

Wood Wise

NATURE INSPIRES EDUCATION

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WOODLAND
TRUST

LEARNING
THROUGH
FOREST
SCHOOL

BRINGING
OUTDOOR
LEARNING
TO LIFE

JOIN THE
GREEN
SCHOOL
REVOLUTION

WOODLAND
AS A
RESTORATIVE
SPACE



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Introduction

Previous generations would have spent far more time in natural surroundings than people today. Jobs are increasingly moving into indoor environments and behind computers, cars are no longer a luxury and are used for even walkable journeys, so many forms of entertainment are linked to electric screens, and parents are less likely than ever to pass environmental knowledge on to their offspring.

This modern way of living has created a disconnect between us and the natural world, which experts believe is a major contributor to the increase in mental health disorders. Additionally, our more sedentary lifestyles contribute to illnesses such as high blood pressure, obesity and diabetes. Yet visits to the forest for relaxation, known as 'forest bathing', are shown to lower stress levels and blood pressure, and improve people's health and wellbeing.

Rediscovering our lost path

Worryingly, lack of exposure to and connection with nature has massive repercussions for the environment. Connection to nature and environmental awareness are associated with pro-environmental behaviour and actions. In order to protect the world's natural habitats and wildlife from loss to development, intensive agriculture, climate change, pollution and other threats, the environmental movement needs to grow and strengthen. An important element of this is educating and inspiring the environmental guardians and conservationists of the future.

Thankfully there are many educators that understand the importance of connecting young people with nature and the additional value outdoor learning can bring. Students develop social skills through team working in natural and informal settings, build self-esteem and confidence, and gain transferable skills such as problem solving and assessing risks.

As well as life skills, educators can use the 'outdoor classroom' to teach sessions linked to the national curriculum. This especially benefits those that learn kinaesthetically and prefer 'hands-on' activities, and those that have difficulties concentrating in the confines of a classroom. It also provides the opportunity to teach subjects outside the curriculum and exposes students to alternative career options.

Inspiring and engaging

The following articles look at various innovative educational approaches using outdoor learning. These approaches all aim to increase young people's connection to nature and environmental knowledge, while simultaneously building interpersonal and practical skills. One particularly pioneering school has fully embedded outdoor learning into its curriculum, while environmental conservation has been effectively used with undergraduates – benefiting wildlife as well as students. The scientific basis for why woodlands in particular facilitate learning and improve attention spans is also explored.

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WTML/Ben Lee

Learning and development through forest school

Frances Harris

Children engaging in forest school head outside to build dens and mud kitchens, climb trees, scavenge, run, chase, balance on logs and even build a campfire to cook or roast marshmallows for their hot chocolate. It sounds like lots of fun, but where, might you ask, is the educational value in all of this?

Forest school is popular with children, teachers and parents precisely because it is fun, but in order to justify its slot among so many competing school activities in a busy timetable, it is useful to gather some evidence.

Forest school is developed from the Danish practice of outdoor kindergartens and is now increasingly common in preschool and primary schools in the UK^{1,2}.

Generally, forest school sessions are not led by the children's regular classroom teacher but by forest school leaders or practitioners who all undergo rigorous training certified via the Open College Network. Training includes aspects of child development, behaviour management and learning theories; skills such as knots, fire lighting and tool use; environmental knowledge including plant identification and woodland management; as well as health and safety and first aid. Fundamental to this teaching is development of an understanding of the ethos of forest school around building self-esteem through small, repeatable tasks.

Research with forest school practitioners can draw on their years of experience working with children from different classes, different types of schools, and for varied periods of time. Interviewing practitioners gives them the opportunity to reflect on their experiences and knowledge, drawing on a body of experience rather than stories of individuals or specific classes. Through telephone interviews, 20 forest

school practitioners were asked about what children are learning at forest school, the significance of the outdoor space and how this impacts on learning and teaching^{3,4}.

Children learning through forest school

Forest school practitioners recognise the potential to link forest school activities with topics in the national curriculum - most obviously biology and geography, but also creative writing, counting and some simple physics around forces when balancing or building. However, they feel the more significant learning taking place at forest school sessions relates to children's personal, social and emotional development. Taking children to this novel learning space to engage with nature in a variety of activities develops their social skills, including team work, and their ability to cope with challenges, so developing resilience. They use their imaginations and resourcefulness to develop games and solve problems and in so doing develop greater self-awareness, confidence and independence.

In a world where children are often 'wrapped in cotton wool' and shielded from risk, children at forest school are actively encouraged to assess and take risks, and to learn to use tools or engage in potentially dangerous play such as tree climbing and building camp fires. Through all of this, children have a chance to engage and connect with nature, sometimes developing an attachment to the specific site where forest school sessions take place.

The significance of moving outdoors

Taking children outside of school to a new venue, with a new activity leader, creates a novel learning space. The

larger, outdoor physical space at forest school permits greater movement and noise. Children are able to move and mix in and out of groups, or find a quiet space to work alone. Away from the standard equipment of classrooms, children use their imaginations and are creative as they use the affordances of natural objects. Sticks become swords or pens for writing on the ground and logs become islands which have to be defended from attackers.

Outdoors, teachers and pupils are freed from the norms and conventions of the classroom. Away from the formality of the classroom, the relationship between children and adults is subtly redefined so that it becomes more relaxed. At forest school there is less directed learning. Instead children are permitted to shape what is done through choosing activities and how long to spend on them. Learner-centred approaches replace task-based approaches and the pace of learning is more relaxed.

Impact on learning and teaching

At forest school, the classroom model of teachers organising learning while children observe changes to become more interactive. Forest school practitioners see their role as facilitating children's learning by offering a choice of activities and allowing children to engage in play-led and peer-led learning, often employing kinaesthetic learning styles (learning by carrying out physical activities).

Forest school is not embedded within the national curriculum, and so for teachers, forest school practitioners and pupils, it is an opportunity to engage in more child-directed learning, free from the rigours and demands of a curriculum, learning objectives, or the associated assessments to ensure children (and teachers) are meeting targets.

Forest school brings together a range of initiatives, such as outdoor learning, child-initiated learning, learning through play, reconnecting children with the natural environment,



Frances Harris

Building a bird's nest

increasing physical activity, and a focus on children's personal, social and emotional development. While often associated with primary school, forest school is also used in a range of other settings including family groups, disaffected teenagers, and those with special educational needs⁵.

As we become increasingly aware of children's disconnection from nature and the role of nature in wellbeing, forest school is seen as an activity that brings together children's education and development. As yet there are no conclusive studies to show the impact of forest school on educational attainment, nor long-term studies to assess whether it impacts on children's attitudes towards the environment and woodlands, but it is believed that positive childhood experiences in nature will have a subsequent effect on engagement with nature when children become adults^{6,7}. Further research is required to assess how forest school will impact children's choice of subjects as they progress through school, their subsequent careers, their attitudes to the environment and the way they value woodland places.

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1. Davis, B. and S. Waite 2005. *Forest school: opportunities and challenges in the early years*. Plymouth: University of Plymouth
2. Knight, S. 2009. *Forest schools and outdoor learning the early years* London: Sage
3. Harris, F. 2015. The nature of learning at forest school: Practitioners' perspectives. *Education 3-13* 45 (2) 272-291 Online 10.1080/03004279.2015.1078833
4. Harris, F. 2017. Outdoor learning spaces: the case of forest school Area <http://onlinelibrary.wiley.com/doi/10.1111/area.12360/full>
5. Knight, S. 2011. *Forest School for All*. London: Sage.
6. Chawla, L. 2009. Growing up green: Becoming an agent of care for the natural world. *The Journal of Developmental Processes*, 4, no.1: 6-23.
7. Pretty J, Angus C, Bain M, Barton J, Gladwell V, Hine R, Pilgrim S, Sandercock G, and Sellens M, 2009. *Nature, Childhood, Health and Life Pathways*, ICES Occasional Paper 2009-02. Colchester: University of Essex.

To find
Outdoor Learning
Experiences at Easthall
Farm visit
outdoorlearningexperiences.org

Educating primary schools through Teaching Trees

Jenny Everitt

Teaching Trees is the Royal Forestry Society's (RFS) primary school education programme. Working in RFS member woods, it offers educational visits to local primary schools.

Teaching Trees is based at various sites all over England. Sessions are delivered by highly experienced education officers. Their understanding of woodland habitats means they are able to work with schools to educate them on the benefits of woods and how woodland management is an essential part of maintaining and preserving these wonderful places.

Connecting through education

Education officers design sessions to teach the pupils about their local woods in a way that not only informs but excites them. All young people should have access to local woodland to discover the opportunities and enjoyment it can provide for the rest of their lives. In an increasingly computerised and technological world, it is important for youngsters to connect to the natural world around them and be immersed in their environment through play and exploration – come rain or shine.

A Teaching Trees education officer's job is to help pupils understand the value of trees for a variety of purposes, while linking to the national curriculum. Once a school has made an enquiry, the teachers are asked for their required outcomes. For example, do they want sessions to link to current classroom topics or will it be a standalone visit? They may also want particular focuses, such as tree identification, woodlands as a habitat, the role of a forester or a maths extravaganza and this results in tailor-made sessions. Some teachers ask for copies of plans and learning outcomes, copies of resources used and any extra links for use back in the classroom, as well as follow up activities.

Learning through play

Sessions often start with a game to put everyone at ease, especially as some participants may not have much experience of natural environments. One such game, 'meet a tree', involves being blindfolded and working in pairs to use touch to identify different trees in their surroundings. They need to think about and describe the textures they can feel and any other identifying features, as well as building trust and teamwork skills. This game is normally demonstrated by members of staff first who are usually keen to join in and enjoy the mystery guessing game. The children also find it hysterical to watch their teachers being blindfolded.

The leaf identification challenge is a popular activity and simple to make yet effective. Using double sided tape attached to a piece of card, the pupils are set the challenge to find as many leaves from trees as possible and stick them to their card. They then try to identify their leaves using the available leaf guides.

Sessions with a numeracy focus have been designed for Key Stage 2. Activities can include tree height calculations, achieved by looking through legs (always a memorable activity), pretending to be foresters setting up firewood businesses by working out how many logs they will get from each tree, and calculating the approximate number of trees in the woodland.

Sessions for Early Years Foundation Stage and Key Stage 1 are usually based around 'fun in the woods' and 'the woods', giving quite a broad area from which to design a session. To aid learning, most education officers like to sing songs, for example 'Roots, trunk, branch and leaves' is sung to the tune of 'Head, shoulders, knees and toes'. Storytime is another popular activity, as there is something magical about sitting in a wood listening to a fascinating tale. Woods are perfect places to let young imaginations run wild. Often the stories are used as a starting point to introduce more focused learning activities, such as drawing maps, creating their own creatures or bug hunting.

Inspiring a new generation of foresters

The concept of woodland management is also introduced to the groups. Pupils can be dressed in safety gear, including boots, trousers, helmets and ear protectors, and shown how they might use a toy chainsaw. Staff and students enjoy dressing up and posing with all the equipment. It is also important to explain that tree felling is not always a bad thing. Education in this way can have a much wider impact over time as the youngsters take their new knowledge home and pass it onto family and friends. In the long term, this could help change the often held belief that trees should not be felled in any circumstance, even if they are replaced¹.

There are so many different, exciting and entertaining ways to teach people about woods and trees and every session is different. Some schools that take part hold forest school status, while others have very little outdoor experience. There is some crossover between Teaching Trees and forest schools in terms of activities that use practical techniques to engage children about trees and nature. However, the focus of forest schools is a little different to Teaching Trees sessions which are curriculum linked and deliver pre-agreed learning outcomes. Nonetheless, the two schemes do complement each other well.

Jenny Everitt is the education officer for Derbyshire and Nottinghamshire, with woodland bases at Stubbing Wood, part of the Chatsworth Estate, near Chesterfield, Hodsock Priory near Worksop, and the Welbeck Estate near Blyth.

1. Forestry Commission Public Opinion of Forestry 2017, UK and England July 2017



Jenny Everitt



Jenny Everitt



An aspiring forester

For more information on Teaching Trees, visit rfs.org.uk/learning/teaching-trees

To book a session, email TeachingTrees@rfs.org.uk.



Bringing outdoor learning to life

Paula Sinclair

Young people of previous generations enjoyed a world of building dens, whittling sticks, building river dams and generally grubbing around the woodland. Yet today's children are increasingly more likely to attend after school clubs or paid sports classes.

With such busy lives, even those parents who wish to are not always able to take their children exploring in the outdoors and so their youngsters are missing out on the huge benefits that activities like camping, hiking or river dipping can offer. These often free pastimes are falling by the wayside as the uptake of activities with professional coaching or technological screen time increases. Therefore, schools need to maximise the education and development of the whole child by using the outdoors as a tool for learning about nature, to acquire life skills, and as a platform for standard curricular subjects.

Enriching a Scottish school

A quick class survey at St George's School for Girls in Edinburgh revealed that, whilst many pupils were adept at activities such as tennis, gymnastics and skiing, there were a few that had never yet climbed a tree, struggled to name three species of butterfly, did not know what a pooh stick was, and had never toasted a marshmallow. Watching footage on YouTube, building a den in Minecraft and offering to find the answers on Google did not count. So, over the last few years, the school has been increasing the environmental awareness and the health and wellbeing of its pupils through outdoor activities and learning. Seeing immediate and life-enriching benefits, outdoor learning has now been embedded into the curriculum.

Connections to nature are being marred by modern day pressures of time, estranged attitude and the advance of technology, and staff at St George's could see the massive potential of skills and experiences that outdoor learning could offer. Consequently, I set up weekly outdoor sessions with Primary 3 pupils to teach them about the nature and biodiversity in their school grounds through hands-on experiences and investigation.

An immediate impact amongst the pupils was observed in essential life skills such as teamwork, communication, respect, negotiation, resilience, perseverance, confidence, problem solving and independence. Bright eyes, glowing faces and excited grins bore testament to a multitude of other health benefits. Where appropriate, maths, language and topic lessons were taken outdoors too, providing an active and engaging classroom without walls and capitalising on nature's free, limitless and ever-changing resources. These outdoor activities became eagerly anticipated by both pupils and teachers and the influence of this teaching progressed quickly to the other year groups.



Den building

Training with Wild things!

To progress and enrich the school's outdoor learning programme further, I attended the Woodland Activity Leader Training (WALT) course delivered by Wild things!.

This course runs for seven days with continual assessment on the various elements taught throughout the week, culminating in delivery of a 30 minute session on the last day. Participants are either given or get to choose

a subject, such as history, maths, physics, confidence building or teamwork to deliver to their fellow participants. During this session, each participant has the chance to put into practice some of the skills they have learned about group management during the course. Research has consistently shown increased levels of engagement and motivation in outdoor learning activities among individuals that may be challenging in the classroom. The hugely positive effects that outdoor learning gives to all generally make for a smooth session if well planned and prepared. The WALT course is officially accredited by the General Teaching Council for Scotland and can lead to professional recognition in outdoor learning for Scottish based teachers who complete the course. Topics covered during the WALT course include:

- Tree and plant identification, including traditional uses and edible species
- Bushcraft, including instruction on tool safety and maintenance
- Den building, hammocks and knot tying
- Fire building and cooking
- Animal tracking and minibeasts
- Games and activities
- Top tips for leading a group in the outdoors.

Newly qualified as a woodland activity leader and back at school once more, I set up a bushcraft club and with the support of the management team, purchased a variety of equipment to extend the outdoor learning programme. This included knives, saws, fire steels, hammocks, tarps, para cord and identification charts. In this way, the Primary 5 Ranger Club was founded. The club was an instant success, not only with the pupils but also with the parents who delighted in hearing the excited chatter about the likes of popcorn making over a 'leave no trace' fire, camouflaging in the trees and eating nettles. Due to the demand on the limited spaces, bushcraft skills have also been incorporated into the Primary 5 Camp so that everyone gets the opportunity to take part.

The main outdoor learning curriculum was extended to offer pupils a Level 1 Award in the Natural Connections programme developed by Fife Council. Through this, they venture out onto the Pentland Hills as scientific researchers and along the Water of Leith as conservationists. The school grounds, however, are used as the setting of all regular sessions and St George's is fortunate to have wild and natural areas on campus. Funds have been raised to develop the extensive grassy spaces over the last few years to complement the programme. A log trail was built and an Indian canoe donated – the source of many an imaginative paddle. A property developer contributed several wooden pallets to create an enormous bug hotel, a local tree surgeon provided lots of large branches to mark out paths and the pupils helped to design and build various



Camouflage and tracking

plant structures. A large tree platform in the 'Fantastical Forest' was completed this year by the environmental education organisation Earth Calling and is the basis for a huge number of creative and imaginative activities, as well as just for climbing and jumping off.

Outdoor learning has become a core part of the curriculum at St George's and a key aspect of the school's objectives in nurturing the whole child. The enriching experiences that these activities provide for the pupils equip them for the world with essential life skills that can never be taken away and complement their academic prowess.

Rewarding success

There are many resources available to schools and awards that pupils can work towards to inspire, motivate and recognise their achievements. St George's offers the Natural Connections Award to the Primary 5 pupils, an undertaking of six different elements worked on throughout the year: nature discovery, conservation work, adventure skills, teamwork, mapping and journeying. Its launch last year was a great success. Every pupil completed the award and learned a great deal along the way, not only about nature and the sustainability of our world, but also about themselves. The full day



Paula Sinclair

The Fantastical Forest Tree Platform



Paula Sinclair

The junior school bug hotel

The pupils at St George's School have certainly gained many skills that they will draw upon throughout their lives. They have also found that there is nothing quite like sitting around a fire, singing songs and enjoying a toasted marshmallow, while the birds chirp overhead, the bugs busy themselves, the wind rustles the leaves of the trees and the sun goes down behind the hills.

A promotional video about outdoor learning at St George's School can be viewed at:

stge.org.uk/blogs-and-news/show/914/outdoor-learning-at-school----why-do-we-do-it

Wild things! delivers a selection of accredited outdoor learning courses at various locations throughout the UK. It also provides one day courses aimed at teachers, exploring individual aspects of outdoor learning, such as: the world of the minibeast, or creatures of the shore.

Paula Sinclair is curriculum leader of outdoor learning at St George's School for Girls, Edinburgh.



Chris Muir

Paula on Wild Things! training

hike up Scald Law was the highlight for many, providing both physical and mental challenge as entomologists, hydrologists, mycologists, botanists and geologists scoured the hills, equipped suitably for their jobs by the senior school biology department.

Another award scheme that can be used to structure outdoor learning sessions is the RSPB's Wild Challenges. Pupils at St George's were delighted to gain bronze, silver and gold awards for the school in quick succession. Many of the younger pupils were also involved in this through their Eco Day of Action, a full day of outdoor activities and workshops for all classes.

There are also many free workshops available for teachers from organisations such as the RSPB, Changeworks and the Scottish SPCA. Their education teams are more than happy to help enthusiasts develop as leaders of outdoor learning, to inspire wild ideas, to enrich the curriculum and maximise the benefits for and impacts on children.



Paula Sinclair

Making popcorn

For more information on Woodland Activity Leader Training or any of the other Wild things! courses, visit wild-things.org.uk, call 01309 690450 or email enquiries@wild-things.org.uk.



WTML/Philip Formby

Tree planting in school grounds

Join the green school revolution

Aaron Benson

The Woodland Trust works with schools and nurseries across the UK. Through the Green Tree Schools Award programme it encourages outdoor learning and helps teachers inspire their pupils about trees, woods and wildlife.

The award celebrates its tenth birthday in 2018 and over 9,000 schools and nurseries are currently registered. Free to join, it has made a positive impact on the lives of at least 2.8 million young people and teachers so far.

Why is the award important?

The disconnect between people and nature is a contributing factor to many of the mental and physical health issues the UK is suffering. Connecting people with the natural environment from a young age could help prevent such issues and make a positive impact on their lives in the long term.

A survey of 46 schools that recently joined the Green Tree Schools Award showed that 98 per cent of teachers believed the award will improve the health and wellbeing of their pupils. Furthermore, 98 per cent believed the award will make their pupils more environmentally friendly. As the award aims to develop students' love for trees and create

the next generation of tree and woodland ambassadors, this is a great success and an important way to engage young people in the Woodland Trust's work.

Achieving the award

Schools gain award points by completing a number of environmental activities that help teachers to deliver key outdoor learning (there are also indoor elements). Activities include tree planting, recycling and creating a wild trail within a local wood. Completing these tasks and collecting points allows the schools to progress through bronze, silver and gold levels to the prestigious platinum award, and at each completed stage they receive a plaque to mark their achievements. The award is designed to take the pupils and teachers on a journey which develops and celebrates their awareness of the importance and benefits of native woods and trees.

Most activities are focused on students physically interacting with woods and trees, to help form an emotional and lasting bond. They include planting trees in the school or local community and creating stories and displays from visits to local woods. Other activities are designed to increase knowledge of the benefits of woods

and trees, including an assembly designed around Jean Giono's beautiful story of *The Man Who Planted Trees*. This wonderful tale demonstrates the difference one person can make to the natural world if they care enough about it.

Schools can apply for free tree packs from the Woodland Trust to plant in their grounds. The pupils plant these trees, care for them and watch them grow during their years at the school. This helps form a deep connection between the young people and their trees, and what the Trust hopes is the basis of a long-term relationship with nature, one which may see them go on to be protectors and ambassadors of the natural world, which we so greatly need.

Success and expansion

The award receives a wealth of positive feedback from the teachers and pupils that take part. One said: "The Green Tree Schools Award is great for helping students become aware of what an important role trees play in the biodiversity of habitats. The award enhances their knowledge of the importance of being good global citizens. Some of our sixth form students have also turned the planting and maintenance of the school trees into a project that will assist them with their UCAS applications."

While another said: "The project has highlighted the importance of trees and how they are key to our world, and the children feel like they have helped the planet as well as learning so much of the biology focus of the curriculum."

In late 2016, a generous £550,000 donation from the players of People's Postcode Lottery enabled the development of an enhanced award programme that is being rolled out in three areas: Heartwood Forest in Hertfordshire, Skipton Castle Woods and County Durham. The extra funding allowed recruitment of a dedicated woodland learning officer for each area to increase awareness and participation in the award, as well as offering greater support to help schools remain engaged and progress within the programme.

Early results from this enhanced programme are very encouraging. Since November 2016, 763 schools in these three areas have registered or been active in the award, compared to 907 schools that registered in the rest of the UK over the same time period.

Importance of outdoor learning

A recent large-scale study, the Natural Connections Demonstration Project¹, found outdoor learning had a positive impact on pupil health and wellbeing. It increased social skills and improved behaviour. As well as bringing subjects to life for young people, this greater enjoyment led to increased creativity and engagement with learning. Similarly, teachers said the delivery of outdoor learning had a positive impact on their teaching practice and performance, and increased job satisfaction and their own wellbeing.

While organisations like the Woodland Trust understand the need for and benefits of outdoor learning for young people, it is vital to gain important evidence such as this to support their work, secure future funding and influence policymakers.

Get involved

Schools can register on the Green Tree Schools Award website, access a wide range of free curriculum linked activities and order their free tree packs at woodlandtrust.org.uk/schools. Millions of pupils across the UK are already benefiting from the award. Help your school make a difference for people and nature and sign up now.

1. Natural England. Natural Connections Demonstration Project. <http://publications.naturalengland.org.uk/publication/6636651036540928>



WTPL/Matt Limb

Plaque for achieving the gold award

Restoration of ancient woodland as an educational resource

Peter Shaw, Mary Mackenzie & Christina Bows

From a biodiversity perspective, it is clear that replanting our ancient woodlands with non-native conifers has been damaging. At Cottshayne Wood in Devon, conifer removal and the subsequent return of native species has been used as an educational resource.

To restore Cottshayne back to native woodland, the conifers needed to be removed using a gradual process of thinning and haloing. Felling was phased over time as theory suggests woods of mixed successional ages have the highest biodiversity^{1,2}, and clearfelling of large areas during restoration is shown to negatively impact remaining ground flora and remnant ancient woodland features that need to be retained.

Between 2001 and 2011, small groups of third-year undergraduates from the University of Roehampton spent three days in the wood every autumn. Research projects included studies of dormouse, *Muscardinus avellanarius*, activity, plant recolonisation, habitat use by mixed groups of birds, residual effects of fires on soil chemistry and entomological surveys. In addition, monthly common bird censuses conducted since 2002 have produced data for desk-based spatial analyses.

While worries persist that today's students are isolated from the natural world³, this certainly is not the case for any student who collected data in Cottshayne Wood. Undergraduates rated the module very positively and for

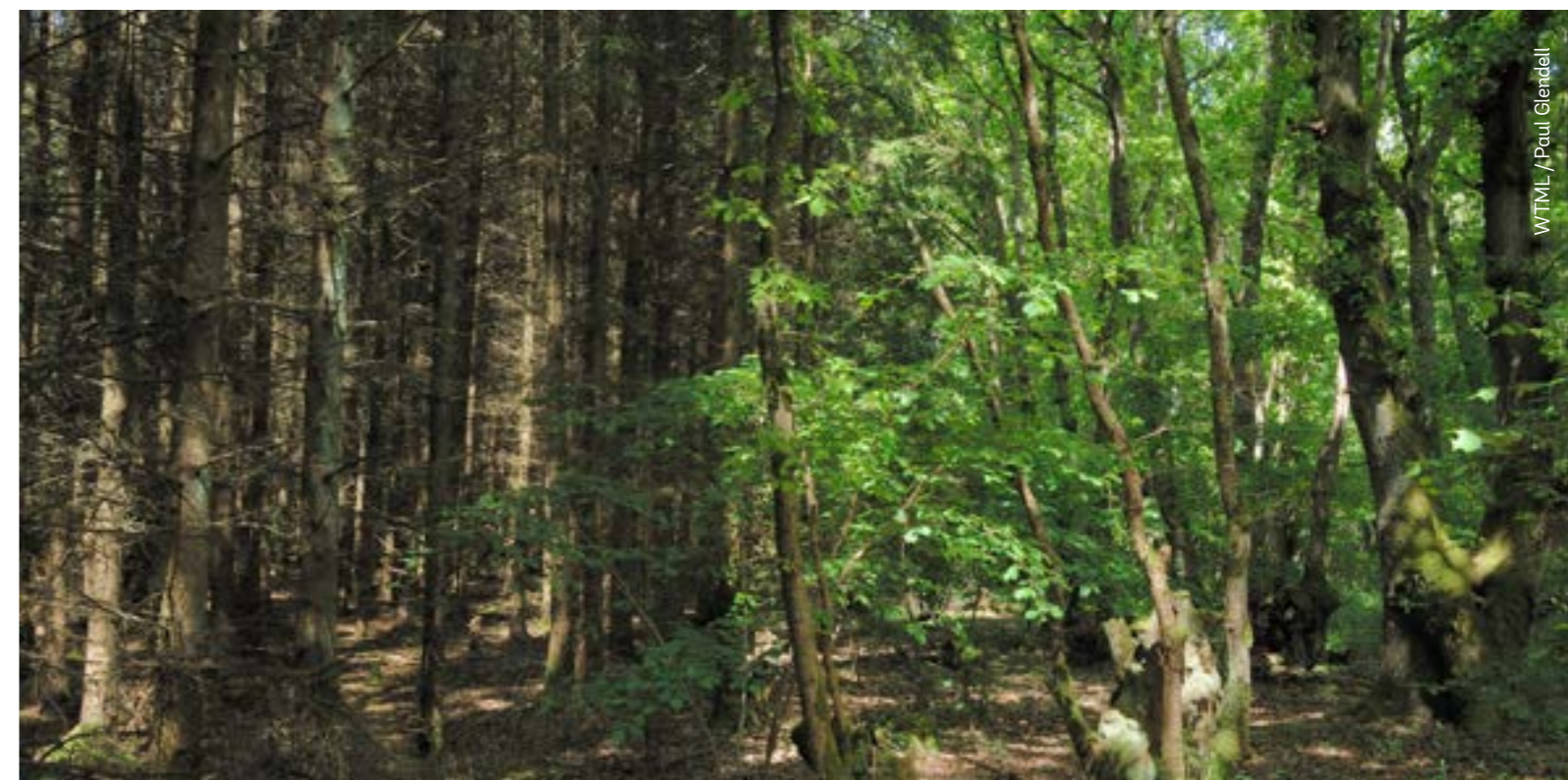
many it was a highlight of their degree. Feedback also reflected how much students enjoyed getting to know each other; collecting data with a partner in the depths of a wood can provide a more intense, fulfilling interpersonal experience than a laboratory practical.

Gradual woodland conversion

The first area felled in 1999, next to the residual old woodland, briefly produced a spectacular display of foxgloves, *Digitalis purpurea*, as more light reached the woodland floor and stimulated the seed bank. The subsequent understorey regeneration of birch, *Betula* sp., and willow, *Salix* sp., intertwined with bramble, *Rubus fruticosus*, and gorse, *Ulex europaeus*, became almost impenetrable due to the deer-proof fencing, a Forestry Commission requirement.

There was regeneration outside the fence too, albeit more scattered, which interspersed with the first heather, *Calluna vulgaris*, on the site. As a result, all subsequent areas of clearfell were left unfenced. The contrast between the spiky mass caused by deer exclusion and the open, flower-rich paths in deer-grazed patches allowed students to study and better understand Frans Vera's models of pre-human 'forest' which had open areas maintained by grazing animals⁴.

The next site, cut in 2002 covered a spring line, so a new pond was dug in which frogs spawned the following spring.



WTML/Paul Glendell

Conifer plantation on the left compared to native woodland on the right.



Peter Shaw

The legacy oak

Colonisation by water life was rapid, with 12 species of dragonflies and damselflies now recorded, including the beautiful damselfly, *Coenagrion puella*, and the golden-ringed dragonfly, *Cordulegaster boltoni*.

Although mainly conifers were cleared in the next felling in 2006, the clearance may have disturbed dormice using hazel, *Corylus avellana*, bordering the site, as there has been no dormouse activity recorded there since. However, in 2007 a new population of dormice appeared 100 metres away in the thick regrowth and the population has continued to expand in what is proving to be a 'dormouse paradise'.

In January 2013 the final non-native conifers were felled. In 2017, 25 years on from its acquisition, rotation coppicing of the regenerated birch, hazel and willow began and the

Box 1 - Cottshayne Wood

Cottshayne Wood is an 11.6 hectare wood in East Devon, over half of which was planted with Douglas fir, *Pseudotsuga menziesii*, and Sitka spruce, *Picea sitchensis*, in the 1970s. Before the conifers were planted, the wood was a "place of magic, full of willow warblers and bluebells," a neighbouring farmer remembers.

When the site was acquired in 1991, the conifers were over 10 metres tall, casting deep shade with virtually no ground flora. They nevertheless supported goldcrests and many fungi, notably milkcaps, *Lactarius* sp., and crumble-caps, *Russula* sp., as well as unnamed mycelial mats (fungal 'threads' spreading over or under the soil, which are unusual in the UK). The remainder was mainly oak, ash, *Fraxinus excelsior*, hazel and birch, with willow, along a spring line.

North-facing on acid sandy soil (pH 5.5), Cottshayne's ancient woodland heritage is indicated by coppice stools, medieval hedge banks and ancient woodland indicator plants: native bluebells, yellow archangel, *Lamium galeobdolon*, and primrose, *Primula vulgaris*. Old maps showed it had provided common grazing and coppice woodland for hundreds of years.

Box 2 - Benefits for flora and fauna

Since 2002, 115 species of vascular plants have been recorded in Cottshayne Wood, many appearing post-clearfell. Boggy patches under conifers that became considerably wetter after clearfell have been colonised by sphagnum moss and water plants.

The ground flora along the rides and glades has grown from virtually nothing and diversified into a mix of violets, *Viola* spp., selfheal, *Prunella vulgaris*, marsh thistle, *Cirsium palustre*, bird's-foot-trefoil, *Lotus uliginosus*, skull cap, *Scutellaria galericulata*, water mint, *Mentha aquatica*, and spotted orchid, *Dactylorhiza fuchsii*. As a result, butterflies returned in good numbers, including silver-washed fritillaries, *Argynnis paphia*.

Roe deer *Capreolus capreolus*, is the main browsing mammal on site, though in low densities (maximum two animals seen at once, but regularly). Badgers, *Meles meles*, foxes, *Vulpes vulpes*, and wood mice, *Apodemus sylvaticus*, are all permanent residents.

Hazel dormice were discovered when a hibernating dormouse was found under conifers in 1997. In 2005, 48 dormice tubes were set out in dense scrub and checked each September. These are notoriously tricky animals to monitor, but student surveys found evidence of nesting every year.

45 bird species have been recorded at the site, including spotted flycatcher, *Muscicapa striata*, and firecrest, *Regulus ignicapilla*. Woodcock, *Scolopax rusticola*, numbers have increased every winter, making it one of the best sites in East Devon. Coal tits and goldcrests are continuously present, strongly associated with the conifers, as were the sporadic visits from crossbills.

subsequent wood products used for fuel. The plan is to leave the developing oaks, *Quercus* sp., and rowans, *Sorbus aucuparia*, as standard trees.

Lessons learned

Giving students free rein to design projects made it hard to collect consistent long-term datasets, with the exception of counts of dormice nests that were easily comparable between years. Even 'standard' vegetation transects changed over time as the denser parts of the regrowth became impenetrable by year five.

Nevertheless, the project delivered results that are applicable more widely. In particular, it was not necessary to fence, replant or 'weed' clearfell to restore native woodland. Deer grazing only generated a mosaic, with some saplings protected by gorse and brambles. To quote Oliver Rackham, "Planting is not conservation but an admission that conservation has failed"⁵. Surrounding clearfell with deer-proof fencing led to thick regeneration, impenetrable for humans though excellent for dormice.

Secondly, substantial conifer removal has undoubtedly created a richer biodiversity (see Box 2). Spatial analyses confirmed that the clearances benefited broadleaved woodland birds such as robin, *Erithacus rubecula*, blackcap, *Sylvia atricapilla*, willow warblers, *Phylloscopus trochilus*, and chiffchaffs, *Phylloscopus collybita*, at the expense of goldcrests, *Regulus regulus*, and coal tits, *Parus ater*. However, total extirpation of the conifers from this woodland would actually reduce biodiversity, for example by loss of goldcrests, crossbills, *Loxia curvirostra*, and some fungi. Analyses in 2007 showed goldcrests declining in tandem with conifer clearance.

The future

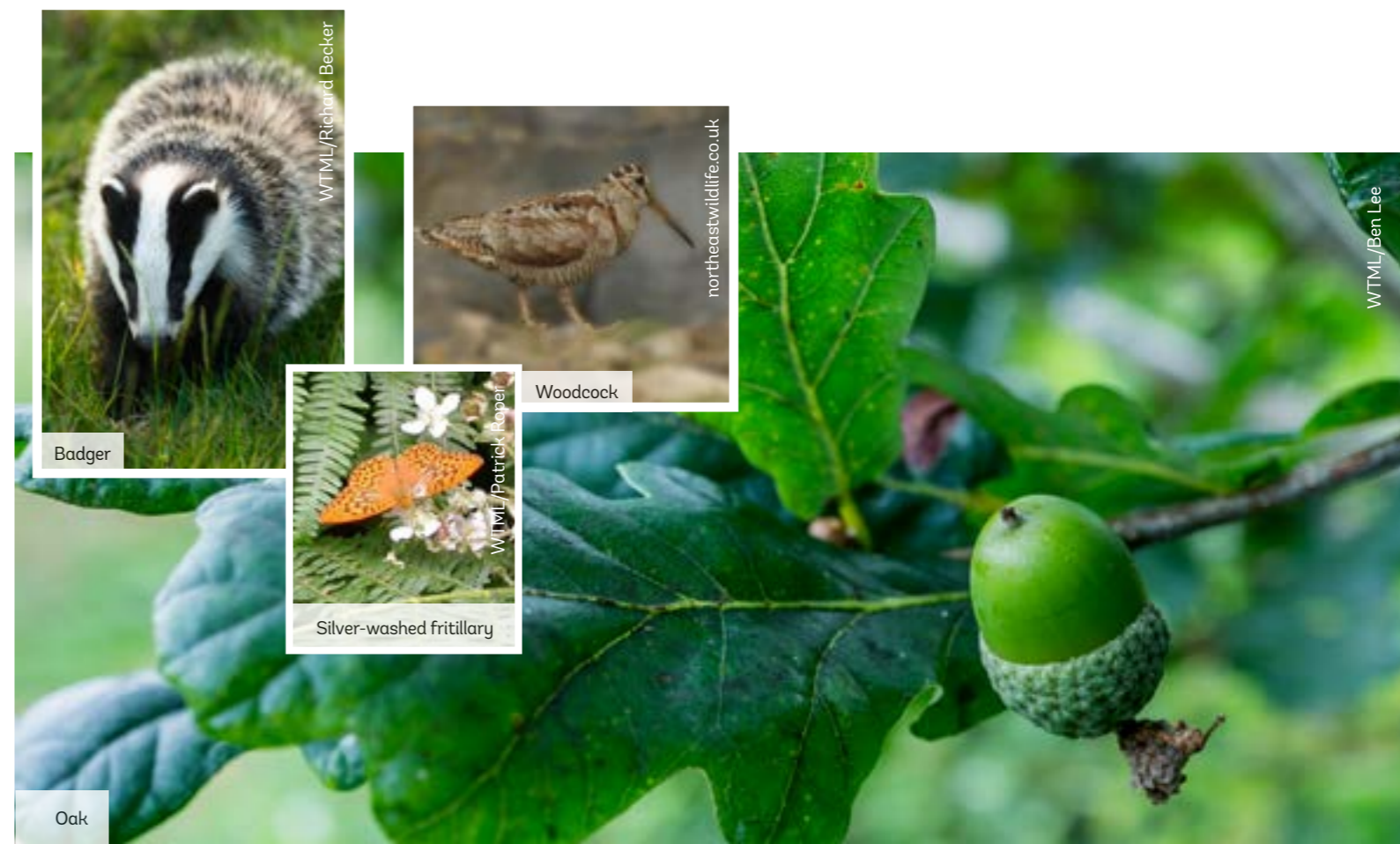
These findings have altered the view of the remaining patches of conifers, seen now as oases for a different set of lifeforms and they will be retained in the future woodland mosaic.

There are still 10 more years of bird data in need of analysis. It is also hoped that nearby wild beavers will move in to help with coppicing and pond building!

The site is part of a new Area of Outstanding Natural Beauty, Woodland Trust and Devon Wildlife Trust project that will connect King John's Oak and its medieval deer park and estate to conservation and education activities in Cottshayne for many years to come.

Peter Shaw lectures in zoology at the University of Roehampton and is the UK recorder for springtails (Collembola) at work plus a Surrey Wildlife Trust assistant warden outside work. Mary Mackenzie is the technical manager at the University of Roehampton, and Christina Bows is the owner and manager of Cottshayne Wood, a restored orchard, a community forest garden and the Spiral Centre.

1. Watkins, C. 1990 *Woodland Management and Conservation*. Peterborough: Nature Conservancy Council.
2. Peterken G 1993 *Woodland Conservation and management*. London: Chapman & Hall
3. Blumstein DT, Saylan C 2007 The Failure of Environmental Education (and How We Can Fix It). *PLoS Biol* 5(5): e120. Doi:10.1371/journal.pbio.0050120
4. Vera, F.W.M. 2000 *Grazing ecology and forest history*. Wallingford: CABI International
5. Rackham, O. 1996 *Trees & Woodland in the British Landscape*



Badger

Woodcock

Silver-washed fritillary

Oak

Woodland as a restorative space

Paula Mata and Fernando Mata

Scientific evidence shows that access to woodland and green space is beneficial for people's mental and physical health and wellbeing¹. People from different cultures generally prefer natural environments over urban environments, which is consistent with the old and widely-held belief of the positive effect of exposure to nature on human health and wellbeing².

In modern life there is an increase in sedentary work and mental stress. Increased stress levels are connected with urban living and contemporary work practices dominated by high use of technology and virtual worlds. Young people spend more time indoors due to the increasing use of games consoles and computers. The combination of these factors has a negative impact on wellbeing and health, for example the link between a lack of physical activity and consequent obesity.

Restoring wellbeing through education

Ruskin Mill College (RMC) offers a range of course subjects to learners with complex needs, providing both residential and day placements. The college offers practical land-based and traditional craft activities, including animal husbandry, fish farming, woodland management, horticulture, catering, drama and art, with communication and functional skills embedded throughout, and residential provision. At Gables Farm, the market garden and the fish farm, students help grow and harvest healthy biodynamic food, and prepare meals in the college canteens, café and households. Students can achieve awards, accreditation and qualifications, both through college courses and external placements.

The insights of Rudolf Steiner, John Ruskin and William Morris have inspired the Ruskin Mill Trust (RMT) method of education, using a holistic approach that encourages people to work as one with the Earth and universe³.



Ruskin Mill Cottage

Ruskin Mill Trust

The RMT curriculum of Practical Skills Therapeutic Education (PSTE) combines arts and craft work with the development of morals, bringing together the theories of Steiner, Ruskin and Morris in a teaching/learning model named 'contemporary apprenticeship'. This model of apprenticeship is based on social constructionism (learning by making) and social constructivism (learning as a social process).

Woods affecting the senses

A research study has been created to look at how individuals feel and sense the woodlands where Ruskin Mill College is located, in order to understand how they may impact the educational process taking place. The study compares the impacts of the woodlands, flow forms (water features located in the valley), historic buildings and the farm on people with regular access to these facilities. The woods proved to be the most appreciated place and provided the highest degree of wellbeing.

Unhealthy city life can drain the brain as city dwellers must continuously respond to multiple stimuli surrounding them, which is the main factor responsible for 'directed attention fatigue'. It is characterised by 'a neurological state that occurs when our voluntary attention, the part of the brain that we use to concentrate on particular stimuli while ignoring distractions, gets worn down'. The symptoms of directed attention fatigue include feelings of heightened distraction, impatience and forgetfulness, and eventually poor judgement and increased levels of stress. Simply going for a walk in the park can alleviate these symptoms and refresh the brain⁴.

The study showed the sense of sight to have the highest score of all the senses and highlighted the importance of scenery and colours. Woodlands are sensed positively, which impacts on individuals and promotes wellbeing, as described in the ART and PSRT theories (see Box 1). This is a huge contribution to the desired therapeutic effect sought by PSTE.

Walking, exercise and fresh air also scored highly in the study. To walk and exercise is an invitation to breathe, and can be regarded as indicative of a sense of relief and alleviation from some of the claustrophobic trauma often caused by a modern life confined to small rooms. Exercise in an environment with purified air can promote a restorative experience, including the recovery of directed attention; it also evokes very high levels of fascination that can fulfil the mind⁵.

These aspects are also confirmed by results of the emotional senses, where contemplation (again associated with the visual senses) obtains the highest score. So woods can be considered a source of fascination. Relaxation, peace, quietness and freedom follow in terms of score and are linked to alleviation from confinement in closed spaces. Nature can improve an individual's mood, can lead to increased levels of vitality, and can offer an opportunity to recover from stress, and replenish depleted attentional resources⁶.

Offering constructive healing

Exposure to and movement in the natural world can be extremely therapeutic, and a new treatment⁷ has been developed for those impacted by Attention Deficit Hyperactivity Disorder (ADHD) that involves immersion in the outdoors. Young adults with ADHD struggle with concentration and their attention can easily be distracted away from learning processes. However, as woods promote relaxation, wellbeing and fascination these natural surroundings can help overcome this obstacle and maintain an individual's attention span, so facilitating the learning process and their sense of achievement. Education that enables people to spend quality, extended time in the outdoors and teaches skills that further connect them to their environment is vital. The results of the above study highlight the importance of woodland in the context of PSTE. The courses offered at RMC are based in the natural world, so encourage vitality and fascination, and include practical aspects which involve exercise that restores and boosts the mind through the release of endorphins. The potential of RMC's Horsley Valley Woodlands as a therapeutic place of healing and learning is huge, and could be mirrored in other locations throughout the country and indeed the world.

The research article is available from:

<http://onlinelibrary.wiley.com/doi/10.1111/1471-3802.12258/full>

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1. Milligan, C. & Bingley, A. 2007. 'Restorative places or scary spaces? The impact of woodland on the mental well-being of young adults', *Health & Place*, 13(4), 799-811
2. Parsons, R. 1991. 'The potential influence of environmental perception on human health', *Journal of Environmental Psychology*, 11(1), 1-23
3. Gordon, A. 2013. *Recovering Gifts: Practical Skills Therapeutic Education, "Apprenticeship in Service" Learning*. Nailsworth: Ruskin Mill Trust
4. Berman, M., Jonides, J., Kaplan, S. 2008. The cognitive benefits of interacting with nature. *Psychological Science*, 19(12), 1207-1212
5. Herzog, T., Black, A., Fountaine, K. Knotts, D. 1997. 'Reflection and attentional recovery as distinctive benefits of restorative environments', *Journal of Environmental Psychology*, 17(2), 165-170
6. Joye, Y., Pals, R., Steg, L., Lewis-Evans, B. 2013. 'New methods for assessing the fascinating nature of nature experiences', *PLoS ONE* 8(7): e65332
7. Kuo, F., Taylor, A. 2004. 'A potential natural treatment for attention-deficit/hyperactivity disorder: Evidence from a national study', *American Journal of Public Health*, 94(9), 1580-1586
8. Wilson, E. 1984 *Biophilia*, Cambridge: Harvard University Press
9. Kaplan R. & Kaplan, S. 1989. *The experience of nature: a psychological perspective*. Cambridge: Cambridge University Press

Box 1: Theories that support the positive influence of natural environments on human wellbeing

Biophilia Theory (BT)

The idea behind biophilia is that humans are biologically connected to the natural world, this connection being of crucial importance to the individual's sense of wellbeing⁸. In essence, biophilia urges people to slow down so that the various stresses in life become less harmful, allowing people a higher degree of satisfaction and fulfilment.

Attention Restorative Theory (ART)

Contact with nature can have a restorative or curative effect on directed attention fatigue and the accompanying impulsivity, distractibility and irritability. By using effortless attention (attention that evokes fascination accompanied by aesthetic pleasure in ordinary natural surroundings capturing our interest) we restore the brain's ability to focus, refresh the attention, and relax the mind. This is the theory behind other practices such as horticulture therapy, healing gardens and restorative gardens.

Psycho-physiological Stress Recovery Theory (PSRT)

Certain natural features elicit primary, limbic-mediated processes of affective and physiological response leading to stress restorative outcomes. This response causes a rapid reduction in stress, usually within minutes of exposure to nature and is most obvious when the body is already stressed. The limbic system is one of the oldest parts of our brain and is connected with our autonomic nervous system and implicit memory, where preverbal traumatic experiences are 'remembered' in the body. Ulrich hypothesised that we have evolved to instinctively 'tune in' to scenery that induces such positive responses, because this adaptive strategy would have been significant for the survival of our early ancestors⁹.



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