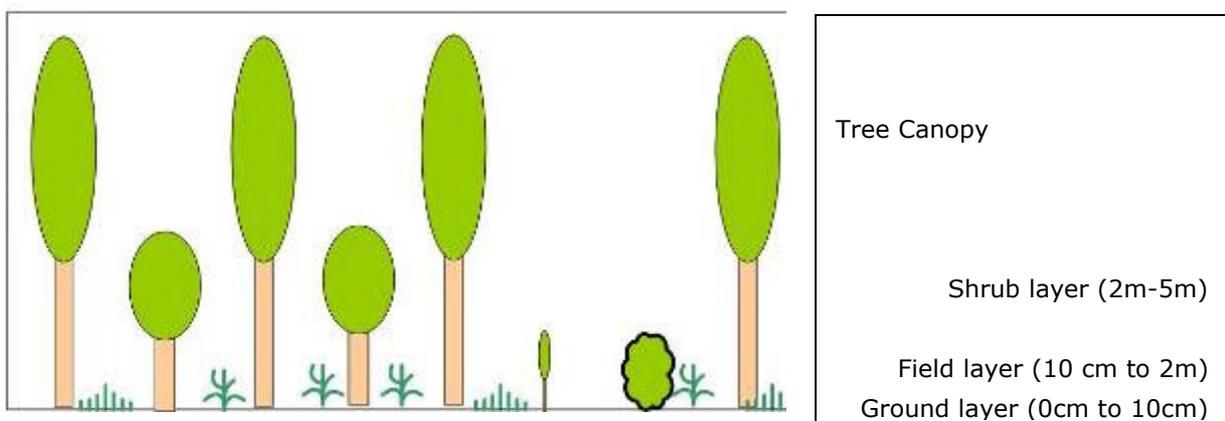
Vegetation data is always assessed for each individual Component or Component Group within all Sections regardless of whether the Component Group is in open, treed, NFI or non-NFI Sections. The data is recorded against all the Components within the lowest storey of the Component or Component Group. If there is a Seedling Trees storey then it is recorded against all the components within this storey. If there is only an Upper storey then the vegetation is recorded against the Components in this Storey.

For all Storeys above the lowest Storey delete the red vegetation record by right clicking on it and choosing Delete. Failure to do this will result in a validation error.

Double click on the Vegetation folder to get the red Vegetation field.
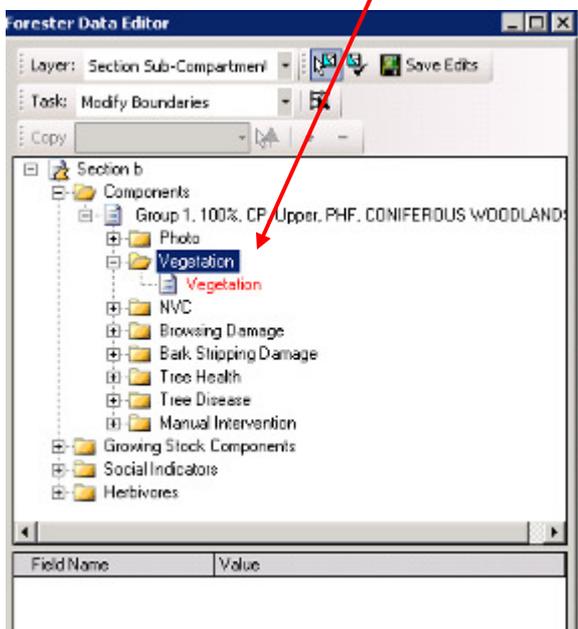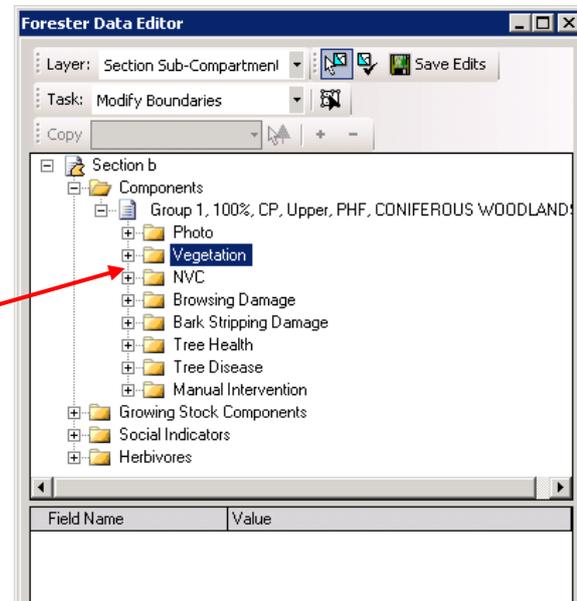
Click on the red Vegetation field to get the Layer Data Field.
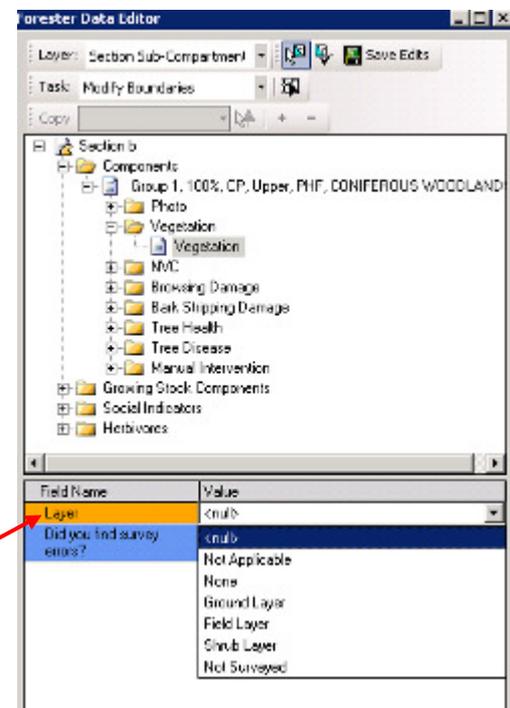
Table 9 - 2: **Vegetation Layer field drop down menu:**

Data Field	Options	Comments
Layer	Not surveyed	For use where vegetation cannot be assessed. E.g. due to snow cover, flooding etc., or the surveyor could not complete the assessment for any other reason.
	Not Applicable	For landuses where no surface vegetation can physically occur such as deep open water, tarmacadam, a road, caravan standings etc., or the protocol does not require assessment against that landuse.
	None	None; means no vegetation at all within the 0-5m band where it may be expected to grow. For example where growth is inhibited due to artificial substrates; Astroturf, rubber chips, or matting, or natural products such as sand, mulch matting, bark chips etc.
	Ground Cover	To qualify as a ground layer category it must be: • A non-plant category at ground level (e.g. soil, water) or, • A plant category ≤10 cm high estimated for the middle of the growing season. The surveyor is not expected to search every square centimetre of the Section to ensure every single plant species has been accounted for. However the main categories present should become evident as the whole survey is progressed over the day/days. In turn these should be recorded. This 'broad sweep' assessment can be calibrated against the plant categories located near to mensuration assessment areas. Plants/plant groups intimately mixed with a taller field layer do not qualify.

	Field Layer	Herbaceous vegetation, woody perennials and sapling trees, over 10 cm tall and <2 m, including woody perennials such as honeysuckle, bramble, raspberry etc. It may also include tree seedlings, saplings and suckers and shrub species which do not exceed the surrounding vegetation by 50 cm in height.
	Shrub Layer	Shrub Layer (≈2 - 5m) – the majority of the 'canopy' of the plant/group needs to be within the height band to qualify as Shrub layer. Includes woody plants which are less than 5m tall or, if taller, has at least 50% of their crown volume below 5m, and must exceed the surrounding field or ground layer vegetation by at least 50cm in height.

9.4.1 Ground Layer categories

Table 9 - 3: Ground Layer vegetation categories

Category	Comments
Aquatic Plants	
Bare Soil	
Cotton-grass – Hare's-tail	
Cotton-grass – other	
Fungi	
Grasses – Broadleaf	Leaf blade is flat (has a top, bottom and two edges) and may be very narrow (1mm). Only applicable in this level if the site is regularly grazed throughout the year or heavily suppressed.
Grasses – Fineleaf	Leaf blade tightly in-rolled i.e. bristle like. Only applicable in this level if the site is regularly grazed throughout the year or heavily suppressed.
Honeysuckle	
Ivy	
Leaf Litter	
Lichens	
Mosses and Liverworts	
Other Plants: Native	Where a plant does not fit into any of the other categories, e.g. violets, wood sorrel
Other non-native plants	Where a plant does not fit into any of the other categories, e.g. violets, wood sorrel and is non-native
Rock	
Tree Seedlings: Native	Ensure that Seedling Tree Storey Components are completed
Tree Seedlings: Non-native	Ensure that Seedling Tree Storey Components are completed
Tree Suckers: Native	Ensure that Seedling Tree Storey Components are completed
Tree Suckers: Non-native	Ensure that Seedling Tree Storey Components are completed
Water	

9.4.2 Field Layer categories

Table 9 – 4: Field Layer vegetation categories

Category	Comments
Agricultural Crop	
Bilberry	
Blackthorn	
Box	
Bracken	
Bramble	
Broom	
Buddleia	If this plant is seen it must be notified.
Cotoneaster: non-native	If this plant is seen it must be notified.
Cotton-grass – Hare's tail	
Cotton-grass – other	
Dogwood	
Dwarf Shrubs – Other	
Dwarf shrubs – Heather (*Calluna*)	
Elder	
Ferns	
Forbs	Definition: Non-woody, herbaceous plants (excluding grasses, sedges and rushes) that die back each winter or last only one season.
Giant Hogweed	If this plant is seen it must be notified.
Giant-rhubarb (*Gunnera*)	If this plant is seen it must be notified.
Gorse – Common	
Gorse – Dwarf	
Gorse – Western	
Grasses – Broadleaf	Leaf blade is flat (has a top, bottom and two edges) and may be very narrow (1mm).
Grasses – Fineleaf	Leaf blade tightly in-rolled i.e. bristle like.
Himalayan Balsam	If this plant is seen it must be notified.
Honeysuckle	
Horsetails	
Hottentot-fig	If this plant is seen it must be notified.
Ivy	
Japanese Knotweed	If this plant is seen it must be notified.
Juniper	
Laurel	
Mosses and Liverworts	

Other plants - Native	
Other Plants: Non-native	
Other Shrubs: Native	
Other Shrubs: Non-native	
Other Woody Climbers	E.g. clematis, dog-rose.
Ragwort	If this plant is seen it must be notified.
Rhododendron	If this plant is seen it must be notified.
Rushes	
Sedges	
Shallon	If this plant is seen it must be notified.
Snowberry	If this plant is seen it must be notified.
Spanish Bluebell	If this plant is seen it must be notified.
Spindle	
Tree Saplings: Native	Ensure that Sapling Tree Storey Components are completed
Tree Saplings: Non-native	Ensure that Sapling Tree Storey Components are completed
Tree Seedlings: Native	Ensure that Sapling Tree Storey Components are completed
Tree Seedlings: Non-native	Ensure that Sapling Tree Storey Components are completed
Tree Suckers: Native	Ensure that Seedling/Sapling Tree Storey Components are completed
Tree Suckers: Non-native	Ensure that Seedling/Sapling Tree Storey Components are completed
Wild Privet	
Wood-rushes	

9.4.3 Shrub Layer

Table 9 – 5: Shrub Layer vegetation categories

Category	Comments
Blackthorn	Do not use – this is defined within the NFI as a tree species only and should be recorded as a Component.
Box	
Broom	
Buddleia	If this plant is seen it must be notified.
Cotoneaster: Non-native	If this plant is seen it must be notified.
Dogwood	
Elder	
Giant Hogweed	If this plant is seen it must be notified.

Gorse – Common	
Gorse – Dwarf	
Gorse – Western	
Honeysuckle	
Ivy	
Juniper	
Laurel	
Other plants - Native	
Other Plants: Non-native	
Other Shrubs: Native	
Other Shrubs: Non-native	
Other Woody Climbers	E.g. clematis, dog-rose.
Rhododendron	If seen this plant must be recorded.
Shallon	If seen this plant must be recorded.
Snowberry	If seen this plant must be recorded.
Spindle	
Tree Saplings: Native	Ensure that Sapling Tree Storey Components are completed
Tree Saplings: Non-native	Ensure that Sapling Tree Storey Components are completed
Tree Suckers: Native	Ensure that Seedling/Sapling Tree Storey Components are completed
Tree Suckers: Non-native	Ensure that Seedling/Sapling Tree Storey Components are completed
Wild Privet	

Depending upon the Layer chosen different Data Fields will appear and further assessment is required:

Not Applicable, not surveyed & None – No other Data Fields to complete
Ground, Field and Shrub Layers – see table below

Table 9 - 6: Vegetation Data Fields

Data Field	Options	Comments
Vegetation Name	Varies depending upon Layer Data Field choice	
Shrubs acting as trees (NB: Only visible if 'Shrub Layer' is chosen in the Layer data Field)	<null> Yes	Decide if the Shrub Layer vegetation chosen in the Vegetation Name is acting as a tree layer (see below). To answer 'Yes' the shrubs must

		be measurable (DBH ≥4cm).
% Cover	Free text	Enter % of Component area covered by the vegetation category (0-100%). 0% can be used in the rare circumstances where surveyors are certain that there is only a tiny coverage of the category (e.g. a single plant type)
If Rhododendron is chosen in the Vegetation name the following Data Fields appear:		
Height Class	• Less than 1.3m • More than 1.3m • No Rhododendron	
Management evidence	• No • Yes • Not Surveyed	Is there evidence of management of the Rhododendron?
Evidence of P. ramorum	• No • Yes • Not Surveyed	Is there evidence of *Phytopthera ramorum?*

Where Rhododendron has been completely cut back and there has been no regrowth by the time of the survey enter:

Layer: Shrub Layer
Vegetation name: Rhododendron
Shrubs acting as trees: <null>
% cover: 0%
Height Class: Less than 1.3m
Management evidence: Yes

9.4.4 Shrubs acting as trees

Where a proportion of a shrub species is displaying the morphology of a tree (a woody perennial forming a single self-supporting main stem (the potential to reach over 2 m) and having a definite crown that has the potential to reach 5m) that proportion should be recorded separately and as a 'tree component'.

For example: Laurel covers 50% of a Component Group of which 20% is acting as a tree. Record:

Data Fields	For the proportion acting as a tree:	For the proportion not acting as a tree:
Layer	Shrub Layer	Shrub Layer
Vegetation name	Laurel	Laurel
Shrubs acting as trees:	Yes	<null>
% cover:	20%	30%

Where a shrub is acting as a tree the shrub <u>also needs to be recorded as a measurable Component</u> as though it was a tree species, i.e. the shrub stems must be ≥4cm DBH.

In the component record in the shrub acting as tree field, select 'yes' and the species list provided will swap from tree species to a list of shrubs that can act as trees.

Mensuration assessments will be taken of these shrubs where they are included within a mensuration plot as though they were trees.

9.4.5 Adding, Deleting and Cloning records

If there is more than one vegetation layer or multiple species/species groups within vegetation layers 'Add' or Clone vegetation.

- Add by right clicking on the Vegetation folder to 'Add' a new vegetation record.
- Clone by right clicking on a vegetation record. Cloning is useful where a new record is similar to an existing record and can save entry time BUT it is vital that the new record is edited correctly.
- Delete by right clicking on a vegetation record.

9.4.6 Validation

The Vegetation folder lettering will turn from red to black if the % Cover Data Field/s is/are entered correctly. To do this, ensure the following:

- The combined total of the % cover data fields for Ground Layer and Field Layer equals 100%.
- No % cover, individually, is >100%

9.5 NVC

The National Vegetation Classification (NVC) is the standard classification for describing vegetation in Britain. It is a "phytosociological" classification, which means it classifies vegetation solely on the basis of the plant species of which it is composed.

You are expected to assess and record NVC types within woodland areas, but not in open areas. Whilst often you will have one NVC type per section, component group or component, occasionally you will have more than one NVC per component. The protocol and software thus allow you to assess and record more than one NVC per component.

The NVC breaks down each broad vegetation type into communities, designated by a number and a name e.g. W10 *Quercus robur - Pteridium aquilinum - Rubus fruticosus* woodland. Communities contain sub-communities which describe the range of floristic and structural variation within the community. These are designated by a letter e.g. W10b *Quercus robur - Pteridium aquilinum - Rubus fruticosus* woodland, *Anemone nemorosa* sub-community.

NVC is recorded against the **lowest** storey within the Component or Component Group. Thus if the Component Group only contains an Upper storey then NVC is recorded against the components within this storey. If it contains an Upper and a Seedling Tree storey then the NVC is recorded against the Seedling Tree storey.

NVC is always assessed for each individual treed Component Group regardless of whether the Component Group is NFI or non-NFI. The data is recorded against all the Components within the lowest storey of the Component Group.

For all Storeys above the lowest Storey delete the red NVC record by right clicking on it and choosing Delete. Failure to do this will result in a validation error.

9.5.1 Woodland NVC

The NVC woodland classification is based on more than 2500 samples taken from natural, semi-natural and planted woodlands throughout Britain.

There are 18 woodland communities (W1-18) and 7 scrub/underscrub communities (W19-25).

- Full descriptions of each of the woodland and scrub NVC communities and sub-communities are given in "British Plant Communities Volume 1: Woodlands and scrub", edited by J.S. Rodwell (1991). This includes information on the general species composition and appearance, the associated habitat, zonation and successional characteristics, and the geographical distribution. It also includes a detailed floristic table showing frequency and abundance values for all species found in the samples upon which the classification is based.

- Summary descriptions are given in "Summary Descriptions of Woodland NVC Communities (and their Relationships with UK BAP Priority Habitats) and UK BAP Broad Habitats", compiled by Ben Averis (2010). This includes notes on how to distinguish between certain NVC communities, in summer and in winter.

- Summary descriptions for communities W1-18 are given in "JNCC National Vegetation Classification Field Guide to Woodland" by J.E. Hall, K.J. Kirby and A.M. Whitbread (2004). Species names are in Latin.

- See also the "NVC Woods table" compiled by Ben Averis (2010). This lists the dominant/common plant species associated with the various acid, neutral, base-rich, wet and dry communities. Species names are in Latin.

9.5.2 NVC Keys (found in the Additional Documents Folder)

You can use these to help find which of the published NVC community descriptions best fits the stand of vegetation you're attempting to identify in the field.

- A concise key to woodlands and scrub can be found in "JNCC National Vegetation Classification Field Guide to Woodland" by J.E. Hall, K.J. Kirby and A.M. Whitbread (2004). Species names are in Latin.

- NVC Key edited by Julie Gardiner (2010). Part 1 is for native woodlands, Part 2 is for plantations and non-native woodlands. Species names are in English.

Please note that keys alone are not enough to confirm identification. Before accepting a result, check the composition of your stand against the description for the NVC community. If the stand seems very different, then review the sequence of steps that you've taken and see whether an alternative community would be a better fit.

Also bear in mind the following:

- Not all of the species mentioned in the community description need to present in the Component Group.

- Species referred to as "constant", including those used to name the community, may be absent in the Component Group.
- Differences in grazing levels can change the appearance of a community e.g. bilberry and wood-rush may be grazed out in W11, W16 and W17.
- Intermediate stands do occur, but most can be identified as closer to one NVC community than another.
- A community can occur in a place not shown on the distribution map.

9.5.3 Beech NVC communities

There are 3 NVC communities in which beech is overwhelmingly dominant:

- W12 *Fagus sylvatica – Mercurialis perennis* woodland (base-rich and calcareous).
- W14 *Fagus sylvatica – Rubus fruticosus* woodland (neutral to acidic).
- W15 *Fagus sylvatica - Deschampsia flexuosa* woodland (strongly acidic).

These NVC communities are concentrated within the native range of beech, but do also occur as plantations outwith the Beech Zone, in Wales and as far north as the Scottish Borders (although the latter are better classed as W16 Oak-birch woodland).

So when matching your stand to an NVC community, remember that W12, W14 and W15 can be assigned to beech-dominated stands of planted origin within and outwith the native range of beech, assuming the ground flora is a good fit. This is a slightly broader definition than that for the Lowland Beech and Yew Woodland Priority Habitat (which only includes long-established beech plantations outwith the Beech Zone).

Note: regenerating patches within W12, W14 and W15 where beech is scarce are usually classed as W8, W10 and W16 respectively.

9.5.4 Pine NVC communities

There is 1 NVC community in which Scots pine is dominant:

- W18 *Pinus sylvestris – Hylocomium splendens* woodland (strongly acidic).

This NVC community is confined to Scotland and best represented in the central and north-western Highlands. Planted Scots pine woodlands in England and Wales are considered as replacements of other woodland types, notably W16 *Quercus* spp. – *Betula* spp. – *Deschampsia flexuosa* woodland in southern England.

So when matching a stand to an NVC community, remember that W18 can be assigned to pine-dominated stands outwith the Pine Zone, but only within Scotland. This is a slightly broader definition than that for the Native Pine Woodlands Priority Habitat (which excludes all pine woodlands outwith the Pine Zone).

9.5.4.1 Pine bog woodland

In the National Forest Inventory we have added another NVC category:

- W18 **bog** *Scots pine – Hylocomium splendens* woodland.

This should be assigned to stands of Pine Bog Woodland- a rare habitat in the UK, but known at a number of sites within Caledonian Pinewoods in the Scottish Highlands.

Pine Bog Woodlands develop on peaty ground in hollows and along valleys where the high water table and shortage of nutrients restrict tree growth. They typically occupy the transition zone between pine woodland and bog, where the trees are thinning out.

Pine Bog Woodlands have a unique open character (see photo below). They are composed of mire vegetation (dominated by mixtures of *Sphagnum* bog-mosses, cotton-grasses and heather) with a scattering of variably stunted pine trees and saplings (some trees of considerable age- perhaps 350 years old but only 2-4m tall). The prominence of deep tussocks of *Sphagnum* bog-mosses can be a striking feature.

Plate 9 - 1: Scots pine bog woodland at Loch Morlich

The structure and function of this habitat type is finely balanced between tree growth and bog development. Tree growth is always slow (or the trees would take over the bog), trees are likely to be widely-spaced (because much of the bog surface is too wet for them to establish) and dead trees may be common (because their weight depresses the peat, locally leading to waterlogging and death). Open woodland is therefore maintained without loss of bog species.

This habitat is not to be confused with the progressive invasion of bogs by trees (through natural colonisation or afforestation) following changes in the drainage pattern, which eventually leads to the loss of the bog community.

9.5.5 NVC community assessment

Record woodland and scrub NVC communities, W1-W22, where these are present.

9.5.5.1 Recommended steps:

1) Do a quick walk-over survey of the Section or Component Group, identifying homogenous units of vegetation. For each unit in turn, note the tree, shrub and ground flora species present and roughly estimate their individual abundance (e.g. dominant, abundant, scarce etc.).

For beginners with limited plant ID skills, surveyors can still make a good stab at NVC by noting whether the vegetation:

- Is predominantly grassy- if so, is there a good variety of grass species, mostly fine-leaved, or broad-leaved or a mix of both?
- Is predominantly heathy- if so, what is the % cover of heathers, bilberry etc.
- Is predominantly composed of sedges and marsh plants?
- Is species-rich or species-poor- i.e. does it contain a diverse mix of herbaceous plants or just a narrow range of things?
- Contains a lot of ferns- if so, lots of different species or just a few?
- Contains an abundance of mosses- if so, lots of different species or just a few, and are any of these *Sphagnum* or *Polytrichum* species?

2) Determine which of the published NVC community descriptions best fits each vegetation unit. There are a number of tools to help with this:

- Work through the NVC key in the "JNCC National Vegetation Classification Field Guide to Woodland". Electronic copy supplied in the Additional Documents folder.

Species names are in Latin, so for beginners it is recommend that they purchase a hard copy and pencil in the English species names.

- Read through the published NVC community descriptions (and the sub-community descriptions to understand the variation across the community).

9.5.5.2 NVC surveying issues

If there is a choice between two NVC communities, chose the one which best describes the vegetation in the field. If there are several possibilities, none of which are a good fit, or if there is very little vegetation to go on (e.g. spruce plantation with leaf litter and moss) then record "Not Determinable". This also applies when there is snow cover.

Clearfell - ordinarily a non-woodland NVC type would be assigned, but it is not required to identify these in the National Forest Inventory, so record "Not Applicable".

If more than 1 NVC type is present in the Section or Component Group, then right click on the NVC Sub-component record to add another NVC record. Remember that the NVC percentages must sum to 100% for each Component Group.

For the Component Group fill in the following Data Fields:

Table 9 - 7: **NVC Data Fields**

Data Field	Options	Comments
NVC Class	Various	See the NFI Survey Manual Appendix D for more details, also the NVC documents in the Additional Documents folder.
	Not applicable	Non-treed/open Component Groups e.g. urban areas
% Cover	Free Text	Ensure that the total NVC coverage equals 100% for the Component Group.

9.5.7 Adding, Deleting and Cloning records

- Add by right clicking on the NVC folder to 'Add' a new NVC record.
- Clone by right clicking on a NVC record. Cloning is useful where a new record is similar to an existing record and can save entry time BUT it is vital that the new record is edited correctly.
- Delete by right clicking on a NVC record.

9.6 Browsing Damage

Open the Browsing Damage Sub-component. For the Component fill in the following Data Fields:

Table 9 - 8: **Browsing Damage Data Fields**

Data Field	Options	Comments
Browsing Damage	No Yes Not Applicable Not Surveyed	If Yes then further fields appear (see rest of table). Not Applicable –use for when trees are protected (either singly or in small groups) e.g. tubes, or where trees cannot be accessed for assessment.
Browsing Frequency	None <20% damaged 20-80% damaged >80% damaged	This Data Field relates to the % of trees within the Component that show evidence of browsing.
Browsing Severity	<20% browsed 20-80% browsed >80% browsed	Of those trees that have been browsed only, what is the mean proportion of the tree that has been browsed?

9.6.1 Adding, Deleting and Cloning records

- Add by right clicking on the Browsing folder to 'Add' a new Browsing record.
- Clone by right clicking on a Browsing record. Cloning is useful where a new record is similar to an existing record and can save entry time BUT it is vital that the new record is edited correctly.
- Delete by right clicking on a Browsing record.

9.7 Bark Stripping Damage

Open the Bark Stripping Damage Sub-component. For the Component fill in the following Data Fields:

Table 9 - 9: Bark Stripping Damage Data Fields

Data Field	Options	Comments
Stripping Location	None Not Applicable Up to 0.5m 0.5m – 1.8m > 1.8m Not Surveyed	If anything other than None or Not Applicable then further fields appear. Not Applicable – use for when trees are in tubes or other protection (singly or in small groups) or for trees that cannot be accessed for assessment.
Damage Frequency	<20% damaged 20-80% damaged >80% damaged	This Data Field relates to the % of trees within the Component that show evidence of bark stripping.
Stripping Severity	Majority of Trees Damaged will Survive Majority of Trees Damaged will Die	Of those trees that have been damaged, will the majority of them Survive or Die due to the damage?

9.7.1 Adding, Deleting and Cloning records

- Add by right clicking on the Bark Stripping Damage folder to 'Add' a new Browsing record.
- Clone by right clicking on a Bark Stripping Damage record. Cloning is useful where a new record is similar to an existing record and can save entry time BUT it is vital that the new record is edited correctly.
- Delete by right clicking on a Bark Stripping Damage record.

For example: Adding more than one category of damage:

If 25% of the Component has damage at 0-0.5m and it is felt that most of these trees will die then the following should be recorded:

Stripping Location – Up to 0.5m

Damage Frequency - 20-80% damaged
Stripping Severity - Majority of Trees Damaged will Die

If there is also evidence of bark stripping above 1.8m (from Squirrels for example) for 10% of the component and these trees are likely to survive the following will also need to be Added:

Stripping Location – Above 1.8m
Damage Frequency - <20% damaged
Stripping Severity - Majority of Trees Damaged will Survive.

9.8 Tree Health

Open the Tree Health Sub-component. For the Component fill in the following Data Fields where there is any evidence of the following on one or more stems of:

Table 9 - 10: **Tree Health Data Fields**

Data Field	Options	Comments
General Poor Health	Yes No Not Applicable Not Surveyed	 Not Applicable – for use when the trees cannot be accessed for assessment
Crown Dieback	Yes No Not Applicable Not Surveyed	Death of branches in the upper crown rather than needle/leaf loss. Not Applicable – for use when the trees cannot be accessed for assessment
Stem Decay	Yes No Not Applicable Not Surveyed	Areas of exposed wood evidently decayed, or a cavity has formed, or fruit bodies of wood-rotting fungi form on bark or exposed wood. Not Applicable – for use when the trees cannot be accessed for assessment
Poor Health Indicators	None Not Applicable Mechanical Damage Snow damage	 Not Applicable – for use when the trees cannot be accessed for assessment From harvesting vehicles, e.g. abrasion Branches, and occasionally stems, permanently

	Windsnap	bent or broken by weight of snow. Stem is snapped by wind rather than blown over
	Resin Bleed	
	Bacterial Seep	
	Red Needles	Excessive needle drop
	Yellow Needles	From fungi
	Needle Drop	
	Fruiting Bodies	
	• Excessive leaf loss	
	• Needle retention	Bore holes are assessed for live and dead trees.
	• Brown needles	
	• Leaf retention	
	• Bore holes – Oval	
	• Bore holes – Circular	
	• Bore holes - D-shaped	
	• Bore hole location – Buttress	
	• Bore hole location - Knee height to lower canopy	
	• Bore hole location – Canopy	
	• Bore hole - size class – Up to 3mm across	
	• Bore hole - size class – >3mm across	
	• Bark lesions (bruising / dieback of bark)	
	Not Surveyed	
Site Indicators	None Not applicable Evidence on live trees Evidence on deadwood Evidence on stumps Signage evidence Bio security management Informed by land owner Not surveyed	If you find evidence of a plant health problem on the site record the source of evidence. If there is more than one source create another record. See note below.

It most instances the most obvious signs of tree pests and diseases are found on the trees themselves and these are the principal source of evidence as to the presence of a disease. However there are instances when signs of pests and disease are obvious and clearly apparent in other areas of the sample. For instance *Phytophthora ramorum* may heavily infect *Rhododendron ponticum*, *Armillaria melia* (honey fungus) may be very evident on stumps or dead trees. Beyond biological evidence there may be actual signs highlighting sanitation felling and asking for the public to take phyto sanitary procedures when walking through a wood. These can be taken as clear signs of disease.   In these instances the presence of such indicators should be recorded under the 'Site Indicators' field of 'Tree Health'. The pest or disease itself should be recorded against the 'Tree Disease' field if evident.

If you find evidence of *Phytophthora ramorum* on *Rhododendron Ponticum*, record the plant within the vegetation layers and fill in the 'Evidence of *P ramorum*?' field accordingly.

9.8.1 Adding, Deleting and Cloning records

- Add by right clicking on the Tree Health folder to 'Add' a new Tree Health record.
- Clone by right clicking on a Tree Health record. Cloning is useful where a new record is similar to an existing record and can save entry time BUT it is vital that the new record is edited correctly.
- Delete by right clicking on a Tree Health record.

For sites with tree health issues submit photographs in the Photo field (See 9.3 Photo) with descriptions of the issue/s.

9.9 Tree Pest/Disease

Open the Tree Disease Sub-component. For the Component, fill in the following Data Fields:

Table 9 - 11: **Tree Pest/Disease Data Fields**

Data Field	Options	Alternative Name
General Poor Health	Not Applicable	Not Applicable – for use when the trees cannot be accessed for assessment
	None	
	Anoplophora chinensis	Citrus Longhorn beetle
	Anoplophora glabripennis	Asian Longhorn beetle
	Canker	-
	Cryphonectria parasitica	Chestnut blight
	Dendroctinus micans	Great spruce bark beetle
	Gibberella circinata	Pine Pitch canker
	Horse Chestnut Bleeding Canker	*Pseudomonus syringae*
	Ips amitinus	}
	Ips duplicatus	} 8-Toothed spruce bark
	Ips typographus	} beetle
	Oak Processionary Moth	*Thaumetopoea processionea*
	Phytophthora kernoviae	
	Phytophthora ramorum	Sudden oak death
	Red band needle blight	Dothistroma needle blight
	Tomicus piniperda	Pine Shoot beetle
	Weevils	*Hylobius/Hylastes/Pissodes*
	Asian Longhorn beetle	*Anoplophora glabripennis*
	Ash Dieback	*Chalara fraxinea*
	Pine Lappet Moth	*Dendrolimus pini*
	Sawyer Beetle	*Prionus coriarius*
	Pine Processionary Moth	*Thaumetopoea pityocampa*
	Emerald Ash Borer	*Agrilus planipennis*
	Bronze Birch borer	*Agrilus anxius*
	Horse chestnut leaf miner	*Cameraria ohridella*
	Phytopthera lateralis	-
	Phytopthera austrocedrae	-
	Phytopthera spp	-
	Acute/Chronic Oak decline	-
	Not Surveyed	

The table below highlights the main pests & diseases the surveyors need to be aware of in each Bidding Area. These are the priority pests & diseases the surveyor needs to ensure they know how to identify for work in any given Bid Area. The numbers next to the pest or disease relate to the numbered diseas in the previous table.

Table 9 - 12: Top five pests & disease per Bidding Area

Area	2. Anoplophora glabripennis / Asian Longhorn Beetle	4. Cryptonectria parasitica / Chestnut Blight	5. Dendroctinus micans / Great Spruce Bark Beetle	11. Oak Processionary Moth / Thaumtopoea processionea	13. Phytophthora ramorum / Sudden Oak Death	14. Red Band Needle Blight / Dothistroma	18. Ash Dieback / Chalara fraxinea	19. Pine Tree Lappet Moth / Dendrolimus pini	26. Phytophthora austrocedrae	28. Acute / Chronic oak decline	Larch bark beetle / Ips cembrae
Scot Isles					Y		Y				
N. Scot			Y		Y	Y	Y	Y			
NWScot			Y		Y		Y	Y			Y
WS			Y		Y		Y	Y			Y
NEScot			Y		Y		Y	Y	Y		
E Scot			Y		Y	Y	Y		Y		
SWScot (N)			Y		Y	Y	Y				Y
SWScot (S)					Y	Y	Y			Y	Y
NW Eng (N)					Y	Y	Y		Y	Y	
NE Eng					Y	Y	Y		Y	Y	
York					Y	Y	Y		Y	Y	
NW Eng (S)					Y	Y	Y		Y	Y	
N Wales					Y	Y	Y			Y	Y
E Mid		Y		Y	Y	Y				Y	
S Wales					Y	Y	Y			Y	Y
Midlands	Y			Y	Y		Y			Y	
E. Eng	Y	Y		Y	Y					Y	
S. West	Y	Y			Y		Y			Y	
S. Cent	Y	Y		Y	Y		Y				
SE&Lon	Y	Y		Y	Y		Y				
Mid Scot			Y		Y		Y	Y	Y		
Marches N		Y		Y	Y	Y				Y	
Marches S	Y				Y	Y	Y			Y	

9.9.1 Adding, Deleting and Cloning records

- Add by right clicking on the Pests & Disease folder to 'Add' a new Pests & Disease record.
- Clone by right clicking on a Pests & Disease record. Cloning is useful where a new record is similar to an existing record and can save entry time BUT it is vital that the new record is edited correctly.
- Delete by right clicking on a Pests & Disease record.

For sites with tree health issues submit photographs in the Photo field (Chapter 9.3 Photo) with descriptions of the issue/s.

9.10 Manual Intervention

Open the Manual Intervention Sub-component. Assessments for Manual Intervention are mainly for each individual Component Group but there are instances where individual Components within a Component Group have extra Interventions e.g. pruning. For each Component fill in the following Data Fields:

Table 9 - 13: **Manual Intervention Data Fields**

Data Field	Options	Comments
Management	Less than 3 years old Approx. 3-10 years Approx. 10-40 years Approx. 40 plus years Not surveyed None	Try to assess the approximate time period when the intervention occurred and assign either a 'less than 3 years' category or one of the 'approx.' categories. If you cannot discern an 'approx.' category record 'greater than 3 years ago'.
	Greater than 3 years ago	Only use if you cannot discern into the 'approx.' categories. The previous surveyor did not have access to the 'approx.' categories, so you will find some records that need updating from this category. Where a management intervention has occurred within 3 years and after 3 years record the intervention multiple times and assign to multiple time categories. The exception to this rule is where Thinning has occurred more than once and how many times and when is not discernible (see below).
Category	Brashing	Removal of the lower dead tree branches of the Component up to about two metres. This does not include inspection brashing racks (paths) but does include patch brashing for

		e.g. educational use
	Cleaning	The removal of unwanted broadleaves and woody shrubs usually before canopy closure
	Clearfell	The site has been clearfelled
	Coppicing	Trees that are cut near ground level causing them to intentionally produce many new stems
	Draining	The site has open drains dug to drain water
	Fencing – Partial	Fencing that has fully/partially collapsed and is no longer acting as a complete barrier
	Fencing – Complete	Fencing that is whole within the square and as far as can practically be seen outside the square
	Planting	A Component planted within the last five years.
	Pollarding	A pollard is a tree with branches which have been cut back to the trunk, above browsing height, so that it may produce a dense growth of new shoots
	Pruning	Removal of selected branches to improve the end-product
	Weeding	Removal of competing vegetation during the establishment phase of the trees
	Brash - removal / mulched / burned	Lying branches and deadwood has been removed or mulched
	De-stumped	Tree stumps are removed
	Mounded	Site has mounds of earth across it in preparation for planting

		Ploughed – Single mouldboard	Ploughed – the earth from the plough line is all to 1 side
		Ploughed – Double mouldboard	As above but earth is gathered on both sides of plough line
		Ripped	A ploughing method to break up iron pans
		Scarified	A method for clearing planting lines by clearing brash and vegetation and leaving the soil bare
		Windrowed	Timber and/or stumps which are pushed into lines after clearfelling
		Other	An intervention not included in any of the other options
		Thinning Once Thinning more than once	Thinning – only record the timing of the most recent thinning event – whether <3yrs old or ≥3 years old. Do not record thinning twice.
		Orchard	The site has been turned into an orchard
		Agroforestry	Agroforestry is an integrated approach of using the interactive benefits from combining trees and shrubs with crops and/or livestock. It combines agriculture and forestry.
		Conservation	The land is being used for conservation purposes, e.g. for fritillary butterflies. If the site is classed as a SSSI according to the GIS layer record as Conservation
		Game Birds	There is evidence that the land is currently, or will be, used for game birds, e.g. feeders are present
		Grazing	Intentional grazing by domestic and wild herbivores

	Ornamental	An area managed for aesthetics and tree diversity e.g. arboreta
	Public Recreation	Intentional management of the area for public use
	Screening / Shelter	A site intentionally planted to be used mainly for screening/shelter
	Timber Production	Commercial timber production
	Personal recreation	Managed for the personal recreation use of the owner e.g. dens, huts etc. which are not for public use
	Orchard	The site has been/will be turned into an orchard

9.10.1 Adding, Deleting and Cloning records

- Add by right clicking on the Manual Intervention folder to 'Add' a new Manual Intervention record.
- Clone by right clicking on a Manual Intervention record. Cloning is useful where a new record is similar to an existing record and can save entry time BUT it is vital that the new record is edited correctly.
- Delete by right clicking on a Manual Intervention record.

Re-measure Squares: Variations

9.11 Vegetation

You will make your own assessment of vegetation, informed by the previous surveyor's observations. With Vegetation in particular you should expect to see change between the survey cycles as the shrub, field and ground layers.

Change will be due to the natural development of the vegetation layers, as plants and shrubs compete with one another and fall prey to the influences of their own life cycles and competitive pressures. Through this plants and shrubs will grow, establish and die back both within the year and between years.

Some change may also be due to factors external to the plants and shrubs themselves and plants and shrubs will be affected by the presence of trees, animals and humans.

For example plant communities will be impacted if the over storey of trees changes to a significant level through the 5 years. An example would be if available light for plants decreases due to tree growth leading to crown closure or an increase in crown density.

Similarly a decrease in canopy occupancy or density through events like thinning or certain pests and diseases will impact on the plant communities below as light levels increase.

Human activity can also impact on plant communities and forest management in particular can have significant impact. This can either be indirectly through the use of heavy machinery or directly through activities like rhododendron control or wider vegetation management in restocking or new planting sites.

Changes in the presence of specific herbivores and changes in their level of presence can also have significant impacts on plant communities. For example deer have spread greatly within GB over the last 3 decades and will probably continue to do so. When they first arrive in an area they may do little damage to trees as their populations are low and food stocks are abundant, but as their numbers build and they begin to outstrip their food supply they may begin to impact on tree health. So a square on the 'front line' of deer spread that was not browsed in the first cycle could well be browsed in the second.

The time of year that the previous assessment was made in comparison to yours will also have an impact on how the two surveys compare. Even just a few weeks difference may have significant impact on the coverage, height and presence of certain species.

Note that if a new Component becomes the lowest storey then the vegetation (and NVC) records will need to be moved to the new lowest storey.

9.12 Identifying causes of change

There are three additional fields in the re measure square subcomponents which determine the nature of any changes between the two cycles. These are specific to the subcomponent level and you will be prompted to complete these for all subcomponent records, primarily when you add or delete records. This requirement applies equally to all sub component records; NVC, browsing, stripping, tree health, pests and diseases and management intervention. We will use vegetation as an example for how to complete these 'change' records:

9.12.1 Did you find survey errors?

This field is held against each vegetation record and has two options – yes and no. The field is automatically set to 'no' on the assumption that the majority of previous assessments will have been correct at the time. The 'yes' option should be selected if you have significant evidence that the previous assessment for that vegetation record was incorrect.

9.12.2. Adding a new record

If you find a vegetation category that was not recorded in the previous survey you will need to create a new record and classify the new record according to the 'type of change'. Equally if you find that a previous record has divided into two records (through natural growth – see example below), such that you need to create an additional record, you will also need to complete the 'type of change' assessment.

9.12.3 Type of change; new, missed or evolved.

- **New** – you believe that the plant category is new to the site.
- **Missed** – the plant is well established and the last surveyor 'missed' its presence.

- **Evolved** – The layer has 'grown on' and has split into two new layer categories. An example would be a field layer of holly saplings in the first cycle, evolving through natural growth into both a field layer and a shrub layer, through some of the holly trees achieving over 2 m in height. If the entire layer changes its height category, you do not need to add a new record, simply change the layer field from 'field layer' to 'shrub layer'.

9.12.4 Deleting a record

There are three reasons to discern why you deleted a record:

1. Not observed.
2. Real Change.
3. 1st Surveyor error.

If your assessment cannot find a vegetation class that the previous surveyor did, do not spend more than 20 minutes of your time hunting out the class. The chances are it was either a very small class and you have missed it through 'bad luck' or it has gone from the site. In such circumstances delete the record and classify that record as 'Not observed',

If you can tell that a class has gone from the site, perhaps due to vegetation removal (e.g. rhododendron clearance), then delete the previous record and record 'real change'.

If you have definite evidence that the precious surveyor recorded a plant class that they should not have and it is not possible that the plant class could have gone without trace in the intervening years, record 1st surveyor error.

9.12.5 Examples of applying these classes of change

Only where there is clear evidence that the previous assessment of vegetation was incorrect should you amend the classification and classify it as a survey error. E.g. the previous surveyor recorded the presence of rhododendron in the shrub layer, but you cannot find either rhododendron or rhododendron stumps. That would be an error.

If a species class was recorded by the previous surveyor and you find that it is not evident on the site, this could be due to many reasons, seasonal variation, competition or grazing pressure alongside surveyor error. Remember that some species such as bramble are likely to be persistent and readily evident throughout the year, whereas

others such as bluebells have varying levels of conspicuousness throughout the year. Make your assessment as to the cause and delete the record and classify the type of change accordingly.

Do not be overly cautious about deleting records. Any records you delete will be stored within the NFI databases in perpetuity, so it is not that the recording of that plant at that site 5 years ago is lost forever, just that it was not observed when you visited the site. Once you have deleted the record subsequent NFI analysis will be able to trace how the plant was on site but has since been lost to the site.

If your assessment of % cover is greater than +/- 10% different to the previous surveyors assessment (as a % of the original record), amend the record. Do not record survey error if the difference is due to natural expansion, seasonal variation or difference due to subjectivity within the visual assessment. If you accord a difference to seasonal variation or subjectivity in the visual assessment and the difference is less than +/- 10% it is permissible not to update the field at all. If the difference is greater than 10% and you are convinced this is not due to natural expansion, then record surveyor error.

If a plant within a layer has grown or 'shrunk' (grazing, dieback etc.) to the point where its height has changed from one layer category to another between surveys, you should update the 'layer' value accordingly. If such growth leads to two layers being formed from the one, create a new record to record the new class and classify the change as 'evolved'.

If a new species has been introduced to the site between surveys, classify that as 'new'. An example may be that you observed relatively low presence of bramble in the field layer, whilst the previous surveyor did not.

9.13 NVC

NVC should not change greatly between cycles as it is a broad ecological classification driven by underlying site characteristics.

An NVC community may have changed in condition over the 5 year cycle and for example a healthy W10 site in the first cycle may through spraying or cultivation in the intervening year's loose condition. This does not however change its NVC classification.

It is only rarely that operations or natural events (erosion, land slip, fire) are so intense or extreme that all traces of the previous NVC are removed.

Thus in most instances you should make your own assessment of NVC and record that. If you see a difference with the previous surveyor in terms of the type of NVC observed record error change where appropriate (in the 'did you find survey errors?' field). If you have a difference in % area allocation allow for a tolerance of 10% of the original assessment before you amend records.

As per vegetation, the causes of change in the assessment need to be identified and recorded; surveyor error or not, the causes of deleting records and the causes of adding records

9.14 Management Interventions.

Assess what you observe to be the management intervention that the site has undergone.

Interventions may have occurred since the last survey, if so record these appropriately.

Review any existing management intervention records from the previous survey and see if these align to your assessment.

Correct the timing of the interventions (if they were previously less than 3 years, now they must be updated to Approx. 3 – 10 years etc.). You will need to check the date of the last survey to ascertain this, but 5 years will be the usual time span.

As the traces of most interventions fade with time you should only delete a record if you have strong evidence that a previous intervention was incorrect. If you do find no evidence of an operation delete the record and record the change as 'not observed'.

As per vegetation and NVC records the causes of change in the assessment need to be identified and recorded; surveyor error or not, the causes of deleting records and the causes of adding records

9.15 Browsing, Stripping, Tree Health and Tree disease

Make an assessment as per the main protocol. Observe and record any tree health and damage factors that you encounter. Use the information that the last surveyor collected as a guide to inform your assessment.

Be aware that browsing, tree health and pests and diseases are factors that can change rapidly with time and evidence of their occurrence can fade rapidly over time. For example; if the previous surveyor recorded crown dieback and you see no evidence of crown dieback, it does not mean that the previous surveyor was incorrect in their assessment. A crown can suffer minor or moderate dieback and recover several times in 5 years. In such circumstances if you do not observe a finding of the previous surveyor, delete the record and classify the change as 'not observed'.

Again do not spend more than 20 minutes hunting out such signs. If after a day or more of surveying you cannot identify any issues that the previous surveyor did then it is probable that the damage or health issue has passed. Delete these records and classify as 'not observed'.

It will be unusual that you will have enough evidence to be certain that the previous surveyor was incorrect, but there will be instances. For example; evidence of severe stripping would likely span the 5 years and you can often determine its broad age to ascertain if the stripping was present at the time of the last survey.

As per vegetation, NVC and manual intervention observations, the causes of change in the assessment need to be identified and recorded; surveyor error or not, the causes of deleting records and the causes of adding records.