



©Andrés Luis Dominguez Blanco

MONTANARO



Biodiversity Loss

Mass Extinction: the impact on business and society
Kate Hewitt

Executive summary

The purpose of this Deep Dive Report is to gain a greater understanding of how companies are coping with the biodiversity crisis.

Nature, the global economy and human prosperity are inextricably linked. However, it is clear that there is a lack of acknowledgement amongst corporations of how much they are reliant on, and impact, nature. Beyond acknowledgement, even fewer action plans have been produced on how to cope with accelerating extinction rates amongst living organisms and their effect on business. As a result, we have chosen to approach this engagement project slightly differently to those we have undertaken in the past. We have focused on research organisations, charities and academics when gathering information in the hope that we can use this as the foundation for future considerations of ecology as part of environmental risk analysis in our investment process.

There are some companies that have already begun their journey to nature positivity. We have been able to speak to some of them as part of our project. However, even in the cases of these first movers, understanding the quality of their methodologies is difficult due to the absence of specialised third-party assessment frameworks.

Yet there is a silver lining in this regard. Emerging models for best practice are being drafted. Chief among them is the Taskforce on Nature Related Financial Disclosures (TNFD). The TNFD was established in response to the growing appreciation of the need to include nature when making financial and business decisions. The TNFD is an initiative designed to offer market participants a roadmap for risk management and disclosure on evolving nature-related risks and opportunities. The ultimate aim is to catalyse a shift in global financial flows away from nature-negative outcomes and toward nature-positive outcomes. We have participated in calls, roundtables, and workshops to provide feedback on the beta version of the TNFD framework. You can read more about this framework on Page 14 of this report.

The crisis of biodiversity loss and the exceeding of planetary boundaries should lead to widespread recognition that social and economic resilience is only as strong as nature itself. We are not separate from it but are within it. The pushing of ecological tipping points beyond their recovery thresholds will lead to untold damage. The lack of reporting and action to address this pending catastrophe should be addressed as a matter of urgency.

At Montanaro Asset Management, through our investment decisions and as a responsible business, we try our best to ensure that we are stewards of nature, the biosphere and client capital. We, along with a growing number of other important stakeholders, are working towards a nature-positive transition that can bring about a better world.

On a personal note, biodiversity and conservation are topics that inspired my choice of undergraduate degree. As a fresh faced sixth former studying for my Biology A-level, photographs taken by my teacher adorned the walls of our classroom. The images of animals and plants he had captured on his travels offered a glimpse of the natural wonders of the world that, if we revised hard enough, our interest in ecology would allow us to explore. There could only be one subject to pursue at university, it would be the one that allowed me to get closer to understanding the science of life and seeing it up close in all its fascinating glory.

During my time as a biology student, the most enjoyable part of my degree was the field trips. It was a wonderful chance to study mycology, ornithology, and entomology not from books or in a lecture theatre, but in the (often very rainy) British countryside. This hands-on approach to learning influenced my further educational choices, but this time, I was keen to go further afield. For my master's degree I chose to go to Costa Rica.

Costa Rica is a conservation success story and should give hope to all those wishing to turn the tide of mass extinction.

Between 1940 and 1987, Costa Rica was the most deforested country in Latin America, with nearly half of the original forest cover lost during that period. Radical action was taken to address this and from 1996 it was made illegal to clear trees without approval from a government authority. Since then, the tropical forests have returned with a beautiful green vengeance. **Trees are now thought to cover 60% of the country's surface and it is estimated that Costa Rica is home to 6% of the world's biodiversity, despite only representing 0.03% of its surface.**



Image of a red eyed tree frog taken by Kate Hewitt in Costa Rica

It might be easy to think I have forgotten my academic roots. Sitting in the lovely Montanaro offices in central London, I'm a long way from the cloud forests of Costa Rica and even the rainy woods in Northumbria where I did my field work as an undergrad. **But it is here that the real action must be taken.** The idea that future generations might only ever get as close to nature as I did as a sixth former, looking at pictures of the wild rather than being able to experience it first hand, is the catalyst that we all need to re-think our relationship with nature and how we are best able to advocate for change.

Investors and asset managers are a key part of the puzzle. In directing capital towards solutions to biodiversity loss and backing businesses that are managing their ecological footprint in a responsible way, the terrible eradication of Earth's creatures, plants and fungi can be stopped.

Kate Hewitt

ESG & Impact Specialist

Contents

Biodiversity: what is it and why is it important?	Page 4
Inter-related crises	Page 8
Policy and regulatory landscape	Page 12
Engagements	Page 14
What are businesses already doing?	Page 23
Conclusions	Page 31
What is Montanaro doing?	Page 32
Glossary	Page 34

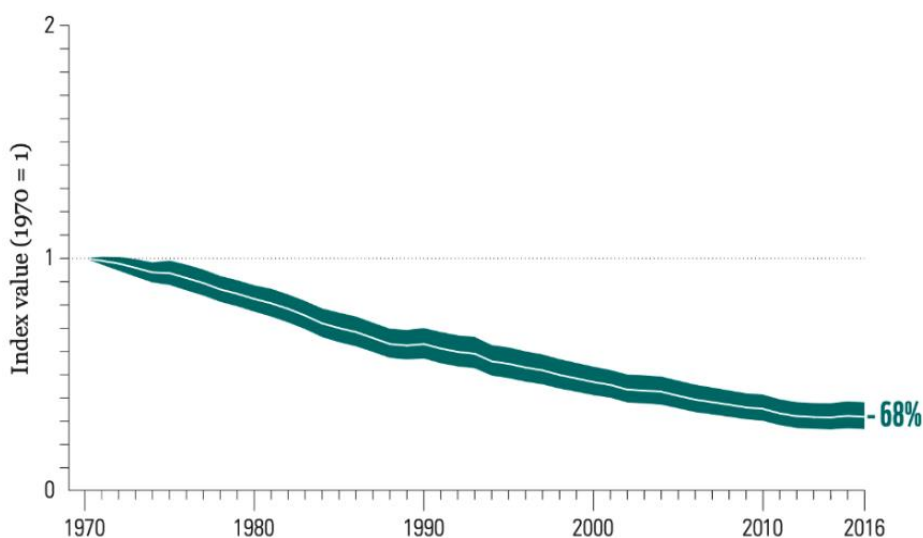
Biodiversity:

What is it and why is it important?

Biodiversity is the term used to describe the number and variety of organisms in a region. Living animals, plants, fungi, and microorganisms constantly interact with the landscape surrounding them. This diversity and abundance of interactions create a robust biosphere capable of withstanding shocks that put a strain on the natural environment. However, biodiversity is declining at an alarming rate. This reduction in the variety of life is thought to be the planet's sixth mass extinction event – and it is accelerating¹.

A mass extinction event is when species vanish much faster than they are replaced. This is usually defined as about 75% of the world's species being lost in a short amount of geological time². We associate this type of massive species loss with the death of the dinosaurs but unfortunately this has not been consigned to the past. The five previous mass extinctions have changed the face of life on Earth and the present event, dubbed the “Holocene extinction”, is unlikely to be much different.

There are those who have proposed that we have transitioned from the Holocene into a new geological epoch, called the “**Anthropocene**”³. This era has been shaped by human activity and has led to huge planetary changes all at a rate measurable during a single human lifetime. The chart below shows the loss of life since 1970.



Key

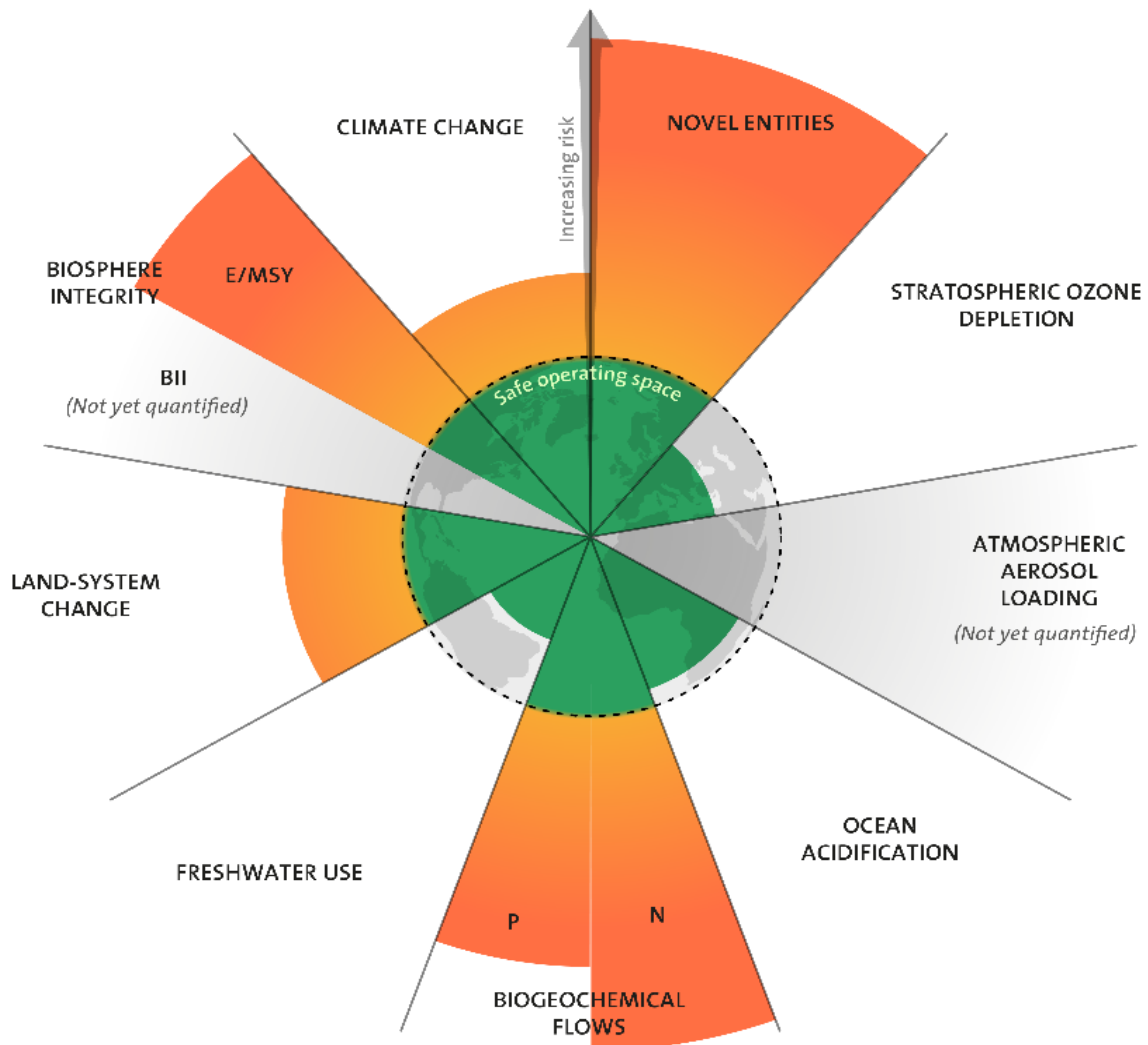
- Global Living Planet Index
- Confidence limits

¹ <https://earth.org/sixth-mass-extinction-of-wildlife-accelerating/>

² <https://www.nhm.ac.uk/discover/what-is-mass-extinction-and-are-we-facing-a-sixth-one.html>

³ <https://www.nhm.ac.uk/discover/anthropocene.html>

This apocalyptic picture is mainly caused by habitat destruction, the introduction of invasive species, illegal wildlife trade, pollution and climate change. In short, human activity is leading to decreasing flora and fauna. Work undertaken by scientists at the [Stockholm Resilience Centre](https://www.stockholmresilience.org/research/planetary-boundaries.html) has assessed how far we can push the natural world before causing irreversible damage. They have attempted to define a “*safe operating space for humanity*”, which does not degrade the natural world. However, according to their analysis, we have already breached a number of these boundaries, with devastating consequences for the world’s biodiversity⁴.



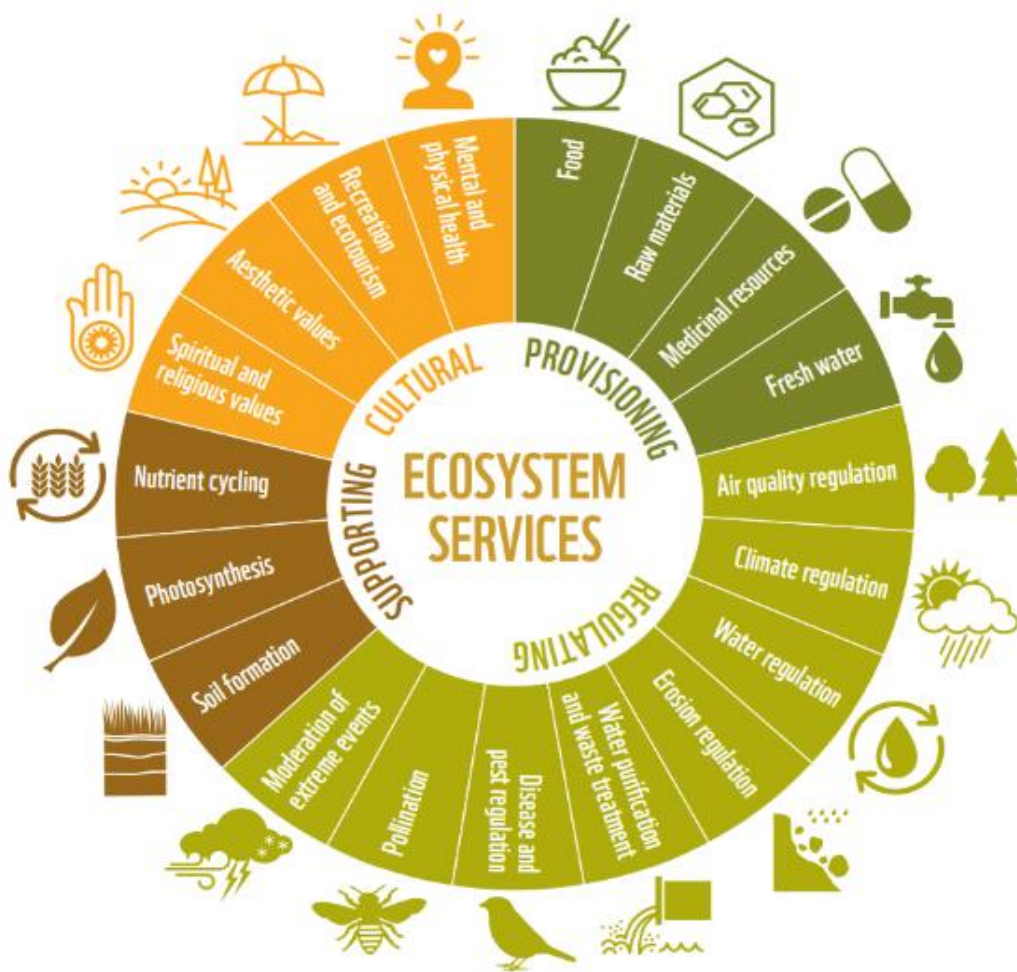
The diagram above shows the “*safe operating space (for humanity)*” in green, while the increasing risk of tipping the planetary boundary into unrepairable damage is shown in orange and red. Biosphere integrity indicates the risks posed by species loss. E/MSY relates to genetic diversity and BII relates to functional diversity. BII has yet to be quantified as a Planetary Boundary, but the loss of genetic diversity is thought to be beyond the zone of uncertainty and so presents a high risk to humanity.

⁴ <https://www.stockholmresilience.org/research/planetary-boundaries.html>

As human populations congregate in urban centres, our interactions with nature dwindle. Other than watching the latest David Attenborough documentary, most of us do not really interact with biodiversity on a regular basis and therefore are not primed to notice its declining abundance. This begs the question: if we do not notice it, why should we care?

Ecosystems are not as efficient at producing raw materials and providing the conditions humanity needs without the rich array of life that sustains, interacts with and is part of the natural environment. Functioning ecosystems are underpinned by biodiversity. It has been shown that biodiversity and the ability of an ecosystem to provide services are inextricably linked⁵. This is due to the diversity of living organisms and the interactions they have with their abiotic surroundings. It is this variety of life that provides natural resilience and stable habitats.

Ecosystem services refer to the benefits human populations derive from nature. These services are fundamental for human well-being and society



The diagram above from the WWF shows the range and variety of ecosystem services. Ecosystem services can be split into four groups⁶.

⁵ <https://academic.oup.com/bioscience/article/57/10/868/232508?login=false>

⁶ https://www.wwf.org.uk/sites/default/files/2016-10/LPR_2016_full%20report_spread%20low%20res.pdf

The four groups of ecosystem services:

1. **Provisioning Services** - the products obtained from ecosystems.
2. **Regulating Services** - the benefits obtained from the regulation of ecosystem processes.
3. **Cultural Services** - the nonmaterial benefits people obtain from ecosystems.
4. **Supporting Services** - those services that are necessary for the production of all other ecosystem services.

The joy of each of these services is that humanity has been enjoying their myriad benefits completely free!

However, is the lack of a financial exchange between people and the planet what has led us to ascribe little value to these natural resources and degrade them so ruthlessly? As the Environmental Economist, Pavan Sukhdev, said *“Not a single bee has ever sent you an invoice. And that is part of the problem - because most of what comes to us from nature is free, because it is not invoiced, because it is not priced, because it is not traded in markets, we tend to ignore it.”*⁷

This is particularly true of those services that do not directly translate to an easily monetised commodity. A tree that does not produce fruit or timber is still providing photosynthesis, contributing to soil quality and nutrient cycles. It is therefore supporting all other ecosystem services despite it not charging for a single one.

Cultural Services sit in a category of their own. As well as the physical benefits of sustaining the air, soil, and water quality on which we rely, there are intangible services that ensure well-being and good mental health. It is worth noting that most people want to protect nature for its intrinsic value rather than greedily surveying the landscape for what can be extracted and sold. So, it may seem simplistic and even uncomfortable for some to think of the benefits of all other life on Earth in terms of what it can offer to a single species (*Homo sapiens*). However, clarifying this connection is an important exercise. It illustrates the link between mangroves and storm protection; rainforest flora and biomedical discoveries; the insects in our soil and the nutritional value of our food.

Businesses have the power and resources to do a great deal to implement a reversal of current levels of biodiversity loss and by extension, the erosion of ecosystem services. The connection of the corporate world to the natural one is often not acknowledged. This is reflected within the corporate sustainability reporting that we review as part of the Montanaro investment process. Only a small number of the companies in which we invest appear to make any reference to biodiversity. Even fewer have forward-looking targets to manage and improve their impact on the ecosystems that they rely on and influence through their activities. It should be recognised more widely within corporate sustainability reporting that environmental risks are business risks due to humanity’s reliance on natural capital. This is particularly important for those companies with operations in high-risk areas (such as biodiversity hotspots) and those closely involved with land use change such as forestry, mining and agriculture. However, this does not mean that companies with lower biodiversity risk should neglect to tackle the issue entirely. Biodiversity loss is an issue that poses an existential threat to humanity, and it will require a collective effort to halt and reverse the damage.

⁷ https://www.ted.com/talks/pavan_sukhdev_put_a_value_on_nature/transcript?language=en

Inter-related Crises

Climate resilience and ecosystems

Stewardship of natural resources is also essential for helping to alleviate the climate crisis. It is estimated that 50% of humanity's carbon emissions are removed annually by ecosystems⁸. However, land-use change means that the benefits of carbon sequestration we receive from nature are being lost. Degradation of habitats and the conversion of resilient and wild ecosystems through human activity means that natural carbon sinks are no longer able to absorb carbon dioxide. The Brazilian Amazon has already turned into a carbon source due to deforestation, higher temperatures and increased frequency of droughts and wildfires⁹. This is why conservation and climate action should be viewed as two sides of the same coin. Through the conservation and restoration of natural carbon sinks in forests, oceans and other ecosystems, we can combat global warming and meet the targets of the Paris Climate agreement of 2015. Companies that can integrate their climate goals with protecting and restoring natural resources will be well placed to meet their targets using a holistic approach to mitigating environmental risks.

Case Study

Severn Trent has integrated the restoration of natural environments into their Net Zero Carbon Pledge for 2030. The company is undertaking land remediation projects to restore landscapes through nature-based solutions. This facilitates the protection and growth of carbon sinks, like forests and peatbogs that remove carbon from the atmosphere. In addition, the restoration of river ecosystems helps the provision of water services.



Image of an Arctic Tern taken from Severn Trent's water protection site.

⁸ https://jacksonlab.stanford.edu/sites/g/files/sbiybj15141/f/friedlingstein_et_al.2020_esd.pdf

⁹ <https://www.stockholmresilience.org/research/research-news/2021-10-17-paris-climate-goals-unattainable-without-rich-biodiversity-and-ecosystems.html>

In addition to preserving these valuable carbon sinks, natural habitats can offer protection against the physical effects of climate change. For example, mangroves and coral reefs can protect coastal communities from storm surges and increased forest cover can alleviate flooding.



The photograph above was highly commended in the 2022 Natural History Museum's Wildlife photographer of the year awards. Photographer [Rakesh Pulapa](#) captured the remains of a mangrove swamp on the edge of Kakinada, India to show the human impacts on this vulnerable ecosystem.

Biodiversity and Health

The chemicals and genetic codes that exist in nature hold enormous benefits for medical science. Pharmacological discoveries are made through studying nature and naturally derived compounds can be used for therapeutic purposes including cancer treatments.

Where the biological activities of plants are understood, this may lead to over exploitation.

Example

The Indian Nard (pictured right) is listed as Critically Endangered by the IUCN Red List (the global catalogue of known species populations and their risk of extinction). Populations are continuing to decline because the species is extensively harvested for their medicinal uses. Studies of the plant's extracts indicate possible uses in the treatment of diabetes, some types of cancer and dementia. Scientific advancements resulting in further applications for any of these purposes could greatly increase demand for the species and exacerbate the problem of over-exploitation.

A balance should be struck between conservation and benefitting from the important properties of the plant.



In some cases, the pharmaceutical benefits of plant species are not yet understood but populations are still in decline. Biodiversity is the source for important drugs (as shown in the example of the Indian Nard) but if it is lost before we can access and understand it, we may never discover the medicines needed for many diseases and health problems^{10,11}.

Example

Species of orchid have been used in traditional medicine for centuries and have also been studied for modern therapies due to their pharmaceutical potencies. The *Calanthe* genus of orchids are found in tropical and sub-tropical forest and a continuing decline in the extent and quality of these habitats is a key threat. Bioactive compounds isolated from some orchids have been reported to exhibit anti-tumour activity. However, many important species remain underexplored and poorly understood. Due to risks such as habitat fragmentation and unsustainable harvesting, species of orchid that could be incredibly valuable for healthcare treatments have a high risk of extinction.

As well as being a valuable resource for the development of scientific knowledge that helps to treat and cure diseases, natural barriers can protect us from novel pathogens. Ecological protection and conservation can prevent the emergence of new zoonotic diseases (infectious diseases that cross from animals to humans). It is thought that 75% of all emerging diseases have been transmitted in this manner¹².

¹⁰ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4650206/#R44>

¹¹ <https://www.sciencedirect.com/science/article/abs/pii/S0378874121010527>

¹² https://ec.europa.eu/commission/presscorner/detail/en/fs_22_3749

Deforestation and the encroachment of humans on previously untouched wilderness mean more interactions between humans and animals. These animals can carry pathogens that can make the leap to infect humans. These new diseases can have catastrophic consequences when they jump from animals to humans as we saw during the coronavirus pandemic. When we destroy habitats and convert land for human use, we become exposed to disease and put ourselves at greater risk of a health crisis.

Protecting nature to prevent pandemics costs just 1% of fighting them¹³.

In addition to the conservation of habitats leading to an important barrier between us and vectors of disease, healthy ecosystems filter the air we breathe and the watercourses we rely on for potable water and sanitation. This pollution reduction has a knock-on impact on our health by preventing diseases caused by avoidable environmental factors such as poor air and water quality. The World Health Organisation have calculated that 4.2 million deaths occur every year as a result of ambient air pollution¹⁴. Therefore, ecosystem conservation can reduce this disease burden as well as reducing the health impacts from climate change by acting as carbon sinks.



Image taken from the [WWF Living Planet Report 2020](#) ©Malin Rivers

¹³ <https://www.science.org/doi/10.1126/sciadv.abl4183>

¹⁴ https://www.who.int/health-topics/air-pollution#tab=tab_1

Policy and Regulatory Landscape

Measuring exposure to ecological risks is challenging, but efforts are being made to establish a common model of best practice. The TNFD (Taskforce on Nature-related Financial Disclosures) is a new framework modelled on the existing TCFD (Taskforce on Climate-related Financial Disclosures).

Both frameworks aim to standardise corporate reporting on environmental issues. The TCFD is already well established, and the UK Government has introduced mandatory reporting against this framework for some businesses. The TNFD aims to use the momentum of this reporting framework to expand the scope beyond climate change and encompass wider ecological metrics. We have participated in consultations with the TNFD to reflect how we think new disclosure requirements should be developed (read more about our involvement on page 14). We're hopeful that TNFD will aid businesses in assessing their impact on complex natural systems in a meaningful way.

In addition to corporate disclosure frameworks, the international community is coming together this year (following a COVID induced hiatus) to discuss the next decade for biodiversity action planning. The Convention on Biological Diversity (CBD) is a global agreement that aims to bring the world together under a ten-year plan to reverse the loss of biodiversity. It is an important summit that has its own Conference of the Parties (COP) – the first of which was held in Nassau, in the Bahamas, in 1994. Confusingly similar to the recent COP26 held in Glasgow, however the conferences are separate¹⁵. How the latest COP on Biodiversity - COP15 - aims to improve the world's biodiversity will have repercussions on how the international community deals with climate change. These conferences allow decisions to be made between countries for the benefit of all people and the planet. These decisions can guide, and shape national and local action taken for nature.

At the 2010 meeting of the CBD, countries agreed to a set of 20 global targets which aimed to halt biodiversity loss. These came to an end in 2020 and few of the targets were actually achieved by the countries involved, including the UK. There are a number of COP15 conferences taking place this year, the most recent finished at the end of June in Nairobi. The focus is the development of a post-2020 action plan on biodiversity and will conclude in Canada this December. The new targets will range from addressing species extinctions and recovering populations, to reforming unsustainable extractive industries and tackling pollution. Alongside these targets, the money to deliver them and the methods of monitoring progress are also being discussed. This new framework will be adopted at CBD COP15 but so far little has been agreed upon. As with COP26, achieving a meaningful agreement between the participating countries and balancing their interests is proving to be no small feat¹⁶.

Investors are using the conference as a catalyst for their own engagements with companies. Nature Action 100 (NA100), is an investor-led collaborative engagement programme to engage with companies and policymakers on nature. The collaboration is launching in summer 2022 to coincide with COP 15 global biodiversity talks. As part of NA100, investors will engage with both companies and policymakers deemed key to achieving the goal of reversing nature loss by

¹⁵ <https://www.cbd.int/>

¹⁶ <https://rspb.org.uk/our-work/rspb-news/rspb-news-stories/what-is-cop15/?from=morelikethiscop>

2030. As with TNFD, the NA100 is modelled on a climate change focussed predecessor, Climate Action 100+. It seems that the progress made on climate action (although still too slow) is providing templates for other important ESG causes to follow.

At a national level, HM Treasury commissioned a review of how a prosperous society is reliant on the natural world. “The Economics of Biodiversity” (or The Dasgupta Review) outlines the relationship between ecosystems and our economy. This review calls for a shift in the way we view the assets nature provides and warns of the dire consequences of overexploitation. Since its publication, it is already informing future policy action and will likely influence the approach taken to biodiversity in the UK¹⁷.

Regulatory pressures are already being exerted elsewhere. In the EU, an action plan has been developed on sustainable finance. An important part of this plan is the introduction of the EU Taxonomy which attempts to define “green activities” for the first time. The idea is to tackle the phenomenon of “greenwashing” (overstating or misrepresenting sustainability credentials of a business) by defining commonly used criteria that economic activities should comply with in order to be considered environmentally sustainable. Business activities must contribute to at least one of the six environmental objectives that have been decided upon; this includes protecting or restoring biodiversity and ecosystems. The EU regulators are still in the process of ironing out the details of what type of operations can be considered meaningful contributors to this theme, but the introduction of this regulation is helping to push biodiversity and ecosystems further up the business agenda¹⁸.

Although this regulation is still in development, some European countries are already acting on these requirements. France has been at the vanguard and introduced a decree in 2019 that will require French investment firms to undertake biodiversity reporting. The lack of biodiversity data is raising eyebrows about just how financial institutions will comply with this decree. This is why frameworks like the TNFD are desperately needed to ensure consistency in reporting and establish a best practice standard¹⁹.

With all these advances in how policymakers and investors are considering humanity’s place in nature, we are confident that businesses will be forced to consider the impact of their activities on biodiversity sooner rather than later. Those that are leaders rather than laggards will be ahead of the regulatory curve.

¹⁷ <https://www.gov.uk/government/publications/the-economics-of-biodiversity-the-dasgupta-review-government-response>

¹⁸ <https://www.nossadata.com/blog/sfdr>

¹⁹ <https://tnfd.global/news/frances-article-29-biodiversity-disclosure-requirements-sign-of-whats-to-come/>

Engagements

Given the benefits of biodiversity and ecosystem services as well as regulatory developments, we were keen to explore how we at Montanaro could integrate biodiversity stewardship into our investment process to a greater extent. We spoke to research organisations, academics and investor networks to broaden our understanding of how investors can assess biodiversity risk and advocate for better environmental stewardship through engagement.

TNFD – participating in development of the framework

The TNFD is a framework currently in development. The intention is that the completed framework will allow organisations to report and act on evolving nature-related risks, with the ultimate aim to support companies, investors, and lenders to shift global financial flows away from nature negative outcomes and toward nature-positive outcomes.

Beta versions of the framework have already been released and feedback gathered from market participants on the proposed approach of the Taskforce. We have joined roundtables and workshops run by [NatureAlpha](#) a specialist biodiversity research provider that has been tasked with collating investor feedback to input into the consultation process.

We have shared our thoughts on both the first and second beta releases and eagerly await the publication of the framework (due in 2023). We hope that our contributions to the process will help make this science-based approach to measuring, reporting on, and protecting nature globally accessible to businesses of all sizes and useful across many industries.

Helen Edmundson and Neha Dutt– Department for Environment, Food and Rural Affairs (DEFRA)

We were interested to hear how the new policies might be shaped and informed by the TNFD framework. We were able to schedule a conversation with Helen and Neha at DEFRA to understand what might be expected of businesses regarding environmental stewardship going forward.

The UK government is supporting the development of the TNFD in a number of ways:

- Funding
- Capacity building
- Diplomatic influence
- Catalytic stakeholder engagement
- Targeted research on financial materiality of nature-risks.

Once developed, it is anticipated that the TNFD will create the global baseline on nature risk management and reporting in a manner that can potentially be woven into International Financial Reporting Standards (IFRS) broader global baseline on sustainability reporting. The IFRS Foundation Trustees announced in 2021 the creation of a new standard-setting board—the International Sustainability Standards Board (ISSB). The ISSB will create a global baseline on sustainability reporting. The current focus is on rolling out a final climate protocol which will build on the TCFD and it is anticipated that they will focus on nature next.

Whilst it will be up to individual jurisdictional regulators to adopt the ISSB's reporting requirements, it is likely that the UK will explore ways to incorporate it into overall reporting requirements. This is evidenced through support for the ISSB's work within HM Treasury's Roadmap for Sustainability Disclosures. The end goal envisaged is for institutions to report only once, in the same way that annual financial reports are produced.

An interesting point raised during the discussion is where the adoption of TNFD would fit into other accounting frameworks. For example, the EU has been developing their own sustainability reporting standards. This is a sticking point as it is unclear if the dream of a common global sustainable reporting framework will be realised if different regions decide against accepting the ISSB.

The role of the Green Finance team at DEFRA in the interim will be to engage with market participants to embed thinking about the risks and opportunities associated with nature. This will hopefully cultivate a smooth market landing of TNFD when it is launched in 2023. Beyond this, the team are trying to cultivate project investment for nature positive assets within the UK.

The comparability of reporting that the ISSB hopes to establish through the integration of existing and developing frameworks is incredibly important for establishing where businesses are taking meaningful action. Helen finished by emphasising the importance of the role of policy in standardising reporting: "If companies want to make sustainability claims, they have to prove them. Otherwise, it's market abuse. They have gained access to capital based on false reporting."

Dr Frank Hawkins – The International Union for Conservation of Nature (IUCN)

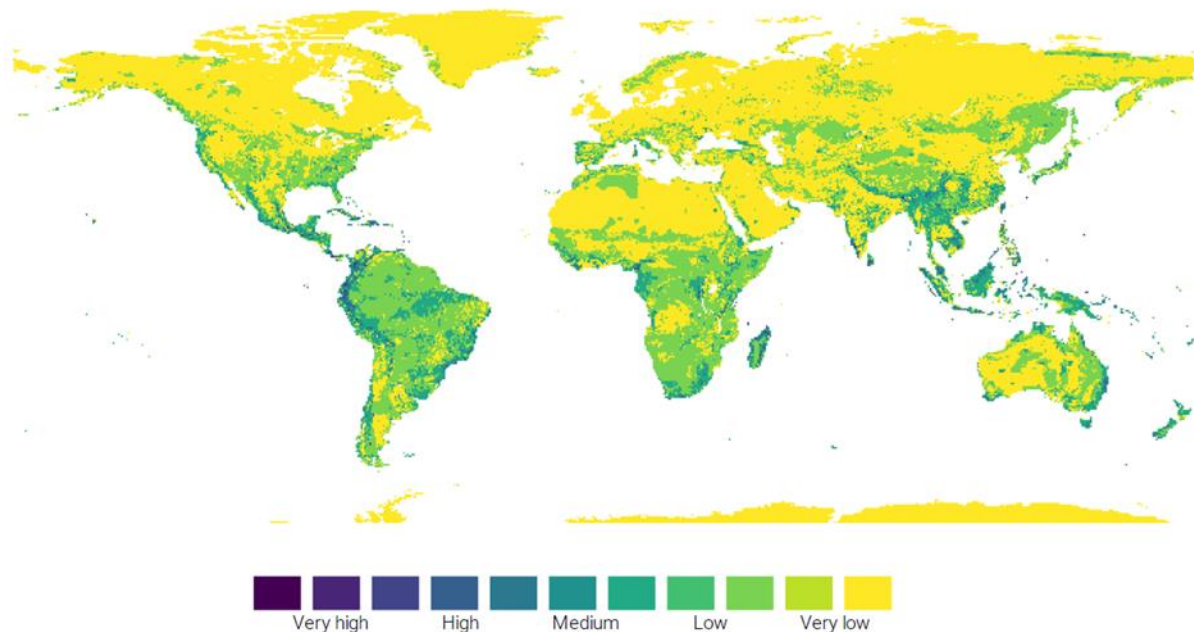
Frank is a conservation biologist and the director of the IUCN's office in Washington DC. The IUCN is a conservation network and is responsible for the publication and maintenance of the [Red List](#), the world's most comprehensive information source on the global conservation status of animal, fungi and plant species.

We arranged to call him whilst he was on site in Madagascar. As a director at the world's largest and most diverse environmental network, made up of government and civil society organisations dedicated to safeguarding nature, we thought Frank would be well placed to discuss the role of the private and financial sectors in contributing to biosphere stewardship.

We were able to talk through the risks and the opportunities presented by the protection of the natural environment and the tools that are in development to aid companies as they explore how best to approach this for their operations. Frank pointed out that supply chain transparency is a big hurdle for companies when assessing the extent of their impact on nature. This is likely to be something that will be detrimental to their adherence to TNFD requirements. Due to the focus the TNFD places on transparency, it is likely that those who are not in a position to track their supply chains accurately will be penalised. Those businesses that understand the extent of their dependencies on nature will already have a good baseline in place for meeting these new disclosure requirements.

In order to help with that task, Frank introduced us to the Integrated Biodiversity Assessment Tool and the Species Threat Abatement and Restoration (STAR) data. The aim is to support businesses and help them apply the STAR data to identify opportunities for investment into

species conservation to support science-based targets for nature. STAR is a biodiversity metric, based on the IUCN Red List of Threatened Species²⁰, that allows businesses to measure their impact on nature. STAR focuses on species extinction risk, using information on where threatened and near-threatened species occur and the threats they face. Frank explained that this is because species-specific data is more developed than data for entire ecosystems. Businesses can use STAR for a range of applications in biodiversity management, for assessing opportunities to reduce species extinction risk and helping understand potential positive and negative impacts associated with operations on the ground.



The figure above shows the Global STAR Threat Abatement map²¹. Grid cell score categories range from Very Low to Very High to indicate the risk exposure of different regions. Note that Indonesia (where M.P. Evans operate) has some high and very high-risk areas.

By using the database of threatened species locations and mapping these against business operations, companies can build their understanding of supply chains. This will bring benefits beyond the understanding of exposure to biodiversity loss and help further a broader knowledge of various ESG risks throughout the company value chain.

Frank also discussed plans in place at the IUCN to develop guidance on net nature positivity to create science-based targets for nature. This is the next step in the process. The vision for the future of corporate biosphere stewardship is:

1. **Measure:** tools like the IBAT STAR data will be used to assess risk and opportunities.
2. **Report:** the TNFD will be used to disclose this exposure in a simple way for stakeholders.
3. **Set goals:** then science-based targets for nature will be used to set the future agenda for the company's ecological protection program.

²⁰ <https://www.iucnredlist.org/>

²¹ <https://www.ibat-alliance.org/pdf/star-industry-briefing-note.pdf>

The Impact Cubed approach to biodiversity

We first spoke to Antti Savilaakso, the Head of Research at Impact Cubed, a specialist organisation focused on measuring the impact of investments. Antti is also the biodiversity specialist in charge of developing their approach to the measurement of biodiversity risk and so was the perfect person to speak to at the start of our journey.

We began by discussing the challenges of measuring biodiversity and what has hampered efforts to create a coherent approach to ecosystem protection from businesses.

One of the key challenges is the **lack of a standardised unit of measurement**. Biodiversity cannot be manufactured and so how companies might go about enhancing the natural environment to cultivate a thriving habitat is hard to replicate from place to place.

This brings us on to the second challenge: the **difficulty in reporting**. Not only does the lack of a common measurement mean it is difficult to reflect the effectiveness of corporate nature restoration programs, but it is also difficult to characterise conservation as a positive output from business operations. The reality is that any disruption might have a negative impact on surrounding biodiversity, and this is a tough message to convey. Antti speculated that the difficulty in putting a cheery spin on how a company's operations have avoided harming the surrounding habitats means that companies have not been incentivised to report on this particular environmental measure.

The final hurdle is the **supply chain transparency**. Many companies have large, complex supply chains and generally speaking, the further down the chain you go, the more opaque the operations of suppliers become. This means that lots of businesses may miscalculate their exposure to ESG risks associated with biodiversity. Biodiversity is very location specific and so idiosyncrasies over where companies operate and how will play a role in the risks that companies are exposed to. This means that without having a firm grasp of where and how materials are sourced, the company could be playing a role in detrimental land use changes without knowing the extent of the damage. Just because a business may be headquartered in London does not mean that its activities do not impact vulnerable habitats elsewhere. Hence why understanding the supply chain and raw material sourcing is very important.

Antti went on to discuss how Impact Cubed have developed their methodology. As the name would suggest, Impact Cubed focus on a three-pronged approach to all their research: What, Where and How. Each of these elements are assessed independently. Antti told us that this methodology is still in development and has not been integrated with their wider research offering as yet.

What

This relates to an industry classification in order to decide the materiality of certain sustainability risks to certain companies. There is a degree of subjectivity here but generally speaking, those companies that are heavily reliant on natural resource use will be more exposed to biodiversity risks.

Where

Biodiversity risk is very location specific and as a consequence Impact Cubed have focused on locating industrial facilities to see whether those sites overlap with at risk habitats. They have been able to gather an expansive data set with nearly five hundred thousand coordinates. These have been mapped against biodiversity indicators. Due to the lack of consensus on the best biodiversity measures to use, Impact Cubed have opted to avoid one single data set to assess a particular site. They have remained flexible due to the difference in physical measures and rely on a number of metrics, including mean species abundance, the IUCN red list, biodiversity hotspots and species richness.

How

This poses the question of how a company is currently managing its biodiversity risk(s). There is not much done here due to a large reporting gap in this area. However, Impact Cubed take into account factors such as: Do they have a policy? Do they measure biodiversity in any way? Do they produce a report?

The lack of specific reporting on biodiversity means that Impact Cubed rely on other externality metrics as a proxy. For example, a company operating in a water scarce region with a large water footprint is likely to have an impact on local biodiversity, a measure that can be used to assess the likely negative impact and have more direct, fruitful engagements.

We discussed ambitions and goals of companies aiming for net-nature positivity. As with many goals concerning biodiversity and conservation, there is a lack of clarity over how this is measured and delivered. Antti's take is that net nature positivity was about relativity rather than creating biodiversity. That is to say that businesses that select the least disruptive operational choices will be considered "net-nature positive". This returns to the idea that the crux of a company's impact on biodiversity centres on how well they can avoid ecosystem damage.

Net-Nature Positivity

A high-level goal and concept describing a future state of nature (e.g., biodiversity, ecosystem services and natural capital) which is greater than the current state.

Antti gave the example of the metals needed for electrification. Ultimately, a reduction in the reliance on fossil fuels brought about by this technological advancement will have a positive impact on biodiversity as climate change is one of the leading causes of biodiversity loss. However, in the short term, the metals need to be mined. Metals such as lithium can be extracted via open pit mining or via evaporation ponds. Open pit mining is notoriously disastrous for surrounding wildlife due to the nature of the extractive process necessitating the destruction of the local area²². Evaporation ponds are thought to have a smaller impact as this process usually takes place in arid regions such as the Atacama Desert which is not designated a biodiversity hotspot using the traditional definition (it must have at least 1,500 vascular plants as endemics, and it must have

²² MSCI Biodiversity Threats from Mining Report

only 30% or less of its original natural vegetation remaining)²³. This means that in simplistic terms, the choice to mine lithium in deserts takes less of a toll on global biodiversity. However, the Atacama Desert is still a fragile and unique ecosystem. The large quantities of water needed to extract lithium via evaporation leads to ecological damage as well as depleting the drinking water of local indigenous communities²⁴. Nevertheless, using this thought process to determine the more preferable route to electrification on a net nature positive basis, lithium mining in the Atacama comes out on top.

Whilst at Montanaro we do not invest in mining companies, we do wish to support a transition to the Green Economy through our investments. Given this complex array of interrelated environmental factors, it is clear that an understanding of raw material sourcing is essential for building a holistic picture of the risks a company may face. The Impact Cubed tool should help to enhance transparency and provide investors with to information necessary to perform a detailed assessment of where operations are likely to pose the most risk to local ecosystems.

Case Study

As investors in renewable energy, we attended the Global Wind Energy Council (GWEC) webinar in June following the publication of their Global Wind Report for 2022. We usually think of wind farms and immediately see the contribution renewable energy is making to a green future, but does this mean we miss the net effect on the environment? Speakers at the event touched on this and how the commissioning of huge offshore wind farms necessitated careful consideration of the ocean ecosystem prior to initiating the project. In the case of offshore wind, ocean sustainability and health need to be discussed alongside the climate crisis and how we overcome this.

The [GWEC Global Offshore Wind Report 2022](#) notes that the impact on biodiversity from offshore wind development has emerged as a crucial issue for project developers. The industry is seeking to position itself as a responsible custodian of the ocean and it is therefore incumbent on the offshore wind industry to ensure the health of the environment is both protected and even enhanced where possible.

In order to mitigate negative biodiversity impacts, project developers are investing in new solutions and approaches to better understand marine biodiversity and how offshore wind can harmoniously coexist with its natural environment.

A net zero future and a nature positive future are inseparably connected. However, backing conscious developers is essential to ensure that a low carbon future does not come at an ecological cost.

²³ <https://www.conservation.org/priorities/biodiversity-hotspots>

²⁴ <https://www.theguardian.com/commentisfree/2021/jun/14/electric-cost-lithium-mining-decarbonasation-salt-flats-chile>

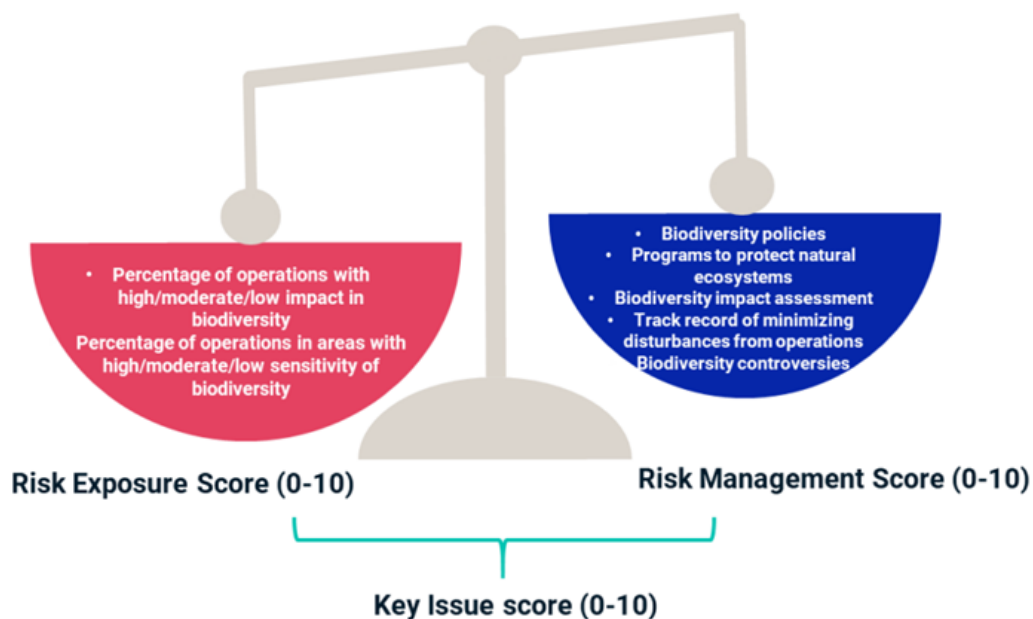
The MSCI approach to biodiversity

Our primary ESG service provider is MSCI. We use MSCI in conjunction with company sourced data to measure the environmental intensity of our companies. This information is then integrated into our investment process by our Risk Analyst and our Investment Team using our proprietary ESG checklists. One score that MSCI provide us with for our approved list companies is the Biodiversity & Land Use Exposure Score. We were intrigued as to how these scores are generated and so looked into the methodology used by MSCI.

This exposure assessment is based on two factors:

- 1) the extent of a company's operation in regions with fragile ecosystems;
- 2) the extent to which companies' business activities impact on ecosystem services and cause biodiversity degradation.

MSCI compile data from different sources to conduct the evaluation. These sources include: Global Forest Watch, World Resources Institute, UNDP Human Development Report, and The Corporate Ecosystem Services Review, World Resources Institute²⁵.



Of the 256 companies on our Approved List, 205 had been assigned a Biodiversity & Land Use Exposure Score (as of June 2022). The average key issue score (combining both risk exposure and management) for the companies featured in this list is 1.6. This compares favourably to the average of the MSCI World Small and Midcap Index, which is 2.1.

²⁵ MSCI Data and Metrics Overview: Assessing Biodiversity Impacts and Risks, February 2022

Farm Animal Investment Risk and Return (FAIRR)

Agriculture is an industry that is closely associated with biodiversity loss due to the land conversion necessary for developing farmland. In fact, it is thought that the food system threatens more species than any other sector²⁶.



Image taken from the FAIRR Biodiversity Investor Briefing

Given the longstanding role of FAIRR as a facilitator of important collaborative engagements topics of ESG risk and animal agriculture, we wanted to schedule a meeting with the organisation to discuss their approach to biodiversity. We met with Max Boucher who leads the organisations efforts on biodiversity research and engagement.

He explained that FAIRR are launching a suite of engagement projects all centred on biodiversity. They have focussed on three “pathways”, all of which are associated with animal agriculture and lead to biodiversity loss. These are: land use change; land management; and waste and pollution.

The first of these pathways will concern waste and pollution. Agricultural run-off and dumping of fertiliser can lead to algal blooms in local waterways which reduces the oxygen content of the water and can result in huge losses of flora and fauna. Max discussed the need for more joined up thinking when it comes to dealing with issues such as this. FAIRR is trying to encourage companies involved in animal agriculture to invest in appropriate manure management.

One use for the animal waste is biogas. This has the following benefits:

- The waste enters into fermenters rather than being spread on the land as fertiliser which reduces the risk of pollution and ecological damage.
- Reliance on fossil fuels is reduced.
- Principles of circular economics are used to convert waste into a useful product.

²⁶ <https://royalsociety.org/topics-policy/projects/biodiversity/preserving-global-biodiversity-agricultural-improvements/>

However, FAIRR are sceptical about the use of biodigesters as a solution to the impact of manure on biodiversity loss and climate change. This is principally because this solution fails to address N₂O, a greenhouse gas 273 times more potent than CO₂ on a 100-year basis²⁷.

Max said that the initial objectives of the engagement would be to understand the biodiversity, climate and social risks arising from manure mismanagement. The overall aim will be to encourage the reversal of nutrient pollution from manure and help companies to capture its full potential as a fertiliser.

This project is still in development and we will monitor target companies to see if any of our portfolio companies are included.

²⁷ <https://www.fairr.org/engagements/biodiversity-engagement/>

What are businesses already doing?

With very few companies including ecological considerations within their reporting, we were keen to gather examples of those that already factor in biodiversity when making operational decisions

M.P. Evans Group

M.P. Evans is a UK company that owns, manages, and develops sustainable oil-palm estates in Indonesia. The Company operates through segments, including palm-oil-plantation crops in Indonesia and property development in Malaysia. Its plantations are spread across five Indonesian provinces: North Sumatra, South Sumatra, Aceh, Bangka-Belitung and East Kalimantan.

Oil palm is an incredibly high yielding crop. Due to its high yield, it needs less than half the land required by other crops to produce the same amount of oil. This makes palm oil the least expensive vegetable oil in the world. As a consequence, it is found in many products including food, cosmetics and soaps. However, this tropical palm is associated with habitat destruction, which in turn leads to biodiversity loss and the conversion of carbon sinks which exacerbates climate change. There have also been social-ills committed in the name of palm oil production, such as land grabbing and labour-rights violations. **This has culminated in well-founded concerns over the use of palm oil (a topic we have engaged on extensively over the years).**

However, replacing palm oil would require more land conversion due to the lower yield of other oil crops. In addition, millions of farmers and their families work in the palm oil sector. Palm oil plays an important role in the reduction of poverty in these areas. In Indonesia and Malaysia, a total of 4.5 million people earn their living from palm oil production. Stopping the production of palm oil altogether would create significant problems for these people who support their families by working in this industry. Finally, replacing palm oil with other types of oil is not always feasible due to palm oil's unique properties as a food ingredient. Using other oils would not give the products the same texture and taste that palm oil offers²⁸.

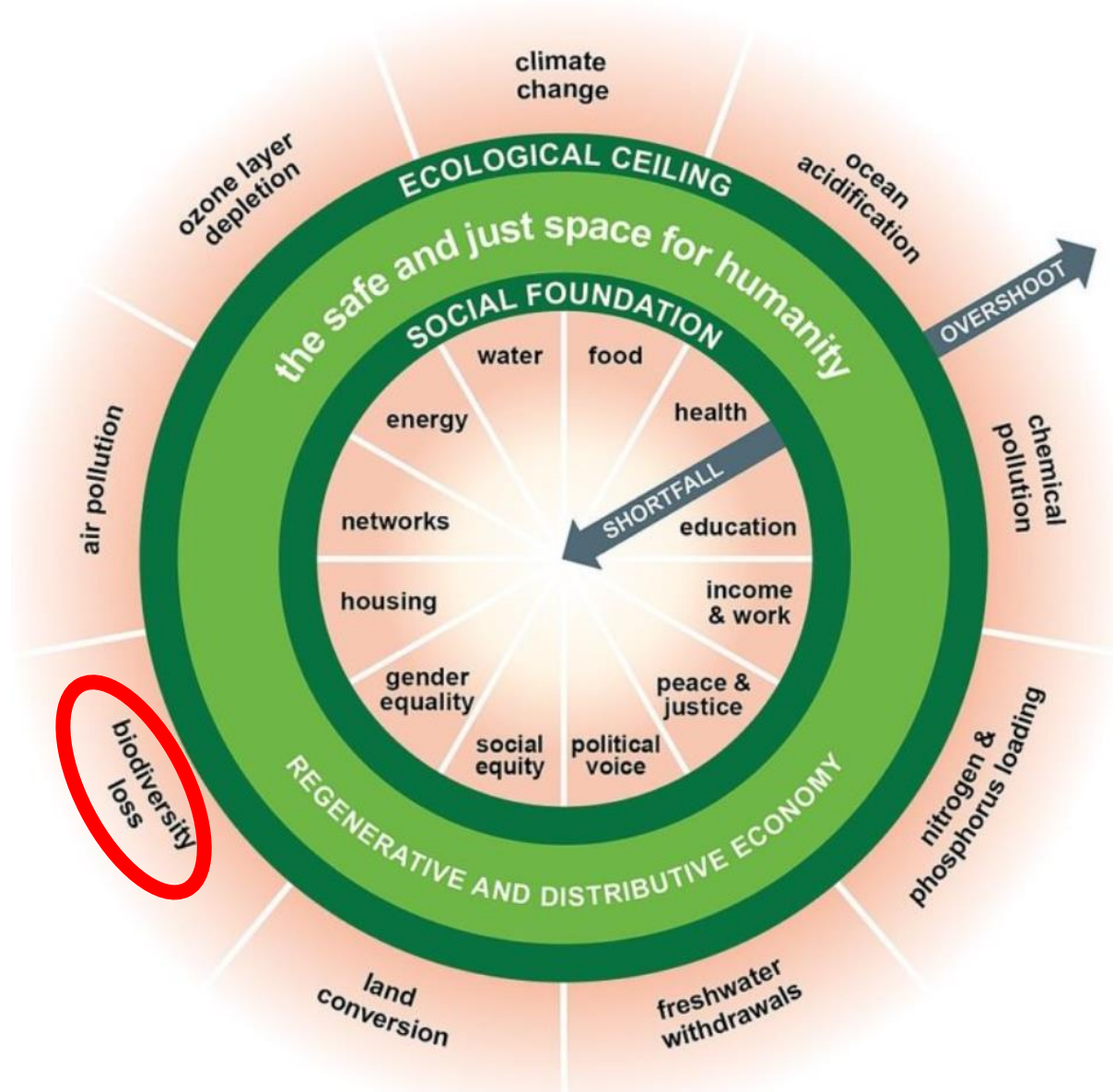
So, what is the answer to this difficult balancing act between human prosperity and protecting nature? We have to accept a certain amount of land use for agriculture and other forms of necessary production to cater for basic human needs. However, when does the toll of this production become too great and therefore unsustainable?

The commonly accepted definition of sustainability is meeting the needs of today without compromising the ability of future generations to meet their own needs²⁹. It is this compromise that scientists at the Stockholm Resilience Centre attempt to capture with their Planetary Boundaries model (see page 3 of this report).

The environmental economist, Kate Raworth, goes beyond this to suggest how the planetary boundaries can be used as an environmental ceiling but we must also consider a social floor which ensures equitable and safe societies living within planetary thresholds.

²⁸ <https://rspo.org/about>

²⁹ Brundtland Commission – “Our Common Future”



30

Palm oil is an interesting case that exemplifies the struggle between the social foundation and environmental limit of resource use. This important agricultural commodity is widely used and provides employment to many communities, but the history of environmental and social abuse still tarnishes the reputation of growers, processors, and buyers of the oil. This has led to the establishment of the Roundtable on Sustainable Palm Oil (RSPO) in 2005. The RSPO developed a set of environmental and social criteria which companies must comply with in order to receive RSPO accreditations for their products. An RSPO Credit is proof that one tonne of certified palm oil was produced by an RSPO certified company or independent producer and has entered the global palm oil supply chain. By purchasing credits, buyers encourage the production of certified sustainable palm oil.

³⁰ 'Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist' – Kate Raworth

The credit symbol can be found on products made using oil that has met RSPO standards for sustainability:



When they are properly applied, the RSPO criteria can help to reduce the ESG risks associated with the sector. One of the most important RSPO criteria states no primary forests or areas which contain significant concentrations of biodiversity or fragile ecosystems, or areas which are fundamental to meeting basic or traditional cultural needs of local communities (high conservation value areas), can be cleared. Other RSPO principles stipulate fair treatment of workers according to local and international labour rights standards, and the need to inform and consult with local communities before the development of new plantations on their land³¹.

Only by being RSPO-certified by an independent auditor approved by the RSPO can producers claim that they produce, use and/or sell sustainable palm oil. M. P. Evans have been audited and certified by the RSPO for a number of years and we were able to talk to CEO, Matthew Coulson about how this process has influenced the company's approach to biodiversity and the protection of the ecosystems on which they rely.

We wanted to hear about the RSPO certification process first hand. We had previously spoken to other companies about the organisation as part of our 2018 Supply Chain Investigation and wanted to know whether the M.P. Evans experience differed from our previous engagements and how recent changes had affected the business. Matthew explained the thorough nature of the audit process and some of the nuances to receiving the accreditation. The mills are accredited and the supply base for each assessed as part of this audit. The plantation areas managed by the Group were included in the accreditation, but not those owned by independent smallholders who supplied crop for processing in the Group's mills. In 2019, the RSPO introduced an "Independent Smallholder Standard" with the aim of increasing smallholder inclusion. Matthew explained that the Group has been supporting smallholders in obtaining their own certification.

The RSPO assess biodiversity risks as part of their audit through establishing where High Conservation Value (HCV) areas on the land and where there are High Carbon Stocks (HCS). As well as looking at how the companies are respecting HCV and HCS areas today, RSPO will review the history of development to ensure that inappropriate land conversion has not taken place in the past and look at the conservation value of the land to assess opportunities to enhance biodiversity. This has affected M.P. Evans and their plantation in Musi Rawas, Indonesia. The company had purchased a development that was planted on a former rubber plantation. However, due to the need to demonstrate that the area was suitable for ongoing cultivation, the company paused operations for 18 months in order to ensure that the RSPO requirements were met.

Matthew also talked about the improved governance procedures within Indonesia when it comes to awarding land entitlements to companies. In order to begin development, companies must engage in discussions with the local community and conduct separate ecological surveys. There have been cases of criminal prosecutions by the state where protected lands have been

³¹ <https://rspo.org/about#about-sustainable-palm-oil>

cultivated without the appropriate permissions, which indicates an increased willingness to act on breaches in environmental protection laws by the country. This point ties into a criticism that we have heard of the RSPO, the organisation needs to balance the political interests in the countries in which it operates as well as considering the interests of members. We put this to Matthew, and he agreed that the need to think about the commercial interests of members and balance this against its vision of achieving a sustainable palm oil industry is not perfect. However, despite this they have advanced sustainability amongst the sector and all changes made to their requirements had tended towards making them more stringent and therefore the accreditation harder to obtain. Regarding political interests, Matthew thought that the RSPO and the countries in which it operates most widely tend to be pushing in the same direction, as evidenced by the enforcement of laws relating to land conversion.

Beyond the requirements of RSPO, Matthew discussed some of the other methods they use when ensuring that their environmental footprint is well-managed. The company uses independent ecological consultants as well as internal sustainability professionals who are resident at all sites to patrol conservation areas daily. They have also made use of satellite imagery to monitor HVC areas and use drones to help ecologists view large swathes of land from the ground and prevent encroachment.

M.P. Evans have embraced a zero-waste model at their mills. The Group produces compost from empty bunches, a waste product in its mills. Using compost reduces the need for inorganic fertilisers and helps the Group in its aim to minimise the use of organic and inorganic chemicals. In addition, other organic matter that would otherwise go to waste water treatment ponds to decompose is used in a biogas generator. The Group's mills in Kalimantan and Bangka capture methane from mill effluent. This methane is used to fuel an engine which generates electricity for office compounds and housing in workers' villages in the vicinity of the mill, giving rise to a significant reduction in the use of diesel for the generators which would otherwise have been needed. The Group sells surplus electricity to the state electricity company in both Kalimantan and Bangka. The use of circular economy principles to reduce reliance on finite resources is evidence of holistic thinking on environmental protection.

Matthew also spoke about the importance of engagement with local communities. While receptiveness varies from place to place, their influence tends to be more powerful in areas where they have operated for a long time and built-up trust with local people through years of respectful dialogue and the offering of employment opportunities. He also stressed the importance of smallholder programs; they have supported the foundation of a number of cooperative schemes where M.P. Evans manage the land. This mutuality underpins the shared interest between M.P. Evans and local communities.

Matthew was also very forthcoming about the challenges the business faces when it comes to managing their sustainability commitments alongside the need to plant, harvest and process their crop. The main challenge is bringing everyone along and striking the right “tone from the top” to emphasise the importance of sustainability to the business model. Nevertheless, there is sometimes tension between the plantation managers who want to cultivate land and improve yields and the sustainability professionals who wish to uphold the need to protect biodiversity. This is an ongoing issue that requires careful management.

The company currently do not have any goals or targets in place when it comes to future biodiversity protection and restorations, but these are in development. They are also reliant solely on RSPO certifications as a third party for their biodiversity risk verification. As a result, we were keen to see if M.P. Evans would be open to trialling the IBAT STAR data on their locations to potentially identify new risks and opportunities. Fortunately, Matthew thought that this would be an exciting prospect and so agreed to undertake the mapping exercise as a new

way of assessing their exposure to biodiversity loss and conservation that could feed into future target setting.

Following advice from Dr Hawkins, we were able to speak to Ben Jobson at the IBAT Alliance to discuss how we could further this project. STAR combines data on species, the threats they face and their risk of extinction, to produce two scores that companies can use to direct their conservation efforts, these scores are: threat abatement (STAR_T) and restoration (STAR_R). This amounts to the biodiversity risks (STAR_T) and opportunities (STAR_R) that any particular operation is exposed to. These can be used to identify areas where actions to address threats to local species or undertake restoration can help reduce species extinction risk and contribute to conservation goals. High STAR_T scores indicate areas that currently contain relatively high numbers of threatened species, a large proportion of individual species' ranges, and/or species that are severely threatened³². Where there is the potential to make a large contribution to global conservation efforts, companies are given a high STAR_R score to indicate that there are opportunities that they could pursue to lower extinction risk through habitat restoration.

The scores are generated using global data and are standardised to allow comparability between different countries and locations.

We are now in the process of uploading the detailed information about the M.P. Evans plantation locations into the STAR database to develop species threat abatement scores and restoration scores for the company. This unites the IBAT database and detailed IUCN data on threatened species with the corporate actors who are willing to use the information to advance their sustainability strategy. You can read more about the STAR metric and its relevance for business on page 16 of this report.

Below is a sample from one of the STAR reports showing how data for a specified area of interest is used to categorise that area from Very Low to Very High in terms of the potential impact on species present as well as the opportunity to restore habitat in order to promote biodiversity. These “heat maps” can be used to identify where resources can be deployed to result in the most material positive impact and help to set science-based targets for contributions towards global biodiversity goals in the future. The anticipated release of a finalised definition of nature positivity from the IUCN should help with the establishment of such goals.

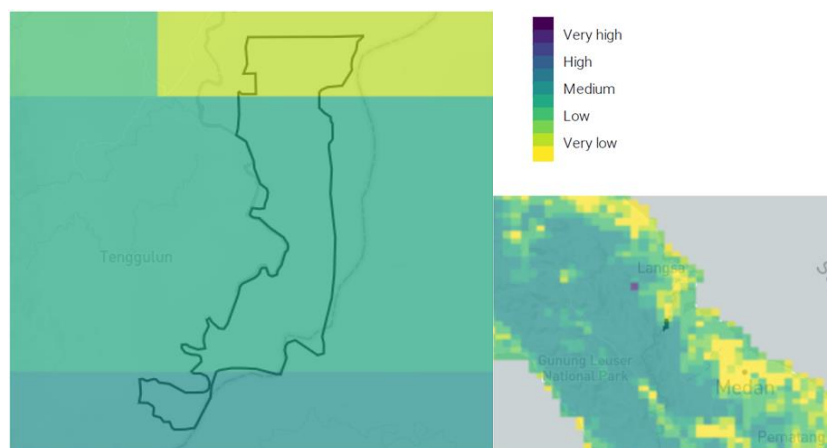


Figure 1: STAR Threat Abatement map for Area of Interest. Grid cell score categories range from Very Low to Very High. Note that low scores do not mean that there are no threatened species present. Grid cells are at a 5 km resolution.

³² <https://www.ibat-alliance.org/pdf/star-business-user-guidance.pdf>

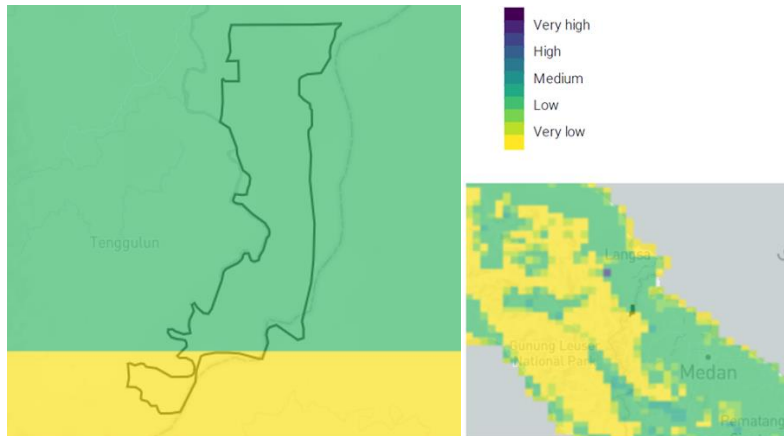


Figure 2: STAR Restoration map for Area of Interest. Grid cell score categories range from Very Low to Very High. Grid cells are at a 5 km resolution³³.

The colour key for the figures is the same, ranging from a deep purple to signify higher levels of threat/opportunity to yellow to show low levels.

Conclusion: Our engagement with M.P. Evans on how they currently approach biodiversity and their plans for the future has been very informative, particularly with reference to the influence of the RSPO and their current obligations for maintaining the accreditation with this organisation.

We're grateful for the efforts of Matthew Coulson, Ben Jobson and Frank Hawkins in helping to make use of the IBAT STAR framework. We look forward to providing our feedback from an investor perspective alongside the views of M.P. Evans to the IBAT in order to further the STAR project. We will continue to participate in the trial and hope the results will be mutually beneficial to all stakeholders involved.

We hope that our work with M.P. Evans will help in the development of their approach and hope to see forward looking targets on biodiversity and net-nature positivity in the future.

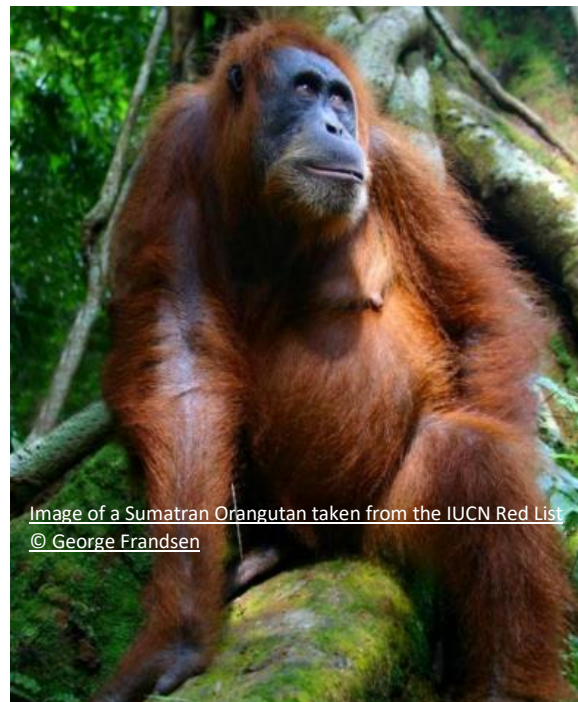


Image of a Sumatran Orangutan taken from the IUCN Red List © George Frandsen

³³ IBAT STAR Report, 2022. Generated under licence number 30312-34031 from the Integrated Biodiversity Assessment Tool on 5/09/2022. <http://www.ibat-alliance.org>

Ameresco

Whilst companies such as M.P. Evans have already sought external verification of their nature conservation approach from specialist third parties, we find that the majority of companies tend to consider biodiversity on an ad-hoc basis. One such company is Ameresco, a leading cleantech integrator and renewable energy asset developer, owner and operator. Their portfolio includes energy efficiency, infrastructure upgrades, asset sustainability and renewable energy solutions delivered to clients throughout North America and the United Kingdom. Whilst their services mean that the company are well placed to take advantage of the opportunities offered by a transition to a greener economy, we wanted to discuss the management of ecological impacts when undertaking new projects.

Following a site visit to see the company's operations in the US, we were told that local regulation usually dictates the approach taken to risk assessment. Analysis of the potential damage that could be inflicted on natural resources is necessary to receive the correct permits prior undertaking their work. For solar farm assets in particular, their plans are not in greenfield sites and so the considerations regarding biodiversity were usually less stringent, but they need to put mitigation plans in place that approvals are dependent on. In most cases, the plans need to demonstrate how they will "leave the site better than when they found it" via their remediation proposals.

On occasion, the potential mitigation plans have been prohibitively expensive, and this has led to a change in the selected site because of the delicate local ecology in favour of a site with fewer protected species.

Ameresco were able to share numerous examples of ecological assessments that they had conducted to provide further colour on the types of considerations that play a role and the lengths that the company go to in order to protect local wildlife.

Animal protection examples:

Blanding's Turtle Protection - In cooperation with the Massachusetts Natural Heritage and Endangered Species office, Ameresco installed a turtle exclusion fence to protect the Blanding's Turtles when building a solar project in Massachusetts.

Elk and Mule Deer Habitat - Ameresco funded a habitat improvement project for elk and mule deer at a location outside of a project site in Colorado.

Fruit Bat Habitat - An environmental study completed for one of the company's Illinois solar projects resulted in guidelines to protect the migration of the Indiana fruit bat. They avoided tree trimming during the months of migration in order to provide a habitat corridor for the bats to use along their route. These practices have been repeated across several projects in Massachusetts.

Eastern Box Turtle Habitat Protection - In order to protect Eastern Box Turtles during a solar project construction in the Northeast, Ameresco installed a turtle exclusion fence to keep turtles from entering the work area. The company's inspectors routinely performed manual sweeps to ensure turtles were safely removed prior to activity.

If an active nest was found during a nature survey, the biologist would advise on a buffer distance for adjacent construction activities. Once the nest was inactive, construction was able to resume within the buffer area.

Ameresco was able to schedule construction to occur during periods of lowest sensitivity to wildlife and Species at Risk where practical (i.e., October to April).

Pollinator Gardens - A solar project in Iowa will include more than 6 acres of pollinator gardens, adding to the overall sustainability impact of the project locally. Ameresco have implemented pollinator gardens in additional projects in the Northeast.

Prevent Spread of Invasive Species - One of the major threats to biodiversity is biological invasions caused by alien invasive species. The impacts of alien invasive species are immense, insidious, and often irreversible. They may be as damaging to native species and ecosystems on a global scale as the loss and degradation of habitats³⁴. An environmental study gave Ameresco guidelines to thoroughly clean and inspect construction equipment transported onto a project site in Canada. This ensured that no vegetative matter or seeds were attached to the equipment. This was achieved through high pressure water wash prior to transport. Construction equipment was routinely inspected and cleaned as necessary to prevent the risk of spread of invasive species.

Conclusion: Whilst these projects provide interesting insights, it seems that Ameresco take a “case-by-case” approach to protecting nature. It would be nice to see the business develop a policy and company-wide targets to ensure consistency and cement an ambition to protect biodiversity that goes beyond regulatory requirements. Ameresco provide an important example of how corporate biosphere protection is currently seen by many companies, namely a problem to solve as and when it arises. In the future, we hope to encourage a more proactive and coordinated approach amongst investee businesses.

³⁴ <https://www.iucn.org/resources/issues-brief/invasive-alien-species-and-climate-change>

Conclusions

With no consensus amongst experts, researchers, and academics on how biodiversity should be measured and preserved, it is difficult to come up with a template on what best practice looks like. This makes the assessment of our investee companies' efforts difficult at this point, as comparisons can't be drawn, and third-party frameworks are still in development. This is exacerbated by a lack of disclosure. Despite being in the midst of a biodiversity crisis, this is not an issue that is widely reported on by companies within our approved list and seemingly in general. However, like the response to the climate crisis and greenhouse gas emissions (which is inseparably linked to ecological damage and species loss) companies will face increasing regulatory and investor pressure to react. The TNFD hope to be able to provide a disclosure framework for businesses to start planning a transition pathway to a nature positive future. In addition, new regulation such as the EU taxonomy, hope to provide clarity over what must be done to prevent degradation of natural resources and define sustainable activities in this regard.

The main challenge is achieving the ecological complexity needed for nature to restore and revive. This is a more difficult feat than aiming for a reduction as with other environmental goals. It is only by having a huge array of ecological interactions between plants, animals and their surrounding abiotic environment that we can achieve healthy ecosystems. Unlike net zero (the aim for GHG emissions) net nature positive is more difficult to envision. Biodiversity cannot be manufactured and so how we might go about enhancing the natural environment to cultivate a thriving habitat is hard to replicate from place to place. It is this lack of a commonly accepted definition of what a "good level" of biodiversity is that often acts as a stumbling block.

However, this should be seen as an exciting opportunity rather than an insurmountable barrier. We have seen that some companies already have processes in place to preserve the natural environments on which their operations rely. While some wait for a commonly accepted best practice to emerge, others benefit from being the first to act. It can be a daunting task but delaying until it is possible to achieve "perfection" means that companies are too late. The development of an ambitious and effective corporate sustainability programme is an iterative process which can be adapted as new frameworks and regulation emerge.

Our message to companies is, **"start now or be left behind"**. Regulation is around the corner and investors will be placing increasing pressure on businesses to do their bit, to recognise their reliance on nature and their role as protective stewards. It is also worth remembering that evolution, as well as being an important biological process, is essential for managing ESG risks and taking advantage of opportunities. **Adapting an existing approach to meet emerging best practice is far easier than starting from scratch to meet regulatory standards as they are imposed.**

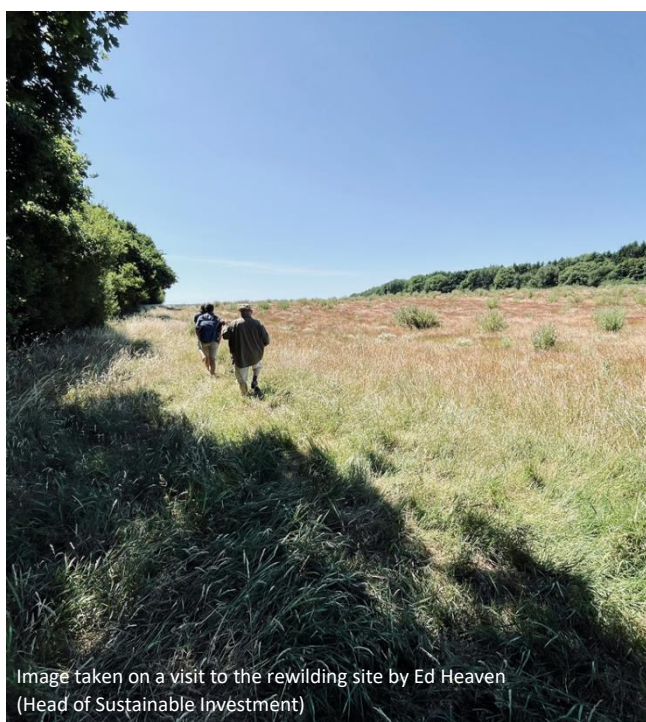
What is Montanaro doing?

Other than ensuring that the companies we invest in are trying to seek out opportunities to contribute to nature and are avoiding harm, Montanaro are conserving biodiversity in a number of ways:

- **Rewilding Britain**

Our latest charity partnership is with Rewilding Britain, an organisation taking restoration of ecosystems to the point where nature is allowed to take care of itself. Rewilding seeks to reinstate natural processes and, where appropriate, missing species – allowing them to shape the landscape and the habitats within. It is focused firmly on the future although we can learn from the past.

Our funding to Rewilding Britain will support its “Rewilding Network”, a network of rewilding projects across Britain that provides support, education and guidance to those undertaking rewilding projects. The support we provide to the Dorset Wildlife Trust will help to restore the River Sherford in Wild Woodbury. This is a flagship rewilding project, not only for the Trust (it is their biggest ever large-scale rewilding project), but for the country too.



Covering an area of 170 hectares of farmland, acquired by the Trust last year, the project aims to restore woodland and wetland habitats across the site, reducing high nitrate levels in the local waterways and preventing them from entering Poole Harbour, located at the river’s mouth.

From a national perspective, the Wild Woodbury project is unique: it is the country’s first community rewilding project and will provide opportunities for people of all backgrounds and abilities to play a key role in helping to create a new space for nature, including the Montanaro team.

- **Connection with Indigenous populations**

Biodiversity indicators show declines of 30% less and 30% more slowly in Indigenous lands than in lands not managed by Indigenous people³⁵.

Local communities and Indigenous peoples play a critical role in safeguarding nature and protecting and restoring ecosystems. This is often due to the direct connection they have to the natural environment, rather than the built one.

³⁵ https://www.researchgate.net/publication/333775295_Chapter_22_Status_and_Trends_-_Nature_IPBES_Global_Assessment_on_Biodiversity_and_Ecosystem_Services

The practices of Indigenous peoples and local communities have proved highly effective for the wider protection of ecosystems through their knowledge, culture, and institutions.

Our founder, Charles Montanaro, established Tribal Survival in 2014 – a UK-registered charity which aims to promote the wellbeing of indigenous people across the world. Charles is an anthropologist by training and has visited remote tribes across the world for decades. Ever increasing resource pressures are placing stress on the lives of those fighting to retain their ancestral lands, customs, and traditions. With support from the World Health Organisation, Tribal Survival has sponsored a number of trips to distribute medication to remote tribes. In so doing, there are environmental benefits to the preservation of indigenous communities as well as social and cultural positive outcomes.

- **Urban pollination**



Around 4 out of 5 wildflowers and crops need animal pollination and 75% of global food production depends on animal pollination³⁶.

Bees are important insect pollinators, but their populations are declining for a number of reasons, mainly due to disease, pesticides, and a lack of food.

Urban horticulturalists have less need for agrochemicals that can be damaging to bee health. As a consequence, bees can thrive in urban environments particularly where pollinator friendly plants are prevalent in parks and gardens.

Montanaro have increased the bee population of central London by housing hives on our office roof.

Members of our sustainability committee were able to visit the bees with the Montanaro apiarist!

³⁶ https://ec.europa.eu/commission/presscorner/detail/en/fs_22_3749

Glossary

- **Biodiversity** - The variability among living organisms from all sources, including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.
- **Biome** - Global-scale zones, generally defined by the type of plant life that they support in response to average rainfall and temperature patterns e.g., tundra, coral reefs, or savannas.
- **Dependencies** - Aspects of ecosystem services that an organisation or other actor relies on to function. Dependencies include ecosystems' ability to regulate water flow, water quality, and hazards like fires and floods; provide a suitable habitat for pollinators (who in turn provide a service directly to economies), and sequester carbon (in terrestrial, freshwater, and marine realms).
- **Ecology** - the branch of biology that deals with the relations of organisms to one another and to their physical surroundings.
- **Ecosystem** - A dynamic complex of plant, animal and microorganism communities and the non-living environment, interacting as a functional unit.
- **Ecosystem Services** - The contributions of ecosystems to the benefits that are used in economic and other human activity.
- **Habitat** - The area, characterised by its abiotic and biotic properties, that is habitable by a particular species.
- **Natural Capital** - The stock of renewable and non-renewable natural resources (e.g., plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people.
- **Nature** - The natural world, with an emphasis on the diversity of living organisms (including people) and their interactions among themselves and with their environment.
- **Nature loss** - The loss and/or decline of the state of nature. This includes, but is not limited to, the reduction of any aspect of biological diversity e.g., diversity at the genetic, species and ecosystem levels in a particular area through death (including extinction), destruction or manual removal.³⁷

About the front cover image:



Sunflower songbird.

The photographer Andrés Luis Dominguez Blanco won the 2021 Young Wildlife Photographer of the year in the 11-14 Years category for capturing a melodious warbler amongst sunflowers.

³⁷ Definitions taken from the Beta TNFD Report <https://framework.tnfd.global/>