# Barnsley Biodiversity in Schools project

# Guidance for Volunteers and Schools

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## 1. Introduction

The purpose of this booklet is to provide guidance for school communities and volunteers in developing and maintaining a healthy biodiversity in the school grounds.

It has been produced as part of the Barnsley Biodiversity Trust's Biodiversity in Schools project funded by the Heritage Lottery Fund.

## 2. What is biodiversity?

Biological diversity or biodiversity for short is the variety of life. It includes all plants and animals, their habitats and the factors that link them to each other and their surroundings. It is not restricted to rare and threatened species and habitats but includes the whole of the natural world from the commonplace to the critically endangered.

In every habitat, living things – the plants, invertebrates, fish, amphibians, reptiles, mammals, and birds found there - form communities that interact with each other and are dependent on the rocks, soils and climate of the area. These interactions, operating over thousands if not millions of years have resulted in the beautiful, habitable world we live in today, and continue to provide essential services that keep our environment in balance, allowing humans to survive.

Put simply it is the balance of nature on which we all depend.

## 3. Why is maintaining a healthy biodiversity so important?

The benefits of biodiversity are endless, but include:

- Plants, animals and the natural environment enrich our everyday lives as they produce the necessary ingredients for all life to exist.
- Habitat destruction and species extinction are all gathering pace and will deeply affect us all if not checked. For example: insects (especially bees) pollinate the plants that give us our fruit and vegetables.
- The variety of living things and the natural environment make an important contribution to our quality of life, health and wellbeing.
- Learning about and experiencing the biodiversity of Barnsley and elsewhere is of interest to most children and many adults.
- Without conserving biodiversity, we will pass to our successors a planet that is markedly poorer than the one we benefit from. We have a duty to ensure that the earth's biodiversity is protected for generations to come.

School grounds provide an excellent site for children to learn about biodiversity and can raise environmental awareness in local communities. Involving children in improving school grounds can influence children's values and attitudes towards the wider environment.

**4. What do the Biodiversity in Schools project does in schools?**

Working with a school will typically start with a survey of the school grounds. The survey will be aimed at identifying the range of habitats within the grounds and suggesting how these might be improved. This could be through the addition of trees, shrubs, or plants, or by creating new habitats, such as marshes, ponds and rockeries to support insects, butterflies, bees and amphibians. Sites for artificial shelters and nesting boxes for birds and small mammals will be identified. The proposed improvements and details of the habitats and nesting box locations will be recorded on the plan. The proposed developments and improvements in the plan will be implemented by the pupils, assisted by a volunteer with school staff, and guided by a member of the Trust.

Later on schools will be supported to record the wildlife they see in their school grounds. It is also important to continue to maintain the schools grounds with their improved habitats for wildlife.

Briefly, as volunteers, this is what the Biodiversity in Schools project involves:

- Give a presentation of 'The Work of the Barnsley Biodiversity Trust' to a class sized group of children
- Survey and write a report on the wildlife possibilities within the school grounds
- Provide appropriate nest boxes (approx value £300/400) and build ponds/wet areas (approx cost £1500) free of charge, hides, and feeding stations where requested
- Present the nest boxes at a whole school assembly
- Install the nest boxes and begin the process of mapping and recording observed data (children involved)
- Follow up work including Autumn nest box cleaning, recording nest box contents and begin the process of analysing data (children involved)
- Provide an advice booklet on follow up work
- Give talks on Biodiversity to parent/community groups

The whole process requires the school to follow up work done with the children and involve community/parent/staff volunteers.

All of this is provided by volunteers with the support of the Heritage Lottery Fund.

**5. How does biodiversity fit within or enhance the National Curriculum?**

The study of Biodiversity involves aspects of Science, Geography, Maths, English, IT and Art. During our work with schools the following N C Learning Objectives are considered (key words in bold):

- That different **habitats** have different features
- That different habitats support different **species** (organisms)
- That the distribution of organisms in different habitats is affected by **environmental factors**, eg light, nutrients or water availability
- That animals have features which are **adaptations against predators** eg camouflage
- That some plants have **adaptations to deter animals** from feeding on them eg prickles and stings
- That animals are **adapted** to their particular **food source** eg bird's beaks
- To make careful **observations** of plants and animals and sources of evidence about animal's food eg purple bird droppings
- To observe and record the organisms which comprise the **living community in a habitat**
- To work **safely** with living things
- To show **sensitivity** to living things in their environment.
- That all **feeding relationships** within a habitat are interconnected
- To link organisms together in **food webs**.
- That food webs are made up of a number of **food chains**.
- To make **predictions** about the effect of different environmental factors on plant and animal populations
- That plants benefit from waste products and the **decay** of other organisms
- How **green plants** can be classified
- That animals can be classified into **vertebrates** and **invertebrates** and that these groups can be subdivided.
- That organisms only survive in a habitat where they have all the **essentials for life and reproduction**
- That **collecting, recording and comparing data** is important for habitat and species protection
- To collect sufficient data to reduce error and obtain **reliable evidence**
- That careful **observational drawing** is one way of learning about our environment
- That **educational dance**, **poetry** and **creative writing** will enhance empathy and involvement with nature

**6. What are the key species and habitats in the school environment?**

The key habitats in school grounds are Hedgerows, Grassland, Woodland, Still Water (ponds) and small Wild Flower Meadows. We have found that, in the main, school grounds are wild life havens in a suburban/urban setting and, as such, should be cherished by the local community.

The key declining species/species groups that we can help within school grounds are: Tree Sparrows, House Sparrows, Song Thrushes, Bees and other invertebrates, Amphibians, Bats, Hedgehogs, and English Bluebells and other native woodland plants.

Our nest boxes also encourage Great Tits, Blue Tits and Robins.

Please see the habitats and species sections of our Barnsley Biodiversity Plan: www.barnsleybiodiversity.org.uk.

**7.How can we help nature have a home in our school grounds?**

**Habitat Improvement**

School grounds often contain large areas of closely mown grass and borders with flowering plants and shrubs. Some have mature trees.

Habitat improvements can be introduced by making small changes. Grass in the edges and corners of mown areas can be left to grow, untreated with fertilisers or weed killers so that wild flowers are encouraged. Poorly drained areas can be allowed to accumulate standing water and to develop as marshes to host dragonflies.

Native plants, shrubs, or trees can be added to support wildlife. Native woodland flowering plants such as English bluebell, foxglove and honeysuckle can be planted in woodland areas. A mixture of native and introduced plant species in planted borders can attract pollinating insects such as butterflies and bees. New habitats, such as rockeries, deadwood areas, ponds and marshes, can support other invertebrates and amphibians. And shelters and nesting boxes in suitable places help birds and small mammals such as bats and hedgehogs.

Once school grounds are intended to be maintained as habitat for wildlife, ground maintenance staff may need to adjust their practice – for example leaving sections of grass long, only mowing once a year, not using lawn 'improvers' and weedkillers, allowing hedgehogs to come under fences around the ground.



Hide, feeding station and pond provided by the Biodiversity in Schools project

**Birds**

Many areas of the school grounds contain plenty of food for small birds but nowhere for hole-nesting birds to nest. Nest boxes are an excellent substitute for holes in old trees and are provided by the Barnsley Biodiversity Trust as part of the Biodiversity in Schools project. Regular residents of nest boxes include blue, great and coal tits, nuthatches, house and tree sparrows, starlings, robins, house martins. In recent years blue and great tits have prospered but house sparrows and starlings have declined. Different species of bird of course need different types of nest box.

Nest boxes for sparrows and starlings should be high up (2-4 metres) up a tree, wall or under the eaves of a buildings. If possible face the box north and east to avoid strong sunlight and the wettest winds. Make sure there is a clear flight path to the entrance. It is helpful to tilt the box forward slightly so that driving rain will bounce clear. House Sparrows, Tree Sparrows and Starlings nest in loose colonies so two to three boxes could be spaced out on the same side of a tree or building. The entrance hole size determines which species can use the box; tits are favoured with a hole diameter of 25 mm, tree sparrows require 28 mm, house sparrows and nut hatches 32 mm and starlings 45 mm. Try to site the nest boxes to attract species that genuinely need help.

Bird nest and other boxes being presented to schools in the Barnsley area.

**Bats**

Bat activity can be supported by avoiding the use of pesticides which kill off the insects that form the bats' diet. Bat boxes are supplied by the Barnsley Biodiversity Trust in the Biodiversity in Schools project.

Placing bat boxes

A bat box

Bats do not like cold, wet conditions so boxes must be damp-proof and draft-proof and should have rough internal surfaces that allow the bats to grip. Bat boxes should be sited in a quiet position out of reach of cats and can be placed to face in different directions to provide shelter at different times of the year.

**Hedgehogs**

Hedgehog boxes (also made available by the Barnsley Biodiversity Trust in the Biodiversity in Schools project) should be located on the ground in a quiet, dry area, against a wall or fence and should be covered over with leaves or garden debris. Dry leaves and straw could be placed within the nesting compartment to encourage the hedgehog. Avoid facing the entrance north or north-east to keep out cold winds.

Hedgehog box with Harry the Puppet Hedgehog

Placing a Hedgehog Box

**Pollinating Insects**

Pollinating insects such as bees and butterflies thrive in areas where there is a good range of nectar producing flowers such as asters, daisies and goldenrod (use the web to find other nectar producers). Many bees and other pollinating insects have declined in recent years. Nectar-producing flowers should be planted in groups to attract bees, butterflies and other pollinating inspects and chosen so that they flower throughout the year. More information is available on the Royal Horticultural Society website.

**Bees**

Honey bees are just one of Britain's 267 bee species. The rest are bumblebees and solitary bees.

Bumblebees and solitary bees make their nests in holes in the ground or cavities in trees, building walls, bales of hay etc where they will raise larvae and store food. Bumble bees nest in small colonies, solitary bees - as the name suggests – by themselves, although you may find a number of solitary bee sites in the same area.

Bumble bees have been known to use bird boxes for nesting and bee boxes can be provided for them with sizes from 15 x 15 x 15 cm to 25 x 25 x 25 cm.

Insect 'hotels' provide sites for solitary bees to nest and for bees and other insects to over-winter.

Bumble bee box

More information from the Bumblebee trust

**Butterflies**

Butterflies need shelter from predators and wind. Hedges are ideal, as are groups of small trees and shrubs and especially climbing plants like honeysuckle. Butterflies do not drink from open water so a patch of damp ground should be nearby. Different butterflies lay their eggs on different plants or trees, for example the cabbage white favours nasturtium and cabbage, whereas the painted lady requires thistles. Identify the butterflies that are present locally and use the internet to find out which plants are suitable hosts.

More information from Butterfly Conservation

**Other bugs and invertebrates**

Rockeries and Deadwood can be constructed to provide additional insect and other invertebrate habitats. Create deadwood habitats with fallen or sawn off branches to encourage a variety of invertebrates.

**Bug Hotels**

A simple bug hotel can be made from a collection of hollow stems packed into a plastic bottle with the end cut off. These can be placed in different positions in the school grounds to attract different invertebrates.

Larger bug hotels can be made with recycled materials such as bricks and wood can to create a layered structure with abundant nooks and crannies which should be filled with leaf litter, straw, wood chips or twigs. Build the stack as wide or as high as you wish in a layered structure. Keep the stack dry with a sheet of wood covered with roof felt or polythene. Site the hotel in an area with dappled or light shade.

**8. How do we clean and maintain nest boxes?**

Bird Boxes: All nest boxes need to be cleaned out in the Autumn once the nest has been vacated : carefully scrape out the contents with a knife or scraper and place in a plastic observation container. Any remaining invertebrates or materials are then thoroughly but carefully brushed into the container for children to study and record nest materials and species dead or alive! Once the recording has been done the nest and contents should be

placed under the nest box tree so that invertebrates can re-home. The nest box should then be closed.

If Grey Squirrels or Great Spotted Woodpeckers have damaged the nest box to feed on the young birds then we will provide metal nest hole covers to be screwed on to the box.

It is quite normal for a few eggs to fail to hatch, or for some young to die. Blue and great tits lay up to 14 eggs to allow for such losses. Cold weather and food shortage may lead to nest desertion, or to only the strongest young surviving. The death of one parent or interference from animals or humans may also cause desertion.

Unhatched eggs in the box, can only be removed legally between August and January - and must then be disposed of.

If you place a small handful of clean hay or wood shavings (not straw) in the box once it is thoroughly dry after cleaning, small mammals may hibernate there, or birds may use it as a roost site.

Do not clean hedgehog boxes

Do not clean bee boxes

Do not clean bat boxes.

**9. How do we observe, record and monitor?**

Monitoring and recording the species that are found in the various habitats and their numbers on a regular basis is a vital part of conserving biodiversity, and is a key activity in which volunteers will be involved.

Details of the habitats will be recorded on the site plans and records of the species present will be made by the volunteers, school staff and pupils.

These records can be collated by the Biodiversity in Schools project and submitted to the Barnsley Biological Records Centre.

Recording needs only simple equipment (pens, pencils, paper and/or a field record sheet downloaded from a web site; magnifying glass, binoculars, glass jars and a camera) but should be carried out regularly. It is useful if some of the same observers are involved.

Bird boxes. A useful activity during Spring and Summer is for children to be asked to observe nest boxes for five-minute periods every day and to records any activity on a spreadsheet. This provides ongoing records for analysis.

Avoid inspecting nestboxes in use, however tempting it may be to take a peek! Only open it up if you've got appropriate skills and experience and are taking part in a monitoring project, such as the BTO's Nest Record Scheme. If you want to see the chicks as they grow, you should consider installing a nest box camera before the breeding season starts

During the Autumn, the contents can be be recorded in detail on a spreadsheet when they are being emptied and cleaned

**Bats:** Observe them at dusk if possible and look for droppings during the day.. Record the location of any roost, and the date, time and weather. Identify the type of bat emerging from the roost and the direction of flight (inward, outward, approximate compass direction). Use binoculars and photograph bats where possible. UKSafari has an inexpensive foldout guide to British bats (www.uksafari.com). The Bat Conservation Trust (www.bats.org.uk/ ) has a guide on its website.

Once up, a bat box cannot be opened legally without a licence. It might be difficult to tell if bats are using a box and the only way to find out is to look inside - which might disturb them- and this is illegal.

**Hedgehogs:** Hedgehogs are nocturnal and usually forage between dawn and dusk. A good way to record the activity of hedgehogs (and other mammals) is to use a mammal tunnel located in the vicinity of the nest. This can be filled with different types of bait and has a soft sandy floor that records mammal footprint which can be identified, drawn or photographed. The website of the Mammal Society (www.mammal.org.uk/) has instructions on building a mammal tunnel. The date and location times can be recorded with the location, weather and type of bait supplied and eaten described. There is an inexpensive laminated, foldout guide to British Mammal Footprints and Signs available from UK Safari (www.uksafari.com)

If the hedgehog nest is observed, care should be taken. Lifting the roof off the hedgehog nest should be done carefully so as not to disturb the resting animals. Record the date, time and weather and the number of hedgehogs present and whether these are adults or young.

**Bees.** There is a guide to identifying bumble bees on the Natural History Museum website (www.nhm.ac.uk) and a guide to monitoring and recoding bee activity on 'bee walks' on the website of Scottish Natural History (www.snh.gov.uk). The approach in this guide can be used with school grounds or adapted to study activity around a nest. The bumblebee conservation society has more information on identifying bees. (www.bumblebeeconservation.org/about-bees/identification)

Describe the sites visited, record the date and time of the survey and the weather, Bees are most active during periods of light wind and weather recordings can usefully include windspeed on the Beaufort scale and air temperature. Identify the bee species and record the flowers visited.

Bee boxes: Carefully lift the lid off the box and observe. It may be used by Wood mice instead of bees.

**Butterflies.** Butterfly Conservation (www.butterfly-conservation.org.uk) have a web site that explains how to carry out a butterfly count. The Society has an annual Butterfly Count period when results can be sent in and are collated over the whole country, but the same principles can be applied to regular monitoring within the School grounds. Choose a bright, sunny day. Record the date, time and weather. Decide on one (or more different) sites where butterflies are commonly observed and describe and record the location. Butterfly Conservation has a downloadable identification guide. Count for 15 minutes at each site, identify the species and record the maximum number of each species that are present. Try not to record the same butterfly more than once.

**Bug Hotels.** Record the date, time, weather and location of the hotel. Layers from insect hotel can be carefully lifted off and bugs present transferred carefully to a glass jar for study using the magnifying glass. Insects can be drawn or photographed and should be replaced gently in their original position, which should be recorded. The hotel layers should be carefully replaced. The web site of the Natural History Museum (www.nhm.ac.uk) has details about making recordings and also provides a downloadable Bug Field Identification Guide and a Recording Sheet.

## 10. Risk management

Health and safety in a school is about taking a sensible and proportionate approach to ensure that the school is a healthy and safe place for pupils, staff and visitors.

Schools have risk assessment procedures for activities in their premises and grounds. The Biodiversity in Schools project has produced some guidance for volunteers from the project and schools highlighting ways of working together in a safe way. A risk assessment form is also available. The guidance covers:

- Risk 1 Handling animal artefacts carries the risk of infection
- Risk 2 Handling live animals carries the risk of infection
- Risk 3 Young children and those with a low immunity are more at risk of infection
- Risk 4 Those with allergies e.g. animals, nuts, eczema etc are more at risk of an allergic reaction

## 11. How does the Biodiversity in Schools project follow up work?

Our relationship with schools is intended to be long term to provide continuity for wildlife and for the children.

School grounds should, where possible, be monitored at least once a fortnight to inspect the habitats for damage or the presence of predators, and check the occupation of nest boxes of all kinds and the progress and health of special plantings done or features installed (for example, ponds) in order to improve the school environment.

More detailed population surveys of different species (say butterflies, frogs, bumblebees, house sparrows or hedgehogs) perhaps with the advice of a Biodiversity Trust volunteer, can be undertaken as required. Generally speaking, these will involve recording over a longer period of time on a specific day. The Barnsley Biodiversity Trust will provide monitoring and recording forms.

One of the educational aims of the project is to involve pupils, school staff and parents in practical activities to improve schools' biodiversity wherever possible. These activities will, however need to be negotiated and are likely to vary from school to school.

Schools and volunteers will be asked to complete a questionnaire each year which asks their opinion of the programme, how it should progress in the school where they work or volunteer, and which provides data to monitor the project's impact on the school grounds to benefit wildlife.

## 12. Volunteering

### Is this an opportunity for you?

Barnsley Biodiversity Trust is always seeking volunteers to help with the Biodiversity in Schools project. These persons may be a school Environment / Science coordinator, a teaching assistant, or a person interested in natural history or a member of the public wanting to get involved and willing to learn. Some volunteers will be able to give more time than others; any time given is worthwhile. Volunteers are needed to:

- Help develop wildlife management plans for local schools.
- Help give presentations on biodiversity and natural history
- Help survey schools grounds and identify their wildlife possibilities
- Help with improving the school grounds for wildlife
- Help with putting up nest boxes and around the school grounds
- Help with observing and recording wildlife species in the school grounds (children involved)

- Help with nest box cleaning Autumn – also involves recording nest box contents (children involved)
- Help with records and analysing data (children involved)
- Help with giving talks on Biodiversity to parent/community groups and with visits to nature reserves and wildlife sites in Barnsley.

Some regular volunteers will be allocated to one or more schools in Barnsley, especially where may have a special link with a local school. Some volunteers will already be involved with a school as a member of staff, a governor, or a member of a support group.

He or she will work with a member of the Trust who will provide support and guidance to enable school staff and pupils to identify how best to enhance biodiversity in the school grounds.

Biodiversity in Schools Project Volunteers Training Day, October 2013

**Am I the right person for the job?**

If you are not sure, ask yourself a few questions. Are you interested in local wildlife? Do you enjoy open spaces, parks or gardens? Do you enjoy being or working with children? Are you interested in education, and helping to make sure that today's children have a better future? Do you enjoy learning new things and taking on new challenges? Have you a special link with a local school? Have you got some time to spare that you would like to put to a good use and benefit the community? Above all, are you enthusiastic and energetic, and willing to learn?

If your answer to most of these questions is "yes," then you could be the ideal person to work with the Barnsley Biodiversity Trust as a School Biodiversity Volunteer. Age and gender are unimportant and specialist knowledge or experience is not necessary. You will be given training and opportunities to gain the skills required, beginning, in fact, with this manual.

## 13. Contacts

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| **Barnsley Biodiversity Trust** | www.barnsleybiodiversity.org.uk<br>barnsleybiodiversitytrust@gmail.com<br>Chair: Peter Roberts<br>Secretary: Monica Ward |
| **Biodiversity in Schools project** | Leader: Colin Graham |
| **Barnsley council biodiversity officer** | Trevor Mayne |
| **Barnsley Biological Records Centre** | www.barnsleybiodiversity.org.uk/records |

**Thanks!**

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**Appendix 1 Guidance on risk management**

In order to enjoy contact with wildlife artefacts, wildlife and the environment we have produced a guidance form highlighting how schools and BIS volunteers can work together to ensure that everyone is safe and can have an enjoyable and educational time.

This does not replace a school's own formal risk assessment.

**Risk 1 Handling animal artefacts carries the risk of infection**

School's Responsibilities
Explain health issues prior to visit. Wash hands after handling. Discourage children from putting fingers in mouths.

BIS Responsibilities:
Staff to explain risks and suitable behaviour prior to handling.

**Risk 2 Handling live animals carries the risk of infection**

School's Responsibilities:
Explain health issues prior to visit. Wash hands after handling. Discourage children from putting fingers in mouths.

BIS Responsibilities:
Staff to explain risks and suitable behaviour prior to handling.

**Risk 3 Young children and those with a low immunity are more at risk of infection**
School's Responsibilities:
Explain health issues prior to visit. Children under four have restricted access to handling animals to comply with health and safety guidelines. Those with low immunity should refrain from handling animals.

BIS Responsibilities:
Staff to explain risk of infection.

**Risk 4 Those with allergies e.g. animals, nuts, eczema etc are more at risk of an allergic reaction**

School's responsibilities:
Explain health issues prior to visit. Those with allergies should refrain from handling the animals. Make BIS staff aware of children who have allergies.

BIS Responsibilities:
Staff explain the risk of allergic reaction to fur, feathers, food, hand wash etc.