Woodland ecosystems and their management

Royal Geographical Society with IBG
Advancing geography and geographical learning

Embedding fieldwork into the curriculum

Woodlands fieldwork can add value to a range of topics including:

- Tourism and leisure
- National Parks
- Woodland management
- Environmental conservation
- Ecosystems
- Conflicts of interest
- Economic use of woodlands
- Comparing types and ages of woodlands
- Vegetation species
- Microclimates

There are several cross curricular themes such as:

- Geography units such as unit 16 'What is development?', in terms of resource use
- ICT, including using a mapping package, using internet search engines
- Citizenship thorough conflicts of interest, considering topical issues, justifying personal opinion
- Science in terms of habitats, toxic materials in food chains and environmental chemistry
- Geography units such as unit 8 'Coastal environments' and unit 13 'Limestone landscapes of England' in terms of human impacts on natural areas and pressures of tourism
- key skills, working with others, improving own learning and performance
- PSHE in terms of taking responsibility for own actions
- Enquiries and decision making preparation for GCSE and A level

QCA unit schemes available to download for:
Geography http://www.standards.dfes.gov.uk/schemes2/secondary_geography/?view=get
Science: http://www.standards.dfes.gov.uk/schemes2/secondary_science/?view=get
Citizenship http://www.standards.dfes.gov.uk/schemes2/citizenship/?view=get

Accompanying scheme of work

The scheme of work below has been created using aspects from a variety of QCA units and schemes available, including:

Unit 14: Can the earth cope? Ecosystems, population and resources
http://www.standards.dfes.gov.uk/schemes2/secondary_geography/geo14/?view=get
Unit 23: Local action, global effects
http://www.standards.dfes.gov.uk/schemes2/secondary_geography/geo23/?view=get

Woodland Ecosystems

About the unit

The unit is adapted from the QCA scheme of work Unit 14 *Can the earth cope? Ecosystems population and resources.* and Unit 23 *local actions, global effects.* There are two aspects to the investigation, one looking at the ecosystem of a temperate woodland and the other looking at the impact of human use and management. Pupils investigate the global distribution of one or more selected biome. In this unit pupils investigate the conflict between increasing economic activity and conserving the environment. The unit encourages pupils to think about how individual action taken at a local level may have positive or negative effects at a variety of scales. This provides a strong link with citizenship. There are numerous opportunities for pupils to practise their research and enquiry skills.

This unit is expected to take 12–20 hours.

Key aspects

Geographical enquiry and skills

Pupils will:

- ask geographical questions
- suggest investigation sequences
- collect, record and present evidence
- analyse evidence and draw conclusions
- appreciate values and attitudes
- use atlases/globes/maps
- use secondary evidence
- draw maps, plans and graphs

Knowledge and understanding of places

Pupils will:

- locate places and environments
- explore interdependence and global citizenship

Knowledge and understanding of patterns and processes

Explored through:

- ecosystems
- resource issues

Knowledge and understanding of environmental change and sustainable development

Pupils will study:

- sustainable development

Expectations

At the end of this unit

most pupils will: describe and begin to explain the physical and human processes that contribute to the distinctive characteristics and world distribution of one or more biomes, the global distribution patterns of population and an important resource, and understand the nature of interrelationships between them; describe how physical and human processes create geographical patterns and may lead to changes in places and environments; appreciate that different values and attitudes result in different approaches in managing environments sustainably and that these may have different effects; suggest relevant questions and a sequence of investigation of ecosystems; select and use effectively a range of skills and sources of evidence; present their findings about these issues in a coherent way and reach conclusions that are consistent with evidence.

some pupils will not have made so much progress and will: begin to recognise and describe the physical and human processes that contribute to the distinctive characteristics and world distribution of one biome; explain their own views and recognise how people try to manage environments sustainably; begin to suggest explanations for how human activities cause damage to the environment and recognise how people may try to improve the environment; suggest suitable geographical questions and sequences of investigation of ecosystems; use a range of skills and secondary sources of evidence and communicate their findings using appropriate vocabulary

some pupils will have progressed further and will: show how these interactions create geographical patterns and help change environments; understand that many factors, including people's values and attitudes may influence decisions; appreciate that human actions may have unintended consequences for the environment and that considerations of sustainable development may affect the planning and management of such environments in the future; identify geographical questions and sequences for investigation of ecosystems, population and resource issues; select and use accurately a wide range of skills and sources of evidence; evaluate critically sources of evidence for bias, present well-argued reports and begin to reach substantiated conclusions

Prior learning

It is helpful if pupils have:

- used the contents page of an atlas and thematic world maps
- carried out research using a range of sources, *eg internet, CD-ROM, library*
- studied global population distribution
- studied world climatic types

Language for learning

Through the activities in this unit pupils will be able to understand, use and spell accurately words relating to:

- ecosystems, *eg biome, vegetation, climate, distribution, characteristic, natural resources, interrelationships, relief, aspect*
- public opinion, *eg fact, opinion, probable and preferable futures (others according to case studies selected)*

Speaking and listening – through the activities pupils could:

- discuss and question what they are learning and how it is relevant in other contexts or when using variables

Reading – through the activities pupils could:

- distinguish facts from hypotheses/theories/opinions and how far information is complete and helpful

Writing – through the activities pupils could:

- link ideas and paragraphs into continuous text

What are the characteristics and distribution of temperate deciduous woodlands?			
• To understand the nature of temperate forests • to use atlas maps at a world scale • to use secondary sources of evidence, including photographs • to investigate the characteristics and distribution of a major biome • to investigate native and non-indigenous species of trees.	• Organise pupils into pairs and give each pair an atlas. Ensure there is a visual barrier between them. One pupil has a world map showing the distribution of the major ecosystems (biome) and the other a blank world map outline. Ask the pupil with the ecosystems map to describe the world distribution of temperate woodlands, while the other draws it. Ask pupils to check and evaluate the accuracy of their work before swapping roles (perhaps one could do Northern Hemisphere and the other the Southern Hemisphere). This time the distribution and type of woodland can be mapped using an OS 1.50,000 map with settlements and relief marked on the 'blank' version. .A detailed description of the distribution should be written. Some pupils may need appropriate support such as a structured step-by-step framework for the task of describing world distribution, *eg Even/uneven? Which hemisphere? What latitudes? Coastal or inland? Any distinctive pattern?* • Ask pupils to use photographs and/or video clips (using freeze-frame as appropriate) to create wordscapes (sequences of adjectives) to describe the characteristics of temperate woodlands. Then ask them to annotate diagrams or photographs using this vocabulary, including details about structure, named plant and animal species, plant adaptations and seasonal variations • Using historical and recent OS maps, pupils could investigate how woodlands have changed over time, particularly in their local area. Which trees are native to the country and which are not?	• describe and explain the world distribution of temperate deciduous woodlands	• Some pupils might need prompts from a word bank. • Language for learning: this activity provides pupils with the opportunity to discuss and question what they are learning and how it is relevant in other contexts, or when using different variables. • Some teachers may wish to extend the study of ecosystems and how they reflect climate patterns by studying four vegetation belts north/south of the equator.
How is an ecosystem related to climate, soil and human activity?			
• To appreciate the ways in which plants are adapted to their environment	Pupils create a climate graph for the area. If the woodland is near the school this could be as the result of firsthand observation over a period of time. Provide pupils with details of different types of world climate, including graphs and maps, and a set of cards with various plant adaptations. Pupils decide which adaptations are suitable for a temperate climate. Pupils study the adaptations of a coniferous tree Build up an annotated flow or systems diagram to demonstrate the interrelationships between temperate deciduous woodland and climate, soil and human activity. Ask pupils to use this model to create a diagram for coniferous woodland. How suitable is this adaptation for a temperate climate? In the field pupils can look at the effect of vegetation on microclimates and the role of relief and aspect in the patterns of vegetation cover by using quadrats. Microclimate data could be plotted on a map later maybe electronically by means of GIS software.	• describe and explain the range of vegetation adaptations to climate and soils • describe and explain the relationships which exist between vegetation, climate, soil and human activity	• Homework activity: pupils repeat the activity for another vegetation type. • Science: links with life processes and living things – habitats, interdependence and organisation adaptations

What is the economic significance of woodlands?			
To investigate the ways in which woodlands contribute to the economy on a variety of scales	Pupils produce a spider diagram of the various uses of woodlands such as timber, leisure, windbreaks, noise barriers. They then look on an OS map to hypothesise which of these are most likely to be relevant in the case of the woodlands they are studying. They can then classify them as of local, regional, national or international importance. Link this to information about SSSIs, SINC, SLINC, NNR and LNR. A comparison between the uses of deciduous and coniferous woodlands can be made	Understanding of the nature of a primary resource	
What leisure facilities are located in woodlands?			
To investigate the ways in which woodlands contribute to the economy on a variety of scales to ask geographical questions and suggest appropriate sequences for investigation • to select and use appropriate techniques to present evidence, *eg maps* • to use fieldwork techniques to identify different leisure uses • to determine how conflicting demands on an environment arise • through a decision-making task, how and why attempts are made to plan and manage environments • to consider the effects of environmental planning and management on people, places and environments	On the visit, map all different uses and take photographs of and/or video the leisure facilities/activities – pupils can use these records to establish possible conflicts of interest between different uses and user groups later. Data-collection forms could be designed and loaded onto a palmtop computer for completion in the field. Ask pupils to record what they have found by drawing annotated sketch maps and diagrams. (For some woodlands maps may already exist.) Also ask pupils to complete an 'impact matrix' to help them assess any conflict of interest between different leisure users.	• produce a map of different uses and leisure activities in a woodland • produce annotated sketch maps and diagrams of the leisure activities to summarise findings • take suitable photographs and/or video of the leisure facilities/ activities to identify potential conflict of interests between different uses and user groups • prepare a presentation with a suggestions plan to manage leisure activities • produce an information leaflet detailing leisure activities in a local woodland (higher-attaining pupils)	Prepare an impact matrix with the different leisure uses on both axes. How one activity might affect the other can be noted in the grid boxes. Citizenship: this activity provides an opportunity for pupils to use their imagination to consider other people's experiences, to think about, express and explain views that are not their own, and to reflect on the importance of resolving conflict fairly.

How are woodlands used and misused by people?			
To study the impact of human use and intervention of a woodland area	Pupils undertake a trampling and footpath survey in the field They undertake an environmental survey at selected locations around the woodland There might be the opportunity to compare deciduous woodland and coniferous and the different impacts of management on a plantation and an area of more open woodland	An understanding of the different impacts of human use on an ecosystem	

Potential fieldwork locations

The following list of woodlands to visit is sourced from the ***Forest of Avon website*** www.forestofavon.org.uk and Avon Wildlife Trust website www.avonwildlifetrust.org.uk . The websites indicates the type and age of woodland, ownership and management of the site, directions and access routes, and footpath types. Choose sites depending on the topic of the fieldwork you intend to do and the field techniques to be used. Note: Some sites below may not be suitable for fieldwork.

- *Ecosystems* (species and vegetation) – look for woodlands with different types of trees – conifers, broadleaves – to compare, also for woodlands of different ages – ancient, semi-ancient and new plantations.
- *Human impact* (footpath erosion, trampling) – look for woodlands which indicate unsurfaced paths as tarmac paths are no good for erosion studies!
- *Purpose* (visitor questionnaires and facilities mapping) – choose larger woodlands with good public access, particularly those within the city for looking at leisure and tourism.
- *Management* – choose woodlands reflecting different purposes such as leisure, community, education, conservation, forestry to look for conflicts of interest.

Location	Description and details	Facilities
Ashton Court Estate on the western edge of Bristol city centre	An historic estate owned by Bristol City Council including woodland, deer parks and open parkland. It is a Site of Special Scientific Interest for its veteran/ancient trees. The woodlands on the estate are managed for conservation, leisure and timber production. This has resulted in the development of a very diverse and mixed group of natural environments: Rownham Plantation is a quiet wood, Clarkencombe is a brilliant example of ancient wood pasture with very old oak trees and Summerhouse Plantation is full of interesting land forms and archaeology. Access is very good – there is a good network of hard surfaced and un-surfaced paths.	Car park
Ashton Hill Plantation near the village of Failand, approx 4 miles west of Bristol	A mixed woodland with conifers and broadleaves and areas of ancient woodland owned by the Forestry Commission. There is a magnificent stand of California Redwoods. There is a good network of hard surfaced and un-surfaced paths.	Car park
Bishops Knoll at Stoke Bishop in North West Bristol on the East side of the Avon Gorge	An attractive 3-hectare mixed woodland (mature and new woodland) on a steep slope which is owned and managed by the Woodland Trust. It has good views and is a site of local nature conservation. The wood has a good number of well used paths.	Car parking
Blaise Castle Estate on the northwest edge of Bristol by Henbury	An historic estate owned by Bristol City Council. It is an Historic Landscape and a Site of Nature Conservation Interest. The estate has several different woodlands to explore, some of which are semi-ancient with rich natural habitats. There is a good network of hard surfaced paths.	Car park
Leigh Woods on the western bank of the Avon Gorge on the edge of the Bristol	Mainly broadleaved ancient woodland with some areas of conifers owned and managed by the Forestry Commission and The National Trust. It is a Site of Special Scientific Interest, a Site of Nature Conservation Interest and a National Nature Reserve. There is also a recently-built timber-framed barn, constructed from local wood using techniques unchanged since medieval times. There is a good network of hard surfaced paths.	Car park
Lower Woods, near of Wickwar northeast of Bristol	The most extensive semi-ancient woodland in the Forest of Avon, jointly managed by the Avon and Gloucestershire Wildlife Trusts. The site is made up of many distinct woodlands, separated by wide tracks known locally as 'trenches'. There is an extensive network of paths through the woods, which are open to the public at all times. Leaflets are available from the Avon and Gloucestershire Wildlife Trusts.	Parking at Lower Woods Lodge or in Wickwar.

Tower House Wood at Wraxall, near Nailsea	A 16-acre ancient broadleaved woodland owned and managed by the Woodland Trust. The woodland is well used by the public and has a network of pathways throughout.	No designated car park
Weston Big Wood near Portishead, overlooking the Gordano Valley	An ancient broadleaf woodland owned by the Avon Wildlife Trust. It is a Site of Special Scientific Interest and a Site of Nature Conservation Interest. There is a network of un-surfaced paths	No designated car park – park in the adjacent residential area with considerati on
Lower Knole Farm near Almondsbury	This new woodland is the largest new planting by a private landowner in the Forest of Avon. The 67 hectare woodland of both native broadleaves and conifers was planted in 2000/2001. There is full public access; all paths are grass.	Parking in the yard area of the farm
Manor Road Community Woodland between Keynsham and Saltford	A new broadleaved woodland on a site owned by Bath & North East Somerset Council. It was planted at stages between 1993 and 2006 by local people, voluntary groups and local contractors and is one of the best examples of new community woodland in the Forest of Avon. It is also designated as a Local Nature Reserve. There is full public access with a mixture of grass and hard-surface paths.	No designated car park – park in the adjacent residential area with considerati on
Overscourt Wood between Pucklechurch and Bridge Yate east of Bristol	A new woodland planted by The Forest Enterprise since 1998. All paths within the wood are grass.	Small parking area on site
Wooscombe Wood near Compton Dando, a few miles south of Keynsham	A new broadleaf woodland of 40 hectares planted in 1993 by a local farmer. This is one of the largest new woodlands in the Forest of Avon. The site also has a number of older woodlands within the new planting. There is full public access and a number of public footpaths cross the site. All paths are grass	Small car parking area
Avon Valley Woodlands adjacent to the River Avon south east of Bristol city centre	A broadleaf woodland with some ancient woodland owned by South Gloucestershire Council. It is a Site of Nature Conservation Interest. There is a good network of hard surfaced and un-surfaced paths.	Car park
Oldbury Court Estate four miles northeast of Bristol city centre along the banks of the River Frome	A diverse estate combining woodland, riverside paths and historic parkland. A good network of pathways throughout the estate with plenty of flat tarmac paths near to both car parks.	Two car parks
Golden Valley Nature Reserv***e*** near Wick http://www.golden-valley.info/	Footpaths are too wide for erosion surveys, but this is a good example of an old industrial area that has been abandoned and is now used for leisure purposes. Steep access from one side, flatter access from the other. River available but not good access for rivers fieldwork. Teachers resources available on website	Car park at Wick Village Hall

Existing fieldwork centres

Goblin Combe Environment Centre
Provides a combination of environmental education and outdoor pursuits, set within a range of stunning natural habitats from woodland ridges to the North Somerset moors. Residential trips are available
http://www.goblincombe.org.uk/
By e-mail at: enquiries@goblincombe.org.uk or training@goblincombe.org.uk
By phone on: 01934 833723
Goblin Combe Environment Centre
Plunder Street
Cleeve
Bristol
BS49 9PQ

	**Goblin Combe has some good paths for footpath erosion studies. This pictures shows one of the main paths into the woods, which can be compared to erosion levels on smaller paths which are used less often.**
	**Goblin Combe also has varied areas of woodland, with different species and ground cover. Large quadrats (5m by 5m for example) can be studied for species type, ground cover and number of trees. This is especially useful when comparing areas of managed and unmanaged forest. It also encourages students to be aware of why the forest looks like it does, and the human and natural impacts that affect species diversity and frequency.**
	**Areas like the one above can be compared to a more sparse area such as this one. Groups can be split up to cover different areas of the forest.**

Willsbridge Mill
Environmental education programmes, out-door classrooms and many walking trails. School programmes are available all year round, developed with strong curriculum links, catering from reception to year 10. Activities include pond dipping, stream quality survey, river study, woodland tree id, mini-beast hunts, wildlife games, nature, history and geology treks.
http://www.forestofavon.org.uk/willsbridgemill.htm

Choosing a site for a field visit **(please note this is written from the perspective of a teacher researching potential woodlands locations- these locations may not be suitable for fieldwork and must be checked first)**

Using an Ordnance Survey map, it is very easy to identify possible locations for local fieldwork. All areas of woodland are clearly marked in green, but a number of other features will help to find appropriate and accessible sites. Here are some useful tips:

- Look out for the different tree symbols which indicate coniferous wood, non- coniferous wood and mixed wood. Coniferous wood is usually a sure sign of a managed wood or forest, as is the name 'plantation' rather than 'wood'.
- Some areas of woodland are unnamed – these will tend to be private, whereas named woodlands tend to have public access.
- Look for footpaths and bridleways marked through the wood – this is a good sign that the woods are open to the public.
- Look for other symbols which indicate the public access to the wood, such as car park, picnic site, viewpoint, historic site, information point.
- Woodlands with designated status are often open to the public too, for example on OS maps:
    - diagonal blue lines over the text is a place of tourist interest, such as a visitor centre or nature trail.
    - a bold yellow or pale yellow border round an area signifies a National Park or Forest Park.
    - a pink border round a site with NT indicates land owned by the National Trust.

I am a teacher in Bristol. I want to find possible sites for fieldwork that represent woodlands managed primarily for public use and woodlands managed primarily for commercial use. Using the OS map to look for sites in and around Bristol, I can suggest the following locations for different fieldwork:

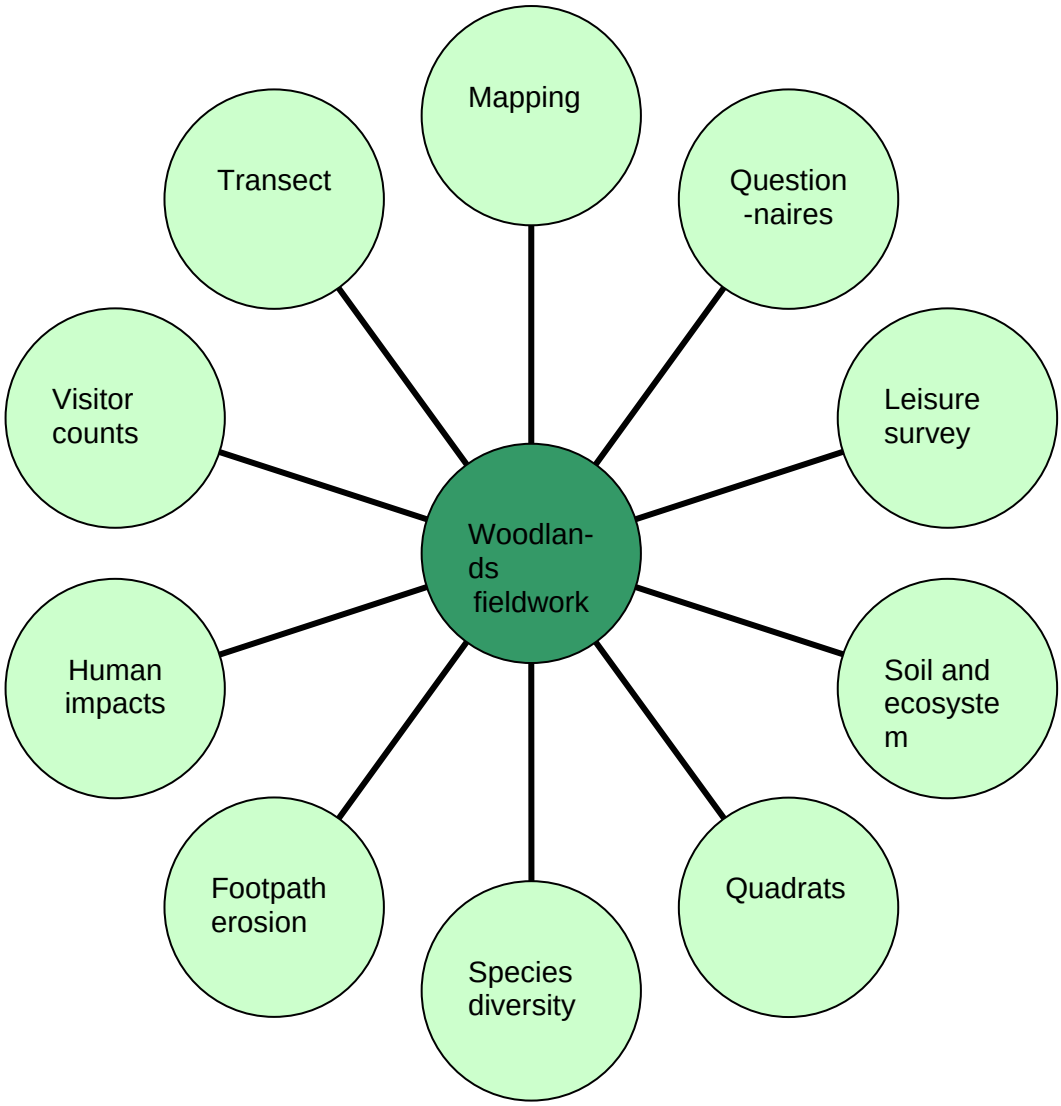
If I am looking to do fieldwork such as visitor questionnaires and the mapping of facilities, I need a medium to large wood intended for recreational use which offers a variety of visitor activities. ***Leigh Woods*** is one option, located on the western banks of the River Avon to the west of the city centre. A number of features indicate that this is a recreational woodland intended with good public access: footpaths and tracks, a car park, ancient monument, National Trust land, Avon Walkway, Forest Walks and Avon Gorge Nature Reserve. Its size means that it is suitable for a large group of students who can be split up into groups. Since it is very close to the city centre, which means for quick and easy access from the school, although many of the children may have been there before which may take some of the excitement out of going on a fieldtrip (although it will ensure they look at their local woodland in a different way).

If I am looking for a site to conduct fieldwork such as species counting, vegetation trampling and footpath erosion, I may wish to choose a smaller woodland which will be quieter and safer. The woods by ***Stoke Park Hospital*** to the northeast of the city centre near to the M32 are one possibility for this. The map indicates access by road, footpaths marked through the woods and an obelisk to visit. With students split into groups undertaking different data collection, it would be easier to monitor them on this smaller site, and the public would not be endangered by tape measures held across footpaths and flying quadrats!

If I am looking to compare different types of woodland in terms of vegetation type and function, I may want to choose a route which takes in three or four sites. Based on what I can see on the OS map, I can identify a number of sites to the southwest of Bristol. I propose starting at the furthest point and working back towards the city. The first site I select is ***Rowberrow Warren*** on the Mendip Hills, off the A38 around 8-10 miles from the city centre. According to the map, the entire wood is coniferous. Access is good and the site contains footpaths, a number of ancient sites and part of a long distance footpath. The second site I select is ***Wrington Warren*** between the A38 and A370 and near Bristol Airport. It is marked as a non-coniferous and with a Nature Trail passing through is obviously designed for some public recreational use. The third site I select is ***Tyntesfield Plantation***, off the A370, which is marked as mixed woodland, and the name plantation indicates commercial management. A road loops through the wood, although public access to this road would have to be checked. I would also pass by an orchard marked on the map, which is part of ***Glen Farm*** near Abbots Leigh. This would illustrate another type of managed woodland to the students, although it being private land means that they could only make field observations.

Fieldwork activities

There are a variety of fieldwork activities associated with woodlands, which support several themes depending on what you may be studying.



Environmental surveys

Environmental surveys can be taken by individuals or groups of pupils at regular intervals throughout the day. Try and find very different positions within the area to take these surveys, including car parks, in the middle of dense forest, footpaths, near visitor facilities, in open grassland. It is usually an idea to scope these areas before pupils take the survey, to ensure results are sufficiently different to produce interesting bi-polar graphs.

Location:
Date:
Weather:
Observations:

	-2	-1	0	+1	+2	
Ordinary						Distinctive
Cramped						Spacious
Dirty						Clean
Ugly						Beautiful
Noisy						Quiet
Boring						Interesting
Untidy						Tidy
Unattractive						Attractive
Unpleasant						Pleasant
Badly kept						Well kept
Dangerous						Safe
Unfriendly						Friendly
Monotonous						Varied
Polluted air						Fresh air
Total score						

The results of these are transferred into a bi-polar graph, which can be analysed together to show the environmental quality of areas in the study area. These results can be mapped onto a map of the area, so that any impacts on the environmental quality can be clearly seen i.e. regularly used footpath, car park, public toilet etc. Results will obviously be affected by students' own opinions of the area, so will be biased.

Footpath erosion

There are several observations that can be made when surveying footpaths and erosion:

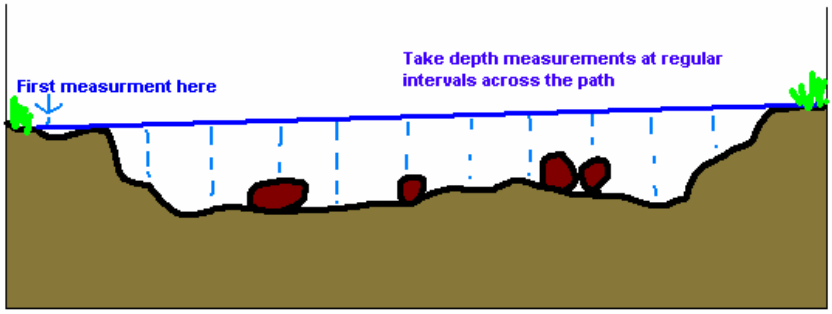
- The amount of erosion of the actual footpath
- The amount of trampling of the areas either side of the footpath
- The impact on species diversity around the footpath

Select several footpaths to survey, including ones that are used regularly, ones near car parks etc and one that is rarely used. Measurements for the following should be taken at regular intervals along the footpath (10 metres is a good choice), and include around 5-6 separate measurements per footpath to build up and idea of the erosion levels.

Measuring footpath erosion

Measurements of width and depth can easily be taken on footpaths to assess the damage caused by trampling and other types of erosion. To measure the amount of erosion:

1) Stretch a measuring tape across the width of the path.
2) Record the width of the footpath
3) Record the depth of the footpath at regular intervals across the width (intervals will change depending on whether the path is narrow or wide- use smaller intervals for narrow path). See diagram below.
4) Repeat the depth measurements at regular intervals along the path, to build up an idea of the amount of erosion along the path.
5) The data can be presented in the form of an isoline map (older students only), or via cross section diagrams showing the depth and width at each measuring interval along the path (these can then be compared to the results from another path).
6) To compare footpaths effectively you could have groups working on a path each, then presenting their data to the rest of the group. The class can then decide where each of the paths may have been within the woodland area and discuss what has caused the erosion. Management strategies could also be discussed.



Measuring trampling on either side of the footpath

Trampling either side (approx 0.5 - 1 metre either side) of the footpath can be measured according to the trampling scale below.

1. No impact on vegetation – flower heads present and stems of plants not broken
2. Vegetation obviously affected – plants present are mainly grasses
3. 1-25% of the topsoil is exposed – plants are very short or squashed
4. 26-50% of the topsoil is exposed – plants are very short or squashed
5. 51-75% of the topsoil is exposed – plants are very short or squashed
6. 76-100% of the topsoil is exposed – plants are very short or squashed

Measuring species diversity

Species diversity can easily be measured using a quadrat, placed at random places throughout the woodland to survey the plant cover in that area.

1. Place the quadrat in the desired area (either planned i.e. near footpath survey areas, or randomly)
2. Provide students with a guide to plants found locally, including pictures. The Field Studies Council does some interesting wall charts which may be of use for this http://www.field-studies-council.org/publications/foldout.aspx
3. Students count the number of squares within the quadrat that contain a certain type of plant, which is then noted as a % cover for that survey site.
4. Students can compare species diversity at different areas, and discuss how human activity can affect species diversity.

$$\text{Species frequency} = \frac{\text{Number of quadrats containing that species}}{\text{Total number of quadrats}} \times 100$$

Visitor surveys and questionnaires

Visitor surveys are an excellent way of familiarising students with the types of people that visit woodlands and for what reasons. Rough visitor numbers can also be gained from this, and then compared to official figures if available. The questions used in a survey or questionnaire can be altered depending on the outcome intended and the type of analysis and skills you are aiming your students to use when back in the classroom. There can be a mix of qualitative and quantitative questions and the results can be collated in different formats. The issue of bias should also be approached with the students, both before and after the fieldwork takes place. Students can be asked how representative the results might be and why (e.g. a survey may be undertaken midweek so may show higher numbers of retired people and less responses in younger age categories).

Example questionnaire / survey below

Woodland Visitor Questionnaire

We are from Kingswood High School and we are doing some fieldwork about this woodland. We want to find out who uses it, why they come here and how it is managed. Would you be able to answer a few questions for us? It should only take a couple of minutes.

Name of interviewer	*Freddie T*
Name of woodland	*Hill Top Woods*
Date	*28 April 2006*
Time	*2pm*
Weather conditions	*Sunny and dry*
Location within woodland	*On main footpath near car park*

Respondent details

Age group Under 10 10-19 20-29 30-39 40-49 50-59 (60-69) 70+

Gender (Male) Female

Travel

Where have you travelled from to visit this woodland (name of village or town)?
Littleton

Approximately how far away is that in miles?
6 miles

How long did it take you?
10 minutes

How did you travel here (e.g. private car, public bus, train)?
Own car

Visits

How many times have you been to this woodland before?

Never Once Twice Between 3 and 10 times (More than 10 times)

How frequently do you come?

A More than once a week
B Once a week
(C Several times a month)
D Once a month
E Several times a year
F Once a year
G Less than once a year

What is the main purpose of your visit today?
Dog walking

How long do you expect to stay?
About 1 hour

How many people are in your group today?
One

If you have visited the woodland before what other activities have you done?
Bird watching
Picnics
Nature Walks organised by the Visitor Centre

Impressions

What do you like most about this woodland?
Nice wide footpaths which are not too steep – I am getting older!

What do you like least about this woodland?
Lots of litter near the main car park

Have you noticed any ways in which this woodland is managed?
They keep some parts fenced off so you can't walk there – I think it's to protect some types of flowers.
I sometimes see volunteers repairing the footpaths.

Have you noticed any changes over time in how this woodland looks or the way it is managed?
There are a lot more footpaths now and they're surfaced better, probably so that wheelchairs and prams can use them.
They put up new information boards and maps a few years ago.

Would you like to make any suggestions as to how this woodland could be improved?
I'd like to see the Visitor Centre run more of their special walks.
Maybe there should be a few more litter bins too.

Thank you very much for your time

Recreational Surveys

For areas of woodland that are used by higher numbers of the general public, a recreational survey is a good way to assess how the woodland is used. Groups to look for include:

- Dog walkers
- Pedestrians
- Joggers / runners
- Cyclists
- Skates boarders
- Roller bladders
- People in playgrounds
- Young people socialising

The results of this survey can then be used to investigate the impacts these groups have:

- On each other
- On the woodland
- On what facilities are needed at the woodlands
- On the local community

Mapping an area of woodland

Sketch maps

To develop map skills and spatial awareness, students can be provided with a simple sketch map of the woodland area on arrival. In small groups, they should be given a certain amount of time to map the area (with clear boundaries given or shown before the exercise), showing features such as:

- Footpaths (concrete and dirt)
- Car parks
- Visitor facilities such as toilets
- Benches
- Litter bins
- Playgrounds
- Bridal paths
- Conservation areas

Students should be encouraged to use symbols and think about scale when adding to their sketch outline. This map could also be used later to add footpath erosion, species diversity and visitor data. To follow up, compare students work with the 'real' map of the area and possibly award a prize for the most accurate map.

Field sketches and digital photographs

Field sketches of the woodland area which are then annotated are also an excellent way to ensure students are aware of their location and the space around them. Encourage the use of geographical words. Allow students access to a digital camera to take pictures of various features and areas, which can then be used in reports and to support findings from the data analysis.

Microclimate of woodlands
Can be investigated and linked to vegetation structure

Comparing woodlands
As an extension activity pupils could compare their local woodland to an area of tropical rainforest, in terms of structure, species diversity and ecosystems.

Things to think about

- Get permission from the land owner before you start digging any soil profiles.
- Take wet wipes if you intend to allow students to do the hand texturing soil identification.
- Think of stranger danger- most woodlands are public areas. Ensure students are never in groups of less than 3 and have been briefed about the dangers and who to report to if they are approached by a stranger.
- If you are intending to spend a day doing woodland fieldwork, ensure you have an adequate place to go for a lunch break as many public areas do not have toilets.
- Think about coach access- will your coach fit down those small country lanes?
- Take a fully charged mobile phone with you in case of emergencies, ensuring that you leave a map with your study location/s clearly marked on with a named contact back at school.

Adding value to your fieldwork with additional data

Using local organisations

Troopers Hill Local Nature Reserve is owned by Bristol City Council and managed by Bristol Parks. The Friends of Troopers Hill http://www.troopers-hill.org.uk/ is one of a variety of organisations that share an interest in the conservation and preservation of the Bristol region's woodlands and open spaces. A quick internet search of your chosen study location should reveal whether there is a local conservation group for the area. http://castletime.brinkster.net/foth/naturecity.htm provides a link to a page that lists several local groups in the region.

The Friends of Troopers Hill recently collected local opinions about Malvern Road Open Space and people's views of the area. Information such as this could be compared to students' survey results.
http://castletime.brinkster.net/foth/mrosresults.html .

Most local organisations will probably be happy to supply data such as this if they have it, or provide a point of view or opinion for a conflicts of interest report or investigation.

Using forest tourism data

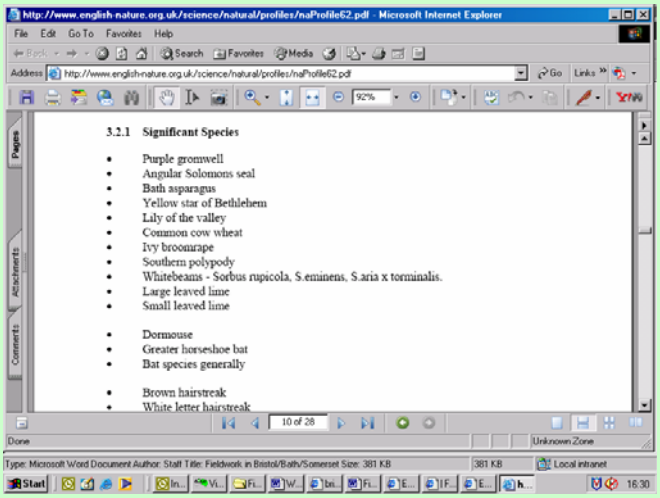
Land Use Consultants have a Bristol office and have produced a variety of documents concerning environmental issues and strategies in the area. One of these is the SW England Woodland and Forestry Strategic Economic Study http://www.landuse.co.uk/Bristol/Downloads/SW%20Forests/Chapter5.pdf which contains a wealth of tourism data about forests in the South West. Unfortunately this is not forest specific, but can give you a general idea of types of visitors, expenditures and visitor numbers.

The Forestry Commission have produced a document Forest' Role in Tourism: Phase 2 http://www.forestry.gov.uk/pdf/tourismsum.pdf/$file/tourismsum.pdf which contains tourism data for the UK. The visitor classification is particularly useful. Surveys were carried out for this document at 44 sites thorough the UK, so further information will be available for some specific sites.

By counting visitor numbers and surveying the types of visitors to the woodland you can work out yearly averages for each type of visitor. This can then be compared to the figures found in the documents above to see if the woodland is above or below UK average for that number / type of visitor.

Using plant guides and species information

English Nature have released a Nature Conservation profile for Bristol, Avon Valleys and Ridges, found at http://www.english-nature.org.uk/science/natural/profiles/naProfile62.pdf



3.2.1 **Significant Species**

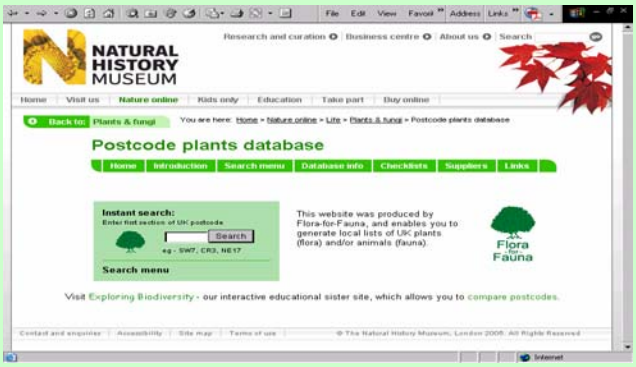
- Purple gromwell
- Angular Solomons seal
- Bath asparagus
- Yellow star of Bethlehem
- Lily of the valley
- Common cow wheat
- Ivy broomrape
- Southern polypody
- Whitebeams - Sorbus rupicola, S.eminens, S.aria x torminalis.
- Large leaved lime
- Small leaved lime

- Dormouse
- Greater horseshoe bat
- Bat species generally

- Brown hairstreak
- White letter hairstreak

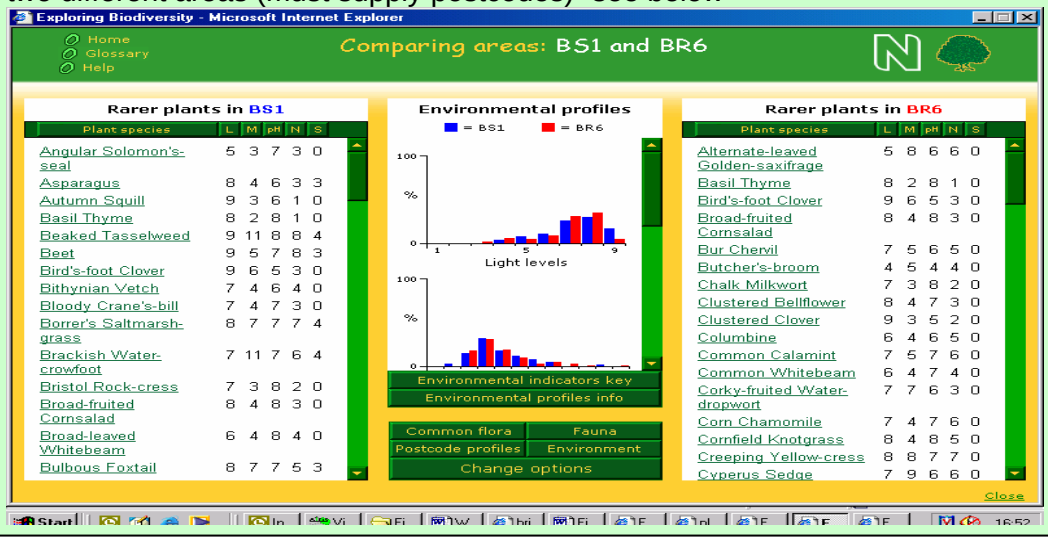
It contains a list of significant species for the area and for various types of woodlands (see above), which can then be used to compile a species guide for species diversity investigations.

The Natural History Museum has a plant postcode guide called ‘Postcode Plants’ http://www.nhm.ac.uk/nature-online/life/plants-fungi/postcode-plants/



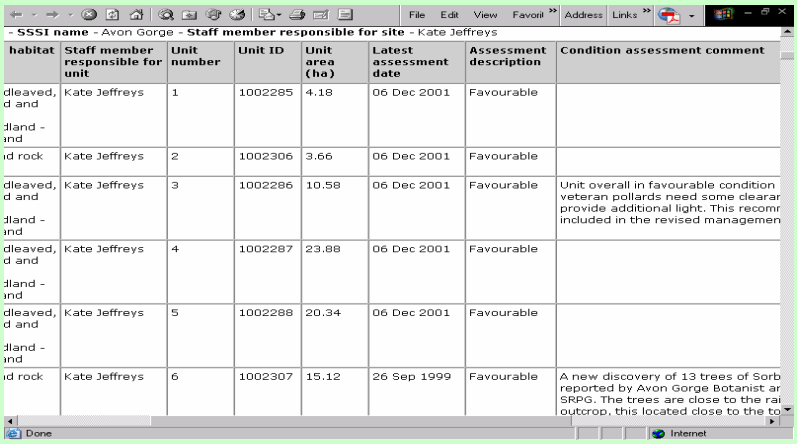
This can be used to gain more information about the species you are likely to find in your area, which you can then research in a common plant guide and piece together a sheet with pictures of the most common plants students are likely to find so they can be easily identified.

Its sister site ‘Exploring Biodiversity’, also from the Natural history Museum http://internt.nhm.ac.uk/eb/index.shtml contains further information about biodiversity fieldwork, species investigation and allows you to compare species and biodiversity in two different areas (must supply postcodes)- see below



Using information about SSSIs and other conservation schemes

English Nature has a detailed section about SSSIs on its website http://www.english-nature.org.uk/special/sssi/ , which includes detailed reports for specific SSSI areas at county and regional levels, like the Avon Gorge report below.



- **SSSI name** - Avon Gorge - **Staff member responsible for site** - Kate Jeffreys

habitat	Staff member responsible for unit	Unit number	Unit ID	Unit area (ha)	Latest assessment date	Assessment description	Condition assessment comment
dleaved, d and dland - and	Kate Jeffreys	1	1002285	4.18	06 Dec 2001	Favourable	
d rock	Kate Jeffreys	2	1002306	3.66	06 Dec 2001	Favourable	
dleaved, d and dland - and	Kate Jeffreys	3	1002286	10.58	06 Dec 2001	Favourable	Unit overall in favourable condition veteran pollards need some clearar provide additional light. This recomr included in the revised managemen
dleaved, d and dland - and	Kate Jeffreys	4	1002287	23.88	06 Dec 2001	Favourable	
dleaved, d and dland - and	Kate Jeffreys	5	1002288	20.34	06 Dec 2001	Favourable	
d rock	Kate Jeffreys	6	1002307	15.12	26 Sep 1999	Favourable	A new discovery of 13 trees of Sorb reported by Avon Gorge Botanist ar SRPG. The trees are close to the rai outcrop, this located close to the to

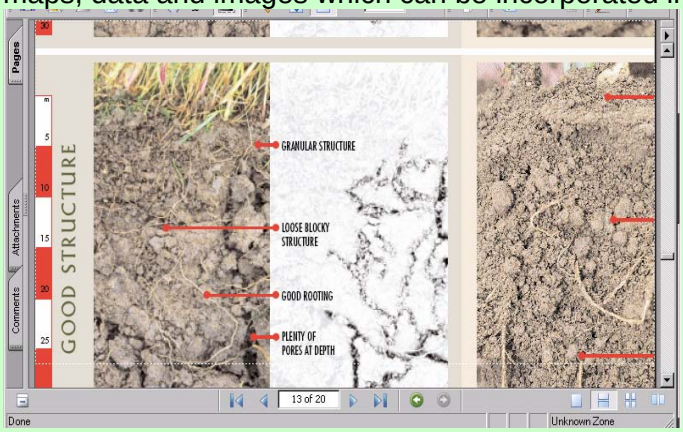
English Nature also has a search facility to search for your nearest SSSI, found at http://www.english-nature.org.uk/special/sssi/search.cfm

Bristol Zoo Gardens run an Avon Gorge and Downs wildlife project http://www.bristolzoo.org.uk/conservation/wild/avongorge
Leaflets and further information are available through the website, and the project also has an Education Officer who runs walks, talks and childrens' events.

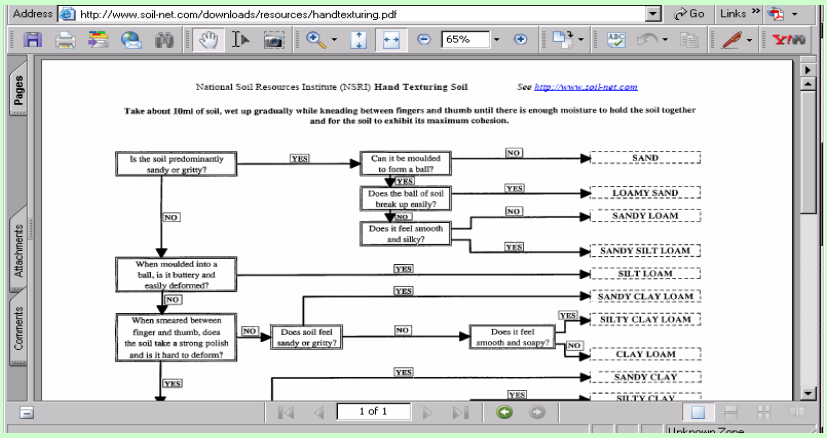
Using soils information

Soil-net.com http://www.soil-net.com/ has some extremely useful downloads that could be used both for background information for soil profiling etc and also to help with soil identification.

Produced by Cranfield University., the Soil Structure Brochure found at http://www.soil-net.com/downloads/resources/structure_brochure.pdf (shown below) provides information about examining soil structure, problems with soils and provides maps, data and images which can be incorporated into fieldwork.



Cranfield University also provides a National Soil Resources Institute hand texturing soil identifier guide to download http://www.soil-net.com/downloads/resources/handtexturing.pdf which is an excellent accompaniment to any fieldtrip, particularly if your student don't mind getting a bit muddy.



Web links

Forestry Commission: National Inventory of Woodland and Trees- Avon
http://www.forestresearch.gov.uk/pdf/avon.pdf/$FILE/avon.pdf
A survey of woodland in the Avon area, including maps, data (including management techniques, ownership, species)

Countryside Quality Counts- Character Area Profiles
http://www.countryside-quality-counts.org.uk/cap/southwest/index_sw.htm
Monitors and assesses countryside change, and includes information and graphs on woodlands, boundary features, agriculture, settlement and development, semi natural habitats. Other regions throughout the UK available.

Bath and North East Somerset Council: Rural Landscapes of Bath and North East Somerset, A Landscape Character Assessment

http://www.bathnes.gov.uk/committee_papers/PTandE/PTE020321/14zBackgroundpaper.htm
Landscape Character Area Descriptions of:
Thrubwell Farm Plateau
Chew Valley
Upper Chew and Yeo Valleys
Mendip Slopes
Dundry Plateau
Hinton Blewett and Newton St Loe Plateau Lands
Hollow Marsh
Farrington Gurney Farmlands
Stockwood Vale
Hicks Gate
Bickley Wood Gorge
Cam and Wellow Brook Valleys
Paulton and Peasedown St John Ridge
Avon Valley
Norton Radstock Southern Farmlands
Cotswolds Plateaux and Valleys
Hinton Charterhouse and Baggridge Plateau
Bathford and Limpley Stoke Valley

Forest of Avon: The Forest Plan

http://www.forestofavon.org/forestplan.html
Vision for the future and forest strategy. Maps are included.