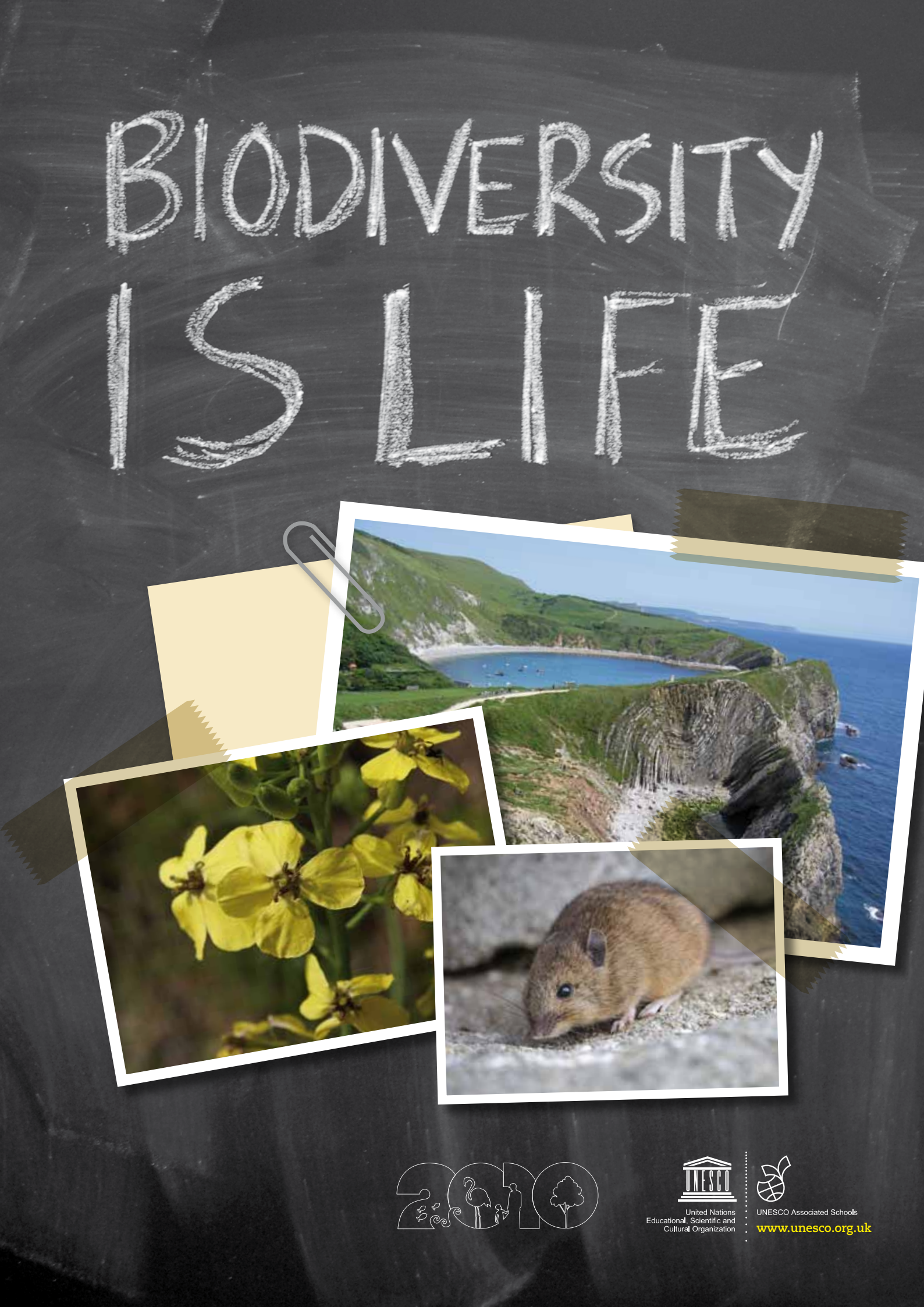
BIODIVERSITY IS LIFE



2010

United Nations
Educational, Scientific and
Cultural Organization

UNESCO Associated Schools
www.unesco.org.uk

2010 is the
International Year of Biodiversity.
Let us reflect on our achievements
to safeguard biodiversity and
focus on the urgency
of our challenges for
the future.

NOW IS THE TIME TO ACT.

2010 International Year of Biodiversity

Biodiversity is life

You are biodiversity. Most of the oxygen you breathe comes from plankton in the oceans of the world and lush forests around the globe. Your diet depends almost entirely on the plants and animals around us, from the grasses that give us rice and wheat, to the fish and meat from both wild and farmed landscapes. Your body contains up to 100 trillion cells and is connected with everything around you and the wider world in a wonderfully complex and timeless system. You share your atoms with every being and object in the natural world, you are both ancient and inconceivably young.

Humans are part of nature's rich diversity and have the power to protect as well as destroy it. Every species is an integral part of nature. So far about 1.75 million species of the 13 to 14 million species that are thought to exist on Earth have been identified. Humans rely on this diversity of life to provide us with the food, fuel, medicine and other essentials we simply cannot live without. Yet this rich diversity is being lost at an alarming rate. Scientists estimate that between 150 and 200 species become extinct every 24 hours. This loss of biodiversity is due, in large measure, to human activity. Over the past 50 years, a growing human population, together with an ever-increasing demand for food and other resources, has put great pressure on the natural environment.

Doing nothing is not an option!

The United Nations has designated 2010 as the **International Year of Biodiversity** to celebrate the importance of biodiversity and highlight the different threats facing this irreplaceable natural wealth across the globe. The International Year is an opportunity to celebrate progress made so far in protecting biodiversity, and also recognise that we need to do more to promote creative solutions to reduce threats to biodiversity. In the UK, over 200 partners ranging from universities, media organisations and museums to theatre companies and artists have come together to promote the understanding of biodiversity. This year is your

chance to learn more about the rich tapestry of life around you, discover why it's important for a healthy environment and get involved in monitoring and conserving your local biodiversity.

Celebrating the International Year of Biodiversity is a great way to engage with issues around sustainable development, a key study theme for UNESCO Associated Schools. This leaflet will tell you more about the International Year of Biodiversity, how UNESCO is helping to protect biodiversity in the UK and different ways your school can help raise awareness about the importance of protecting biodiversity, including taking part in our International Year of Biodiversity competition.

What is biodiversity?

Biodiversity is a shortened term for biological diversity. Biodiversity refers to all living entities. It does not just refer to endangered species but every plant, animal and micro-organism. The biodiversity we see today is the fruit of billions of years of evolution, shaped by natural processes and increasingly, by the influence of human activity.

Why is biodiversity important?

Biodiversity plays a vital part in our everyday life and in maintaining the life support system on Earth. It has a key role in nature's many ecosystems. An ecosystem is a natural unit (e.g. a wetland, a pine forest) consisting of living and non-living parts which interact to form a stable and interdependent system. Examples of living parts of an ecosystem are humans, plants, animals and micro-organisms, while non-living parts include air, water, soil and nutrient supplies. An ecosystem is a finely balanced unit. If one or more species disappear from the unit (reducing the biodiversity), the balance of the ecosystem is disturbed. This can have a knock-on effect on the other species in the ecosystem because they are all interdependent. It is the combination of life forms and their interactions with each other and with the rest of the environment that has made Earth a uniquely habitable place for humans.

Biodiversity is important for our physical as well as mental well-being. We are dependent on plants and animals for food, medicine, fuel and construction materials. A total of 25% of global medicines come from plants, while 80% of the income for the world's poorest people comes from local biodiversity. Biodiversity has greatly contributed to and inspired our cultures, history and arts. Our cultural heritage, knowledge and educational values are all rooted in our natural environment and nature plays an important role in enriching our lives on a spiritual and emotional level.

The Convention on Biological Diversity

One of the most important international instruments for protecting biodiversity is the Convention on Biological Diversity (CBD) which came into force in 1993. So far 168 countries, including the UK, have ratified the Convention. The Convention aims to protect biodiversity, use biodiversity in a sustainable fashion and share the benefits of biodiversity fairly and equitably.

What are the threats and opportunities for biodiversity?

Despite international efforts to protect biodiversity, it is increasingly threatened across the globe**.** According to the International Union for Conservation of Nature (IUCN), 21% of all known mammals, 12% of birds, 37% of freshwater fish species and 70% of plants are under threat. The IUCN Red List helps raise awareness of threatened species by providing information about the global conservation status of plant and animal species. And it is not just single species that are under threat. Entire ecosystems – like mangroves, tropical forests and coral reefs – are endangered in some parts of the world. The threats to biodiversity across the globe are complex and interlinked, often creating a knock-on effect on each other.

In the UK, biodiversity is facing a broad range of interlinked threats, but there are also opportunities for creative solutions:

Climate change

Most scientists now agree that the planet is warming and that this is at least partly due to human activities, such as the burning of fossil fuels. Fossil fuels emit large amounts of greenhouse gases into the atmosphere when burnt. Rising temperatures are causing long term changes in average global weather conditions. These changes in the climate are set to accelerate, making it difficult for animals and plants to adapt and threatening their ability to survive and reproduce. Some researchers have predicted that for every one degree centigrade temperature rise that takes place, 10% of species will become extinct globally. The release of large amounts of greenhouse gases such as carbon dioxide (CO_2) has an impact on our oceans which absorb much of the CO_2 emission we generate. High levels of CO_2 turn oceans more acidic, affecting plankton, coral, sea snails, barnacles and fish larvae. The knock-on effects threaten to upset the delicate balance of marine ecosystems with serious consequences all the way up the food chain. Climate change poses a threat to biodiversity, but by developing creative solutions we can attempt to lessen the impact. One possibility is to prepare 'green routes' or 'corridors' that allow more mobile species in threatened habitats to move to new areas. In the UK hedgerows already form vital wildlife corridors that link habitats.

"Climate change poses a serious threat to biodiversity, but by developing creative solutions we can attempt to lessen the impact"

Introduced species

Exotic animals and plants that have arrived from other parts of the world (often because humans have transported them) are known as *introduced* or *alien species*. They can have a substantial impact on local ecosystems as they may prey on native species or compete for resources. In the 19th century the grey squirrel was introduced to the UK from North America leading to greatly reduced numbers of the native red squirrel. Greys can feed more efficiently and can survive at greater densities than the reds which require more space.

Habitat loss and fragmentation

The UK is a small country with a large human population and there are many demands upon our land. We have already removed or altered most natural habitats (a habitat is a specific place or natural conditions in which a plant or animal lives). As a result, many UK species live in small isolated patches of suitable habitat, making their populations less stable. Clever use of built development and urban design can offer new opportunities for roof-top gardens, climbing plants on walls and well connected green space for people to enjoy contact with biodiversity.

Agriculture

Agriculture has had a fundamental impact on the UK landscape. Farming produces high volumes of agricultural products for domestic consumption as well as export and has inevitably led to many areas of land being cleared. In the UK this has led to loss of some biodiversity but has also offered semi-natural habitats such as heathland, wetlands and hedgerows.

Forestry

Ancient woodlands are some of our richest sites for wildlife, but over time large sections have been cleared for timber, agriculture and development. New species, such as Sitka Spruce (a conifer native to North America), have been introduced to the UK, often in large plantations. Sitka Spruce can grow close together, making it difficult for light to filter through to the forest floor and thus reducing the abundance of other plants and wildlife. Sitka Spruce can, however, provide shelter from wind, rain and cold. Larger animals such as deer and foxes like to find cover amongst their branches.

"Pollution occurs when humans emit more waste than the ecosystem can absorb"

Pollution of soil, water and atmosphere

A consequence of industrialisation has been the release of chemicals into the environment. Greenhouse gases, fertilisers and industrial waste all disturb the balance of the ecosystem, impacting on biodiversity. Pollution occurs when humans emit more waste than the ecosystem can absorb. There are international and national laws and regulations in place to safeguard against such activities which pollute the air, water and land, but accidents and deliberate dumping continue to pose threats to biodiversity.

Over-exploitation of plant and animal species

In modern times our methods of production and consumption have often been unsustainable. Many fish populations in waters around the UK, such as cod and herring, have been reduced to critically low levels. Once such a population has crashed it may take decades to recover, if it recovers at all. Such crashes may alter ecosystems irreparably.

Despite all the threats to the UK's biodiversity, there have been many success stories. The large Blue Butterfly and the Red Kite are two species that have been successfully re-introduced in the UK. Otters are now found in every county in England and populations of the Ladybird Spider and Lady's Slipper Orchid are at their highest levels for 50 years. Some habitats are also beginning to make a come-back. Large areas of lowland heathland have been re-established and lowland beech and yew woodland, meadows and chalk grasslands have been expanded.

UNESCO and biodiversity

UNESCO works to protect biodiversity in a number of ways, particularly through its network of Biosphere Reserves and World Heritage Sites.

UNESCO Biosphere Reserves are places with superb natural environments that are accredited by UNESCO to promote and demonstrate a balanced relationship between people and nature. They are places where conservation and sustainable development go hand in hand. It is a unique designation that is based on the understanding that nature is not contained by fences. Biosphere Reserves have special ecosystems and communities that care about them and want to sustain them for the future. They include a protected area for nature conservation and areas where people live and work that are managed sustainably.

UNESCO World Heritage Sites are cultural and natural sites across the world which are deemed to be so unique and important that they are part of our shared global heritage and should be preserved for future generations. In 2009 the World Heritage List included 890 sites spread across 148 countries. All World Heritage Sites must develop a management plan which outlines how the site will be preserved and protected while at the same time being made accessible to visitors. World Heritage Sites have a special responsibility to reach out to young people to communicate the importance of protecting our shared heritage for the future.

In the UK and its overseas territories there are **eight** Biosphere Reserves and **four** natural and **one** mixed (natural and cultural) World Heritage Sites. They all showcase the UK's special biodiversity in their own way as highlighted in the case studies below. Some are home to unique species which are not found anywhere else in the world, while others have played an important role in our understanding of biodiversity and the evolution of species. The UNESCO designation brings with it a special responsibility for protecting the site's biodiversity.

St Kilda World Heritage Site

St Kilda is the most remote part of the UK and lies 41 miles (66 kilometres) west of the Outer Hebrides in Scotland. It has a dramatic landscape with some of the highest sea-cliffs in Europe. St Kilda is an important seabird breeding station and has the world's largest colony of **Northern Gannets**. There are two species that are endemic to St Kilda (which means they only live on St Kilda): the **St Kilda Wren** and the **St Kilda Field Mouse**. The **Soay Sheep**, the most primitive domestic breed in Europe, originates from St Kilda. Despite its remote location, people lived on St Kilda from prehistoric times, exploiting the rich resources of the sea, growing crops and keeping animals. Today, however, the islands are no longer permanently inhabited after the local population was evacuated in 1930. St Kilda is designated a mixed World Heritage Site for its natural and cultural significance and is currently the only site with this mixed status in the UK. For more information about St Kilda, please see www.kilda.org.uk or contact Susan Bain at SBain@nts.org.uk.

Darwin's Landscape Laboratory - UK 2009 World Heritage Site nomination

Down House, with its surrounding gardens and countryside of meadows, farmland, woods, ponds and hedges, was **Charles Darwin**'s home and workplace from 1842 until his death in 1882. The site is located in the London Borough of Bromley and includes a diversity of habitats within a small area. Darwin carried out the world's first systematic study of biodiversity in a field behind Down House as well as experimenting on plants both indoors and in the gardens outside. The different habitats provided Darwin with a wide range of plants and animals which he could observe and study as he looked for evidence supporting his theory of evolution. Darwin wrote his world-famous book "***The Origin of the Species through Natural Selection***" while he lived at Down House. For more information about Darwin's Landscape Laboratory, please see www.darwinslandscape.co.uk or contact Alister Hayes at Alister.hayes@bromley.gov.uk.

Brosphere Reserves demonstrate a balanced relationship between people and nature.

World Heritage Sites have a special responsibility to reach out to young people to communicate the importance of protecting our shared heritage for the future.

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Biosffer Dyfi Biosphere includes one of the most unspoilt estuaries in the UK

Biosffer Dyfi Biosphere

Biosffer Dyfi Biosphere is located on the west coast of Wales and includes diverse and contrasting landforms with many different habitats. The area was confirmed as a UNESCO Biosphere Reserve in 2009 because of its outstanding biodiversity and the close relationship between the local communities and their surrounding natural environment. The core area of Biosffer Dyfi Biosphere includes one of the most unspoiled estuaries in the UK. It also has one of Europe's best examples of sea-level raised mire and an oak forest with rare mosses and lichens. The Biosphere is home to the **Red Kite** which survived here despite once becoming close to extinction in the rest of the UK. **Common Bottlenosed Dolphin**, **Atlantic Grey Seal** and **Eurasian Otter** can also be spotted close to shore. For more information about Biosffer Dyfi Biosphere, please see www.biosfferdyfi.org.uk or contact info@dyfibiosphere.org.uk.

Dorset and East Devon Coast World Heritage Site

The Dorset and East Devon Coast, commonly known as the "Jurassic Coast", is England's first and only natural World Heritage Site. The cliff exposures along the coast provide an almost continuous sequence of rock formations spanning some 185 million years of the Earth's history. The area's important fossil sites and classic coastal features have contributed to the study of earth sciences for over 300 years. The varied geology provides an excellent example of coastal change and supports rare and important plants and animals. The Axmouth to Lyme Regis Undercliffs National Nature Reserve is an important wilderness area in the UK. The nature reserve is formed from coastal landslides which create an internationally important mix of habitats from dense scrub and woodland to open ground, with many special plants and animals. These include the largest natural ash wood in the UK and different birds such as the **Linnet**, **Stonechat**, **Whitethroat**, **Yellowhammer** and even **Nightingales**. For more information about the Jurassic Coast, please see www.jurassiccoast.com or contact Anjana K Ford at A.K.Ford@dorsetcc.gov.uk.

The Jurassic Coast is England's first natural World Heritage Site

©Jurassic Coast Team

Lundy cabbage supports a unique pair of insects

© National Trust

North Devon's Biosphere Reserve

Around 150,000 people live within the area designated as North Devon's Biosphere Reserve, including the towns of Bideford and Barnstaple. The area has been named a UNESCO Biosphere Reserve because of its blend of special landscapes, wildlife areas and rich local cultural heritage. The area's unique biodiversity is particularly evident in Braunton Burrows, one of the finest sand dune systems in the northern hemisphere. Braunton Burrows is the core area of the Biosphere Reserve and has over 400 species of plants. The nearby special Culm grasslands are host to the **Marsh Fritillary butterfly**, which is one of the UK's most threatened butterflies. The rare **Freshwater Pearl Mussel** can be found in the area's interlinking river systems. The Biosphere also includes Lundy Island in the Bristol Channel, home to the **Lundy Cabbage** which only grows on this island. The Lundy Cabbage in turn supports a unique pair of insects: the **Lundy Cabbage flea beetle** and the **Lundy Cabbage weevil** which feed on their host plant. For more information about North Devon's Biosphere Reserve please see www.northdevonbiosphere.org.uk or contact Matthew Edworthy at Matt.Edworthy@devon.gov.uk.

Gough and Inaccessible Islands World Heritage Site

Gough and Inaccessible Islands are part of the UK's overseas territories and are located in the middle of the South Atlantic Ocean. They have one of the least disrupted island and marine ecosystems in the cool temperate climate zone. The islands' spectacular cliffs, towering above the ocean, are home to one of the world's largest colonies of sea birds. Almost the entire population of the **Tristan Albatross** – one of the rarest birds on Earth – lives here. Gough Island is also home to two endemic species of land birds (meaning that they only live on Gough Island) – the **Gough Moorhen** and the **Gough Finch** – as well as 12 endemic species of plants. The only introduced mammals on Gough Island are house mice that were accidentally brought to the island by ships in the 19th century. The mice have had a severe impact on the ecosystem. They have grown to twice the size of an ordinary house mouse and are eating young birds in huge numbers, threatening to drive species such as the Gough Finch and the Tristan Albatross to extinction. For more information about Gough and Inaccessible Islands, please see:

- home.intekom.com/gough
- www.ukotcf.org/pdf/TristanFactsheets.pdf

© Sue Scott

The Tristan Albatross is one of the rarest birds on Earth

ENTER OUR COMPETITION!

What can your school do?

To celebrate the International Year of Biodiversity we are launching a competition to find the school that best communicates the messages of the International Year. Your task is to devise a creative and effective campaign that can spread the following messages to your local community:

- **celebrate the importance of biodiversity**
- **raise awareness of the need to safeguard biodiversity**
- **encourage people to take action to help protect the irreplaceable natural wealth around us**

You can submit a poster, collage, brochure, video or podcast. There will be two categories for the competition, one for primary schools and one for secondary schools. The deadline for entries is 28 May. For more information about the competition see www.unesco.org.uk or contact Anne Breivik at abreivik@unesco.org.uk.

We suggest you use the week leading up to the **International Day of Biodiversity** on **22 May** to put biodiversity on the agenda of your school. Marking the International Year of Biodiversity is a great way of engaging children and young people with issues around sustainable development – a key UNESCO theme. The topic of biodiversity is relevant to a number of subjects, particularly Science and Geography, but also Citizenship, PSE, English, Art and Design and Technology. Celebrating the International Year of Biodiversity is a great way of facilitating learning outside the classroom and is an ideal topic for a shared project with your international partners.

In addition to taking part in our competition, here are some other suggestions for ways to celebrate the International Year of Biodiversity:

- Join schools around the world and plant a tree for the Greenwave, an international biodiversity initiative (**www.greenwave.cbd.int**).
- Get inspired by Darwin and carry out your own biodiversity survey in your school grounds using lesson plans based on *The Origin of Species.* Share your findings with your local or international partner school (**www.darwinslandscape.co.uk**).
- Invite someone from the local parks or a nature and wildlife charity to talk about biodiversity where you live.
- Learn more about UK Biosphere Reserves and natural World Heritage Sites and the biodiversity they are home to.
- Watch the short film "Rising Tides" to learn more about the threats to biodiversity in the UK and abroad. Email **abreivik@unesco.org.uk** for a free copy.
- Create your own wildlife garden in your school yard (**www.bwg.naturalengland.org.uk**).
- Adopt a seed at Kew Gardens to help preserve our flora biodiversity (**www.kew.org**).
- Use the IUCN Red List to learn more about the most endangered species of plants and animals around the world (**www.iucn.org**).
- The Foundation for Endangered Species has a library of resources, including DVDs which schools can borrow (**www.ffes.org.uk**).

Share your activities with us! Contact abreivik@unesco.org.uk

Please visit:

www.unesco.org.uk
for more information about Biosphere Reserves and World Heritage Sites in the UK

www.biodiversityislife.net
for more information about the International Year of Biodiversity and a list of teaching resources

www.nhm.ac.uk
for teaching materials on biodiversity from The Natural History Museum

Please contact:

abreivik@unesco.org.uk
for more information about UNESCO Associated Schools in the UK

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