

THE GREEN FUSE

A natural history magazine created by young naturalists for young naturalists



Issue One
Winter 2020

Welcome

Welcome to the first edition of The Green Fuse. The Green Fuse is a magazine for young naturalists produced by young naturalists.

The name 'The Green Fuse' was inspired by Dylan Thomas' s poem. The editorial team of The Green Fuse live in Carmarthenshire, the home of Dylan Thomas, so we found The Green Fuse a fitting name to take.

In creating this magazine, we want to share our passion for wildlife and to inspire others to enjoy being out in nature, to create art about nature and to each do our bit to protect the natural world around us.

We are a small team of contributors at present but we hope that more of you will join us to make the future issues of The Green Fuse.

We, the editors and contributors, are all home educated. Home educated children are often overlooked and in making The Green Fuse, we want raise the profile of the great things that home educated children do! Having said that, we welcome contributions from any young eople.



The Force that Through The Green Fuse Drives the Flower

The force that through the green fuse drives the flower
Drives my green age; that blasts the roots of trees
Is my destroyer.
And I am dumb to tell the crooked rose
My youth is bent by the same wintry fever.

The force that drives the water through the rocks
Drives my red blood; that dries the mouthing streams
Turns mine to wax.
And I am dumb to mouth unto my veins
How at the mountain spring the same mouth sucks.

The hand that whirls the water in the pool
Stirs the quicksand; that ropes the blowing wind
Hauls my shroud sail.
And I am dumb to tell the hanging man
How of my clay is made the hangman' s lime.

The lips of time leech to the fountain head;
Love drips and gathers, but the fallen blood
Shall calm her sores.
And I am dumb to tell a weather' s wind
How time has ticked a heaven round the stars.

And I am dumb to tell the lover' s tomb
How at my sheet goes the same crooked worm.

By Dylan Thomas

Contents

Welcome page 1	Mini Book Review 'Beetle Boy' Page 19
The Green Fuse by Dylan Thomas page 2	Coleoptera Competition Page 19
About Us Page 4	Book Review 'Seaweeds of Britain and Ireland' Page 20
An Interview with Kate Humble Television Presenter Page 5	A Willow Bird Hide Page 21
Book Review 'The Essential Guide to Beachcombing and the Strandline' Page 9	The Readers' Pages Page 23
Exploring Owl Pellets Page 10	Gallery Page 24
Making Track Casts Page 11	A Feather Puzzle Page 25
An Interview with Marc Dando Scientific Illustrator Page 13	The Quiz Answers
The Shout Trout Workout Page 17	
The Shout Trout Quiz Page 18	
The Shout Trout Quiz Page 19	



Illustration by Rose Fulton

About us



To contact The Green Fuse, please email
thegreenfusemagazine@gmail.com

We are looking for contributions for the Spring 2021 edition to be submitted by the 15th February 2021. We would welcome articles, artwork and activities on the theme of the natural world in the UK and beyond.



Rose Fulton (12)
Editor, Illustrator, Journalist, Photographer

I am a keen naturalist. I have always loved nature and have recently become interested in meteorology. I particularly enjoy birdwatching and woodland walks.



Megan George (10)
Co-editor, Photographer

I am a young naturalist living on a farm in the beautiful countryside of Carmarthenshire. I love photography and watching wildlife and particularly birds, but my favourite animal has to be my pet sheep Daisy.



George Rover (13)
Co-editor, Web Designer

I am a home educated nature enthusiast. I own chickens, a turtle, an axolotl and loads of shrimps. I play ukulele and piano. I love to read. I live in the countryside of south-west Wales and love spending time at our river.



George Fulton (9)
Illustrator, Photographer and Contributor

I love aquatic life. I like birds and would like to work in conservation when I am older. I have my own museum with lots of natural history exhibits. I love drawing and creating things.



An interview with

KATE HUMBLE

By Rose Fulton

What is your earliest memory of connecting to nature?

I grew up in a house in Berkshire in the south-east of England. We had a narrow kitchen, like a corridor with a window that looked out on the garden and the toaster was by the window. Mum used to make toast every morning and a sparrow used to fly and sit on the window sill while my mum was making toast and then come into the kitchen and peck up the crumbs from the toast. The sparrow used to come in every morning and in the end we decided she ought to have a name and so we called her Martha. I think that was the first time I experienced that cross-over of a completely wild animal being part of my everyday life. I was very small, probably seven or eight, when Martha used to come in, and she came in every morning. That as the most exciting and tangible connection with nature that I had. There was something about Martha coming into our kitchen every morning that made me think nature was pretty amazing.

When did your interest in the natural world begin?

Unconsciously, if that makes sense. I was very lucky, I grew up in the country side but also I grew up in the 1970s and no one had invented laptop computers or ipads or any sort of screens, there wasn't much television either. If you grew up in the countryside, there was lots of outdoor space where you could play and explore, and that is what you did. The natural world was all around me, part of growing up, and one of the things we all did was, we would collect wild flowers a press them and make them into book marks or make them into cards. We would find a bird's nest and watch it, we knew not to touch it or disturb it. And when the eggs hatched, you would find the little bits of cracked egg shell, half a robin's egg or blackbird's shells, and we would collect them in match boxes. If you saw a butterfly, you knew it was a cabbage white or a peacock butterfly because your mum told you. It was really part of the way I grew up. It wasn't a conscious thing, I didn't go out and look for wildlife, it was just all around me, like my extended family.

What aspects of nature are you most interested in?

The thing that really interests me is ecosystems and how they work. Everything is connected, you can't just fix one bit or be interested only in one bit of nature, because they are all connected. I was very lucky because in 2016 I made a television series for the BBC about Yellowstone national park. Yellowstone used to have a big population of wolves and over the years they were basically hunted to extinction.

Then about, I think it was 30 years ago, wolves were reintroduced to Yellowstone, it is huge, a massive, massive area. Yellowstone became the largest intact ecosystem in the world, what that means it has its full range of species, it has its apex predators like mountain lions and wolves, right the way down to all the tiny little insects and amphibians that make that ecosystem work. It was a real privilege for me to be in a landscape where nature was in charge, where nature didn't need human beings. Essentially, what I was witnessing was how nature works when all the right parts are in place, when an ecosystem is able to function the way nature designed it to. So that is the thing that really interests me – how trees, and plants and animals, insects and birds, how all those things join together to make the jigsaw that is the perfect ecosystem.

Who was your mentor or role model when you were growing up?

The same person who has been the mentor and role model for lots and lots of people, David Attenborough. I remember watching one of his very early TV series, Life on Earth, when I was about ten and it was the most extraordinary programme to watch, I was just captivated by it and have been just as captivated by every series he has ever done since. I think what he does so well is, he never dumbs anything down, he gives the facts absolutely as they are, and he has a way of broadcasting that is very inclusive, it allows everybody – whether they are an expert or a non-expert, or whether they even like wildlife at all and have just turned on the TV – to get pulled in, because he is able to tell stories about animals, or a part of the world or a habitat, in a way that connects with everybody, whatever age they are or whatever their level of expertise. And that is really, really clever and he's been doing it for fifty or sixty years. I just think, to have the power to inspire people and to galvanise them to behave differently, to change the way they behave so it is better for the natural world, and to do it on the scale he has done, to appeal to a broad range of people from not just the UK but all over the world, is something that I have huge, huge admiration for.

Of the programmes you have presented, which is your favourite?

Tough question because I have been really lucky and have presented some really amazing programmes. I think the one I will never forget was the first programme I did for the Natural History Unit, it was a programme called The Abyss. It was made after the first series of Blue Planet came out (2001). The Abyss was a live programme from the very deep sea, it was filmed just off the coast of Monterey on the west coast of America. About half a mile of the coast there is a very deep trench in the ocean floor that goes down about 2000 metres. We had this opportunity to drop this ROV (Remotely Operated Vehicle), like a tiny submarine with cameras on it that is attached to a boat. We could send it right down to the bottom of the sea and see the pictures it was sending back up. But for an ROV to drop that deep takes quite a long time, about two and a half hours, so we had to make some other films to show while the ROV was doing this journey down to the bottom of the trench. I was asked – bear in mind this was my first job for the Natural History Unit – someone phoned me up and said “can you go to the Cayman Islands and film on coral reefs and why they work and what they do and why they have the biodiversity they have? And then we would like you to go in a submarine 300m below the sea and try and catch on film a very rarely seen shark called the six gill shark”, and so that was my first job for the Natural History Unit. It took a very long time to find that shark and to persuade it that it actually wanted to be on the BBC. And it was the most incredible and incredibly exciting experience to see that animal and to know that only about ten people in the world had ever seen one in its natural habitat. That is a programme I will never ever forget doing.

What's the best part of your job?

I think the best part of my job, funnily enough, is some of the people I get to meet. Over the years I have met some really amazing scientists, conservationists and local people who have been incredibly generous with their knowledge and time, they have been incredibly friendly and hospitable. Wherever you go, in a funny sort of way it's the people that make the experience. You can go to see something like the sixgill shark, even though that encounter with the shark was incredible, it was made all the more incredible because of the people I was working with to try and find it. It was the local people who knew where to look to find the shark. The best part of my job is the chance to meet a whole range of different people, and when you are a television presenter your job is to ask lots of questions, to be curious, and I love being curious and I love being nosy!

What's the worst part of your job?

The worst part... sometimes you're away from home a lot. I have missed friends' weddings, birthdays, when people's babies have been born. Sometimes you have to spend a lot of time travelling and a lot of time in airports and that's no fun when you have lots of equipment. Lots of people think it's really glamorous, but the actual getting to places can be really boring and really hard work. And the animals don't always cooperate, you turn up having done all this work, all this research, you've got the best cameraman and the best crew, you're there to film something in particular, and the wretched animal doesn't do what you expect it to or it doesn't turn up at all! You have to be very patient because sometimes – a lot of the time – nature reminds you that you're not in charge, nature is, and you're going to wait until that animal feels like doing what you have come to film. You have to be very patient, sometimes things go wrong, sometimes you don't get what you're after.

One time I was filming in Namibia in south-west Africa and I was filming with a man who was an expert on vultures. Vultures are extraordinarily interesting birds! It was nesting season and he was going up and monitoring a whole range of African white-backed vulture nests in Namibia. One of the things he had to do was take the chicks out of the nest, weigh them and put a ring on them, and vultures often nest really high up in messy nests made of sticks, and so he would have to put a ladder up against a tree, often an acacia tree, which are really spikey, which is hard for a start. He would climb up the ladder to the nest and I would climb halfway up the ladder, so he would pass the chick down to me and to carry it down to the ground where he had his work station set up so he could weigh the chick, ring it and take wing measurements and that kind of thing. And a vulture chick, in common with a lot of birds of prey, tends to be almost bigger than the parents as they are being fed and fed and fed, so they are enormous. And they are being fed carrion so you can imagine, when a vulture has a poo, it is quite smelly and quite big, there's quite a lot of it! One of my most memorable experiences, which I have to say was not that fun, although it does feel like a badge of honour, was standing halfway up a ladder, leant against an acacia tree in a very hot, very dusty part of Namibia, and being pooped on by a very cross vulture chick! And there was a lot of it!

What do you miss most when you are on your travels?

My husband's not going to like this but I miss my dogs, that's what I miss the most. I live on a smallholding so I have pigs and sheep and chickens and ducks, plus my dogs. First thing in the morning my job is to let the ducks and the hens out and collect the eggs and feed my pigs and make sure they're okay and clean out their sties, check the sheep and walk the dogs. I love that little routine in the morning, I love it.

First thing in the morning, it gives me is the chance to connect with the day – what's nature doing? What birds are singing? What plants are coming out, what are the trees doing? Are their leaves coming out or are the leaves changing colour? I love that little daily connection with my patch.

Of all the animals you've met in your life, which is your favourite?

Very difficult question! Every animal is fascinating, but I think there is something about underwater animals when they choose to come up and inspect you, that feels particularly special. Even more so, you are in their environment, you are their guest. If you're able to go diving, to go underwater for an hour, it's like you have special permission, a backstage pass, to meet all the things that live underwater. One of the things I love is seeing turtles underwater, often they are very curious and if you're very quiet and very still, they'll swim up and sometimes you can almost be nose to nose with a turtle, and they have these very wise, kind eyes and I just think there is something about them choosing to come and see you, there is something very wonderful about an animal in their own element, not my element. They have no idea what I am, but they choose to come up and spend time with me, that's why turtles are one of my favourite animals.



What advice would you give to a young naturalist?

To just really enjoy the world that is immediately around you. I have met lots of people who love nature and love wildlife but one of the things they really want to do is travel. They want to go and see exotic animals that don't live on their doorstep, and I totally understand that, I have been really lucky and I have seen amazing animals in all different parts of the world. But I think it is very easy to forget that we have amazing wildlife right on our doorstep. Some of the finest naturalists I know, people like Chris Packham for example, they got their love of nature and the natural world, their extraordinary knowledge and enthusiasm, from looking at the wildlife that was right under their noses. Don't always look for the exotic, there are things that are magical and extraordinary right on our doorstep.

BOOK REVIEW



THE ESSENTIAL GUIDE TO BEACHCOMBING AND THE STRANDLINE
Steve Trehwella and Julie Hatcher

Wild Nature Press
www.wildnaturepress.com

Review by Rose Fulton

This is a comprehensive book about anything you could possibly find beachcombing or wandering along the strandline. It includes both finds from the natural world as well as artificial finds, such as glass and nurdles. What makes this book interesting is the breadth of information covered, it includes everything from seaweed identification, what the foam you see on the beach is and the insect life in coastal areas to why we have multiple strandlines. The book includes recommended beachcombing necessities and activities for the family.

The book is clearly presented and easy to navigate. The photographs make it easy to identify your beachcombing finds. The Green Fuse team were able to identify this Manx Shearwater skull quickly and efficiently using the book.

The book is written in an engaging style that is informative yet accessible.

The Green Fuse team recommend this book for anybody who has ever said 'what on earth is this?' whilst enjoying a walk along the strandline.



Manx Shearwater skull found on Lundy by George Fulton and Sam Bosanquet.

OWL PELLETS

Megan George

What is an owl pellet?

Simply put, a pellet is regurgitated food that a bird is unable to digest. Many birds of prey form pellets including owls, kestrels and red kites, these pellets will often contain bones, fur, feathers and teeth. Some other birds also expel pellets, including song birds, herons and kingfishers. Given that part of these birds' diets consists of invertebrates and fish, their pellets would usually contain bones and insect exoskeletons.

How to recognise a pellet?

Each pellet will look different depending on the species and diet of the bird. In the case of a tawny owl, they are 20-50mm in length, usually greyish in colour, they can be softer than other owl pellets and may appear furry.

Where can you find them?

The best places to find tawny owl pellets are next to perches in fields and woodland where they hunt, for example gate posts, fence posts or tree branches. You could also find them near nest sites (be careful not to disturb active nests). Pellets can be bought online if you are unable to find any.



Young Tawny Owl
Photograph By Megan George



Dissecting an owl pellet

To get a close-up look at what exactly your neighbourhood owls are eating, you can take the pellet apart and carefully reveal the bones for inspection.

Some tools that you might find useful would be tweezers, toothpicks and a tray or piece of plain coloured paper.

Gently use your toothpicks to prise the pellet open and you should start to see the little white bones and fur. Some of the bones will be very tiny and that's where a pair of tweezers comes in handy. As the bones are revealed, set them aside on a sheet of clean paper until you have found all you can.

If you want to clean the pellet before handling you can bake them on a low heat in the oven, being careful not to burn them.



Frame It!

If you collect all the rodent bones you find in the pellets you can start to arrange them back into a skeleton. Glue them onto a piece of card, label the bones and frame it. A great addition to your natural history collection!



TRACK CASTS

Megan George

Have you ever found an animal or bird track when out in the countryside?

If not, you could have a look next time you are out walking, you may be amazed at what wildlife is living close to you.

If you are lucky enough to find a really great track, you could try making a cast and then you will have your own perfect copy of that track to take home with you.



You can use a track identification chart to help you identify what you find.

Step two

Take the paper or plastic ring and press firmly into the ground around the track, being careful not to damage the track. This will stop the plaster leaking out.



Step three

Mix the plaster with the water in your container. You will need roughly two parts plaster to one part water, but make it a little thinner if the tracks are fragile.

What you will need:

- plaster of Paris powder
- water
- spoon
- container for mixing
- plastic or paper ring

Step one

The first step would be to go out and find an animal track. Some ideas of where to find these tracks would be in soft ground by rivers or streams, or near well used wildlife habitats.



I like to make these rings by cutting up an old plastic bottle which can then be reused for another print or recycled in the usual way.

Step four

Gently pour your plaster mix into the plastic ring, making sure the whole print is covered, then let it dry for 15 to 30 minutes. It may take longer if the ground around the track is very wet.

Step five

Once the cast is set hard, it's ready to remove. Gently dig around the base and lift, don't try and pull it straight out of the mud, you may damage the cast.



Step six

Remove the plastic ring and clean the cast by rinsing it in cool water (an old toothbrush is very handy for cleaning mud stuck in tricky corners).

Your cast is now ready! Just leave it to dry completely before displaying in your collection.



Get creative! If you have trouble finding tracks or want to try some exotic or even prehistoric animals, you can research the tracks and create your own imprints in some sand or mud and then make a cast...



An interview with

Marc Dando

By Rose Fulton

How did you get into being a scientific illustrator?

No plan, just a slow drift. I always loved drawing animals and then crazy machines with cutaways to show all the mechanics. I always drew constantly. Through school I was attracted to the sciences, especially biology, and of course art. So my choices of 'O' and 'A' levels reflected this. I did a degree in Zoology but then after that I did not know what to do, so I took various jobs, worked abroad and finally went back to illustrating and graphic design. I was, through a very tortuous route, introduced to a natural history publisher, Christopher Helm, and that was it, I was brought in to illustrate Sealife and have not looked back since.

Of the books you have illustrated, which is your favourite?

I can't say I have one single book, like most people I have favourite things for different reasons. My first real book I illustrated, Sealife: the Complete Guide to the Marine Environment, is a big favourite as it was my first and also challenging with gouache and watercolour paintings as well as pen and ink illustrations. I also wrote a chapter, it sort of escalated into a big project. Another favourite is a set of children's books when I first used pencil drawings and digital work, probably the Exotic Birds one was my favourite out of them. Marine World was another challenge, illustrating everything in the sea, again from the smallest organisms to the largest, and finally the book I am finishing now, which is a guide to sharks, rays and chimaeras of Europe and the Mediterranean. But which one of them is my most favourite – I don't know!

Do you have a favourite animal or group of animals that you like to illustrate?

I am known for illustrating sharks, but I like to do all groups – extinct species, as you get to try to recreate how they might have been when alive; bony fishes with their intricate scaling, fin rays and colouration; insects, again because of their fine detailing; and skeletons of any animal, including the planktonic "shells" of tiny micro-organisms.

How does scientific illustration differ from other kinds of illustration?

It is the same way of working with briefs, layouts, sketches, approvals and finally the finished illustration, but as you are trying to explain a process or an object with a scientific eye, there are more restrictions on what you can do. It does not mean you have to show how it is exactly (although that is my style of work), you can have Picasso-esque figures explaining scientific principles. As long as the subject or idea you are explaining in the image is correct and is easily understood, you can use any style or design to do that.

What do you think is the role of scientific illustration in developing our understanding of the natural world?

Immense, there are some amazing graphics that, within that image, explore or explain scientific thought in a way that words alone cannot, and more so than photos and text. A single graphic can explain so much in a way that is comprehensible to everyone to some degree. Scientific illustration has that power to draw the reader or viewer in, so much can be explained, and when it comes to younger people, illustration is the stalwart to explain science and the natural world.

How do you make sure your illustrations are accurate?

Much research and liaising with experts, and often long discussions, alterations and even updates. I spend evenings looking at source materials, passing them to authors or experts and then hopefully arriving at that ideal illustration – well, sketch first, then final sketch, rough colour and final work-up. At least half of the time that an illustration takes is the preliminary work, but nobody is infallible and I update illustrations as and when new, more accurate information comes in, so should someone want to reuse that piece of work, then it is as accurate as possible.



Do you work from photographs?

Most of the time. I tend not to have the time or opportunity to do much illustrating 'from life'. Marine animals are very tricky to sketch from life, other than when they are taken out of their environment, and that also slightly applies to 'fish tanks', as most are not natural. But the main reason is the time and money involved – most clients cannot stretch budgets like that. It must have been exciting (and dangerous!) to go off on an expedition to record what you saw – but we have the camera now, so what illustrators do then is to interpret, to distil, to explain what is seen in those photographs, even to make speculative composite drawings from photos that might be blurry, dark or imperfect in some other way.

Is it okay to copy a photograph directly when you are doing scientific illustration?

Not really, unless it is the only photo of that species with no other reference, but even then you, as the scientific illustrator, the knowledge that you and the author or experts have enhances that photo to clarify features, clarify the image, to help understand the species so that identification or understanding is made easier.

What can scientific illustration show that a photograph can't?

An illustration has no bounds, it can be 3D, even 4D, showing time as well in a 2D format. You can zoom in, look around, explore with the illustrator and author. For identification, illustrations can accentuate features that are key to tell species apart, you can have the same species in all its colour forms with the same lighting on each in one view – photos will have, more often than not, varying lighting, poses and definition, making it less clear than an illustration. Comparing species is also made easier using illustrations.

What medium do you use in your illustrations?

I began with pen and ink and watercolour, then went on to gouache for colour work. Now I finish work in pencil and then many get worked up on computer. I have worked in acrylic but prefer oil colour and hope to get back to that soon. My work is small – not tiny – so a big canvas for oil painting would be good for me to try again. I will explore any medium and am now embarking on creating 3D sharks on computer, but I love using all mediums and when I combine them all, that's when it gets fun!

What advice would you give a young naturalist interested in scientific illustration?

Keep drawing, keep exploring, have a quizzical mind. Develop a couple of styles, or more, by trying different techniques. Look at the work of other illustrators. See if you can use your skills to help locally – it'll get your work out there. Nowadays, you can post your work everywhere, a good thing in one way but it does mean there is more out there to compete against, but at least your work will be seen. You could join a local art group, I had two really good art teachers at school who helped me explore different mediums, styles and were good fun to be with as well. Art schools and colleges are a place to aim for if you can, but they are not absolutely necessary as it really helps to have a good scientific knowledge. Many illustrators I know have their illustration work running alongside their main job, but all have a great understanding of science and nature, whether they are a very keen amateur naturalist or work in the science field. But the biggest advice – don't ever get disheartened with your work and enjoy what you do as much as possible.

Thank you.

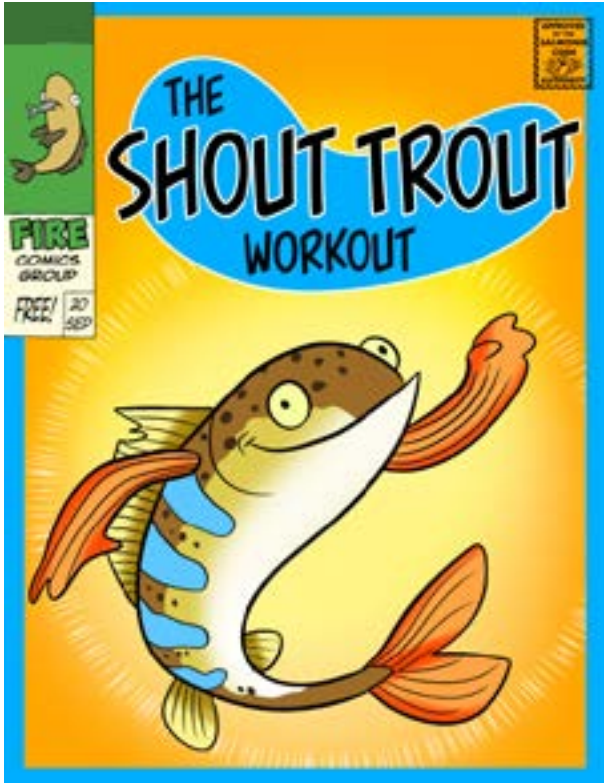


The Shout Trout Workout

The Freshwater Interdisciplinary Research and Engagement Lab

At Swansea University's Freshwater Interdisciplinary Research and Engagement (FIRE) Lab (www.firelaboratory.uk), we are passionate about making a difference for our rivers and aquatic ecosystems through research, community, and communication.

One of our latest projects is the Shout Trout Workout, a comic and video created through a collaboration with Wes Tank and the creative team at Tank Think, and artist Ethan Kocak. The Shout Trout Workout is the story of a Brown Trout. These amazing colour-changing fish hatch in streams and migrate to the sea to feed and grow into adults. Once big and strong, they return to streams to lay their eggs. Migratory fishes like trout support livelihoods for millions of people worldwide and are essential to the functioning of ecosystems. Yet many of our migratory fishes are also under threat because of different human activities. A recent study (<https://worldfishmigrationfoundation.com/living-planet-index-2020>) showed that migratory fishes have declined globally by 76% during the past 50 years. There are many pressures, including roads and dams that prevent these fishes from reaching their preferred spawning areas in rivers and seas. Check out the Shout Trout Workout video and comic on firelabkids.uk. Then try our quiz to find out more about these amazing creatures and share your ideas with us about how you think you can help!



The Shout Trout Quiz



1. What is migration?

2. Name a bird, mammal, insect, and fish that migrates.
a) bird _____
b) mammal _____
c) insect _____
d) fish _____
3. Brown trout are migratory fish, with the Latin name 'Salmo trutta'. Put these biological classifications for brown trout in order, from kingdom all the way down to species.

Phylum:	Chordata (chordates)
Genus:	Salmo
Kingdom:	Animalia (animals)
Family:	Salmonidae (salmonids)
Order:	Salmoniformes
Species:	Salmo trutta (brown trout)
Class:	Actinopterygii (ray-finned fishes)
4. Why do fish migrate? (circle all that apply)
a) to feed
b) to avoid predators
c) to reproduce
d) to find the appropriate habitat for different life stages
5. What does Anadromous mean?
a) a type of fish that migrates from rivers to the sea to spawn
b) a type of fish that migrates from the sea into freshwater to spawn
c) a type of fish named by a girl called Ana Dromous in the 1960s
6. This trout's lifecycle is all jumbled up! Put the life cycle back in order, starting with eggs. You can use the Shout Trout comic for clues. Label the life cycle to show which stages happen in the river, and which ones happen in the sea.





7. Which of the following can prevent fish migrating up and down rivers?

- a) headwaters (the source of a stream or river)
- b) dams (barriers that impound water in a reservoir)
- c) weirs (smaller barriers that allow water to flow steadily over the top)
- d) culverts (tunnels carrying water under roads or railways)
- e) saltmarshes (inter-tidal grasslands, often found in estuaries)
- f) oxbow lakes (river meanders that have been cut off, creating a free-standing lake)



8. What do you think could be done to help fish migrate up and down rivers?

Quiz by Merryn Thomas and the FIRE Lab team at Swansea University. Illustrations by Ethan Kocak. FIRE Lab is funded by an award to Stephanie Januchowski-Hartley by the Welsh European Funding Office and European Regional Development Fund, Project 80761-SU-140 (West).



A Mini Book Review:

Naturalists who like wild fantasies and crazy adventures would enjoy Beetle Boy. Darkus Cuttle has become a detective by default and gets into all sorts of tricky and terrifying situations trying to discover the truth. Through this elaborate and dramatic story of intrigue we get a well researched introduction to coleoptera (beetles), however, these may not be the kind of beetles we're likely to spot in our gardens!!

Coleoptera Competition:

Stag beetles are a threatened species in the UK. For our competition, we would like you to draw a scientific illustration of a stag beetle. Please scan and email your entries to thegreenfusemagazine@gmail.com. We will include the winning entries in the Spring 2021 issue of The Green Fuse. To find out more about stag beetles in the UK and how you can support the stag beetle population, please visit:

<https://ptes.org/campaigns/stag-beetles-2/stag-beetle-facts/>

BOOK REVIEW



SEAWEEDS OF BRITAIN AND IRELAND (Second edition)
Francis StP D Bunker, Juliet A Brodie, Christine A Maggs and Anne R Bunker

Wild Nature Press
www.wildnaturepress.com

Review by Rose Fulton

I always loved exploring seaweed on the beach, however, I never totally understood its importance or its diversity. This book has helped me to understand the role of seaweed as a habitat for marine life and has also shed light on its importance in other aspects, for example in dampening the water motion in waves. I also learnt about the commercial value of seaweed and its many uses.

This book helps a novice seaweed enthusiast to learn about the three main groups of seaweed and to begin to learn to differentiate between different types of seaweed. For the more experienced seaweed spotter, this book would be invaluable in aiding identification of various species. The guide is so simply laid out and beautifully illustrated with both line drawings and photographs.



Illustration by George Fulton, pictured above on Dale beach in Pembrokeshire

WILLOW BIRD HIDE

By Megan George

What better and more natural way to watch and photograph birds than to grow your very own bird hide? Willow is a hugely diverse plant and has been used for generations for weaving a huge variety of baskets, making lobster pots, to build coracles, to coppice as quick growing fuel, and even to weave coffins!



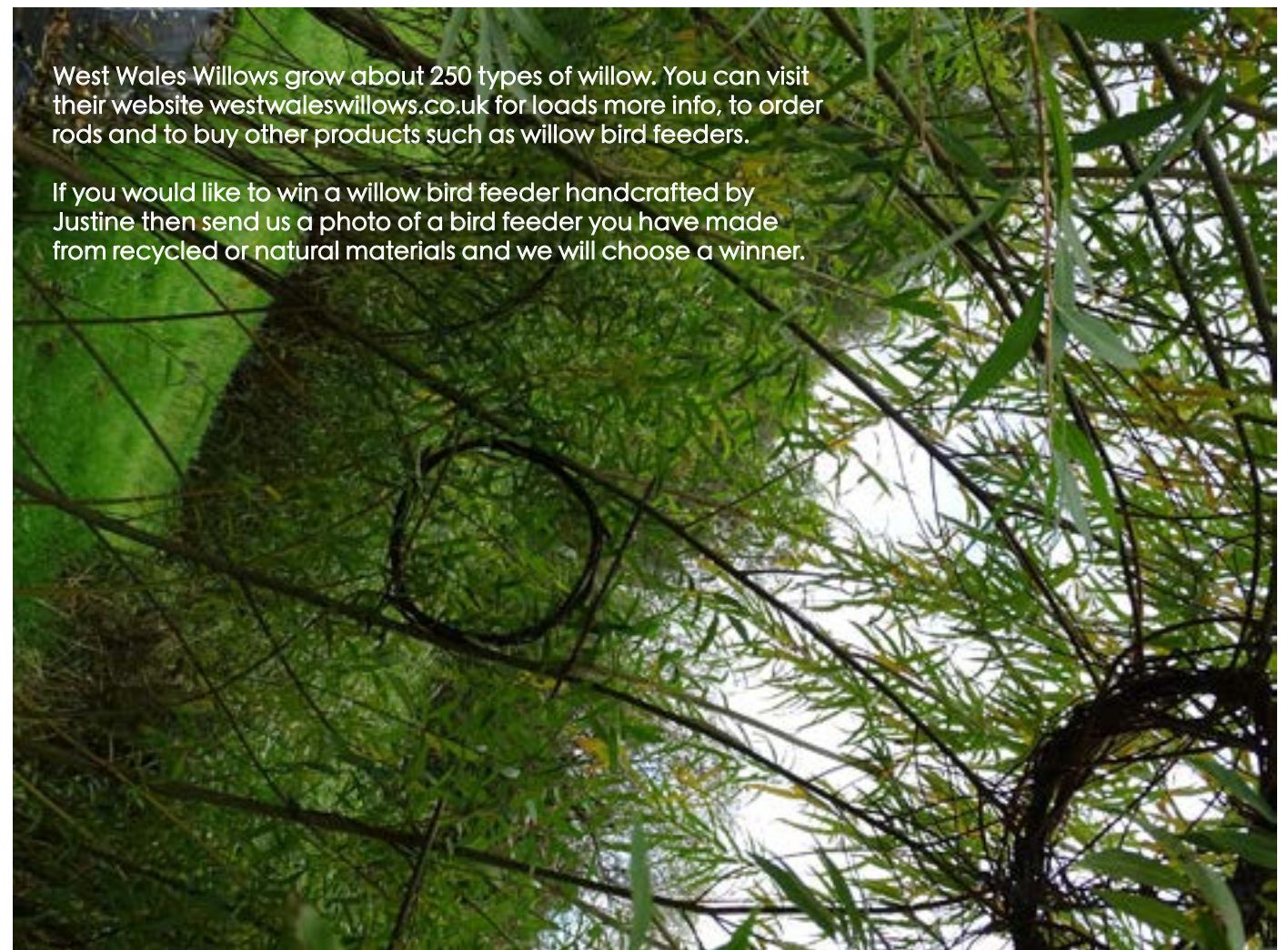
I met up with Justine Burgess at West Wales Willow, to walk her willow fields and talk about why willow would be a perfect material for a bird hide. I came away with these main points of why I think willow is the best way to go.

- It's natural!
- It provides great camouflage when all the leaves grow thick
- You can weave your hide into any shape, size or design that suits you and your growing space
- You can use the branches to hang bird feeders from
- It absorbs and stores carbon
- A great winter project as that's the best time of year to plant willow cuttings or rods
- Provides early nectar for bees
- An attractive garden feature where you can sit and relax in the shade
- It provides a home for invertebrates which, in turn, feed many birds
- Trimmed branches can be used for weaving, compositing or material for bug hotels

The best time of year to plant willow rods (which are short pieces of cut willow stem) is in winter when the plant is dormant. The energy of the plant is not focused on growing leaves but drawn back into the stem and root, ready to kick back into action in early spring.



It is simple enough to grow your own willow hide, first clear the ground the size and shape you want your hide to be. Next, cover the area with a weed suppressing material to allow the willow rods to establish without competing with other plants. Insert the rods into the ground on your chosen outline. They will start to take root and new leaves will start to appear as the weather warms up. As the rods grow (which they do quickly), you can tie them and shape them to create your perfect hide, adding 'windows' as you go.



West Wales Willows grow about 250 types of willow. You can visit their website westwaleswillows.co.uk for loads more info, to order rods and to buy other products such as willow bird feeders.

If you would like to win a willow bird feeder handcrafted by Justine then send us a photo of a bird feeder you have made from recycled or natural materials and we will choose a winner.

The Readers' Pages

The Peregrine Falcon

By Nina (10 yrs)

When a peregrine dives, it folds its wings back, making itself bullet shaped. We call this shape a 'stoop'. It can dive at over two hundred miles per hour. The peregrine falcon hunts pigeons, starlings and other small birds. They can see their prey a mile away. When they dive, they do not get dry eyes like we would at that speed. They also have specially shaped nostrils to allow them to breathe.



Leon (11 yrs)

Gallery



This beautiful blue tit was painted by Maya (13 yrs) and she is the winner of the first ever Green Fuse Art Competition. Your prize is on its way!



Photographs by Erin Ibbotson



Illustration by George Fulton

Across:

- 2. CRWO
- 3. KAU
- 4. PEYROS
- 5. ESANTHP
- 6. HRSHUT
- 8. RBSDTAU
- 12. ERTEG
- 14. MUE

Down:

- 1. KTSOR
- 2. COUKOC
- 5. PROTRA
- 7. RBZUZAD
- 9. LLGU
- 10. AGEEL
- 11. YAJ
- 13. OIOELR



Puzzle by George Fulton



Photograph by Megan George



The Shout Trout Quiz The Answers....

1. Migration is regular, predictable, long range movement.
2. Lots of animals migrate! European swallows fly south for winter in Sub-Saharan Africa; hundreds of thousands of wildebeest migrate across the Serengeti-Mara ecosystem in Africa every year; Monarch butterflies migrate some 3000 miles south to California and Mexico in autumn; European Eels migrate across the Atlantic to spawn in the Sargasso Sea near Bermuda.
3. Kingdom: Animalia (animals) - Phylum: Chordata (chordates) - Class: Actinopterygii (ray-finned fishes) - Order: Salmoniformes - Family: Salmonidae (salmonids) - Genus: Salmo - Species: Salmo trutta (brown trout).
4. Fish migrate for any of these reasons!
5. b) Anadromous fish migrate from the sea into fresh water to spawn. Some brown trout are anadromous (like the trout in our story), while some remain in rivers and lakes for their whole life cycle.
6. Eggs, alevin, fry, parr, smolt (rivers); marine adult (sea); spawners (rivers).
7. Some of the main barriers to fish migration are dams, culverts and weirs; 100s of millions of these have been built all over the world for reasons such as water storage, leisure, flood management and transportation networks. The other three are not barriers! Rather than providing an obstacle for migratory fishes, many fish migrate to the headwaters of streams to spawn (lay their eggs). Saltmarshes and oxbow lakes can provide important habitats and nurseries for some species of fishes.
8. Why don't you email us at team@firelabkids.uk with your ideas?! We'd love to hear them! Groups such as Rivers Trusts are removing barriers and installing fish passes so that fish can migrate more freely up and down rivers. This can be difficult, because barriers are sometimes valued for aesthetic, leisure or heritage reasons, or for providing flood defence or structural support for buildings. For more information see the Severn Rivers Trust, for example (<https://www.severnriverstrust.com/about>).

The feather crossword answers



Illustration by Rose Fulton