



# Ecosystems

## Introduction

The aim of this web site is to provide teachers with a means of

- delivering up to date material.
- using local examples.
- covering a wide range of geographical themes.
- integrating ICT with good classroom practice.
- examining the themes with a sustainable focus.
- applying the differentiated tasks according to ability.

## What is Education for Sustainable Development?

*“Education for sustainable development enables people to develop the knowledge, values and skills to participate in decisions about the way we do things individually and collectively, both locally and globally, that will improve the quality of life now without damaging the planet for the future.”*

**(Panel for Education for Sustainable Development, 14 September 1998)**

## How to use site

The site is designed to allow teachers to integrate the material on the web site into their classroom practice. The material is available in a variety of formats to allow as wide a range of flexibility as possible. The material is available on CD-ROM, and on the Internet. The material can be accessed ‘live’ or downloaded to a single or cached computer.

The material covered within each section is sequential. However the individual topics of each theme may be examined separately. Initially each section is placed in a spatial context and then the relevant geographical themes are explored through a wide range of resources, with tasks and activities throughout. Within each section there is direct reference to the sustainable nature of the area in question. Each section has a terminal task in which the overriding themes are explored. Each section of the site has a Scheme of Work. This outlines the main Teacher activities, as well as pupil activities and links to other sites.

Therefore a wide range of approaches may be adopted when using the site.

- The material may be followed through from beginning to end in a linear fashion, using the tasks within the site and worksheets provided on the teachers’ site.
- Separate areas may be examined as part of a wider unit of work, as exemplar, or applicable tasks.
- Individual pieces of information may be lifted for use with KS3 students or older, or even to address different themes, or different subjects.
- Tasks may be set based on research from the material presented.



## The aims of this section are that students will

- Understand the nature of the various components of an ecosystem.
- Recognise that there are variations within and between ecosystems.
- Realise that human impact can have a detrimental as well as beneficial impact on the sustainable nature of ecosystems.

## Learning Outcomes

By the end of this unit students will be able to

- Understand that an ecosystem is a community of plants and animals within a physical environment or habitat.
- Realise that a tree serves a wide range of purposes in an ecosystem.
- Recognise that the distribution of the forest ecosystem in NI has changed over time.
- Identify that the Belvoir estate is a region made up of areas of differing characteristics.
- Realise humans may have a beneficial or detrimental impact on an ecosystem.
- Appreciate that introduced species can alter the characteristics of the ecosystem dramatically.
- Identify that the forest ecosystem is made up of a wide variety of plant and animal species.
- Appreciate that the location of Belvoir as a forest within a city, results in constant threat to the forest from development.
- Realise that there are many threats and opportunities for Belvoir forest - which must be managed carefully if the area is to be sustainably developed.



# Scheme of Work - Ecosystems

**Activity** - exercise within the site. Individual / Group-work.  
**Worksheet** - PDF printable downloadable file.  
**Differentiated** - depending on ability, age range, differentiation can be upward or downward.

Topic titles	Learning outcomes	Teaching activities	Pupil activities	Further activities [Differentiation U - upwards D - downwards]
<ul style="list-style-type: none"> <li>Introduction</li> </ul>	<ul style="list-style-type: none"> <li>An ecosystem is a community of plants and animals within a physical environment or habitat.</li> </ul>	<ul style="list-style-type: none"> <li>Introduce the various components of the ecosystem identifying key concepts - herbivore, carnivore etc.</li> <li>Introduce sustainability in relation to ecosystems.</li> </ul>	<ul style="list-style-type: none"> <li><b>Individual/group-work.</b></li> <li>Read through material - discuss examples of each level in the ecosystem &amp; suggest additional examples.</li> <li>Discuss ways in which humans can impact on the ecosystem, giving examples.</li> </ul>	<ul style="list-style-type: none"> <li><b>Worksheet A [U][D]</b></li> <li>Fill in blanks to reinforce what an ecosystem is.</li> </ul>
<ul style="list-style-type: none"> <li>Tree facts</li> </ul>	<ul style="list-style-type: none"> <li>A tree serves a wide range of purposes in an ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>Introduction of the various functions that a tree performs in respect of                             <ul style="list-style-type: none"> <li>- Creating and providing <b>food</b></li> <li>- Role in the <b>carbon</b> cycle</li> <li>- <b>Shelter</b> and layers of vegetation</li> <li>- <b>Soil</b> profile</li> <li>- Use of <b>water</b> and role in interception and runoff</li> <li>- <b>Timber</b> production and wood products</li> </ul> </li> <li><b>NB double click on label to access information.</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Individual/group-work</b></li> <li>Read/discuss information and complete summary activities.</li> <li>Some teacher lead interpretation may be necessary.</li> <li>Complete quiz!</li> </ul>	<ul style="list-style-type: none"> <li><b>Worksheet B [U][D]</b></li> <li>Match the correct facts to the function of a tree.</li> <li>Complete descriptive paragraphs.</li> <li>Activity [U] What does a tree do? Write a brief report in notebook under the headings - food, carbon, timber, shelter, water, and soil.</li> </ul>
<ul style="list-style-type: none"> <li>Forest location</li> </ul>	<ul style="list-style-type: none"> <li>The distribution of the forest ecosystem in NI has changed over time.</li> </ul>	<ul style="list-style-type: none"> <li>General outline of the causes of the change in the distribution of forest cover over time.</li> <li>Identification of the current location of forest.</li> <li><b>NB right click on forest for additional information.</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Individual/group-work</b></li> <li>Investigate timeline, identifying the change through time.</li> <li>Explore the location and characteristics of the current forests.</li> <li>Complete the graphs/pie charts activity showing change through time.</li> </ul>	<ul style="list-style-type: none"> <li><b>Worksheet C [D]</b></li> <li>On map of the current distribution of the forests, name forests and complete questions.</li> <li>[U] Complete summary paragraph describing the distribution of forests for the present day. How has the distribution changed over time?</li> </ul>



## Scheme of Work - Ecosystems Continued

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**Differentiated** - depending on ability, age range, differentiation can be upward or downward.

Topic titles	Learning outcomes	Teaching activities	Pupil activities	Further activities [Differentiation U - upwards D - downwards]
<ul style="list-style-type: none"> <li>Forest tour</li> </ul>	<ul style="list-style-type: none"> <li>The Belvoir estate is a region made up of areas of differing characteristics.</li> </ul>	<ul style="list-style-type: none"> <li>Define key terms of coniferous, deciduous, mixed woodland.</li> <li>Identify the different areas that exist in the Belvoir region. Discuss these in respect of varying management practices over a long period of time.</li> </ul>	<ul style="list-style-type: none"> <li><b>Individual/group-work</b></li> <li>Read/explore the information through the transcripts of the tour, Ipix and audio clips.</li> <li>Complete the summary quiz at the end of the section.</li> </ul>	<ul style="list-style-type: none"> <li><b>Worksheet D [D]</b></li> <li>What is found at each location - shade map and complete sentence for each numbered area.</li> </ul>
<ul style="list-style-type: none"> <li>Forest tour</li> </ul>	<ul style="list-style-type: none"> <li>Humans may have a beneficial or detrimental impact on an ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>Highlight various management issues throughout, especially investigating issues arising in <b>Human Impact</b> section.</li> </ul>	<ul style="list-style-type: none"> <li><b>Individual/group-work</b></li> <li>Read/explore the information identifying management issues.</li> <li>Investigate the <b>Human Impact</b> topic. Using Ipix, discuss image of the high-level sewage pipe.</li> </ul>	<ul style="list-style-type: none"> <li>Activity[U] Write a short report - In what ways have people improved the Belvoir forest ecosystem, and in what ways have they harmed it?</li> </ul>
<ul style="list-style-type: none"> <li>Forest tour</li> </ul>	<ul style="list-style-type: none"> <li>Introduced species can alter the characteristics of the ecosystem dramatically.</li> </ul>	<ul style="list-style-type: none"> <li>Explore the impact of Norway spruce, larch, and rhododendrons throughout.</li> <li><b>NB investigate the Dense Conifer topic.</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Group-work/individual</b></li> <li>Read/explore the information identifying introduced species.</li> <li>Investigate the <b>Dense Conifer</b> topic, using Ipix images.</li> </ul>	<ul style="list-style-type: none"> <li>Activity[U] Which species have 'taken over' the ecosystem in places? What has their impact been?</li> </ul>
<ul style="list-style-type: none"> <li>Build a forest</li> </ul>	<ul style="list-style-type: none"> <li>The forest ecosystem is made up of a wide variety of plant and animal species.</li> </ul>	<ul style="list-style-type: none"> <li>Outline the need to have various tree, vertebrate and invertebrate species to have a 'balanced' ecosystem.</li> <li>Recap on information provided throughout.</li> </ul>	<ul style="list-style-type: none"> <li><b>Group-work</b></li> <li>Read/explore information and complete building forest activity.</li> </ul>	<ul style="list-style-type: none"> <li><b>Worksheet E</b></li> <li>Complete image of the forest - name the species in the correct location.</li> <li>State why, for at least one species, it was the most suitable.</li> <li>Activity [U] Explain why the species chosen are most suitable.</li> </ul>
<ul style="list-style-type: none"> <li>Belvoir timeline</li> </ul>	<ul style="list-style-type: none"> <li>Within Belvoir forest there have been many changes which have threatened its survival.</li> </ul>	<ul style="list-style-type: none"> <li>Exploration of the resource building up of changes through time.</li> <li><b>NB</b> Explain that double clicking on each feature brings up more information.</li> </ul>	<ul style="list-style-type: none"> <li><b>Individual/group-work</b></li> <li>Scroll through the timeline, identifying the changes throughout.</li> <li>Discuss impacts of the changes.</li> </ul>	<ul style="list-style-type: none"> <li><b>Worksheet F [D]</b></li> <li>Shade map and label each section.</li> <li>Describe how the area has changed.</li> <li>[U] Explain what has happened in each area.</li> </ul>



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<ul style="list-style-type: none"> <li>Transport or trees</li> </ul>	<ul style="list-style-type: none"> <li>The location of Belvoir as a forest within a city, results in constant threat from development.</li> </ul>	<ul style="list-style-type: none"> <li>Outline how different groups have different perspectives regarding the need for development.</li> </ul>	<ul style="list-style-type: none"> <li><b>Individual/group-work</b></li> <li>Read/listen to the opinions of the individuals.</li> <li>Discuss the benefits and disadvantages of each position?</li> </ul>	<ul style="list-style-type: none"> <li><b>Worksheet G</b></li> <li>Match the opinion to the person.</li> </ul>
<ul style="list-style-type: none"> <li>Decision time</li> </ul>	<ul style="list-style-type: none"> <li>There are many threats and opportunities for Belvoir forest - which must be managed carefully if the area is to be sustainably developed.</li> </ul>	<ul style="list-style-type: none"> <li>General outline of the main opportunities and threats facing Belvoir in the light of the proposed Bus Super Route. Recap on information provided throughout.</li> </ul>	<ul style="list-style-type: none"> <li><b>Individual</b></li> <li>Complete report.</li> </ul>	