Eco-Schools

Northern Ireland

Biodiversity
Topic

Post-Primary

TIDY Northern Ireland

Loughs Agency
Gníomhaireacht na Lochanna
Factrie fur Loughs

Biodiversity

"The Earth has an abundance of everything, but our share in it is only what we really need." **Sir Richard Attenborough.**

Biodiversity is the wealth of wildlife in the world around us and including us. From wildflowers and insects to mammals and birds, all the woodlands, meadows, wetlands and other natural habitats, as well as man-made places such as plantations, fields, canals – even 'wasteland' is valuable for wildlife.

Biodiversity literally means 'the variety of life,' but there are several more complicated definitions, such as: "Biodiversity – or Biological Diversity – is the variety of life in all its forms, levels and combinations including ecosystem diversity, species diversity, and genetic diversity." (IUCN, UNEP and WWF, 1991). Biodiversity is also a key component in understanding and delivering sustainable development, without that understanding, we risk the systems that maintain our environment.

The Global to the Local

At the 1992 Earth Summit in Rio de Janeiro, 159 countries signed the Biodiversity Convention, committing them to "conserve the variety of animals and plants within their jurisdiction", with further items agreed at the Johannesburg Summit in 2002. The Northern Ireland Biodiversity Strategy launched in 2002, provides a province wide framework for species and habitat conservation and encourages local people and local organisations, to work together to ensure that biodiversity is considered while protecting the environment. In understanding biodiversity, we will also understand more about ourselves and the World around us.

Schools and Biodiversity

Schools can introduce children to the natural environment and in particular to biodiversity, in a variety of ways. Biodiversity is not just a science subject, but the arts, language, geography, and technology, could all be employed to further a pupil's understanding, knowledge and skills about biodiversity. In addition to curriculum related work, students can also help to provide the reliable, quality data on habitats and species that is fundamental to determining the effectiveness of biodiversity action.

Getting Started

Biodiversity, like the other topics within the Eco-Schools Programme, needs to have an action plan developed after your environmental review. This **action plan** highlights what key actions you take and when to undertake them. School grounds provide a useful starting point, but it may also be an idea to contact your local council environmental officer or Local Biodiversity Officers, or some of the partner organisations listed under each theme. They may have some ideas on local projects that your school could take part in.

To provide you with some initial ideas on getting started, a number of themes are highlighted below. Included under each theme is a case study that aims to provide inspiration, contacts for organisations that play a role in ensuring Northern Ireland's biodiversity is conserved for future generations, and links to the NI Curriculum that may prove useful for schools in planning their biodiversity action plan.

Theme: Using Science and Technology

If we are to conserve Northern Ireland's biodiversity, it is important that we understand these plants, animals and habitats that go to make up our local environment, and how our actions can have both positive and negative impacts on them. Science and technology can be utilised to research and to monitor these impacts on biodiversity. From this research, actions can then be taken to conserve it and measures put in place protect it.

One such programme is Vital Signs delivered here in Northern Ireland by The Lough's Agency. The project is based in schools located in the Foyle, Blackwater, Carlingford and Melvin river catchments on both sides of the Ireland/Northern Ireland border. The project Vital Signs Ireland is a school's, environment and ICT project which promotes science fieldwork along with ICT know-how to raise awareness and understanding of local river environments. Students have the opportunity to use palm computers to study a local aquatic environment, by monitoring weather, water quality, river habitats, plants and animals in the riparian environment. The data collected in the field is Geography Information System (GIS) - linked and uploaded to the Vital Signs website so the students can then display their results and compare their data with that of other schools within

their catchment and further a field. The Vital Signs website gives details of what's involved in the programme and ideas and information on river and stream studies.

Case Study

Castlederg High School in Co Tyrone using the Vital Signs programme, and with guidance from Loughs Agency staff, undertook a study of a number of local rivers. Using these hand held computers, the students were able to note at each site; weather conditions, water pH, air and water temperatures and oxygen content of the water. They also noted some of the invertebrates as an indicator of water quality. The students wrote up reports **(report 1**, **report 2)** and took photos **(photo 1**, **photo 2**, **photo 3)** as a record of their fieldtrip.

Curriculum Links

Learning for Life and Work

Local and Global Citizenship   Actively engaging and participating in a local project.

Education for Employability   Learning about the work of those involved in biodiversity.

Personal Development   Managing own personal health and safety in field and lab, sharing ideas and working as a team.

Home Economics   Choosing food etc that have fewer impacts on local biodiversity.

Learning Area and Subject Strands

The Arts

Art and Design   Communicating graphically, producing engaging presentations e.g. posters.

Drama   Employing drama strategies for engaging with and responding to environmental   issues.

Music   Composing and performing music in response to the Natural World and   environmental issues.

Environment and Society

Geography   Mapping habitats, noting weather conditions etc.

History   Investigating significance of biodiversity in the past e.g. place names.

Science and Technology

Science   Investigating species and habitats significant to Northern Ireland, developing identification skills using ID keys.

Technology   Using internet to research species, using field equipment such as temperature probes and light meters, recording findings.

Language and Literacy

English/Irish Medium	Carrying out an awareness raising campaign, identifying and describing species.
Modern Languages	Making and maintaining links with other International Eco-Schools.
Mathematics	Recording temperature and light conditions within habitats and under laboratory conditions.
Physical Education	Taking part in responsible outdoor field work.
Religious Education	Looking at other religions' view of nature.

Thinking Skills and Personal Capabilities

Managing Information	Surveying, researching, thinking, problem solving.
Decision Making	Analysing patterns, relating cause and effect, creative problem solving, informed decision making.
Being Creative	Thinking through alternative methods and solutions.
Working with others	Co-operating, taking responsibility.
Self management	Regulating own work, setting/meeting targets.

Core Skills

Communication	Responding and presenting appropriately for audience and purpose.
Using mathematics	Analysing and presenting data e.g. temperature, light, pH etc.
ICT	Researching, analysing, communicating etc. using variety of sources e.g. web, power point.

Contacts/Links

These web links provide additional ideas and information in using science and technology to teach biodiversity. The organisations will also be able to provide supporting materials and information including advice on preparing for field studies, health and safety, and information on local biodiversity.

The Loughs Agency

Vital Signs

Environment and Heritage Service

Local Biodiversity Officers

Northern Ireland Biodiversity – It's in Our Nature

Magilligan Field Centre

Theme: Practical Ideas for School Grounds

School grounds are an important resource for schools and can not only add to the overall appearance, but can provide important space for local biodiversity to flourish. Whether you are an urban or rural school, some planning and a few small changes can create wildlife habitats for a wide range of living things. Ponds, wildflower meadows, trees and pot plants, are all invaluable for wildlife such as insects, birds and mammals

such as hedgehogs. Even foxes may find their way into your school grounds. Creating such spaces, shows a respect for living things and provides pupils with an opportunity to study plants and animals and where they live at first hand.

To get an idea of what you could create for wildlife, it's a good idea to undertake a **habitat survey** of your site or a biodiversity audit or map. Click on the links for ideas.

Case Study

St Rose's High School in Belfast had a formal courtyard area that was well suited to create a wildlife garden including a pond. This ideal location in the heart of the school, has reduced the chances of vandalism, while providing an easily accessible study site. With the advice and help of Conservation Volunteers Northern Ireland, the pupils put together a plan of the garden and assisted in digging the pond and planting the area around it with native plants. Take a look at the **before** and **after** **photos** to see what planning and action can achieve.

St Malachy's Primary School in Belfast has also created a wildlife garden with the help of Conservation Volunteers. Follow the link to St Malachy's PS website for further design ideas.

Curriculum Links

The school grounds can not only provide a resource for teaching a variety of subjects, but can instill care and pride in students. Schools involved in looking after their school grounds, may also notice a drop in littering and graffiti. In planning and creating a wildlife garden, students' skills and confidence are also developed as they work together investigating ideas and putting these ideas into action.

Learning for Life and Work

Local and Global Citizenship	Actively engaging and participating, linking local to global.
Education for Employability	Learning about the work of those involved in biodiversity.

| Personal Development | Managing own personal health and safety on site and lab, sharing ideas and working as a team. |
| Home Economics | Choosing food that have fewer impacts on local biodiversity. |

Learning Area and Subject Strands

The Arts

Art and Design	Communicating graphically, producing engaging presentations e.g. posters.
Drama	Employing drama strategies for engaging with and responding to environmental issues.
Music	Composing and performing music in response to the wildlife observed etc.

Environment and Society

| Geography | Mapping grounds, noting weather conditions at particular areas on site etc. |
| History | Charting changes to school grounds from past to present. |

Science and Technology

| Science | iInvestigating species and habitats significant to Northern Ireland, applying this to possible habitats introduced, developing identification skills using ID keys. |
| Technology | Using internet to research species and habitats. Using field equipment such as temperature probes and light meters, recording progress with digital camera. |

Language and Literacy

English/Irish Medium	Carrying out an awareness raising campaign in the school, identifying and describing species.
Modern Languages	Making and maintaining links with other International Eco-Schools.
Mathematics	Recording temperature and light conditions within habitats created.
Physical Education	Taking part in responsible outdoor practical work.
Religious Education	Looking at other religions' view of Nature.

Thinking Skills and Personal Capabilities

Managing information	Surveying, researching, thinking and problem solving.
Decision Making	Analysing patterns, relating cause and effect, creative problem solving, and informed decision making.
Being Creative	Thinking through alternative methods and solutions.
Working with others	Co-operating, taking responsibility, working as team.
Self management	Regulating own work, setting/meeting targets.

Core Skills

Communication	Responding and presenting appropriately for audience and purpose.
Using mathematics	Analysing and presenting data etc.
ICT	Using web to research, communicating e.g. power point.

Contacts/Links

Schools across Northern Ireland have been developing their grounds for wildlife and as places to teach. Many schools in the Eco-Schools Programme have used the partner organisations for advice and assistance, and many like St Rose's High School have a wealth of knowledge and experience to share. Contact some of the schools in your local area who are taking part in Eco-Schools as well as linking to some of the contacts below.

Growing Schools

Conservation Volunteers Northern Ireland

The Ulster Wildlife Trust,

Learning Through Landscapes

Groundwork UK

Environment and Heritage Service

BBC - Breathing Places - Be inspired

Trees For All

The Woodland Trust,

Nature Detectives.

The Royal Society for the Protection of Birds (RSPB)

Conservation Volunteers Northern Ireland

St Malachy's Primary School

Transforming School Grounds

Nature in your Neighbourhood

Theme: Getting Involved in Local Projects

Taking some of what you have learnt within the classroom and applying it to real life situations can prove an invaluable learning experience for students. This work also provides organisations reliable, quality data on habitats and species that is fundamental to their work in conserving biodiversity.

Regent's House in Newtownards undertook a creative approach to helping the RSPB find out about **a local ASSI**. This project asks students to brainstorm ideas for raising awareness about a locally protected site – Area of Special Scientific Interest. From this, students are asked to develop a case study on the designated site, considering; the

criteria which led to its designation, how it is to be managed, possible conflicts with the wider community etc. To date students at Regent's House have created a brainstorm list (list 1, list 2) on how to raise awareness. These ideas will then become the focus of their action plan. This case study will be updated regularly, so check to see how the project progresses.

Curriculum Links

Learning for Life and Work

Local and Global Citizenship   Actively engaging and participating in a local issue.

Education for Employability   Learning about the work of those involved in biodiversity and the systems used to conserve wildlife and habitats.

Personal Development   Managing own personal health and safety in field, sharing ideas and working as a team.

Home Economics   Applying relevance of biodiversity to choices in running a household e.g. organic food.

Learning Area and Subject Strands

The Arts

Art and Design   Communicating graphically, producing engaging presentations e.g. posters

Drama   Employing drama strategies for engaging with and responding to environmental issues and promoting solutions.

Music   Composing and performing music in response to the Natural World and environmental issues.

Environment and Society

Geography   Mapping habitats, noting weather conditions etc

History   Investigating significance of biodiversity in the past e.g. place names

Science and Technology

Science   Investigating species and habitats significant to Northern Ireland, developing identification skills using ID keys.

Technology   Using internet to research species and issues etc. using field equipment such as digital cameras to produce background information etc.

Language and Literacy

English/Irish Medium   Carrying out an awareness raising campaign, identifying and describing species and issues, debating etc.

Modern Languages   Making and maintaining links with other International Eco-Schools.

Mathematics   Recording site details, plotting measurements on site etc.

Physical Education   Taking part in responsible outdoor field work.

Religious Education   Looking at other religions' view of nature.

Thinking Skills and Personal Capabilities

Managing information	Surveying, researching, thinking, problem solving,
Decision Making	Analysing patterns, relating cause and effect, creative problem solving, informed decision making.
Being Creative	Thinking through alternative methods and solutions.
Working with others	Co-operating, taking responsibility.
Self management	Regulating own work, setting/meeting targets.

Core Skills

Communication	Responding and presenting appropriately for audience and purpose.
Using mathematics	Analysing and presenting data e.g. maps, statistics etc
ICT	Researching, analysing, communicating e.g. power point.

Contacts/Links

There are many ways your school can become involved in protecting local biodiversity. Organisations such as The Ulster Wildlife Trust, The Woodland Trust, The Royal Society for the Protection of Birds (RSPB), The Loughs Agency and Conservation Volunteers, as well as local councils and government offer opportunities to become involved with biodiversity projects and research. The links below will put you in touch with these organisations and provide you with some ideas for getting your students involved in a local biodiversity project.

The Ulster Wildlife Trust,

The Woodland Trust,

Nature Detectives

Trees For All

The Royal Society for the Protection of Birds (RSPB),

The Loughs Agency

Conservation Volunteers Northern Ireland

Environment and Heritage Service

Local Councils

Biodiversity Officers

The Natural History Museum

Ulster Museum

Ecos

Enfo

BBC Wildlife

BBC - Breathing Places - Be inspired

WWF

National Trust

Habitas

Growing Schools

Nature in your Neighbourhood

Theme: Northern Ireland Species and Habitats

The Northern Ireland Biodiversity Strategy launched in 2002, provides a province-wide framework for species and habitat conservation and encourages local people and local organisations to work together to protect Northern Ireland's biodiversity. This strategy highlights the priority species and habitats in Northern Ireland, and actions needed for their conservation. There are 200 plant and animal species and 40 habitats, details of the strategy are available from the Environment and Heritage Service website. To find out about particular species and habitats follow the links to the following organisations; The Ulster Wildlife Trust, The Woodland Trust, The Royal Society for the Protection of Birds (RSPB), and Habitas.

Year 10 pupils from Foyle and Londonderry College undertook the "Salmon in the Classroom" programme with The Loughs Agency. The project commenced with the delivery of the hatchery tank which enabled the pupils to investigate possible places depending on light and temperature in which to set up the hatchery. Once this was decided, 100 Atlantic Salmon eggs were delivered and the pupils monitored and recorded the development of the eggs under different conditions. The students took this project to the Young Scientists Conference in W5 Belfast. **Click** for a pupil's account of taking part in the project.

Curriculum Links
Learning for Life and Work

Local and Global Citizenship	Engaging and participating in an action project.
Education for Employability	Learning about the work of those involved in biodiversity.
Personal Development	Managing own personal health and safety in field and lab, sharing ideas and working as a team.
Home Economics	Assessing choices such as organic food with fewer impacts on biodiversity.

Learning Area and Subject Strands

The Arts

Art and Design	Communicating graphically, producing engaging presentations e.g. posters.
Drama	Using drama for engaging with and responding to environmental issues.
Music	Composing and performing music in response to the natural world and environmental issues.

Environment and Society

Geography	Mapping rivers and associated habitats etc.
History	Investigating significance of biodiversity in stories and tales etc.

Science and Technology

Science	Investigating species and habitats significant to Northern Ireland, developing identification skills using ID keys
Technology	Using internet to research species and habitats etc. using field equipment such as temperature probes and light meters, recording findings, taking photos etc.

Language and Literacy

English/Irish Medium	Carrying out an awareness raising campaign, identifying and describing species.
Modern Languages	Making and maintaining links with other International Eco-Schools.
Mathematics	Recording temperature and light conditions within habitats and under laboratory conditions.
Physical Education	Taking part in responsible outdoor field work.
Religious Education	Looking at other religions' view of nature.

Thinking Skills and Personal Capabilities

Managing information	Surveying, researching, thinking, problem solving.
Decision Making	Analysing patterns, relating cause and effect, creative problem solving, informed decision making.
Being Creative	Thinking through alternative methods and solutions, presenting ideas etc.
Working with others	Co-operating, taking responsibility for others and self.
Self management	Regulating own work, setting/meeting targets.

Core Skills

Communication	Responding and presenting appropriately for audience and purpose.
Using mathematics	Analysing and presenting data e.g. temperature, light, pH etc.
ICT	Researching, analysing, communicating e.g. power point.

Contacts/Links

The following organisations have information, advice and resources that will assist in understanding Northern Ireland's species and habitats. Many also provide identification

keys which will prove useful in undertaking any research or study, particularly while in the field.

The Loughs Agency

Environment and Heritage Service

Local Biodiversity Officers

Habitas

Magilligan Field Centre

The Ulster Wildlife Trust,

The Woodland Trust,

Nature Detectives

Trees For All

The Royal Society for the Protection of Birds (RSPB),

The Loughs Agency

Conservation Volunteers Northern Ireland

Environment and Heritage Service

Local Councils

Biodiversity Officers

The Natural History Museum

Ulster Museum

Ecos

Enfo

BBC Wildlife

WWF

National Trust

Habitas

Growing Schools

Something Fishy

Froglife

Butterflies of Ireland

Bat Conservation Trust

Mammal Society

Theme: Issues Facing Biodiversity

Biodiversity matters because it impacts on all our lives, both directly and indirectly. The benefits of biodiversity include:

- 20% of wild plants provide 80% of our foods (Natural History Museum),
- plants and animals provide many of our medicines, our energy, and industrial materials such as timber.
- natural systems help control flooding, recycle wastes, create soils and water etc.
- people enjoy nature and wild places, encouraging creativity and leisure.

The quality of our lives is greatly enriched by the natural environment, yet a lot of human activity is having a negative impact on biodiversity across the world. These threats include:

- climate change,
- introduced species,
- habitat loss and fragmentation,
- genetically modified organisms such as crops,
- pollution of soil, air and water,
- over exploitation and
- industry, agriculture and forestry.

Case study

To find out what issues may be facing a local habitat, Foyle and Londonderry College undertook a comparative study of 300 Atlantic Salmon eggs raised under 3 different hatchery systems. The aim of "Hatched and Dispatched" study **(insert 1**, **insert 2)** was to see what factors affect egg survival both in the natural environment and under controlled conditions. With assistance from The Loughs Agency, pupils set up a school hatchery, a natural hatchery in a local river and a professional system based at Riverwatch – The Loughs Agency's centre in Londonderry. The students drew together their conclusions and presented their findings as part of the Crest Award in 2005, winning a bronze/silver award.

Curriculum Links

Learning for Life and Work
Local and Global Citizenship Actively engaging and participating in a local issue.
Education for Employability Learning about the work of those involved in biodiversity and the systems used to conserve wildlife and habitats.

| Personal Development | Managing own personal health and safety in field, sharing ideas and working as a team. |
| Home Economics | Applying relevance of biodiversity to choices in running a household e.g. organic food. |

Learning Area and Subject Strands
The Arts

Art and Design	Communicating graphically, producing engaging presentations e.g. posters
Drama	Employing drama strategies for engaging with and responding to environmental issues and promoting solutions.
Music	Composing and performing music in response to the Natural World and environmental issues.

Environment and Society

| Geography | Mapping habitats, noting weather conditions etc |
| History | Investigating significance of biodiversity in the past e.g. place names |

Science and Technology

| Science | Investigating species and habitats significant to Northern Ireland, developing identification skills using ID keys. |
| Technology | Using internet to research species and issues etc. using field equipment such as digital cameras to produce background information etc. |

Language and Literacy

English/Irish Medium	Carrying out an awareness raising campaign, identifying and describing species and issues, debating etc.
Modern Languages	Making and maintaining links with other International Eco-Schools.
Mathematics	Recording site details, plotting measurements on site etc.
Physical Education	Taking part in responsible outdoor field work.
Religious Education	Looking at other religions' view of nature.

Thinking Skills and Personal Capabilities

Managing Information	Surveying, researching, thinking, problem solving.
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Working with others	Co-operating, taking responsibility.
Self management	Regulating own work, setting/meeting targets.

Core Skills

Communication	Responding and presenting appropriately for audience and purpose.
Using mathematics	Analysing and presenting data e.g. maps, statistics etc.
ICT	Researching, analysing, communicating e.g. power point.

Contacts/Links

Many of the organisations below are involved in monitoring both species and habitats. By undertaking studies of Northern Ireland plants and animals, the students will be adding to the knowledge about such species. In turn this will aid organisations to take action to conserve them.

The Ulster Wildlife Trust,

The Woodland Trust,

Nature Detectives

Trees For All

The Royal Society for the Protection of Birds (RSPB),

The Loughs Agency

Conservation Volunteers Northern Ireland

Environment and Heritage Service

Local Councils

Biodiversity Officers

The Natural History Museum

Ulster Museum

Ecos

Enfo

BBC Wildlife

WWF

National Trust

Habitas

Growing Schools

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Researched and compiled by Paula Flanagan.