

A Biodiversity Guide for Teachers

About This Guide

The aim of this guide is to encourage the appreciation and promotion of biodiversity as part of the everyday life of every school, whether that is through the integration of biodiversity issues into the National Curriculum or in how school grounds are managed.

The document attempts to provide an easily assimilated, working brief for teachers to help them incorporate the concept of biodiversity, and its role in living sustainable lives, into their lesson plans and projects.

The appendices of the guide, taken together, attempt to act as a biodiversity resource guide. Listing places to visit where biodiversity and wildlife studies can be followed or facilitated, useful books and packs, and how to obtain them.

Introduction

– Background Notes

i) The Biodiversity Action Plan Process

Increased awareness of the destruction of habitats, the extinction of species and greater levels of pollution, at both national and global levels, has placed all of these issues in the political arena. Throughout the latter part of the twentieth century the conservation of species and habitats, and the maintenance of natural resources, moved ever higher up the political agenda.

The gathering of world leaders for the United Nations Conference on Environment and Development in Rio de Janeiro, June 1992 (the Earth Summit), propelled conservation into the international forum. Consequently, it is now widely recognized across all sectors of society, that the conservation of habitats and species is important, both intrinsically and economically.

The biodiversity planning process resulted from the UK Government's signing of the International Convention on Biological Diversity (1992), an initiative that grew out of the 'Earth Summit'. This led to the publication of 'Biodiversity: the UK Action Plan' in 1994 and, in order to deliver this, the development of local biodiversity action plans. The national plan lists the UK biodiversity priorities and targets for priority species and habitats. Furthermore, it provides a context for the production of Local Biodiversity Action Plans (LBAPs) such as 'Action for Wildlife – The Durham Biodiversity Plan' (1999). The main objective of the Durham Biodiversity Action Plan (DBAP) is to ensure that the biodiversity of 'Durham' i.e. Darlington Borough, County Durham, Gateshead Borough, South Tyneside and the City of Sunderland, is maintained, enhanced or re-established.

What is biodiversity? Put simply, it is the variety of life around us. It encompasses all living things, from trees to flowering plants, from butterflies to blue whales, from the commonplace to the greatly endangered. It is also about the range of habitats that animals and plants depend upon.

Why is biodiversity so important? It contributes fundamentally to our quality of life, although we often find this difficult to explain. We benefit economically from many aspects of it and, not least in the air we breathe and the food we eat, biodiversity ensures our survival.

Protecting the variety of life around us, making sure that there is access to a wide range of species and habitats, is important not just for man's own needs but also because of the intrinsic worth of the plants and animals themselves.

Even small actions, like cutting down a tree or neglecting a pond, can impact negatively on wildlife. So many ordinary, daily activities are slowly eroding our local variety of wildlife - our local biodiversity.

In January 1999 the Durham Biodiversity Action Plan was launched, by Stephen Hughes MEP. This is a detailed document which attempts to encourage and co-ordinate action for important species and habitats, to ensure that biodiversity is maintained, enhanced or re-established across the area of influence of the Plan. The Durham Biodiversity Action Plan is a local Biodiversity Action Plan and is just one of many such plans across the UK.

Agenda 21, which grew out of the 1992 Rio Earth Summit, is a world-wide programme for sustainable development in the next century. Sustainable development can be defined as "development which meets our needs today without compromising the ability of future generations to meet their needs".

The conservation of wildlife is an essential aspect of Agenda 21 and the state of our wildlife is a good indicator of whether we are living sustainably. Hence, the Biodiversity Action Plan process is a vital element in delivering a Local Agenda 21 and if development is to be deemed truly sustainable, it must give due regard to biodiversity issues.

Biodiversity & Schools

INTRODUCTION

The enhancement of our environment for biodiversity, as part of the wider agenda to encourage more sustainable practices in the lives of both individuals and businesses, has become a central issue in today's society. Biodiversity is a 'quality of life' issue for the individual, both at home and in the work place.

There are few spheres of human activity within which biodiversity benefits can not be secured. In some of these areas, the benefits may be accrued indirectly rather than directly, for example the raising of people's awareness of biodiversity and a more positive perception of the environment.

Aims and Objectives of this Document

Important species and habitats can be found in both 'natural' and man-made areas. Increasingly, many man-made and man-influenced habitats are important for wildlife. Industrial sites and business parks can be havens for wildlife. Not surprisingly, many such sites are managed by people whose expertise does not lie in species conservation and habitat management. It is important that appropriate support information is made available to these managers in a form that is accessible, so that they can incorporate these issues into their procedures.

Habitat creation schemes need not be expensive or overly complex to be of significant wildlife value. The creation of small wetlands, woodlands, species-rich grasslands and the planting of hedgerows can all achieve large net gains for biodiversity in the local context, and still be visually appealing.

It is our intention, through the information contained in this document, to facilitate the easy incorporation of some of the above principles into the process of managing non-operational land within business parks/industrial estates/complexes, and buffer land around large industrial installations. The most effective way of achieving this in a strategic sense is through the production of an estate (or site) management plan.

This document offers up a model for how this might be achieved. The model is designed to be both technically effective and appropriate, as well as accessible to the non-specialist estate manager or grounds maintenance co-ordinator. It is not our intention that any information contained within this guidance should compromise the effectiveness or operational functionality of any school ground for which a management plan is adopted. The guidance notes have been developed, as far as is possible, with this in mind.

This document aims to:

- Provide information about the process of producing a wildlife management plan for school grounds, for example the sequencing of data gathering and the timetable of consultation
- Offer up a model for school grounds wildlife management plans that can be used by grounds managers and staff to assess and, ultimately, create a tool (i.e. a management plan) which will help manage 'their' site for its wildlife importance and to maximise its wildlife potential
- Facilitate these processes by listing additional, appropriate guidance and support information, as well as useful contact details.

Why?

Improving school grounds benefits both humans and wildlife. The benefits include:

- Economic - good environmental practice is often good business practice – for example, land maintenance costs may be reduced, and ‘improving’ areas of marginal land may bring ancillary benefits such as a reduction in vandalism and associated costs. In addition, the promotional opportunities and consequent commercial benefits which might be derived as a result of grounds managers and/or schools taking positive environmental action should not be diminished in the modern school environment
- Environmental benefits - managing areas for wildlife, through the application of the plan, will enhance the biodiversity of the school grounds and will provide an educational facility and a natural softening of the landscape that will develop subtly, over time, as habitats mature
- Social - by improving people’s environs - natural areas can benefit the staff and pupils within the school grounds. For example seating, eating and relaxation areas can be created adjacent to ‘green’ features e.g. a pond or in a woodland glade offering facilities for ‘circle time’ and other educational activities.
- Staff and pupils well-being - “Biophilia” is a concept that suggests that humans intrinsically require to be in close proximity to nature, and benefit in terms of mental and physical well-being as a result of the association.
- Practical wildlife management projects provide schools with the opportunity for their pupils to take part in useful ‘team-building’ and ‘problem-solving’ exercises.

Furthermore, successful wildlife features, such as a wild-flower meadow, can be utilised to promote a company’s green image. Attractive photographs of such features, e.g. a meadow in full bloom, can be used as interpretative features in company reception rooms and foyers. They can provide passive, but effective promotion of corporate environmental awareness - as well as in publications such as annual reports to shareholders and stakeholders.

How?

This document provides information to support the three key elements of the management planning process. Firstly, the procedure to be followed in producing an industrial estate management plan – the sequencing of activities and the flow of information. Secondly, to illustrate the content of such a plan a ‘skeleton’ model management plan is put forward. Thirdly, by providing practical information on how to manage a range of different habitats which might be encountered or created within the context of an industrial estate. In addition, a glossary, bibliography and contacts list are all appended.

In the context of the Durham Biodiversity Action Plan, this document itself has a range of key biodiversity objectives, which, in summary, set out to assist in the implementation of Plan targets for a range of key species and number of habitats

found in industrial estates in the 'Durham' Plan area. In particular, this includes facilitating the delivery of Durham Biodiversity Action Plan Targets, for:

- Habitat Action Plan for 'The Built Environment' – Targets 1, 2 & 3: Actions 2, 3, 4, 5, 6 & 7?
- Habitat Action Plan for 'Parks and Amenity Grasslands' – Target 1: Action 13?
- Habitat Action Plan for 'Transport Corridors' – Target 1: Action 6?

Why should schools and teachers wish to become involved in raising awareness of, and helping to maintain biodiversity through the work they do with children?

For a large number of reasons not least amongst these are to:

- give children the opportunity to appreciate wildlife and better understand the world in which they live;
- realise the study opportunities that biodiversity offers;
- improve the school grounds environment as a place to work in;
- help meet the objectives relating to the environment and sustainability as required by the National Curriculum;
- help improve biodiversity for 'everyone' in society.
- guarantee to the future of wildlife in the region;

"We do not inherit the earth from our ancestors, we borrow it from our children" - Chief Seattle

The message is simple, good environmentally aware teaching makes better citizens of a school's students. In addition a good environment record helps to raise the profile of both the school and its teaching staff.

Landscaping of School Grounds

The maintenance of biodiversity within the school grounds is much facilitated by the use of native species of trees, shrubs and plants in any landscaping around the school. Biodiversity principles are usually simple ones. Whenever possible, use locally native species and try and create a variety of habitats. A wide range of plant species, native to the area are available for use in such schemes.

Habitat Creation in School Grounds

Habitat creation schemes need not be expensive or overly complex to be of significant wildlife value. The creation of small wetlands, woodlands, species-rich grasslands and the planting of hedgerows can all achieve large net gains for biodiversity within the context of the school grounds.

Habitats which can be created relatively easily in the school grounds include:

Hedgerows These should be of native species, principally hawthorn, mixed with blackthorn, hazel, holly, goat willow and with scattered hedgerow trees such as ash and oak.

Wetlands (Ponds) Ideally, any ponds created should: exhibit large amounts of edge (islands are a good way of creating this); be of a depth of at least 500 mm and contain a large enough volume of water to resist drying out. They should not be stocked with fish, should be surrounded by at least a one metre wide strip of rough grassland (to benefit amphibians) and have a range of depth profiles to maximise the range of habitats for invertebrates. If ponds are stocked they should contain only locally native species of plant and should never be planted with invasive, non-native species such as water fern or Canadian pondweed.

Wildflower Meadows and Species Rich Grasslands These can be created in low nutrient soils (often sub-soil), at relatively low cost. Locally sourced seeds can usually be obtained from commercial outlets or from hay cropped grasslands, or even collected by older children as part of specific project work. If the meadow is established from scratch, the seed mix should contain a large proportion of annuals to allow a colourful first-year sward to develop. A varied sward structure in such meadows is desirable and a dense sward coverage is not necessary, as many insects, especially butterflies, require some areas of bare ground. Post-establishment management is important in maintaining biodiversity. Ideally, this will involve a 'once a year hay crop' regime with some grassland margins being left uncut, to harbour over-wintering invertebrates.

Woodland Corners These should comprise only locally native tree and shrub species and are a useful way of using small corners of school fields etc.

Butterfly Gardens Useful for schools with little space or in largely urban locations. The objective is to provide a range of colourful plant species which will provide nectar and pollen sources for a wide range of butterflies and other invertebrates throughout the year.

General Guidelines for School Grounds Maintenance

Some general principles of grounds maintenance which, if adopted, can help to deliver biodiversity include: creating corridors and linear features can reduce the fragmentation of habitats; habitat mosaics and diversity of form usually leads to an increase in biodiversity; and untidiness can be good for wildlife.

General Guidelines

- Attempt to set aside even some small areas for wildlife and create biodiversity friendly green space within the context of any landscaping.

- Attempt to develop specialised wildlife areas within the school e.g. a pond, a hedge, a meadow, a woodland or nest-boxes.
- Use locally native species, ideally, of local provenance of shrubs, trees and plants in all planting schedules.
- Incorporate in and around school buildings, wildlife-friendly features e.g. nesting platforms for kestrels, gaps under eaves to accommodate swifts, nesting spaces and openings for titmice and barn owl boxes and niches in roof spaces.
- Manage greenspace around schools in a less intensive manner e.g. by reducing the area of short sward grassland around buildings by changing mowing regimes.
- When it is determined that herbicides have to be used, use only biodegradable, systemic herbicides and, ideally, these should be applied using spot treatment methods.
- Use only peat alternatives in all work with students.
- Create landscaped linear features and corridors to connect to any areas of semi-natural vegetation around the school e.g. hedgerows and strips of unmown grass.
- Use wildflower mixes as a low maintenance alternative on low profile areas e.g. at the rear of factory units or as an interpretative feature for the company reception area - illustrating the 'company wildflower meadow (with photograph of the area in full bloom).

This document has been produced by the **Durham Biodiversity Partnership**. The partnership manages the Durham Biodiversity Action Plan Project and includes representatives from most local authorities, from statutory bodies, such as English Nature and the Environment Agency, as well as businesses and voluntary nature conservation groups.

Appendix 1 Biodiversity and Wildlife Conservation Jargon -Buster

Biodiversity The variety of life, wildlife and its habitats. The term embraces the full range of habitats, species, and the variation within species (i.e. genetic variation), across those areas in which species and habitats occur or would be expected to occur. Often used to refer to all of the wildlife found within a habitat.

Biodiversity Action Plan (BAP). A plan to conserve or re-create biodiversity. The term may be used to describe the whole process by which this happens or a document which sets out how this is to be achieved.

County Wildlife Site A site of nature conservation importance, designated for its local wildlife importance but which has no legal protection (sometimes known as an SSSI).

Durham Biodiversity Action Plan (DBAP) The Local Biodiversity Action Plan for Durham. It also describes the process by which action is taken to conserve wildlife locally, specifically those habitats and species for which our area has a special responsibility under the UKBAP.

Durham Wildlife Audit A thorough habitat survey of County Durham and Darlington which mapped and measured the amounts of important wildlife habitat across the county in the early 1990's.

Ecosystem A network of animals and plants all depending, in one way or another, on each other.

Habitat Action Plan (HAP) One of two sorts of plans contained within the DBAP document (see also *SAP*). A plan geared toward the conservation or re-creation of a particular habitat, such as lowland heathland, upland oakwood or limestone grassland.

Habitat A part of the landscape which takes its character from particular types of vegetation e.g. marsh, woodland.

Local Agenda 21 (LA 21) A term, describing the actions we must take locally to promote sustainability and sustainable development, which has its origins in the 1992 Rio Earth Summit. Sustainable development has been described as "development that meets the needs of the present, without compromising the ability of future generations to meet their own needs".

LNR Local Nature Reserve.

SAP Species Action Plan. One of two sorts of plans contained within the DBAP document (see also *HAP*). A plan geared toward the conservation or re-introduction of a particular species, such as red squirrel.

SSSI Site of special scientific interest - a nationally important wildlife site, which has legal protection under the Wildlife and Countryside Act.

SNCI Site of nature conservation importance. A site designated for its local wildlife importance but which has no legal protection (sometimes known as a County Wildlife Site).

Steering Group A group formed by representatives of local authorities, conservation organisations and business, who undertake the direct management of the DBAP project.

UK Biodiversity Action Plan The BAP for the United Kingdom, which has its roots in the Rio Earth Summit. Various UKBAP documents have been produced by the UK government which detail actions necessary for a wide range of the country's habitats and most threatened plants and animals. The UKBAP forms the basis for all local Biodiversity Action Plans as well as other initiatives.

Appendix 2 Useful Biodiversity Resources and Texts for Teachers.

Sharing Nature with Children Joseph Cornell (1985?)

The Durham Wildlife Audit (Durham County Council 1996)

Action for Wildlife: The Durham Biodiversity Action Plan (DBAP Partnership 1999)

Species Protected by Law - Guidance for Local Planning Authorities in County Durham (April 1997) available from Environment and Technical Services Dept., Durham County Council

Educating for Life - Guidelines for Biodiversity Education (Council for Environmental Education 1997)

Creating Native Forests (Forestry Commission Bulletin 112)

Literally Wild - Wildlife Texts for the Literacy Hour (London Wildlife Trust 1999)

Appendix 4 Useful Species for Habitat Creation and Maintaining Biodiversity in School Grounds.

Useful Tree and Shrub Species Native to the Durham Area

Alder	<i>Alnus glutinosa</i> (useful for damp locations)
Silver Birch	<i>Betula pendula</i>
Downy Birch	<i>Betula hirsuta</i> (useful for damp locations and upland areas)
Bird Cherry	<i>Prunus padus</i>
Hawthorn	<i>Crataegus monogyna</i>
Blackthorn	<i>Prunus spinosa</i>
Hazel	<i>Corylus avellana</i>
Elder	<i>Sambuca nigra</i>
Oak	<i>Quercus robur</i>
Sessile Oak	<i>Quercus petraea</i> (especially in upland areas)
Wych Elm	<i>Ulmus glabra</i>
Ash	<i>Fraxinus excelsior</i>
Grey Willow	<i>Salix cinera</i>
Goat Willow	<i>Salix caprea</i>
Aspen	<i>Populus tremula</i> (should not be planted in the vicinity of building foundations or drains)
Rowan	<i>Sorbus acuparia</i>
Juniper	<i>Juniperus communis</i>
Dog Rose	<i>Rosa canina</i>
Broom	<i>Sarothamnus scoparius</i>
Gorse	<i>Ulex europaeus</i>

Local Biodiversity Action Plan for Schools in County Durham

Targets

- To increase the biodiversity (the variety of life) in Durham's schools.
- To raise awareness of biodiversity in schools.
- To provide a fund for further school projects.

Current Status

There are approximately 300 schools in the county, most have at least a patch of grass, hedgerows and walls.

What % of schools in the county are managing their grounds for nature conservation.

What type of habitats are found in school grounds? e.g. ponds, hedgerows, grassland, walls, trees.

What is already being done to raise awareness about biodiversity in schools? e.g. through National Curriculum, nature clubs, wildlife projects, number of school visits to nature reserves.

What flagship species are found in schools? e.g. mini-beasts (snails, ladybirds, beetles, butterflies, ants, worms, frogs, spiders, pond insects, etc.), also foxes, badgers, moles, voles.

Good examples: Ferryhill Station Primary School, Wingate Infant School, Leadgate Junior School, Ouston Junior School, etc.

Current projects/initiatives

The School Grounds Development Project (County Durham).

Learning Through Landscapes (national).

Local Agenda 21.

Threats to Biodiversity in Schools

Land sold off for housing.

Lack of funding to develop/maintain school grounds.

No time within National Curriculum.

Lack of time for extra-curricular clubs etc.

Unsympathetic management of school grounds.

Litter

Vandalism.

Actions to Achieve Targets

Any ideas?

Education

Schools/Careers:

- encourage careers teachers and the careers advice service to promote placements for students within countryside management sections and at similar environmental facilities.

- support the development of programmes for student placements with organisations which are involved with running/servicing the National Biodiversity Network or in supporting the work of Local Biological Records Centres.

- incorporate awareness and conservation of biodiversity, into lesson plans and the National Curriculum across as many subject areas as possible, using appropriate published guidance for support.

- encourage the creation of wildlife areas in school grounds.
- encourage the creation/management of wildlife areas in the local community through partnership between schools, business and local authorities.
- utilise good quality countryside facilities (which champion biodiversity) as teaching resources/locations for days out and study visits - see "Places to Visit on Website.