www.naee.org.uk

Environmental Education

Vol 111 Spring 2016

The Wildlife Issue

* Invertebrates
* Birds
* Marine wildlife
* Amphibians
* Young writer
* Tree planting
* Nature watching
* ICT outside

THE JOURNAL OF NAEE

National Association for Environmental Education (UK)

An organisation for anyone who has an involvement in Environmental Education and Sustainable Development. An educational charity for teachers of Environmental Education everywhere!

ALL MEMBERS RECEIVE THESE BENEFITS:

- Environmental Education journal 3 times a year
- Resources and information for teachers and educators
- Network with outdoor and environmental education specialists
- Share your ideas with NAEE online, twitter, facebook, LinkedIn, pinterest
- NAEE works with key related groups in the UK and worldwide

For details and rates, visit *www.naee.org.uk* or contact *info@naee.org.uk*

University students FREE | Join NAEE today!

NAEE: Helping re-connect young people with their environment, in and out of school

***Write for* Environmental Education:** We welcome articles, book reviews and website suggestions from NAEE members, supporters and readers. We are especially interested in case studies, including environmental education, outdoor classrooms, forest schools etc. — in primary or secondary schools and colleges. Articles may occasionally be reprinted either on their own or with other articles in NAEE publications or on the website. Photos should be as high resolution as possible and sent as separate jpeg files. You must have the permission of the picture taker. For more information, please contact *editor@naee.org.uk*.

Executive Committee: If you want to find out more about the roles of the NAEE Executive Committee, and consider becoming nominated to this governing body, contact the National Coordinator at *info@naee.org.uk*.

NAEE Office University of Wolverhampton, Walsall Campus, Gorway Road, Walsall, WS1 3BD
National Coordinator Heatha Gregory **Tel** 0747 928 7183
Email info@naee.org.uk **Web** www.naee.org.uk

Environmental Education Volume 111, Spring 2016
Editor Henricus Peters **Deputy Editor** Juliette Green
Proof Readers Alona Sheridan, Philippa Riste
Environmental Education is the termly journal of the NAEE. Views expressed in the articles of this journal are those of the authors and do not necessarily represent those of NAEE.
ISSN 03098451

Contents

The Wildlife Issue

Comment

United Kingdom

World

Reviews

Cover: Children taking part in the Great Eggcase Hunt (J. Rawlins for Shark Trust); dragonfly photo taken on photography course (A. White, young writer); five-spot burnet moth feeding on buttercup (J. Lewington for Royal Entomological Society). All photos within articles by the author, unless otherwise stated.

Comment

From the Chair Nina Hatch

Spring is here in the UK – a time when schools are teaching about life cycles, growth, change and development in living things. NAEE is also looking forward to growth and change as we are applying to become a modern style of charity: a charitable incorporated organisation (CIO). The Executive have had to revisit our constitution which is often a very dry procedure. In our case it has made us review our core role and mission within the formal education structure. Thanks to the guidance provided by our President Professor Bill Scott the process is well underway and I will let you know when we have achieved our goal.

In addition, we are aiming to support colleagues working in Secondary education with a follow-up to our Primary Curriculum guidance document that has been so well received.

From the Editor Henricus Peters

Wildlife has always had a place in my head and heart, and the same with my family, which is why this special themed issue of Environmental Education journal was so important. I grew up with New Zealand's wetlands, beaches, mountains, forests – seemingly plentiful wildlife but in truth a country with a dire record of endangered species on a world scale – before arriving in the United Kingdom to find.... more of the same: creatures in trouble!

The reasons wildlife species get into trouble are of course many and complex, but certainly include our ignorance, or too often humans' push for unsustainable development leading to arguably wanton destruction. Learning about wildlife, gaining more knowledge, leading to better and deeper appreciation, which then engages action.

Celebrating the crucial role of all invertebrates via National Insect Week (20-26 June) – bees for example are an economic powerhouse group, but are in real jeopardy worldwide – we feature a wide range of animals: amphibians (page 15), insects (page 13), sea-life (pages 10, 11, 23 and 26), birds (pages 18 and 25), iconic British species (page 19), not forgetting plants (page 24). Our new young writer (page 8) explains the very real importance of gaining hands on appreciation of wildlife - to a young person! Plus, as always, we bring you the latest books (page 28) and websites (page 30), all with wildlife in mind.

Thank you for reading Environmental Education and being part of educating for a sustainable future – for us, for our children, for wildlife!

Visit us at www.naee.org.uk; follow us at twitter/NAEE_UK and Facebook/NAEE_UK.

President's Column Professor William Scott

Do we need to learn to be more welcoming of nature's migrants?

The current migration of people into Europe from North Africa, the Middle East, and farther afield because of war and other social turmoil has already been linked to climate change – not only because this has been seen as a contributor to the conflicts within Syria, but also in the sense that what we are seeing now is likely to be a harbinger of things to come as the world warms further and greater numbers of people will seek more hospitable (in every sense) places to live.

Migration applies not just to people, but to nature more generally, and a new report from the RSPB: *'The Nature of Climate Change – Europe's wildlife at risk'* explores the issues. This is part of Mike Clarke's introduction which lays out the issue clearly:

> "We are at a point in recent geological history where the rate of human-induced climate change will far outstrip the ability of species to adapt successfully, especially when the resilience of nature has been reduced by habitat loss, non-native species introductions and over-exploitation. The disruption to the web of life is a threat not just to wildlife, but to the lives of people around the world."

The report sets out evidence that wildlife of all kinds will be challenged because of climate change, and it says that protected areas and nature reserves will be vital in helping wildlife cope with a changing climate, which is something that many UK wildlife charities will agree with. For UK birds, for example, higher rainfall will adversely affect bearded tits, capercaillie and shags, and warmer temperatures in southern Europe will result in habitat loss for Dartford warblers. But Clarke says that it's not all bad news from the RSPB perspective, as new bird species have begun breeding here, such as little egrets, black-winged stilts and little bitterns.

Clarke also raises the issue of whether we need to be both less precious about the idea of native, and much more welcoming of nature's migrants:

> "The wildlife we typically accept as being part of our 'native' flora and fauna is moving, and new species are arriving as colonists, partly driven by climate change. The assemblage of species we consider 'native' is therefore in a state of flux. We cannot arrest the changes, so to aid adaptation it will be important to enable species to colonise new areas via provision of sufficient, suitably-protected habitat, in areas that will become more climatically suitable over time."

This idea is also part of what Fred Pearce argues in his book *'The New Wild: why invasive species will be nature's salvation'*. Pearce says that keeping out non-native species looks increasingly flawed as a strategy and that we should celebrate their dynamism and the novel ecosystems they create. Pearce thinks that, in an era of climate change and widespread ecological damage, we should be finding ways to help nature regenerate, and that embracing this 'new wild' is our best chance.

Clearly, not everyone will agree with this open, liberal approach, and there are other, considered points of view. In all this, it's necessary, perhaps, to distinguish between the invasive, and the merely non-native: that is, between those species that are here causing trouble, and those that are just here. Invasive species can be plants, animals, or other groups such as fungi or algae that cause disease or pest problems, and the RHS says that, after habitat destruction, invasive non-native species are the most serious threat to global biodiversity. It says that, in the UK, there are now 1402 non-native plant species, with 108 (8%) of these considered as invasive. Internationally, the database of such troublesome species is managed by the International Union for Conservation of Nature, which now lists 3,163 such plants and 820 animals. Based on this, the EU looks set to approve a list of 37 plant and animal species that member-states must eradicate where possible. Mercifully, this does not include John Wyndham's triffids, that ultimate invasive species.

Non-native species are those that occur outside their natural range due to direct or indirect introduction by humans, and where the introduced species persist in natural or unmanaged habitats, they are termed 'naturalised'. It is obvious that many naturalised species do not cause a problem; however, if they spread and out-compete native species they can threaten ecosystems, habitats, or the existence of native species themselves, and give rise to environmental damage and economic cost. One problem is that many non-native species can take a long time to become invasive, and many of the plants now considered invasive have been growing in the UK for over 100 years without causing a problem. Where they are a problem, however, they can be expensive to eradicate and it can take a long time: for example, at least ten years might be needed to eradicate giant hogweed, and

three to four years to get rid of Japanese knotweed. A recent Economist article: Invasive Species – day of the triffids (which surprisingly doesn't mention climate) argues for a measured and pragmatic approach to non-native species. It quotes Chris Thomas, a biologist at the University of York, who has calculated that of the UK's 677 most widespread plant species, 68 were introduced by humans before 1500 and another 56 after that date, with not one of these introduced species ranking among the 50 most widespread plants in the country. Even Himalayan balsam is so rare that it barely makes the list. This is, of course, to take a national view, whereas all politics (whether about plants or people) is local and Himalayan balsam has to be tackled wherever it is found.

As I hinted at the outset, there are some parallels in all this with the current debate about the migration of peoples, although there are clearly important differences as well. For example, some of the language regularly used in relation to plants and animals cannot be used about people. But it's possible that a discussion of the migration of plants and animals, and how tolerant we should be of the benefits and problems they bring, might ease a consideration of the much more difficult topic of the immigration of people.

More information

Royal Horticultural Society (RHS) Invasive non-native species http://ow.ly/Wauus

Pearce F (2015) *The New Wild: why invasive species will be nature's salvation*. London: Icon Books

RSPB (2015) *The Nature of Climate Change – Europe's wildlife at risk* http://ow.ly/Wauq6

The Economist (2015) *Invasive Species – day of the triffids* http://ow.ly/Waulx

Obituary: Penny James

Penny James was a volunteer for NAEE for 3 years. Penny loved the outdoors – stories abound of her enjoying the beaches and woodlands with her cousins. Penny was a dedicated teacher, being head of the English department at Handsworth Girls' Grammar School until she retired. It was Penny's love of nature that inevitably lead her to NAEE's door.

She joined NAEE and became a key team member as 'the office volunteer' helping Heatha, our National Coordinator. Her attention to detail meant she was perfect for keeping an eye on financials, and her command of the English language meant it wasn't long before NAEE had roped her into some editorial work too.

Sadly, Penny became unwell with cancer and passed away at the end of 2015. The number of people at her service, according to Heatha Gregory who attended, was a real testimony to the number of lives she influenced. The NAEE Executive will fondly remember Penny for her generosity of spirit and her wish for NAEE to continue its mission of connecting NAEE with all and especially young people.

St James' Catholic Primary School visit report

Edited by Nina Hatch *NAEE Chair & Teacher / Centre Manager at Mount Pleasant Farm*

NAEE's Hugh Kenrick Days offer schools in the West Midlands the opportunity to apply for financial support to give their pupils a chance to visit an outdoor learning centre. We believe that first-hand educational experiences in their local environment help young people to understand the importance of the biosphere to all life on the planet. These experiences can be the springboard for excellent further curriculum-focused activities back at school.

St James' Catholic Primary School, Rednal, Birmingham, Mount Pleasant Farm visits

Lindsay Hall *Key Stage 1 teacher*

Two years ago St James' began a new Outdoor Learning project which has been extremely successful, especially since the new National Curriculum has a great emphasis on the outdoors and the seasons. Every Friday, we focus on various environmental and outdoor activities and during these sessions the children learn about where their food comes from and how we can keep healthy. We were keen to create links with Mount Pleasant Farm after an initial visit in September 2013. The farm is only a ten-minute drive away and we wanted to visit on a more regular basis so that the children could find out about what is produced in the local community. It was also a wonderful opportunity for the children to become involved in the jobs on a farm.

In addition, St James' has recently taken part in Birmingham's Sustainable Schools Programme and has achieved the Eco-Schools Bronze Award. The staff are very keen to promote St James' as an Eco-School and are currently working towards Silver. *(Editor's Note: the school achieved Eco-Schools Silver award in July 2015)*

Mount Pleasant Farm offers an excellent opportunity for the children to see a sustainable project in action as well as providing an insight into farm life. Rain water is harvested to operate the toilets, and to provide water for the hens, pigs and sheep. At break-time, the children had their milk and fruit in the farm classroom. We were able to recycle the milk cartons in the appropriate recycling box and gave our leftover fruit to the 2 farm pigs: Pinky and Perky.

Pinky and Perky, the Mount Pleasant pigs.

Years 1 and 2 both spent a half day at the farm and the hands-on activities gave them a valuable insight into farm life. They had the chance to feed the hens and cockerels, and some collected the eggs. We had great fun feeding the sheep, feeling their wool and learning about what wool is used for. The children found out about the life of a dairy cow. They were amazed by the number of cows at the farm (over 200) and could not believe how huge they actually were! They discovered how the cows are milked and practised on a full-size cow model.

More information

Visit http://naee.org.uk/apply-for-a-school-bursary. Note: Kenrick bursaries are currently only available to schools in the West Midlands.

Young Writer

Inspiring a new generation of nature lovers

Alex White *Year 8 pupil*

Who sparks the interest in nature and the environment in my generation? Is it teachers, parents, television, social media or friends?

In my case the passion was sparked by a number of sources merging together around my primary school years. This then led to me starting my own wildlife blog in May 2013, when I was just 10 years old. My blog mainly concentrates on what I see around my local patch on a daily basis. These animals, birds, insects and plants are there for everyone to see if they have the interest to look.

A hare photographed by Alex on his local patch.

I rarely go looking for something in particular but instead note and photograph things I come across. It could be something like a ladybird that everyone recognises or something I have to go home and look up, such as a type of beetle.

In February 2014 I was chosen by BBC Wildlife Magazine as a Local Patch reporter, which really encouraged me to learn more about what surrounds me in my local area.

I am now in Year 8 of secondary school and my interest in nature, the environment and blogging about it, is only getting stronger, but this has a lot to do with the encouragement from my followers and connections I have made and a few individuals who have continued to influence me.

In the beginning it was my parents being interested in nature and taking me out walking with our dogs or badger watching. Also one of my Godparents owned a falconry so I was always surrounded by nature and it felt a big part of my life.

Two particular DVDs stick in my mind that my parents bought me, *'Through the Garden Gate'* by Stephen de Vere and *'Halcyon River Diaries'* by Charlie Hamilton James, as well as popular television shows like *'Deadly 60'* with Steve Backshall.

During primary school, one particular teacher really helped connect us to nature through lessons such as art, English, geography and science.

On a personal level, having nature, animals and photography as a hobby and a passion is not seen as being 'cool', especially now as I am in secondary school. It is an odd hobby to have and I don't talk about it to many of my classmates. My friends are into 'gaming' for which they have ICT clubs at school, others like football, again supported by lunchtime and after school clubs. There are even chess clubs, book clubs, Scrabble clubs, but no nature clubs, no environmental clubs where I could meet other people with similar interests. If the school promoted these interests, it may seem less 'uncool'.

On a much more positive note, I have had lots of encouragement from social media such as Twitter. I have made some good friends with whom I share points of view on environmental and animal welfare issues. Although many of them also comment on how they hide their hobby from their school friends for fear of being picked on for being 'different'.

Many celebrities like Ben Garrod and Chris Packham are extremely encouraging and are happy to advise and help my generation foster their interest, as well as groups like 'A Focus on Nature' who are actively supportive to young people.

Ben's thoughts on this are: "I genuinely believe we are a generation of naturephobes ... where we don't like getting our hands muddy or our feet wet. If we turn our backs to nature, we risk never knowing the world in which we live. We need to follow those lucky few who are always muddy, scratched and exhausted from a day outdoors".

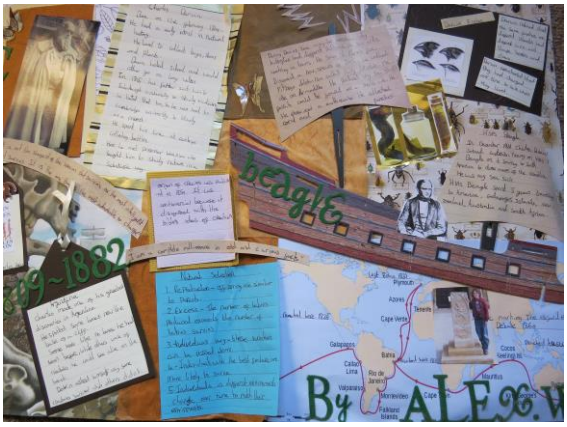
There are also some other great ways of connecting with other people and learning about your environment through organisations that carry out citizen science projects. I have been on some great surveys and courses where I have had incredible fun and learnt a lot as well.

What can schools do better to spark the interest and encourage children to be interested in Environmental Education?

Chris Packham's answer is: "Schools currently offer the best opportunity for young people to engage with wildlife. You see, they are a trusted environment and everyone, every class, creed, religion, goes to school. We all should have an equal chance of meeting and becoming interested in life. And because too many parents think that the countryside is a dangerous place for kids to be in alone . . . school should be the answer. But is it? I'm not sure because for me young people have to touch it, feel it, get bitten, slimed and stung by it to actually falling in love with it. And in most schools they are too busy running around with sanitising hand gel. How I hate that stuff! The schools need to allow their pupils to get in touch with wildlife - that is the answer."

My earliest memories of learning about the environment are from pre-school and going to watch lambing on farm visits, going apple picking and making hedgehogs from clay and sticks.

In primary school, I can remember bug hunts and a river visit, but that was down to the enthusiasm of an individual teacher. Mrs Barker's attitude was: "It's incredibly important that children learn about nature, as one day they will be responsible for it! It's wonderful when children are inspired by what we do in schools and then build on it themselves, like Alex has done. Hopefully the hard work that teachers all over the country are putting in will help children to feel more connected to nature and interested in what they can do to protect and enjoy it."



One of Alex's primary school projects.

Although since I have left they have started a Forest School. I also really enjoyed some of the projects which I always made an excuse to do something connected with nature. Now, after one year at secondary school I realise that the older I get, the less hands-on and physical the interaction with nature becomes in schools.

Unfortunately, most people will look at a photo of something like a butterfly and think "what a beautiful picture", or be told to read a paragraph about an animal, a mountain or a tree and not learn much from that. But if they actually went outside and watched a spider build a web or leaves fall off a tree; watched different birds eat different foods from a feeder or an ant climb up a wall; then that interest would be one hundred times greater, encouraging them to ask "why?" or "how?" and then follow that up by wanting to learn more.

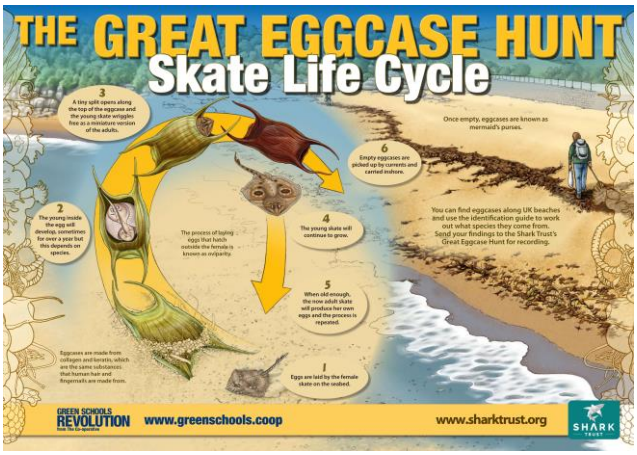
Once someone like me has learnt to connect with nature we then want to learn more about it, learn how to protect it and share that knowledge with others. Stephen de Vere sent me a few words that sum up why children should be taught about nature in schools: "Inspiring just one youngster is to me worth infinitely more than influencing a hundred adult minds. I wish I knew how to make the natural world a popular topic across all age groups. It would probably solve the world's problems in one go!"

I do wonder if my parents hadn't been interested and hadn't let me watch nature programmes whether one teacher in one school would have been enough encouragement to pursue my hobby and hopefully my future career.

Marazion School joins the Great Eggcase Hunt!

Cat Gordon *Conservation Officer, The Shark Trust*

On the 19th June 2015, Marazion School joined the Shark Trust in search of mermaids' purses as part of the citizen science recording project, the Great Eggcase Hunt. The school group gathered on the local beach where they learnt about the biology of sharks and their cousins the skates and rays. They also discovered which species are found right here in British waters – from the huge gentle giant the Basking Shark, to the speedy Shortfin Mako and the bottom-dwelling skate – while also learning about more unusual species such as the sawfish. Different species were measured out on the beach using cones as markers to demonstrate the huge difference between the largest and the smallest sharks and a fantastic sand sawfish was created.



A3 skate life cycle poster, available to download from the Shark Trust website

While many species of shark give birth to live young, others are oviparous, meaning they are egglaying species. The Great Eggcase Hunt's illustrated skate life-cycle (along with skate and eggcase puppets) helped to explain the process that the embryo goes through once an egg has been deposited on the seafloor, through to when the young shark or skate emerges as a fully formed miniature version of the adult. Eggcases have different appearances, with some features used to anchor the capsule to a substrate (such as seaweed or the seabed) – this keeps them securely in place while the embryo develops. The Great Eggcase Hunt identification guide was used to compare the morphology of different species, from the huge Flapper Skate eggcase which is larger than an adult's hand, to the tiny Smallspotted Catshark eggcase which has tendrils that tightly wrap around seaweed. Eggcases of some species are harder to distinguish from one another so a keen eye for detail is needed when trying to identify what has been found. Having taken a closer look at what we were searching for, it was time to start eggcase hunting…

What did the pupils learn?

"We learnt how to identify different types of shark eggcases and ray eggcases." – Jemima, age 9.

"We learnt how to tell the difference between a ray eggcase and a shark eggcase." – Caidan, age 9.

What did they think of the event?

"It was awesome, I'd really like to do it again."
– Layla, age 9.

"We found loads of barrel jellyfish." – Leo, age 5.

"The models of the sharks were great, we learnt lots about their body parts." – Enid, age 10.

Egg case finds. ® Jane Rawlins

"Hopefully it made people think differently about sharks, because I don't think many people like them very much." – Caidan, age 9.

Marazion pupils eggcase hunting. ® Jane Rawlins

The results from the successful Great Eggcase Hunt with Marazion School were recorded on the Great Eggcase Hunt database and added to the online maps which show the broad distribution and abundance of egglaying species around the British coast. Over 87,000 individual eggcases have been recorded to date, and the project is rapidly gathering momentum!

More information

Visit www.sharktrust.org/en/great_eggcase_hunt.

Cool Seas Investigators: a community action learning initiative

Jenny Griffiths *Conservation Officer, Marine Conservation Society*

The Marine Conservation Society (MCS) is the UK charity dedicated to the protection of our seas, shores and wildlife. It campaigns for clean seas and beaches, sustainable fisheries, and improved protection of marine life and habitats. Through education, community involvement and collaboration, the charity raises awareness of the many threats that face our seas and promotes individual, industry and government action to protect the marine environment.

Cool Seas Investigators (CSI) is MCS's community action learning initiative. This problem-based learning programme is designed to encourage real-world interaction with marine conservation issues among students aged 10-16 years.

MCS recently ran a successful CSI pilot project with Saxmundham Primary and Saxmundham Free School in Suffolk, investigating the issue of beach litter in the local area.

The project, which ran over a period of 8 weeks, saw students take part in a beach clean and litter survey at Sizewell Beach. Students were out on the beach collecting and recording details of all litter items over a 100-metre stretch of beach. The beach clean is the start of a project which enables students and teachers to get a hands-on grasp of the issue without any prior teaching. This is fundamental: first-hand experience rather than being taught about it.

The information collected by the students was added to 10 years' worth of previous data from the beach and was the basis for subsequent project work.

Surveying litter items

A week later, a day of workshops was held, providing further opportunities for students to investigate the issue, discuss the project and gain skills that would be useful as the process progressed. Real people who are touched by the issue of beach litter – environmental agencies, plastics manufacturing and the recycling industry – attended to share how their work impacts beach litter and the ways in which they work to reduce litter in general.

Students then worked in small groups, looking at the data, identifying a particular problem from an item collected, such as plastic bottles, balloons or carrier bags, and were then asked to identify a real-world solution to that issue.

MCS Education Officer, Jenny Griffiths, along with teachers, offered support and advice via a purpose-built online platform of blogs and discussion forums. Known as the CSI Hub, this site enabled students to discuss the issue, share ideas and understanding and even provided the opportunity to 'Ask an Expert'. MCS were also able to keep track of the learning remotely through the site.

Each project group prepared a presentation, and schools selected three presentations each to pitch to a panel of experts. Held at Seckford Theatre, this provided an opportunity for students to apply their presenting skills in grander surroundings than their classroom or school hall. The winning idea was to publish the 'Beat the Microbead' app to make it more widely used. Created as part of a collaborative campaign to eradicate microbeads – small particles of plastic added to cosmetic products, like face washes and toothpaste - the app enables customers to check product ingredients so they can make informed choices about the products they use. MCS is now working with the winning group to make the idea a reality.

The winning group's presentation

Student responses to the project were really positive, with most enjoying the collaborative aspects and the 'unusual' learning approach.

> *''In CSI you got to work in a group and I think teamwork is the best way to sort out a problem like this!''* Natasha

> *"I learned that people REALLY need to stop littering and that if you want to get something done, you need to work as a group."* Daniel

In addition, the CSI Hub enabled students to apply and develop the core digital skills required to be a lifelong learner in our modern world.

The benefits of CSI extend way beyond supporting the delivery of the core curriculum areas of science, English and maths. As a real-world investigation centred around a problem, students are supported to develop key 21st century attributes, such as collaboration, co-operation and global citizenship.

Feedback from the participating teachers indicated that the project was well organised, included quality resources and encouraged students to engage with the subject matter. The problem-based learning approach was seen to be 'a bit scary' initially as teachers were not in control of the learning, but on reflection encouraged a greater connection with the topic and deeper learning as the children led the way.

In fact, one teacher commented that she felt the approach was much more effective than a traditional teaching approach. Teachers felt that students thoroughly enjoyed the project and gained a greater connection to their local community, environment and their beaches.

Perhaps the most telling feedback of all though is that 95% of students said they would like to take part in a similar project in the future – they enjoyed a change to the 'normal' learning experience.

As a charity, MCS is now actively seeking funding to further develop and extend this project, and other similar projects, to schools across the UK.

More information

Visit www.mcsuk.org/coolseas; email jenny.griffiths@mcsuk.org

Insects - little things that run the world

Dr Luke Tilley *Director of Outreach and Development, Royal Entomological Society*

Insects are easily the most abundant and diverse group of animals, with over 24,000 species in the UK alone. They can be found in almost every habitat on Earth and are fundamentally important to ecology, conservation, food production, animal and human health, and biodiversity. Insects are a prominent feature of almost every food web in the UK and worldwide. They can be directly beneficial to humans through pollination, nutrient cycling and the predation of plant pests, or they can be detrimental, as vectors of disease and crop pests. They truly are the 'little things that run the world'. This is why the Royal Entomological Society, through its National Insect Week (NIW) campaign, aims to raise the awareness and understanding of insects and other terrestrial invertebrates. National Insect Week 2016 (20-26 June) brings together scientists, educators and naturalists to show people, particularly children, the fascinating world of insects and entomology (the study of insects).

Life in the undergrowth

We are fortunate in the UK to have relatively safe outdoor spaces for children to explore, without threats from wildlife. Most risks posed by living things are already well known by adults and children (nettles, brambles, some fungi, stinging wasps and bees etc.). So once the usual risks of outdoor education have been assessed and managed (water, trip hazards and sunburn, for example) what remains is safe compared with many other continents and countries.

Easy entomology

There are simple and inexpensive things that can be done at school or at home to encourage insects and provide more opportunities to watch and understand them.

Children carefully exploring a log pile.

Get sweeping! Sweep nets are good for swishing through grass and catching small insects, although they are not really suitable for butterflies or moths. You can make your own with a coat hanger, a bamboo cane (no more than 1 m long) and a wide carrier bag or old pillowcase – white or pale is best so that you can see what you catch. Pull out the coat hanger to make a circle but don't untwist or cut it. Straighten out the hook, slot it into the hollow in the centre of the bamboo cane and secure with some tape. Attach the carrier bag or pillowcase to the coat hanger using strong tape. You have a sweep net!

Find an area of long grass (just allow grass to grow through spring) and on a warm day walk through it while moving the net gently from side to side in a figure-of-eight shape, making sure that the mouth of the net hits the grass first so that the insects go into your net. When you have moved the net back and forth several times, inspect your catch. Leave the net open for a few seconds before emptying to allow any bees or wasps you might have caught to escape before you take a look. Empty the net into a shoebox or tray by reversing it through the coat

hanger frame. You will be surprised how much you catch even in a small patch of long grass and weeds.

Minibeast hunts The end of June is a perfect time in the UK to get children out and get up close to invertebrates. The most important equipment for this is the children's eyes. It is also useful to have a container to put things in and a magnifying glass to see more detail.

One thing that teachers sometimes struggle with is the identification of the finds. You can use online pocket guides to help identify your catch. A simple start to narrowing down what an invertebrate might be is to group things as insects (wings, six legs, three body parts) or as another invertebrate (no wings, fewer or more than six legs and fewer or more than three body parts). There are many online guides available which can be accessed from the NIW website.

Habitats at school/home Create an insect-friendly habitat with a patch of wildflowers in your school. This can link to topics on growing plants and observing the environment through different seasons. You can show the relationship between food and insects by watching insects visit the flowers and track the transformation of the flower into a fruit or seed, thanks to the insects. It is also possible to show how some insects control pests on our food; for example, aphids (green or black fly) on beans are likely to attract ladybirds and you can watch the predators clearing your plants of aphids.

A 7-spot ladybird has an aphid in its sights. (Image: Rachel Travis)

Tree tapping If you have trees within your school grounds or garden, tree insects can be easy to explore once you know how. Trees are often teeming with insect life; The wildlife species pages of the Woodland Trust website are a good resource for learning more about these insects.

Some insects will only live on certain types of tree. Bees, for example, don't just collect nectar and pollen from flowers close to the ground but they also visit the flowers up high.

Insect education and the global need for entomology

Entomologists (those who study insects) do not just go out and look for 'bugs'. They work in genetics, medicine, agriculture, ecology, conservation and even engineering. The study of insects provides opportunities for learning at every age and can lead to careers in important sectors, such as:

Genetics The fruit fly, Drosophila melanogaster, was among the first organisms to be used for genetic analysis and it is one of the most widely used and genetically best described of all multicellular organisms.

Medicine Mosquitoes carry malaria; the World Health Organisation has estimated that in 2010, there were 219 million recorded incidences of malaria and the disease killed between 600,000 and 1.2 million people (WHO, 2010). Understanding mosquitoes is fundamental to reducing the occurrence of malaria worldwide.

Agriculture It is estimated that more than 150 (84%) European crops are directly dependent upon insects for their pollination – worth £3.5 billion per year (Williams, 1994).

Ecology Insects are incredibly diverse (over half of all known species worldwide are insects); they are herbivores, carnivores and detritivores (decomposers). It is this diversity that makes the study of insect ecology so critical.

Conservation Conserving our habitats is becoming increasingly important worldwide, especially as global population continues to grow. Insects are part of most terrestrial food webs and perform crucial services within our ecosystems. Without insects it would very difficult to continue living on this Earth.

Engineering For many years, engineers and architects have been studying termites to learn how to naturally ventilate high-rise and large buildings without using powered, mechanical methods.

Join the buzz

Get involved in National Insect Week, 20-26 June 2016, and show children how easy it is to get close to British wildlife. Over 70 partner organisations come together to celebrate insects and entomology (the study of insects). There are a number of ways in which teachers, parents and young people can get involved in the campaign:

Access learning resources The website for National Insect Week has activity packs, podcasts and videos on offer for all ages.

Attend an event There were over 400 events up and down the country in 2014. The aim is to beat that total in 2016. You can join a minibeast hunt, a bioblitz, a public talk or an activity day. Event listings will be regularly updated throughout the six months before 20th June 2016.

More information

Visit www.nationalinsectweek.co.uk

Williams, I. H. (1994) The dependence of crop production within the European Union on pollination by honeybees. Agricultural Zoology Reviews, 6, 229–257.

Froglife's Green Pathways project

Becca Neal *Green Projects Officer, Froglife*

"#ProudestMoment: lifting a pees of plastic with a snaik unden neef" – young person from Ken Stimpson Community College

I love my job; I get to be outside most days, I get paid to toast marshmallows and I know for sure that what I do really helps people.

I work for the environmental charity Froglife. We are an amphibian and reptile charity with a strong education department and a focus on hard-to-reach audiences not traditionally engaged in conservation. I run a project called Green Pathways based in Peterborough.

Green Pathways is a project doing practical outdoor activities with young people aged 5-18, funded by BBC Children in Need. The project supports those with extra difficulties in their lives to improve green spaces for wildlife and people, and to learn about and enjoy the environment. We receive referrals from schools, charities and children's services in Peterborough, Fenland and Northamptonshire, and work in small groups, one-to-one or with families. Students are often referred from pupil referral units, special schools and learning support departments within mainstream where working with us enhances their alternative curriculum.

We aim to increase knowledge of the environment, enjoyment of the outdoors and to develop conservation skills whilst improving confidence, working on social skills and encouraging positive behaviour and thoughts. Benefits are far wider than those we report on and may also include: increased attainment in school, reduced involvement in anti-social behaviour and improved family relationships.

Green Pathways enables children who often struggle in mainstream, to achieve in an informal environment, and provides them with powerful educational experiences. Many of the children we work with deal with multiple disadvantage on a daily basis for example: mental health issues, physical disabilities, confidence issues, behaviour problems or chaotic family lives.

Beetroot harvesting: Green Pathways immerses young people in sustainability.

We work in a variety of green spaces such as community gardens, local woodlands, parks and nature reserves and try to connect young people with somewhere they can go back to in their own time. Over several years, Green Pathwayers have: created a radio show, dug successful amphibian breeding ponds, revamped vandalised walls with fantastic wildlife-inspired spray-art murals, conquered their fears of heights or reptiles, learned how to use tools to manage newt habitats, made friends, jumped in puddles, thrown sticks in the woods, eaten fresh vegetables, slept outdoors for the first time and given presentations in front of the Mayor.

In the summer of 2015, we worked with a group from a deprived area of Peterborough. All of the children were in the special care of the school's family support worker and had severe additional needs. We organised a programme of activities which included: reptile hunting, tree climbing, helping at a local community garden, bird watching and lighting a safe bonfire. Here is the feedback given by the teacher at the end of their sessions, relating to each child (names have been changed):

#IFelt: Many young people lead stressful lives and being outdoors helps them to relax.

> "Olive's knowledge of the environment was already impressive but she has added to this through her natural curiosity and interest and by you sharing your own knowledge. Some of the many things she said she had learnt were that a magpie is a crow and there is a snail that lives in the water. Olive's confidence has grown and she very much enjoyed learning about conservation and generally being outdoors. Olive said that pond dipping and making things were her favourites and her proudest moment was when she held a slowworm."

> "Zach's behaviour improved whilst at Froglife as he was able to 'let himself go' and enjoy being outdoors. This is something he is unable to do so much at home and school. Giving Zach responsibility helped to improve his behaviour. Zach said the sessions were exciting and fun and he is proud that he climbed a tree, held a frog and stroked a slowworm. Zach said that he learnt that a slowworm is a lizard not a snake and that their tails fall off to protect themselves."

"Ross thinks that Froglife is 'wicked'. He said that he loved being outside and learning about nature. Ross is proud that he climbed to the top of a tree and stroked a slowworm. Ross has learnt that male and female slowworms are different colours. Ross's behaviour improved whilst with the Froglife group."

Green Pathways provides opportunities for many young people to try something new.

"Muhammed really enjoyed the freedom of being outdoors. He benefitted from kinaesthetic learning and using his senses to explore the environment. Froglife has had a positive impact on his social skills and resilience. He was proud to have climbed a tree."

"Hamzah really enjoyed the freedom of being outdoors, as his home life is quite strict. Hamzah's social skills and confidence have grown immensely and he is now able to contribute more and express himself. Hamzah particularly liked the frog and he is proud of himself for holding one as he found them scary at first. He also enjoyed eating peas, strawberries and herbs, and toasting marshmallows round the fire. Froglife has increased his resilience and the opportunity to try new things in a less controlled environment."

The final comment from the teacher was quite revealing and shows that being outdoors helps everyone:

> "The whole Froglife experience has had a huge impact on this group of children (and the adults accompanying them)."

I was blown away by receiving this feedback because each individual in this group had serious difficulties with communication and so I found it hard to really evaluate the impact of sessions in the usual ways. It did show me though that even when I think I may not have got through to a young person, nature probably has.

Froglife are currently working with environmental education specialists at the University of Hull to improve our evaluation. Our present methods show that what we do helps people, and we want to be able to demonstrate this in the most robust scientific way possible. This will allow us to provide a better service to more young people and leave us leading the way with our best practice.

Holding a slowworm: Green Pathways enables young people to get closer to nature

More information

Visit www.froglife.org; facebook.com/froglife; Twitter @froglifers.

RSPB help schools to explore their local environment

Tim Webb *Communications Officer, Royal Society for the Protection of Birds (RSPB)*

"Get out!" is what the RSPB wants teachers to shout at their students as part of a movement to use outdoor spaces as classrooms.

The conservation charity has been delivering outdoor education on many of its reserves for years, but is now expanding its delivery thanks to a partnership with the supermarket chain, Aldi.

The three-year partnership will see Aldi donate all profits from its carrier bag sales to the RSPB. Money raised will allow the RSPB and Aldi to work together to provide opportunities for more than half-a-million children to engage with nature. It will also help improve children's health and well-being while inspiring them to love and understand the natural world.

RSPB's Schools Outreach Development Officer, Janet Watt said: "Children across the country are loving getting out into their playgrounds and discovering spiders and slugs in all the hidden corners. UK wildlife is in serious trouble: around 60 per cent of bees, birds, bugs and mammals are declining and the natural places they depend on are vanishing. Engaging the next generation with nature is vital. Our partnership will help to give nature a home in school grounds and local green spaces that will help turn the fortunes of UK wildlife around."

Currently, schools in 11 cities across the UK can choose from three sessions in their school grounds; delivered by fantastic teams of trained educators. Each session involves at least 30 minutes of outdoor discovery, giving pupils first-hand experience of the natural world.

Giving nature a home

If you create a habitat map of your school, what does it look like? Does it have all bricks and no bird boxes, all tarmac and no habitats? This session is designed to help pupils map their school for nature – identifying habitats that already exist and spotting opportunities for creating more. Armed with a scorecard, pupils can score their school for nature and work out how to make it more wildlife-friendly, and hopefully more attractive for children too!

Big Schools' Birdwatch

Using ID guides and with some RSPB expertise, children will be helped to spot, identify, count and record the birds around their school. If this session is delivered in the first half of the spring term, the data can be compared to other schools in the area and fed into a database as part of the national Big Schools' Birdwatch. In this way, children and their school will be taking part in the world's biggest birdwatch, and contributing to a well-established citizen science project.

Bioblitz

It is likely your school is already giving nature a home, but what wildlife and where? Using RSPB nature detective equipment, pupils will have help to hunt for plants and minibeasts under every rock, bush and doormat. Bioblitzes can unearth some amazing results – there could be dozens of species of wildlife in corners the children have never thought of. This session offers pupils the chance to investigate micro-habitats around their school to find species adapted to different environments and to identify them using RSPB 'Spot It' guides. This session is available all year round: in autumn there may be more animals tucked away for warmth and in summer animals will be more active!

More information

Watch http://ow.ly/Yrvgu; visit http://ow.ly/Yrvv3; Twitter @RSPB_Learning.

Children on safari: experiencing nature in the UK

Compiled by Henricus Peters *Editor of Environmental Education; teacher*

The word 'safari' conjures up images of swift moving herds of wild creatures sweeping across the African savannah, but as we are encouraged to reduce our carbon footprints, UK nature lovers – children, families, youth groups, school groups – are asked to seek wildlife experiences closer to home. This taster list mainly covers locations with good to excellent environmental education programmes. Remember to always 'be prepared' for the outdoors, especially changes in the weather.

Image from www. peakdistrict.gov.uk

National Parks

The UK has 15 National Parks, including the Cairngorms in Scotland, which made the cover of Countryfile magazine as the key haven for 25% of Britain's threatened species; the New Forest, Hampshire, home to all six of the UK's deer species; and the South Downs, whose chalk grasslands support the swallowtail – largest of our butterflies.

Nature reserves

For wildlife watching closer to home, check out one of the specialist reserves managed by a conservation group such as the Royal Society for the Protection of Birds (RSPB), Wildfowl and Wetlands Trust (WWT), National Trust, Forestry Commission or Natural England. There are also 46 designated Areas of Outstanding Natural Beauty (AONBs). RSPB's Minsmere reserve in Suffolk is excellent for seeing migrant birds, damselflies and dragonflies (see Book Reviews). The Arne reserve in Dorset is home to all six of our native UK reptile species, including the rare sand lizard. The National Trust protected sand dunes at Formby, Merseyside, are an important habitat for natterjack toads.

Woodwalton Fen, Cambridgeshire (image from www.countryfile.com/countryside/ten-britains-best-nature-reserves)

Britain's Natural Icons

Red Deer: These can best be found in one of London's parks or on a National Trust reserve.
Red squirrels: Though over-run by grey squirrels in most parts of England, red squirrels are easily seen on Brownsea Island, near Dorset. This is also the first campsite of the Scouting movement, whose founder Lord Baden Powell was very much the outdoorsman.
Otters: These are also making a comeback. See this secretive river creature at a local Wildlife Trust reserve, such as Cricklepit Mill near Exeter.
Badgers: Very secretive and hard to spot, badgers can be found near small towns (Chesham in Buckinghamshire, for example). Badgers are still at the centre of the bovine TB storm.
Red Kites: Once persecuted, this beautiful bird is enjoying a resurgence in locations like Gigrin Farm near Rhayader, Mid Wales.

Sea eagles: Various locations in Scotland, including the Isle of Mull, are home to this iconic bird of prey.

Other top wildlife watching sites

Bass Rock: This 100m high volcanic rock plug is home to the world's largest single rock colony of gannets. You can view them on cameras mounted on the rock from the Scottish Seabird Centre in North Berwick. As well as gannets, 300,000 seabirds, including puffins, guillemots, shags and kittiwakes, nest here each spring.

Malham Tarn: William Wordsworth described Malham as being created by the same giant who created Ireland's Causeway. Part of the Yorkshire Dales, it has England's highest freshwater lake and limestone cliffs. The RSPB has telescopes to spot the birds of prey.

Giant's Causeway: This World Heritage Site is a spectacular landscape of polygonal basalt rocks between Ireland and Scotland. As well as wild flowers – bird's-foot trefoil, kidney vetch, spring squill and thrift – the site supports many birds including buzzards, peregrine falcons, eider ducks and oystercatchers.

Cheddar Gorge: Cheddar Gorge is located in the Mendip Hills, an Area of Outstanding Natural Beauty, which was inhabited by our ancestors 40,000 years ago. The gorge is home to endangered greater horseshoe bats, dormice, yellow-necked mice, slowworms, adders, rare whitebeams, chalk grassland-loving species such as marjoram, wild thyme, and the large blue butterfly, originally thought to have become extinct in 1979.

The Tweed: With its head at Berwick-upon-Tweed in Northumbria, this is a vital European river for salmon, with fish born here migrating to Iceland and then returning. In autumn, they leap upstream – head for Philiphaugh on the Ettrick, a tributary of the Tweed, where you can watch the salmon on underwater cameras.

Hickling Broad: This part of North Norfolk is the best place to see the spectacular common crane – our tallest breeding species with the longest wingspan, wider than the golden eagle!

Built environment - London

London is renowned for its urban wildlife. City-dwellers can see red deer and fallow deer at royal Richmond Park; it's also a great place to spot an urban fox. The WWT London Wetland Centre, though a man-made reserve, is home to spectacular bitterns and bats.

Lee Valley Park, London's 'green lung', comprises five nature reserves and eight Sites of Special Scientific Interest (SSSIs). The park is home to the elusive bittern, 32 different species of mammal, 500 types of flowering plant and 21 species of dragonfly. Around 10,000 waterbirds overwinter here, including tufted duck, pochard, goosander, great crested grebe, coot, gadwall and shoveler. The park stretches from near Stratford in East London to Ware in Hertfordshire.

Tips for watching wildlife

Don't wear bright colours. Earthy shades and camouflage gear will blend in and break up your outline so that birds and animals are less likely to spot you.

If 'stalking' mammals, make sure you stay up-wind of them so that they don't smell you. Insects can't stand our breath, so try not to disturb them by breathing on them!

Essential pieces of kit: binoculars, a camera to record key creatures, a good guidebook (be aware: there are many), a magnifying glass, a pooter for collecting insects, a net for catching butterflies, a net and tray for pond dipping. Remember to put back any animals you collect afterwards.

More information

UK National Parks: www.nationalparks.gov.uk

Areas of Outstanding National Beauty (AONBs): www.landscapesforlife.org.uk

Wildlife Trusts: www.wildlifetrusts.org

The new 'London National Park': www.nationalparkcity.london

See our Webwatch page for specific wildlife sites.

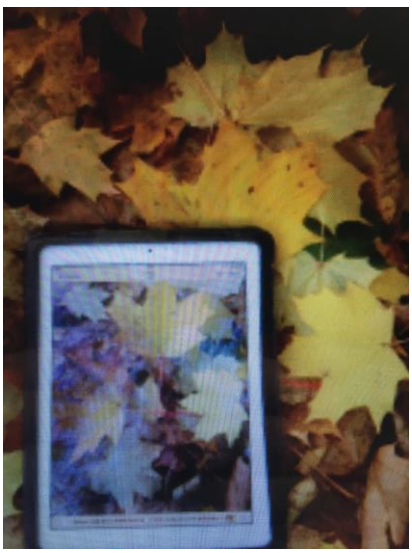
Using technology outside

21st Century technology and outdoor learning

Craig Armiger *Outdoor Coaching UK*

What are your thoughts on using 21st Century technology out in the field to assist your session?

Until recently I had not used technology outside, relying on the outdoors to weave its magic. However, I teamed up with Value Added Education Solutions who coach teaching staff using Apple technology in the classroom to enhance teaching and learning. We have worked together to find ways of using both ICT and the outdoors to create a unique impact on learning.



Provide pupils with tablets to use outside for taking photos, videos and using apps

Learning outdoors is cross-curricular and has the added bonus of being in a healthier classroom! Introducing flora, fauna and environmental impact as a motivational tool, along with ICT, can enhance teaching and impact on pupil performance.

Below are some elements from my Outdoor Learning Tool Box which I have been using to enhance Key Stage 2 maths activities such as angles, estimating and measuring.

Selfie search

I took a selfie in a chosen location – which added a bit of humour to the session – to see if the pupils could find the same spot. It took a while and many selfies to find the right place. Handy tip: make sure that the ground is not too wet if the appropriate clothing is not being worn!

'Leaf it out!'

In this activity, mark with your foot or stick a memorable starting point on the leaf carpet. Choose a pupil to be the 'finder' and make sure they are not looking! Take 2 or 3 photos of the leaf carpet around you with your tablet: the finder then holds it up to match the picture. Differentiation and progression can be obtained by using compass directions, for example: "It's between 90 and 180 degrees". Also using a metre-stick with 10cm sections marked off allows measuring distance and angles by practical exploration with the stick enhancing the teaching and learning: "Aah! now I can see it!" (Year 5 pupil, Maesglas Primary School – holding the stick.)

Record the results as data to use for learning or evidence for assessment. For pupils with additional needs you can arrange the leaves into easily recognisable patterns or shapes for them to find.

Photo trail

This uses flora & fauna and a curricular task; one trail used leaf shape and species recognition; another, discussing lichens, brings in aspects of geography, biology, prevailing wind directions and the subject of clean air. The whole activity can be done as a Year 6 ICT project for use lower down the school, widening the impact.

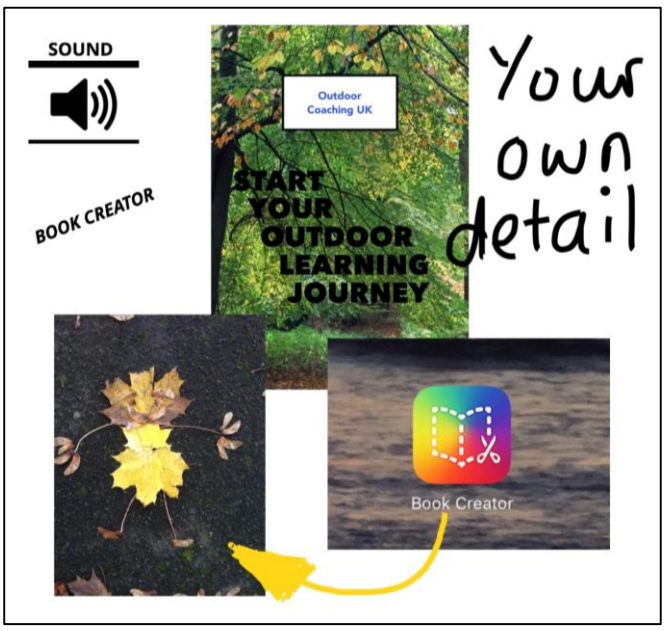
Apps

Using the picture app 'Phoster', you can make a poster for the class from a photo of the outdoors, which could be instructional or informative. Another app is 'Explain Everything', which is a great

way of enhancing comprehension. A third app which I have been using a lot recently is 'Book Creator', which uses both audio and visuals. Pupils can gather information and create their own e-books. For example, by using a sycamore leaf carpet, seed dispersal is instantly visible with its characteristic 'helicopters'. Himalayan Balsam pods when tickled give a fantastic display of explosive seed dispersal and all can be included in 'Book Creator' as a video, bringing the learning to life.

Leaves

Using leaves, you can explore shapes, colours and structures. A handmade pre-prepared cardboard protractor can be used to measure the angles of the leaf stems and branches of the veins in the leaves. These angles can be compared with man-made items for further discussion. Record and reflect in learning groups: it's amazing what questions will arise when comparing each leaf's length, width and angles.



Pupils can use the 'Book Creator' app to make e-books of their outdoor learning experiences.

Leaf Man Game

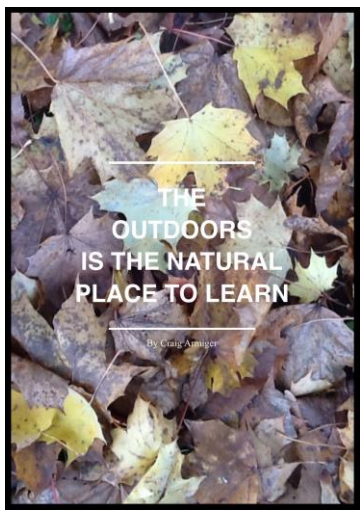
Sit two people back to back. One person gets to use leaves and ground materials to create a 'leaf man'. Then, using communication skills, ask them to describe the picture to their partner to see if they can create a copy of the 'leaf man' in front of them. Describing the different leaves used helps in learning the various types. Once they have finished, ask them to compare their work to assess how accurate the communication has been. They can reflect or record how the communication could have improved, any problems and any 'top tips'. Take photos for comparison and/or use a recording of the communication as evidence or to contribute to your e-book.

Not all aspects of the Welsh curriculum are based around the Literacy Numeracy Framework (LNF). Creating a foundation of well-being is a vastly important part of the infrastructure to learning, before moving into core curricular areas.

Don't leave all the natural exploration to the dry sunny days; nature works 24/7 all year round. Walk in a wood or natural space to refresh yourself with a dose of 'Green Medicine'. "I can smell the rain!" (Year 6 pupil, Malpas Church Primary School). You will also hear the clarity of the birdsong and soak up the radiating tonic of the forest canopy.

Plug into nature, recharge at no cost to the National Grid and watch yourself becoming brighter by the minute! Don't retreat inside your hood, masking all your senses apart from your inner thoughts; don't switch on the virtual outside world when you're inside: open up the page of the Adventure Literacy Manual that says 'Rainy Days', put on a coat and head outside to soak up the nature around you.

Your pupils will remember the feeling of fulfilment and learning of that walk in the rain. What's the worst that can happen? Nature made skin waterproof! Coincidence or clever planning?



More information

Visit https://craigarmiger.wordpress.com/

Lionfish Patrol: Stopping the Beautiful Invaders

David Carson *Tropical Conservation Consortium*

The Indo-Pacific lionfish is a striking animal. With ornate frilled fins that ebb and flow in the current and hypnotic vertical stripes running down its body, it's no wonder lionfish make popular pets in aquariums around the world. Their beauty, it seems, is matched by their adaptability. When unwanted pet lionfish were first released into Florida's warm Atlantic waters in the early 1980s, it set off a chain of events that has had devastating consequences for coral reefs throughout much of the Caribbean region.

By 2009, the invasion had reached Bocas del Toro, a small town in Panama near the border with Costa Rica. It was around this time that a group of young, enthusiastic marine biologists in the area came together to form what would become Lionfish Patrol. They had a clear mission: "to conduct research and provide better solutions for management of the lionfish threat," says Dr Lais Chaves, Marine Biologist and founding member of Lionfish Patrol.

Dr Lais Chaves and a volunteer for the Lionfish Patrol give a presentation to elementary school students from the Drago School in Bocas del Toro, Panama.

During 2009 and 2010, those same marine biologists – all of them educators at heart – started, through a field school in Bocas, to educate others in the fight against lionfish and in other conservation issues. They mobilised into a single organization called the Tropical Conservation Consortium, totalling more than 40 specialists and professors in marine and terrestrial ecology, social sciences and education. "With the help of our students, we expanded our lionfish monitoring program in the region," says Dr Chaves. "We also conducted a baseline assessment at more than 60 reefs to better understand the scope of the problem."

As Dr Chaves notes, in order to truly be successful in this fight, they needed community buy-in and participation, which is why they started an outreach campaign with the local government, fishers, restaurants, dive shops and elementary schools. For Dr Chaves, one of the most important aspects of this campaign was engaging with young people. "We created a partnership with the elementary school in the Drago neighbourhood of Bocas, a cross-cultural community made up predominantly of the indigenous Ngobe people, where we gave presentations about the local marine environment and the threat lionfish pose. By increasing awareness in children, we believe lionfish—which locals are still reluctant to eat despite their excellent taste—could potentially become a new source of protein for local communities."

A tangible outcome of Lionfish Patrol's efforts came about last spring when the municipal government passed a law to reduce the tax local restaurants pay to purchase lionfish direct from fishers. Looking ahead, the Lionfish Patrol intends to expand its field course offerings and create even deeper community partnerships.

More information

Visit www.tropicalcc.org/.

Young minds grow in the forest

Sudarat Sangkum *Project Executive, Plant A Tree Today (PATT) Foundation*

> "Working with PATT is an absolute delight for both staff and students alike. As part of our Rainforests topic, we study deforestation and the devastating effects it can have on the environment. When we come to PATT, the children get to see firsthand exactly what it takes to rebuild this precious resource. They love getting their hands dirty, learning how to grow trees, from the small seed right through to planting the trees in the forest. Such a rich learning experience gives them lasting memories and a great feeling that they have actually helped give something back." – Laura Rodgers, Bangkok Patana School

This delightful testimonial from a teacher who worked with PATT Foundation for their residential trip in Khao Yai National Park really made us so blissful. As a PATT staff member who would like to pass on our passion to plant trees and share love to mother earth, I was so blessed by this feedback from students and teachers.

The forest is the best classroom!

Plant A Tree Today (PATT) Foundation is a UK registered charity (Registered Charity No: 5610212) and Thai Foundation established in 2005. We are a passionate organisation, dedicated to combating climate change by planting native trees to restore forest areas which have been destroyed. We aim to plant trees in the ground and also in people's hearts through our environmental education. Our planting sites are in Khao Yai National Park, Phrapadaeng Greenspace and Bang Pu Mangrove in Thailand, and with other partners in other countries. We have already planted 900,000 trees and we want to plant one million trees!

Each tree needs about 40 years to absorb one ton of CO_2, so it's not just 'plant a tree today and walk away tomorrow'. Our work is not yet finished. We run the aftercare and maintenance for a couple of years to maintain our restoration plot to make sure that the trees will do their job of offsetting CO_2 and cherishing the lives of our future generations.

Our restoration areas are home to wild animals such as elephants, bantengs, gaurs, bears and monkeys. Our tree planting sites act as a living fence between wild animals and local people which helps to reduce conflict between humans and wildlife.

We work with most of the International Schools in Bangkok, offering a professional service which enables hands-on activities that love and care for the environment. We aim to generate hope for the future regarding environmental issues in the people of Thailand.

We also work with many UK primary schools who donate towards planting trees with us in Thailand. We believe that everyone has a right to show love to Mother Nature and everyone can be an Earth Hero by supporting us as we plant more trees.

More information

Visit www.pattfoundation.org/plant-it-forward; email info@pattfoundation.org; Facebook: pattfoundation.

Seabird Advocacy across the Pacific

Emma Cronin *Ethos Environmental*

Try to imagine 30 students sprinting towards you, all yelling in Spanish, intent on collecting popcorn from an open bowl you are holding. The students are in teams of three, consisting of a seabird family: mum, dad and their sole chick, and the race is on to feed it the quickest. This was one of the games we facilitated to raise awareness of seabird conservation; particularly the plight of the black petrel or taiko, a migratory seabird which travels between South America and New Zealand annually.

This was part of an education resource I had developed initially for local New Zealand school-children living on Great Barrier Island (one of only two islands in the entire world where this seabird now breeds). Following a successful application to the Winston Churchill Memorial Trust for a Travel Fellowship, I adapted the resource for delivery to Peruvian schools. I travelled to Peru and Ecuador, working alongside conservation organisation Pro Delphinus to deliver information and experiential learning about the black petrel/taiko to remote schools along the northern Peruvian coast. Understandably the language difference presented quite a barrier, but the team I was working with made it all possible – providing translations, logistics and contacts to make the trip possible and hugely successful.

Taiko life cycle game – in Spanish!

The lesson consisted of a PowerPoint presentation, various worksheets and games. I had created a life-cycle board game, which involved students working either individually or collectively to increase the colony size of a threatened seabird species. Another game consisted of assigning threatened seabird species to each student in groups of four, and calling out the name of one or more bird species, which had to be 'saved' by the remainder of the group, by lifting them off the ground. This resulted in much hilarity. One student group created art work to demonstrate what they had learnt from their lessons. These were exceptional – colourful A4 pictures clearly demonstrating the link between New Zealand and Peru, the threats seabirds face and how we all share the responsibility of looking after them.

Peruvian students' art work

I returned home elated from my experiences, yet feeling I had barely scratched the surface – the issues surrounding conservation, fishing and politics are huge and complex. But at least I had been influential in some conservation education and raised awareness among students that will hopefully be transformed into action in the future.

When back on Great Barrier Island, I returned to the island's schools to relate some of my overseas experiences. More artwork was created and together with the Peruvian schools' pictures, I produced a community exhibition at the local art gallery, Aotea Gallery. This was followed by two workshops to make clay black petrels. We also took school groups on day excursions to see researcher Biz Bell working with the black petrels during the breeding season. It was a very informed community following all this exposure – exactly what I was aiming for in the initial inception of the idea.

More information

Visit www.facebook.com/Black-Petrel-Action-Group-229756540415467

Fins Up: Shark Education for Students

Jillian Morris-Brake *Founder and President, Sharks4Kids*

It is estimated that 100 million sharks are killed each year and with these animals being critically important for healthy oceans, it is necessary for people of all ages to understand they are not man-eating monsters, but actually amazing and very misunderstood creatures. The goal of Sharks4Kids, a Florida based organization, is to create the next generation of shark advocates through education, outreach and adventure. Our team does this by providing classroom curriculum, shark lessons in person and via Skype, activities, videos and opportunities for students to see sharks in the wild.

Skype for Sharks

Our Skype education program has allowed us to connect with nearly 50,000 students in 47 US states and 34 countries. In 2013 when we launched our website, one of the first connections was with Mr. Grabowski's year 6 students in Guelph, Ontario, Canada. The students were so inspired they wrote a letter to the Premier of Western Australia, speaking out against the shark cull that was happening at the time. They received a response, although not a great one, but they learned first-hand the impact they could make. Their letter received a lot of press both in Canada and Australia and inspired dozens of other schools to do the same. A single drop makes ripples, which in turn can make waves. Students have a voice and they can make a difference.

Changing Fear into Fascination

Working with students on the island of Bimini, The Bahamas, then seeing them create amazing artwork and speak to dignitaries from other Caribbean islands about why sharks are important, was a truly powerful moment for our team. The islands of The Bahamas are home to a shark sanctuary (shark fishing, landing or distribution of sharks or shark parts is illegal), world-renowned shark research and some of the best shark diving on the planet, so getting local kids active and involved is very important. We strive to educate them on the necessity of sharks for both the environment and the economy of The Bahamas and hope to inspire them to speak up and take in action in protecting what is in their own backyards.

Student Shark Tagging

Our Shark STEM program for middle school girls in partnership with Seacamp on Big Pine Key in Florida is designed to focus on opportunities and access for young women interested in the marine sciences. The program includes classroom and field sessions that provide hands-on experiences capturing, measuring, tagging and releasing sharks. During our last session the students tagged and released 16 sharks including an 8-foot bull shark. One student remarked, "This experience showed hands-on application to marine science (and) made me think of reasons why sharks are not scary and why there are so many misconceptions."

An 8-foot bull shark tagged and released during Sharks4Kids & Seacamp shark STEM program (Image: Duncan Brake)

We genuinely believe students will save sharks and hope our work inspires and empowers them to take action and make a difference.

More information

Visit sharks4kids.com.

Nigeria's children call for environmentally friendly future

Paul Evans *BirdLife International Africa Partnership Secretariat*

Under the auspices of the BirdLife initiative, the Wildlife Africa Clubs of Africa project, children have become bolder in demanding communities to be accountable for their environmental actions. On an annual basis, various schools from within the BirdLife Africa Partnership comprising of 24 countries, commemorate global events such as World Environment Day (WED), World Wetlands Day and World Migratory Bird Day (WMBD) to mention a few. The theme for the 2014 WED was a befitting one for the little ones: 'Raise Your Voice NOT the Sea level'!

One of the participating schools displaying their handmade costumes ©Paul Evans

In Nigeria this occasion was marked at the Lekki Conservation Centre being run by the Nigerian Conservation Foundation (the BirdLife Partner in Nigeria). One of the activities through which children were able to state their plea for an environmentally friendly future was the Flora and Fauna Fancy Dress Parade. This occasion was graced by children from 10 different schools in Nigeria. The colourful parade, involving children aged between 5 and 15 years, depicted a green and scenic environment. The school groups made a five minute playlet each describing the nature of their costume in relation to the theme of the day. Part of their presentation focused on the human action and lifestyles that promote climate change impacts; steps towards mitigating climate change; adaptation techniques for overly dependent communities affected by climate impact; and climate projections for the coming years.

> "For the 5-7 year age group, the Centro Escolars School Ikeja received the first prize, followed by Lightword Schools. For the 8-11 year age group, the Corona School Apapa recorded the highest scores, followed by Govera School Igando and Joyceville School." – Solomon Adefolu, WCA National Focal Coordinator.

In addition, a total of 3 Wildlife Clubs took part in the 'Pass It On' awareness competition to create awareness on how people can express their views about climate change. Furthermore, the schools visited supermarkets, beaches, public markets, and slums in Lagos to inform and educate the community about the negative human practices which affect the environment and cause changes in the Earth's atmosphere leading to climate change.

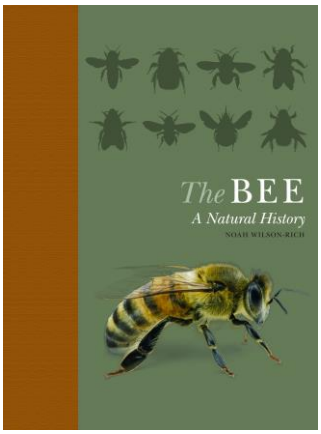
The winner (category 8-11yrs): Corona School Apapa during their performance at the NCF WED Event ©Paul Evans

More information

Visit www.birdlife.org/africa/wildlife-clubs-africa-phase-two.

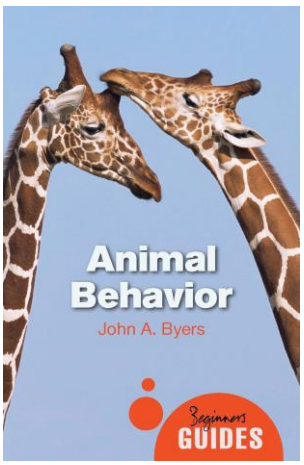
Reviews

The Bee: A Natural History Dave Smallshire and Noah Wilson-Rich; ISBN: 978-0-691-16135-8; Princeton University Press, 2014



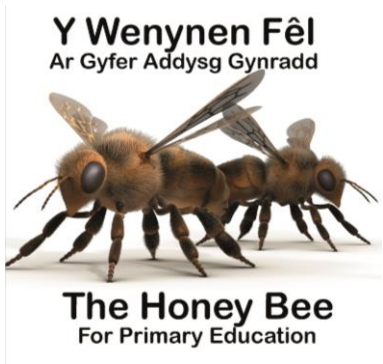
This is a beautiful book (I could not put it down), as well as being an important work about a very important subject. Bees pollinate more than 130 fruit, vegetable, and seed crops that humans rely on. Bees are crucial to the reproduction and diversity of flowering plants; their economic contributions are measured in the tens of billions of dollars each year. Yet bees are dying at an alarming rate, threatening food supplies and ecosystems around the world. Noah Wilson-Rich and his team of bee experts provide a window into the vitally important role that bees play in the life of our planet. The volume covers everything from the human-bee relationship through history, to a directory of bee species (there are 20,000 in total); guides on beekeeping, to what we can do to help our local bee population. Recommended as a deceptively easy to read book about a very crucial insect. ***Henricus Peters***

Animal Behaviour John Byers; ISBN: 978-1-078074-260-1; Beginners Guides, One World Publications, 2013



Why do birds have regional accents? Can horses learn mathematics? What do animals without eyes see? How do salmon return to their spawning grounds? How does the Syrian desert hamster know where its burrow is, after hours of foraging in the pitch black desert night? Ethology – the study of animal behaviour – has thrown up these and many other fascinating questions for scientists and nature lovers alike, since it became a science in the 1970s. More recently, as issues of conservation and animal welfare have become more prevalent, an understanding of how and why animals act the way they do has become even more critical. Drawing together evolutionary theory, ecology, population biology, genetics, physiology and anatomy, Professor of Zoology and Animal Behaviour Society fellow, John Byers, explains the mechanisms and motivations behind a range of animal movements. Recommended for secondary and university students, fellow scientists and wildlife enthusiasts everywhere. ***Anne Peters***

The Honey Bee for Primary Education Kirsty Williams & Gilly Films; The British Bee Company, 2015; DVD; £9.99 + £1.50 p&p; http://thebritishbeecompany.com/buy-dvd/; thebritishbeecompany@gmail.com



This 28-minute DVD about the native UK honey bee is available in both Welsh and English on the same disc. It is aimed at Key Stage 1, although it says it is suitable for all primary school children. The DVD sets out to explain in straightforward language the importance of the honey bee to us all. It can be accompanied by a range of pupil worksheets covering the KS1 curriculum from maths and science, to art, craft, drama and music, and to cooking with honey.

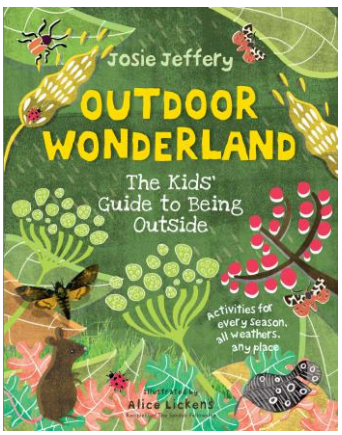
There are 10 sections: (1) Introduction (2) Where do bees live? (3) The bee family, worker bees, queen bee, drone bees (4) The life cycle (5) Jobs of worker bees (6) Bees and flowers (7) The waggle dance (8) Honey extraction (9) The beekeeper (10) Bees are important.

There is much to like in this DVD, and I learned a lot from watching it. In particular, I'm now much better informed about the roles and activities of the different types of honey bee, and how they support and complement each other. The images (both real and animations) are very good, and you can see why it took so long to record them all. I particularly liked the pictures of the stages of pupation. All this is commendable, and a good reason to have a copy of the DVD in school.

I am more equivocal about the spoken text. Whilst it is mostly clear, and the vocabulary is apt: thorax, abdomen, pollination, fertilisation, etc., I do not like the use of terms such as 'girls and boys' to differentiate the bees; surely female and male are both more accurate and appropriate terms? Rather inevitably, the pathetic fallacy was there as well with references to bees being happy, unhappy, and down in the dumps. I don't think so.

I was also not convinced by the way that the English text was spoken. The words were so very clear and slowly spoken and carefully-enunciated that it came across (especially in the early sections) as quite stilted. It reminded me why jobbing actors make a living out of voice-overs. The Welsh version seemed better in this respect, although I didn't understand a word. ***William Scott***

Outdoor Wonderland: The Kids' Guide to Being Outside Josie Jeffery; ISBN 978-1-78240-082-0; Ivy Kids, 2015



It's very easy, with rules and regulation, for school children to spend much of their class time... indoors.

This book is full of ideas to get kids to experience and enjoy being outside... and help adults stuck for what to do! Tried-and-true activities cover: gardening (the author is a horticulturalist); things to do at dawn and dusk; park activities; windy and (all importantly) rainy days; in addition to more summery activities. The sections could have been more clearly marked, since they are only obvious in the contents. Most of the images are colour drawings and do their job, but real photos could have helped in some cases to show what something such as a potted fruit might look like in the flesh. In the activities themselves, 'you will need' lists, safety warnings and top tips are used consistently. A colour code system would have been useful. A list of useful websites ends this good resource. Recommended for any parent, teacher, or even a student who wants to know 'where do I begin?' ***Anne Peters***

Britain's Dragonflies: a field guide to the damselflies and dragonflies of Britain and Ireland Dave Smallshire and Andy Swash; ISBN: 978-0-691-16123-5; Wildguides, Princeton University Press, 2014

"Dragonflies are rock and roll insects," states Nick Baker in the foreword. They are high energy aerial predators that have the raptorial appeal of birds of prey and the grace, agility and vibrancy of butterflies. They inhabit just about anywhere and everywhere connected to water. Did you know there are 56 species? The high quality photos and detailed and accurate drawings, alongside clean and colourful charts, take this from a 'could have been boring' text to a very easy to read yet handy resource. Covering everything from biology, ecology, habitats, and photography, to the actual ID sections with tips on how to see them in the wild, this guide really does encourage you to get outside and close to nature. The authors are experts with connections to the British Dragonfly Society. Highly recommended for any wildlife enthusiast, naturalist or school library. ***Henricus Peters***

Webwatch

Compiled by Henricus Peters *Editor*

In line with the wildlife theme of this journal, here's a selection of websites for the main wildlife charities and organisations. Remember to check the group's twitter and/or facebook feed for latest information.

Amphibians & reptiles Amphibian and Reptile Conservation www.arc-trust.org

Badgers Badger Trust www.badger.org.uk

Barn owls The Barn Owl Trust www.barnowltrust.org.uk

Bats Bat Conservation Trust www.bats.org.uk

Bees British Beekeepers Association www.bbka.org.uk

Birds British Trust for Ornithology (BTO) www.bto.org; Royal Society for the Protection of Birds (RSPB) www.rspb.org.uk

Butterflies Butterfly Conservation butterfly-conservation.org

Deer British Deer Society www.bds.org.uk

Dragonflies British Dragonfly Society www.british-dragonflies.org.uk

Eagles www.white-tailed-sea-eagle.co.uk

Fish Marine Conservation Society Guide to Seafood www.goodfishguide.org

Foxes National Fox Welfare Society (NFWS) www.nfws.org.uk

Invertebrates Buglife www.buglife.org.uk

Mammals The Mammal Society www.mammal.org.uk

Marine/coastal environments Marine Conservation Society www.mcsuk.org

Otters Wild Otter Trust www.ukwildottertrust.co.uk

Plants Plantlife www.plantlife.org.uk

Ponds Freshwater Habitats Trust freshwaterhabitats.org.uk

Red kites www.redkites.net

Red squirrels Red Squirrel Survival Trust rsst.org.uk

Seabirds The Scottish Seabird Centre www.seabird.org

Seahorses The Seahorse Trust www.theseahorsetrust.org

Whales & Dolphins Whale and Dolphin Conservation uk.whales.org

Wildfowl & Wetlands Trust www.wwt.org.uk

Woodlands The Woodland Trust www.woodlandtrust.org

Zoology Institute of Zoology, London www.zsl.org/science

Web News Updates

The **Year of Fieldwork** continues. Fieldwork and other out-of-classroom learning experiences are increasingly being recognised across the curriculum as a valuable method to raise standards and skills in participants of all ages. The following organisations are promoting and supporting the Year, which continues through to August 2016:

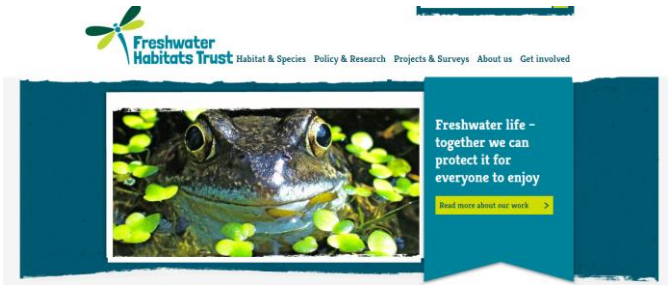
- Field Studies Council http://ow.ly/YpNuA

- Geographical Association www.geography.org.uk
- Council for Learning Outside the Classroom http://ow.ly/YpNCl

Plantlife, the organisation that speaks up for wildflowers, plants and fungi, is celebrating 25 years: www.plantlife.org.uk

Geography as a subject has received The Guardian stamp of approval: http://ow.ly/YpNYW

Pond Conservation has been rebranded as The Freshwater Habitats Trust. Find out more at: http://ow.ly/YpOgI



Britain from the Air exhibition has been visiting locations across the United Kingdom and there are now some excellent resources, including maps and images, based on this. http://ow.ly/YpO44

100 years of the US National Park Service! The centennial will kick off a second century of stewardship of America's national parks and engaging communities through recreation, conservation, and historic preservation programs.

The National Park Service www.nps.gov/subjects/centennial/index.htm and National Park Foundation www.nationalparks.org/ are working closely with partners and stakeholders across the United States to ensure that the centennial is more than a birthday. Organisers want people everywhere to embrace the opportunities to explore, learn, be inspired or simply have fun in their 407 national parks. To this end, the Foundation and the Service have kicked off the 'Find Your Park' movement – inviting those who already know the national parks and the next generation of visitors, supporters, and advocates to join the movement at http://findyourpark.com and by using #FindYourPark on social media.

National Geographic Photo Ark: Photographer Joel Satore is capturing a global archive of biodiversity – he wants people *'to care, fall in love with animals, to take action.'* http://nationalgeographic.org/projects/photo-ark/

Latest! Keep up with the latest updates here: naee.org.uk for the website, twitter, facebook and linkedin.

Please share your favourite websites, blogs and apps with the editor: editor@naee.org.uk and Henricus.peters@gmail.com

Poem

Pedagogy of the Amazon

Lee Beavington *poet*

Amazonia
every leafblade watches you
a study for each pupil
unfurls vision that never blinks
mentors through mystery and survival
a million lessons for those who listen

Ants
carve roads with six-legged fortitude
the way Maxine Greene speaks of the quest
a tornado of pheromone forges the path
one antennae twitch perceived by all
a tsunami that ripples through the colony

Dolphin
he glides through water's pedagogy
locating echoes of our evolution
fabled fins that once walked on land
this shape-shifting intelligence
narrates my ocean ancestry

Mosquito
buzz I want to slap
before that bloodsucker slips past my skin
this pest food for bat and bird
shows me a knot in the food web
and the human-made holes we cannot stitch

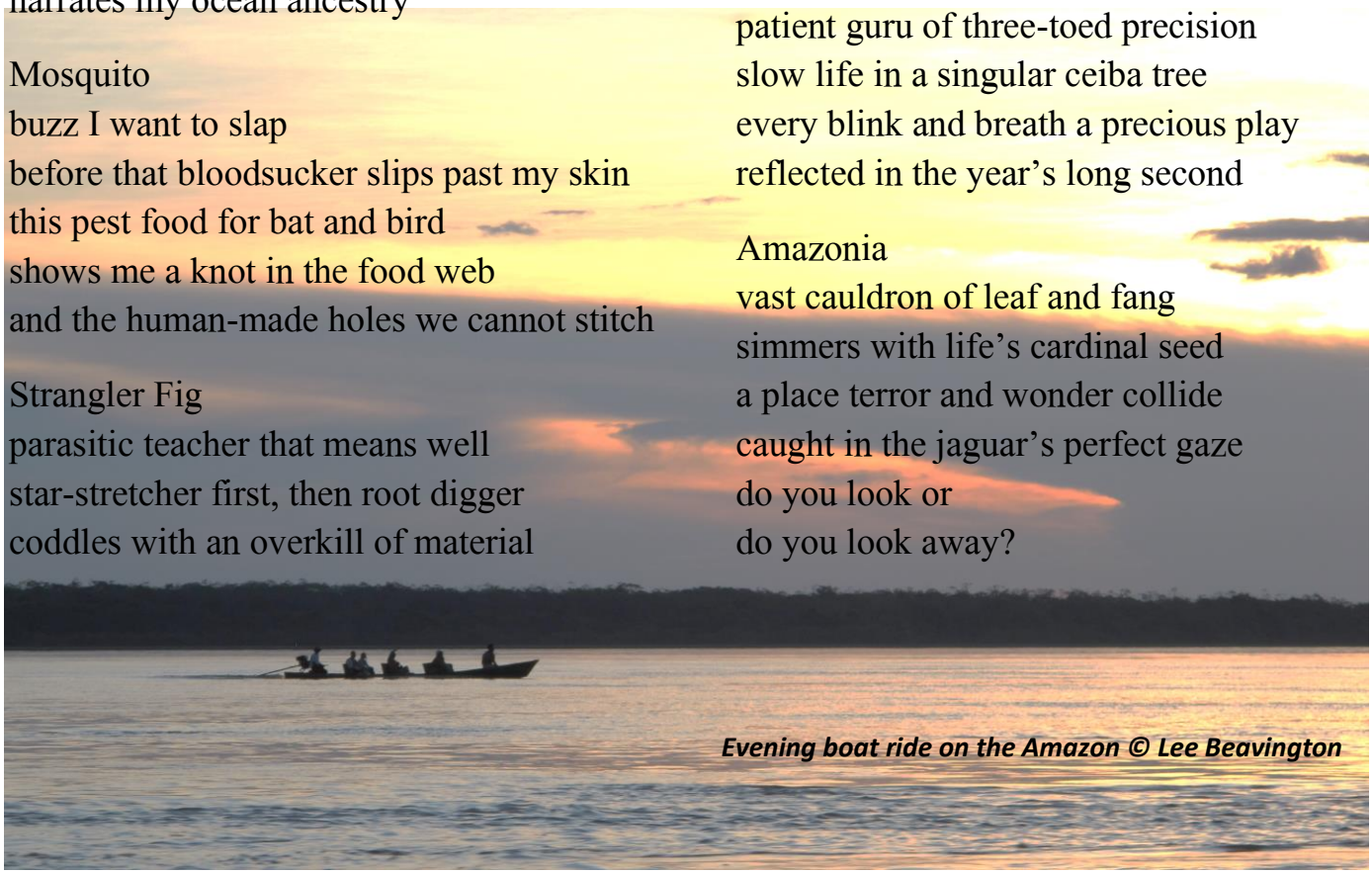
Strangler Fig
parasitic teacher that means well
star-stretcher first, then root digger
coddles with an overkill of material
the student becomes but a shadow
inner cavity hallowed of creativity

Tarantula
I fear those eight anxious appendages
an undulant of waves along the cabin wall
why does my stomach lurch before this beauty?
such delicacy in her gesture and touch
slows my heart in trepidation

Anaconda
limbless queen of the jungle river
with skin that weds sinuous to simple
no fingers to point or vertebrae to raise
to swim climb slither prey
this boa swallows caiman whole

Sloth
a still and single-minded reminder
patient guru of three-toed precision
slow life in a singular ceiba tree
every blink and breath a precious play
reflected in the year's long second

Amazonia
vast cauldron of leaf and fang
simmers with life's cardinal seed
a place terror and wonder collide
caught in the jaguar's perfect gaze
do you look or
do you look away?



Evening boat ride on the Amazon © Lee Beavington

LITTLE THINGS THAT RUN THE WORLD

National Insect Week encourages people of all ages to learn more about insects.

Every two years, the Royal Entomological Society organises the week, supported by a large number of partner organisations with interests in the science, natural history and conservation of insects.

ROYAL ENTOMOLOGICAL SOCIETY
FOUNDED 1833

www.nationalinsectweek.co.uk