

# inpractice

Issue 109 | September 2020

## Climate Action and Green Recovery

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– New Approaches  
for Fresh Momentum

Recovering Nature:  
Learning from the North  
Devon Landscape Pioneer

Nature-Based Solutions  
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## Welcome

# The Green Recovery

Writing this a year ago, under the banner of the 'green recovery', would have been wholly different. We would have espoused efforts needed for whole-scale ecosystem restoration, a 'greening' of government policies in support of tackling both the biodiversity crisis (so brilliantly articulated in the IPBES report) and the Climate Emergency, as well as elevating the vital importance of nature in how we live and work. All of this still applies. The UN declaration of 2021–2030 as our 'Decade on Ecosystem Restoration' is key to galvanising global, national and regional efforts to restore degraded ecosystems, combat climate heating, sustainably provide food and clean water, and of course restore biodiversity.

*But*, late last year, with the emergence of one of our newest recruits to biodiversity, COVID-19, we have transformed our approach to the Green Recovery (now Capital letters are used!). The awful impacts on our lives are played out incessantly. Every one of you reading this will have been touched by some of these. CIEEM has risen to this brilliantly, with the advice given on its website widely praised for clarity, sensitivity and country-specific, nuanced guidance. This issue of *In Practice* demonstrates we are up to helping devise and deliver the Green Recovery.

Transformation is now inevitable – we simply have to transition to a nature-rich and net zero economy. UNEP states: "*An inclusive green economy is one that improves human well-being and builds social equity while reducing environmental risks and scarcities.*" This addresses the twin challenges of climate change and biodiversity loss as central components of a more resilient and inclusive economy. The Green Recovery will truly resonate politically and environmentally if it does three things. First, it must be the cornerstone of the recovery of societal resilience – economically, socially and environmentally. Second, it has to reach into everyday lives – through underpinning new jobs, improving education, health and well-being, and reducing inequalities. Third, it has to be real in terms of public understanding and engagement, so that the benefits are seen and felt.

The COVID-19 pandemic, and others, are much more likely because of changes to nature that are also bringing about climate change and the loss of biodiversity. We are reaching a tipping point in our relationship with nature. Ecosystem destruction is coinciding with a sharp increase in the prevalence of pests, diseases and viruses (the 'acute emergencies') which are manifestations of the 'chronic emergencies' of climate heating and the parlous state of nature.

The Green Recovery will rest on investing in nature recovery and sustainable use of nature on land and at sea. The immediate work will devise 'Nature-based solutions' to tackling climate change *and* ecosystem degradation – peatland, wetland and woodland restoration; natural flood risk management; enhancing coastal resilience; investing in blue carbon and soils restoration programmes; and growing the urban green infrastructure. These interventions must be *in addition to*, not instead of, reducing our use of fossil fuels.

All of this needs to be done at large-scale and deploying a green-tooled workforce. To support this we need 'green finance' from private and community investment; a transformation in land use across rural areas and in sustainable marine management; a green-revived urban environment that especially embraces social and health equality; and investment in youth employment founded on developing green skills. The pandemic has exposed our reliance on tourism and global supply chains. Hence, we have to help create resilient local communities, which benefit from nature and its capital. And we need to walk and cycle more!

CIEEM will be at the forefront of all this – leading the Green Recovery through its membership and many influences.

**Des Thompson FCIEEM FRSE, Sally Thomas MRTPI and Clive Mitchell FRGS  
NatureScot**

## Information

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Front cover: Annual average temperatures for Earth from 1850-2019 #ShowYourStripes <https://showyourstripes.info/>  
(Data Source: UK Met Office)

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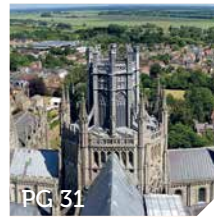
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*Sarah Taylor, Simon Duffield and Mike Morecroft*



### From Anxiety to Action

*Sarah Simons*



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## Charitable Status

On 12 June 2020, CIEEM became a registered charity – as well as a chartered professional body. You, our members, voted for an application for registration to be made at the 2018 annual general meeting (AGM). Attaining charitable status recognises the public benefit of the work of the Institute and its members in support of our Objects:

- a. To advance the understanding and the standards of practice of ecology and environmental management for the benefit of the natural environment and the public good; and
- b. To further the conservation, management and enhancement of biodiversity and the maintenance of ecological processes and life support systems essential to a fully functional biosphere.

The elected members of the Governing Board are now also Trustees. In practice this changes little at a governance level. The Board is still accountable to members, and members are able to make key decisions by voting at the AGM. In addition to oversight from the Privy Council, CIEEM will now also be under the scrutiny of the Charity Commission. There are some minor adjustments to accounting requirements and some small financial benefits.

The main purpose of charitable status is to allow CIEEM and our members to expand the public benefit aspect of our work, often in partnership, by applying for grant funding. The Board will be developing ideas for future projects but are also keen to hear your ideas. Possible areas for new charitable activity include: increasing access to the profession from under-represented sectors; careers promotion and support; re-connecting people and nature; promoting nature-based solutions to tackle climate change and biodiversity loss; and ecological research. The Board may consider setting up restricted purpose funds to cover activities such as these. That way, any money donated by members with a specific purpose in mind can be 'ring-fenced' for that purpose (and perhaps used as match funding).

We would love to hear your ideas. How would you like to see CIEEM's charitable activities develop? What do you think should be the priorities? Please do let us know via [enquiries@cieem.net](mailto:enquiries@cieem.net). We would love to hear from you.

## Recent CIEEM Blog and News Posts

Recent blog posts on the CIEEM website (<https://cieem.net/news/>) include:

- World Environment Day 2020: Biodiversity – By Jason Reeves CEnv MCIEEM
- Graduate Ecologists and Their Exploitation in Ecological Consultancy – By Marcus Kohler MCIEEM
- Supporting LGBTQ+ Professionals – By Steven Roe CEcol MCIEEM
- Breaking the Mould for Carbon Offsetting – By John Box CEcol CEnv FCIEEM
- Coral Reefs in a Changing Climate – By Katie Medcalf CEnv MCIEEM
- Building Back Better: A Nature-Led Green Recovery – by Jason Reeves CEnv MCIEEM
- Diverse Species and Ecosystems across the UK's Overseas Territories – by UKOT-SIG
- Flexible Working – By Sarah Simons CEnv
- We Need to Talk About Diversity – By Diana Clark MCIEEM

## CIEEM Conferences

22-23 September 2020	CIEEM Welsh Conference 2020 – Sustainable Management of Freshwater Resources: Bringing Our Rivers Back to Life	Online
27 October 2020	CIEEM Scottish Conference 2020 – Land Use in Scotland: Changes, Challenges and Solutions	Online
1-2 December 2020	CIEEM Autumn Conference 2020 – Time to Change: Putting the Environment at the Heart of Social and Economic Well-Being	Bristol

Find out more: [www.cieem.net/events](http://www.cieem.net/events)

## In Practice Themes and Deadlines

Edition	Theme	Article submission deadline
December 2020	Nitrogen	n/a
March 2021	Ethics and Standards	20 November 2020
June 2021	Biosecurity and Invasive Species	26 February 2021
September 2021	30th Anniversary Edition: The Next 30 Years	21 May 2021
December 2021	Urban and Cultural Ecology	20 August 2021

If you would like to contribute to one of these issues, please contact the Editor at [GillKerby@cieem.net](mailto:GillKerby@cieem.net). Contributions are welcomed from both members and non-members. Further information and guidance for authors can also be found at: [www.cieem.net/in-practice/](http://www.cieem.net/in-practice/)

## In Practice Digital Editions

If you would like to reduce your and CIEEM's carbon footprint and receive only digital editions in the future, please let us know by contacting [enquiries@cieem.net](mailto:enquiries@cieem.net).

## Erratum

Fennelly, R. (2020). Contrasting Project Assessments Under Article 6(3) of the Habitats Directive in Ireland and the UK. *In Practice - Bulletin of the Chartered Institute of Ecology and Environmental Management*, **108**: 39-42.

This article stated incorrectly that 'The UK is expected to be technically free from Article 6(3) obligations on 1 January 2021, potentially rendering UK 6(3) practice, as we know it, obsolete...'. We have been advised that regulations have already been put in place by the UK administrations to ensure that the requirements for assessments under Article 6(3) of the Habitats Directive will continue to apply in the UK. As things stand, it is expected that there will be no changes to procedures relating to Article 6(3) once the UK withdraws from the European Union.

### Government announces “new deal” for economic recovery from COVID-19

Prime Minister Boris Johnson has announced a range of funding plans to rebuild the economy following the COVID-19 pandemic. This includes a £40 million Green Recovery Challenge Fund.

<https://www.gov.uk/government/news/build-build-build-prime-minister-announces-new-deal-for-britain>

### Committee on Climate Change (CCC) calls for more action from Government

The CCC recently published their 2020 report on the UK Government's progress in reducing emissions. The report states that the UK is not making adequate progress in preparing for climate change.

<https://www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf>

### Independent review recommends introduction of Highly Protected Marine Areas

An independent review, commissioned by then Environment Secretary Michael Gove, has concluded and called for the introduction of Highly Protected Marine Areas in England's seas.

<https://cieem.net/independent-review-recommends-introduction-of-highly-protected-marine-areas/>

### EU launches biodiversity strategy for 2030

The European Commission has set out its plans for restoring and protecting ecosystems over the next 10 years, including protecting 30% of EU land and seas by 2030 and overhauling agriculture, with a budget of at least €20 billion per year.

[https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/actions-being-taken-eu/eu-biodiversity-strategy-2030\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/actions-being-taken-eu/eu-biodiversity-strategy-2030_en)

### Government publishes progress report on 25 Year Environment Plan for England

The UK Government has published a progress report on the implementation of the 25 Year Environment Plan for England for the year 2019-20.

<https://www.gov.uk/government/publications/25-year-environment-plan-progress-reports>

### Environment Secretary says planning authorities must have access to ecologists to deliver net gain

During questions from the Environmental Audit Committee, Environment Secretary George Eustice noted that, in order to deliver 10% biodiversity net gain, “we will have to make sure that all planning authorities have access to expertise”.

<https://www.endsreport.com/article/1686961/eustice-planning-authorities-access-ecologists-deliver-net-gain>

### Welsh National Marine Plan: implementation guidance published

Welsh Government has published guidance on the practical application of the Welsh National Marine Plan. It provides further detail on WNMP policies to help ensure effective and consistent implementation.

<https://gov.wales/welsh-national-marine-plan-implementation-guidance>

### Scottish Government announces new EU Continuity Bill

The Scottish Government has announced a new Bill to align devolved Scots law with those in the European Union after the end of the Brexit transition period. The Bill makes provisions regarding replacement arrangements for EU environmental principles and governance, including establishing a new governance body, Environmental Standards Scotland.

<https://www.gov.scot/news/parliament-asked-to-back-european-union-continuity-bill/>

### Welsh Government announces new funds for nature

As part of World Environment Day celebrations, the Welsh Government announced two new funds: the National Forest Community Woodland Grant Fund, and the Local Places for Nature Capital Fund.

<https://gov.wales/world-environment-day-new-funds-nature-will-help-communities-plant-seeds-wales-we-want-see-post>

### SNH publishes updated renewables guidance

Scottish Natural Heritage has updated its onshore wind scoping and pre-app guidance. The new updates include advice on the scope of landscape and visual impact assessment.

<https://www.nature.scot/general-pre-application-and-scoping-advice-onshore-wind-farms>

### MSPs vote to make mountain hares protected species

Members of Scottish Parliament have voted to ban the unlicensed culling of mountain hares and make them a protected species under the new Animals and Wildlife Bill.

<https://www.bbc.co.uk/news/uk-scotland-53087039>

### Environment Minister plans ‘Green Growth’ approach for Northern Ireland

Environment Minister Edwin Poots has announced a roadmap for a ‘Green Growth’ recovery from COVID-19, saying “developing and defending our natural assets is key to creating a resilient economy and a healthy environment”.

<https://www.daera-ni.gov.uk/news/poots-plans-green-growth-approach-ni>

### New global extinction target proposed

Experts from the UK and Germany have put forward new proposals recommending that extinctions of plants and animals should be kept well below 20 per year.

<https://www.bbc.co.uk/news/science-environment-53008292>

# Building Back Better:

## A Nature-Led Green Recovery

**Jason Reeves** CEnv MCIEEM

Head of Policy and Communications, CIEEM

Keywords: biodiversity, climate, COVID-19, economy, green recovery, nature-based solutions

### Introduction

We've heard a lot about "build back better" and a "green recovery". We've seen NGOs, charities, businesses, politicians, the European Union and the public support a green recovery.

A green recovery is an opportunity for us to come out of the COVID-19 pandemic by building back the economy and supporting jobs and communities in a way that also addresses the climate emergency and biodiversity crisis. We have an opportunity to make a step change in the way that the economy works, for the benefit of people and the planet.

### What does a green recovery look like?

Most will see climate action and economic recovery as paramount. There is much that can be done to support: renewable energy generation, storage, and grid modernization; energy and heating efficiency and retrofitting; investing in training and reskilling to help people move to green jobs; supporting active transport (walking and cycling); improving public transport; rethinking agriculture and food production; implementing a circular economy; green infrastructure and green technologies; and social equality. All of this needs substantial investment.

On the flipside, we need to support polluting and high-energy industries to improve their own performance and not just return to business-as-usual. Governments need to remove counter-productive incentives and subsidies.

It is obvious that we need to link recovery to climate action, and more widely also the Sustainable Development Goals. But we must ensure that the main focus is not just carbon. We must use the economic recovery to help restore nature as well.

### Biodiversity in a green recovery

We all know the many benefits of healthy, functioning ecosystems and the urgent need for action. The climate and biodiversity crises are inextricably linked; we cannot address one without the other.

There needs to be investment in nature-based solutions and natural capital, including supporting climate- and wildlife-friendly agriculture and restoring carbon-rich habitats. One way to do this would be to directly invest in jobs (e.g. farm advisors, habitat restoration and creation, and local authority ecologists). Investing in jobs gets people back to work and stimulates the economy directly.

There needs to be an emphasis on natural capital accounting, and ensuring that nature's value is included in recovery packages. Business support should be accompanied by a mandatory requirement to report on natural capital impacts. CIEEM can help governments to develop these reporting mechanisms.

We need governments to be aware of unintended consequences and should undertake impact assessments on all COVID-19 recovery investments. This would ensure that governments can deliver on their ambitions to enhance and restore the natural environment, now and for future generations.

Governments also need to take account of the forthcoming post-2020 global biodiversity framework. The draft proposal includes ambitions for land and sea to be set aside for nature. This needs to be considered in conjunction with national infrastructure plans – and we advocate that governments develop 'natural' infrastructure plans as well.

### CIEEM's contribution

We are involved in the ongoing development of Biodiversity Net Gain, and now also Environmental Net Gain. The fifth

episode of our Sector Streams webinar series was on recovery, and we have published new briefings on nature-based solutions and rewilding. We have also responded to consultations and inquiries, and continue to engage with governments and their agencies.

At the time of writing we are conducting a second COVID-19 membership survey, partly to understand what our members want from a green recovery.

And our Autumn Conference this year will be on the theme of 'Time to Change: Putting the Environment at the Heart of Social and Economic Well-Being'.

### Next steps

Government promises of investment in nature are welcome, but are nowhere near what is needed to truly restore nature and address climate change.

In England, the Government has the opportunity at the Autumn Budget, the interim report of the Net Zero Review and at the Comprehensive Spending Review to show its true intentions for recovery. Governments across the UK and Ireland must step up. Going back to business-as-usual will only see the continued decline of biodiversity and further climate change.

We have an opportunity now to do things so much better. Governments must be brave and bold. And the ecology and environment sector must play its part too. We, collectively, have the expertise and experience to help deliver a green recovery and move to a green economy.

**Contact Jason at:**  
jasonreeves@cieem.net

A longer version of this article, with references, is published on the CIEEM blog: <https://cieem.net/building-back-better/>

# TIME TO CHANGE



PUTTING THE ENVIRONMENT AT THE HEART OF SOCIAL & ECONOMIC WELLBEING

Annual Conference 🌿 1-2 December, Bristol

- Do we prioritise 'economic recovery at all costs' by championing industrial growth, or do we take a greener path?
- How do we evidence the value of a green recovery?
- What role can our profession play in delivering it?
- Where are the new opportunities for our work to deliver positive change for the environment, society and the economy?

FOR MORE INFO VISIT

[bit.ly/CIEEMTimeToChange](https://bit.ly/CIEEMTimeToChange)



# Seize This Moment – New Approaches for Fresh Momentum

Diana Pound CEnv FCIEM  
Dialogue Matters

Keywords: co-production, hope, overcoming barriers, momentum, systems-thinking



Figure 1. Youth Strike and supporters taking a rest in the heart of Canterbury, 20th September 2019. Photo credit Diana Pound.

The climate emergency and nature crisis are part of the same thing – the overexploitation of the planet’s capacity to handle our waste or provide the resources that humans depend on. Tackling either without the other is flawed thinking. But tackling both together in a technical way is also flawed! There is so much more to be considered. This article focuses on the ongoing and interlinked climate emergency and biodiversity crisis, our role as individuals, breaking down barriers, and building momentum.

## Introduction

As we emerge from COVID-19 to a new world, we must ask ourselves what needs to come with us and what needs to be left behind? This is definitely not the time to restore environmental business as usual, dust off the office, and carry on. We must look for the best of what was going in the right direction and accelerate, amplify and

scale it up. We must take an honest look at our own outdated practices; including where we created barriers to the very change we want to see.

In this article, I want to explore some of those barriers and what we can do differently to solve them. But motivation comes from hope, so that is where this starts.

## Reasons to be hopeful

*The pandemic represents a rare but narrow window of opportunity to reflect, reimagine, and reset our world.*  
- Klaus Schwab (World Economic Forum)

This year was meant to be the 2020 Environment Super Year. Instead it has been a year of biblical disasters: catastrophic bush fires, mega floods, pandemics, and a 38°C Arctic heatwave. But hope motivates and when you look you can see extraordinary reasons to hope.

## The world has woken up

Last year, climate and nature activism grew from a few eager greenies to a global peaceful rebellion in a few weeks. A single teenager reframed climate change as a threat to children, galvanised over seven



million young people from across the world and called world leaders to account.

We are now in a societal tipping point. Tipping points happen when a little extra catalyses rapid nonlinear change. Recent evidence suggests a quarter of a group is enough to change social norms (Otto *et al.* 2020). So, what of attitudes to the environment? A recent Reuters survey showed that in most countries, 97% of people think climate change is serious, while 70% think it is a 'very serious problem'. In Chile, Kenya, South Africa and the Philippines, that figure is between 85-90% (Andi and Painter 2020).

Another survey of the US and UK found 88% of people firmly believe the lifestyle change needed to combat climate change will improve their quality of life or make no difference (Townsend 2020) - an astounding change from seeing green lifestyles as doing without. Extraordinarily the survey found four in five people would do as much for the climate as they have done for coronavirus. Since 'willingness' is a prerequisite to action, this is fantastic news. Brands and corporates will respond too and - honestly motivated or not - their messaging will strengthen the new norm.

### Unexpected allies call for change

Finance and banking minds are changing. At a recent international seminar on 'responsible capitalism', run by the think tank Radix (Radix Think Tank 2020), you could have mistaken leading financial figures for a bunch of environmentalists. Talk focused on ESG (Environment, Society and Governance) and the SDGs (Sustainable Development Goals). Speakers believe COVID-19 will accelerate the shift to green and from shareholder to stakeholder capitalism.

Top UK business leaders are also calling for a green recovery (Ambrose 2020) and 54 national and international companies published a letter in the Financial Times, globally stating their commitment to a more diverse and inclusive circular economy on a basis of renewable materials and energy (Ellen MacArthur Foundation 2020). Of course, it is easy for organisations to sign a pre-written letter and get it published somewhere impressive - and what we really need is accountable, time-bound commitments - but it still helps solidify the new norm: that green is

good and not some irritating side show.

UK arts leaders, even while in their own freefall, sent a letter to Boris saying: "*We urge that action to protect nature and biodiversity is given the attention it so urgently deserves*" and called for a "*rapid, just and green recovery*" (Harvey 2020).

Not to be outdone, 57 UK charities, representing 22 million people, also sent a letter urging the Prime Minister to a green recovery. Signatories include environmental NGOs and allies like the WI, Fairtrade, CAFOD, and the Islamic Relief Fund (The Climate Coalition 2020).

Religious leaders have already shown the way. In 2019, the Pope met leaders of the world's biggest multinationals and declared a global climate emergency, urging them to hear the "*increasing cries of the earth and its poor*". He is leading the church to divest from fossil fuels. The Pope is not alone: Islamic leaders called for Muslims to play an active role in climate change and the Hindu Declaration on Climate Change asks its followers to live in harmony and balance with the natural world.

### Political expediency and new economic paradigms

The growing international consensus is for a green recovery with the EU, US, China and India joining in formulating plans for a global green recovery (International Energy Agency 2020). For politicians, it is no longer a choice between helping people and helping the planet. And solving two major challenges with one set of actions is a very attractive political proposition.

The economic case is stacking up to support this. Leading economic experts found a green recovery will repair the global economy and create more jobs, a greater return on investment short term and increased long-term cost savings compared to conventional stimuli (Hepburn *et al.* 2020).

Markets are also speaking. With renewables, the speed of innovation, market share and cost is causing panic in the financial world. They see the potential for 100 trillion dollars of stranded fossil fuel assets. Pre-pandemic, the prediction was fossil fuel markets would collapse by 2028 - now it's sooner.

This is part of the cross-over to a whole new economic paradigm: "*the third industrial revolution*" (Rifkin 2019).

Crossing points happen when three key things converge:

- A change in communication technologies - from paper to the internet
- A change in energy - from fossil fuels to renewables and battery
- A change in mobility and logistics - the sharing economy, AI and Internet of Things

And this time it is not just convergence but integration in the digital revolution. The shift to the next industrial revolution was at the starting blocks. By accelerating the pace of change, COVID-19 has fired the gun.

Will there be resistance and blockages and steps back? Of course - powerful vested interests are under threat and mobilising. Will it all be in time - we have to make sure it is. What is certain is environmentalists are no longer out in the cold shouting at a deaf world: there are many new allies and opportunities to work with.

### Overcoming barriers to motivating ourselves - from loss to 'stubborn optimism'

*Our individual boundaries are porous - we infect each other with ills and joys - so let's infect each other with stubborn optimism and determined action.*

*A compelling vision is like a hook in the future. It connects you to pockets of possibility that are emerging and pulls them into the present. Hold on to that.*

- Christiana Figueres (UN Secretary for Climate Change 2010-2016)

We create the future we focus on, and narratives of despair bring about the future we dread. Humans are wired to scan for threat, danger and loss and environmentalists are particularly good at it. Research suggests environmentalists are in the minority; able to face terrifying truths, but as a result generally more depressed and less self-assured! (Andrews 2017).

Eco-grief is real and at least naming it means we can gently support each other when it overwhelms us. But we can't afford to dwell there. We can't be paralysed by grief and loss and let it erode our ability to act. With our expertise, if we

# Feature Article: Seize This Moment – New Approaches for Fresh Momentum (contd)

don't gather every jot of courage and show the way, who will?

Consider these statements (Figueres and Rivett-Carnac 2020). Which lifts your energy, gives hope, and motivates you?

*"The year is 2050. The world is on fire. The air is suffocating and deadly. Entire countries are under water."*

*"The year is 2050. The world is breathing. The air is fresh. Nature is thriving. Entire populations have better quality of life"*.

Let's set our sights on this regenerative future where humans and nature flourish. This is not about wishful or naïve thinking. Whatever the future holds, and whatever losses and setbacks, the world's need for this future is undiminished.

It helps to tap into your own deep motivations – the reasons why you do this work. When describing her green vision for the EU, President Ursula von der Leyen spoke of the next generation and said *"we have to do this, we are going to do this"*. So why do you think this future is worth fighting for? Work it out and then determinedly encourage yourself and others with stories and signs of hope, and hold close a vision of a better future.

### Suggestions for action:

- Accept your eco-grief but increase your resilience and hope: just 20 minutes in nature every day will do wonders
- Find your 'why': why is this future worth fighting for? Write it down and revisit it when times are tough
- Actively filter for signs of hope and share them with others - practice taking a 'cup half full' perspective

- Become a stubborn optimist. *The Future we Choose* by Christiana Figueres and Tom Rivett-Carnac, and Jonathan Porritt's *Hope in Hell* are must reads
- Sign up to Global Optimism: <https://globaloptimism.com/>
- Check out and consider signing up to Ark2030 - the most ambitious project I have ever collaborated with.

### Overcoming barriers to motivating others: understand some psychology

*Green won't spread by guilt or fear, we need aspiration and desire.*

- Carlotta Perez (Economist)

*Creep subtly into people's hearts.*

- Jane Goodall (Primatologist)

*Knowledge is overrated as a way to change behaviour.*

- Sabione Phal (Plymouth University)

Our sector has spent too many frustrating years trying to catalyse deep and genuine sustainability. What if our approach was part of the problem? It turns out it was!

Focusing on problems and telling people how to fix them, triggers deep psychological barriers. It also diverts resources from what is already working to fix what isn't. This is self-defeating and plays to weaknesses not strengths.

What happens if we do the opposite? If we focus on positives and how to amplify them? This sounds like idealistic twaddle but it is transformative - and grounded in research and experience of facilitating environmental dialogue.

Table 1 summarises the findings of Action Research about sustainable forest use by Indonesian forest communities (adapted from Yuliani *et al.* 2008). This approach seeks transformative change through simultaneously taking action and doing research, linking both by critical reflection. In one set of communities the researchers took a problem-solving approach; in the other, a constructive and appreciative approach. Look at the difference it makes (Table 1).

Understanding individual and group psychology, gives us a deeper insight into what is going on here and what to do differently.

Individual psychological drivers include:

- We have a natural bias to short-termism and localism. So, talking big scale and long-term doesn't work. The solution is to focus on a long-term vision and then short- to medium-term action to get there.
- We have a strong desire for autonomy and control. Making decisions and telling people what to do undermines that so, instead, generate solutions together as equals.
- We pursue happiness and avoid negative emotions. Endless talk of loss and disaster threatens that and our minds switch off to protect themselves. Instead, focus on what is already going well and share ideas about action to strengthen, accelerate and amplify that.
- We are driven to maintain self-esteem and self-worth. Telling people they contribute to the climate and nature crisis puts them in cognitive dissonance – either they are not good people or you are wrong – and guess which our brains choose! Instead build self-esteem by focused listening, and identifying and appreciating pro-environmental choices.

There are a bunch of group drivers too:

- We want to be part of groups with a good reputation – so instead of blaming and shaming, encourage and appreciate.
- We create and defend our own group's norms – so engage opinion leaders and opinion formers and create a norm of respect and action.
- We have a strong drive for justice and fairness – so work in ethical ways to find and get as close to genuine win-wins as possible.

Table 1. Summary of the difference between problem solving and appreciative dialogue.

Effect on people in a problem-solving and deficit-based approach	Effect on people when using constructive and appreciative dialogue and an asset-based approach
Frustration	Motivated
Efforts not valued	Efforts valued
Environment is complex and difficult = a problem	Looking after the environment has many benefits and is do-able
Feeling overwhelmed	Believe in own capacity and agency to make a difference
Risk averse	Fosters innovation
Disowning – it's not our problem	Willing to get involved and make a difference
No momentum or resistance	Momentum for delivery

With this understanding, environmentalists can avoid tramping around catalysing the very resistance, denial, reactance and barriers that so frustrate us. We can work with the grain of human nature.

You can apply these ideas to having 1:1 constructive climate and nature conversations with friends, family and colleagues. Try the following steps whilst listening attentively and being genuinely interested, curious and respectful:

1. Invite people to tell you what things they're already doing to help address the climate and nature crisis.
2. Affirm whatever they say however small, e.g. just saying "that's great".
3. Ask if there is a way they could do more or take complementary actions (don't advise, suggest or instruct uninvited... let them think of the answers).
4. Ask what would make it easy for them to do more.
5. Ask which small step would help get that underway and when they might be able to take it.
6. Finish with encouragement e.g. "that sounds really good" and if appropriate "that's got me thinking if I could do the same".

This approach is appreciative, encouraging, supportive and (based on the psychology) most likely to work. Of course, each individual act is small, but it adds up when millions do it. And you can amplify your impact many times over by sharing on social media - this strengthens the new norm and thereby the political pressure for change (Rose 2020). In summary, focus on finding what's working, strengthen and build on that, identify and acknowledge good work, uncover solutions and innovations, and foster a 'can do' attitude.

#### Suggestions for action:

- Let go of thinking doom and gloom motivates you or anyone else! For resources to help, check out 'Love. Not Loss' at <https://www.iucn.org/commissions/commission-education-and-communication/resources/love-not-loss>
- Try out constructive 1:1 climate and nature conversations
- Audit, recognise, celebrate and fanfare success to inspire and motivate others
- Find out more about collaborative, constructive decision-making

- Find out more about the science of effective communication and storytelling, including choice of language, framing, images and messaging.

### Overcoming barriers in understanding: from reductionist linear thinking to collaborative systems thinking

*Applying systems thinking principles and tools enables you to achieve better results with fewer resources in more lasting ways.*

- David Stroh (International Systems Thinking Expert)

There are many examples of where conservation projects overlooked the human aspects of the system and provoked a furious blocking reaction, poverty, collapse of communities, or even caused the species they were trying to save to go extinct (Redpath *et al.* 2015). Solutions to poor drainage have led to catastrophic flooding downstream and solutions to the climate crisis such as biofuels or plantation forests have had catastrophic effects on biodiversity. These outcomes are inevitable if we fixate on parts of the system and think sorting them will sort the whole. It doesn't and can't. In trying we fail to comprehend the whole system and miss the interconnections that really matter. We overlook the intervention points that catalyse transformative rather than incremental change, prioritise short-term benefits at long-term costs, and find that solutions to one problem cause another problem with unintended results.

We must shift from narrow linear and reductionist approaches and adopt systems thinking; focusing on how the whole system works rather than the individual parts. All systems are webs of dynamic relationships with feedback loops, cumulative effects, and tipping points. Ecologists know this better than most but need to expand that thinking to encompass socio-ecological systems. Doing this collaboratively with other stakeholders helps to reveal the connections and linkages, possible consequences, and the interventions for social justice, sustainable livelihoods, nature, wildlife and climate.

In taking a holistic systems thinking approach, it is possible to discover the

comparatively small things which have large effects – the crucial intervention points that catalyse virtuous systemic effects (Stroh 2015). Systems thinking tools and techniques span highly sophisticated modelling and picture-based diagramming (OpenLearn 2012). By using these methods, new possibilities emerge and can be cross-checked against holistic United Nation's Sustainable Development Goals. For example, what is your project doing for gender equality, decent work, or peace and justice? Also, take a look at Kate Raworth's doughnut diagram to check that outcomes will be in the safe space for humans (Raworth 2017).

The 12 principles of the UN Ecosystem Approach (Convention on Biological Diversity n.d.) underpin the 'strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way'. The UK signed up to these 20 years ago, but holistic projects that tick all the boxes are not yet business as usual. An updated version is due but the current 12 will still go further than most projects deliver.

#### Suggestions for action:

- Learn about and apply holistic systems thinking
- Experiment with systems pictures – causal diagrams and rich pictures to get the hang of it
- Apply the Ecosystem Approach via collaborative systems thinking dialogue
- Enjoy doughnuts - whilst considering with others, from other parts of the picture, if your work together delivers results in the socially just and environmental safe space

### Overcoming barriers of power: from experts decide to co-production

*Co-production is one of the most important ideas in the theory and practice of knowledge and governance for global sustainability, including ecology and biodiversity conservation.*

- Miller and Wyborn (Arizona State University and University of Montana) 2018

## Feature Article: Seize This Moment – New Approaches for Fresh Momentum (contd)

At an IUCN Commission on Education and Communication meeting back in 2003, the uncomfortable conclusion was that the greatest threat to nature (outside of locked-in change) was the attitude of nature conservationists and environmental managers! Table 2 explains the shift that is still needed.

Shifting further to a full co-production ethos is long overdue. Co-production is an equitable endeavour which means everyone has responsibility to share in:

- Understanding the system and each other's interests
- Deliberating over solutions
- Making decisions
- Finding resources for delivery and commitment to action
- Enjoying the benefits.

This means going beyond involving people just to give them an opportunity to express their opinions, to relinquishing control and sharing power and responsibility for delivery. This doesn't mean empowering everyone all the time in every decision but rather being very thoughtful about when and how to work with others to share power. Table 3 illustrates the spectrum of empowerment and can be used to facilitate discussion.

To tackle the climate and nature crisis in this empowering and integrated way, requires shifts in attitudes to others so their knowledge and influence counts. Organisational procedures will need to be more flexible, adaptive, experimental and open. Evaluation will need to go beyond monitoring natural features to include social and citizen wellbeing. And an ethos of collaborative systems thinking, principled negotiation and co-production, will result in more holistic, integrated and sustainable outcomes and require new shared governance arrangements. Doing this will reap dividends for nature and climate and will overcome many of the barriers described above.

### Suggestions for action:

- Check out our advice on empowerment and co-production for the Scottish Government (Pound *et al.* 2016)
- Be inspired at Dialogue Matters' and SocEnv's online 'Game Changers' event: 18-19 November <https://dialoguematters.co.uk/events/> or through our training designed to catalyse fresh momentum.

**Table 2. Summary of the change in stance needed by all environmental managers (Pound 2004).**

From...	To...
Focus on scientific and technical knowledge	Many forms of knowledge are needed and used
Seeing other stakeholders as the problem	Realising we've all been part of the problem and are all part of the solution
Seeing other stakeholders as a distraction and drain on resources	Realising they are a resource – of information, ideas and endeavour
Telling others what to do	Listening with an open mind
Pushing others to change	Working with others to agree change
Behaving as experts	Behaving as partners
Formal approaches	Informal and interactive approaches
Our ideas and solutions	The best supported most workable ideas and solutions

**Table 3. The Empowerment Framework showing different power relations in planning and implementing change with examples of what kind of activity could fit in which category.**

		Responsibility for planning land or sea use and management		
		Environmental professionals design and plan	Shared design and planning	Other stakeholders and / or communities design and plan
Responsibility for delivery and implementation	Environmental professionals deliver	Traditional professional service - decide and implement (e.g. emergency pollution response)	Co-planning, professionals hold the resources and power to implement (e.g. design of new flood channel with construction led by professionals)	Self-organised planning, professionals deliver (e.g. a local community wanting expert help to eradicate invasive species from their nature space)
	Shared delivery	Professionals decide 'for' others then build capacity to share delivery (e.g. a citizen science monitoring program)	Co-planning and co-deliver (full co-production) (e.g. integrated management of an area of land or sea)	Self-organised plan, professionals hear what is wanted then share and support delivery (e.g. community-level flood resilience)
	Other stakeholders and / or communities deliver	Professionals design, other stakeholders and / or community deliver (e.g. an agri-environment scheme)	Co-design, users/ community deliver (e.g. deer management groups)	Self-organised plan and deliver (e.g. community woodland, energy, water or food projects)

## If not us, who? If not now, when?

*This is a once-in-a-lifetime moment to transform the way we live, travel and work - tackling the health, climate, nature and economic crises all at the same time - and creating a more equal and secure future for us all.*

- Jonathan Bartley (Co-Leader, Green Party) June 2020

This year will probably be the hottest on record and one of the coldest for decades to come. This year will see a greater loss of biodiversity and yet be more diverse than in years to come. Whilst environmentalists will probably never get clapped on the streets, make no mistake: we are the ICU team for the planet. If we don't act with utter determination to save life on earth, the patient won't make it. This year we lost momentum – but we gained an extraordinary opportunity to pause, rethink and reset.

We are now at a very large fork in the road. Let's remove our own barriers to transformative change and do differently. Life on earth depends on us.

So, what part will you play?

### Acknowledgements

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Figure 2. *"I do my utmost for this future: one where children thrive and are entranced by nature."* Diana Pound. Photo credit Breeze Bishop.

### About the Author



Diana Pound set up Dialogue Matters (DM) in 2000 to design, facilitate, advise, train, and research multi-stakeholder dialogue. She's led over 100 projects at local, national and international levels, worked in 28 countries, and won multiple awards. Diana received IUCN's CEC Award for Excellence in West Europe (2019), Highly Commended in SocEnv's UK Environmental Professional of the Year 2019 and finalist 2020.

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For References please see overleaf.

## Feature Article: Seize This Moment – New Approaches for Fresh Momentum (contd)

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# From Anxiety to Action

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Keywords: community, frustration, influence, proactive, vision, worry

This article looks briefly at the possible mental health effects of climate change and discusses a model that can help focus actions within a person's sphere of influence. Following the model can make taking practical steps feel achievable and offer opportunities to extend your influence, creating a greater long-term impact.

Climate change and biodiversity decline are such huge global issues that, as individuals, we can feel a sense of hopelessness that our own actions cannot make a difference.

**Worry** about how the impacts (from erratic weather patterns to food insecurity) will affect ourselves and future generations; **guilt** that our own behaviour is contributing or we are not doing enough; and

**frustration** around the inaction of those in power, are all understandably on the rise. Phrases such as 'eco-anxiety' have been coined to describe fear triggered by the accelerating climate changes we are facing (Clayton *et al.* 2017).

Anxiety means being in a permanent state of flight or fight, which is exhausting, debilitating even, and worry, guilt and bubbling resentment or frustration are some of the best energy-thieves out there. Worrying makes no difference to the causes we care about and only serves to deplete our energy and cause us stress, both physically and emotionally. Stress has several effects on the body, such as raised cortisol and a weakened immune system, as well as reducing our ability to perform at our best and make good decisions. If we lose sleep over our worries, this can compound the problem even further, as even moderate sleep deprivation can impair our performance, more so than being over the drink-driving limit (Lowrie and Brownlow 2020). As such, when we



Some members of the Wild about Rogerstone committee taking our local Councillor around open spaces to discuss ideas for biodiversity enhancement and point out wildflowers.

are worrying and repeatedly going over options and possible outcomes, we are wasting our available energy for making a difference and can become paralysed by indecision and unable to take action. With this in mind, I wanted to share my own journey of moving from worry, guilt and frustration around biodiversity decline through to action, in the hope that it will help others who may be feeling a bit 'stuck' right now.

In April 2019, I went on a weekend course on career fulfilment where we were asked to write out our vision for the future at various levels (Figure 1)<sup>1</sup>. The idea was to let go of our current experience and write down what we dreamed of for ourselves, our family and our community in decades from now. One tip was to imagine looking back on your life at your 90<sup>th</sup> birthday party and feeling really satisfied with the contribution you had made. What had it

been? We were also encouraged to write down a vision for our country, and for the world, seven generations from now.



*One of many™*

Figure 1. Your vision is a description of how things are in the future (at least over 5 years) which represents where, in general, you want to be headed. You can think about a vision for each of these five levels or focus on one. The personal level would include your professional life. Copyright Joanna Martin, One of Many™ <https://oneofmany.co.uk/>

My vision for my community (a suburban ward of Newport City called Rogerstone, population 10,000) was diverse and abundant wild green spaces accessible to all; wildlife provided for in gardens and people growing and sharing food; the streets lined with plants buzzing with insects in the summer; people appreciating nature with a real sense of joy and wonder; all this creating connection between people, sharing and interacting in this wonderful space. On a national and global level, my vision was governments having sustainability and wellbeing as a central mantra; and global political alignment on environmental issues based on stewardship for future generations. All great, inspiring stuff! Then the kicker: what was I doing to work towards my vision?

When you want to effect change there are often two options: focusing on other people's behaviour or focusing on your own behaviour. In Stephen Covey's book *The 7 Habits of Highly Effective People* (Covey 1989), he describes everybody having a range of concerns (politics, environment, health, wealth, family) with a smaller range of concerns consisting of things we have an emotional attachment to (our Circle of Concern) and an even smaller range of concerns we actually have some control over (our Circle of Influence) (Figure 2).

Covey argues that if we focus all our efforts on our Circle of Concern, we are naturally going to be reactive to things happening beyond our control, e.g. the actions or inactions of other people, and will end up feeling negative and frustrated. These negative feelings, and our efforts to change others, may even alienate those around us meaning our Circle of Influence can actually get smaller as a result. If, however, we focus on our Circle of Influence, on the things we *can* do something about (including our own behaviour), we will find the opposite happening. Our Circle of Influence will increase, as those around us react to the positivity and enthusiasm generated by the results they are seeing us achieve (Figure 2).

I thought about my different visions in relation to my Circle of Influence. The national and global picture felt too big for now and I had no influence on making the people of Rogerstone suddenly plant their front gardens up for pollinators, put up bird

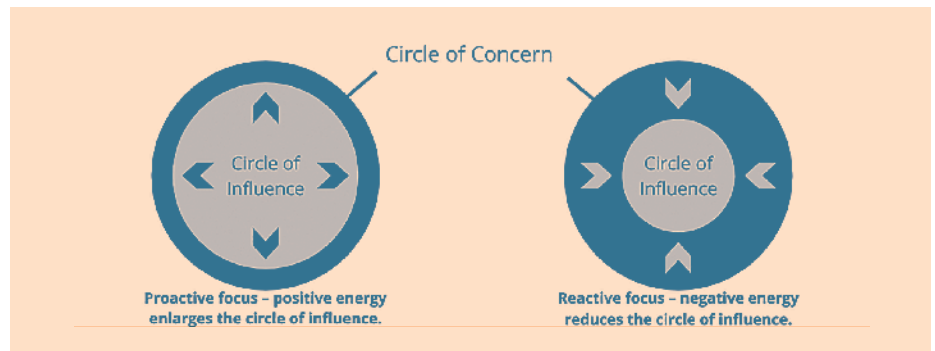
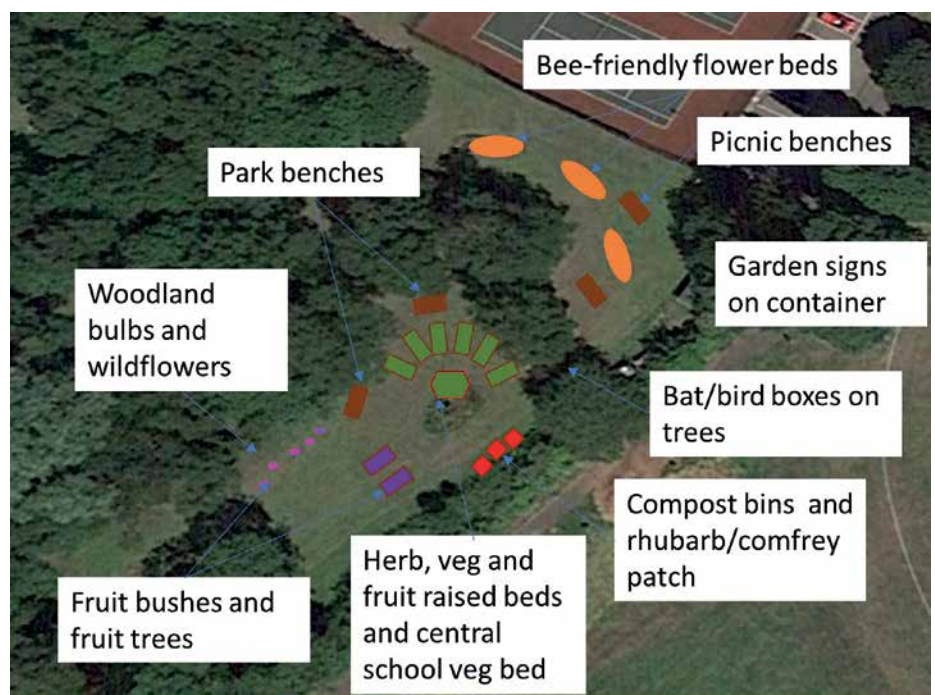


Figure 2. Focusing your efforts on things within your control (such as your own reaction to a situation or person) rather than focusing your efforts on concerns that are not within your control (such as another person's behaviour) is more likely to effect change and create positive energy that can enlarge your circle of influence. Diagram adapted from Covey 1989.

boxes or indeed take notice of the wildlife that did live in the area. What I could influence was my behaviour and, perhaps, some of the professionals already working on community wildlife projects, who I knew from my consultancy career. Maybe if I was willing to be a contact in the area that would have an effect? Within a few weeks of the course, I started looking into wildlife gardening in earnest and set up a wildlife gardening group for local residents on Facebook to share what I was learning, doing and seeing in my own garden. I also got in touch with the community council, the local Wildlife Trust, Newport Council's Biodiversity Officer, some local naturalists

I knew and the manager of a Canal and Rivers Trust centre, which we are lucky enough to have in the ward. I discovered that Newport was the first city in Wales to have its own Natural Resources Wales's Wellbeing Officer and I invited all the contacts I had made to a meeting to discuss how they could support me in enhancing local wildlife. Within six months, the group, which came to be known as 'Wild about Rogerstone', had a constitution and a committee of five people, a Facebook following of nearly 300, a list of willing volunteers for groundwork, five-years' funding for a 1400m<sup>2</sup> meadow creation project in the local park, plus promise of



The plan for the community garden as submitted for funding after being developed by a local landscape gardener.





The Wild about Rogerstone logo was designed by Sarah's 12-year-old son.

funding for our area's first community garden and an event list ranging from bat walks to a Big Butterfly Count talk and vegan café evening.

Setting up and running the group has not only been a positive experience for me and my family in getting to know people in the wider community, but it has indeed expanded my Circle of Influence indirectly in the following ways:

- the local city council has invited me to talk at their biodiversity forum about the group's work to help similar community groups across the city;
- I had an opportunity to talk to the Mayor of Newport and Council Leaders at our meadow seeding event with local schools (unfortunately postponed due to COVID-19);
- I have been invited to talk about my journey from vision to action at two webinars for my course, each with 500+ attendees;
- I was asked if I would like to chair our regional Friends of the Earth Bee Friendly group;
- I have used the project at work to promote meadow creation and discuss community engagement with non-ecologists;
- I was asked to co-create an environment-focussed group within a community of women linked to my course, which has a 7000+ Facebook following;



Sarah giving a talk on wildlife gardening to the local Women's Institute, who were then keen to help with the meadow seeding event by providing refreshments.



The artwork for the interpretation board that will be sited at the community meadow area. Unfortunately seeding by volunteers and four local school eco-groups in April 2019 was postponed due to COVID-19. The group now hopes to seed the area in Autumn 2020.

- two local primary schools approached the group to seek advice on wilding part of their grounds;
- the projects and group have attracted local press attention;
- I was even asked if I would run as a local Councillor (!); and
- I am now writing this article and talking to you.

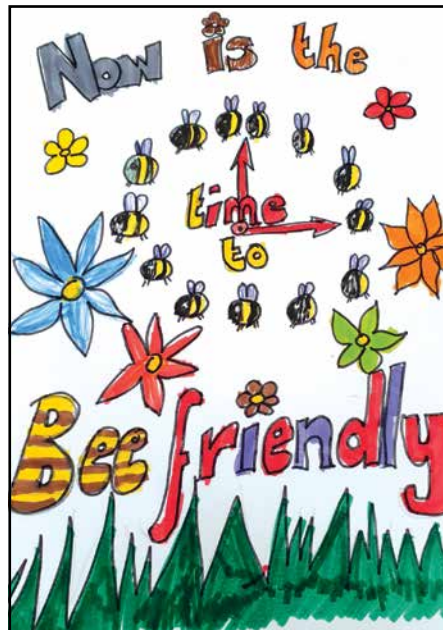
The point is, none of this wider-reaching influence was the aim of that first step towards the vision I had for my community, but by focusing on my own behaviour instead of others', I have extended an *invitation* to change and brought people with me on my journey (and there are certainly more mini-ponds and bee-friendly planting areas in Rogerstone as a result). If I had started by trying to get an audience with lead Councillors or the Mayor of Newport to force change in others, I might have ended up feeling defeated and frustrated.

Practical action on global environmental issues can look like many different things and your vision for the future will be different to mine. How the level of your vision interacts with your circle of influence will also affect what steps you might take to make your own difference or increase the difference you are already

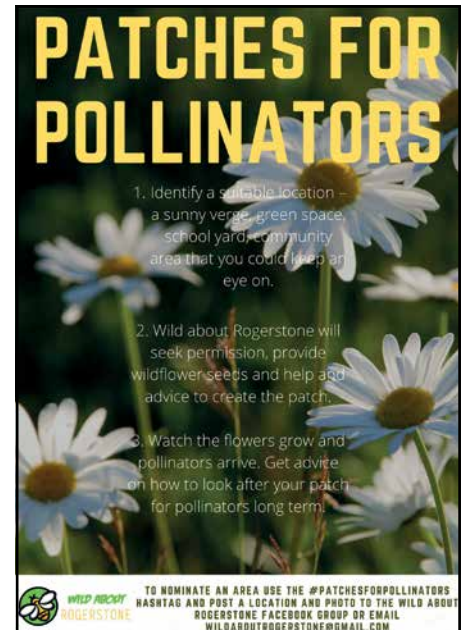
making. On a personal or family level, your influence includes what you chose to eat, what you spend your money on, what energy supplier you use, what kind of companies your pensions and savings are invested in, what you chose to transport yourselves in, how you vote, how you use your right to raise issues with your local MP and who you chose to work for. Bringing any of these areas more in line with your own values around sustainability may be a focus. On a professional level your sphere of influence may include clients, colleagues, suppliers, contractors or those working in local or national government. Sharing what you are doing at a personal, family or community level with your colleagues or clients may be a great way of educating by example. Perhaps starting a conversation circle about sustainability with a range of colleagues would produce a novel idea in reducing your company's carbon footprint, which can, in turn, be shared with their Circle of Influence. Maybe you have influence in the charitable fundraising or charity days undertaken by your organisation and could use the opportunity to highlight the work of an environmental charity? Or, if not, undertake a volunteer day yourself and share your experience with colleagues or clients as a way of highlighting an issue important to you.



Since lockdown, the focus has shifted from community events to running kids' competitions and activities.



Our latest competition winner will have her design created into a real sign by Newport City Council to be placed in a grass verge that the Council have recently agreed to leave as long grass over the summer. (see below)



Patches for Pollinators – our latest campaign.

The lens of the COVID-19 crisis has given us all a chance to re-assess what we value and how we might want to make changes for a better future. Nature and community have come through strongly as important for people's wellbeing and we have the best opportunity for generations to use our influence as environmental professionals to create lasting change. As we work towards green recovery and 'building back better', focusing on what is important to us, being inspired by our own vision for the future and working within our Circle of Influence are all important to making our difference and achieving personal fulfilment.



### Acknowledgements

Thanks to Kath Allen, Women's Leadership and Wellbeing Coach and former University of Liverpool NERC Knowledge Exchange Fellow, for reviewing, editing and adding to the introductory text on anxiety and stress, and the concluding paragraph.

### Notes

1. Course run by One of Many™ (<https://oneofmany.co.uk/>) entitled 'BeFulfilled', undertaken as part of the 'Lead the Change' leadership training in April 2019.

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### About the Author



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# Recovering Nature: Learning from the North Devon Landscape Pioneer

Keywords: natural capital, recovering nature, strategic planning

**Alice Lord, Tim Sunderland,  
Dr Patricia Rice and  
Dr Jo Traill Thomson**  
Natural England

The North Devon Landscape Pioneer was led by Natural England in a collaborative partnership with the North Devon UNESCO Biosphere. The Pioneer has trialled a variety of innovative techniques to understand how we can take account of what nature provides us with and improve these benefits strategically. This article describes the steps in our approach, the lessons we've learned and the changes we think need implementing to begin nature's recovery.

## Introduction

Nature's recovery, or the creation of a healthy and resilient ecosystem, is important for societal wellbeing, but it is also a government priority. The Governments' 25 Year Environment Plan (HM Government 2018) aims to improve the environment within one generation. It recognises that new approaches to nature conservation are needed to meet this challenge. Natural capital is one suggested approach. Natural capital means *'the elements of nature that directly or indirectly produce value to people, including ecosystems, species, freshwater, land, minerals, the air and oceans, as well as natural processes and functions'* (Natural Capital Committee 2013).

## Trialling a natural capital approach in North Devon – a participatory process

The North Devon Landscape Pioneer was one of four projects tasked by Defra with trialling a natural capital approach. It was decided that the boundary for this project would be the North Devon UNESCO Biosphere, an area covering Northern Devon and designated by UNESCO's Man and the Biosphere Programme to explore and promote sustainable development. The Biosphere core partnership became the core working group for the Landscape Pioneer.

A natural capital approach means that we treat the environment as a set of assets. From the assets flow ecosystem services, from which we realise benefits. For example, a woodland ecosystem sequesters carbon, and this mitigates the impacts of climate change. If we have appropriate methods and data available, we can value these benefits using monetary terms. This approach may help us to make better decisions because some people appreciate and understand a concrete value as opposed to a nebulous benefit and will be more willing to protect nature as a resource.

The Pioneer explored whether gathering economic evidence about the environment and embedding it within a truly participatory and deliberative decision-making process could inform ways to strategically improve natural capital in North Devon. A participative and deliberative process is the 'gold standard' for partnership working. This means properly involving partners, where they have a genuine opportunity to steer and influence plans for their place, and discussing (or deliberating) different options together to come to an agreement. This approach is critical to developing shared plans which are supported across a partnership.

The steps in the process were:

- Gather evidence on the state of natural capital and the way partners currently invest in it
- Prioritise assets and ecosystem services on which to focus
- Understand the problems occurring in the assets which impact on the delivery of ecosystem services
- Develop strategic solutions to solve the problems
- Explore innovative funding options
- Develop lessons learned to influence best practice.

The ultimate aim of the process was to develop a range of strategic solutions to solve specific issues in the environment and support assets to provide multiple ecosystem services. We were flexible and adapted the process as we progressed, learning lessons along the way.

## Who did we work with?

As well as core partners from the Biosphere partnership, we expanded to include partners from different sectors as we went through our process. Partners came from sectors such as planning and economic development, health, housing, tourism and business in North Devon. For example, partners include those from North Devon Council, Visit Devon, North Devon Homes and the National Farmers Union.

## What did we do?

*Working out the state of natural capital in North Devon*

Firstly, we set out everything that we wanted to know about North Devon using a natural capital framework. This included information about:

- The condition of North Devon's ecosystem assets – their quantity,

quality, location and management.

Assets were categorised by broad habitat type (Watson *et al.* 2011) with one spreadsheet of information collated per habitat.

- The ecosystem services and benefits which flowed from each asset – described, quantified and valued where possible, as well as information to show if flow of services was improving or declining (their trend) and what might happen in future (their trajectory).

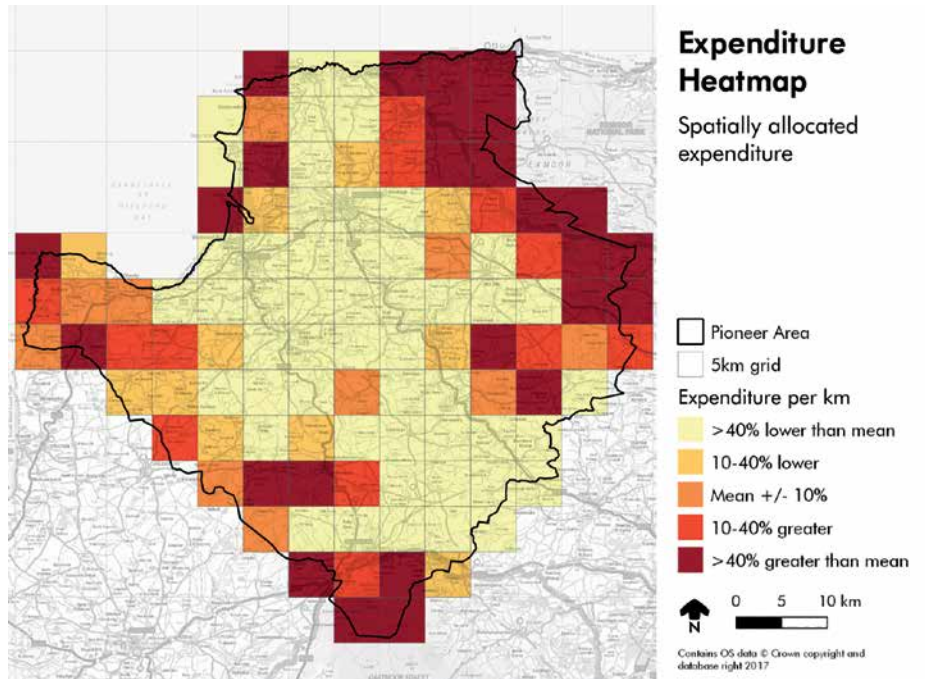
To find data to create the evidence base, local reports and data were investigated, such as data from the State of the Biosphere Report (Bell *et al.* 2015). We then used participatory evidence gathering to identify further data to fill gaps and to increase ownership over the evidence base. Partners identified additional reports and data at a workshop. Partners also provided their expert judgement, creating qualitative data about assets and ecosystem services. Qualitative data was deliberated at the workshop to check and challenge the evidence, so that the partnership came to a consensus. For each piece of information in the evidence base, we included an objectivity rating, to be transparent in the confidence in our evidence.

This participatory way of gathering evidence helped us to create early buy-in, because partners had a shared ownership over the evidence base.

### *Understanding investment, who is spending what and where?*

Many different organisations invest money to try and improve the environment. For example, Natural England invests in agri-environment schemes for wildlife, and the Environment Agency and water companies invest to improve water quality. To gain a partnership-level perspective of current investment in the environment, partners provided their natural capital investment data. We employed an environmental economics consultancy to analyse overall spending. They created an expenditure heat map (Figure 1) which shows variation in investment across the Biosphere, calculated by analysing overall partnership investment data spatially.

The results of this innovative exercise show that different partners are investing money to achieve similar outcomes in the same locations. But only 8% of spending in North



**Figure 1. Expenditure heatmap** (taken from eftec, in press) © eftec and CountryScape. This map shows variation in spending on the environment in North Devon by the Biosphere partnership. Investment was analysed to identify investment in each kilometre grid-square. The darker areas show higher levels of spending and align with National Parks and protected landscapes. To protect data confidentiality, variation is shown rather than amount of investment and the results are presented at 5 km<sup>2</sup>.

Devon is spent collaboratively. This suggests that there is room to make more efficient investments. If investment was better coordinated at a partnership level then the overall outcome for the environment would most probably improve.

### *Prioritising – where are the biggest opportunities for change?*

Having gathered information about assets, and the services flowing from them, the next challenge was to set priorities for further investigation. We wanted to identify the most strategic opportunities, where the potential gains of new management were highest. This was because we wanted to be able to make good cases to fund changes, such as different ways of managing of rural land to improve water quality. Thus, we sorted our evidence base to identify assets providing high-value services, but in poor condition and with a declining trend. This provided us with a list of asset and service pairs. The interim pairs in Table 1 were the assets and services which came to the top of the list.

We learned from this exercise that our partners felt uncomfortable with using economic evidence in this way. The process

was complex and they found it confusing. The way evidence had been presented looked too far removed from the evidence base that they had contributed to. Because we had used overall value of services being provided rather than value per hectare we biased assets covering a larger land area. We also had a bias towards habitats and services for which we had data, particularly farmland habitats or those providing food or carbon sequestration benefits. Thus, this way of prioritising did not necessarily prioritise the assets providing the highest value services in North Devon. Nevertheless, after discussion and deliberation, partners replaced a few habitat and service pairs in the list (shown in the Final Pairs column, Table 1) and we were able to move forward with a set of priorities to investigate further.

### **Understanding issues strategically**

The Pioneer recognised that we needed to reconsider what we do to solve environmental issues. Much of current environmental management is mitigation for a wider systemic issue, for example putting in buffer strips to reduce pollution running off into rivers. This action can

**Table 1. Assets providing services were sorted using a decision rule, identifying assets providing high-value services, in poor condition and declining trend in the Interim Pairs column. This list was discussed at a workshop and some pairs were swapped or changed by the partnership. The final eight priorities are listed in the Final Pairs column, with new pairs in bold.**

Interim Pairs	Final Pairs
Improved Pasture – water purification	Improved Pasture – water purification
Arable – water purification	Arable – water purification
Arable – recreation & tourism	<b>Culm Grassland – water regulation</b>
Permanent Grassland – recreation & tourism	<b>Coastal Margins – tourism, recreation and cultural services</b>
Deciduous Woodland – climate	<b>Woodland - climate</b>
Deciduous Woodland – water regulation	Deciduous Woodland – water regulation
Improved Pasture – climate	Improved Pasture - climate
Permanent Grassland – water purification	Permanent Grassland – water purification

improve water quality in the river by intercepting nutrients, but does not deal with the causes of pollution run-off. We wanted to understand the root causes of problems in North Devon within our eight asset and service pairs, so that we could come up with solutions which would solve issues strategically.

We used Root Cause Analysis (RCA) to do this. This involves identifying the immediate causes of the problem, and asking why they occur (Rooney and Vanden Heuvel 2004). The analyst then examines why each of these further causes occur. By asking “why” at least five times, the chain of causes for each problem can be mapped out and the root cause can usually be identified.

Working in small focus groups, the partners drew up one problem statement for each asset and service pair (such as ‘poor water quality’ for arable land and water purification; other problems included reduced climate mitigation and poor water regulation causing flooding). They then asked *Why?* at least five times to understand all of the different causes of the problem. Through discussion and knowledge-sharing, they created visual maps showing the multiple causes of problems in North Devon (Figure 2). The Root Cause Analysis report uses published reports to confirm our partners’ evidence (eftec 2020).

Partners enjoyed creating these maps. It broadened the focus from specific asset-

service pairs to a wide-ranging discussion of whole ecosystems. It was a good way to think about problems more strategically and allowed everyone to contribute in their area of expertise.

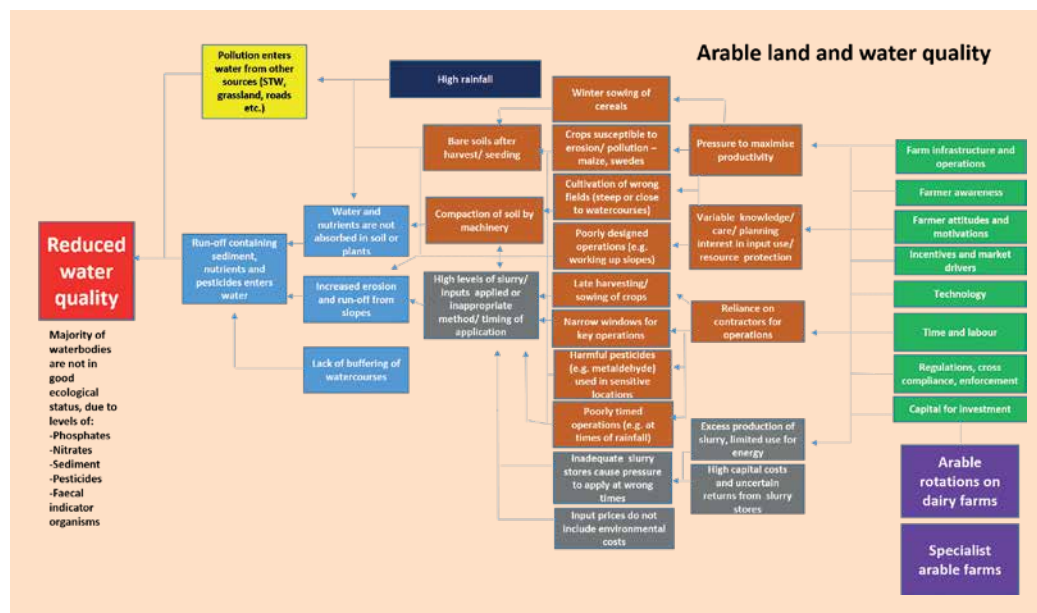
### Identifying solutions and creating a strategy for North Devon

After identifying the problems and their root causes we needed to find solutions to fix them. We held several partnership workshops to generate solutions. We set criteria for our interventions. We wanted them to be:

- Strategic, treating problems at their root causes
- Feasible
- Investible
- Support assets so that they could provide multiple ecosystem services
- Good for biodiversity.

Partners had a lot of good ideas for interventions but we realised that many of them did not meet all of our criteria. It quickly became apparent that a whole suite of solutions were needed to solve our problems. We separated these solutions into those which focused on 1) changes to land management, such as implementing soil conservation practices or creating buffer strips, 2) land use, such as increasing the amount of woodland, semi-natural grassland and coastal habitats in North Devon, and 3) incentives, motivations and capacities, creating a socio-economic system

**Figure 2. A root cause map analysing the problem of reduced water quality in an arable landscape. The map shows that reduced water quality is caused by pollutant run-off, which is caused by erosion and run-off from slopes, which in turn is caused by bare soils after harvest, and so on. The factors identified in the coloured boxes all contribute to poor water quality as a consequence of arable land impacting on the issue. Colours show grouping of causes, for example those in green are about farmers’ capacities, motivations and incentives. Causes on the right of the diagram are the root causes of the problem. From the Root Cause Analysis report (eftec 2020).**



## Feature Article: Recovering Nature: Learning from the North Devon Landscape Pioneer (contd)

in which positive environmental action can be encouraged. A selection of the changes suggested for land management and land use are outlined in Figure 3.

We also considered the changes in governance which would be necessary to implement our solutions. These include: localisation (or devolution), creating responsible institutions to own problems, getting shared commitment for problems across all stakeholders who impact on the problem, and implementing the practice of adaptive management.

We learned that many of the solutions acting near the root cause are changes to socio-economic factors or major land use changes. It is difficult to change these factors in the short term but they should be part of wider discussions in a policy context to meet the aims of the Government's 25 Year Environment Plan. We also learned that changes to 'grey' infrastructure would also be needed (such as improving the sewage network to improve water quality).

The Natural Capital Strategy for North Devon outlines the process, priorities and solutions discussed in brief in this article (Sunderland *et al.* 2020).

### Investment opportunities – are there opportunities for private sector funding?

Our partners identified a long list of ideas which were developed into four investment opportunities for private sector funding (Eunomia 2020) (Box 1).

#### Box 1. Investment opportunities for North Devon (Eunomia 2020).

1. Developing and marketing local food networks to promote sales of produce from farms that maintain and improve natural capital.
2. Creating a new carbon offsetting standard for priority North Devon carbon storage habitats.
3. Creating a woodland management support hub.
4. Developing an ecotourism standard that will promote habitat restoration on the river Torridge.

We learned that it was difficult to identify opportunities where there was a clear financial return on investment. This is because the environment provides benefits which are not always marketable, such as increases in air quality, which cannot be sold to anyone. It is also difficult to create opportunities which would produce cost savings or benefits for one company or individual. The environment provides a wide variety of public goods rather than

only providing the benefit which the investor is seeking. However, there may be some opportunities for innovative private sector investment based around corporate responsibility or offsetting environmental impacts in future. One such example might be carbon offsetting, where organisations can purchase credits to mitigate their emissions. Funds raised from selling credits can then be used to create or restore carbon sequestering habitats.

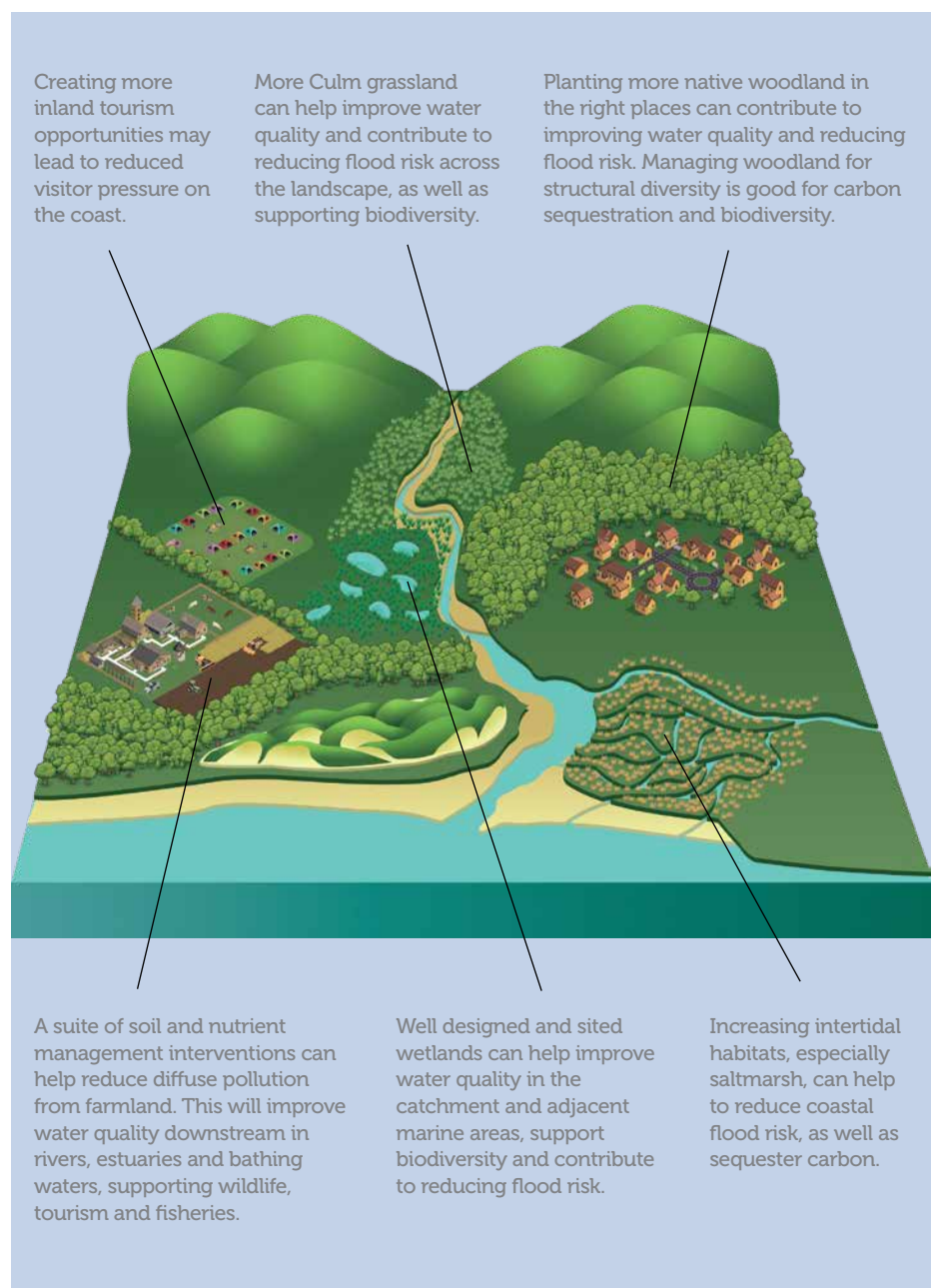


Figure 3. Taken from A Natural Capital Strategy for North Devon – Executive Summary (Sunderland *et al.* 2020) © CountryScape. The Strategy shows a selection of land management and land use changes which would begin to solve environmental problems in North Devon. For example, planting more native woodland in the right place would reduce flood risk and mitigate climate change. Solutions need to be implemented across the landscape at large scales to solve problems.

## How we did it?

Our process was led by Natural England but it was participatory and deliberative. Partners provided their evidence and expertise and they discussed and deliberated with each other at every stage of the process. They worked together on innovative exercises as well as identifying and shortlisting the solutions identified in the strategy. The process was resource intensive but it has resulted in a strategy with a high level of buy-in because the partners own everything which is included in it (Sunderland *et al.* 2020). The strategy is now moving forward as part of North Devon Biosphere's joint land and sea action plan.

## Conclusions

The Pioneer has shown that it is possible to use a natural capital approach to create a transformational strategy for a place. If the changes outlined in the North Devon Natural Capital Strategy were implemented, we would be able to help nature to improve, ultimately providing a wide range of benefits for society.

The use of a natural capital approach helped participants in the project to understand the state of the environment in North Devon and put a value on the benefits for people. It must be embedded within a truly participatory and strategic planning process with a wide variety of partners. This means that the process will be shared, will reflect joint priorities and have the best chance of making a difference on the ground.

The environmental expenditure mapping work shows that there is huge potential for organisations to work more collaboratively with one another. Changes to governance would allow partnerships to work more efficiently and effectively, better facilitating the alignment of investments and outcomes with one another. The natural capital approach outlined in this article was challenging and the recommended changes to policy and investment mechanisms will be no easy task but could have huge benefits.

The experience of the Pioneer project has taught us that the most strategic changes are not just to what we do, but how we work. It is these changes which we now must explore to begin the restoration of a healthy and resilient ecosystem for all of us to enjoy.

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# Nature-Based Solutions for Net Zero

**Ruth Gregg, Ian Crosher CEnv MCIEEM, Jessica Adams and Mike Morecroft**  
Natural England

Keywords: carbon, climate change, green recovery, mitigation, nature-based solutions, net zero

Reducing our greenhouse gas emissions to Net Zero by 2050 is central to tackling the climate crisis. Amid the COVID-19 pandemic, global greenhouse gas emissions reduced substantially, wildlife became more visible in our streets and the natural world was essential to our wellbeing during lockdown. Moving forward, society faces some big decisions on how we can adopt a greener, more resilient future. Here we consider how this can also contribute to our Net Zero goals.

## Net Zero to tackle climate change

Prior to the coronavirus pandemic hitting in early 2020, voices have been loud regarding the need to fundamentally change our society to address the climate and nature crises we are currently experiencing. Entering lockdown has made many of us stop and reassess what type of community we want to be part of, and for many it has provided opportunities to rediscover the greenspaces on our doorsteps and to enjoy the bird song filling our streets as they went quiet. The inevitable need for fiscal recovery packages as we look to the future has led many to question – do we return to business as usual, or instead do we adopt environmentally minded reforms and a greener, more resilient future?

In June 2019, the UK became the first major world economy to make a statutory



Figure 1. Creation of new woodland is vital to achieving Net Zero emission targets. Photo credit M. Morecroft.

commitment to end its contribution to global warming by 2050. This target is termed 'Net Zero' and requires the UK to bring all greenhouse gas emissions to net zero by 2050, this compares with the previous target of at least an 80% reduction from 1990 levels. The 2019 UK Provisional Greenhouse Gas Emissions report shows that total net emissions were

435.2 Mt CO<sub>2</sub>e, an estimated 45.2% lower than in 1990 (Department for Business, Energy and Industrial Strategy 2020).

Emissions have been falling steadily in recent years because of a shift away from burning fossil fuels, particularly coal, for energy. However, to achieve Net Zero we need to go beyond cutting emissions and look for opportunities to



also proactively remove carbon dioxide from the atmosphere. The one tried-and-tested approach we have to do this is via sequestration of atmospheric carbon in the soils and vegetation of habitats.

## Nature-based Solutions

In addition to the climate crisis, we are also experiencing an unprecedented decline in biodiversity with more plant and animal species threatened than ever before in human history (IPBES 2019). 'Nature-based solutions' is a broad concept which describes how protecting, restoring and managing natural systems can solve societal problems. A widely used definition is that of the IUCN: Nature-based Solutions (NbS) are '*actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits*' (IUCN 2020)

The climate and biodiversity emergencies are closely interlinked. The destruction and degradation of natural habitats has resulted in a direct loss of carbon stored within them. Restoring natural systems can start to reverse this damage at the same time as supporting biodiversity. Approaches such as NbS gives us the framework to tackle these twin crises in an integrated way, while providing multiple benefits for people, including health and wellbeing.

Recent work led by the RSPB estimates that in the UK, land of recognised conservation value stores 550 metric tonnes (Mt) of carbon in their top 30 cm of soil and vegetation. Currently these semi-natural habitats exert a net sequestration effect of over 8 Mt CO<sub>2</sub>e per year but their mitigation potential increases by an extra 6 – 7 Mt CO<sub>2</sub>e per year when restoration management approaches are considered (Field *et al.* 2020). It's clear that our biodiversity rich habitats contribute to climate change mitigation, and can do more. So, where should we prioritise this dual approach?

## Woodlands

The most effective Nature-based Solutions for Net Zero are based on habitat creation and restoration, particularly of carbon-rich habitats such as woodland and peatland. Woodland is critical to achieving Net Zero because of its potential to take carbon out



Figure 2. Winter bog pools at Bolton Fell Moss, part of the Cumbria BogLIFE+ restoration project. Photo credit R. Gregg.

of the atmosphere as well as delivering other ecosystem services. For example, upland habitat restoration, including native woodland creation, led by the Woodland Trust, Natural England and the Lonsdale Estate on Tebay Common in Cumbria, was estimated to save up to 41 tonnes CO<sub>2</sub> per year, while also helping to mitigate against future flooding events (Cumbria Wildlife Trust 2020). For the whole of the UK, delivering existing targets would take woodland cover from its current 13% to 17%. This would deliver annual carbon sequestration of 14 Mt CO<sub>2</sub> per year (Committee on Climate Change 2020a), which is equivalent to approximately 3.3% of current UK greenhouse gas emissions. However, a concern is tree

planting in inappropriate places, such as on organic soils and priority habitats. While formerly forested land can benefit adaptation, mitigation and biodiversity, tree planting in certain areas can actually exacerbate climate impacts via disturbance of long-held stores of carbon (Morecroft *et al.* 2019). Tree planting is therefore no panacea – it doesn't diminish the need for large emission cuts in other sectors. It can however compensate for emissions that are very hard to eliminate in the medium term.

## Peatlands

Peatlands are of particular importance because they store vast amounts of carbon in their deep organic soils over many millennia. However, upland and raised bogs



Figure 3. Carbon and greenhouse gas monitoring plots at Bolton Fell Moss. Photo credit R. Gregg.



Figure 4. Rewetted area of Roudsea Woods and Mosses. Photo credit R. Gregg.

have been drained, burnt and cut for peat and sometimes planted with trees. Most of our lowland fens have been actively drained and converted to arable land. This has led to the release of large amounts of carbon dioxide to the atmosphere. In total, the UK's peatland greenhouse gas emissions are estimated at 23.1 Mt CO<sub>2</sub>e per year, 11.1 Mt of which are from England (Evans *et al.* 2017). For the UK as a whole, this is approximately 5% of total greenhouse gas emissions. The restoration benefit of peatland areas can, however, be substantial. Three restoration sites in an EU Life+ funded and Natural England led project, were predicted to save an extra 139 tonnes (t) C yr<sup>-1</sup>, or 489 t CO<sub>2</sub>e km<sup>-2</sup> yr<sup>-1</sup> and were predicted to continue accumulating carbon for the next 120 years. Their restoration must therefore be a priority as, in their current state, degraded peatlands negate the significant sequestration by other semi-natural habitats.

### Agricultural land

The farmed environment covers over 70% of England's land area and so changes to agricultural practices to store carbon in the environment or to adjust land use with higher carbon storage could make significant contributions to the Net Zero target. The Committee on Climate Change

(CCC), the governments independent adviser, has advised that a 'major shift in UK land use is needed to deliver Net Zero emissions' (Committee on Climate Change 2020b). Through a combination of low carbon farming approaches, agroforestry and habitat restoration, farmers and land managers in the UK could cut their carbon emissions by two thirds by 2050, not only benefiting climate change but delivering more biodiverse and resilient landscapes in the process. Soon to be published work by the University of Hertfordshire and Natural England (Warner *et al.* 2020) highlights how the Countryside Stewardship Agri-Environment scheme contributes an estimated emissions saving of 1.1Mt CO<sub>2</sub>e each year by working with land managers on their holdings to deliver a range of options that primarily benefit biodiversity and resource protection.

### Concluding remarks

Natural England's 2020 People and Nature survey and engagement (Natural England 2020) clearly demonstrate the wellbeing value of the natural environment as we collectively experience difficult times. The coronavirus pandemic has already led to reductions in global CO<sub>2</sub> emissions as much of the world entered lockdown. At peak in April there was an estimated 17% decrease

in daily fossil CO<sub>2</sub> emissions (Le Quéré *et al.* 2020), an unprecedented drop not seen in modern times. The overall annual impact is predicted to be a decrease of between 4 – 7% (Le Quéré *et al.* 2020), comparable to the rates of decrease needed year-on-year over the next decades to meet the 1.5°C target of the Paris Climate Agreement, and highlights the challenge we face to meet this. However, this decline in emissions is expected to be temporary as society returns to business as usual, and takes us back to the original question – what type of recovery do we want to see?

By embedding nature-based solutions into our COVID-19 economic recovery we will deliver multiple benefits for people and nature. For example, a restored wetland can slow the flow of flood waters through a catchment and reduce the risk of flooding, an urban woodland can reduce temperatures and increase air quality, and on the coast, natural habitats can buffer against the effects of storm surges on top of rising sea levels.

At Natural England, we support land managers, conservation practitioners and planners with advice and resources underpinned by science to deliver these approaches on the ground. In 2020, Natural England has published the *Nature Network Handbook* which provides technical support to those planning and implementing nature recovery on the ground (Crick *et al.* 2020) and have updated and expanded the *Natural England and RSPB Climate Change Adaptation Manual*, as discussed in this edition of *In Practice* by Taylor *et al.* Following these, in the autumn there will be an update to our 2012 report *Carbon Storage by Habitat* (Alonso *et al.* 2012), which will review new science on this topic and take a new focus on how land use change and habitat restoration can support carbon storage and sequestration in our natural environment.

Here we have shown that by restoring our natural habitats we can not only deliver biodiversity benefits but also reduce emissions of greenhouse gases, supporting efforts to reach the Net Zero target by 2050. Nature can help society build resilience and adapt to climate change, as well as tackle the emissions that cause it.

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## Definitions

A carbon dioxide equivalent (CO<sub>2</sub>e) is a measure used to compare emissions from different greenhouse gases, on the basis of their global-warming potential, by converting amounts of other gases to the equivalent amount of CO<sub>2</sub> with the same global warming potential. Units are usually tonnes (t) CO<sub>2</sub>e at a site level and megatonnes (Mt) CO<sub>2</sub>e at a landscape or national level to reflect the amount of carbon at these different scales. One megatonne (Mt) is equivalent to one million metric tonnes (t).

## About the Authors



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# The New Natural England and RSPB Climate Change Adaptation Manual

**Sarah Taylor, Simon Duffield MCIEEM  
and Mike Morecroft**

Natural England

It feels fitting that when the Natural England climate change team made our last major contribution to *In Practice* the 1<sup>st</sup> edition of the Natural England & RSPB Climate Change Adaptation Manual had just been published and here we are again to tell you about the recent publication of the 2<sup>nd</sup> edition of the Manual.

In the intervening years, the evidence that the climate is changing has only grown and, therefore, adaptation action has become even more vital. The landscape of climate change activity has also changed a great deal. The UK has declared a climate emergency, ratified the Paris Agreement to aim for a 1.5°C limit to global average temperature rise, raised our 2050 target to Net Zero and we are embarking on our third round of the UK Climate Change Risk Assessment and National Adaptation Programme cycle. And of course, there has been a huge rise in public awareness and demand for action. There is a need both to reduce greenhouse gas emissions (climate change mitigation) and to adapt to the changed climate – which is already with us and will increase for years to come even with best possible mitigation efforts. Both internationally and in the UK, we are a long way from achieving the level of action we need on both mitigation and adaptation, but as we look to a recovery from the impacts of the coronavirus pandemic, there is an opportunity to make up for lost time in recent decades. The natural environment has a crucial role to play in our action to limit global warming and

Keywords: adaptation, climate change, conservation, Nature-based Solutions

support adaptation in other sectors, but it is also under threat from climate change itself. The imperative for action to promote adaptation for the natural world has never been greater; we have a lot to do.

The second edition of the Climate Change Adaptation Manual provides a solid evidence base in an accessible format for planning action to deliver sustainable adaptation on the ground (Figure 1). It covers both building resilience and managing change, and brings together recent science, experience and case studies, providing an entry point to a range of available resources and tools. The first edition of the Manual had a strong focus on habitats. This edition provides a substantial expansion, the habitats section is now complemented with a new section on species, providing evidence on their sensitivity, potential vulnerability and potential adaptation responses. And we have also included substantial new sections on Green Infrastructure, Geology and Geomorphology, and Access and Recreation. This means the Manual now provides information and resources for a wider range of conservation activities that require adaptation planning but can also help us to adapt. This new breadth means that what was already a well-used resource to support practical adaptation and pragmatic decision-making, can now provide a more integrated resource.

As in the first edition, the introductory section describes the key concepts and principles for effective climate change adaptation decision-making, but we have added two landscape-scale climate change adaptation assessment methods to help practitioners apply these concepts. The frameworks (one designed by Natural England and one by the RSPB) use an established approach to take practitioners

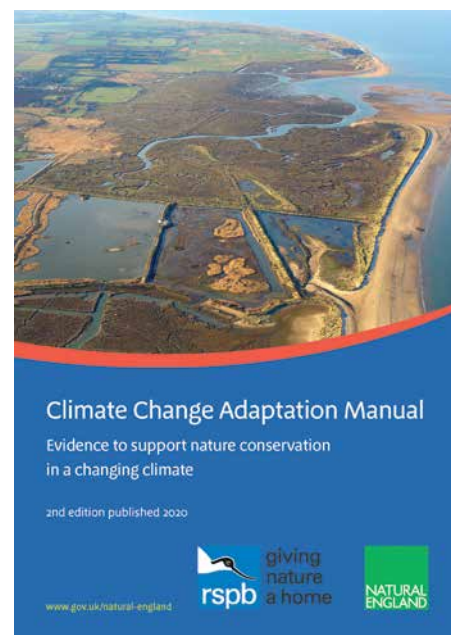


Figure 1. The 2<sup>nd</sup> edition of the Climate Change Adaptation Manual.

through the various stages of an adaptation assessment - identification of 'features of interest' for an area, climate change variables and impacts (direct and indirect), moving on to assessing the resulting vulnerabilities of the interest features and planning suitable adaptation actions. The assessment methods make links to a range of important resources to provide the evidence base for such an assessment, for example the Research & Innovation for our Dynamic Environment Climate Change Impact Report Cards and a range of spatial data that helps design ecological network restoration (See <https://naturalengland-defra.opendata.arcgis.com/> for spatial data from Natural England).

## Habitats

The largest section of the Manual is still the habitats chapter, where each priority habitat type, 33 in total, is described in terms of its species composition, distribution and main features before summarising the evidence for the climate change based impacts it will experience, in terms of the causes and consequences of such impacts. A range of suitable adaptation responses with specific

Countryside Stewardship options, which may be able to provide financial support, are then provided, supported by further information and case studies where available.

## Species

The new species section starts by giving an overview of the impacts and vulnerabilities facing species in general and the different scales required to plan resilience building and change management. We then provide a range of individual species case studies which go into more detail on the ecology and distribution of the species, the evidence for climate change impacts including assessments of the species sensitivity to climate change, ability to manage, and observed and expected distribution change (Figure 2).

The included species are important in their own right, but have also been selected as exemplars from across a range of different taxonomic groups, habitat associations and contrasting sensitivities to climate change. Where possible, species assessments also include a modelled climate envelope map from a Natural England funded project on risks and opportunities for species, carried out by the British Trust for Ornithology, University of York, RSPB and Centre for Ecology and Hydrology, working with Natural England (Pearce-Higgins *et al.* 2015). As with the habitats chapter, adaptation options are then explored.

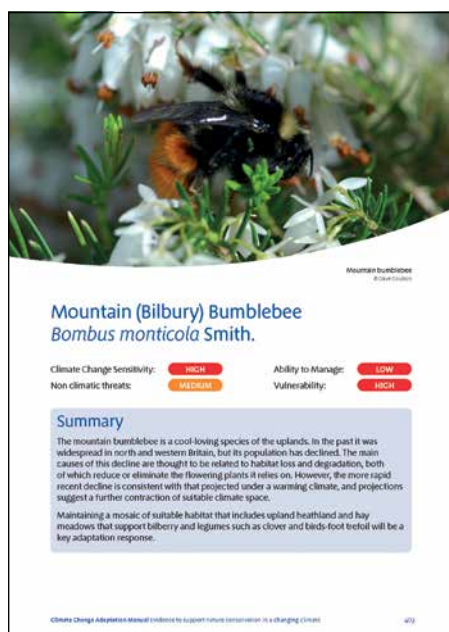


Figure 2. Example of a species case study from the Manual – mountain bumblebee *Bombus monticola*.

## Green and blue infrastructure

The importance of Nature-based Solutions to societal adaptation is increasingly recognised and our new green infrastructure section provides evidence and information on the nature-based components that can help urban as well as rural communities to adapt. Green infrastructure includes parks, street trees, and green roofs and walls as well as more natural areas; blue infrastructure, referring to water and wetland areas, is also important. Green and blue infrastructure can help us by managing increased temperatures and flooding, ensuring adequate water provision and preventing soil erosion as well as providing connection with nature. This section of the Manual describes specific issues for people such as flooding and drought, the urban heat island effect and biodiversity enhancement, among others, and highlights a range of effective nature-based actions to address them (Figure 3).

## Practitioners

The Manual is now a large compendium of information and is not intended to be read from cover to cover: different elements stand alone and can be read individually. We anticipate that the information will be useful to a variety of people, including managers of nature reserves and other protected sites (Box 1, Figure 4), conservation and land management



Figure 3. Nature-based actions to combat climate change – Green Infrastructure in Central London.

advisors, and environmental consultants. The intended audience is those who are involved in the management of land for conservation and amenity, and includes staff of local and national government, conservation partnerships, our protected landscapes, statutory agencies and Non-Government Organisations. Many will be members of CIEEM.

## Box 1. Adaptation in the management of National Nature Reserves – an example of how the Manual is used in practice.

Consideration of the impact of climate change and how to adapt to it is a key element of planning on the National Nature Reserves that Natural England manages. Management plans include an assessment of the climate vulnerability and identify the actions that can be taken to respond to the threats identified. The Adaptation Manual represents a key resource by providing a synthesis of the evidence on climate change impacts on the habitats and many of the climate-sensitive species found on reserves. Site managers use this resource in combination with their understanding of the local conditions to make an informed assessment of the climate vulnerability of their sites. The Manual also provides information on the range of actions that may promote adaptation, which again the reserve staff interpret based on their knowledge of their site.

Figure 4. Stiperstones National Nature Reserve. Photo credit Mike Morecroft.



# Feature Article: The New Natural England and RSPB Climate Change Adaptation Manual (contd)

## Lessons learnt

The focus of the first edition of the Climate Change Adaptation Manual was on habitats and the intention was always to provide more on species. One of the lessons learnt from writing the second edition was that this was not as straightforward as we had originally thought. Even for some of the species where there is considerable evidence of range contractions that suggest a climate change driver, there is very little evidence in the scientific or grey literature of the mechanisms driving this change. This in turn made the identification of appropriate responses difficult, meaning that the number of species where robust evidence could be presented was limited. This reinforces the importance of understanding and working with uncertainty when responding to climate change.

The second key lesson learnt is that the narrative around what adaptation should aim to achieve has evolved since 2014. In 2014, there was a view that building resilience would in many cases suffice. However, the accumulating evidence of the impacts of climate change on the natural world, and the slow progress in reducing global emissions means that this is evidently no longer the case. Conservation, like the rest of society, needs to move into a phase where adaptation incorporates change management. Action to build resilience will in many cases remain important, but we are increasingly moving into a world where climate change will mean that things must be done differently, whether it be accepting change or proactively directing it. Uncertainty should not and must not prevent us from taking the necessary action.

## Action going forward

The work we are doing on climate change has a strong link to our work on nature recovery and ecological networks, such as the Nature Recovery Network (please also see our Nature Networks Evidence Handbook, Natural England 2020). We are working hard with partners across the statutory agencies and beyond to plan and deliver multifunctional Nature-based Solutions for both nature and people (Figure 5).

To complement our recent publications and communicate current climate change thinking, we have recently run a series of introductory climate change webinars

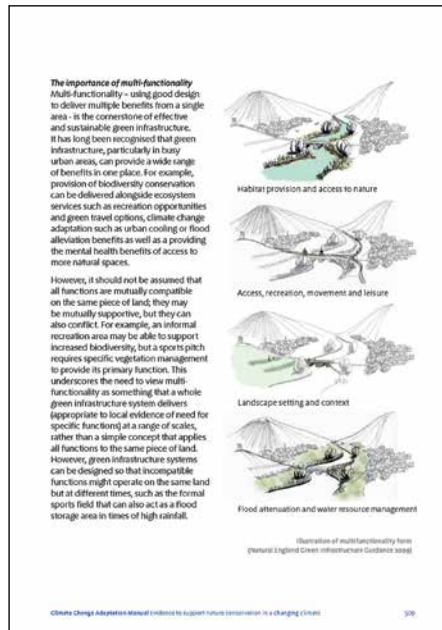


Figure 5. Multifunctional Nature-based Solutions.

covering climate change impacts, adaptation, Nature-based Solutions for Net Zero and Nature-based Solutions for people. You can find the recordings and a video introduction from our Principal Specialist, Mike Morecroft, on Natural England's YouTube channel - <https://www.youtube.com/user/naturalenglandvideo>.

## Feedback

We developed the Manual jointly with the RSPB, and we have benefited from a huge range of contributions including from the academic sector, the Environment Agency, the Forestry Commission and many other partner organisations across both editions of the Manual.

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We would welcome feedback, new information and suggestions for future development of the Manual.

The Climate Change Adaptation Manual can be downloaded from Natural England's publications catalogue: <http://publications.naturalengland.org.uk/publication/5679197848862720>.

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# A New Local Commission to Tackle Climate Change in Cambridgeshire and Peterborough

**Adrian Cannard**

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Keywords: agriculture, carbon, climate, growth, nature, resilience



View from the top of Ely Cathedral over the Cambridgeshire fens.

The Cambridgeshire and Peterborough Combined Authority has set up a new independent Climate Change Commission to identify both challenges and opportunities, and recommend actions and solutions on the full range of issues faced by the region due to the impact of climate change. The objective is to provide an authoritative evidence base for action on reducing carbon emissions and building resilience against climate change across the region over the next 30 years.

## Introduction

In November 2019, the Cambridgeshire and Peterborough Authority Board voted to establish an independent Commission on Climate Change for Cambridgeshire and Peterborough. The task of the Commission is to provide authoritative recommendations to help the region

mitigate and adapt to the impacts of climate change, enabling us to meet our commitment to eradicating net carbon emissions across the area by 2050. The hope is that it will be a shot in the arm for the debate on how best to reduce carbon emissions and will enhance our natural environment, moving us on from

examining the depth of the issue to the successful delivery of high impact solutions at scale and pace.

The Commission has been established for a year in the first instance, during which an interim report will be produced by autumn 2020 and a full report by February 2021. The full report will include recommendations about future arrangements for advice and analysis on climate change, as well as suggestions for how the area can move beyond evidence gathering to action. The Commission will want to understand how climate change mitigation and adaptation impacts are reflected in the ecological assessment and advice given on major new developments, particularly in the light of biodiversity net gain requirements.

# Feature Article: A New Local Commission to Tackle Climate Change in Cambridgeshire and Peterborough (contd)

With the expectation of bold action at the forefront of its review, the focus of the Commission will be how we can build on, and take further, work already done to reduce reliance on fossil fuels and protect and expand our green spaces. For example, £2.9 million has been made available to local authorities for additional cycling infrastructure, and we continue to advance delivery of the Cambridgeshire Autonomous Metro, a fully electric transport system that is forecast to take thousands of cars off the roads every day. Enthusiasm and demand from the public for definitive government action to protect nature and invest in greener modes of travel appears to be gathering pace. A poll of around 2000 adults carried out by YouGov for the Royal Society of Protection of Birds in May 2020, assessed the importance of nature during and in our recovery from the coronavirus crisis in England. The survey found 4 out of 5 people to be in favour of the Government increasing spending on the number of accessible, nature-rich spaces in the UK (RSPB 2020). Cycle-to-work schemes have seen a 200% increase in the number of bicycle orders and car use has dropped 40% since February as more people work from home. At both a local and national level, large-scale government recovery plans present an opportunity to introduce more green measures, which should be capitalised on.

## The Commission

The Commission is independent and will be chaired by Baroness Brown of Cambridge, who also serves on the national Committee on Climate Change. The 12-strong commission will feature a broad spread of expertise, including at least four members each from business and the voluntary and community sectors.

The Commission is supported by a Management Group and a Technical Group. The Management Group includes senior officers from local authorities in Cambridgeshire and Peterborough. The Commission's reports will be public, and the Commission may engage the public in its discussions with stakeholders.

## Objectives

The Commission will conduct independent analysis into economics and policy, and

engage with a wide range of organisations and individuals. It will monitor progress across the area in reducing emissions and achieving carbon budgets and targets, and provide independent advice to businesses and the public sector on setting and meeting carbon reduction targets for Cambridgeshire and Peterborough, and preparing for climate change.

## Challenges and local action

In the Cambridgeshire and Peterborough region, there is staggering diversity, from the high-grade agricultural areas of the Fens in the east, to the rapidly growing industries of Peterborough in the north, and to the knowledge-based economy and international businesses of Greater Cambridge in the south, which is why it makes sense to have a strategy that is locally developed. The 2018 independent economic review chaired by Dame Kate Barker highlighted the area as a global powerhouse of innovation in bioscience and digital communications (with companies such as AstraZeneca, Amazon and Microsoft all located here) (CPIER 2018). Combined with outstanding academics and research scientists, the practical expertise of our farmers and businesses, and our community's commitment to a sustainable future, the area is well placed to take the lead on testing and implementing practical solutions to the climate emergency.

The area has thriving agriculture, particularly in the Fens, yet this industry faces risks around water supply and changing weather patterns, whilst many areas are vulnerable to soil erosion and increased flooding. To help address these challenges, the Cambridgeshire and Peterborough Combined Authority provides direct support to agri-tech companies looking at new ways of farming and food production. The area is already a focus for the development of climate-resistant crops, including research at the National Institute of Agricultural Botany (NIAB), the UK's fastest growing crop science organisation, headquartered on the edge of Cambridge. The Commission will also look at current agricultural practices and ways to improve land management, within the context of the Government's 25 year Environment Plan and emerging Environmental Land Management Scheme.

Addressing the issue of greener transport is complex, with many people living in rural areas currently reliant on private cars and our cities suffering from congestion. The Combined Authority is bringing forward an extensive system of zero-carbon public transport - the Cambridgeshire Autonomous Metro - using electric vehicles that will serve large parts of both rural and urban areas. We are also examining the local infrastructure needed for electric vehicles as the Government phases out existing fossil fuel engines.

As a high-growth region with inward migration and significant infrastructure and housing developments underway, there is a pressing need to ensure that all new developments are sustainable, while also ensuring that the existing stock of housing is made fit for a zero-carbon future. Already, some local communities are experimenting with low carbon power systems to take them off-grid including Swaffham Prior, a village in east Cambridgeshire which is implementing a village ground source heat pump.

There are also great opportunities both for businesses and residents to benefit from leading the way in the transition to a greener future. This includes pressing ahead with improvements to digital infrastructure and broadband provision, for example, to enable more people to work from home, thereby reducing journeys and carbon emissions.

In addition, the Combined Authority is committed to doubling the amount of high-quality wildlife habitat and greenspaces from 8.5% to 17% over the next 30 years (Box 1). By building environmental net gain into economic growth, we aim to maintain and enhance biodiversity and secure better access to greenspace. This will improve the health and wellbeing of our communities and will contribute to better air quality, carbon sequestration and integrated water management, ultimately helping to address climate change.

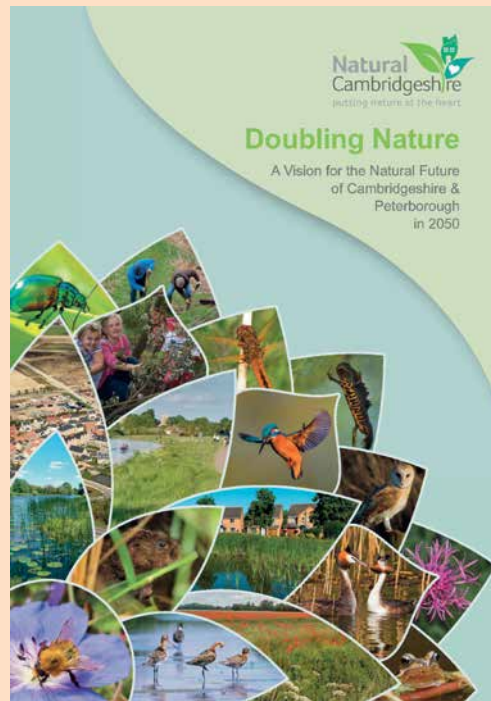
## Outcomes

The Commission on Climate Change for Cambridgeshire and Peterborough will identify both challenges and opportunities in the area and recommend actions and solutions on the full range of issues



**Box 1. Working as a partner in 'Natural Cambridgeshire', we are supporting action to increase the amount of green space for wildlife and people in the following ways:**

- Ensuring new housing and workplace developments incorporate high quality green and blue infrastructure providing multiple benefits for people and the environment
- Encouraging at least 25% of existing property owners to incorporate wildlife friendly features in their gardens, buildings and land
- Securing access to high quality natural green spaces within 300 m of everyone's home
- Enlarging two areas of existing natural fen (Great Fen & Wicken Fen Vision), as the core of a proposed UNESCO Biosphere together with the Nene and Ouse Washes
- Increasing tree cover and the network of woodlands and hedgerows within and around our towns and cities, and on the clay lands of South Cambridgeshire, Huntingdonshire and west of Peterborough
- Expanding the flower-rich grasslands on the limestone plateau west of Peterborough, and on the chalk downs at the southern fringes of Cambridge
- Enhancing and extending the meadows of the Nene, Ouse and Cam river valleys
- Extending wetlands either side of the Ouse and Nene Washes
- Creating natural habitats by restoring mineral workings, including the gravel workings in the Fens
- Ensuring that at least 90% of our richest wildlife areas are in good ecological condition.



Taken from Natural Cambridgeshire's leaflet 'Doubling Nature – A Vision for the Natural Future of Cambridgeshire & Peterborough in 2050'. <https://naturalcambridgeshire.org.uk/wp-content/uploads/2019/07/Doubling-Nature-LR.pdf>

faced by the region due to the impact of climate change. It will also look at how the Combined Authority's commitment to doubling the amount of high-quality wildlife and green spaces can assist in tackling climate change and bringing other benefits.

The recommendations will be considered by the Combined Authority and its partners and will help to provide an authoritative

evidence base for action. This will include implications for nature within the future infrastructure programme of the Combined Authority. If effective, both the actions and this model could be replicated in regions across the UK, helping the nation to build a network of locally applied strategies for reducing carbon emissions and building resilience against climate change over the next 30 years.

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**About the Author**



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# Insights From a Decade of Monitoring a Marsh Fritillary Metapopulation in South Wales

## Part 2: Results

Keywords: data management, devil's-bit scabious,  
invertebrate surveys, Lepidoptera

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Jacobs

A baseline monitoring strategy was established in 2008 to record trends in a metapopulation of marsh fritillary *Euphydryas aurinia* associated with the Blaen Cynon Special Area of Conservation (SAC) in South Wales, potentially threatened by a road widening scheme. The aim was to assess the status of the marsh fritillary metapopulation and inform impact assessments and mitigation design with regard to the A465 road scheme development. Habitat mapping, larval web counts and adult counts have been undertaken annually over the last 12 years at ten sites. Part 1 of this article (published in the June 2020 edition of *In Practice*) discussed the ecology of marsh fritillary and the method of data collection. Part 2 considers the results of the monitoring strategy and discusses how they have influenced the proposed mitigation strategy to avoid adverse effects on the butterfly during the construction and operation of the road widening scheme.



Marsh fritillary *Euphydryas aurinia*.

### Introduction

The aim of the monitoring programme was to provide a robust baseline of conditions and give an understanding of local trends to inform subsequent mitigation strategies, including but not limited to new habitat provision along the proposed road scheme. Annual monitoring over a long timeframe is particularly important where the numbers of the target species fluctuate widely. A summary of the results of the monitoring programme is provided.

Marsh fritillaries exist in metapopulations whose survival depends upon patches of suitable habitat within which there is periodic extinction and re-colonisation, i.e. areas where not all the habitat is occupied by the butterfly all of the time (Warren 1994). In South Wales, marsh fritillary relies on damp neutral or acid grasslands known as 'rhos pasture' (a generic term that

includes marshy grassland, purple moor grass, and rush pasture and wet heath), which includes tussocky vegetation and the presence of devil's-bit scabious *Succisa pratensis* plants. The butterflies lay eggs on devil's-bit scabious and the emerging caterpillars feed exclusively on the plant.

Marsh fritillary is a mobile species and although the Blaen Cynon SAC has a definitive boundary, the metapopulation of marsh fritillary lives across a wider area. This is referred to in the conservation objectives of the Blaen Cynon SAC, which defines the core metapopulation area as being within 2 km of the SAC boundary and sets a target of 200 webs per hectare of suitable habitat within the SAC for at least one year in six (Countryside Council for Wales 2008). The Upper Cynon Valley Functional Landscape Area is an additional, wider, dynamic area which comprises the functional distribution of

marsh fritillary butterfly habitat centred on 2 km concentric rings around records of the species, creating one large functional landscape (Figure 1).

The ten monitoring locations were chosen as representative habitats of those impacted by the proposed scheme within the different metapopulation areas along the existing A465 between the A4060 junction (Dowlais Top roundabout) in the east, and the Rhigous roundabout south of Hirwaun, in the west. The monitoring strategy records trends in the metapopulation through 1) habitat quality mapping (as defined in Table 1); 2) larval web counts; and 3) adult counts, with data collected on an annual basis. The detailed methods are described in the companion article (Emery *et al.* 2020).

## Monitoring results

### Habitat quality

Table 2 summarises the results of habitat quality monitoring for marsh fritillary at each site. Note that the sites vary from 1.2 ha to 66.5 ha. Site 1, the Blaen Cynon SAC, is solely monitored by Natural Resources Wales who do not record habitat suitability annually. Suitable habitat in Table 2 is the sum of Suitable (Undergrazed), Suitable (Overgrazed), Suitable (Sparse) and Potential Rank habitat but excluding Good Quality habitat and unsuitable habitat, (including areas of Not Suitable habitat, Scrub and Secondary Woodland).

The percentage of Good Quality habitat recorded annually varies across sites and between years. Sites 2a, 4, 4a, 6 and 6a consistently recorded over 40% of the habitat in Suitable condition for marsh fritillary, reaching a maximum of 74% Suitable habitat cover at Site 6a in 2016 and 2017. Although Site 4 consistently supported over 45% of Suitable habitat, the percentage of Good Quality habitat never increased over 6.3%. Site 6a had a consistently high percentage cover of Suitable habitat but the proportion of Good Quality habitat has declined since 2010. The key factor at both these sites appeared to be the grazing regime, which changed markedly over the 12 years of monitoring. At Site 4 there has been a consistent grazing presence all year round meaning the sward height rarely increases to a level that would generate high percentages of Good Quality habitat for marsh

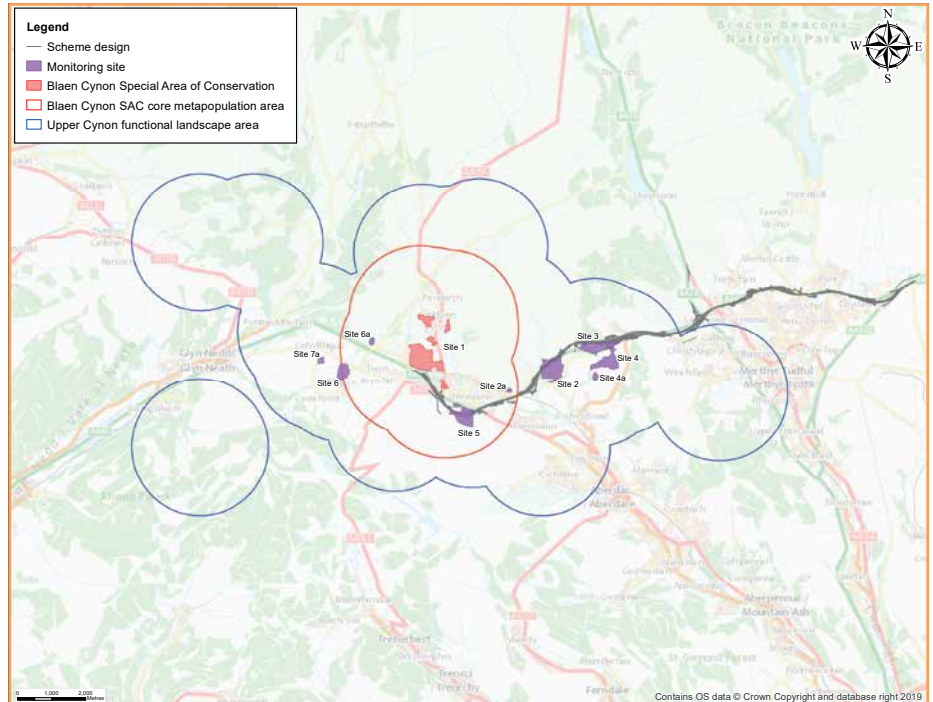


Figure 1. Blaen Cynon SAC core metapopulation area, Upper Cynon Valley Functional Landscape Area and Monitoring Sites along the route of the road widening scheme.

fritillaries. By contrast, at Site 6a between 2009 – 2015 there was no grazing at all, resulting in the sward height increasing, and in 2010 and 2011 most of the site was considered Good Quality habitat. Between 2012 and 2015 the prolonged lack of any grazing meant that Good

Quality habitat transitioned to Suitable Undergrazed habitat. In 2016, intensive pony grazing removed all Good Quality habitat that year. This demonstrates that the introduction of intensive grazing can reduce sward height and change habitat quality and structure very quickly, reducing

Table 1. Descriptions of habitat quality (as defined by Fowles 2005).

Habitat quality	Habitat quality description
Good Quality habitat	Grassland where the vegetation height is within the range of 12 to 25 cm for at least 80% of the quadrat, and <i>Succisa pratensis</i> is present within a 1 m radius. Scrub (>1 m tall) cover <5%
Suitable (Undergrazed) habitat	Grassland where vegetation height is above 25 cm and <i>Succisa pratensis</i> is occasional / frequent / abundant. Or in which sward height is between 12-25 cm and <i>Succisa pratensis</i> is at least occasional, but scrub (>0.5 m tall) covers >5% of area
Suitable (Overgrazed) habitat	Grassland with frequent / abundant <i>Succisa pratensis</i> but which is currently overgrazed such that the sward is below 12 cm on average
Suitable (Sparse) habitat	Grassland with sparse (occasional or rare) <i>Succisa pratensis</i> and vegetation height less than 25 cm on average
Potential Rank habitat	Grassland where <i>Succisa pratensis</i> is rare but which is currently undergrazed or neglected such that the sward is above 25 cm on average and <i>Succisa pratensis</i> occurs as scattered plants in a rank, tussocky sward
Scrub	Scrub up to 3 m in height
Secondary Woodland	Scrub, young trees, etc., established to >3 m height
Not Suitable	All other unsuitable habitat, not containing <i>Succisa pratensis</i>

Table 2. The percentage cover of Good Quality habitat, Suitable habitat and unsuitable habitat for marsh fritillary at 10 sites monitored over 12 years. Suitable habitat combines values for Suitable (Undergrazed), Suitable (Overgrazed), Suitable (Sparse) and Potential Rank habitat. Unsuitable combines values for Scrub, Secondary woodland and Not Suitable habitat (see Table 1). NS – not surveyed.

Site	Area (ha)	Habitat type (% of total area)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1	66.5	Good Quality	5.4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		Suitable	13	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		Unsuitable	81.6	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2	30.8	Good Quality	1	0.5	3.2	4.1	7.2	6.5	8.8	8.4	8.3	8.2	7.7	5.8
		Suitable	44	43	36.2	35.2	31.5	32.1	30.2	30.5	32.6	30.6	30.8	30.9
		Unsuitable	55	56.5	60.6	60.7	61.3	61.4	61	61.1	59.1	61.2	61.5	63.3
2a	1.2	Good Quality	NS	0	0	0	22.5	14.2	38.3	38.3	38.3	9.2	7.5	5.8
		Suitable	NS	43.3	42.5	43.4	33.3	35	10.8	10.8	10.8	40	41.7	50.8
		Unsuitable	NS	56.7	57.5	56.6	44.2	50.8	50.9	50.9	50.9	50.8	50.8	43.4
3	21.1	Good Quality	0.3	0.4	0.9	0.7	0.4	0.7	0.7	0.7	NS	0.8	0.4	1.7
		Suitable	3.4	5.2	4.8	4.9	5.4	5	5	5	NS	4.9	5.3	6.4
		Unsuitable	96.3	94.4	94.3	94.4	94.2	94.3	94.3	94.3	NS	94.3	94.3	91.9
4	21.4	Good Quality	2.5	0.8	1.6	0.4	0.9	0.9	1.7	2.4	2.4	0.9	6.3	3.5
		Suitable	49.3	56.8	54.1	53.8	52.2	52.2	51.4	63.8	63.8	52.2	46.8	51.6
		Unsuitable	48.2	42.4	44.3	45.8	46.9	46.9	46.9	33.8	33.8	46.9	46.9	44.9
4a	2.8	Good Quality	NS	2.2	7.6	0	0	0	0	0	NS	0	0	0.7
		Suitable	NS	59.4	51.7	60.8	58.2	58.2	58.2	58.2	NS	58.3	58.3	58.6
		Unsuitable	NS	38.4	40.7	39.2	41.8	41.8	41.8	41.8	NS	41.7	41.7	40.7
5	23.3	Good Quality	2.8	1.2	2.4	4.3	3.4	2.4	NS	3.1	3.4	2.8	2.8	7.4
		Suitable	26.2	30.9	29.6	23	22.5	23.3	NS	24.6	24.3	25	26.1	20.8
		Unsuitable	71	67.9	68	72.7	74.1	74.3	NS	72.3	72.3	72.2	71.1	71.8
6	12.1	Good Quality	0.2	0	0.2	0.6	1	0	3.2	4.8	0	0	NS	0.2
		Suitable	33.8	46.1	43.6	44.7	44.5	45.5	42.4	40.9	45.2	45.4	NS	45.2
		Unsuitable	66	53.9	56.2	54.7	54.5	54.5	54.4	54.3	54.8	54.6	NS	54.6
6a	2.3	Good Quality	NS	1.3	59.3	57.6	27.7	27.7	24.2	21.6	0	0	NS	NS
		Suitable	NS	74	16	16.5	45.9	45.9	49.4	52	74	74	NS	NS
		Unsuitable	NS	24.7	24.7	25.9	26.4	26.4	26.4	26.4	26	26	NS	NS
7a	2.8	Good Quality	NS	0	2.9	0	0	0	0.4	1.8	1.8	2.5	5.4	0
		Suitable	NS	34	30.2	33.7	33.7	33.7	33.4	32.6	32.6	31.2	28.3	34.4
		Unsuitable	NS	66	66.9	66.3	66.3	66.3	66.2	65.6	65.6	66.3	66.3	65.6

the prevalence of devil's bit scabious and making it less suitable for marsh fritillaries. A site may take a number of years to recover to Good Quality habitat condition after grazing is removed. This emphasises the importance of a considered and reactive habitat management plan for the long-term conservation of marsh fritillary. It also demonstrates how sites are unlikely to ever be 100% suitable for marsh fritillary due to the mosaic of habitats and structural diversity often found in these locations.

#### Larval web counts

The number of larval webs gives an indication of the breeding success of that year's adults while also providing a measure

of abundance of adults the following year. All monitored sites had some larval webs but the number varied between sites and year (Table 3). For example, larval web counts at Site 4 varied year-on-year with a high of 433 larval webs in 2015. Between-site comparisons of annual numbers of larval webs should take into account the varying size of the sites (Table 3).

#### Adult counts

As with the larval web counts, the adult butterfly counts varied between years and sites (Table 3). The smallest monitoring site (Site 2a) varied from a peak of 48 butterflies recorded in 2019 to zero in other years. Peak numbers were recorded

in 2015 and 2018 at Sites 4 and 2 respectively, although these high numbers also reflect their relatively large area.

#### Trends

Due to the large number of unrecorded biotic and abiotic variables, it can be difficult to interpret variability in habitat condition and the link to adult and larval web numbers at individual sites over many years. For example, wet and cold winters can play a significant part in the success of overwintering caterpillars, just as a damp spring can impact on the timing and success of emerging and breeding adults. The cycle of caterpillar parasitism by wasps is also important but was not investigated

**Table 3.** The number of marsh fritillary adult butterflies counted in May and larval webs counted in September each year at the ten monitoring sites. NS – Not Surveyed. Note that the size of the site will be an important factor.

Monitoring Site	Area (ha)	Number counted	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1	66.5	Adults	21	46	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		Webs	16	93	158	18	20	NS	172	220	196	372	259	275
2	30.8	Adults	2	4	12	62	15	16	316	333	20	169	391	238
		Webs	0	0	6	9	32	137	361	355	160	143	66	151
2a	1.2	Adults	NS	0	0	0	1	0	2	5	0	2	13	48
		Webs	NS	0	0	0	0	0	1	0	2	0	3	44
3	21.1	Adults	0	0	0	10	0	2	5	26	NS	11	46	3
		Webs	0	0	1	4	1	10	12	20	NS	7	9	17
4	21.4	Adults	0	11	70	84	2	28	296	435	3	55	342	97
		Webs	0	1	31	0	6	2	122	433	117	51	58	319
4a	2.8	Adults	NS	13	0	0	0	0	9	14	0	8	36	10
		Webs	NS	0	0	0	0	0	0	3	NS	0	1	3
5	23.3	Adults	0	0	0	0	0	0	0	0	0	0	7	0
		Webs	0	0	0	0	0	0	NS	0	0	NS	3	2
6	12.1	Adults	0	0	0	0	0	0	2	3	0	1	105	10
		Webs	0	0	0	0	0	0	1	0	1	1	NS	1
6a	2.3	Adults	NS	0	68	114	254	111	126	148	0	0	0	NS
		Webs	NS	0	107	151	136	332	72	54	0	0	NS	NS
7a	2.8	Adults	NS	0	0	0	2	0	0	0	1	0	5	9
		Webs	NS	0	1	0	0	0	0	1	0	1	3	0

in this study. Nevertheless, this monitoring programme aimed to assess the impact of habitat condition on the Blaen Cynon SAC marsh fritillary metapopulation as a whole by understanding how the abundance of suitable habitat affected butterfly presence and persistence.

**Web density**

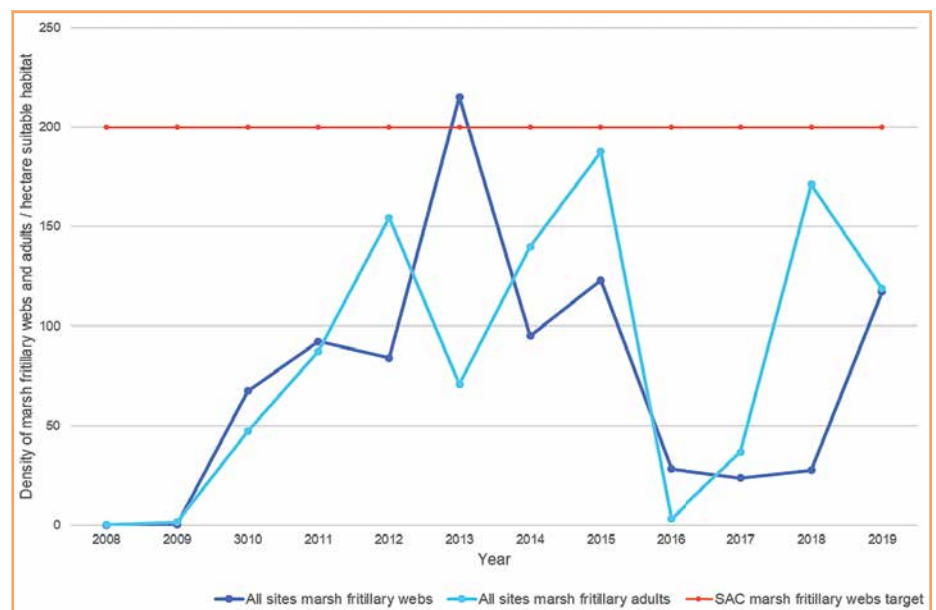
The annual density of webs (number of webs per hectare of Suitable and Good Quality habitat) summed over all monitoring sites varied over time (Figure 2). Larval web density is a measurable performance indicator for marsh fritillary populations. This is reflected in the target of 200 webs per hectare of suitable habitat within the SAC (for at least one year in six) set in the core management plan for the Blaen Cynon SAC (CCW 2008). This target was exceeded in 2013 but has remained below target since then. It will be interesting to see if the positive trend in 2019 continues in 2020, which could be evidence of a second cycle of boom-and-bust – not an unexpected event for a highly dynamic species.

**Adult density**

The annual density of adult butterflies varied across the monitoring period, ranging

from zero to 184 adults per hectare of Suitable habitat (Figure 2). Whilst adult counts are a good indicator of potential future web counts (Emery *et al.* 2020), they are incredibly variable and highly dependent

on local short- and medium-term weather conditions, which affect emergence time, length of time on the wing and peak counts. Whilst every effort is made to capture the peak adult count each year,



**Figure 2.** Survey results from annual marsh fritillary adult and larval web monitoring between 2008-2019 across all ten monitoring sites. The solid lines show how the density of adult butterflies (pale blue) and larval webs (dark blue) varied over the monitoring period, calculated per hectare of Suitable habitat (including Good Quality) available across all sites. The target of 200 webs per hectare is shown by the red line.

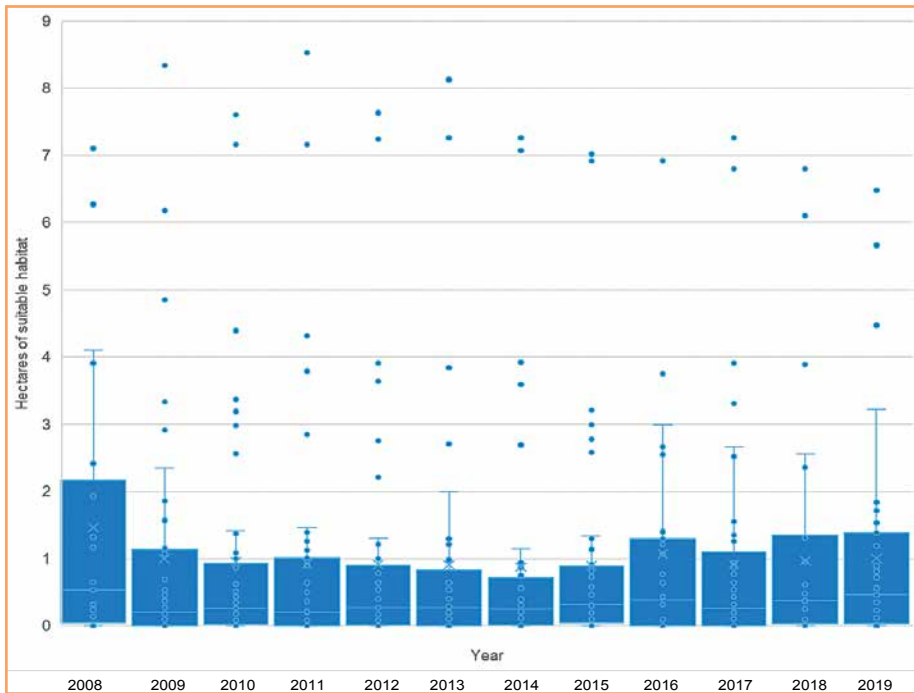


Figure 3. The box plot shows the area of the five Suitable habitat categories in hectares (including Good Quality habitat) recorded at all ten monitoring sites from 2008-2019. Each box represents the interquartile ranges of the data, with the vertical whiskers representing the highest and lowest records in the range, and the points representing data outliers. The cross indicates the mean and the line within the box the median.

the data should be treated with caution and can only give a broad indication of caterpillar overwintering success, pupation and future web numbers. A better indicator of the health of the wider metapopulation is to monitor the presence of marsh fritillary butterflies at individual sites, rather than focus on peak counts.

### Habitat

The amount of Suitable habitat (including Good Quality) recorded annually reflected localised changes at individual sites (shown as outliers in Figure 3) but the core amount of Suitable habitat remained reasonably consistent at around 1 ha per site (Figure 3,

Table 4). Table 4 gives the proportion of Suitable habitat that comprises Good Quality habitat, showing that it varies across the sites between 1 to 13% over the 12-year period.

### Mitigation

The results of the monitoring programme support the work of Gustafson and Gardner (1996), Moilanen and Hanski (1998), Thomas *et al.* (2001), Fowles (2005) and Smith (2005), who concluded that the survival of marsh fritillary metapopulations is dependent upon two main factors:

- landscape scale, extent and distribution of habitat patches; and
- habitat quality.

Based on baseline data, the road scheme mitigation strategy included retention and protection of habitat, avoidance of fragmentation, and the provision of additional Suitable habitat (defined as grassland or heathland habitat that could support devil's-bit scabious), located within the functional landscape area. As the proportion of available Good Quality habitat appears to be particularly important, the mitigation measures included:

- land specifically purchased and secured solely for the benefit of marsh fritillary,
- planting of nursery grown devil's-bit scabious plants using seed of local provenance, and
- translocation of turves of Suitable and Good Quality from under the footprint of the proposed scheme to the mitigation land.

The monitoring programme, particularly Site 4, demonstrated a probable management-driven as well as a naturally occurring variance in habitat quality over time. Therefore, additional habitat 'stepping-stones' will also be provided to link existing Suitable habitat patches together, and to the mitigation land, to help adult marsh fritillary disperse to more optimal breeding habitat should a decline occur in any particular location.

Long-term management of the mitigation habitats carried out as part of the construction and post-construction monitoring contract will help to ensure that suitable butterfly habitat establishes successfully and persists, and will include a dynamic grazing regime that encourages persistence of devil's bit scabious.

### Conclusion

Monitoring ten different sites over a period of 12 years has identified the

Table 4. Amount of Good Quality habitat recorded in different years; also presented as a percentage of Suitable habitat.

Area	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Good Quality Habitat (ha)	1.6	0.8	3.8	3.9	4.3	3.7	4.6	5.4	4.2	3.7	4.7	4.7
Suitable habitat including Good Quality (ha)	37.1	46.2	44.3	43	42.3	42.2	34.9	40.3	37.4	41.3	39.4	40.2
Good Quality habitat as a % of Suitable habitat (% of total ha)	4.3%	1.7%	8.5%	9.1%	10.2%	8.8%	13.3%	13.4%	11.3%	9.0%	11.9%	11.7%

# Feature Article: Insights From a Decade of Monitoring a Marsh Fritillary Metapopulation in South Wales. Part 2: Results (contd)

importance of habitat management to the presence and persistence of marsh fritillary populations. In particular, it has shown that the introduction of heavy grazing can reduce sward height and change habitat quality very quickly. A site may take a number of years to recover to Good Quality condition after grazing is removed. The length of the recovery period depends on the specific site hydrology, microclimate and weather conditions.

Long-term recording of changes in habitat quality over time can provide an early warning of habitat degradation and can identify causes, both generally and site-specific. This knowledge can be used to adjust management practices quickly, helping to conserve vulnerable populations. The data have been invaluable both in assessing the likely impacts on the population at risk from the road widening scheme and has informed the management and mitigation strategy before the scheme is constructed and operational. The continuation of monitoring once the proposed road scheme is operational will allow impacts on the butterfly to be assessed by comparing data from before and after development work, making allowances for patterns or trends in habitat quality or the local metapopulation demonstrated in this study.

The review of the monitoring programme has clearly indicated that habitat assessment is of fundamental importance in assessing the conservation status of species like marsh fritillary rather than the more commonly used population measurements, i.e. adult and larval web counts alone. However, long-term monitoring of adults and larval webs shows how the metapopulation responds to habitat changes, hence all three monitoring methods are required for a robust data set.

Although marsh fritillary is vulnerable throughout Wales, the local Blaen Cynon population is considered to be one of the strongest and most resilient due to the availability, extent and distribution of Suitable and Good Quality habitat. Boom-and-bust cycles are an integral part of marsh fritillary population dynamics but numbers can recover providing that good habitat condition is maintained. It is essential that sufficient suitable habitat is available every year but especially during

the vulnerable period when development work is underway in the metapopulation functional landscape.

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## Note

It should be noted that neither the authors nor their employer (Jacobs) have any rights or influence over the management of the individual monitoring sites, and that any information relating to the management of the sites is purely observational.

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# Closing the Feedback Loop: Improving Post-Development Monitoring for Better Outcomes for Bats

Keywords: bats, buildings, licensing, monitoring, roosts

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Post-construction monitoring of mitigation measures for impacts on bats from development is essential to establish compliance, apply remediation where appropriate and understand if the measures have been successful for bats. A considerable amount of time, effort and money goes into ecological impact assessment, licensing and mitigation. It is therefore surprising that systems do not always support effective compliance and enforcement, or data collation and subsequent analysis of outcomes for bats. It is also surprising that there is limited guidance available on how to conduct and report post-construction monitoring effectively. These are essential to close the feedback loop and get better at mitigation, thus better protecting vulnerable bat populations. Here we present some of the results from our Bat Roost Mitigation Project.

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Brown long-eared bat in bat box. Photo credit Daniel Hargreaves.

We focus on post-construction monitoring and, in light of systemic failings, we call for

significant reforms in England and Wales (the UK countries covered by our project).

## Introduction

Each year, over a thousand European Protected Species (EPS) licences are issued by Natural England (NE) and Natural Resources Wales (NRW), allowing derogation from the strict protection for all UK bat species under the Conservation of Habitats and Species Regulations (2017), for the purpose of development. Where a development is proposed, bat survey work informs an impact assessment and the design of suitable mitigation measures. These include methods to avoid harm and unnecessary disturbance to bats but also to provide bat roosting features to maintain the Favourable Conservation Status (FCS) of the species involved. The measures become legally enforceable conditions of the EPS licence.

Post-construction monitoring (including roost inspection and bat emergence/dawn surveys) is essential to (a) establish legal compliance with EPS licence and planning conditions, (b) apply remedial measures if the mitigation is not as specified or could easily be improved for bats, and (c) establish if the mitigation measures are successful in attracting bats back to the site and could therefore be used in future projects (Hellawell 1991). Mitigation measures are applied to protect vulnerable bat populations and it is essential that we analyse and improve their efficacy to achieve this aim.

A huge amount of time, effort and money goes into bat survey work, impact assessment, licensing and mitigation. However, we know from other research that the aims of post-construction monitoring can be unclear; methods can be inadequate; measures of success are often not defined; monitoring is not always carried out or reported; and the Statutory Nature Conservation Bodies (SNCBs) have not been equipped with adequate resources to investigate non-compliance and carry out enforcement in relation to monitoring (Stone *et al.* 2013, Lintott and Mathews 2018).

In a study of 389 cases in England, Stone *et al.* (2013) reported that 67% recommended post-construction monitoring but failed to submit monitoring reports. Monitoring was only carried out in 19% of the cases studied and in those cases the data submitted on licence return forms was inconsistent and inadequate to assess outcomes (Stone *et al.* 2013).



Artificial gappy mortise joint in new loft. Photo credit Andrew Ross.

Lintott and Mathews' (2018) UK-wide study found that monitoring reports varied considerably and often lacked key information such as exactly which mitigation features were monitored. They issued an online questionnaire and the general theme emerging from 228 responses was that monitoring can be perceived by stakeholders as an unnecessary expense and relatively easy to dispense with.

Despite its importance, it is surprising that guidance available on post-construction monitoring is limited to a few short paragraphs in the *Bat Mitigation Guidelines* (English Nature 2004). Some aims and guiding principles underpinning monitoring are also outlined in *Guidelines for Ecological Impact Assessment* (CIEEM 2018) and *Guidelines for Ecological Report Writing* (CIEEM 2017). Perhaps, therefore, some of the findings of the studies referred to above are not surprising and highlight an ongoing problem.

In 2017, the Bat Conservation Trust (BCT) was awarded funding from the Esmée Fairbairn Foundation for our Bat Roost Mitigation Project. The project aimed to collect evidence on the implementation and effectiveness of licensed bat mitigation work to inform improvements in both systems and practice, and gain better outcomes for bats. Previous research has been desk-based

but our project collected independent evidence in the field. We carried out field surveys in 2017 and 2018 at 71 sites in England and Wales, where development had been completed between 2006 and 2014. We focussed on common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, brown long-eared bat *Plecotus auritus* and the *Myotis* species. The key results from this project are reported in Collins *et al.* (2020) but that paper did not report on our findings in relation to post-construction monitoring, which is what this article aims to do. Here, we highlight our key findings and call for a reform of systems and practices.

## Methods in brief

Monitoring reports were obtained from NE, NRW, Local Planning Authorities (LPAs), ecological consultants and bat roost owners. If these were not available, and there was no evidence that monitoring had been completed, monitoring surveys were recorded as 'cancelled'. It should be noted that data extraction was complex, requiring repeat visits to Statutory Nature Conservation Body (SNCB) offices to obtain both paper and digital files. Data were subsequently extracted manually from all reports obtained and entered into our own, specially designed database.

## Implementation of monitoring

Where monitoring reports were available, we compared the proposed and implemented monitoring regimes to establish if they were fully, or only partially completed based on the following data:

- Monitoring frequency: the number of surveys
- Monitoring duration: the number of years between development completion and monitoring conclusion
- Monitoring type: daytime and/or night-time visits
- Presence of safeguards: in EPS method statements or planning conditions
- EPS licence expiry dates: whether licences expired before or after completion of monitoring (note that NE extended the duration of EPS licences in 2010 to account for monitoring work (Stone *et al.* 2013) but NRW have not done the same)
- Any remedial action proposed.

We also interviewed roost owners to collect information on attitudes towards, and understanding of, the EPS licensing process.

## Effectiveness of monitoring

We analysed surveys carried out by consultants at the baseline (or impact assessment) stage and post-construction stage. We also carried out our own monitoring of sites in the summers of 2017 and 2018 and called this the BCT monitoring stage. For each of the stages we looked at:

- monitoring type
- monitoring frequency
- bat colonisation over time.

Note that bat colonisation over time was only studied for compensatory roosts (rather than modified or retained roosts), and only where bats had returned post-construction and where the roosts had been subjected to comparable levels of survey effort at both the baseline and post-construction stages.

## Summary of results and discussion

### Implementation

From the original 71 study sites, monitoring was fully completed at 38%, partially completed at 24%, cancelled at 31% and not proposed at 7% of sites.



Bat tubes built into brick wall. Photo credit Andrew Ross.

The higher the number and the longer the duration of proposed monitoring surveys, the less likely they were to be completed. For example, the percentage of monitoring surveys concluding early or being cancelled altogether increased from 30% for one-year programmes, to 47% for two-year programmes, to 70% for three-year programmes. If the proposed monitoring included night-time visits, the likelihood of monitoring being completed also decreased. Safeguards to secure monitoring had little influence on the implementation of monitoring: 44% of sites with safeguards had the monitoring cancelled altogether (higher than the overall cancellation rate of 31%). The effect of the licence expiry date is not clear, but may be influential. Only 14% of sites specified some form of remedial action resulting from monitoring.

It is possible that cost is an influential factor (McAney and Hanniffy 2015, Lintott and Mathews 2018). Although monitoring is unlikely to represent a high proportion of the overall cost, it is the last activity likely to commence at a development site and the cumulative cost is the highest at this point.

Our interviews revealed that some roost owners were genuinely unaware of monitoring commitments, with some

assuming it was the responsibility of SNCBs or ecological consultants. Monitoring was triggered ad hoc by conscientious individuals rather than being part of an organised process. Where monitoring was cancelled, there appeared to be a lack of systematic communication between consultants, SNCBs, LPAs and roost owners.

The requirement for planning permission and EPS licences for development provides a clear incentive for roost owners to carry out bat surveys and impact assessments. Short-term measures, such as careful removal of bat roosting features to ensure bats are not harmed when works start, and longer-term measures such as roost provision are obvious in their intention. However, the purpose of monitoring is less clear.

If consultants, SNCBs and LPAs confidently recommend mitigation measures then roost owners may legitimately question why monitoring is necessary. This is particularly so when no remedial measures are proposed and the results do not feed into a wider learning process. If the main incentive is to fulfil licensing requirements, but these are not enforced (we saw no evidence of compliance checks or enforcement), the cancellation or reduction of monitoring is perhaps unsurprising.

## Effectiveness

Night-time surveys were the most effective at detecting bats in smaller, external cavities whilst smaller, internal cavity and void roosts were best detected through daytime inspection or both day- and night-time surveys.

The more survey effort expended, the greater the number of bat roosts found, up to three visits, after which this levelled off (although Froidevaux *et al.* (2020) show this is species-specific with four surveys recommended in order to be reasonably confident (to 95%) that brown long-eared bat is absent).

Bats started occupying new provisions within six months after installation and most effective provisions were occupied within two years (although our sample was biased towards smaller day roosts of *Pipistrellus* species bats). Roost occupancy did increase over a longer time period, up to approximately five years, after which numbers level off. Note that this result is based on presence only, not abundance (due to lack of data), which may be a more important measure of success.

## Recent changes in Wales and England

In Wales, NRW has a tiered system to identify non-compliance with all conditions of active licences. Simple schemes rely on the ecologist reporting non-compliance. More complex, large-scale cases with potentially significant impacts on FCS are subject to audit by external ecologists at agreed timings.

NRW introduced a new IT system 12 months ago to automatically request monitoring reports from the licensee; if they are not received the system flags the relevant case to NRW officers for escalation.

In Wales, breaches of licence conditions are investigated by the police (through a 2015 Memorandum of Understanding (MoU) with the National Police Chiefs Council, the Crown Prosecution Service, NRW and NE) and a number of cases are referred to the police by NRW each year. This system relies on the police being able to prioritise such cases. BCT's Wildlife Crime Project supports police investigations and continues to lobby for wildlife crime to be made recordable and notifiable (to the Home Office), incentivising effective and timely police investigations.

In England, NE now aims to undertake compliance action on at least 5% of the licences which are charged for. For certain licence types, where there are increased risks to species conservation or streamlined assessments are being undertaken (such as the Bat Mitigation Class Licence, which replaces the Bat Low Impact Class Licence), NE aims to check more than 5%. The aim is to ensure compliance with licences and evaluate the efficacy of licence reforms.

Monitoring and evaluation of licences are two key areas that NE is keen to focus on during further comprehensive reform of its licensing work.

The 2015 MoU referred to above identifies NE (not the police) as the investigative body for non-compliance with legally enforceable licence conditions. Natural England has recently established a new, dedicated national enforcement unit to help fulfil this role.

As our project covered Wales and England only we are not able to comment on the situation in Scotland and Northern Ireland.

## Recommendations

Data collected through the licensing process holds huge potential to increase our understanding of how to protect bat populations during and after development. However, there is currently no effective mechanism to collate baseline and monitoring data to subsequently analyse outcomes for bats and there is little guidance for consultants on effective monitoring. Although both NRW and NE have recently introduced better systems for compliance and enforcement, we would like to see continued assessment of their efficacy. We therefore make three recommendations below.

Firstly, we call for NE and NRW to reform the way that licensing data are collected, allowing consultants to enter data into a database when they apply for a licence, during the development process and following completion of post-construction monitoring. The data should be subject to an automated validation process to ensure all relevant fields are completed and in the correct format. An automated system should be built-in to prompt monitoring at the appropriate time and follow-up if monitoring data are not submitted by a given deadline. Although NRW now trigger reminders for monitoring, the data system still does not allow analysis of outcomes.



Bat boxes.

Secondly, we call for both NE and NRW to continue to improve and assess the impact of new compliance and enforcement measures. A very clear message needs to be sent out to stakeholders that non-compliance with legally binding licence conditions has consequences.

Finally, we recommend that CIEEM's new *Bat Mitigation Guidance* (in production, with BCT and the SNCBs on the Advisory Board) includes the following elements:

- What the purpose of monitoring is.
- That the purpose and importance of monitoring to bat conservation should be clearly communicated to all clients.
- That a clear rationale and methodology for monitoring should be included with all licence applications, including what actions (if any) will be triggered by different monitoring outcomes and how success will be defined and measured.
- That more formalised systems should be put in place by all consultancies to ensure that monitoring commitments are fulfilled.
- That indicative fees for all work associated with an EPS licence (including monitoring) should be provided up-front to provide clarity to bat roost owners regarding their financial commitment to the project.
- That night-time monitoring surveys should be carried out for external cavities and daytime (or both night and day) monitoring surveys for internal cavities and voids.
- That if the purpose of monitoring is to establish presence or absence, a sufficient number of monitoring surveys should be carried out (3-4 emergence surveys, depending on species, Froidevaux *et al.* 2020). Ultimately, the purpose and aims of the monitoring should define the methodology and proportionality is an important consideration.
- That monitoring should be carried out in the first few years following completion of development (particularly for day roosts of small numbers of bats), and careful consideration given to whether monitoring over a five-year period would be justified, for example for higher-status roosts (e.g. maternity and hibernation).

## Conclusions

We have put forward three clear recommendations for (a) better management of licensing data to allow easy analysis of outcomes for bats; (b) further improvements to identify non-compliance and ensure enforcement of legally binding licence conditions; and (c) improved guidance on monitoring. Better management of licensing data will provide a hugely valuable data resource for NE, NRW or other researchers to analyse conservation outcomes for bats of different species, for different types of mitigation and in different settings. This will close the feedback loop, steer future practice and see improvements in the protection of bats affected by development projects. Increased enforcement of licence conditions will send out a clear message to stakeholders that EPS licences should be taken seriously or there are penalties to pay. Finally, more guidance is needed on monitoring and we are glad to say that this is already underway.

### About the Authors



Jan Collins has been Head of Biodiversity at BCT since 2013, following over ten years in ecological consultancy. She is the editor of *Bat Surveys for Professional Ecologists Good Practice Guidelines 3<sup>rd</sup> edition* (and is currently working on the 4<sup>th</sup> edition) and sits on CIEEM's Advisory Board for the Bat Mitigation Guidelines update.

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# A View from Some of our Patrons on the Climate Emergency and Ecological Crisis

Part of the Action 2030 Project



As I look out of my skylight window at the 50 mph gales and the horizontal rain devastatingly lashing our crops,

I have to admit, I'm scared. I'm scared at the lack of action from global governments on climate change and nature degradation. I'm scared of the short-term thinking that means politics seems unable to rise to the challenges ahead, whether they are linked to the rapidly deteriorating climate, or the nature catastrophe where the loss of species is rising annually. But being scared doesn't help. That way lies despair and inaction.

I am also an optimist and remain hopeful that, in the words of Donella Meadows: *"There is just enough energy, enough material, enough money, enough environmental resilience and enough human virtue to bring about a planned reduction in the ecological footprint of humankind; a sustainability revolution to a much better world for the vast majority."* For our own sanity and in the interests of future generations, we all have a purposeful part to play in creating a better world. Now is the time to collectively provide the evidence of solutions to biodiversity loss. CIEEM members are better placed than almost anyone else to do that and need to shout loudly about what works. Let this moment become an evidence-based movement for change for which current and future generations will be grateful.

**Jane Davidson was the Labour Assembly Member for Pontypridd and the Minister for Environment, Sustainability and Housing in the Welsh Assembly Government until May 2011, and is the author of #futuregen: Lessons from a Small Country, the story of why Wales was the first country in the world to introduce legislation to protect future generations.**



Over the past 30 years the Institute has established itself as the leading professional body in the field of ecology and environmental management. The fact that it received its Royal Charter in 2013 speaks for itself. It has had an ever-increasing role in addressing the key environmental issues facing humanity, namely climate change and loss of biodiversity. Contributions have been made at many levels, from individual members working on specific local schemes, to the whole Institute advising national agencies and government. We have had an increasingly powerful voice. Much work has been done to develop ecological adaptations to cope with climate change that is either already underway or can be confidently predicted. But I have a major concern. Are we as an Institute doing enough to address the root cause of climate change?

We know that warming of the atmosphere is happening as a consequence of increased levels of greenhouse gases being released through combustion of fossil deposits of coal, oil and gas. The science is absolutely clear. The average concentration of carbon dioxide in the atmosphere has risen from about 280 ppm at the onset of the industrial revolution to 412 ppm today. This represents a rise of 47% above the pre-industrial level. At no time during the past 800,000 years has the average CO<sub>2</sub> concentration exceeded 300 ppm. That includes major climatic fluctuations of the Quaternary ice age. The last time atmospheric CO<sub>2</sub> concentration exceeded 400 ppm is thought to be more than three million years ago. Average temperatures then were 2-3°C higher than our pre-industrial climatic norms.

Despite numerous attempts by the United Nations since 1992 to gain international agreement on emission reductions the harsh reality is that global levels of atmospheric CO<sub>2</sub> have continued to rise unabated every

year. Pledges made by individual countries in 2015 to reduce their future emissions fall far short of what is needed to ensure that the increase in average global temperature does not exceed 1.5°C. The problem is, without question, very real and very urgent. It is the greatest problem facing humanity and will have devastating effects on global ecology if we do not deal with it.

During the past two years there has been a significant shift in public attitudes, recognising that we face a 'Climate Emergency'. Young people especially have been motivated to take action, influenced directly by Greta Thunberg whose plain speaking and steadfast refusal to accept further delay has had a profound effect on many people. The climate emergency is at last being recognised by governments of many countries. The Institute could learn from this. I suggest there is a need to challenge the 'wilful blindness' exhibited by wider society, and we should encourage younger generations in their quest to find more rapid solutions. Finding new ways of engaging with young people should be a top priority for Action 2030. Perhaps it should be Action 2025. The Institute should issue a powerful statement advocating the maximum possible action, with examples of specific measures, to reach zero emissions in the shortest possible time. Opportunities to influence global decisions will exist at COP 26 next year when the UK is in the Chair. The Institute must ensure that its voice is heard.

**Professor David Goode is an ecologist and visiting professor at University College London. In the past he has been the Head of Environment for the Greater London Authority, Director of the London Ecology Unit, Senior Ecologist with Greater London Council, and Assistant Chief Scientist with the Nature Conservancy Council.**



It is impossible to argue against CIEEM's admirable (and essential) objective of making all its activities carbon neutral by 2030, not least by promoting nature-based solutions that simultaneously promote carbon storage in ecosystems and enhance biodiversity. Whether wider society will accept the idea, and in particular whether governments will, is a moot point as we emerge from COVID-19 and strive to return to 'normality'. I can only hope for the best, but fear for the worse. And even if societies head off in the right direction, it will be far from easy. Consider a specific dilemma, a deep worry that I have not so far seen articulated anywhere. I am fortunate to Chair the Oversight and Selection Panel of the Endangered Landscapes Programme, funded by Arcadia and administered by the Cambridge Conservation Initiative (see [www.endangeredlandscapes.org](http://www.endangeredlandscapes.org)). This

ambitious, European-wide \$30 million programme seeks to reverse the decline in biodiversity, enhance ecosystem services and support local economies, the latter primarily by promoting ecotourism across some of Europe's most spectacular but often poorly known surviving wilderness areas. Ecotourists, green tourists, whatever we call them will bring money and jobs and are a central plank of the business plans of many of the sites. Nothing unusual about that; they are at places throughout the world, where we either use nature (through green tourism which provides much-needed jobs for local people with few alternatives) or we lose it. But tourists have to get there, and mostly they will fly, and then drive; electric cars can replace petrol and diesel cars, but planes are planes and flying, particularly long-haul, is terrible for the climate. On the face of it, the desire to conserve and enhance the living world through ecotourism, and

the desire to become carbon neutral look incompatible. Sometimes you can take a train, but mostly that alternative doesn't exist, or is so inconvenient as to be a non-starter for most people. I have no idea how to square this circle; but somewhere in the huge pool of talent that is CIEEM, somebody may have a solution.

**Professor Sir John Lawton FRS is a population biologist with research interests in birds and invertebrate populations. He founded the NERC Centre for Population Biology at Imperial College's Silwood Park and became Chief Executive of NERC in 1999. He was Chair of the Royal Commission on Environmental Pollution from 2005 until its cessation in 2011. Sir John led the review group that resulted in the publication of the influential *Making Space for Nature* report.**



Events over the past year have opened up unprecedented opportunities for those who care about climate change and biodiversity, and recognise the interlinked nature of the two big global challenges. Climate change was thrown into high profile by last summer's marches and Greta Thunberg. The delay of the COP 26 summit has meant more time to build international momentum. The level of commitment amongst young people to solving the climate change and biodiversity challenges has never been higher. COVID-19 has shown to many people who hadn't previously even thought about it how important open greenspace and nature is for health, physical and mental. Corporates are clear that not to engage with these issues is bad for business, both in impact and reputation. In the UK, governments are making big public commitments to both climate and biodiversity, with such mechanisms as the 25-Year Environment Plan and its targets, the Climate for Nature Fund, new agriculture and fisheries support schemes, tree planting targets and equivalent policy commitments in all four UK nations. Local government was stepping up to the plate, though COVID-19 has

meant that they don't have the bandwidth or the resources right now.

CIEEM members are well placed to make a real difference in grasping these opportunities. They have highly valuable and unique skills that are needed by and should be offered to all the decision-makers and players; they can act as a conscience in their dealings with clients or their organisations, knowing that there is a wave of public and ostensibly political support. CIEEM members can hold their clients or decision-makers to account against the Green Recovery agenda, with real 'Build Back Better', not just 'Build, Build, Build'! For the first time in 30 years, we environmentalists are the voice of the mainstream, something that has not been the case since the halcyon days of the Rio Earth Summit. I remember it well. I was the brand new CEO of the RSPB when it happened and I thought this was how it was going to be forever, on the side of the angels! So we need to be brave and bold, to show how our skills are vital, to be the embodiment of the principles and practice we want to see others embrace and above all to be focused, forensic and effective. Every small win builds for big change. Don't take no for an answer. What we do

now in this time of opportunity needs to burn like a beacon for the next decades and the next generations. Go for it!

**Baroness Barbara Young of Old Scone is a member of the UK House of Lords. She has been the Chief Executive of Diabetes UK since 2010. Before joining Diabetes UK, she was involved in the establishment of the Care Quality Commission. Barbara's many previous roles include CEO of the Environment Agency, CEO of the RSPB, Chair of English Nature, and Vice Chair of the BBC.**

### Action 2030

In September 2019, CIEEM declared a climate emergency and biodiversity crisis – but a declaration means nothing without action. That is why we launched Action 2030: a project which sees us reaching net-zero carbon emissions by 2030 and leading the way for our profession in taking urgent action to address the climate emergency and biodiversity crisis.

Find out more at:  
[www.cieem.net/action-2030](http://www.cieem.net/action-2030)

# Sustainable Environmental Solutions in Ecology

Part of the Action 2030 Project

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Upper Wharfdale Natural Flood Management.

## Introduction

As environmentalists we constantly strive to challenge and improve upon our impact on the planet in both our personal and professional capacities. When we start to consider sustainable choices we can make when undertaking our work, it is easy to fall down a rabbit hole of overwhelming and conflicting information. Or maybe there are more sustainable options already available that you hadn't yet discovered? This article aims to highlight potential

alternative sustainable activities and materials that can be used and intends to start a wider discussion on areas for future research and improvement.

Plastics in particular tend to be relied upon for their resilience and strength, which is essential for them to withstand repeated use across a full season. As always, challenging their use is essential. Using the basic concept of Reduce, Reuse, Recycle – is that item really necessary?

Could the activity completed in a different way to avoid the use of resources? Is there a more sustainable alternative that you could purchase instead? Does it need to be completed at all?

## Gloves

One simple change that environmental professionals can make is to utilise biodegradable gloves that break down in a few years rather than 100s of years.



However, one must be mindful of the issue of large-scale disposal into landfill - which can cause the build-up of natural gases. Therefore, could a longer lasting PPE alternative be used instead, such as FSC Certified natural rubber gloves which also have the benefit of being compostable? Of course, with the recent coronavirus pandemic and the necessity for strict hygiene practices in place, the risk assessment process must ensure that reuse is safe and appropriate.

### Fencing

Temporary herpetofauna fencing using standard polythene is another single use item that has longer lasting and sustainable alternatives. The initial outlay for semi-permanent fencing is more expensive and uses more plastic in its production, however it can be sourced from recycled materials and can be reused multiple times. Consideration of the recycling or reusing of herpetofauna fencing within the Construction Environmental Management Plan (CEMPs) is a great place to capture this requirement. Clients are more likely to be receptive to increased costs if provided with a strong environmental and sustainable case for doing so. As such, it is important to highlight the benefits clients can gain, which include the ability to reduce their carbon footprint, promote their sustainable practices and long-term cost savings through the reuse of materials for multiple seasons or sites. If we do not ask, we cannot effect real change.

### Dormouse surveys

A simple alternative to utilising wire or cable ties for securing dormouse tubes is the use of Velcro straps. Velcro can be used across multiple seasons and has the added benefit of easy removal when checking tubes. Biodegradable marking tape for tagging vegetation is also available.

### Great crested newt surveys

In recent years, the endorsement of eDNA survey techniques has reduced some of the requirement for plastic bottles for bottle trapping surveys. A simple (and free!) way to reduce the plastic for these surveys is to utilise previously used bottles. Advance preparation, storage and appeals for bottle donations is required, but the reduction of cost and unnecessary waste of using new bottles generally outweighs this effort.

### Tree guards

The use of plastic tree guards is commonplace, and far too often they are left in place to litter the natural environment. It may be possible to consider alternatives, such as not to provide tree protection at all, and to simply replace or accept a low level of plant loss, however there will be instances where this is not feasible. There is a growing concern from the use of 'bio-plastic' guards made from polylactic acid (PLA), as these do not readily breakdown in the natural environment. More sustainable alternatives are available such as 100% recycled cardboard guards, which fully decompose, no plastic clips or ties are required to secure them and they can be left in place to completely decompose.

### Badger bait marking

Perhaps one of the most problematic activities that ecologists undertake in the field is the use of badger bait marking pellets when determining territorial boundaries of different badger groups in an area. Small 2 mm food grade plastic pellets are used, which are harmlessly passed through the badger's system. This results in millions of microplastics being released into the environment each year. To date, it is unclear if there are any suitable alternatives that could be used such as biodegradable pellets. There is an overwhelming feeling amongst ecology professionals that an alternative is long overdue. Have you found an alternative solution or have an idea to share?

### Get involved!

The suggestions presented within this article are in no way exhaustive and are predominantly focused on ecology; however, we must work to share ideas to cut resource use and emissions wherever we can in the profession if we are to meet net-zero targets and address the climate emergency and biodiversity crisis. CIEEM's Action 2030 Working Group would love to hear from you if you have any additional ideas for reducing waste, single use products or micro plastics that can be introduced into our working practices. Please let us know on our Linked In group here: <https://www.linkedin.com/groups/4306428/>.

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Find out more at:  
[www.cieem.net/action-2030](http://www.cieem.net/action-2030)

### About the Authors



Ria Monckton is a Chartered Environmentalist with a background in ecology and acoustics but is predominantly an environmental coordinator undertaking

Environmental Impact Assessments. She participates and leads sustainable improvements within her office, significantly reducing the amount of paper use, waste and electricity usage. Ria strives to challenge her working practices and continuously improve and encourage sustainability in both her personal and professional capacities. She is a member of CIEEM's Action 2030 group.

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Rachael Maddison is a consultant ecologist who has taken an interest in educating farmers on the incorporation of agroforestry management practices on

their farms. Rachael also focuses on sustainability within her organisation, sharing tips for a more sustainable Christmas and is involved in presentations on environmental issues. She is also a member of CIEEM's Action 2030 group.

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# Sustainable Transport in the Ecology Sector – Finding a Greener Way

Part of the Action 2030 Project

**Tamsin Morris** CEcol CEnv MCIEEM  
Walking-the-talk

**Jean Hamilton** MCIEEM  
Fehily Timoney and Company

Most ecologists entered the sector because they wanted to make a difference and improve our environment. But with long travel distances frequently required, it can sometimes feel like we might be doing more harm than good. Over 75 of you took the time to respond to a recent CIEEM questionnaire on transport in the sector and it seems many of us are aware of this apparent dichotomy. One respondent summarised the issue succinctly:

*"I frequently think I sadly contribute more to environmental 'damage' by the huge amount of driving to-from office and to-from rural sites."*

Many of us will also have made significant changes to our lifestyles during the recent COVID-19 lockdowns, with those changes having the fortuitous by-product of helping to reduce our environmental impact. It seems there has never been a better time for the ecology sector to stop and think

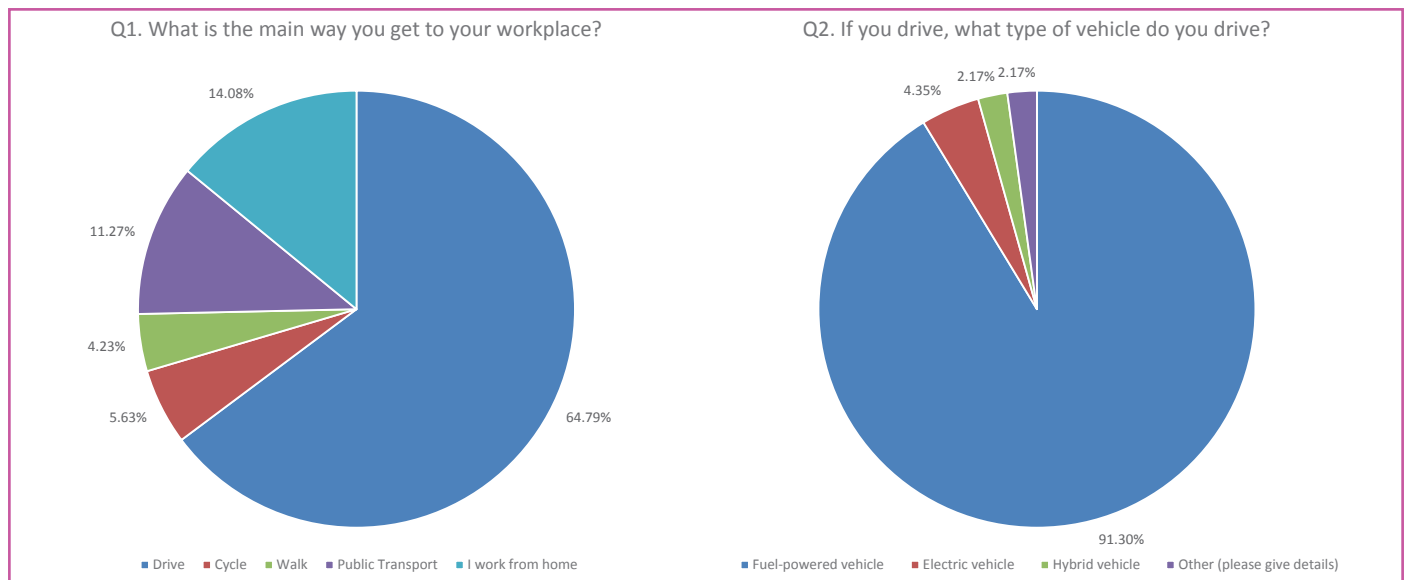


Figure 1. Commuting habits of CIEEM members who responded to our questionnaire.

about our role in the climate emergency. This article aims to generate a discussion amongst the profession about what we can do to minimise our carbon footprints despite the significant amount of travel that our work often entails.

### How to reduce emissions from our daily commute

Ecologists, as nature lovers, tend to live in the countryside, and so for many of us a commute from our homes to a base office is part of our routine. Of the survey respondents, 65% did that commute in a private vehicle, and over 90% of those vehicles are fossil fuel-powered (Figure 1). The CO<sub>2</sub> equivalent of a daily commute of an hour in a vehicle with an engine size of 1.4 L is roughly two tonnes per year (www.mapmyemissions.com), so over half of us are emitting two tonnes of CO<sub>2</sub> a year, before we've even reached the office!

Employers can play a role in encouraging their employees to use more sustainable options for their commute. We asked members to provide information on assistance provided by their employers to encourage uptake of sustainable transport options – results are shown in Figure 2.

#### Financial incentives

Financial incentives are one way to encourage people to use more sustainable transport for their commute. There are a range of tax incentives available for employers to encourage their employees to use sustainable transport options; including salary sacrifice schemes, such as the Cycle to Work scheme and the Tax saver scheme for public transport in Ireland. Over 80% of respondents said that the Cycle to Work scheme was available to them and roughly 15% had access to salary sacrifice schemes for public transport tickets.

Employers could go one step further by offering an 'Environmental Rewards Scheme' to give employees financial remuneration for sustainable transport choices. Our survey results showed only 7% of employers were currently providing financial incentives for their employees to use sustainable transport. Whilst offering a financial incentive may seem expensive to employers, in practice even a few hundred pounds at Christmas time could be a nice bonus for 'doing the right thing'.

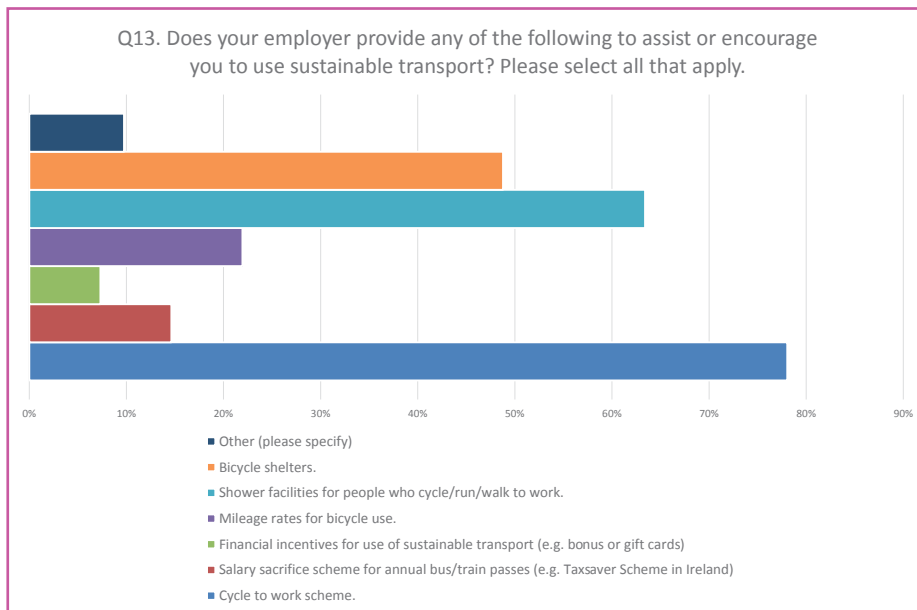


Figure 2. Incentives for use of sustainable transport, as reported by respondents to the questionnaire.

#### Practical considerations

Many respondents said that practicality and safety concerns were their main reasons for not using public transport or cycling for their commute. Whilst this is not a simple fix, employers should, when considering options for new offices, select locations that are on public transport routes and/or cycle paths. Flexible working hours would also help, as employees can make use of sometimes sporadic transport timetables or to cycle/walk outside peak traffic

hours when it is safer to be on the road. Employers could also provide facilities such as bike shelters and showers for those choosing to cycle to work.

#### Remote working

A simple way to help employees reduce their emissions is to allow greater use of home working where possible and facilitating combinations of home and office working. Respondents to our questionnaire reported that most employers allow some degree of remote working (Figure 3), but

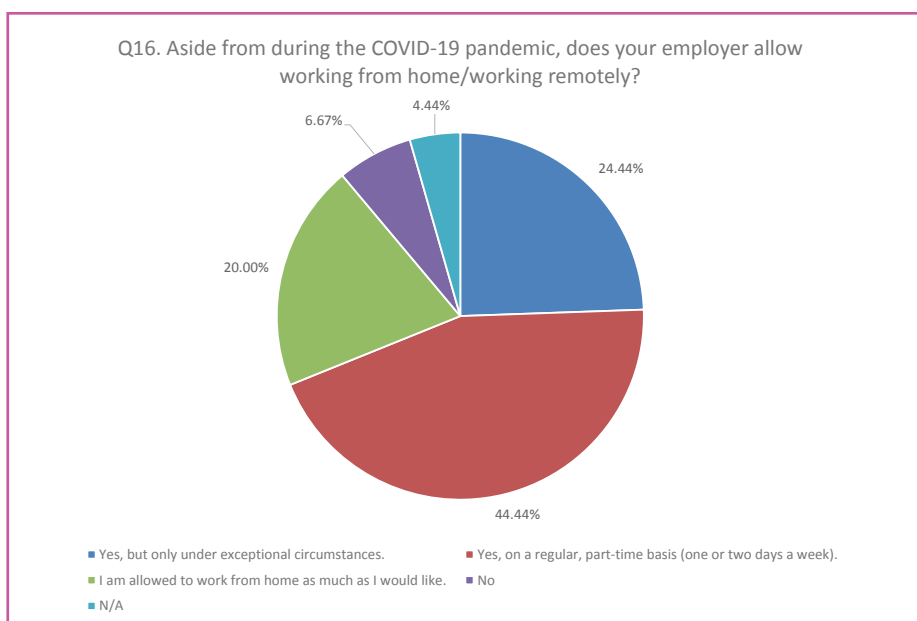


Figure 3. Remote working policies, as reported by respondents to the questionnaire.

many respondents said that they would like their employers to allow more flexibility in this regard. The coronavirus pandemic has shown us just how much home working is possible, though it might not be the right option for everyone.

However, working from home is not the only option for remote working. In recent years, there has been a proliferation of 'Shared Office Space' facilities in small towns and villages throughout the UK and Ireland. Such facilities offer workers the opportunity to get out of their houses and into a dedicated working space without the long, stressful commute. These spaces have the added benefit of keeping people within their communities and working alongside their neighbours, helping to reduce social isolation and increase community cohesion.

### The carbon footprint of fieldwork

Somewhat ironically, ecologists and other environmental professionals may be particularly high carbon emitters as a result of their work practices. Ecological

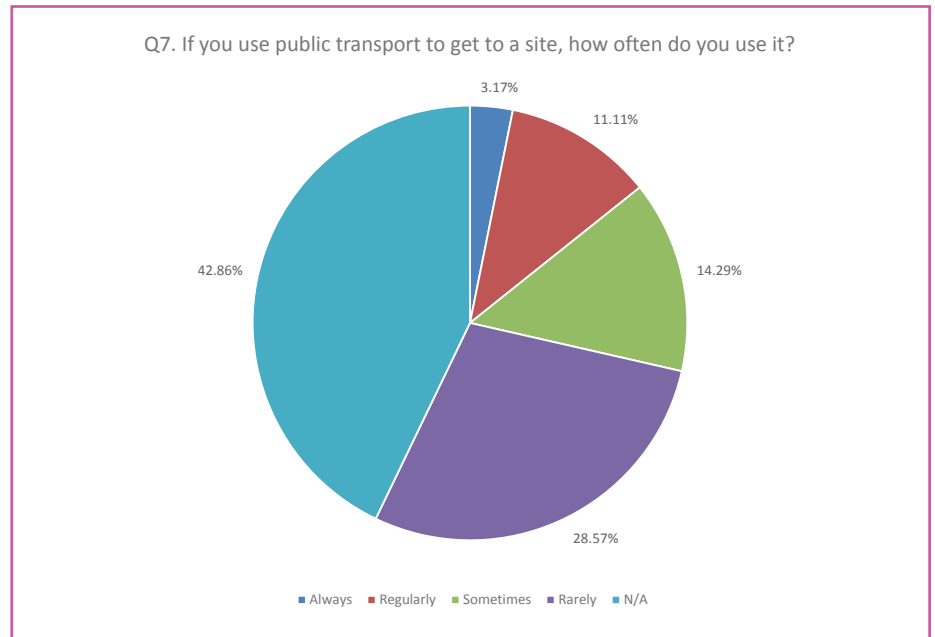


Figure 4. Public transport usage for fieldwork, as reported by respondents to the questionnaire.

survey work requires us to work in remote areas and regular trips are often required. Our survey found that over 90% of respondents travel to fieldwork in their own vehicles, the majority of which are

traditional fuel powered cars. How can we reduce the impact of fieldwork without compromising the quality of our work? Several options are considered below.



### Public transport for fieldwork

Perhaps unsurprisingly given the nature of our work, responses to the questionnaire revealed low levels of public transport usage in fieldwork (Figure 4). As many respondents pointed out, use of public transport or cycling/walking is rarely feasible for fieldwork due to the lack of options, safety concerns of walking/cycling and the requirement to transport bulky equipment. Employers may also be concerned about the additional time required to travel to site, though the use of public transport and the associated extra time required could be built into fee proposals and could be used as a selling point in tenders, demonstrating the 'green credentials' of the tenderer.

### Use of electric vehicles

Where public transport or cycling/walking is not an option, the most obvious way to reduce emissions from fieldwork mileage is to use electric vehicles. Our survey results showed that the high initial purchase cost of such vehicles reduces their feasibility, especially for low-waged workers. A lot of fieldwork is done by those starting out in their careers who are on very low wages or on zero-hours contracts. Therefore, it would be beneficial to provide incentives such as more favourable mileage rates for use of electric vehicles.

Employers could also provide an electric pool car for employees to use for field work. Whilst this may incur a large initial investment, grant aid is available in both Ireland and the UK to assist with initial vehicle purchase and the cost of installing charging points in office premises. Providing electric pool cars would also save money in the long term and will give employees a sense of well-being in reducing the emissions of their work. Many people find electric vehicles more comfortable and relaxing to drive, which will make long journeys more pleasant. Some survey respondents also expressed concern about the range, capacity and all terrain ability of electric vehicles. Whilst these vehicles may not be suitable for every single site visit, could larger 4WD vehicles be hired when required, rather than used routinely?

### Fieldwork planning – sustainability assessments

As we are all aware, good planning is critical for the safe and successful outcome of survey work. The preparation of risk assessments for fieldwork is now a routine exercise for ecologists. Could we apply the same method to reducing our carbon emissions? Consideration could be given to undertaking 'Sustainability Assessments' for fieldwork, where all options are considered for reducing emissions, such as use of local surveyors, options for use of public transport, electric vehicle charging points along the route. Some sustainable transport options might require compromises (for example, a public transport journey might take longer than a car journey), but might also have benefits (for example, it's often feasible to work on public transport, so whilst the journey may take longer, it may be more productive). Sustainability Assessments should also be combined with Health and Safety Risk Assessments to take into consideration the potential hazards of sustainable transport options, such as cycling on busy roads. Evaluating all the options for a journey and deciding what compromises we are and aren't prepared to make may ultimately help us to make more sustainable choices.

### The way forward

Both the climate crisis and the global pandemic have shown us that change is necessary and that it needs to come soon. As ecologists, we should be at the very forefront of that change. As the response to our questionnaire has demonstrated, there is a high level of interest in this topic amongst CIEEM members and here we have highlighted just a few options. To help us all find a way forward, we've set up a LinkedIn discussion post (<https://www.linkedin.com/groups/4306428/>), where we've posted the full results from the survey. This can be used as a platform to share ideas for encouraging the uptake of sustainable transport and tips for planning fieldwork to reduce your emissions. Please join in the conversation to help ecologists find their greener way forward.

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### About the Authors



Tamsin Morris has been a freelance ecologist, trading as Walking-the-Talk, for the past 12 years. She works on a wide range of projects including river restoration;

protected species; agri-environment and peatland restoration. Although based in rural Aberdeenshire and working across Scotland, she is trying to embed sustainable transport choices in her travel.

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Jean Hamilton MCIEM is a professional ecologist with over 12 years' experience in environmental consultancy and has worked on a wide range of projects

in both Ireland and the UK, including infrastructure, flood relief schemes and renewable energy developments. As a member of the Action 2030 Working Group and the Irish Section Committee, Jean is working to develop CIEEM's response to the climate and biodiversity crisis.

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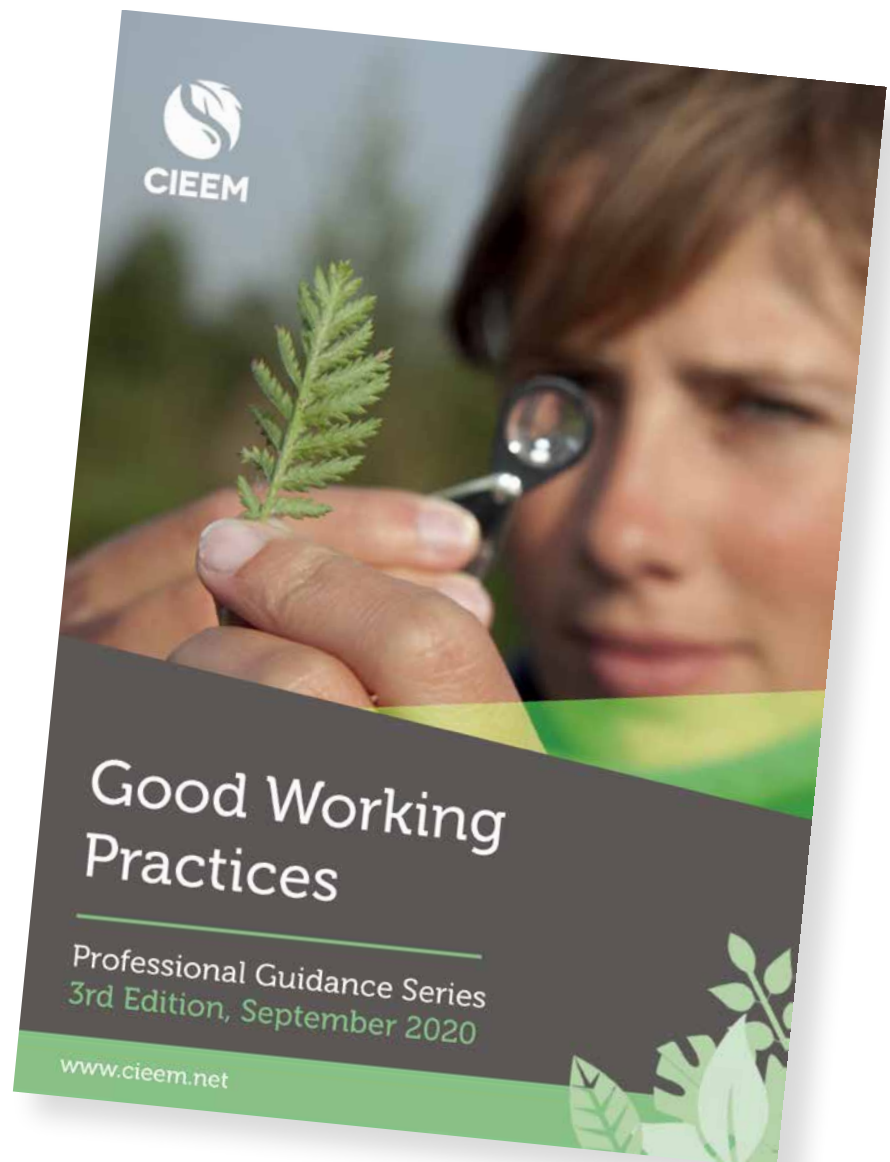
# Good Working Practices

**Sally Hayns CEng MCIEEM**  
Chief Executive Officer, CIEEM

No profession likes to be seen as unattractive, unethical or undermined by unsafe working practices. Reputations like that are hard to shift and will influence careers choices of those starting out in the world of work. Yet that is the risk that we face if we turn a blind eye to some of the issues that pervade some parts of our industry and impact negatively on the health and well-being of its members.

Does that sound alarmist? Well, very possibly if your experience is different, more positive and fulfilling. Yet we know from member surveys, blogs and anecdotal evidence that too many members, especially (but not exclusively) early career members, have experienced or are experiencing unreasonable demands from their employers. Regular long working hours, disrupted work patterns, insufficient breaks, insufficient training and irregular payments are commonly cited issues.

This month sees the publication of the 3<sup>rd</sup> edition of CIEEM's guidance on *Good Working Practices*. The need to produce an updated version arose out of the Health and Well-being Conference held in July 2019. That event highlighted the extent to which, despite the legislative framework, there are still far too many examples of poor practice on the part of employers. CIEEM's guidance is designed to provide clarity for employees and employers, not only on what the law requires but also on what good practice looks like. There is no excuse for breaching the law, but we would also argue that, morally, there is no excuse for creating working practices that are unfair, unsafe or otherwise damaging to employees.



We work in a profession that can, at times, require working unsocial hours or long hours. There is often a lot of work pressure with deadlines, seasonal constraints and challenging stakeholders. We are not unique in this regard and it doesn't matter whether you are field-based, office-based or a mixture of the two. But the key to being a profession that we can all be proud of, and can encourage others to join, is the steps we take to manage these pressures

and support our colleagues and those whom we are responsible for. Please take the time to read the updated guidance and refresh your memory regarding these key workplace issues. Whether you are an employer or an employee, a student or graduate looking for your first paid job in the sector or a team leader responsible for the welfare of your team, there is something in there for you.

# Ethical Dilemmas

This is our series of problems and conundrums that can face members during their professional practice. The purpose of the feature is to encourage you to reflect on and explore scenarios that you may face during the course of your work and to consider the appropriate ways to respond to ensure compliance with the *Code of Professional Conduct*.

In our June issue of *In Practice* we described a dilemma in which an NGO has received funding from sponsors for a piece of habitat restoration work designed to aid recovery of two rare species. This is the first such funding from the sponsor. They have indicated that they are very keen to support the work of the NGO and this is the first tranche in what could be a long-term funding relationship. You are a new project manager (PM) brought in to take over the work from a previous project manager who has now left the organisation.

You discover that the last two funding reports to the sponsor have significantly overstated the results to date. Whilst there has been a small population recovery in relation to one species, the other has shown very limited success, although there have been some positive benefits for other non-target species. The previous reports indicate much more positive results for both target species.

You are tasked with writing the next (and penultimate) report. You report your findings to your line manager who is extremely concerned about the implications of losing the funder by reporting that the project is unlikely to achieve the intended outcomes. The NGO has some significant plans for future related projects and some colleague's roles could be affected by a shortfall of funding.

What do you do? How can you mitigate the impact of this situation?

## Response

### What do you do?

1. We would suggest a **thorough review of all the project information** (project plan, risk register, internal reports, survey results, habitat work records,

etc.) to fully understand the situation (i.e. not automatically assume the previous PM had been acting in bad faith). As you are new to the project you would probably be an appropriate person to undertake this review, but an alternative would be to ask someone else to do this. This would include:

- a. Time period of project – overall length, time gone, time left; timetable for next (penultimate report).
- b. What were the specific project outputs/outcomes e.g. tight focus on target species numbers, habitat restoration area, or also wider, e.g. public engagement, advocacy, i.e. to understand the importance of the target species numbers within the overall project remit.
- c. Nature of habitat restoration work involved, i.e. activities, expected time frame for likely habitat quality improvement and hence consequential improvement of target species. Particularly whether the project period is of an appropriate length to expect measurable results – habitat improvements can take time. And whether the habitat restoration measures involved are 'tried and tested' to improve that habitat or more innovative and hence uncertain?
- d. Where the target species are in the species recovery curve i.e. are the habitat restoration measures a proven method for recovering the target species or is the project testing new/possible approaches?
- e. What surveys have been undertaken to measure changes in target species numbers, other species and habitat

condition and were used to underpin the previous two reports?

- i. Methodology used – most appropriate for each target species, the other species, the habitat, etc. surveyors with relevant knowledge/experience, time of year, etc.? Is all in line with good practice (reference CIEEM information sources)?
  - ii. Number of repetitions – e.g. do we now have more up to date data than when the previous PM submitted the reports?
  - iii. Overall limitations of the data used for reporting.
  - f. Whether anything else has changed (e.g. other impacts on habitat, weather etc.) that could explain variation in target species numbers (i.e. it might be that the previous PM reported accurately but that the situation has changed – population numbers fluctuate year on year). So it would be worth collecting some information about trends/changes in the numbers of other populations of the target species elsewhere to understand the wider picture.
  - g. Whether there were issues with the survey data itself, or whether it was rather how these were interpreted and reported (which is what the dilemma suggests).
  - h. What the NGO quality assurance process is for sign off of reports to funders.
2. If there is not a **recent survey** you should recommend one so that you can be confident of the latest situation and use this as the basis of the current report. Or if time does not permit, for the final report. It would also be worth considering if other related surveys would be useful to provide further information (e.g. on habitat condition, other non-target species, etc.).
3. If the survey data on which the last reports was based looked rigorous and it was rather an issue of how

this was interpreted you may want to look at whether this interpretation, while obviously differing from your assessment, was still within the bounds of what is 'reasonable'.

Different ecologists can give **different interpretations**, and both may be valid – just one more optimistic. If you have concerns that the previous interpretation was not within the bounds of what was 'reasonable' then consider getting a further opinion. It would be usual for a project of this nature to have a steering group (with external experts as well as NGO members) to review monitoring results and their interpretations to add rigour. If such a group did not exist, another option would be to look to establish one for the final stage of the project to bring an element of enhanced peer review.

4. If the previous PM had acted in **bad faith** then this should be referred internally (e.g. to their line manager).

### How can you mitigate the impact of this situation?

5. Implement new **NGO project review/report approval procedures** if needed.
6. Draft the penultimate report as **objectively** as possible based on the results of the analysis and any new surveys.
  - a. There is positive news to report – *"there has been a small population recovery in relation to one species" and "some positive benefits for other non-target species"*.
  - b. Be honest about the results as we see them now – explaining different interpretations (best case, more cautious), changes in situation since the previous report, etc.
  - c. Be professional – unless the previous PM has been negligent/acted in bad faith you should not be pointing the finger as this reflects poorly on the NGO and your management procedures.
  - d. Propose next steps as appropriate from the project review (e.g. new data collection to properly understand the population numbers, changes to habitat restoration works,



establishing expert steering group, extension to project period, etc.).


7. Get project report signed off internally so there is good **corporate responsibility** for its contents.
8. Ideally **go and meet the funder** before submitting the report (to establish a relationship as the new PM) or with a draft for discussion. It will be helpful to understand more about their motivations for funding this project, their interest in a long-term funding relationship; and particularly what is most important to them.

The dilemma says that "[t]hey have indicated that they are very keen to support the work of the NGO and this is the first tranche in what could be a long-term funding relationship". Funders appreciate that things can change as a

project runs, risks can turn into issues, the context may change etc. Generally, funders will be happy to agree changes to a project if there are good reasons and an open and strong dialogue with the grantee. Habitat restoration and species recovery can be a long process and having a discussion with the funder while there is still time to take action and adapt the project work is likely to be much more effective for building a potential long-term relationship than not addressing your misgivings at this stage.

So, now for this issue's dilemma.





You are an ecological consultant. In 2019 you were asked by a property developer to carry out a Preliminary Ecological Appraisal (PEA) of a small plot of land including a barn which would be demolished as part of the proposals. You completed the PEA which included an assessment of the exterior of the barn but no internal inspection (access was not available). Your PEA Report included, amongst other things, a recommendation for a bat survey of the barn, including an internal inspection followed up with dusk emergence and/or dawn re-entry surveys, if needed.

The client subsequently commissioned you to do an internal inspection of the barn to search for evidence of bats, during which you found bat droppings, including both fresh and old droppings. The droppings, their distribution within the barn, and the number of them recorded, were consistent with use of the building as a roost by a single brown long-eared bat (or small numbers of brown long-eared bat). However, during the internal inspection you also noted that there was a partitioned off area of roof void which could not be accessed to search it, but could nevertheless be accessed and

used by bats for roosting. The status and level of use of the building could therefore not be confirmed without dusk and/or dawn surveys.

Before writing your report you phoned the client, as promised, to inform them of your findings and to confirm the need for dusk and/or dawn surveys. The client asked you not to produce a report or do any further surveys, as the project was going on hold. You accepted this instruction and simply filed away the field notes for when the project was re-started.

Approximately 12 months later the client contacts one of your colleagues and asks them to make a minor amendment to the PEA Report and re-issue it. You are suspicious about the client's motives for this, so you undertake a search for planning applications on the local authority website and find that an application has been submitted for the site, including demolition of the barn. Your PEA Report has been submitted with the application along with a bat survey report produced by another ecological consultancy. You read the bat survey report and find that no evidence of bats was recorded during an inspection, which took place only six

weeks after yours, and that no dusk or dawn surveys were carried out. The bat survey report concludes that the barn is of negligible potential for bats, and that demolition can proceed without constraint in relation to bats.

You are concerned that planning permission will be granted without adequate assessment of the barn's status as a bat roost, and that a bat roost will be destroyed without any mitigation or licence. However, you are also concerned that you might breach client confidentiality if you report the findings of your 2019 survey.

What do you do?

Is there anything you could have done differently, which would have helped improve your position in this scenario?

Add your thoughts to the CIEEM  
LinkedIn group discussion at:  
[www.linkedin.com/groups/4306428/](https://www.linkedin.com/groups/4306428/)

## Complaints Update *Breaches of the Code of Professional Conduct*

At a hearing on 28 July 2020, Mr Andrew Gardner CEnv MCIEEM was found to be in breach of clause 4 of the *Code of Professional Conduct* for an error of professional judgment in advising a client contrary to good practice. Mr Gardner was given a reprimand.

# What We Look for in an Early Career Ecologist

**Owain Gabb CEnv MCIEEM**  
Director, BSG Ecology

This article aims to provide guidance to students and early career ecologists on the skill sets they might seek to develop, and how to set themselves apart from their peers in a highly competitive job market.

An earlier version of this article featured in *In Practice* in March 2017. It has been refreshed and updated at the request of CIEEM.

## Background

Ecological consultancies vary in the way in which they are structured and the nature of the work they target. Some recruit large numbers of recent graduates or early career ecologists on a seasonal basis each year to respond to the high volume of survey work associated with e.g. major infrastructure projects. Others aim to secure more varied (often multi-sector) work in an attempt to be resilient to economic and policy changes affecting sectors and projects. These companies have a higher ratio of experienced to early career staff and show less seasonal flux in terms of employee numbers.



BSG falls into this latter category. We recruit relatively few 'entry-level' staff each year (and very few seasonal staff), but tend to retain and invest in developing the consultancy skills of those people we do bring in. This helps integrate them into our team and allows them to start contributing to all aspects of our commercial work.

This article represents a company – rather than a consultancy industry – perspective.

## Prerequisites

There are few essential skills that an ecologist-grade recruit to BSG needs to have other than a good, relevant undergraduate degree and, preferably, a postgraduate degree<sup>1</sup>. These include a clear and demonstrable interest in ecology, some broad-brush field skills (or an emerging relevant technical specialism), motivation and an ability to communicate well. We are not looking for the finished article. We are looking for someone who has an aptitude for problem solving, is likely to develop quickly (given training and mentoring), and will fit into our team.

There are lots of enthusiastic, well-qualified ecologists looking for a career in consultancy: job advertisements elicit a very large response. To set themselves apart, candidates therefore need to find ways to stand out from their peers. Starting to think about positioning yourself for consultancy work during your academic studies is a very good idea.

## What field skills are attractive to an employer?

### Botanical survey

Almost every site ecological consultants work on will require baseline botanical survey. There are two survey methods in common use, JNCC's Phase 1 habitat survey and the UK Habitat Classification. Use of the latter is becoming more commonplace, as it produces higher

resolution results that dovetail more easily with biodiversity net gain calculators.

Both techniques involve classifying habitats based on the dominance/abundance of certain plant species. Both require additional information on habitat condition to be collected if they are to usefully inform biodiversity net gain calculations, and both can be 'extended' to collect additional information on the potential for protected species to occur.

Experience at interview is that many early career ecologists struggle with the identification of common and widespread plant species. While the botanical survey methods referred to above can be taught, if they are to be applied independently in the field we need to have faith that the ecologist is capable of identifying the species present. Otherwise our interpretation of habitat type and quality will be incorrect, and any conclusions based on them open to challenge.

For these reasons, those ecologists with a well-developed (or even a basic) botanical skill set instantly set themselves apart from their peers at interview.

### Protected species

Much commercial consultancy work is driven by the legal and policy protection afforded to a relatively limited number of fairly widespread species/species groups. These include species protected under European law, such as hazel dormouse, great crested newt, otter and bats; and species subject to domestic protection including badger, common reptiles and water vole.

Early career ecologists who are familiar with aspects of the ecology of these species, have experience surveying for them, and in the case of bats, the use of data analysis software, have an advantage over their peers. Demonstrable experience can be gained through the selection

of applicable research projects during academic studies, membership of mammal, bat or other special interest groups (which actively undertake field recording), and through completing seasonal work at consultancy companies. Some applicants for ecologist roles have already secured European Protected Species survey licenses: to have done so is a clear advantage.

Experience with more regionally restricted and/or habitat-specific protected species, such as red squirrel, sand lizard, pine marten, white-clawed crayfish or marsh fritillary will be valued differently by different practices depending on the nature of their work and the areas of the country they are most active in.

### Ornithological experience

The ability to identify birds by sight and sound is very useful in an ecologist grade recruit, as an element of bird survey work is typically required to inform all large-scale developments. Not all development projects require bird survey, however. Due to this and the number of technically proficient freelance ornithological surveyors, being an accomplished birder, while very useful, is less advantageous (when applying for early career ecologist positions) than having an equivalent level of proficiency in botanical or protected species survey.

### GIS and remote technologies

GIS enables the transfer of georeferenced data within project teams, and is particularly useful for passing on information concerning ecological constraints during the development design process. GIS is also extremely useful for analysing and presenting large ecological data sets and for making the precise measurements of habitat area required for biodiversity net gain calculations. It follows that a good understanding of the applications of GIS is advantageous in a recruit, as it integral to the service we provide.

Experience of remote data capture methods is also very useful; in addition to bat data loggers, remote-activated and infrared cameras, thermal imagery, drone and CCTV footage are now all integrated into our ecological survey methods. We have used remote survey techniques for various survey work including demonstrating whether Bechstein's (and

other bats) cross gaps in hedgerows, how nightjar forage and golden plover behave at night in relation to operational wind farms, and for characterisation of cliff ledge vegetation within a Special Area of Conservation. Often automated data collection is completed alongside manual data capture to ground truth a proportion of the results.

Understanding and feeling comfortable with the application of remote technologies and with GIS are very attractive attributes in a potential new recruit. In combination they help us collect, interpret and present data better more robustly and effectively. New recruits with knowledge and experience in these areas will help us think more creatively about how to continue to improve our service to our clients.

### The importance of effective communication

Most consultancies are heavily reliant on repeat work. Achieving repeat business requires effective verbal communication, an ability to develop positive relationships with clients and consultees, a proactive approach to project management and an ability to deliver high quality written outputs.

The first insight we will get into your ability to communicate in writing is through your CV. The primary function of a CV is obviously to showcase relevant experience, while the covering letter should clearly establish why they think they are suitable for the job as advertised. In combination, however, they provide initial insight into your ability to present and communicate information effectively.

Another critical role of a CV is to demonstrate the commitment of the candidate to working in the industry. It should detail how volunteering or other means of self-development have been relevant to growing the skill set needed for a consultancy role, which professional societies (including CIEEM) and nature conservation groups the candidate is a member of (and how they have contributed to them) and the training courses they have completed, along with their learning outcomes. Many early career ecologists will also have undertaken some seasonal work with consultancies, and the understanding gained should be outlined.

While it is reasonable to expect that the interview process (which may incorporate a written exercise) is the best test of communication skills, in a highly competitive job market, investing effort in refining a CV and covering letter is time well spent.

### Conclusion

Graduate and entry-level opportunities in ecological consultancies are keenly contested, but there is much to be positive about as an early career ecologist looking for employment. Firstly, there are a lot of good employers out there; it is time well spent to do some research into who they are. Secondly there are plenty of posts to compete for; recruitment often takes place in the winter and early spring. Finally, if you have the drive to develop the right field skills to complement your academic qualification, and present yourself effectively through your CV and covering letter, you will set yourself apart from most of the other candidates competing with you. The earlier you recognise this in your academic study, the better your decisions will be around bettering your skill set, and the easier you will find it to get the right post for you.

### Note

1. Note that there are other routes into the profession that do not require a degree, such as apprenticeships and vocational qualifications.

### About the Author



Owain Gabb is a Director at BSG Ecology and leads the Welsh team. He has worked in consultancy since 2003, and at BSG since 2010. He has a wider-ranging remit

including technical direction of projects, business development, staff management and recruitment.

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# Nuts and Bolts: The Importance of Contracts and The Need for Certainty

**Darren Hewitt**

Manager – Claims & Risk Management, CIEEM Insurance Services

In my experience, Members of the Chartered Institute of Ecology and Environmental Management are committed to providing their clients with the best service they can to help move projects forward properly with regard to protecting flora and fauna.

Unfortunately, it can often be the case that the aims and interests of the client can occasionally conflict with the views of the ecologists, which can invariably lead to disputes. As a result, to safeguard your position it is important to ensure that the terms of your relationship, and the expectations of both parties, are clearly established at the outset. It is important that your terms of engagement are discussed, agreed and accepted in writing.

## The boring bit

There are few people outside of dedicated legal scholars who would be likely to argue that reading a contract is an exciting task. The reality is that you did not become an ecologist just to spend an interminable amount of time staring at contract documents and the legal jargon that often accompanies them.

However, the consequences of skipping this step or not paying adequate attention to those terms and conditions can have potentially serious implications for you and your company. That being said, we appreciate that it can be difficult to deal with this aspect when the window to undertake your services is rapidly closing and the client is pushing for the work to be done.



## The nuts and bolts

While the client may be looking to put pressure on you to proceed with the work, it is still important to ensure that you take the time to make sure this step is dealt with correctly.

However, when the client is keen to move matters forward and the fees and services have been agreed in principle, you may ask yourself: *"Is it really necessary to sort out the terms of engagement now?"*

The short answer is, of course, "Yes". But why?

The terms of your engagement will contain a number of 'key' provisions that directly

impact on the liabilities that will arise in the event of a breach of the contract or any tortious claim. To help explain the impact of these conditions, I would like to highlight a couple of the frequently recurring issues:

### 1. Reasonable skill and care

When you accept an instruction from the client you are agreeing to provide a professional service to them and they are entitled to rely on that service. However, when considering whether or not the service has been provided properly, one of the key considerations is whether a duty of care to the client has been breached.

While the law in this area has been developed over the course of decades, when it is boiled down to its most basic, the core of the test amounts to whether or not you provided the agreed services with reasonable skill and care.

As a result, one of the most important clauses in the contract relates to the degree of skill and care required in the performance of the services. Now, while the position in the law of negligence is quite clear, it is possible to (and some larger clients may actively attempt to push you to) have this duty extended beyond 'reasonable skill and care'. However, you should be aware that accepting a higher standard than would otherwise exist, conflicts with the terms of your professional indemnity cover and could leave you facing an uninsured loss should a claim arise.

## 2. Liability and insurance

Under the Provision of Services Regulations 2009, and the requirement of any professional body, you may be required to disclose to the Client that you have professional indemnity insurance in place. The terms of engagement will provide you with an opportunity to set out the extent of any cover you are prepared to disclose to the Clients as they may vary from client to client and job to job.

It is also possible that the terms of engagement may look to limit any potential liabilities arising out of the performance of the services, which can help protect your position should a claim be made. However, it should always be noted that attempts to limit liability may not always be accepted by the courts.

## 3. The services

While you may have a clear understanding of the services to be provided, it is important to ensure that the terms of engagement reflect that understanding. Problems can arise if the terms include additional services above and beyond what you believe you have been appointed to provide.

However, it is also important to ensure that the services you do provide are tied to the services noted under the contract. While there can be some advantages to going 'over and above' for a client, this could extend both the services you are providing and the scope of any potential liability.

As the old adage goes, 'the devil is in the detail'. To safeguard your position it is important to ensure that both you and your client are aware and have agreed the scope of the services being provided.

While these conditions highlight some of the issues that can arise, it is important to realise that the contract can help protect your position when the situation changes unexpectedly.

At the time of writing, we are still in the grips of the COVID-19 pandemic which has had a significant impact on the way many people approach how they work. One of the situations that we may now be faced with is 'local lockdowns' which can impact on the work being undertaken. While the contract is unlikely to contain specific conditions for this eventuality, it may contain details on dealing with delays or 'force majeure' events, which help both you and the client.

## The envelope agreement

So, what happens if the terms of your engagement are scribbled on the back of an envelope or just agreed verbally with the client? While this skips past the difficulties and complications of the actual contract process, it can create its own set of problems and complications.

First and foremost, is the courts' expectation that a formal appointment will be in place. If that is not the case, the courts will impose the terms and conditions of your engagement and, in reality, such terms are unlikely to fall in your favour.

Secondly, the lack of a contract can impact on both the extent of any liability you may have and the ability of your insurers to defend a claim against you. Again, if the terms of the agreement are not in your favour, it is likely that the court may interpret the services in wider terms that was your original intention.

## The contract itself

The nature and form of the contract involved in your appointment can vary considerably depending on the client and the size and complexity of the projects involved. But, when considering how to approach this topic, we would offer the following pointers:

**Small-Scale Projects** – If it is a small project and you are being appointed

directly by the Client, they may be unlikely to involve solicitors or have access to pre-determined terms. As a result, as part of your discussions it may be worth suggesting the use of your terms and conditions, provided they are sufficiently robust, or one of a number of standardised wordings (CIC, RIBA, JCT, etc.) that are available.

**Mid- to Large-Scale Projects** – As you move away from the small-scale projects, your appointment is increasingly likely to be part of a design team. In some cases, the clients may still rely on the standardised wordings, but it is increasingly common for solicitors to be appointed to prepare bespoke contract documents.

## Can anyone help me with all of this?

As stated above, we accept that reviewing contracts is not something you signed up to, and it is possible that you may be able to obtain assistance from other professionals.

By way of example, we assist members of CIEEM insured through our facility by offering a free contract review service designed to identify insurance issues within the proposed documents.

If you are insured elsewhere you may be able to obtain some assistance from your current insurance advisers and, subject to agreement of their fees, there is always the option to obtain independent legal advice. As a result, if you are unsure of the assistance available, please contact us or your current insurance advisers to discuss matters further.

### About the Author



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an independent insurance broker regulated by the Financial Conduct Authority.

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# CIEEM Medal Winners 2020

## Introduction

The CIEEM Medal is the Chartered Institute's highest accolade and is awarded annually in recognition of an outstanding single or life-long contribution to the field of ecology and environmental management.

Unusually, this year the judging panel agreed to award the Medal to two recipients.

Read the full story on the CIEEM website: [www.cieem.net](http://www.cieem.net)



### John Hopkins

Dr John James Hopkins is a highly influential ecologist and botanist who, from the early 1980s until his retirement in 2012, spent his career working for Natural England (NE) and its predecessor bodies, the Nature Conservancy Council (NCC) and

English Nature (EN), as well as the Joint Nature Conservation Committee (JNCC).

His PhD was entitled 'Studies of the historical ecology, vegetation and flora of the Lizard District, Cornwall with particular reference to heathland'. This is widely regarded as a seminal piece of work and the quadrat data and vegetation descriptions were subsequently used by the National Vegetation Classification (NVC). He has remained involved with conservation and research at The Lizard for more than 40 years.

John began work for the NCC as the Assistant Regional Officer for County Durham and then spent six years as a national grassland specialist with NCC and EN. He made an important contribution to the conservation of British grasslands, particularly through his work on the designation of grassland Sites of Special Scientific Interest (SSSIs), the production of technical guidance and training, as well as raising public understanding. He moved to the JNCC in 1992, as scientific lead on the implementation of the EU Habitats and Species Directive in the UK and was the official scientific representative of the UK government at related EU meetings.

John then returned to work for EN (later becoming NE). During this phase of his career he made a notable contribution to a range of work areas, but particularly climate change adaptation and ecosystem services.

Since retirement, John has continued to contribute to ecology and he continues to publish erudite and influential articles and papers on topics such as climate change refugia, conservation of crop wild relatives, the ecological impacts of light pollution and the use of pesticides.

John has a considerable depth of knowledge and understanding of British habitats and wider ecological processes and he has made an outstanding contribution to ecology and environmental management over his career.



### Isabella Tree

Isabella Tree is a journalist and farmer who, together with her husband Charlie Burrell, has converted the 3,500 acre Knepp Estate from an unprofitable, intensive farming venture into an exceptional landscape-scale restoration of biodiversity.

The decision to begin 'rewilding' at Knepp was not obvious and went against both traditional farming advice and traditional approaches to nature conservation. The decision to trust nature and to take an approach of minimal intervention was insightful and brave. Opposition from certain stakeholders and issues with, for example, notifiable weeds could have caused the project to lose traction but their faith in the project kept it going and has been justified by the results at Knepp.

As a writer and journalist, Isabella has done a great deal to raise awareness of the Knepp project and rewilding in general. Her book, *Wilding*, which has been well-received both by the professional ecological community and the wider public, not only explains in a very straightforward and non-technical way the changes at Knepp, but also other rewilding projects around the world. It was described by *The Sunday Times* as "one of the landmark ecological books of the decade".

The very visible success of the Knepp project, the eco-tourism ventures which brings people to see the estate, the articles, books, and media appearances (including Desert Island Discs) have all contributed to a higher public understanding of the whole concept of rewilding. The high-profile nature of the project has influenced UK and English nature conservation policy.

Isabella Tree and the Knepp project represent a catalyst for change in our attitudes to land management, particularly in areas of marginal agricultural value. This can only be of great benefit to the profession as we seek to respond to the linked threats of climate change and biodiversity loss.

# International Focus

## COVID-19 and Great Apes

**Corin Simmonds CEcol MCIEEM**

Biodiversity Team Lead for International Projects Group, RSK

The impacts of COVID-19 on people worldwide are unprecedented, but what impacts, if any, is the SARS-CoV-2 virus having on vulnerable wildlife? Great apes (chimpanzees, bonobos, gorillas and orangutans) are susceptible to disease transfer from humans due to their genetic and morphological similarities. Viruses such as tuberculosis, anthrax and Ebola are readily transferred from humans to apes with Ebola being responsible for fatalities of an estimated one third of the world's population of chimpanzees and gorillas (IUCN 2020). Great apes are particularly vulnerable to human respiratory viruses. A report published by *Frontiers in Public Health* noted that respiratory viruses cause up to 20% of sudden deaths in mountain gorillas (Gibbons 2020). Whilst there is currently no evidence of a SARS-CoV-2 virus infection in great apes, the Great Apes & ARRC Task Force IUCN SSC Primate Specialist Group have reported the risk of transfer. Great apes are globally rare and are threatened with extinction and an outbreak of the COVID-19 amongst great ape populations could have catastrophic impacts. Hence, disease prevention should currently be regarded as a priority.

Social distancing and good hygiene practices are thought to be effective approaches to limiting virus transmission between people. Hence, similar measures are being employed by organisations involved in great ape eco-tourism, conservation and research. All great ape tourism has been suspended and sanctuaries are currently closed to the public. Action is being taken at reserves across Africa to train staff, implement measures for the prevention of virus transmission and to monitor great apes for signs of the disease. For example, at the Kibale National Park in Uganda researchers are quarantined for up to 14 days, change their clothes, wear face masks and have their temperature taken before going



Chimpanzee from a camera trap image at a site in Senegal (© Joanne Nightingale).

into forests inhabited by great apes. Conservation teams are also working with local communities to avoid great apes and their habitats and some organisation are offering incentives to reduce hunting in great ape habitat (Gibbons 2020).

General advice for disease prevention in great ape populations is presented in the IUCN joint statement and summarised below:

- Ensure that all individuals coming into close proximity of great apes are wearing clean clothing and disinfected footwear prior to park entry.
- Provide hand-washing facilities and supplies for all individuals entering protected areas or great ape sites.
- Require that a surgical face mask be worn by anyone coming within 10m of great apes.
- Reinforce instructions that people who need to sneeze or cough should cover their mouths and noses with the crook of their elbows rather than their hands; if they need to sneeze or cough they should immediately leave the area and not return.
- Provide hand sanitizer.
- Ensure toilet use is exclusively away from the forest.
- Impose a 14-day quarantine for all people arriving from outside the country

who will come into more frequent and longer-term close proximity with wild great apes (e.g. veterinarians, researchers, journalists) (IUCN 2020).

The Great Apes & ARRC Task Force IUCN SSC Primate Specialist Group has published specific guidance for disease prevention for industries operating in great ape habitat such as mining and oil and gas: *Advisory for Extractive Industry Personnel, Applicable to Energy, Extractives, Transport Infrastructure, Agro-industry and Other Projects Operating in Great Ape Habitats* (see <http://www.primatesg.org/PS6>).

### References

- Gibbons, A. (2020). Primatologists work to keep great apes safe from coronavirus. *Science*, 1 May 2020, doi:10.1126/science.abc5635.
- IUCN (2020). *Great apes, COVID-19 and the SARS CoV-2*. Joint Statement of the IUCN SSC Wildlife Health Specialist Group and the Primate Specialist Group, Section on Great Apes. 15 March 2020.

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# Continuing Professional Development During a Global Pandemic

**Krystie Hamilton**

Professional Development Coordinator, CIEEM

The last few months have been challenging for us all and it is highly likely that your priorities, and usual ways of working, have had to change. We have been changing how we work too. Not only in that we are all working from home, many perched at the kitchen table or holed up in the spare room alongside the boxes that haven't been unpacked since the last house move, but also changing in our professional development offerings.

Since much of the world went into lockdown we have been on a steep learning curve. We have run our first online conferences, begun delivering training online, and also expanded our webinar programme (which ordinarily winds down during the spring and summer months).

We really hope that you have had a chance to join some of these events but also understand that, with other pressures and responsibilities, you may not have been able to. In fact, your completion of CPD this year may have slipped...

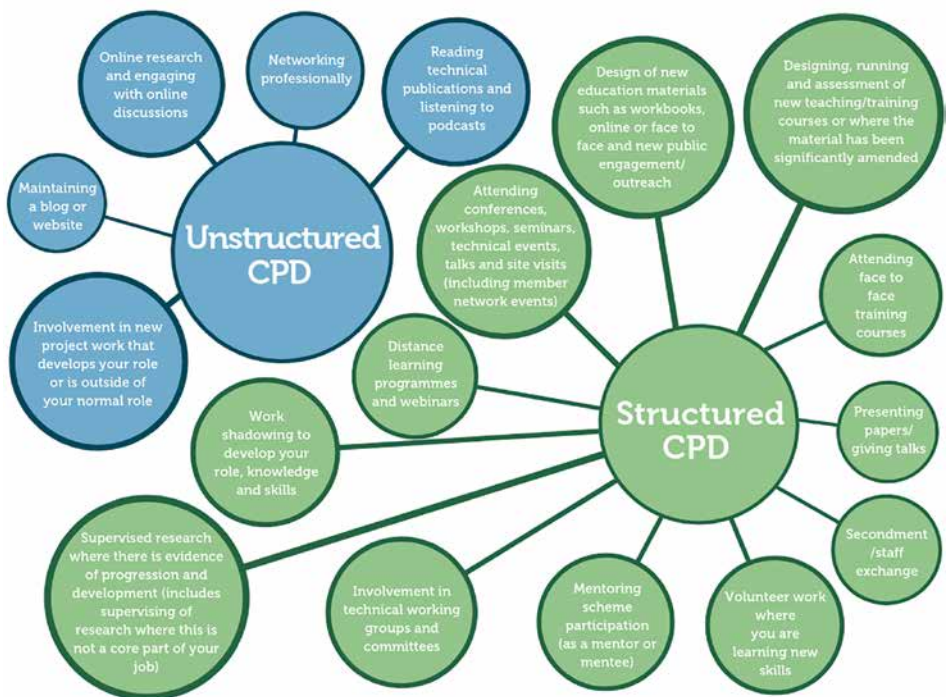
Firstly, we wanted to let you know of the opportunities we have available that may help – we have recordings of our webinar 'back catalogue' available (many free, some for a small fee), together with recordings of both the Irish Conference ('Conservation Approaches to Benefit Biodiversity') and Summer Conference ('Climate and Biodiversity Crises'). If you would be interested in viewing any of these, please see the full listings on our website: <https://cieem.net/i-am/continuing-professional-development/upcoming-training-and-events/> or contact [enquiries@cieem.net](mailto:enquiries@cieem.net).

For further CPD inspiration, much of which can be completed from the comfort of your sofa, with no/little cost, please see below:

But most importantly, we wanted to let you know that we understand it has been a difficult year. If you are struggling to complete your 30 hours of CPD for the year, we encourage you to please get in touch

with the Professional Development Team at [cpd@cieem.net](mailto:cpd@cieem.net). We can discuss your circumstances further and offer ways in which we can help.

In the meantime, we hope that you stay safe, stay well, and perhaps see you at an online event soon!



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# An Overview of the Role of the Training, Education and Careers Development Committee

**Dr Paul Clack CEnv MCIEEM**  
Associate Director, Arup

The Training, Education and Careers Development Committee, affectionally known as 'TEC', is one of three standing committees within CIEEM. Along with the Professional Standards Committee (PSC) and the Membership Admissions Committee (MAC), TEC reports to the Governing Board of the Institute.

## Introduction

TEC has oversight of CIEEM's continuing professional development (CPD) activities, including the professional development programme, conferences, careers advice and links with universities and other higher education institutes. The Committee is made up of a range of volunteers with individuals from larger and smaller consultancies, public sector bodies such as Natural England and the Environment Agency, registered charities, university lecturers and other institutions such as the Natural History Museum. We meet four times annually supported by the CIEEM Secretariat, including the CEO and the Professional Development Team. Recently, TEC has been grappling with a variety of interesting activities that underpin the sector we work within.

## Conferences

Every year TEC advises CIEEM on themes for annual conferences and topics put forward by Geographic Sections and Special Interest Groups. As conferences must be planned well in advance, TEC advises on topics that are relevant for ecologists and environmental managers across all sectors. Recently we have been planning the autumn conference, and a theme around green recovery considering COVID-19 and the changing political landscape has been considered. Likewise, we have discussed topics put forward from the Country Sections, including an exciting

conference in Wales around freshwater ecology with the subtitle 'Bringing Our Rivers Back to Life' and a Scottish conference on reconciling differing land use objectives.

TEC also sees feedback data from recent conferences which is always fascinating, ranging from specific commentary around the quality of speakers, how you felt CIEEM ran the event, and most often how good the food was! TEC provides views on improvements that can be made and what feedback from delegates indicates, which helps CIEEM to plan locations and themes for future conferences.

## Training

TEC also advises CIEEM around the range of training courses and webinars the Institute provides, including the move to online training courses that have been so important during the current pandemic. Recently we have been assisting in the development of a more streamlined 'core' training programme. This will deliver the courses that are in most demand, in the best locations and at an appropriate frequency. Some courses are perennially popular (especially those including bats and badgers), but as new topics such as Biodiversity Net Gain have emerged, TEC has had sight of demand data, which in turn helps inform the planning process. However, we are keen to ensure that more specialist courses still run and are accessible to those who wish to attend, so expect the likes of pine marten ecology and Eurasian beaver mitigation to still feature in the training programme going forward.

## CPD and mentoring

Other interesting topics that TEC covers include CPD auditing and advice, and when the new CPD tool was under

consideration we were given a preview from the developer and offered advice to CIEEM around potential improvements and functionality. We helped with the development of the mentoring platform and were offered advice around usage and benefits for members. Several TEC members signed up early as mentors and it is great to see how this is thriving since launch earlier this year. Personally, I have started supporting someone transitioning from an undergraduate degree course into the early years of their professional career and have found this very beneficial as a mentor.

## Education

TEC supports the development of apprenticeships (both undergraduate and masters level) and has advised CIEEM around becoming an end point assessor. TEC is lucky to have four members from higher education and is working with them and the Academia SIG around alignment of degree accreditation criteria with the overall CIEEM competency framework. As someone working within consultancy, having the ability to work with those within academia to understand student and HE provider drivers and thus shaping degree programmes is fascinating. Hopefully, this will help deliver accredited degree programmes that better equip graduates for careers in ecology and environmental management in the future.

## Join us

TEC is a friendly and welcoming group. As places become available, we would be delighted to have applications from new members. We are currently looking for someone in the early years of their career and if this could interest you, please get in touch with the Professional Development Team via [training@cieem.net](mailto:training@cieem.net).

# Membership Update

**Stuart Parks**

Head of Membership and Marketing, CIEEM

As the 2019-2020 subscription year draws to a close we usually take the opportunity to report on how the year has gone to date. I am writing this in July, at the start of the final quarter of the subscription year that ends on 30 September, and until very recently I would have been able to confidently report that we were on track to exceed the record number of applications for membership that were processed last year. As it stands, we may still at least match last year's total, but for what will now be very obvious reasons we did suffer a significant drop in the number of applications received at the start of the COVID-19 pandemic. However, we have already seen encouraging signs of the number of applications picking up again. What has been just as encouraging is that many of the applications we are now processing are from current members who have taken the opportunity granted by their temporarily altered circumstances to reflect on their skills and experience and apply to upgrade their membership. In order to support members in doing this, we not only launched the online competency self-assessment tool but also waived the fees associated with upgrading membership to further assist those who, for now at least, have found themselves in positions of financial uncertainty.

So what does the next subscription year have for us to look forward to? Well, for the first part we will be looking closely at the realities of the 'new normal' and its real and potential impacts on the work of our members. In fact, we have already started learning about how we need to change the ways in which we offer support to members. Over the last few months our Professional Development Team has been adapting CIEEM's extensive training and conference programme to deliver as much content as they have been able to remotely – including producing our first conferences and training courses held entirely online. The team will be working



to adapt the forward programme into a more flexible and blended mix of delivery, embracing online delivery platforms and supporting our trainers/conference speakers to use them. In addition, an internal working group will continue to review and develop our support for student members and those at the earliest stages of their career. Encouragingly, these audiences remain the fastest growing categories of membership and we remain committed to helping these professionals of the future to gain confidence and competence through their membership.

We will also be developing CIEEM's Strategic Plan for the next three years and considering how we as a professional body can best position our members to play their part in meeting the twin crises facing the climate and biodiversity. Addressing the issues of social inequality and a lack of diversity in our sector will also feature highly on our agenda. Importantly, the Governing Board will also be considering what additional areas of work we might plan towards now that the Institute has been awarded charitable status. This does put a different perspective on the sorts of projects that we might deliver and we very much look forward to gaining the input of our members to this development process in due course.

In summary, there will undoubtedly be some real challenges to face in the next few years, but there may also be some promising opportunities too. As always, we cannot achieve any of our intended strategic aims without your continued support. If you have yet to renew your membership subscription for the coming year, please do so as soon as you can or contact us urgently if renewing will be difficult for you at this time. Prompt payment really helps us to move forward with a greater degree of confidence in what we can achieve. With thanks for your continued and invaluable support.

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# Policy Activities Update

**Amber Connett GradCIEEM**

Policy and Communications Officer, CIEEM

Over the last few months, we have continued our work to support our members through the COVID-19 outbreak and social distancing measures. We continue to maintain our COVID-19 webpages to support the sector as we move towards recovery ([cieem.net/i-am/covid-19/](http://cieem.net/i-am/covid-19/)) and have published and updated guidance on ecological survey and assessment for both the UK and Ireland. These guidance documents have been drafted by experienced ecologists as tools to help CIEEM members continue to undertake ecological survey and assessment during the restrictions necessitated by the COVID-19 outbreak, where they can do so safely.

In June, the UK Prime Minister Boris Johnson presented his 'Build, Build, Build' scheme to support economic recovery from COVID-19. During the statement he attributed the slow rate of housebuilding in the UK to "newt counting delays". We responded with a statement urging the Prime Minister and his government to stop blaming nature for policy failures of the past and to start helping nature provide the solutions we need for a better future. The full statement can be found at [cieem.net/response-to-prime-ministers-green-recovery-speech/](http://cieem.net/response-to-prime-ministers-green-recovery-speech/).

Our Action 2030 group has continued their work on the climate emergency and biodiversity crisis, producing two articles in this edition of *In Practice* (pages 48 and 50), jointly hosting this year's Summer Conference on 'Climate and Biodiversity Crises: Professional Approaches and Practical Actions', hosting a webinar on reporting carbon emissions and a joint webinar with the Overseas Territories Special Interest Group. They have also agreed a work plan for the rest of this operational year and will be producing more webinars, blogs and *In Practice* articles, so please keep an eye out for updates!

## UK and England

The All-Party Parliamentary Group (APPG) for Nature recently held an online panel discussion in July on the 'Global Deal

for Nature and a Green Recovery'. The event, hosted by Barry Gardiner MP (Chair of the APPG for Nature), focused on what we need from a new global deal for nature, and what nature's role is in a green recovery from the COVID-19 pandemic. Panelists included: Martin Harper, Global Conservation Director of the RSPB; Dr Stephanie Wray, Managing Director of RSK Biocensus Ltd and Chair of CIEEM's Strategic Policy Panel (SPP); Mike Pienkowski, Chairman of the UK Overseas Territories Conservation Forum; and Dr Kate Cole, Association of Local Government Ecologists. The webinar is available on the group webpage. We have also opened the opportunity to become an Associate Member of the group. More details are available at: [www.cieem.net/appg-for-nature/](http://www.cieem.net/appg-for-nature/).

Following several webinars and blogs on the concept of rewilding, we have published our position statement on the topic. The statement was compiled by the Policy Team and England Policy Group, but applies to all of the UK and Ireland. The full statement can be viewed at [cieem.net/resource/cieem-rewilding-position-statement/](http://cieem.net/resource/cieem-rewilding-position-statement/).

Our CEO Sally Hayns, Head of Policy and Communications Jason Reeves and SPP Chair Stephanie Wray recently met with Environment Minister Rebecca Pow to discuss the Environment Bill, Biodiversity Net Gain, Environmental Net Gain and the Green Recovery.

## Scotland

At the time of writing, the Scotland Policy Group are finalising a follow up briefing to the *Biodiversity Net Gain in Scotland* briefing paper ([cieem.net/biodiversity-net-gain-in-scotland/](http://cieem.net/biodiversity-net-gain-in-scotland/)) on implementation for local authorities. We hope to publish this in September.

## Wales

The Wales Policy Group and Welsh Section Committee are continuing to work together on a position statement on the climate emergency and are currently (at the time of writing) reviewing Natural Resources Wales' Area Statements as they are published.

## Ireland

In July, the Ireland Policy Group circulated guidance from the All-Ireland Pollinator Plan and highlighted technical issues for members to consider. At the time of writing, the group is planning to follow this up with an in-depth look at the plan through a webinar.

## Consultations

We have recently responded to the following consultations:

- River Basin Management: Challenges and Choices (Environment Agency).
- Environmental Land Management: Policy Discussion (DEFRA)
- Green Recovery - Call for Views (Environment, Climate Change and Land Reform Committee; Scotland)

## Future priorities

Our priorities for the next few months will include: continuing to support members during the COVID-19 pandemic, publishing our Green Recovery position statement, engaging with decision makers on the development of the post-Brexit governance and agriculture schemes, and engaging with post-2020 biodiversity activities.

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CIEEM is grateful to the following organisations for investing in our policy engagement activities:



# British Ecological Society

Publishing Evidence for Better Biodiversity Management



The latest research in a new journal from the British Ecological Society, *Ecological Solutions and Evidence*, shows how it is possible to better connect information from both research and practice

The practice of rearing pollinators such as buff-tailed bumblebee *Bombus terrestris* for pollination services is common in commercial greenhouses. But new research carried out in southern Spain demonstrates the impact of the commercial bumblebees on native pollinators. Ignasi Bartomeus and colleagues from Estación Biológica de Doñana in Seville show that hybridisation between native and commercial bumblebee lines occurs frequently and could displace locally adapted populations. The team's work is among the 10 articles published in the first issue of *Ecological Solutions and Evidence*, the British Ecological Society's newest journal ([www.ecologicalsolutionsandevidence.org](http://www.ecologicalsolutionsandevidence.org)). This issue is being published just six months on from when the journal first opened for submissions.

*Ecological Solutions and Evidence* is at the heart of Applied Ecology Resources (AER); a new initiative to better connect information produced by both research and practice (see Box). AER is not just the journal, it's a repository of a wide range of information sources including research summaries and other grey literature.

The increased 'wildness' of road verges has been in the news recently as COVID-19 impacts led to a reduction in mowing of verges. In another article in our first issue, Swedish researchers Alistair Auffret and Evelina Lindgren show how historical maps can be a useful tool to prioritise which road verges to manage in order to support grassland habitats. The authors looked at a number of different characteristics related to the species richness of verges and found that the richness of species and specialists



*Bombus terrestris lusitanicus* (copula) © Curro Molina.

was more closely related to road age than to the amount of surrounding habitat. Whether its road verges or commercial bumblebees, the journal has been set up to support contributions from all aspects of research and practice, including our short-form flexible article type 'From Practice'. These articles provide practitioners a venue for communicating case studies, calls for new approaches for dealing with problems, or perspectives on research topics relevant for management.

Our stellar international Editorial Board hold roles across applied research and practice, including NGOs, consultancies and government agencies. Our guidelines for article preparation have been greatly

simplified compared to many other journals and we have a strong editorial team on hand to support you through the publication process.

The Journal is open access to ensure that everyone can read the content and we've introduced a range of support mechanisms so that the article charges do not form a barrier for practitioners – including AER membership options, discounts for BES members, and full waivers where necessary. If you're interested in contributing a journal article or wish to discuss membership of Applied Ecology Resources for your organisation, then you'll find all the details you need on our website [www.appliedecologyresources.org](http://www.appliedecologyresources.org).

## About Applied Ecology Resources

- AER is a new information repository from the British Ecological Society that promotes evidence-based decision making in the management of biodiversity and the environment
- All information stored on AER will be free for anyone to access
- Organisations need to become a member of AER to archive and share content. Those that join before the end of 2020 will become a Founding member and receive additional benefits
- Flexible membership options are available to support the community through some of the challenges arising from COVID-19
- Got a question about AER? Visit our FAQs page or get in touch at [www.appliedecologyresources.org](http://www.appliedecologyresources.org)

# Member Network News



## Convenors... assemble!

### This summer sees the first Virtual Member Network Convenors Meeting

In response to feedback from Member Network and SIG volunteers in last December's Convenors Meeting (a meeting with Chairs and Representatives from all Member Networks and SIGs together), CIEEM's Volunteer Engagement Officer, Drew Lyness, hosted the first of possibly many online convenors meetings. July's meeting was attended by a dozen volunteers, who between them represented nine of our member's groups.

The meeting focused on several different topic areas, including a summary of CIEEM's response to COVID-19, and how members groups could continue to support their members during these challenging circumstances when face-to-face gatherings are restricted. The direction of travel for member groups is to enable greater participation in events through technology, with virtual field visits, webinar lectures, coffee mornings and quizzes being popular ideas. There was an emphasis on looking after those in the sector who might be more vulnerable to the economic effects of COVID-19, including those working in smaller consultancies, and members who are still searching for their first step on the job ladder or are in the early stages of their career.

The meeting then discussed how Member Network committees could become more involved in CIEEM's policy work, especially when there is so much knowledge and expertise contained within the Institute's volunteer base. Opportunities to feed into local and topical policy reviews will be passed onto Member Networks and SIGs more frequently in future, helping them to have a greater influence on the future of specific areas in the sector.

The other major topic of interest was CIEEM's Action 2030 project, and how as an Institute we must adapt in response to our declaration of a climate emergency. This involves becoming carbon neutral by using green energy to power the office, reducing the need for travel,

and offsetting to carbon sequestration schemes where possible. It is important that CIEEM's member groups can spread the word of good practice and encourage members and partners to be proactive in eliminating the environmental impact of their organisations. There were some fantastic suggestions from volunteers as to how member groups might do this, and Action 2030 guidance will become available and accessible to all members group volunteers imminently.

We would like to take the time to thank all volunteers who logged in to attend this meeting, and for their excellent contributions to the group discussions. We hope you will join us for these meetings again soon!

## Election time

### Opportunity Knocks! Member Networks seek your nominations to volunteer and be part of something big

At the time of writing, there are no less than 170 individual volunteers working across our Member Networks and Special Interest Groups (SIGs), volunteers working hard to support members in their geographical areas or within specific topics of shared interest. Our members groups play a vital role in the Institute by organising engaging events, such as workshops and field trips, speaking to students and early career members, promoting professional standards, feeding into consultations and policy briefings, and crucially, representing the views of members at local, national and international levels!

By becoming a volunteer for a Member Network or SIG, you will have the opportunity to influence the areas of greatest interest to you within the ecology and environmental management sector. You will be able to share your passions, bring others on board and increase the standards of professional practice to benefit our beloved wildlife in Britain, Ireland and beyond. Being part of a Member Network or SIG committee is a fantastic way to meet like-minded

people who will share a drive to meet ambitious goals. Your efforts will support CIEEM's objectives as well as your own, helping you to gain further skills and knowledge to support your own professional development. Your time is valuable to us, and CIEEM is dedicated to ensuring that your volunteering is both worthwhile and rewarding.

There is no doubt that 2020 has been a challenging year for us all, and Member Networks and SIGs are having to find new ways in which to support and engage with members, that are both safe in the current circumstances, and progressive towards a greener future. You could play an important part in that change. If you are interested in supporting a Member Network or SIG as a volunteer, you can find the volunteer role profiles and how to apply for them by visiting the 'My CIEEM' area of the website, followed by 'Volunteering with CIEEM' ([https://events.cieem.net/Portal/VolunteeringwithCIEEM/Volunteers\\_Opportunities.aspx](https://events.cieem.net/Portal/VolunteeringwithCIEEM/Volunteers_Opportunities.aspx)).

Nominations must be in by the end of September at the latest. Thank you, and we look forward to hearing from you.

## Scotland Geographic Section

### Women in science

In the middle of March, Aberdeen University Careers Service and the School of Biological Sciences held a Women in Science event to help students understand where they want to take their careers after graduation. It was a fantastic event with great speakers and lots of engaged students. It really highlighted the wide array of ecology and environmental management careers that now exist.

Ecology is such a small world and among the speakers were Annie Robinson (CIEEM Scotland Project Officer), Kathy Dale (EnviroCentre and past CIEEM Scotland Vice President) and Ailsa Sharp (a previous student of Annie's, and now working for Matt Pannell, Convener for the CIEEM Scottish Section). All the speakers were graduates or linked to Aberdeen University.

### Species licensing in Scotland

At the end of February, the CIEEM Scotland member network held an event on species licensing. The Scottish Natural Heritage (SNH) Licensing Manager Graeme Taylor was unable to make it, but Christian Christodoulou-Davies (SNH Licensing Officer) kindly stepped in.

It was an evening packed with discussions around the new licensing system, badger ecologist licenses, bat 'low impact' licences, length of time as a named ecologist, survey guidelines and much more. As this event was fully booked and is always popular, we will look to organise it annually with the support of the SNH Licensing team.

## Academia SIG

### Sign up to the group

Our academic members provide a direct link between CIEEM and the next generation of members, as well as facilitating relevant and robust research to support evidence-based professional practice. The aim of the ASIG is to provide an opportunity for knowledge sharing and to help understand and respond to the needs of these members.

The ASIG releases an e-newsletter three times per year (September, January and May). To join the ASIG and receive this, head to your Personal Preferences page in the 'MyCIEEM' area of the website and tick Academia within the Special Interest Groups. We also have space on our Committee for anyone who wants to contribute to driving the ASIG's activities – email the Convener Dr Debbie Bartlett (d.bartlett@greenwich.ac.uk) if you are interested or for more details.

## UK Overseas Territories SIG

### Diverse species and ecosystems across the UK's Overseas Territories

From whale sharks to penguins, from ice sheets to coral reefs, the UK's 14 Overseas Territories host spectacular and globally significant species and ecosystems. In fact, 80-90% of UK's biodiversity is in its Overseas Territories. The UK Overseas Territories Special Interest Group has

published a blog article that introduces the marine environments of two UKOTs – the Falkland Islands and the Turks and Caicos Islands.

Visit the CIEEM website (<https://cieem.net/news/>) to read the blog and find out more about the Falkland Islands and the Turks and Caicos Islands.



Rockhopper penguins on the Falkland Islands.

# New Members

The decision on admission is usually taken by the Membership Admissions Committee or Registration Authority under delegated authority from the Governing Board but may be taken by the Governing Board itself.

CIEEM is pleased to welcome the following individuals as new members:

## ADMISSIONS

### Full Members (MCIEEM)

Dr Shelley Doe, Kevin Duffy,  
Jonathan Harrison, Andrew Higham,  
Kerry Hiorns, Benjamin Jones,  
Katherine Murphy, Chris Panter,  
Joe Salkeld, Mick Smith

### Upgrades to Full Membership (MCIEEM)

James Aldridge, Robert Allen,  
Andrew Bone, Peter Clark, Timothy Elton,  
Christopher Gilbert, Oliver Glenister,  
Errol Ibrahim, Marielle James,  
Nathan Jenkinson, Nicola Johnson,  
Sam Kitching, Sara McBride,  
Katherine Thorne, Peter Timms,  
Michelle Tyrrell, Robyn Walton

### Associate Members (ACIEEM)

Iona Anderson, Maya Baker, Dr Chris Batey,  
Augusta Dorey, Dr Lawrence Eagle,  
Benjamin Fowle, Mary Goddard,  
Clare Gower, Kathryn Killner,  
James Mansfield, William Mulville,  
Nathan Nicholls, Wayne Penrose,  
Joanna Porter, Emma Scotney,  
Jonathan Scragg, Adam Stickler,  
Dr Savannah Worne

### Upgrades to Associate Membership (ACIEEM)

Stephanie Ball, Stephanie Bennett,  
Stephanie Bentham-Green, Helen Butt,  
Joanna Coxon, Joel Cronin,  
Nathan Duszynski, Harry Ferguson,  
Robert Gavan, Alexander Gould,  
Catherine Hunter, Hamish Jackson,  
Daniel Jones, Christopher King,  
Kim Kirkbride, Kristi Leyden,  
Nathan McIlwrath, Jonathan Molesworth,  
Jack Morphet, Kate O'Connor, April Park,

Michael Perkins, Shaun Pryor,  
Shona Redman, Verity Richardson,  
Charis Russell-Smith, Aby Sampson,  
William Steele, Chloë Stephenson,  
Laura Thompson, Josey Travell,  
Sarah Unsworth, Luke Walters,  
Alexandrea White, Carrie White,  
Samuel Wilson, Viola Zanetta

### Qualifying Members

Gareth Ainscough, Martin Arthur,  
Sebastian Ashton, Timothy Asplin,  
Kerry Baker, Laura Beveridge, Oliver Bulpitt,  
Daniel Burrows, Olivia Cairns, Amy Clarke,  
Thomas Cumberland, Danielle Edwards,  
Emily Greaves, Jessica Green, Katie Gunning,  
Elizabeth Hanlon, Catherine Haworth,  
Emma Hickson, Jacob Hill, Thomas Howland,  
Jordan Hurst, Robin Joy, Marie Kearns,  
Fern Kenyon-Hamp, Jalal Khan, Sonia King,  
Genevieve Labram, Alexi Lamoon,  
Max Lawson, Taylor Lawton, Ilaria Lonerio,  
Duncan Macaulay, Katarzyna Majewska,  
Sean Manley, Larissa Masterson,  
Declan McGovern, Amber Morgan,  
Amy Murdoch, Colin Murphy,  
Jasmine Newton, Brendan O Connor,  
Fern Ocroft-Crompton, Charlotte Page,  
Michaela A P Pape, Alexander Parr,  
Melissa Reid, Eileen Robley,  
Chloe Rossi-Easto, Callum Salter,  
Sofia Sanchez, Alison Saunders, Adam Silk,  
Samuel Slater, Abigail Smart,  
Daniel Wyn Smith, Daniel Stewart,  
Jacob Tassaker, Joanna Thow, Felix Tuff,  
Bethany Turner

### Upgrades to Qualifying Membership

Isabel Commerford, Christine Duffield,

Vanessa Gouldsmith, Jake Hill,  
Rebecca Holmes, Charlotte Scales,  
Lilly Statham, David Stone, Abby Thomas,  
Georgia Vessey, Joseph Wilkie

### Student Members

Joshua Ajowe, Fraser Anderson,  
Viorel Anitei, Susmita Aown,  
Bethany Ardern, Frida Backstrom, Jack Bage,  
Charlotte Barclay, Conor Barley, Ellie Barrie,  
Tracey Bennett, Samuel Bray, Reiss Bush,  
Phoebe Collier, Robert Conway, Jayne Davies,  
Keith Dineen, Patrick Doran, Rachel Downes,  
Alexandra Efthymiou,  
Sandrina Finocchio-Daniels,  
Sarah Gibson-Brabazon, Ella Glover,  
Louise Gower, Arthur Greene,  
Emilia Heiskanen, Josephine Hewitt,  
Ebonie Hicks, Katie Horsburgh,  
Bethany Horswell, Anita Howard,  
Daniel Howes, Sunny Jones,  
Rhiannon Kamink, Liam Kelly,  
Shane Kennedy, Aisling Kinsella, Tunde Kiss,  
Dr Archith Krishnamurthi Sridhar,  
Rebecca Leake, Kwan Leung, Natalie Lewis,  
Claudia Lowry, Suzie Lyons,  
Joseph Mangham-Brown, Lucy Mason,  
Nicholas Matthews, Hannah McGovern,  
Freddie Mckendrick, Zainuldeen Muhammad,  
Manuela Naprta, Bethany Norris,  
Fatai Olabemiwo, Alexander Orr,  
Michael Owen, Emily Parsons,  
Leanne Riddoch, Asha Rodgers, Clare Ross,  
Liam Ryan, Bianca Schehl, Luke Scott,  
Liam Singleton, Jenny Smith, Lilly Statham,  
Scarlett Sturt, Matthew Thompson,  
Sara Tracey, Lucy Turnell, Melissa Viguier,  
Katherine Warren, Miriam Wearing,  
Jody Webb, Lewis Webster, Laura  
Whitehead, Mathilda Whittle, Ellie Wolfe

## Recent Publications



### Effective Scientific Communication: The Other Half of Science

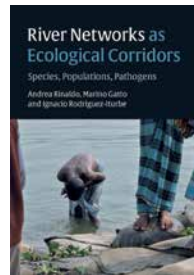
Authors: Cristina Hanganu-Bresch and Kelleen Flaherty

ISBN: 9780190646813

Price: £41.99

Available from: [www.nhbs.com](http://www.nhbs.com)

Aimed at undergraduate STEM students who want or need to improve their scientific writing skills, this book makes the case that writing is an essential component of science regardless of the stage of the scientific process, and that it is a component of thinking about science itself. Writing allows science to be funded, communicated, replicated, enhanced, and applied and, as such, is an essential skill to be developed.



### River Networks as Ecological Corridors: Species, Populations, Pathogens

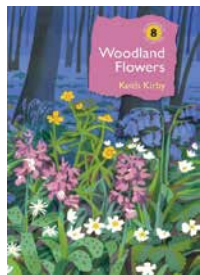
Authors: Andrea Rinaldo, Marino Gatto, Ignacio Rodríguez-Iturbe

ISBN: 9781108477826

Price: £49.99

Available from: [www.nhbs.com](http://www.nhbs.com)

The authors summarise research on the ecological roles of the structure of river networks, including studies on the spread and control of waterborne diseases, biodiversity loss due to water resource management, and invasions by non-native species. Practical implications of this research are illustrated with examples throughout.



### Woodland Flowers: Colourful Past, Uncertain Future

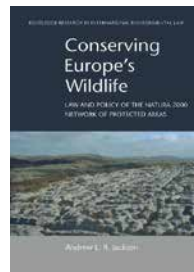
Author: Keith Kirby

ISBN: 9781472949073

Price: £35.00

Available from: [www.bloomsbury.com](http://www.bloomsbury.com)

CIEEM Fellow and Medal recipient Keith Kirby explores the rich diversity that exists on the forest floor, including grasses, sedges, flowers and ferns. Keith journeys through how these plants have come to be and discusses the threats and pressures that have contributed to their development.



### Conserving Europe's Wildlife: Law and Policy of the Natura 2000 Network of Protected Areas

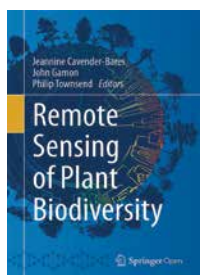
Author: Andrew L.R. Jackson

ISBN: 9780367508548

Price: £36.99

Available from: [www.routledge.com](http://www.routledge.com)

This book critically assesses the origins and implementation of the Natura 2000 network, established under the Birds Directive of 1979 and the Habitats Directive of 1992. The author identifies three phases in the history of EU environmental policy and presents a comprehensive summary and assessment of the law and policy that protects Natura 2000 sites at EU level. The nature conservation outcomes for targeted species and habitats are also reviewed.



### Remote Sensing of Plant Biodiversity

Editors: Jeannine Cavender-Bares, John Gamon, Philip Townsend

ISBN: 9783030331566

Price: £44.99

Available from: [www.springer.com](http://www.springer.com)

This book provides a framework for how biodiversity can be detected and evaluated using proximal and remotely sensed hyperspectral data and other tools such as LiDAR. Ways for determining traits of plant biodiversity through spectral analyses across spatial scales and linking spectral data to the tree of life are described. Specific instrumentation and technologies are also described, as well as the technical challenges of detection and data synthesis, collection and processing.

### New fieldguides that will be of interest to members and readers:

- Britain's Orchids: A Field Guide to the Orchids of Great Britain and Ireland - Sean Cole, Michael Waller, Sarah Stribbling (Illustrator)
- Britain's Habitats: A Field Guide to the Wildlife Habitats of Great Britain and Ireland - Sophie Lake, Durwyn Liley, Robert Still, Andy Swash

Both available from: [www.nhbs.com](http://www.nhbs.com)

- Britain's Spiders: A Field Guide – Fully Revised and Updated Second Edition - Lawrence Bee, Geoff Oxford, Helen Smith

Available from: <https://press.princeton.edu/>

### Free downloads that may be of interest to members:

- Oberč, B.P. and Arroyo Schnell, A. (2020). *Approaches to sustainable agriculture. Exploring the pathways towards the future of farming*. Brussels, Belgium: IUCN EURO. Available at: <https://portals.iucn.org/library/sites/library/files/documents/2020-017-En.pdf>
- FAO (2020). *The State of World Fisheries and Aquaculture 2020. Sustainability in action*. Rome. Available at: <http://www.fao.org/documents/card/en/c/ca9229en>



### Ecological impact and cost-effectiveness of wildlife crossings in a highly fragmented landscape: a multi-method approach

Sijtsma *et al.*

*Landscape Ecology* 2020, 35: 1701–1720 (Open Access)  
DOI: 10.1007/s10980-020-01047-z

To mitigate the negative impacts of infrastructure, various types of wildlife crossings are used worldwide, but little is known about their effectiveness. The cost effectiveness of a wildlife crossing programme in the Netherlands was analysed using a multi-criteria cost-benefit analysis. Wildlife crossing bridges were found to be most effective.

Correspondence: <https://link.springer.com/article/10.1007/s10980-020-01047-z/email/correspondent/c1/new>

### A biodiversity target based on species extinctions

Rounsevell M.D.A., Harfoot M., Harrison P.A., Newbold T., Gregory R.D. and Mace G.M.

*Science* 2020, 368: 1193-1195  
DOI: 10.1126/science.aba6592

The authors argue that arresting the loss of biodiversity will require a target, underpinned by a clear global goal for biodiversity, that can be readily communicated to galvanize both political will and public support. They recommend a measurable, near-term target of keeping described species extinctions to well below 20 per year over the next 100 years across all major groups and across all ecosystem types.

Correspondence: [mark.rounsevell@kit.edu](mailto:mark.rounsevell@kit.edu)

### Selection of indicators for assessing and managing the impacts of bottom trawling on seabed habitats

Hiddink J.G. *et al.*

*Journal of Applied Ecology* 2020, 57: 1199-1209 (Open Access)  
DOI: 10.1111/1365-2664.13617

Development of fisheries-, conservation- and ecosystem-based management strategies requires the selection of indicators of the impact of bottom trawling on the state of benthic biota. The authors collated data from 41 studies that compared the benthic biota in trawled areas with those in control locations, examining seven potential indicators to assess their performance against a set of nine criteria. Results show that whole-community numbers of individuals and biomass are the most suitable indicators of bottom trawling impacts as they performed well on all criteria.

Correspondence: [j.hiddink@bangor.ac.uk](mailto:j.hiddink@bangor.ac.uk)

### Dryness, wetness and temporary flooding reduce floral resources of plant communities with adverse consequences for pollinator attraction

Walter J.

*Journal of Ecology* 2020, 108: 1453-1464  
DOI: 10.1111/1365-2745.13364

It is unclear how community shifts under changed hydrological conditions might affect pollinators. This study assessed the effects

### Reintroduction modelling: A guide to choosing and combining models for species reintroductions

Hunter-Ayad J., Ohlemüller R., Recio M.R. and Seddon P.J.

*Journal of Applied Ecology* 2020, 57: 1233-1243  
DOI: 10.1111/1365-2664.13629

The article provides an overview of habitat suitability, dispersal, population dynamics and interspecies models, considering potential uses and limitations of established methods for reintroductions. The results outline how key ecological models can be applied to reintroductions and can aid practitioners to assess and quantify their data and modelling needs.

Correspondence: [james.hunter@postgrad.otago.ac.nz](mailto:james.hunter@postgrad.otago.ac.nz)

### Plant diversity in hedgerows and road verges across Europe

Vanneste *et al.*

*Journal of Applied Ecology* 2020, 57: 1244-1257  
DOI: 10.1111/1365-2664.13620

Linear landscape elements such as hedgerows and road verges have the potential to mitigate the adverse effects of habitat fragmentation and climate change on species, for instance, by serving as a refuge habitat or by improving functional connectivity across the landscape. This hypothesis has not been evaluated at large spatial scale. The authors assessed plant diversity patterns in 336 vegetation plots distributed along hedgerows and road verges to show that linear landscape elements provide a potential habitat for plant species across Europe, including slow-colonising specialists.

Correspondence: [thomas.vanneste@ugent.be](mailto:thomas.vanneste@ugent.be)

### Forest damage by deer depends on cross-scale interactions between climate, deer density and landscape structure

Spake R., Bellamy C., Gill R., Watts K., Wilson T., Ditburn B. and Eigenbrod F.

*Journal of Applied Ecology* 2020, 57: 1376-1390 (Open Access)  
DOI: 10.1111/1365-2664.13622

Previous research has assumed that deer density consistently increases forest damage. However, the effect of deer density is likely to be contingent on a range of other drivers, such as climate and landscape structure. This study applied a multiscale approach to identify the drivers of forest susceptibility to damage by deer and found the complex interactive effects are difficult to interpret. The authors provide an interactive Deer Damage Tool for practitioners to visualize impacts in different forests and regions across Britain.

Correspondence: [r.spake@soton.ac.uk](mailto:r.spake@soton.ac.uk)

of drought, wetness and temporary flooding on nine insect-pollinated and six wind-pollinated plant species. Results indicate, while dryness had negative effects for floral resources both in terms of community descriptors and floral traits, negative effects of wetness and temporary flooding were mostly caused by a decrease of insect-pollinated herbaceous species. Changing precipitation patterns will likely adversely affect floral resources and pollinator attraction in agriculturally used temperate grassland.

Correspondence: [walter.julia@uni-hohenheim.de](mailto:walter.julia@uni-hohenheim.de)

# Forthcoming Events

For information on these events please see [www.cieem.net](http://www.cieem.net).

## Conferences

Date	Title	Location
22-23 September 2020	CIEEM Welsh Conference 2020 – Sustainable Management of Freshwater Resources: Bringing Our Rivers Back to Life	Online
27 October 2020	CIEEM Scottish Conference 2020 – Land Use in Scotland: Changes, Challenges and Solutions	Online
1-2 December 2020	CIEEM Autumn Conference 2020 – Time to Change: Putting the Environment at the Heart of Social and Economic Well-Being	Bristol

## Training Courses

### September 2020

3 & 10	Calculating and Using Biodiversity Units with Metric 2.0	Online
10-11	Plant Identification and Botanical Keys	Online
10	Eurasian Beaver Ecology and Surveys	Online
11	Eurasian Beaver Mitigation and Management	Online
15-16	Water Vole Ecology & Surveys	Online and Cirencester
17-18	Soils, Plants & Phytoremediation	Online
24-25	Plant Identification and Botanical Keys	Online
24 & 1 Oct	Calculating and Using Biodiversity Units with Metric 2.0	Online
25 & 2 Oct	Biodiversity Net Gain Through Development	Online
28-29	Water Vole Mitigation	Online
28 & 5 Oct	Calculating and Using Biodiversity Units with Metric 2.0	Online

### October 2020

1-2	Soils, Plants & Phytoremediation	Online
7	Introduction to Bats and Bat Survey	Dunblane
8	Bat Impacts and Mitigation	Dunblane
8	Phase 1 for Development	Nr Cambridge
8 & 15	Calculating and Using Biodiversity Units with Metric 2.0	Online
13 & 15	QField for Ecologists and Environmental Practitioners	Online
14	Barn Owl: Ecology, Surveying and Mitigation	Birmingham
14-15	Beginners QGIS for Ecologists and Conservation Practitioners	Nottingham
15-16	Vegetation Survey Techniques: Extended Phase 1/Phase 2 Using NVC	Online
20 & 27	Mental Health Awareness in the Work Environment	Online
21	Preliminary Ecological Appraisal	Newport
21	Introduction to Bat Ecology and Bat Surveys	Online
22	Bats: Impact Assessment and Mitigation	Online
22	Badger Survey, Impacts and Mitigation	Falkirk
22-23	The Importance of Meres and Mosses	Online
27-28	Water Vole Live Trapping, Handling, Practical Care and Re-establishment	Lifton

## Reassessing Training Courses

We are working closely with all of our trainers and venues to assess each training course individually in order to determine whether:

- 1) the content lends itself to online delivery; or
- 2) if the course needs to be delivered in-person (owing to field visits, handling of specimens etc.), how this can be done in the safest possible way and in accordance with current government guidance.

Following assessment, this may mean moving to online delivery, or, for in-person training, reducing delegate numbers, moving to a larger meeting room, or moving to a different venue to ensure adequate delegate parking, etc.

This applies to those training courses that were postponed from 20 March to 31 August 2020 and are due to be re-scheduled, as well as for training courses that are planned to take place from 1 September 2020 onwards.

We will be in touch with all booked delegates as soon as we can and thank you for your patience in the meantime.

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